

# The Grower

Newsletter for the Association of Scottish Shellfish Growers

October 2021



## Mussels venture on the Cromarty Firth



A further Crown Estate Scotland commissioned report in what has become a series of helpful reports related to the Scottish shellfish industry has just been published. This one looks at the stated ambition of Scottish shellfish to increase production significantly (*see report on page 13*) and how it may be achieved. One idea the authors suggest is to utilise East Coast sites with a view of providing shellfish to slightly different markets than directly to the consumer as at present. Seen above is part of this change in practice as Cromarty Mussels Ltd produce seed mussels for Shetland Mussels Ltd. For full story see Nick Lake's article on page 10. *Above*, the workboat Pegasus all the way from Shetland lays out seed collection droppers in the Cromarty Firth.

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## Lantra training

James MacDonald from Stornaway (*pictured left*) at work for Hebridean Mussels. James seized the opportunity afforded by the Lantra Modern Apprentice scheme. More details can be found about this on page 9.

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# Seafood promotion on Mull

Nick Turnbull

A week of promoting our Island seafood was organised by members of the local community in Dervaig, Isle of Mull. The event was sponsored by the Regional Food Fund, Crown Estate Scotland, Inverlussa Marine Services and Scottish Seafarms.

The week started with an **oyster farm tour** of the Isle of Mull Oysters site in Loch Chumhainn and then a tasting at a local restaurant close to the farm. I was the tour guide and the varied participants included restaurant owners and shop keepers as well as interested holiday visitors. I explained the process of oyster farming from start to finish and of course extolled all the virtues of oysters as a

superfood and an environmental indicator of our local coastal seas.

As expected, there were loads of really good questions from the visitors and Tobermory Fish Co. who sell Inverlussa Mussels and Isle of Mull Oysters in their shop, were particularly interested in the process and oyster details, as the proprietor explained, "My staff are always being questioned about oysters and how they are grown and now we can finally answer their questions."

We were able to find some native oysters under the trestles and I explained how the native oysters differed from the *gigas*. Native oysters have increased in number in the Loch Chumhainn site, due in part to the trestles and oyster bags which have provided shelter for the spat. Indeed, a restoration project with minimum interference.

The tour finished with a 20 minute walk from the oyster beach to the Am Birlinn restaurant, where a glass of wine and plates of oysters were waiting for those who had braved the rather cold, damp day.

*Continued on back page*

*Left; the intrepid group who braved the damp to learn more about shellfish. Nick is identifiable by his yellow wellies.*



## Dates for your diary

EAS Conference  
Madeira

October 4-7, 2021

NORA 4

**NOW** Online—see page 17

November 23-25, 2021

NSA Triennial - Aquaculture 2022  
Town & Country Resort and Convention Center  
San Diego

February 28 – March 4, 2022

Aquaculture UK, Aviemore  
May 3-5, 2022

**ASSG Annual Conference**  
**Corran Halls, Oban**  
**October 6-7, 2022**

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# CEO's Column

## Nick's Notes

### *Mad mad World*

It is a crazy world at present and only a mad man could seek to explain the daily soap opera in terms of what shellfish can do to restore the resilience of humanity – so here goes!

If residing in the UK the irony will not be lost regarding the fact that due to a shortfall in energy supplies and specifically the rise in natural gas prices, two agricultural fertiliser plants have shut down. This in turn has seen a shortage of the by-product from the manufacturing process – carbon dioxide. We of course have become dependent on CO<sub>2</sub> to enable our salad leaves and ready sliced carrots in their plastic bags to have a shelf life measured in millennia (OK slight exaggeration - weeks)! Lifestyle dictates of course that we have come to expect this rather than select fresh and seasonal products – like whole carrots in a brown paper bag from the greengrocer (or indeed Sainsbury's or Morrisons – other supermarket outlets are available).

These same types of lifestyle choices are of course going to be the subject of endless debate over the next couple of months ending with a “what can we get away with regarding greenhouse gas emissions” outcome from the leading nations (except China?) meeting in Glasgow at the end of October. Surely a shortage of CO<sub>2</sub> preventing its release from plastic pre-packed vegetable bags could be seen as a major contribution made by the UK in this regard? Hence, we are ahead of the game in the UK as usual. However, in Scotland woe betide anyone who thinks we will drink our Irn Bru uncarbonated!

### *Good COP / Bad COP*

The climate change discussions will continue at the COP26 event. Obviously, it must be considered by those planning to be present in Glasgow as likely to be a good COP as there have been numerous before, and they seem to continue to attract a world-wide audience. Those in the limelight will want to be seen as virtuous in how they intend to reduce their greenhouse gas emissions and thus be good social partners, with only the best interests of the planet at heart? In the order of 20,000 delegates will attend and presumably there will be a similar number of individuals for policing and protesting at the event? Possibly the light refreshments are the major draw at these gatherings (sans CO<sub>2</sub>?) as it is difficult to see much progress being made on any matters of substance? Climate change for the next millennia now appears to be locked in, and the debate really needs to move to economic and social resilience in the face of the magnitude of the challenge.

The Glasgow event will only be a bad COP if we let a bunker mentality set in. It is really important that the doom-mongers do not predominate – the planet will not disappear in a ball of fire. It did pretty well before *Homo sapiens* came to dominate and I am sure it can still be a wonderful World if we get our act together and show our inbuilt resilience and adaptability. Extremely importantly we should not be scaring younger



*Dr Nick Lake, CEO of the Association of Scottish Shellfish Growers (ASSG)*

generations about the perceived futility of their futures on a planet severely abused by their forebears.

Fundamentally climate change is an economic issue. I would suggest that it will be another 10-15 years before most of the governments in the leading industrialised countries begin to take it seriously. It will be the G20 nations at that time that ultimately will need to agree to scale back our excesses. The intervening period is likely to be dominated by each trying to secure access to the maximum quantity of natural resources to sustain their economies.

Unfortunately, climate change emissions are simply a symptom rather than the underlying cause of our current predicament. Target setting is fine but tends to distort goals with delivery a major problem if you want to be a leading industrialised nation (or more importantly want to win the race to be THE leading industrialised nation?). Easy fix solutions just throw up more problems. Ergo – let's lurch into the electric vehicle cul-de-sac. Well, looks like a good idea for the UK – but our current importation of lithium for batteries is around 2000 tonnes – to sustain our current car industry changing to producing solely electric vehicles we would need possibly 75,000 tonnes.

Cornwall may see a resurgence of its mining past changing from copper and tin (which the Romans came over for – not the weather and wine as some may think?) to lithium - and if successful this may ultimately supply 30,000 tonnes. But processing ore is a dirty business. I am not sure all those who visualised a “Poldark” romantic novel depiction of Cornwall when they purchased their weekend holiday homes will appreciate the face of the region being brutalised to supply lithium in order for the masses to travel around by car?

