

# **A Review of the Aquaculture Regulatory Process in Scotland**

**Russel Griggs OBE**

**February 2022**



**Scottish Government**  
Riaghaltas na h-Alba  
gov.scot

## CONTENTS

### Summary

Introduction .....	1
Regulatory Context.....	3
The Scottish Aquaculture Sector .....	8
Finfish .....	10
Shellfish .....	13
Seaweed .....	14
Current Regulatory Situation .....	15
A Consenting and Framework System for the Future.....	21
Single Consenting Document.....	22
Management of the Process .....	23
Local Authorities .....	23
Local Communities .....	24
Evidence Based Decision Making.....	24
Governance .....	25
Management of Sites .....	25
Science, Data and Evidence .....	26
Moving Forward .....	27
Who Pays for all this.....	28
Conclusions.....	31
Annexes .....	32
Annexe A Participants.....	33
Annexe B Sector Production Data .....	35
Annexe C Aquaculture Farm Locations .....	38
Annexe D Planning Applications and Decision Times by Authority for 2020/21 ....	40
Annexe E Norwegian Application Process .....	41
Annexe F Scottish Application Processes.....	42
Annexe G External Audits Data .....	44
Annexe H The Salmon Lifecycle .....	45
Annexe I Anonymised Comments by Theme .....	46
Annexe J Seaweed Marine Licence Applications.....	50

## ACRONYMS

APB	Aquaculture Production Business
CAR	Controlled Activity Regulations
COSLA	Convention of Scottish Local Authorities
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization
EMP	Environmental Management Plan
FF	Finfish
GBP	British Pounds Sterling
HOG	Head on Guttled
IAF	Integrated Authorisation Framework
LA	Local Authority
MS-LOT	Marine Scotland – Licensing and Operations Team
MSP	Member of Scottish Parliament
MSS-FHI	Marine Scotland Science – Fish Health Inspectorate
PR	Public Relations
RAS	Recirculation Aquaculture System
RRG	Regulatory Review Group
SalScot	Salmon Scotland
SAMS	Scottish Association for Marine Science
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Agency
SF	Shellfish
SIWG	Salmon Interactions Working Group
SNP	Scottish National Party
SW	Seaweed
USA	United States of America

## Summary

The Scottish Government from what I have read and can gather considers aquaculture to be an important industry to Scotland particularly for rural coastal and island communities, where it provides a range of economic benefits. While the economic benefits are evident there are other impacts that any industry would have to consider in order to operate so achieving the balance between both is where all countries strive to reach.

I was asked by Mairi Gougeon MSP Cabinet Secretary for Rural Affairs and Islands to

- review the existing evidence base and engage with key stakeholders in order to identify the issues impacting on the efficient and effective operation of the regulatory framework for aquaculture from the perspective of industry, users of the shared marine environment (tourism, wild fisheries), communities and regulators; and
- make recommendations for further work in relation to improved efficiency and more fundamental institutional reform.

Throughout the evidence gathering stage of this review a lot of what I have heard and seen resonates with other reviews of this type I have carried out. Many of the issues and challenges around regulation that involve multiple public bodies, regulators, and developing or changing industries and sectors have similarities and overlaps. However in all the reviews I have conducted over the years, there are two characteristics that I have never come across before namely

- All the people and organisations that I have met with or had input from think that the current regulatory system for aquaculture is not fit for purpose and in one form or another needs change; and
- The degree of mistrust, dislike, and vitriol at both an institutional and personal level between the industry (mainly finfish), certain regulators, parts of the Scottish Government and other stakeholders is at a level that I have never seen before which makes the current working relationships within the sector challenging.

The above primarily addresses the issues within the finfish industry. The shellfish and seaweed industry exhibit some of those issues but to a lesser degree. The level of mistrust in the finfish sector is such that there are those in the industry who believe officials within some Regulators and Government bodies have on occasion been actively briefing and supplying information against the industry to those that would seek to close it down completely. The converse to this are the accusations from some environmental groups that the Scottish Government and regulators are “green washing” or “in bed” with the industry. I make no judgement on whether either is true but these beliefs have driven relationships and mistrust to a level that is not just unusual but unhelpful as well.

In my view it is Government that set the policy around an industry and no one else, and its officials, associated bodies, and regulators implement and manage the rules and guidelines that policy sets out. Government policy should cover everything with regard to the presence of that industry; whether the country wishes to have an industry like this in the first place, its size, impact, and how all that will be controlled.

The above is especially true where an industry is developing dynamically. I believe the aquaculture sector in Scotland, especially finfish needs a policy framework within which development, change and growth can happen over a period of time in a manner that Government agrees with across the issues that may cause it concern. That policy and framework should therefore not be solely about what the industry looks like today but how it can develop over time, for example, 5-10 years. It is the future that should be at the heart of the vision for the sector and form the parameters of the framework.

That flow of policy is set out in Figure 1 below and all else in this report is set within that context and structure.



**Figure 1:** The flow of policy

As knowledge, experience, and science have grown from all parts of the sector, ways of operating have changed and will continue to do so over the coming years both to reflect learning but also because its customers have, themselves, also become more discerning on what they need in terms of product and the environment they want that product to be produced in.

My second task was to make recommendations to Scottish Government on further work required and also what institutional change might be necessary to do that. These recommendations do both, I believe, but maybe slant more to the institutional and other change necessary than they would have done had not the evidence and desire for change been so strong. I believe my recommendations will give the aquaculture sector an opportunity to develop in a way that allows commercial certainty within a controlled environment while taking into account the different status of each sector.

The Scottish Government will shortly produce its own Vision for Aquaculture in Scotland, which all else for the sector should develop from. I believe though some of the recommendations I make can be implemented prior to the production of the Vision as they should happen no matter what that is as they make the processes involved more effective and efficient.

Indeed it would be useful to pilot the new proposed single consent document and to start to pull together what would be in the frameworks for each sector. I believe that Shetland would be the ideal candidate to carry out the pilot. A pilot would allow improvements to the new regulatory system to be designed within a supportive environment, aiding in a transition to the full roll out of the new process.

Government will create, from the Vision, and own its frameworks for the aquaculture industry. It will assess industry size, development and innovation within strict environmental parameters. Evidence based policy will drive the framework agenda. This will allow for change over time as the individual sectors develop. I am firmly of the view that once the framework is in place only the Cabinet Secretary should have the power to sanction change. Different bodies within National and Local Government, regulators, and other associated bodies will be responsible for implementing the framework to ensure they are delivered. They do so as implementers only.

While the Vision for the sector is being produced I propose that a Project Board be established to start to take forward the initial work on a framework. It is likely that its work will fall into a number of phases with the initial one deciding what should go into the framework perhaps being the most critical. Further work can be progressed on each part of the framework once that is done with individual timescales being put in place at that time. While that is being done it seems sensible perhaps to consider the timing of other consultations and other things that are to be implemented in aquaculture so that duplication, confusion, or divergence is avoided.

Below are the main recommendations I am making (including any associated recommendations) set out in the order they appear in the report and not for any other reason:

- There should be different regulatory solutions for finfish, shellfish, and seaweed with each based on a framework specifically designed for that part of the sector and in which the consenting and all other regulatory processes will sit and be driven by;
- There should be a single website and body where anyone with any questions around starting up an aquaculture business or who have questions on more general issues or aquaculture regulation can go to find out all that they need to know;
- A new single consenting document for aquaculture should be created, that mandates what all parties (the applicant, regulators, the community, and other statutory consultees) involved in an application are subject to derived from a pre-application consultation prior to submission;
- The new consenting document contains a 'social contract' that recognises the community and its needs;
- The science and other evidence that is currently being used by all parties involved in the sector is reviewed independently to ensure it is the best and most up to date available;