### *Nuclear submarines and trade deals*

Then of course there is the issue of where does the other 45,000 tonnes of lithium appear from? China is the leading processor of the ore. Thankfully the USA also has historic investment in lithium-ion battery production and there are large quantities of ore in South America as well as national reserves – so not far to ship it. We can probably do a beneficial trade deal as they are one of our oldest allies (well possibly – and definitely since they gained independence from the British Crown - an act ably supported by France at the time? My knowledge of history is of course reliably based on the film – Dancing with Wolves!)

If it is the case that the USA does not have any spare battery capacity for us, we can always access batteries to

## CEO's Column cont.

power our cars on the international market. However, that means someone else may be controlling our ultimate industrial output – not a comfortable place to be if you are a politician? Hence - let's get our access to resources agreed through trade deals with our allies and secured through perceived intent (nuclear submarines policing the trade routes?) in order that we can meet our future targets for greenhouse gas emissions?

The immortal words of a former president of the USA neatly summarises the priority for any industrialised nation "It's the economy - stupid". The BRIC countries are also intent on ensuring they can access the resources they need to not be disadvantaged in seeking to develop their own economies. If carbon has to be used to do this - well that just follows those already successful industrialised nations.

Valuing natural resources has been deficient in most of our world governance policies in the past and there is a complete disjoint between the amount of money circulating within the world economic system and the inherent value attached to any natural resource. In essence there is a dilemma for the national politicians within the western industrialised nations when it comes to tackling the cause of climate change. The conundrum is currently that of skilled labour being too costly and natural resources being too cheap. To change this, politicians within each and every industrialised nation would have to commit political suicide by suggesting to their electorate that the only solution would be to reduce their general standard of living. Not a great vote winner – but one potentially likely to occur when we are all really up against the wall with climate change impacts. But of course, in those countries not subject to a democratic decision process this action can be taken by the state at the appropriate time to maintain their world economic position?

### **Shellfish**

So, where the heck do shellfish fit in all this, I hear you ask after reading through these assertions? Good question!

Like many issues in this seemingly dysfunctional world individuals only have direct control over their own actions. The UK contributes approximately 1% to the world's greenhouse gas emissions and so regardless of our good intent we have to rely on or encourage others to follow a reasonable course of action for the widest benefit of all humanity.

Within the UK we have been exceptionally lucky (throughout history) to be surrounded by productive waters and a range of natural mineral resources virtually unrivalled in the world. Clearly if we are to develop our national climate resilience, we need to optimise the use of our available space and assets. The natural capital of these assets is only just beginning to be realised and factored into Government policy and decision making. In the marine environment there needs to be a genuine desire to both understand and embrace change rather than seeking to maintain a perceived and largely unrealistic marine environment status quo.

If I were a betting man and given all the current evidence available, I would suggest that in the not-too-distant future we are likely to lose the Gulf Stream (more scientifically referred to as the Atlantic Meridional Overturning Circulation AMOC) which has been responsible for shaping the current fauna and flora not only of the Scottish west coast but the climate of the UK and beyond. We could end up with a regime more akin to Atlantic Canada – warmer summers and possibly stormy and colder sea ice winters. While this would undoubtedly cause issues, we should still be able to cultivate shellfish as the underlying environmental conditions of primary phytoplankton production will remain - but likely vary in distribution and intensity.

Shellfish cultivation along with seaweed farming are forms of regenerative aquaculture. Because we have a productive and dynamic marine ecosystem the species available may change with time, being both resilient and/or potentially susceptible to physio/chemical disturbances. The key point is that our aquaculture production relies on a healthy marine ecosystem capable of supplying seed and feed with a degree of consistency. We can contribute to seed supplies through hatcheries (or optimising collection as noted in the article on Cromarty Mussels elsewhere in this issue of The Grower) but we are fundamentally reliant on natural



Above; Richard Tait and Nick Lake seen aboard the workboat Pegasus on the Cromarty Firth. Full story on pages 10-13.

primary production - micro algae/phytoplankton.

Healthy and productive and biologically diverse are all key elements of Scottish Government Policy when it comes to the safeguarding of the marine environment. Of utmost importance is that we guard against

## CEO's Column cont.

pollutants and waste streams contaminating our coastal waters.

The imposition of a £90M fine on a water company in England recently for the prolonged and deliberate release of sewage into coastal waters was a clear indication of the potential to cause harm. But obviously also a commercially cost-effective way of getting rid of waste if you don't value the environment and can get away with it for long enough without getting caught? Who had to drive the powers that be to actually take notice of this gross pollution? Was it the environmental regulator, or other public agencies? Did the Water Framework Directive or any other of the nature conservation regulations adopted from our time in the EU come into play? No, it was fundamentally – the shellfish growers who were impacted!

Climate change will magnify the potential for such waste discharges and especially such anthropogenic contaminants. (Cornish mining has in the past caused gross changes to water resources – the Red River at Gwithian Sands being a graphic example from my youth. Named Red River because of the mine working waste, with a resultant plume clearly evident well out into the bay. Will lithium processing be cleaner when the

urgency is on to tackle green-house gas emissions?). Risks from man-made pollutants and chemical discharges are all too evident (including hydrocarbon-based fertilisers for agriculture and potential for eutrophication of water courses - which neatly takes us back to the current shortage of by-product CO<sub>2</sub> issue!) with such contaminants often freely consented by our own environment agencies, and even oil spills from shipping accidents are likely to increase due to stormier conditions. These and many other issues can and will undermine our potential to maintain a productive marine environment capable of consistently delivering high quality protein for human consumption.

Molluscan shellfish have always been used as a primary indicator species for the health of the marine environment. Cultivated shellfish are particularly suitable as the owner/operator has an investment in maintaining their health.

If there is a take home message from all this it is that we have to anticipate change and invest accordingly. Regenerative aquaculture would appear to supply part of the solution provided we start to build in to our future policy making the natural resource value.

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Tim Reed, President, CEO and Founder of Reed Mariculture, Inc.

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## CEO's Column cont.

### *Investing for the future*

I am extremely pleased to say that help and guidance is at hand for how public policy should consider investment within our sector! The arrival on my desk of a recently completed MSc thesis by Hannah Fougner at the University of Edinburgh, entitled: Is Sustainable Blue Finance Suitable for Mobilising Investment for Scottish Bivalve Aquaculture? – gives the answer. I hope that Hannah will be able to have a short piece in the next issue of The Grower to provide an encouraging read at Christmas!

### *Departing tribute*

On a personal note, you will see elsewhere in this edition a tribute to John MacMillan who was a keen advocate of shellfish, their cultivation and the joy of diving in Scottish waters! John was the Shellfish Officer and lead diver at the Ardtoe field station in Argyll, where I pitched up as an MSc student intent on discovering how many cultivated scallops could be consumed by crabs! Never a one to complain and always willing to take on a task given his previous career in the Royal Navy; John was great to work with – despite my desire to destroy the shellfish team's hard won scallop stocks! Much of the early trials work with shellfish cultivation at Ardtoe was

backed up with John's input and diving skills. I am sorry that we have lost John and his advocacy for all things shellfish.

### *Date for your diary!*

In the words of the immortal DREAM song – Things can only get better! Hence, we have identified a date for the next ASSG Conference.

**ASSG Annual Conference - 6<sup>th</sup> and 7<sup>th</sup> October 2022 - Corran Halls, Oban.**

Please get this date in your diary along with our Annual Dinner on the evening of the 6<sup>th</sup> October (venue to be confirmed)

The only things standing in our way is the requirement for all to have the Covid vaccine and our insurers rules at the time on hosting a face-to-face event based on Government Guidelines!

All the best

Nick



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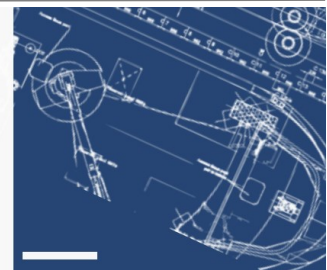
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# Letters *via* the Editor

## From Lawrence Eagling

Dear Shellfish farmers and interested parties,

My name is Lawrence Eagling, I'm a biologist and documentary filmmaker, currently outlining a documentary film on oysters (subject to funding) and I would love to feature your operations. My aim is to explore the history of oysters as an important food source and to showcase UK oyster fisheries and farms (both native and non-native species) as an exciting food grown on our doorstep. This will showcase the benefits for food security by buying shellfish locally, highlight the environmental benefits of healthy oyster beds, and show some of the research going into native oyster restoration. As so many people seem to think good seafood is something we only get on holiday abroad, (missing the wonderful local options right here in the UK!) I would like to highlight the quality of our locally grown shellfish.

Before I began making films, I spent 8 years working in fisheries and the marine environment. My PhD thesis was based on the native oyster fishery in Loch Ryan where I spent a bit of time working the grounds to better understand the fishery and collect data. I've given talks at numerous conferences about my research including at the ASSG conference in Oban, and I'm very passionate about the oyster industry across the UK which is why I am so interested in making this film. I feel that this is an important topic particularly now with the likes of Brexit and Covid affecting the industry and the increasing effort put into restoration. As a lot of our shellfish is currently sent abroad for consumers, I hope that this film will help to raise public awareness of our oysters and encourage more people to eat them locally. It will aim to explore local stories and amplify differing voices across the industry.

If you might be interested in this project, I would be really keen to hear from you. I'm looking to interview a range of stakeholders so your involvement might be



meeting me for a recorded interview on your farm or fishery, sharing your experience or views on the future, showcasing your oysters, telling stories or local histories. I would love to share the stories of the people behind the product, and use this as a basis to promote and share our wonderful local shellfish.

You can contact me by email ([lawrence.eagling@hotmail.co.uk](mailto:lawrence.eagling@hotmail.co.uk)) and I look forward to hearing from you,

Best regards,  
Lawrence Eagling

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## Good news from Neeltje Jans, Shellfish conference planned



The 7th edition of the **international shellfish conference** will be held on January 20 and 21, 2022, in the Delta Park, Neeltje Jans, South-West Netherlands.

Provided that the Covid measures will allow the meeting in person, the conference offers plenty of opportunities to see each other again and meet new colleagues. In addition to ample opportunities for informal contact, the programme consists of lectures, discussions, poster presentations, pitches and a trade fair for companies and institutions. The “Sustainability award shellfish sector 2020/2021” will also be presented during the conference.

The conference focuses on the shellfish sector at home and abroad. There will be translation facilities provided, both ways, between English and Dutch.

The theme, “*Shellfish as the future protein source*”, addresses the need to find healthy and sustainable alternatives for traditional food sources that are under pressure. Now is the time to discuss what the shellfish industry can contribute to the urgently needed food transition. In how far can we make clear that shellfish are a source of healthy food, produced in a sustainable way. What is their nutritional value and why are they the best alternative? Is it the culture in the natural environment? Is it the natural way of food acquisition, and consequently the low ecological footprint compared to other types of food? Is it the recycling of nutrients, that promotes the growth of their own food - the algae? Can we address the relevance of shellfish in the context of preferences of consumers for healthy food sources?

Yet, it should be acknowledged that traditional European farming areas have limited capacities to fulfil needs of a growing market. New rules also apply for the shellfish industry, like severe limits in nitrogen emissions, and space is scarce due to competing claims. Going offshore is a major challenge to sustain future production, but technology as well as new management and regulations are still to be developed. Other offshore initiatives such as wind parks, provide new opportunities for cooperation, and this asks for both technical and management innovations. The shellfish industry is on the edge of new perspectives of product demand for healthy and sustainable consumption, as well as for new production technologies and management.

On day one of the conference the focus is on shellfish as a healthy and sustainable food source, and on day 2 the focus is on how this can be achieved in terms of regulations, space, technology and management.

We strive for a balance between presentations, time for the trade show, and opportunities for informal contacts during extended breaks. Further information is available at [www.shellfishconference.com](http://www.shellfishconference.com)

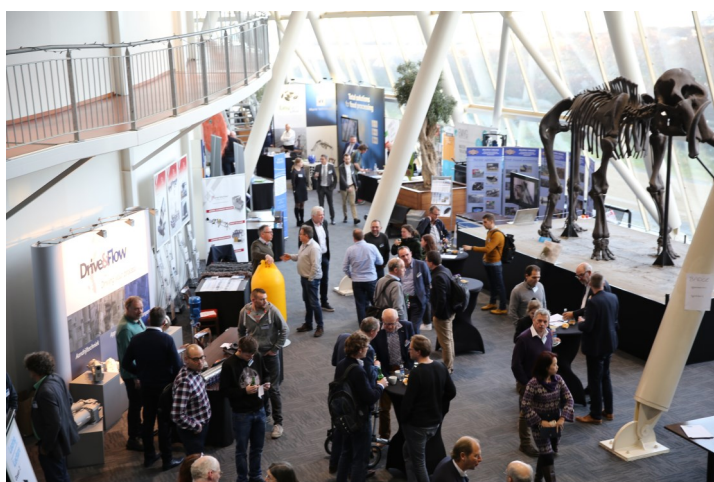
For enquiries and remarks please mail to [info@shellfishconference.com](mailto:info@shellfishconference.com)

We hope to welcome you,  
Jaap Holstein, Jasper van Houcke and Aad Smaal  
Shellfish Conferences Foundation  
September 1, 2021

**Editor's note;** full reports of previous meetings at Neeltje Jans can be found in the The Grower issues of April 2020, April 2017 and April 2015 on our web site at [www.assg.org.uk](http://www.assg.org.uk)

Travel advice supplied earlier in context of NORA 4 can now be used for travel to Neeltje Jans (see April 2021 issue!)

*Below;* a small part of the trade fair which is such an important part of the Neeltje Jans shellfish conference, as seen in earlier years.



## News from Lantra

### Aquaculture Modern Apprenticeship in a Shellfish Production Environment

While 57-year-old James MacDonald from Stornoway might not be most people's idea of a typical Modern Apprentice, he has turned out to be an ideal candidate for the training programme.

After leaving school with no qualifications, James worked in a warehouse and progressed within the retail industry for the next 30 years. He was looking for a new challenge and decided to change careers, joining the Scottish Salmon Company in their hatchery station, then moved on to become Production Manager with Hebridean Mussels, part of The Loch Fyne Group, two years ago. It was here he was offered the opportunity to do a Modern Apprenticeship.