- The Scottish Government work with all parties through a Project Board to produce, within 12 months, a 10 year framework for each part of the aquaculture sector (finfish, shellfish, and seaweed) within which all must operate;
- Once that framework is in place all existing sites should be examined to ensure that they can operate within the framework;
- All sites where it is unlikely, after evaluation against the new framework and remedial action that further finfish production will occur, give up all licences held on that site by the current owner;
- The creation of a central science and evidence base should be put in place jointly run and managed by industry and the Scottish Government which gathers, collates and examines scientific and other evidence relating to this sector so decisions within the framework can be made in the most effective way;
- A new single licencing payment is introduced based on tonnage output of each site, which covers the costs of all bodies involved in the process and addresses community benefit as well. A separate charge on established sites that are to continue post review to be examined;
  - A review of the length of validity for all the licences involved so all consents share the same timescale;
  - The time of the licence/consent validity is long enough for the licence holder to gain value from the site and ideally allows it to be capitalised as an asset on their balance sheet;
  - The full payment will only apply to new tonnage and not any transfer of existing tonnage to a new site, if that has come from consolidation of others e.g. if a company creates a new 5000 tonne site by closing three 1000 tonne sites, then the payment would only be calculated on the additional 2000 tonnes;
  - That a separate tonnage payment be agreed for existing sites once consolidation is complete;
  - Who makes the collection and distribution of the payment to be agreed by all regulators including Crown Estate Scotland, the latter which should be an integral part of the process;
  - There is an allowance in the licence charge for local community benefit for the area where the site is situated. It's my belief that a significant amount of what is collected (similar to Norway) goes back to the communities in whatever form so that they can also benefit from the economic prosperity that the farms will bring. Decisions will have to be made on whether this part of the payment should be collected by Government for redistribution or whether the operator should be legally obliged to disburse that payment themselves directly to the community;
  - Part of the licence cost is used to fund further scientific and other research in areas which is mutually agreed through the new composite scientific body;

- The payment be designated for accounting purposes in a way that allows it to be treated in a way that it can be taken out of annual EBITDA calculations;
- It should cover the costs of the new licencing and consents unit as well as the costs and fees of other bodies involved in the process;
- The process should encourage innovation and development across all three sectors with special consents or licences aligned to innovation including the length of validity and costs;
- A short term project board is established which oversees, drives, and guides all the varying parts, so that all the above can be put in place, where possible, within a 12 month period.

I could not have done this review without the honest, open, and full input of the many people and organisations that I have spoken to, visited, or have submitted written views to me. Their honesty has helped me better understand the issues and look at solutions that will not only work, but allow the sector to come back together in all its parts rather than the fractured state it currently appears. I save special thanks for those who have been my support and sense check throughout including Scottish Government officials who have fulfilled the role of secretariat for the process and Jane Malloch of South of Scotland Enterprise who has arranged all the meetings – virtual and physical – that have taken place and kept that part efficient and sane.

I would also like to take this opportunity to thank all those who contributed face to face and in writing.

## Introduction

In the SNP's (Scottish National Party) pre-election manifesto were a number of undertakings relating to the aquaculture industry in Scotland, namely:

- We will reform and streamline regulatory processes so that development is more responsive, transparent and efficient;
- At the heart of our new approach will be a new, single determining authority for farm consents, modelled on the regulatory regime in Norway;
- We will expect producers to contribute much more to the communities and local economies which support them so we will also explore how a Norwegian-style auction system for new farm developments might generate significant income to support inspection and welfare services, provide real community benefit on islands and in remote rural areas and support innovation and enterprise;
- We will support innovation in aquaculture, for example by exploring the development of closed containment fish production on land and explore the potential to produce more shellfish in warm water, land based farms to cut the amount of unsustainably produced fish and shellfish being imported to Scotland.

Subsequent to that in the Scottish Government's Program for Government it's stated:

- We will deliver a Scottish Government led Vision for sustainable aquaculture which places an enhanced emphasis on environmental protection and community benefits – and explore how producers can contribute more to support inspection services, reduce their environmental impact, provide real community benefit, and support innovation;
- We will take forward an immediate programme of work to better protect wildlife and the environment, responding to the Salmon Interactions Working Group, consult on a spatially adaptive sea lice risk assessment framework for fish farms by the end of the year, and strengthen controls on sea lice, wrasse and fish escapes in the course of 2021-22,

and within the subsequent Next Steps paper one of the 100 day pledges were to:

- Appoint an external reviewer of the current regulatory processes involved in fish farming, to identify how best to reform and streamline the system and establish a new single determining authority.

As a result of the latter, Mairi Gougeon MSP Cabinet Secretary for Rural Affairs and Islands asked me as Chair of the Regulatory Review Group (RRG) (the Scottish Government's independent advisors on better regulation) to initiate a review of the current regulatory framework for Scottish aquaculture. Details of the review can be found on the [Aquaculture Review website](#).

The remit of the review is to:

- review the existing evidence base and engage with key stakeholders in order to identify the issues impacting on the efficient and effective operation of the

regulatory framework for aquaculture from the perspective of industry, users of the shared marine environment (tourism, wild fisheries), communities and regulators; and

- make recommendations for further work in relation to improved efficiency and more fundamental institutional reform.

I have carried out this review totally independently as Chair of the [Regulatory Review Group](#), which for many years has been the Scottish Government's independent advisors on business regulation.

The evidence that I have received is a combination of written submissions from many as well as meetings, most of which were conducted virtually. I also visited:

- one new hatchery and fish farm;
- one organic fish farm, which just had their application turned down;
- one seaweed farm, and
- one shellfish farm.

I have learned much about the aquaculture industry in Scotland, its opportunities, and challenges and also where it could go in the future. The visits helped contextualise many of the conversations I had with others and in reading the many submissions that were sent to me.

In carrying out my review I asked the following questions:

- Why does the sector need regulation in the first place?
- Why has that regulation to be in the form of legislation rather than self regulation by the industry?
- What are the issues with the current regulatory framework?
- What could be done to improve the current framework and importantly the process?
- Are there any examples that might provide useful insight on how this is done elsewhere?

A full list of the stakeholders who contributed is set out in Annexe A. The contributions show the diverse interest that the aquaculture industry generates across many parts of the wider community and society in Scotland. What is perhaps the most interesting and a common view from all, in varying ways, is that the regulatory system and process that manages this industry is not as good as it could and should be and all stakeholders advocated for change.

There was criticism about the number of reviews that had looked at aquaculture in recent years. The stakeholders were keen to see change at pace and not another report to sit on a shelf. It's for this reason the recommendations I have made are, I hope, precise and substantive.

## Regulatory Context

The Scottish Government's own regulatory agenda aims to focus on producing Better Regulation that allows businesses and sectors to operate within an environment that balances other societal and Government desires with the need to produce economic benefit within those constraints. It is therefore not about less or more regulation but to ensure that what is there works effectively and efficiently for all. It is governed by a set of principles that most developed countries throughout the world use, namely;

- Proportional
- Accountable
- Consistent
- Transparent
- Targeted

The Scottish Government is committed to have all regulation (both statutory and voluntary) guided by these principles.

Good regulation is also about having a process that exists within a framework that everyone understands, with rules and boundaries that allow those operating them to make good and consistent decisions based on evidence or fact using the 5 principles as the envelope within which they sit. That is why the process around how things are done within a regulatory framework can be at least, if not more important than the regulations themselves. Good regulations in a bad process or framework tend not to work and, at times, can create negative rather than positive outcomes. Good regulation does not always need the strength of legislation. Legislation can be a very blunt and inflexible tool and can sometimes make the legislation difficult to enact and in some cases contradictory within itself. It also relies on good guidance, for those who will use the legislation, to be issued at the same time so that it is clear what it means. Again that has not always been the case in recent decades and in certain instances has led to inconsistent decision making.

Regulation has evolved and self regulation is done by industry. Most of that though is now done in partnership with Government and has become known as Government Sponsored Voluntary Regulation. The threat of legislation being put in place behind this is why many industries now have their own rules and regulations that work well and more importantly are policed and monitored. The food and retail industry are good examples of that where much of what they do in terms of regulation comes from within the industry in partnership with Government.

To be clear though it is Government that sets regulatory policy and the frameworks that are created and others implement it. If others outside Government are left to create their own policy then divergence or contradictions in policy can occur which is not helpful or useful for anyone.

How judgements are made within those regulatory envelopes and processes have always been the subject of discussion but a key principle is that those making the decisions within the process need to be:

- Knowledgeable about what they are making the decision or judgement on;
- Understand the evidence base they need to source to make those decisions or judgements on, which is agreed by all to be the best evidence available at that time;
- Do it often enough to have built up learning of how the whole process works;
- Be at a level within the organisation taking the decision or making the judgement that is proportionate to the size or importance of that, and
- Do all the above in a collegiate and co-operative way that takes into account and understands the views of others, including other regulators, who may be involved in the process as well as those that the decision or judgement will impact on.

If the above is not done well and properly then decisions and judgements tend to be made inconsistently or worse, on the basis of evidence that might be flawed or out of date. It also relies to an extent on the frequency such decisions or judgements have to be made and done well, which is why those industries and regulatory frameworks where decisions or judgements are made on almost a daily basis tend to have a greater body of people who understand clearly what the evidence and issues are. Aquaculture is not like that with the number of decisions and judgements made being relatively limited as will be discussed later in this report. The above is important as decisions and judgements are being made on what has become known as the Precautionary Principle.