James said, "I completed the SCQF Level 7 Modern Apprenticeship in Aquaculture through NAFC Marine Centre UHI, which is now part of Shetland UHI. Having come from a retail background, I found it really useful to be able to learn in my new workplace, doing everyday tasks. I could then explain situations better to my assessor, as we were in a real-life work environment".

Despite his rural location and COVID restrictions, James was delighted with the support he got from NAFC. He said, "They really were fantastic – if I ever had a question, I could email or call the team at the college, and they were quick to get back in touch. I uploaded my assessments online, which made things easier with feedback when we couldn't physically meet."

James recognises that having the Modern Apprenticeship qualification will help his career in the long run – he said, "My company are really supportive with training, encouraging us to get as many qualifications as possible. I'm so glad I did the course – it helped me immensely, especially coming from another sector. All my previous qualifications from retail were in-house, so having my aquaculture ones officially accredited and recognised by the industry is fantastic."

Kerrie Ferguson, Head of Technical at The Loch Fyne Group, supported James through the Modern Apprenticeship. She said, "James came to us with strong managerial skills, so moving into a role in a new sector came naturally – it was just a matter of applying these skills to an aquaculture environment. There was great



value in him going through the Modern Apprenticeship. It has given him a chance to reinforce what he has been learning in the workplace, but also helped him support others in his team. Having James as a manager buying into the programme means that other staff understand the process and see the benefits it can bring."

"Training is a cornerstone to our business" she added. "It can save money in the long run, makes staff and production more efficient and makes the job more attractive. It is a very competitive job market on the islands, and anything we can add to our offer to new starts in terms of personal and career development means they will stay in the local community. The accessibility of the Modern Apprenticeship is a great benefit to employers, especially for staff in remote areas with no time needed off-site, no need to travel long distances and no age limits, making it accessible to everyone."

Lesley McEvoy of Shetland UHI was James's assessor for the course – she was impressed with his level of work and how he encouraged two of the younger members of his team to participate in the SCQF Level 5 Aquaculture Modern Apprenticeship, which they both completed.

Stuart Fitzsimmons, Aquaculture Training Leader at Shetland UHI, said, "The Modern Apprenticeship programme is a great benefit to shellfish employers and staff as it allows them to achieve an industry recognised qualification. Students can work by distance learning to gain relevant knowledge and skills to enhance their aquaculture knowledge and career, and employers have the benefit of qualified and trained staff."

Modern Apprenticeships in Aquaculture are available through Shetland UHI, Argyll College UHI and West Highland College UHI – for more information, please contact Lantra Scotland ([scotland@lantra.co.uk](mailto:scotland@lantra.co.uk)).



# Cromarty Mussels Ltd. – *Qui venientes viderunt messum*

Nick Lake

No great excuse needed to visit a shellfish site virtually on my doorstep. Given that it was during June and the summer weather was at its height it was a real pleasure to be invited to take a boat trip – which also started at a civilised hour! More about the Latin later?

The Cromarty Firth - on the north-east coast – is an area not typically associated with commercial shellfish cultivation. Such activity tends to focus on the sheltered waters of sea lochs and voes within the Highlands and Islands. The Firth has historic associations with the offshore oil industry and more recently been developed as a suitable base for the construction of renewables rigs for wind and wave energy. With a deep channel and main basin together with extensive shallows and drying areas the port has historically been a major hub for the marine industries. Putting this in context – both the aircraft carrier Queen Elizabeth and a Disney cruise liner were moored alongside at least eight oil exploration rigs when I popped over to grab a look at the Queen Elizabeth during her 2019 sea trials, the aircraft carrier being effectively overshadowed by the height of the liner! The area is a hive of activity and yet has successfully maintained large areas for nature conservation including feeding grounds for wading birds.

The inherent biological productivity of the Firth is evident as in years gone by natural shellfish stocks sustained a finfish fishery using longlines baited with mussels by fish wives, and prosecuted from sailing smacks. (I am unsure if the term “fish wife” is acceptable in today’s PC world – but let’s keep history in context?)

Moving forward a few hundred years and the potential for shellfish cultivation within the Firth was considered. During the 1970s trials with wild shellfish transplanted to the intertidal zone were undertaken by Robert Davie. These considered the performance of rock and native oysters, scallops, mussels, surf clams and cockles.

Oysters grow well within the shallower areas of the Firth subject to the fallout of natural productivity and sediments from the strong tidal flow associated with the deeper water channels. While there is some fresh water input it is primarily from the general catchment area rather than a dominant river input establishing stratified layers.

Such ambient conditions have facilitated two registered shellfish farm sites and businesses being established - and I was able to benefit from a BOGOF day out! Both lie in the area adjacent to the Black Isle (south side of the Firth) and both exemplify innovation of techniques to optimise their performance in relation to the available natural resource.

First stop was the oyster farm site of Alan R. MacKenzie, recently consented to be established with 72 000 linear metres of oyster trestles. Alan worked with Robert Davie for many years and developed the consent for the site on the basis of his earlier trials, and with the secure knowledge of the growth potential able to be exhibited by contained rock oysters. However, establishing an oyster site is a young-persons prerogative (very strong back required!). Hence Alan has also determined to identify the potential for the site to be used for the collection of mussel larvae – which he regards as a valuable and currently wasted asset. Within the freehold oyster farm area there is also the ability to deploy three one-kilometre mussel lines with each supporting four individual long lines deployed for the settlement of mussel spat.

When approaching by boat at what was a low neap tide it appeared similar to a bouchot system except that the upright stakes comprised a cross bar supporting the parallel head ropes and the mussel spat rope was looped from footer to header along a fifty-metre section. (*see facing page*). At the time it was too early in the season (and without my glasses!) to determine if mussel



*Left;* aerial view of the Cromarty Firth showing the area of the Cromarty Mussels Ltd site.

## Cromarty Mussels cont.

settlement had occurred, but looking at the general fauna and flora within the vicinity of the recently established equipment - it looked promising.

Fast forward a few months and there has been a prolific spatfall within the area with the prototype system delivering abundantly seeded lines. One swallow does not make a summer – but this trial has shown the potential of the area to allow settlement of a valuable resource which would otherwise be lost to the wider environment. Seabed sediments in the area are soft mud and sand - indicative of the ambient tidal currents and as such are unsuitable for natural mussel settlement on the seabed or the formation of mussel habitat. Even if they did establish, the amount of cast shell of crabs able to be seen through the water in the vicinity, indicates that predation pressure on settled spat would likely be over whelming. Hence collection of the mussel larvae from the water column using dedicated materials, is a way to provide a settlement habitat which is naturally in short supply in this area of the Firth.

But what to do with the collected spat? Well, this is part of the learning curve for this development – the lines will be maintained during the coming year and the growth and survival of the mussels monitored. In a similar manner to the French system of bouchot culture the daily exposure to air will slow the growth of the mussels but also strengthen the shell and hinge, with the mussel muscle getting a daily workout to help retain moisture within the shell. While the meat yield and growth rate from such stock may not match those of constantly immersed individuals – they could be sought-after delicacies within the local seafood appreciation community?

The ability to reliably collect mussel spat in the water

- before it settles on a hard surface and has to be removed by physical extraction - has become a key



*Above;* settled spat are abundant on the special collection rope at the Cromarty Mussel longline site



*Left;* Andrew Jones looks out on the mussel long lines fashioned after bouchot culture on the oyster site of Alan R. Mackenzie.

## Cromarty Mussels cont.

requirement for the continued expansion of the wider Scottish mussel cultivation sector. In the past the movement of mussel seed from as far afield as southern Ireland has been necessary during periods of poor spatfall and recruitment. However, home sourced supplies will always be preferable and so development of a seed supply business could be a win-win opportunity.

Viewing the shallow water oyster/mussel site was a good introduction to the bounty the Cromarty Firth has potential to supply. The main reason for my boat trip however, was to look at a site already reliably producing mussels. Moving slightly further away from the Black Isle shoreline and into water of depth to allow the establishment of surface float longlines, I was ferried to the Cromarty Mussels Ltd site, which is now being operated by Shetland Mussels Ltd.

I am reliably informed that the above Latin title translates as “they came, they saw, they harvested”. Being of a trusting nature I have followed the title suggested by my vessel Captain (Pirate?) for the day – but please direct all complaints of misuse of the Latin language to Andrew Jones!

Not by chance I was subsequently able to board the work boat Pegasus – down from Shetland with the crew of Richard Tait, Steven Wilson and Thomas Currie. The title of this report may now begin to make more sense!

Well not only were they all working hard harvesting seed mussels – but also deploying further “hairy” ropes to check the possible span of mussel spat settlement within the Firth.

The site consists of thirty-two

longlines with double head rope surface buoys. Beneath each line the continuous length of “hairy” collector rope is attached with droppers set to provide the stability to maintain the spat rope integrity in the high tidal flow.

Such tidal conditions are just about manageable for conducting collection of spat and are extremely beneficial in terms of growth rates. Despite the Cromarty Firth being exceptionally sheltered from virtually all directions with a fetch of less than five miles, the volume of water in transit during spring tides is however, significant.

Andrew Jones explained that his initial plan was to grow the stock to marketable size but found that in order to keep the seeded ropes near vertical in the water column an increasing weight had to be attached as the



*Above;* Aboard the Pegasus with Richard Tait and Thomas Currie continuing operations to attach the spat collection hairy rope to the double headrope mussel longline on the Cromarty Mussels site.

*Below;* Thomas Currie and Steven Wilson harvesting seed in May.

## Cromarty Mussels cont.

stock increased in volume - with associated increased flow resistance. This meant that big tides would cause ropes to contact each other and stock to be dislodged.

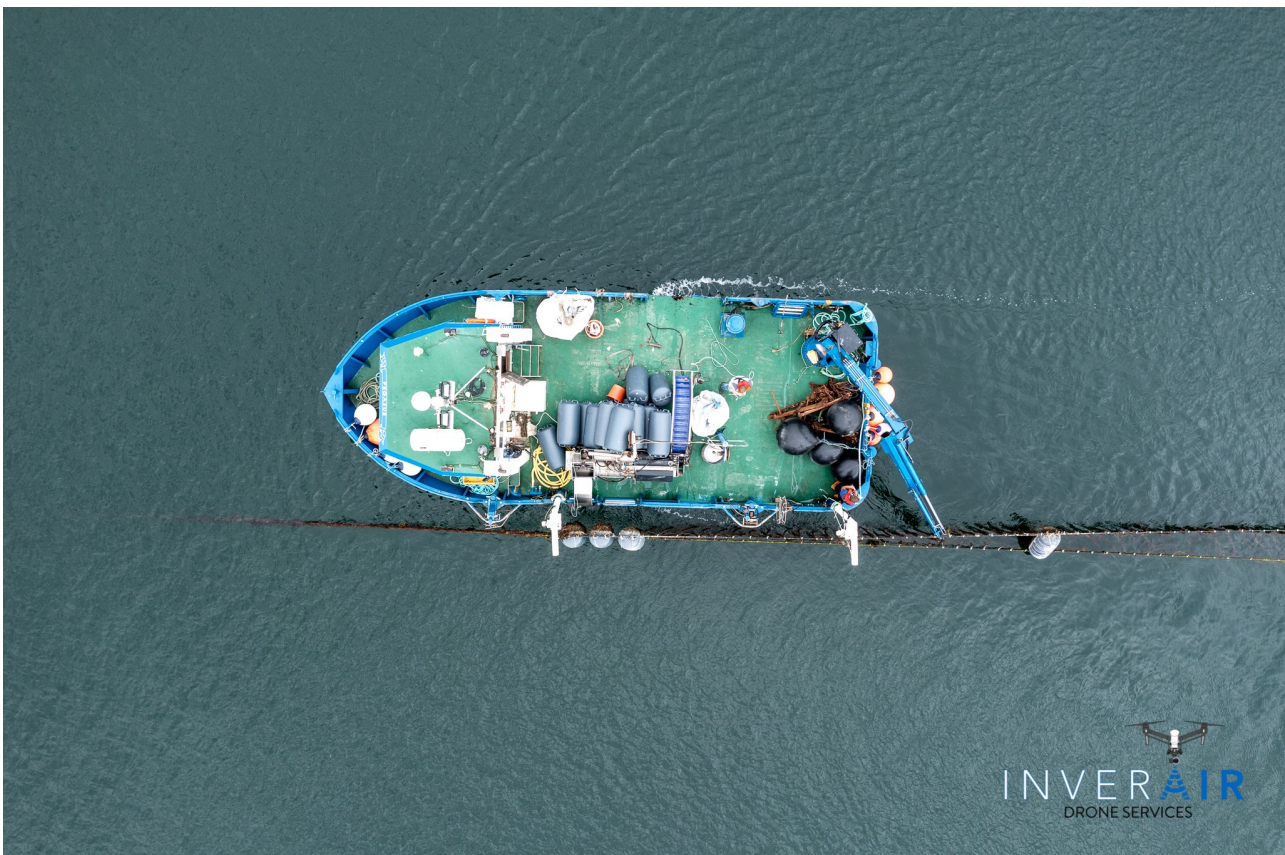
The obvious solution was to come up with a business model that valued part grown stock as an end product. Hence the collaboration between Cromarty Mussels and Shetland Mussels was established. Effectively managing the collection and resocking of seed mussels is the basis of maintaining production economic efficiency and for this to work for all concerned, it has to be done at scale and be automated with specialist equipment. Luckily for commercial longline mussel production all aspects of the recovery, grading and resocking are undertaken on a fully automated vessel – which given the right sea conditions can move between sites.