It should be noted that the Scottish Government are currently consulting on [draft statutory guidance for the five guiding principles on the environment](#), set out at section 13(1) of the Continuity Act, following The UK's Withdrawal from the European Union (Continuity) (Scotland) Act 2021 ("the Continuity Act").

An academic institution which contributed to the review, in relation to the precautionary principle and in the context of aquaculture, stated that:

"The relevant interpretation of the Precautionary Principle requires that no development should be allowed unless it can be shown that it will not cause harm to water quality, habitats, species and biodiversity. Adaptive Management allows development to proceed on the basis of best existing scientific knowledge of impacts, subject to continued monitoring and if necessary adaption of farm management. Some sectors of the public favour the former, while the latter is more likely to allow the regulated expansion of aquaculture. Adaptive Management and the Precautionary Principle require different public strategies for ensuring compliance, but this does not seem to have been explicitly debated in recent years, and the present situation suffers from lack of clarity in policy and its enactment, relative to this distinction."

From my own knowledge of how the precautionary principle has been applied I have more than a degree of sympathy with that argument especially in an industry where knowledge, science and indeed the ways of operating, as is the case in aquaculture are growing, changing, and being added to constantly. If you are making a decision or making a judgement on an issue that you do not understand fully, do not interact with often, or sometimes just have no experience of then the caution applied can go

beyond what the science or other factors may say, simply due to a lack of awareness so take no risk at all. Also without an agreed framework within which everyone operates to ensure that decisions are made consistently then different and sometimes conflicting decisions can be made on the same subject by different parts of the regulatory process. Government need to ensure that in terms of these overarching principles that can be applied across more than they were perhaps initially intended for, wider consequences are taken into account when they are initially discussed or proposed.

Two other things that good regulation has to do is to be enabling and not impede or prevent innovation. The latter can be impacted by harsh application of the precautionary principle or a regulators lack of knowledge of a sector or issue that makes them ultra-cautious. For any industry to develop it needs to innovate. Aquaculture is no different and indeed it could be argued that to develop and work within developing constraints put in place by their customers, Government and others it has to do so if it is to be sustainable and grow at the same time. Therefore, with any regulatory framework or system there has to be allowance, usually through special practices or derogations, to enable that to happen where it adds value in any way over what is there currently.

That regulations should be enabling would have been an additional 'key principle' if it had not been agreed that it covered all the other principles. Too often, historically, regulators issued companies with instructions that allow them to 'tick a box' rather than own and believe in what they had to do. Enabling is the opposite where the regulator helps the company in achieving what they need to do but the company owns what it is doing. All regulations and regulators should be enabling and help to make things happen in a way that gives that positive end result rather than just stop people from doing certain things. If all regulation and regulators do is stop things from happening they in effect become the compliance officer for that sector so the sector has no incentive to improve the performance or what it does. In my view SEPA for many years did not enable but enforced across much of what they did but have changed greatly, and are to be commended for that. That enabling action has helped them to become a better regulator and allow others who they regulate to take on that responsibility for their actions themselves and become better for it.

In cases where multiple regulators are involved in licensing and decision making for industry, multi-lateral discussions are replacing bi-lateral practices. This allows all parties to discuss and agree on the final outcome be that positive or negative.

Much of this has been driven by communities who felt that decisions were being taken about them without their initial involvement and by the time they were involved it could be too late to do anything. This multi-lateral approach has been shown, not just to make the process better in terms of time and resource for all parties but it has generally produced a better outcome. A discussion with all those involved, together, at the outset of the process allows each party to understand the wider issues and work together to find solutions where possible. This has worked well on wind farms – especially offshore – and other complex issues. Indeed, the much talked about and promoted 'One Stop Shop' that the Norwegian Government uses to produce aquaculture licences for Norway is in fact, just a system which improves efficiency of the process. The Norwegian single window enables a coordinated approach so that

consents and licenses are granted at the same time/or in a sequence. The purpose is to improve efficiency of the process. The single window provides a single point of contact for the industry. Annex E shows the process in flowchart form.

Finally, in this section two issues relating to investment and the size of businesses in a sector.

From other work RRG has been involved in over the years it is clear that the regulatory framework and ways of doing things as displayed by Government on its web and other outward facing sites can have a material impact on whether businesses from outside Scotland invest in a sector or particular company. For example, in the work that RRG did with the chemical sector some years ago, the Scottish Government, and SEPA depicted flood issue scenarios that were publicly available on the Scottish Government and SEPA web sites. The website displayed a single scenario resulting from the failure of flood defences. This showed half of Grangemouth as flooded, following a once in 1000 year event. It was clear that companies looking to invest in Grangemouth at that time could be put off. This has changed and the sites now display multiple scenarios that show all end results on the websites. This came about as all parties understand that the regulatory environment can impact on industry and is one of the first things that external investors look at when thinking about investing in a country. That multi-lateral approach was instrumental in achieving this.

What has become clear through this and previous work by the RRG is that while large companies are subject to negative public opinion in the media for example, assuming they will use their size to get around regulations, recent evidence suggests the contrary. Large international businesses operating in countries worldwide are more likely to be concerned about the reputational damage any deviations from or infringement of local regulations can have on them, not only in that country, but also on all their other business internationally. As a result they tend to be more cautious. The oil industry is a good example of this.

In the sections below I will look at where the aquaculture industry's current regulatory process sits in terms of the above and what I recommend that may need to change to satisfy the aspirations of the Scottish Government, the sector itself, those who interact with it, and perhaps most critically the communities within which this industry sits.

To reiterate, it is key that it is Government which makes policy and the frameworks within which policy operates. Agencies and regulators implement, not create policy themselves. If they did there is a danger that Scottish Government outcomes are not met.

I have considered all the evidence received within the context of the review and now provide advice and recommendations to the Cabinet Secretary. In doing so, the following criteria were applied to the responses provided:

- Must be relevant to what I have been asked to do, which is to review the effectiveness and relevance of the current regulatory system;

- Have the weight of scientific or other evidence to support them;
- That those making them represent a community or constituency directly impacted by the specific regulatory issues;
- That those making representations, especially on behalf of communities in its widest sense, represent as far as is possible the majority within them, and
- Responses were proportionate and realistic.

## The Scottish Aquaculture Sector

Finfish aquaculture farming has been prevalent in Scotland since 1965 when a trout farm was established in Loch Ailort, Inverness-shire. It developed into the first salmon farm in 1971 (SalScot, 2022; [The history of Scottish salmon farming](#)). Since then the industry has developed as have shellfish farms (mainly mussels and oysters), and now seaweed farms (of many varieties). Aquaculture now forms a significant and sustainable part of the Scottish economy contributing to both exports and local communities in mainly rural areas of Scotland. Annexe B shows the development of the finfish and shellfish industry both in terms of volume and number of sites.

To be clear this report covers only those parts of the aquaculture industry that are 'farmed' and not those shellfish, seaweed or other species that may be harvested from shore line or 'fished' in whatever way from the sea.

There are three parts to the sector, namely finfish farming (mainly salmon but also some trout), shellfish (mainly mussels and oyster), and seaweed of various varieties. They all come under the same regulatory framework at present but through this investigation it is my opinion that they have developed and are developing differently. The similarities that perhaps were once there due to their location and size no longer exist.

Therefore my first recommendation is that **there should be different regulatory solutions for finfish, shellfish, and seaweed with each based on a framework specifically designed for that part of the sector and in which the consenting and all other regulatory processes will sit and be driven by.**

In the early stages of the aquaculture sector, there was little knowledge or incentive to establish a proper and cohesive regulatory system around it. It was small and much came as adjuncts to crofting etc. in rural areas. As the industry and knowledge has expanded, it appears that regulation has effectively been bolted on in an ad-hoc basis as issues have emerged. This has resulted, as one contributor to the review stated:

“in a fragmented system of regulatory bodies, without in some cases the devolution of appropriate powers of enforcement, with a lack of clarity regarding a specific remit of responsibilities (resulting in regulation gaps), disjointed areas of responsibility, and poor accountability of regulatory decision making.”

This sentiment was reflected in varying degrees by the majority of consultees.

In recent years Government Committees and working parties have produced a number of recommendations on new policy to address some specific issues relating to the industry. Good new regulation on its own of any type, going into an ineffective process will become poor regulation.