While Shetland to the mainland across the Pentland Firth may not be exactly a Disney cruise at times, it is a manageable journey that Shetland Mussels Ltd are prepared to take. Regional sourcing of wild mussel seed and the ability to transport stock in volume rapidly to the Shetland on growing sites serves to maintain their final production outputs and quality. There are minimal losses and the stock recovers quickly post transport and resocking. The quality of the spat originating from the Cromarty Firth has been found to be extremely good in terms of the final meat yields achieved and shell strength

– which assists when delivered for final processing.

Given that mussel larval distribution and settlement has become a concern for many producers in recent years and not just in Scotland, the value of the Cromarty Firth to the future expansion of our own industry has yet to be fully evaluated. However, based on initial observations of the operations in place and the abundant supplies of planktonic mussel stages being detected by both the inshore and nearshore collection sites – the natural supply of mussel spat settling out from the plankton seems like a sustainable business development for all parties concerned.

They came – they saw – they co-operated – seems an equally realistic assessment of how Scottish cultivated shellfish producers can develop their businesses - and the sector - for the benefit of all.



*Above;* Drone's eye view of the Shetland Mussels' working boat Pegasus deploying mussel spat collection hairy rope on site.

# Book Review: “Molluscan Shellfish Aquaculture: a practical guide”

Janet H Brown

There has been a lot of interest in recent years in the wider benefits of bivalve farming, stimulating publications such as “Shellfish Aquaculture and the Environment” Ed. Sandra E. Shumway (2011)<sup>1</sup> and “Goods and Services of Marine Bivalves, Eds. Smaal *et al* (2019)<sup>2</sup>. This emphasis on the benefits of shellfish aquaculture perhaps stimulated the idea that there was a need for a look at the “how do we do this?” aspect of culturing molluscs of all sorts. This book despite its sub-title “a practical guide” is not so much a “how to do this” book as a “how is it done, taking in the full panoply of molluscs and the different methods used for their culture globally”. The intention, as the Editor, Sandy Shumway says in her preface, is intended as a usable text for those interested in an up-to-date introduction to the field and to guide those who decide to join the aquaculture industry.

There is certainly a wealth of information in the chapters dealing with the different types of molluscs, with chapters dedicated to mussels, oysters, clams but within these chapters there is a lot to be sorted between specific types of culture and geographically related practice which may be difficult for someone new to the topic. So it is not so much an introductory text, more something from which to begin a greater in-depth study of a topic. Certainly someone joining the industry will find the book interesting and a helpful introduction but it might equally be extremely daunting in just how much there is to know and which method described might be the best for their purposes. I would see it as a very useful textbook that would introduce the reader/student to both the subject and where to find more detail. It does have a North American focus to some extent and but will definitely be useful globally (and in this context a pronunciation guide might be useful for the geoduck clam for those unfamiliar with this strange bivalve!)

Outlier chapters cover giant clams and conch aquaculture and it was encouraging to read there that the small scale local culture of giant clams can assist natural recruitment. There was a time when giant clam culture seemed set for great things in the tropics. Also included is a chapter on something totally new to me, the carnivorous marine snail *Concholepas concholepas*. This sounds a far cry from the ecosystem service providing bivalves!

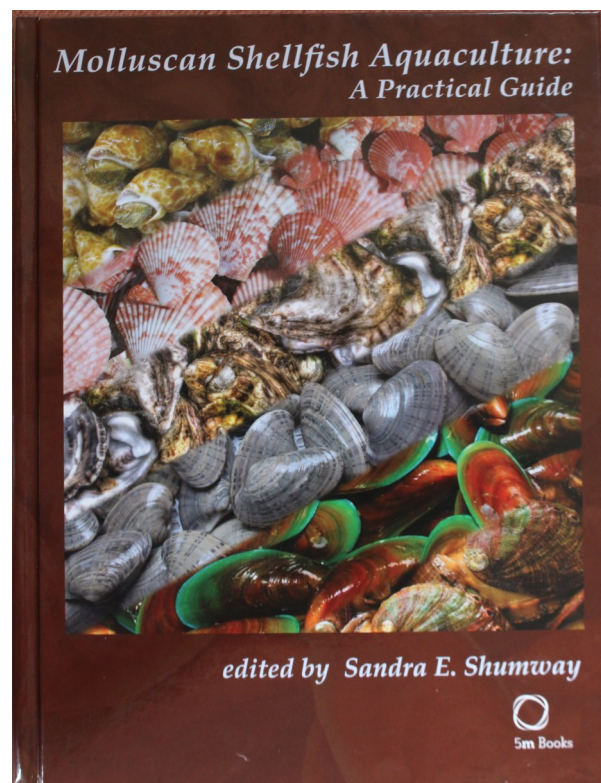
Once the book has dealt with its comprehensive look at the different types of molluscs it does become somewhat easier for both the authors and the reader dealing with more specific topics. Thus there are chapters on site selection, water and shellfish quality concerns, and control of biofouling, disease – this is not an exhaustive list. The chapter on genetics in shellfish aquaculture is particularly useful with information equally relevant to current practitioners when Ximing Guo writes “It is inconceivable that shellfish aquaculture can be sustained without serious efforts in genetic improvement.” Over 30 species of molluscs are currently produced in hatcheries and the crucial advice is that “without a well-managed breeding programme

in place, hatcheries may unknowingly inbreed their stocks and suffer from the negative consequences” and he proceeds to provide practical advice from what is actually one of the longest established breeding programmes, that of Rutgers University, USA. The long line of achievements he includes here makes one wonder what could be achieved elsewhere with this focus.

There are chapters included on new topics such as the chapter on environment and social certification of aquaculture which speaks to the current situation very clearly. This review started by pointing out recent publications on environmental services of shellfish but these books are read by few consumers so how can one use these known environmental benefits to help market the product? This becomes a very serious question when the process of certification can become very costly. The book neatly ends with chapters on “Marketing” and “Business planning for aquaculture”. The reader is all set.

<sup>1</sup> (review The Grower, December 2011)

<sup>2</sup> (review The Grower, October 2019)



See details for how readers of The Grower can purchase at a special discounted price on back page.

# NEWS

## Report for CES: Scotland's shellfish sector can aim for more global growth

Crown Estate Scotland has recently (14 September) launched a report which shows ways in which Scotland's shellfish producers can access new markets and deliver lasting economic benefits for communities.

The report highlighted three areas that may offer opportunities for growth and diversification:

- UK retail and foodservice sectors
- The potential for nutritional pharmaceutical products
- Possible markets for carbon off-setting or other green investment opportunities

Among the key findings is that there is clear scope for the future growth and expansion of the Scottish shellfish sector, both in existing markets and in new areas such as carbon offsetting and green investment.

The sector can play a big role in supporting the economic development of highland and island communities and in building Scotland's blue economy.

The report builds on previous work by Crown Estate Scotland such as a study on critical mass for viable farmed mussel businesses and on ecosystem services provided by shellfish, while work is projected on possible opportunities for larger scale shellfish and seaweed farming operations in Scotland.

Alex Adrian, Head of Aquaculture for Crown Estate Scotland, said: "Scotland is known around the world for excellent food and drink and now more than ever we want to support Scottish producers. We know that shellfish farming provides huge potential and can form part of Scotland's green economic recovery as a sustainable and low environmental impact product."