From my examination I believe that it is the process itself that is at fault and needs rectified. However, fixing that process on its own will not work either if it does not sit

within a framework that provides guidelines and boundaries on how and in what parameters decisions and judgements are, and should be made on the sector. Without that framework, even with an effective process, you get inconsistency and poor decision making as different parts of the process create their own parameters and boundaries which may conflict with others and make the process even more dysfunctional.

Although the above has resonance across most of Scotland, which is involved in aquaculture, it is not as prevalent on Shetland. The aquaculture sector on Shetland is seen as a key economic driver. It has the resource in place with skills and expertise to make decisions, has the support of the public and local bodies, and also critically the community. That is not to say that the system works perfectly on Shetland. From my discussions with them it is clear that they believe that some parts could be done better both in terms of consistency of decision making by other parties involved in the process but also in resolving most of the issues through pre application, multi-lateral consultation, which they believe strongly in.

Therefore, while I do think Shetland should be included in all the recommendations that I make in this report I believe that they could implement it quicker than other parts of Scotland.

The rationale behind this is:

- It has an established and locally supported aquaculture sector that supplies over 20% of all farmed salmon, and over 70% of all farmed mussels in Scotland and is a key driver of the economy on the island;
- It has established expertise across the island and the Council already works well with the industry;
- There appears to be support for the industry within the community, and
- The Shetland Islands Council have jurisdiction over aquaculture planning through the Town and Country Planning Act 1997 and the Zetland County Council Act 1974 applies a works licence to seaweed cultivation (up to 12nm), as set out in the Shetland Islands Regional Marine Plan.

The sections below set out what I think both a framework and a consenting process may look like for each part of the aquaculture sector, which will allow sensible and agreed decisions to be made within a vision and framework for the Aquaculture sector in Scotland.

The vision gives the overarching statement on what the Scottish Government wants from that sector, the framework sets out the operating principles, boundaries and guidelines in which that vision will operate and the consenting system will operate within that framework to ensure that decisions are made consistently and transparently on evidence that the framework creates. Therefore, in terms of timing the Scottish Government led Vision for Aquaculture needs to be put in place first before the others can be concluded. However, there are some parts of the process where I believe work could begin now, prior to production of the Vision.

## **Finfish**

The finfish industry started in 1965 as a 'cottage industry' and while it took some time to develop, today it has become a very sophisticated industry with a view to develop even further over the coming 5 to 10 years.

Scottish salmon is the UK's biggest food export, and supports 12,000 jobs in Scotland. It competes in a global market with the main competitors being in Norway, Faroes, Chile, Canada, and Iceland.

Annexe B shows the growth in both salmon and trout over the last 2 decades. While the tonnage has grown significantly since it began, it has plateaued in recent years. The industry has indicated that one of the reasons for this is the ineffective regulatory system that is in operation, in terms of the length of time taken to make decisions and how uncertain and inconsistent the outcomes are. Given that the sums of investment required to take the industry forward in a sustainable way are significant, that uncertainty can halt or slow down those development plans. While I understand their concerns, I am not convinced that the regulatory system itself is entirely at fault. I believe the erosion of trust has a part to play. It is clear, however, that the timescales for consenting process, set out in Annexe F are not an encouragement to the sector and are the current minimum times taken.

It should also be noted that it has taken 10-20 years to increase and maintain a 50 tonne increase in production, industry is predicting an uplift of 40 tonnes in one year according to the latest production statistics issued by the Scottish Government, coinciding with better modelling by SEPA and the removal of the biomass cap of 2500 tonnes. In terms of international brand share over the past 10 years Scottish salmon's share of world wide salmon sales has dropped from 10% to around 6% (Iversen et al., 2020 and reported from meetings with industry).

The industry have also indicated that some of the historical sites they currently operate may not now always be the most optimal, based on advances in knowledge of site suitability and operational experience. The location of active Atlantic salmon sites throughout Scotland is shown in Annexe C.1. Industry have again indicated that there are options to move some or all of those to more appropriate locations with the possibility of consolidating some of those sites. The current regulatory system makes it difficult to implement consolidation plans to close smaller sites and relocate to a single larger site elsewhere.

Finfish and mainly the salmon sector is now made up of a number of large international businesses who have and will continue to invest heavily in the industry as long as they feel the return on their investment is satisfactory. While there are other smaller players, the cost of entry into the finfish industry has and will continue to increase due both to their customers' expectations and technological changes in the production process. Regulation also plays a part in that cost for a variety of reasons and as long as it is sensibly and scientifically based should remain so.

I had not visited a fish farm for almost 20 years and like many, I expect who have done the same, found it totally different than I remembered. Having spoken to the industry before visiting, it is clear that salmon farming now is a much more sophisticated industry than it was even perhaps 5 years ago, and that pace of change is accelerating.

Annexe H shows the lifecycle and current production cycle of a farmed salmon. The industry appear to be moving toward a production process, which shortens the time fish are in sea water. How long that process will take and how far that can go is still unclear. The current aspiration is to grow larger smolts in order to reduce the marine cycle to a maximum of 1 year. If this is achieved, it will alleviate some of the disease, sea lice, and other issues including their interaction with other species. Also to look at other ways of achieving a similar outcome there are pilot operations investigating different types of offshore containment. Advances in science and data gathering are the driving force behind this plan.

As is stated above the finfish industry in Scotland is dominated by a number of large international companies. Those larger companies have been encouraged to invest, to date, due to the fact that Scottish Salmon has managed to maintain its position as a premium product. However, in recent years, Scottish salmon's share of the world market has fallen. According to industry this is, in part, due to the regulatory process slowing down growth of the sector, but it is also, due as well to the increasing production in the Faroes and the arrival of new players such as Iceland. One of the purposes of the new framework would be to establish levels of biomass for the sector in terms of future tonnage of finfish. This should be implemented by Government and not by individual bodies or regulators as that biomass figure needs to include economic as well as environmental factors. Our experience during the COVID-19 pandemic has demonstrated why Government should make those important decisions and not individual bodies.

There is a SNP manifesto commitment to "support innovation in aquaculture, for example, by exploring the development of closed containment fish production on land". RAS (Recirculating Aquaculture System) technology, is being explored in southern USA, South America, and in parts of Europe and has been advanced rapidly in recent years. There are RAS hatcheries in Scotland for smolt production that didn't exist 5 years ago. The energy cost involved in RAS to produce fully grown salmon is also significant resulting in a bigger carbon footprint than open net pen farming.

It is, however, important to address the previous point that Scottish Salmon has maintained its premium compared to elsewhere. This is likely due to the quality of the waters it is grown in. If the Scottish industry were to fully progress to onshore RAS then I doubt it could maintain its premium or indeed its rationale for being in Scotland at all given that proximity to its customer would become a key determinant.

In summary from what I have read and heard during this review leads me to believe that there is still a perception that the finfish farming practices remain in the cottage industry. A better understanding of the reality and the direction it is heading might improve the image of fish farming. Even in Shetland where the development of aquaculture has been integral to the community they commented that:

“We feel the public perception of the aquaculture industry in Shetland is very different when compared to other parts of Scotland and developments around our coast have been accepted as part of our progression to using our ability to make the most of our assets. We have considerably less public opposition to aquaculture developments when compared to other aquaculture authority areas in Scotland and development is generally supported by our communities as an established source of jobs and income. This can also be attributed to having fishing communities that have progressed and diversified to take on aquaculture in the last 40 plus years.”

Finfish farming is a key rural employer with companies now recognising that keeping people in these communities is critical to their future supply of labour by building houses in communities where they operate. Aquaculture companies also help create and maintain infrastructure as well as provide support to community activities including tourism. Companies have also created their own supply chains using local suppliers, where possible. I have been told tourists are interested in how fish and other farms operate and companies are now considering how they might turn hatcheries and farms into visitor centres based on that demand. One operator who runs boat services and other excursions around aquaculture sites told me that the fish farms they passed always stimulated positive interest from visitors.

It's clear that those that live in the communities where aquaculture is prevalent and are economically active in that community are generally supportive, where it is understood and trusted that the environmental impacts are appropriately considered and regulated as well. There is however strong opposition to further growth of the finfish sector which has gained momentum in recent years. This is not peculiar to aquaculture but mirrors the picture in other sectors, where objectors are prevalent.

The industry could and should do a lot more to promote the benefits it is providing to communities and others through its activities. It is my understanding that some within the industry are looking to promote their new sites as visitor attractions. This would be a positive step in promoting the industry and could help to restore trust.