"The possibilities outlined in this report include food production as well as a host of potential markets for Scottish shellfish growers to tap in to. We know that diversification can be a key part of future proofing a sector, and this can help deliver real economic benefits to rural communities around Scotland."

One of the more surprising suggestions include tapping the monetary value of data farmers could collect. There has been increased realisation of the value of environmental data for farm management in recent years but the concept that people will pay for this data may come as news to many. No funders for this monetisation were identified as part of the report but they suggest it could be worth ASSG investigating further.

Another area of the report identified from scientific literature that mussels have by far the lowest carbon footprint of any animal protein. That raises the question how to turn that into a suitable slogan to capture interest at COP26? The figures they quote in the report are :-

0.6 kg CO<sub>2</sub>e/kg of mussel meat  
19–36.7 CO<sub>2</sub>e/kg for beef  
6.4–8.6 CO<sub>2</sub>e/kg for pork  
3–6.5 CO<sub>2</sub>e/ for poultry  
4.2–5.4 kg CO<sub>2</sub>e/kg for salmon

The report also deals with financing opportunities. They report on the potential of a scheme being set up called the Blue Impact Fund specifically targeted for increasing UK aquaculture. It is being developed in conjunction with WWF UK, and aims to have a particular focus on low carbon production such as seaweed and shellfish. The authors point out there is a real opportunity to capitalise on the low carbon story and this seems an important area to follow up. There is useful background data that might encourage shellfish farmers in the form of two PowerPoint presentations. These can be accessed very easily at the Crown Estate Scotland website. Appendix 1 is on traditional markets and new opportunities and Appendix 2 on pharma and nutraceuticals - an absolute fund of information on nutrition in particular but also on a huge range of commercial products already on the market that are based on shellfish in some form. It would seem unlikely that Scottish shellfish will be being used in pharmaceuticals or pet food in the near future but readers may well be surprised at the range of products currently available.

The full report can be found at [www.crownestatescotland.com/resources/documents/alternative-markets-for-farmed-scottish-shellfish-and-associated-requirements](http://www.crownestatescotland.com/resources/documents/alternative-markets-for-farmed-scottish-shellfish-and-associated-requirements)

Full links for references

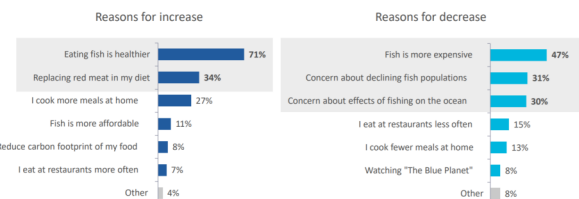
[www.crownestatescotland.com/resources/documents/scottish-shellfish-critical-mass-study](http://www.crownestatescotland.com/resources/documents/scottish-shellfish-critical-mass-study)

[www.crownestatescotland.com/resources/documents/review-of-the-contribution-of-cultivated-bivalve-shellfish-to-ecosystem-services](http://www.crownestatescotland.com/resources/documents/review-of-the-contribution-of-cultivated-bivalve-shellfish-to-ecosystem-services)

Below; encouraging information on slides taken from Appendix 1 of the report.

Health is the most cited reason for increase in seafood consumption, followed by replacing red meat.

Reasons for change, Europe



Source: The Rise of the Conscious Food Consumer: Globescan November 2020

Base: Seafood consumers who say they have increased their consumption, Europe, n=3,525. Seafood consumers who say they have decreased their consumption Q14.7a: What are the reasons for this change? (Increased) Q14.7b: What are the reasons for this change? (Decreased)

There is a thirst for more information on sustainability and traceability of fish and seafood products.

Attitudes toward ocean sustainability issues, "describes opinion well," top three (5+6+7 on 7-pt scale), Europe

87%

want better information so they can be confident that they are not buying unsustainable fish or seafood products\*



71%

would like to hear more from companies about the sustainability of their fish and seafood products



66%

want to know that the fish they buy can be traced back to a known and trusted source



Source: The Rise of the Conscious Food Consumer: Globescan November 2020

Base: Seafood consumers, Europe, n=1,512

\*Q11.3: Please indicate how much you agree or disagree with the following statements, "agree" (3+4 on a 4-pt scale)

Q11.1: How well does each of the following statements describe your opinion?

## John T MacMillan (1950 – 2021)

### Craig Burton

After a successful career in the Royal Navy, John retrained and joined the inaugural shellfish team at the Sea Fish Industry Authority's legendary Marine Farming Unit based at Ardtoe. His work developing cultivation techniques for oysters (Pacific and native), mussels, clams (native palourde and Manila), scallops (King and Queen), winkles and razorfish was widely respected by the industry and the associated publications to which he contributed remain important reference works. He was also closely involved with the lobster stock enhancement research programme and the finfish cultivation development work, making important contributions. As the Unit's Chief Diver, he led the team that kept much of the vital in-water infrastructure running smoothly, as well as overseeing all the underwater scientific work for Seafish. He was an ardent supporter of ASSG and was involved with it from the outset.

Alongside his Seafish career, John established a scallop farming site and secured one of the first Several Orders for the species awarded by the Crown Estate in the UK. After leaving Seafish, he continued to provide highly-valued practical support and advice to growers, frequently at his own expense, as well as quietly growing and marketing his scallops and dabbling briefly with native oysters. He also ran a small diving business sup-

porting many local marine operators with their moorings and other work.

His contribution to the community should not be overlooked, as he had served them as the Watch Manager (it used to be called the Station Officer) for the retained Acharacle Scottish Fire & Rescue Service crew and with the Salen HM Coastguard rescue team.

John is survived by his wife, Karen, and his son and daughter, Jack and Lucy.





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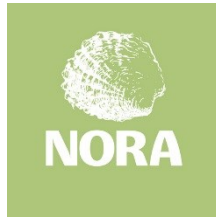
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Triskell Seafood Ltd, Unit 9e, North West Business Park, Collooney, Co. Sligo, Ireland

## SCIENCE NEWS NORA 4 update



The NORA 4 meeting due to have taken place in the Netherlands from November 23-25 has now been moved online. The online meeting will boast the full speaker line up and network building breaks due to have taken place in person, but in an online format. The event is packed full of updates and novel findings from the native oyster habitat restoration community across Europe, with more than 30 novel presentations over the two half days and one full day. Furthermore there will be two international keynote speakers and a vibrant poster session.

Registrations for the online meeting are still open and a full programme for the event will be available on the NORA website shortly [noraeurope.eu/](https://noraeurope.eu/). Registration for this event is free and not to be missed. Sessions include talks on the themes monitoring, oyster production, site selection, production, management and pilot results. "Reconnecting across Europe" is still the aim of the conference, despite the online format and participants will have ample opportunity to interact and share virtual coffee breaks between the sessions.