## Shellfish

The majority of shellfish production is centred on mussels but oysters and scallops are also grown. Farming tends to be located on the west coast, Western isles and Shetland. Shellfish need pristine waters to grow. Oysters are normally grown in bags whereas mussels tend to be grown on ropes. While spat (juveniles) can be purchased from a hatchery many (particularly mussel farmers) rely on the spat arriving naturally in the tide.

The cost of planning in relation to profitability is an issue due to the number of years it can take for a shellfish farm to be deemed productive. It can take up to 5 years for a farmer to establish whether the site is in the right location. This essentially renders that farmer unproductive in the early years.

Annexe C.2 shows the location of active shellfish sites throughout Scotland.

The shellfish industry, with the exception of some of the Shetland farms, is essentially still a cottage industry with small operators and crofters adding it to their current activities.

Annexe B.3 shows the tonnage of mussels produced for table in Scotland. The tonnage has been fairly stable for the last 10 years with only the odd fluctuation. Other than Shetland, where aquaculture is seen as an integral part of their economy, accounting for about 70% of all shellfish produced from farms, no large scale shell fish farms have been established. International companies have not invested as heavily and the sector is still made up of a multitude of smaller companies on small-scale sites scattered across Scotland from Hunterston to Shetland.

In discussing with the industry and others why shellfish has not reached the same size and structure as finfish one factor seems to stand out, namely the margin that shellfish farms can make compared with that of finfish. As one industry expert said:

“For mussels to be obtaining the same margin as finfish it would have to be selling at £15 a kilo rather than the £3 per kilo that it is achieving.”

This is reflected in much of the feedback that I have had from operators. Cost of compliance, licencing etc. was frequently mentioned, compared to the finfish sector, who either never mentioned the costs or never to the same extent.

There are issues around regulation that the sector need addressed, mainly to do with planning and the associated costs of providing impact assessments. Without a way of obtaining a premium for their product the industry may continue to exhibit slow growth as it has in recent years.

## Seaweed

The seaweed sector in Scotland is still in its infancy and I would categorise it currently as in the exploratory phase of establishing what it could realistically be in the future and what are the optimal operational practices needed to produce efficiently and effectively.

Applications to grow and harvest seaweed by farming began in 2017 (Annexe J). As of May 2021 there were 12 registered Crown Estates Scotland sites but only 1 fully commercial cultivation agreement with the others being pilot studies (CES, 2021). Annexe J details all seaweed marine licence applications up to December 2021, totalling 17. The basic challenge is the different types of seaweed that could be farmed and their end uses. It's not yet clear which species will dominate. There are a number of researchers looking at sea weed farming practices and the optimum species to grow and their end uses. Some of that is determined by the waters around Scotland where only certain types of seaweed will grow well.

Seaweed farms are much larger than traditional finfish or shellfish farms in terms of the hectares they cover. The seaweed grows on horizontal ropes that sit just below the surface as they need sunlight to develop. The size of the farm is linear in terms of the tonnage production. The site I visited was over 60 hectares. In simple terms, to produce 1000 wet tonnes of seaweed you need plots which are approximately 5 km by 7 km of seabed. Certain species will have preferences for certain conditions (e.g. more wave exposure and strong tidal current). Shelter from different wind directions is also important to reduce the sea days lost to poor weather. Increasing the density of seaweed farming structures (i.e. more growing rope per hectare) will come at a cost of inefficient deployment and harvesting.

Unlike finfish and shellfish, sea weed does not require planning permission or CAR consents. It is consented through a marine licence, and requires a Crown Estate lease and Works License in Shetland.

The size of the industry is undetermined and will remain so until a stable market is identified. However, I do still believe that like the other parts of the aquaculture industry, it needs a framework. The Scottish Government has already set up a [Seaweed Review Steering Group](#) to better understand the sector.

## Current Regulatory Situation

The current situation in terms of aquaculture can be summed up neatly by what happens if you Google 'how to start a fish farm' in Norway or Scotland.

Searching 'how to start a fish farm, Norway' returns a number of sites that clearly set out the whole process from end to end, including who is involved in terms of regulators, Government etc. and requirements at each stage. The FAO present a fact sheet providing [an overview of Norway's aquaculture legislation](#). An alternative source of information comes from the Salmon Business website in Norway, which provides information on the [laws and regulations involved in land-based salmon farming in Norway](#).

The same search for Scotland will return a website of one of the regulators involved, where you can find out what they do but there is no consolidated site that sets out the whole process simply and easily. Again that is not the case in Shetland where they do have a good established process for helping people should they wish to establish a farm there. As I have talked to many people during this review it is clear that finding out precise detail of the process requirements in a single place is not easy. One person starting a shellfish farm said that they had to go to one of the regulators who provided information on their requirements only. The proposer had to actively seek help to establish where else they had to go. Further guidance was variable depending on how knowledgeable the official was in the processes of the other parties involved. This resulted in a slow and tortuous process for that person.

In this respect, my first recommendation is **there should be a single website and body where anyone with any questions around starting up an aquaculture business or who have questions on more general issues or aquaculture regulation can go to find out all that they need to know.**

Table 1 shows the process for each type of aquaculture consenting.

Application	Authorising regulator	Legislation	Aquaculture type		
			FF	SF	SW
<b>Planning Permission</b>	Local Authority (LA)	Town and Country Planning (Scotland) Act 1997	✓	✓	
<b>Environmental Impact Assessment</b> (if necessary, mainly relevant to FF but can be required for SF)	Local Authority (LA)	The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011	✓	✓	
<b>Marine Licence</b>	Marine Scotland Licensing and Operations Team (MS-LOT)	Marine Scotland Act 2010	✓	✓	✓
<b>Seabed Licence</b>	The Crown Estate	The Crown Estate Act 1961	✓	✓	✓
<b>Authorisation to operate an Aquaculture Production Business (APB)</b>	Marine Scotland Fish Health Inspectorate (MSS-FHI)	The Aquatic Animal Health (Scotland) Regulations 2009	✓	✓	
<b>Controlled Activity Regulations (CAR) licence</b>	Scottish Environment Protection Agency (SEPA)	The Water Environment (Controlled activities) (Scotland) Regulations 2011	✓		
<b>Habitats Regulations Appraisal (if Necessary)</b>	All of the above	The Conservation (Natural Habitats, &c.) Regulations 1994 and its amendments	✓	✓	✓
<b>Works Licence</b>	Shetland Islands Council	Zetland County Council Act 1974			✓
<b>Notes:</b> FF = Finfish    SF = Shellfish    SW = Seaweed					

**Table 1:** Licensing requirements for each type of aquaculture and the responsible authorising bodies.

The system is complex and each part has evolved separately. Each regulator being responsible for their own procedures with no overall authority or joined up process. Each party can be approached separately and it is unusual for all regulators to meet together to discuss applications and other issues. That means that each part is licenced or approved separately and while all permissions are needed to reach a final outcome there is no real coordinated approach. Annexes F.1 and F.2 outline the differing routes that both finfish and shellfish can take to gain all licences required to commence operations. The length of time taken occurs because the current process is sequential, when it does not need to be. Even without a new process, it could be managed quicker as the timescales shown in Annexe F are not always achieved.

Local Authorities became involved in finfish and shellfish development through the Town and Country Planning Acts of 1997 and 2007 when marine finfish and shellfish aquaculture was deemed to be a 'development' and therefore should be part of the planning process. However, under the 1997 Act, aquaculture is considered as development, rather than the operational activity that it is. From discussions with Local Authorities and others it appears this has resulted in a very rigid system, with no real flexibility to suit the needs of an industry and its regulators who need to be

able to react and adapt to a very fluid and constantly changing environment in the water. It has been suggested that such a system is also detrimental to innovation and effective change management, two vital factors in enabling the sector to future proof its operations and promote sustainable development.

While it is clear from Table 1 which licences and approvals are required to operate an aquaculture business, both onshore and off shore, the consenting process is not aligned (i.e. there is no order in which an applicant must apply for these permissions). There is no overarching body presiding over it, and there are often inconsistencies and information gaps between planning and marine licence applications. Each part of the process relies on the actioning regulators having sufficient knowledge and practice of the process to allow them to make their decisions and judgements in a competent way. While that may have been the case in the initial days of finfish farming I do not believe that is now the case for two main reasons:

- To do regulation well you need to do it often enough to build up a bank of knowledge and practice that you can draw on, and
- The finfish industry is becoming more and more sophisticated and the science while more exact in some places, is not in others.