## NSA



The National Shellfisheries Association (NSA) are promoting Aquaculture 2022 (logo above!) which is to be held in San Diego February 28-March 4 2022. Programme co-chairs Sandy Shumway and Jay Parsons have worked out it will have been 2 years, 11 months, and 22 days since NSA last met in person (1090 days) as the Baltimore conference was cancelled March 2020. This will be their triennial joint-event which was last held in New Orleans. It is being held at Town and Country Resort and Convention Center. Registration is open at [was.org/meeting/code/AQ2022](https://was.org/meeting/code/AQ2022) or [www.shellfish.org](https://www.shellfish.org)

## Recent publications of interest

### *Poor quality food is not good for baby oysters but nor is over feeding....*

Dietary exposure of Pacific Oyster (*Crassostrea gigas*) larvae to compromised microalgae results in impaired fitness and microbiome shift

Julien Vignier, Olivier Laroche, Anne Rolton, Pandora Wadsworth, Karthiga Kumanan, Branwen Trochel, Xavier Pochon, and Nick King<sup>1</sup>

Published in Frontiers in Microbiology

Published online 2021 Aug 24. And available to download at doi: [10.3389/fmicb.2021.706214](https://doi.org/10.3389/fmicb.2021.706214)

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# Aquaculture Common Interest Group (ACIG) SEAFISH

The latest ACIG meeting was centred on “Aquaculture responses to the climate change crisis” (8 September 2021)

This meeting was the second in a series to look at climate change impacts for aquaculture, and adaptation responses. This session looked at integrated multi-trophic aquaculture (IMTA) in the context of ecosystem services and climate change, with a practical example of how it is being adopted in the UK. It also looked at what a major feed manufacturer is doing to reduce the environmental footprint of aquaculture production. See the presentations:

[Reducing aquaculture's environmental footprint](#), James Deverill, Cargill SeaFurther™ Sustainability Programme.

[IMTA, seaweeds, ecosystem services, climate change: how do we translate a moment into a momentum beyond the present hype?](#) Dr Thierry Chopin, University of New Brunswick.

[IMTA project reports first seaweed harvest](#), Kyla Orr, Kelp Crofting and Alexandra Bulgakova,

University of Stirling.

[Q&A Briefing note on the session](#).

The next ACIG meeting will be in November and details can be found at the ACIG site when available.

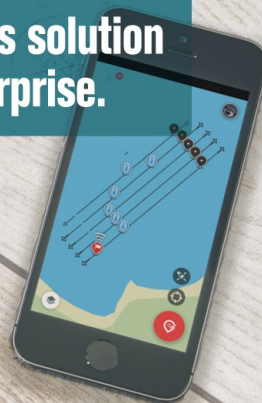
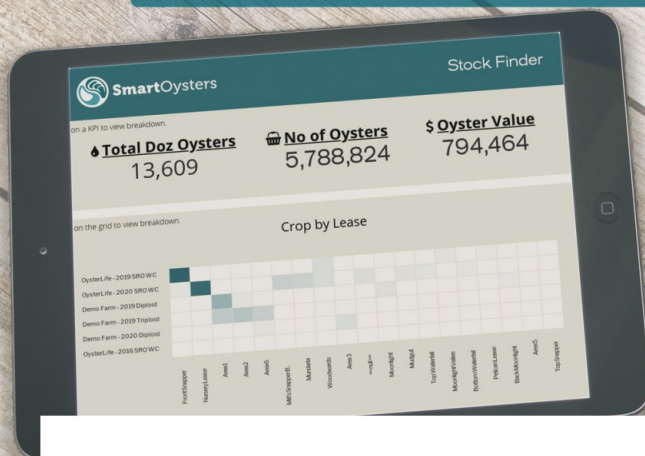
Full information on the group and past meetings can be found at

[www.seafish.org/responsible-sourcing/seafood-issues-groups/aquaculture-common-issues-group/#z-acig-meetings-and-bite-size-meetings-1](http://www.seafish.org/responsible-sourcing/seafood-issues-groups/aquaculture-common-issues-group/#z-acig-meetings-and-bite-size-meetings-1)



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## Photo news

### Seafood promotion on Mull cont.

There were several other events during the seafood promotion week including a “secret seafood picnic” and a number of promotional media events that can be seen on the Mull and Iona seafood pages of Facebook and Instagram.

Finally the week ended with what has now become a tradition - **the Seafood Extravaganza**.

This is the 19th year of this event and although it was a reduced number of diners, due to Covid restrictions, it was a great community celebration with the young and not so young volunteering to make the event a big success.

50 people dined on the seafood taken from the waters of Mull and Iona. Oysters and mussels of course featured but “The Dervaig Plank” has become the stuff of legends, a specially made plank that stretches across the table laden with lobster/ prawns etc. There is always a hush that comes over the Village Hall as the plank arrives to be laid across the tables.

An auction at the end of the night raises funds for the RNLI and is always well supported.

There are plans next year to make the week-long event much bigger, incorporating more food businesses and more events around the Island.

Editor’s note. The Mull seafood extravaganza last featured on the back page of The Grower in 2009. It already included the “seafood plank” but with 80 places available.



inverlussa Crown Estate Scotland Scottish Sea Farms

This event has also been supported by the Regional Food Fund which is delivered by the Scotland Food & Drink Partnership with funding from Scottish Government

**DERVAIG SEAFOOD EXTRAVAGANZA**  
Saturday 25th September 2021

*Isle of Mull Oysters – natural and grilled*

- beetroot and whitetail gin cured Scottish sea farms salmon with beetroot and apple purée
- Smoked mackerel, dill and chive profiterole
- Tobermory fish co. Hot smoked salmon taco with cream cheese and red onion and tomato salsa

*Cream of pea soup with crispy bacon, Inverlussa mussels and parsley, served with a sautéed leek, craig crab and Tobermory smoked cod spring roll*

**The Dervaig Seafood Plank!**

*Poached bramble and apple cranachan with a ginger biscuit*

*Tea/Coffee and Isle of Mull Shortbread*

*Dram of Tobermory Whisky*



## Shellfish culture 1

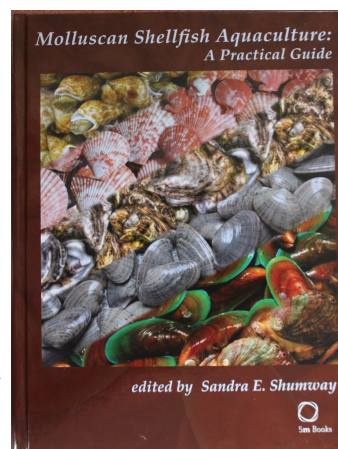


Above; Shellfish decoration as seen in on the sea front in North Berwick on an appropriately named house!

Photo credit JHBrown

## Shellfish culture 2

### Book offer for readers of The Grower



The Grower is pleased to announce that this excellent book on shellfish culture (reviewed on page 14) is available to readers of The Grower at a discount of 20% off the list price. In order to gain this discount go to [www.5mbooks.com/molluscan-shellfish-aquaculture-2204.html](http://www.5mbooks.com/molluscan-shellfish-aquaculture-2204.html) and add GROWER20 in the discount code

field at the checkout. At the time of The Grower going to press their online payment system only included PayPal and Bank transfer. The discount will work for these two payment methods but not for card payments until their new site is fully active which should be around mid-October.