Annexe D shows the number of aquaculture applications that were made in 2020 which I believe is typical of the process. The numbers in terms of regulatory decision making are small compared with other sectors so the ability of the regulators to build up their knowledge is lost to a great extent. The issues around fish farming are complex and there is an appetite for developers to do things new and differently. This has meant that the knowledge among regulators has had to evolve, which again generally comes from doing things regularly. Added to this is the need for regulators to recover costs and the general pressure on finances and resources has meant a shrinking in numbers and expertise.

Highlighted below are some comments which reflect on the need for change, 4 of these comments were from regulators, 1 was from academia, 1 from an ENGO (environmental non-governmental organisation) and 1 from industry.

#### Comment 1

“Applications for offshore renewable Marine Licences and s.36<sup>1</sup> consent applications are determined by the Marine Scotland Licencing Operations Team (MS-LOT). Section 36 Consents refers to consents granted under the Electricity Act 1989. Under this system, both Local Authorities and SEPA are statutory consultees for s.36 applications and are also fully consulted on any deemed planning components of s.36 applications. Both the local authority and SEPA must also be consulted with

1. Marine Scotland - Licensing Operations Team (MS-LOT) is responsible for marine licensing in Scotland on behalf of the Scottish Ministers. Marine licences are issued under Marine (Scotland) Act 2010 for the Scottish inshore region (0-12 nm) and under the UK Marine and Coastal Access Act 2009 for the Scottish offshore region (12-200 nm). Licensable marine activities include, but are not limited to, marine construction (including seaweed farms and wind, wave and tidal energy devices) and deposit of finfish and shellfish farm equipment. MS-LOT also administers the consenting function of s.36 of the Electricity Act 1989, where required, for marine electricity generating stations (0-200 nm).

respect to Marine Licences. This is one of the major differences between offshore renewable consenting and fish farm consenting. In other respects there are similarities between the processes in terms of NatureScot being statutory consultees in both systems, with seabed leases being required from the Crown Estate in both cases also.

As a marine activity with the requirement to obtain a Marine Licence from MS-LOT, fish farm operators are in the unique and invidious position of having to comply with both marine (e.g. National Marine Plan, regional Marine Plans) and terrestrial planning guidance. The consenting system for offshore renewables is significantly more efficient and effective than that which currently exists for fish farming. It is the most obvious example of an existing one-stop-shop consenting process which allows for more effective and efficient outcomes whilst securing local decision making in the form of statutory consultees.”

### Comment 2

“A fundamental principle of good regulation is that the regulator needs the appropriate capacity, expertise and/or resources to monitor and enforce any conditions for a consent. For fish farming, planning authorities are required to attach conditions to planning consents for which they have no capacity, expertise and/or resources to monitor and enforce. Planning authorities, and other regulators, do not have the appropriate resources to regulate fish farming. Given the existing value of the sector, the complex nature of its environmental interactions and the ambitions for future growth, significant additional investment is required in regulation.

Environmental Management Plans are not fit for purpose. They were intended to be a stop gap to address the sealice and wild salmonid issues until better regulation was brought in. However, the issue remains that planning officers do not have the capacity or scientific expertise to allow for effective monitoring or review of the EMP planning requirement, that is largely based on industry self-monitoring.”

### Comment 3

“There may be some inconsistency in the various regimes and how they are applied. For example there may be inconsistency in timeframes across leases and permits (such as planning permission or marine licence) which gives uncertainty to operators. Marine licences are granted for a six year period, the timeframe inherited from the previous CPA regime. This is short for such permits and is taking views from statutory consultees and considering extending the validity period of such licences to be more in line with other permissions. It is currently giving consideration to extending such durations to 20 years to reduce the burden on applicants and realise benefits in terms of resource for determining applications.”

#### Comment 4

“Allowing middle or junior managers to make critical decisions or not being capable of answering is not sensible. Decisions should be made at the right level by people with specific knowledge.”

#### Comment 5

“The focus on sea-lice and the interactions between farmed and wild salmon has taken attention away from the broader ecosystem effects of salmon-farming.”

#### Comment 6

“For salmon farming to grow sustainably in Scotland, it is essential that all salmon farm operators manage their farms within the environmental limits of the surrounding marine environment. Whilst an industry code of practice exists, which is largely followed by the industry, it is important that any cases of poor farm management and unacceptable environmental impact are detected, and that farm managers, and parent companies, are held accountable.

A single consultation process, led by a single body, would be a more efficient process. It would allow for all concerns to be raised and considered together, and for adequate resources and expertise to be available to scrutinise every aspect of a new salmon farm proposal.

Existing and new regulation need to meet the tests of being robust, transparent, enforceable and enforced. To ensure environmental impacts of salmon farming are identified and addressed, and therefore deliver environmentally sustainable growth of the industry, it is essential that salmon farm operations are reported on and monitored in a transparent way.”

#### Comment 7

“The precautionary approach is a measure outlined in legislation to be implemented based on the predicted minimum impacts a site will have on a sensitive environmental factor. This measure is often applied by planners in cases where there is no knowledge of minimum impacts (e.g., sea lice dispersal, impact on wild fish population or other technical influences) resulting in the rejection of planning applications based on a lack of understanding rather than informed decision-making. The use of the precautionary principle is simply not appropriate if there are other existing bodies (e.g. Marine Scotland/SEPA) which would have the requisite knowledge to confidently determine such applications.

A recurring issue is the lack of alignment and effective communication between statutory agencies. This issue is observed not only between separate regulators with shared remit for aquaculture consenting, but also within the same agencies. An example of this is different interpretation of regulation/legislation and advice by different areas/teams/officers within the same body. In the same vein local authorities regularly interpret national planning policies and guidance in different

ways. This is frequently due to highly variable staff resources and experience between authorities."

Annexe I sets out the major themes of all the comments received for information.

It is clear from the evidence I have gathered that the current process of consenting and licencing for aquaculture does not work as well as it could. It has many regulators and the process is sequential but not linear so you can start anywhere, with any of the regulators, which in itself leads to inconsistency and process delays. The regulations appear to be OK but it is difficult to be definitive on that because the process does not work well so to be clear what I am recommending is not new regulations per se but a different and improved process that allows all that is there to work in a process that is simple, efficient, and effective.

The changes I recommend further in my report take into consideration all views on aquaculture and importantly, not just those of the industry itself. However, I believe that if that process is to change it should do so for finfish, shellfish and seaweed utilising a different framework for each which I will expand on later.

To be effective, the decisions and judgements within the regulatory processes need to be based on credible evidence. Throughout this review, I have been led to believe that this is not the case currently within the aquaculture sector. The science and evidence has developed over the years and while some is excellent and has a basis in sound research and analysis other parts may not. Therefore whatever regulatory process is put in place, all decisions and judgements made should be based on the same science and evidence. In other sectors there are frameworks or more specific guidance in place, which allow those decisions and judgements to be made within an agreed policy context, boundary, or parameter that Government and those implementing policy on their behalf adhere to. I believe that changes should be made to the regulatory process for aquaculture, which should be underpinned by a framework that all regulators and operators in Scotland agree with and will comply with.

One of the many things that the COVID-19 experience has taught us is that following agreed science leads to positive outcomes. To do that the science itself needs to be proven to have the soundest base in fact. Also COVID-19 has shown that even within a regulating system for aquaculture things can change and work better. While SEPA has been criticised many times throughout this process they should be congratulated for their flexibility during the COVID-19 pandemic. If that flexibility could be applied to my recommendations then I believe we would all be on a better journey.

## A Consenting and Framework System for the Future

Norway has recently published a new aquaculture strategy in order to achieve their goal of sustainable growth for the sector ([An introduction to the Government's new aquaculture strategy](#)). The Norwegian Government has set out 5 aims to achieve their goal:

- ensure good fish health and fish welfare;
- produce sustainable seafood with a small climate and environmental footprint;
- produce healthy and safe seafood that meets nutritional needs and food preferences;
- ensure good access to the markets where the products are competitive and be able to document that Norwegian seafood meets applicable requirements as regards food safety, sustainable production, fish health and welfare etc., and
- contribute to good and profitable jobs and local ripple effects along the entire coast of Norway and revenue to society.

Recently published documents and the opinions put forward, of almost everyone involved in the sector, indicate that no one would disagree with those standards and in many cases should be the benchmark.

A repeated theme throughout the evidence gathering phase has been the request for a system similar to the one in Norway. I have looked at the process in Norway and while I agree that it does do some things well, I believe the licencing and consenting system that can be implemented in Scotland can be better.

From work and visits by others to Norway, a key point of learning was that fish farms need both a location approval and to buy a permit for growth in biomass. The location approval is delivered through a “single window” approach where the various regulatory bodies deal with an application within a co-ordinated process. This sets a maximum scale of production and then permits for additional biomass are sold through a process that combines both fixed price and auction elements. The location consent process incorporates a number of related components within a co-ordinated system. There are still individual decision-makers for a number of these components. The timeframe for processing applications under this system is 26 weeks for straightforward applications. Cooperation between industry, science input and the regulatory authorities is seen as essential. In simple terms this means that when an applicant wants to start or enlarge a finfish farm they apply through a single portal. Those in that portal then manage the process with other regulators and interested parties with the person in the portal acting as the project manager. The result is one single consented document covering all aspects and for a single length of time across all bodies involved.

## Single Consenting Document

The Norwegian single window regime is not a panacea nor is it a single consent covering all requirements. Rather, it is a co-ordinating mechanism to give all necessary location permissions, including environmental discharges (equivalent to SEPA's Controlled Activities Regulations but determined by regional authorities), at a point coterminous with licence award.

While that in itself would bring advantages to the current process, I believe that it misses out something, which has been proved to lead to effective and efficient licencing and consenting outcomes in other sectors both in Scotland and elsewhere.

**I am recommending a new single consenting document for aquaculture should be created, that mandates what all parties (the applicant, regulators, the community, and other statutory consultees) involved in an application are subject to, derived from a pre-application consultation prior to submission.**

All parties would go through all of the parts of the application jointly and agree or not on what the application will look like. If they agree to the application the presumption is that it should proceed to a single consenting document which would be approved and it can be set out in a way that is clear to all parties. That is not just in terms of what it is that has been consented, but also what the 'rules' and caveats are, and importantly what can be changed with or without further agreement and consultation in the future, and cover a period of time that is the same in terms of consent for all parties.

The technical process has been called multilateral pre application consultation but it is much simpler than it sounds and has been proven to work well in other sectors and places. In the current process all the exchanges are done bilaterally which leads to all parties requesting the same, or similar, information leading to duplication of work, with little sharing of information or views. This in turn causes issues, with parties not knowing or understanding, in many cases, the reasoning behind certain decisions or judgements. In my opinion, the reason the multilateral process is underutilised is that it needs someone to manage the process and indeed manage the meetings that are needed to make this work well. The belief is that if someone who is an integral part of the consent process managed the process they would lose their independence so could be accused of influencing the outcome. While I think there are ways round this, having an independent person in control of and managing the process is useful as someone will have to draw together and produce a single consenting document that all parties agree to and eventually sign up to.

This will not influence or diminish the roles of the current regulators nor dilute their responsibilities as long as they are operating in the new framework put in place for each part of the aquaculture sector. They will perform their duties collectively. The same applies to other statutory consultees and most importantly to the community involved. For this to work there would need to be alignment of the time taken to award each consent otherwise this will make the consenting document complex.

## **Management of the Process**

The new single document process will need a person or body to be appointed as the process manager. Their role will be to chair, steer, manage and produce the final consenting document. That person or body will be:

- Knowledgeable in all the aspects of the sector and the process that is proposed;
- Be seen by the community as a 'local' namely understanding their challenges should they have any, and
- Be trusted by all parties to do this independently and within a framework and set of rules already is agreed.

This is important as in all the years I have carried out reviews I have never come across a sector where there is so much mistrust and indeed vitriol between industry and some of the regulators and other parties involved in aquaculture. This led to a formal complaint by the industry in respect of one of the regulators.

It is imperative that whatever new process is put in place restores trust and can be managed with respect in the process. I believe the best way of doing this is to create a dedicated and separate part of Marine Scotland whose only role is to manage the consenting document process for aquaculture in Scotland within a framework decided by Government. This will require knowledgeable and experienced people to run it and manage each of the multilateral consenting and other meetings as they occur.

## **Local Authorities**

Whilst I recognise the professionalism of the Local Authority planners, there is an option in the Marine (Scotland) Act 2010, Section 63 that provides for fish farming not to be deemed a development under the Town and Country Planning (Scotland) Act 1997. This Order can only be made with the consent of local authorities for their relevant waters. This essentially means that Local Authorities can give up their planning rights to the Scottish Government in respect of aquaculture, should they think that appropriate. I believe that Local Authorities must have a role in this process as it affects their communities and their local economies. They require some legal status to ensure accountability in this respect. That could be achieved through designating them as statutory consultees to the process. This could allow them to widen their remit beyond planning issues.

From my engagement discussions I am aware that there are differing views among planning authorities to retaining planning powers for aquaculture. The issue of resourcing and maintaining expertise was raised by all, except Shetland. Discussions with COSLA noted that they would be content for each Local Authority to decide whether to retain planning powers for aquaculture or not.

## Local Communities

In respect of the local community I recommend the **new consenting document contains a 'social contract' that recognises the community and its needs.** I acknowledge that aquaculture companies already work well with the communities within which their operations sit. I believe comparisons should be drawn with the wind farm industry where local communities receive a 'share of the benefits' that companies make from a local operation. The recommendation I understand is not without its complexities and it must not just be a way of communities claiming 'benefit' for everything that is done locally but I do think it is worth considering.

## Evidence Based Decision Making

The recommended consenting process should resolve many of the issues raised by all parties, and indeed many proposed a single consenting system in their submissions. However, it will not resolve one of the key issues, namely inconsistency and the ability for everyone to use their own evidence or sources in making decisions or judgements which may conflict with other evidence and views elsewhere. That is not to say that each body involved should not still make its own decisions and judgements but should do so within the boundaries that have been agreed by the Scottish Government in the policy framework for the sector.

I believe this conflict in the decision making process is mainly due to the pace of change in industry and the corresponding science. Those using science must ensure that they have the most current, effective and relevant scientific evidence to defend their arguments against any negative issues raised. To be clear, that is not just science for the industry to defend itself but it needs to ensure that it has in place the most effective, efficient, and humane process for producing its products.

It is also worth raising at this point that my report has been primarily to do with statutory licensing. The industry are also regularly audited by both their customers and various accreditation bodies. Many customers provide their own parameters within which the fish farmer has to operate. To highlight this, one of the large finfish farms shared the number of audits and time spent on them, which is set out in Annexe G. Customers also produce data and scientific reviews adding to the increasing amount of scientific evidence produced by industry, academia and Government. What is not clear is how often the science and other evidence used by individual organisations involved in the current regulatory process is reviewed or shared to ensure it is the most up to date and accurate available.

Therefore another recommendation is **the science and other evidence that is currently being used by all parties involved in the sector is reviewed independently to ensure it is the best and most up to date available.**

Any mistrust or inconsistency in the science and evidence base is key, and the reason I believe that the new consenting process without a framework will not work effectively.

## Governance

I recommend that once the Scottish Government has produced its Vision for Aquaculture it should **work with all parties through a Project Board to produce, within 12 months, a 10 year framework for each part of the aquaculture sector (finfish, shellfish, and seaweed) within which all must operate.**

The framework, should be owned by the Scottish Government, and should set out a 10 year strategy for each sector. It should include:

- The type and size of industry they want within that period, including the levels of tonnage and biomass;
- Where they want sites to be as part of a larger Marine Planning exercise. (The proposals outlined in the Fourth National Planning Framework recommends that local development plans should guide new aquaculture developments to locations that reflect industry needs and take account of environmental impact and wider marine planning. Local Authorities will be required to do this. Shetland already has this in place);
- Parameters for disease control and other issues such as sea lice<sup>2</sup> within which the industry must operate;
- The community benefit that it should achieve in all aspects;
- How interactions with other species and predators would be managed;
- The licencing and consenting regime and how that will operate;
- Clear lines of responsibility in terms of who does what;
- The length and substance of each licence, and
- How it would be funded.

This framework would become part of the Government policy and no decision can be made outside of those parameters without agreement of the Scottish Ministers. The framework needs to be adaptable in line with emerging scientific evidence that all parties agreed were relevant. The framework could comprise of targets, to be achieved over a number of years others could be enacted now. The creation and management of the framework would be the responsibility of the new part of Marine Scotland, which would operate and manage the licencing and consenting process.

## Management of Sites

The framework and single consenting process could pave the way for the sector to examine the effectiveness of their sites.

Stakeholders in the finfish industry have stated that not all the current sites they operate are as optimal as they could be given the passage of time. This is mostly due to the development of the industry over the last 50 years and the better understanding and knowledge. Some sites that were initially put in place may, with the advances in knowledge, not now be in the right place or be the right size. The current consenting system doesn't allow 'consolidation' proposals to be dealt with

2. SEPA are currently consulting on a [new risk-based, spatial framework for sea lice](#).

sensibly or indeed at all. The industry are aware that site configuration today is not optimal on many points but, there is not the trust in the system to initiate any consolidation works. Therefore, **once that framework is in place all existing sites should be examined to ensure that they can operate within the framework.**

In 2020 there were 232 active salmon sites in Scotland (Marine Scotland, 2020) with only 131 actually producing, leaving the rest dormant. From my discussions with the industry, who want to grow the output of the industry overall, they believe that with proper and good consolidation a bigger industry could operate from fewer sites. That consolidation exercise would also leave a number of sites fallow. There are also sites that have not been used for some years but have not been closed or the licence given up.

It is recommended **that all sites where it is unlikely, after evaluation against the new framework and remedial action that further finfish production will occur, give up all licences held on that site by the current owner.** Those sites would either then be:

- Returned to the wild;
- Become available for shellfish operators who see some as good places for shellfish production, and
- In some cases help the seaweed industry expand.

This does not mean that any site that does not fit within the new framework should immediately be shut. The framework will need to be flexible to allow parties to work through these issues and take action to bring the site within the agreed parameters or consolidate in a compliant site. Only if there is no mitigation should a site be considered for closure.

### **Science, Data and Evidence**

In Norway there is a separate scientific body which advises the various regulatory functions in Norway and is deemed to work well. Currently in Scotland each regulatory body houses its own scientific functions.

The proposed new framework will be based on data and evidence, of all types, that will inform its parameters and targets over time. That scientific and other evidence needs to be consistent as is stated above so Government needs a body that can advise it on what evidence they should be using. Therefore, I recommend **the creation of a central science and evidence base should be put in place jointly run and managed by industry and the Scottish Government which gathers, collates and examines scientific and other evidence relating to this sector so decisions within the framework can be made in the most effective way.**

Where it sits would need to be agreed but it needs to be a body where the scientific and other evidence from industry, Government, and elsewhere can be brought together and managed effectively including commissioning new science where it thought it was necessary.

Many of the changes I am proposing throughout this report could be started now and indeed information gained from an initial trial on that new system would add useful information and knowledge to the creation of the framework. In terms of the pilot I believe that Shetland would be the ideal place to carry any out due to their expertise and ability to work well with the industry already. A pilot would allow much of the administration that any new regulatory system requires and can be designed within a supportive environment. This would allow a smooth transition to the full roll out of the new process.

### **Moving Forward**

Governments produce frameworks for industry and regulators implement that policy. COVID-19 has been a good example of where Government has created frameworks and guidance on what it considers to be the appropriate balance. Frameworks exist everywhere in society be it for the speed we are allowed to drive our cars, the way we are dealt with legally, and many others.

While the Vision for the sector is being finalised I propose that the Government led Project Board take forward the initial work on a framework that will allow a timeous meld in with the Vision, once in place.

Although I am not clear on the legislative implications, I believe that much of what I am recommending can be implemented either through alterations to existing legislation, where there is flexibility to use Statutory Instruments to give change, and through change in the ways we administer or process actions, which can be done with Ministerial direction. There is the possibility that alternatives, that take us away from that need for legislation may be found.

I believe that my recommendations will start to restore trust within the aquaculture sector, which is key to going forward. I also believe that all parties are ready and willing for this change which I think is highlighted in a paragraph from a regulator's written submission:

“In a fast changing sector, we believe the flexibility of regulations like CAR and IAF (Integrated Authorisation Framework) is important in facilitating on going, adaptive regulation of sites, able to respond rapidly and appropriately to innovation by developers and operators and to poor environmental performance.”

## Who Pays for all this

It is clear in terms of resourcing and also the management of the science that there will be an extra cost to Government.

In Norway the industry pays for much of this through an auctioning scheme, which has an upfront payment for the licence they receive. The money raised in the last auction round (2020), was estimated at 5.9 billion kroner (circa £497 m). This was shared on a ratio of 70% to local municipalities, 10% to county authorities and 20% kept centrally (Åm, 2021; DoF, 2021). On a per tonne basis that equates to around £18,293<sup>3</sup> per tonne of production on all sites in Norway. It is also designated as a financial mechanism that can be treated for accounting purposes like a 'tax' rather than a fee so it does not have a material impact on the applicants EBITDA (earnings before interest, taxes, depreciation and amortization) and Profit and Loss Accounts.

The Norwegians also have categorized their coast line and off shore areas in relation to environmental parameters and the cost of licences vary by location category. I am not suggesting at this time, the same for Scotland, but I believe Marine Spatial Planning should form part of the future framework. This is a longer term aspiration but will be guided by the Vision, National Planning Framework and any changes to the National Marine Plan. Also for spatial planning for aquaculture to be part of the new proposed framework going forward we must all first agree on what the sector will look like in the future perhaps rather than it is now.

In terms of licencing costs Salmon Scotland have undertaken some assessments of the current cost to operate in Scotland. While further work will need to be done to validate these numbers, add anymore for the purposes of this report and also contextualise my recommendations, they are a good place to start.

Their estimate of the overall costs of doing business in Scotland, under the current licencing regime, accounts for in excess of 1% of farm gate value and could be as high as 1.5%. Currently the combined costs of SEPA, Crown Estate Scotland, Scottish Government and Local Authorities and other modelling costs are in excess of £13 million each year (potentially £15 million). The SEPA proposed charging scheme (not yet implemented) suggested an increase of 120% cost to producers (on monitoring, subsistence and application costs) to around £9.5 million p.a. (up from £4.2 million p.a.). The Crown Estates Scotland's recent consultation suggest an increase of 50% to charges incurred by the sector to in excess of £9 million p.a. across the industry. If these increases were put in place the overall aquaculture sector charges could be in the region of/in excess of £20 million p.a. These costs do not include all the employment hours and investment required which are borne by companies and others to satisfy the demands of the above and their customers.

3. Norwegian sites charged on a "traffic light" system, this number is an average of all aquaculture site licences granted in the auction round for 2020

What is also useful to examine is how costs of production in Scotland compare with others across the world in this sector given that finfish in Scotland is predominantly owned by large international businesses who can choose where to invest. However, Scotland's finfish price is still at a premium so to an extent that may balance those costs despite what is set out below. Again from work Salmon Scotland has done, it appears that Scotland has a relatively high production cost base compared to other main Atlantic salmon countries. Figure 2 shows the total Atlantic salmon production costs per kg HOG (head on gutted) in 2018. The cost of the regulatory approach taken in Scotland is 64% more than the equivalent in Norway (Iversen et al., 2020). However, if Norway's auction costs are not deemed to be charges but a tax and do not appear in the industry's EBITDA then further work would need to be done on these numbers to ensure we are comparing the same thing across countries, which may not be the case I believe.



**Figure 2:** Atlantic salmon production costs per kg HOG (head on gutted); converted to GBP (2018) (regulatory costs are included in the “miscellaneous” category)

I suggest the increased costs of what I am proposing will in the main fall to Scottish Government which will both create and oversee the frameworks for each part of aquaculture sector as well as operate and manage the single consenting process. Where that sits within Scottish Government is for Ministerial consideration, but a new and separate part of Marine Scotland or within Scottish Government could be considered. As I state in the section on this above, it would have to be led and managed by individuals who bring the degree of expertise and knowledge (local as well as general) that will be required. The industry also accept that to put in place the framework, and a better licencing and consenting system will mean extra cost and are prepared to look at how they can contribute to that. However, there is a balance to be struck in doing so, that recovering costs does not endanger further investment.

I recommend that to pay for these changes **a new single licencing payment is introduced based on tonnage output of each site, which covers the costs of all bodies involved in the process and addresses community benefit as well. A**

**separate charge on established sites that are to continue post review to be examined.**

The payment would be based on the current predicted output of the site so if there were to be growth later beyond that tonnage then an additional payment would be made at the time of agreement of that increase. In introducing a new payment system and process, I recommend it is done in the context of:

- A review of the length of validity for all the licences involved so all consents share the same timescale;
- The time of the licence/consent validity is long enough for the licence holder to gain value from the site and ideally allows it to be capitalised as an asset on their balance sheet;
- The full payment will only apply to new tonnage and not any transfer of existing tonnage to a new site, if that has come from consolidation of others e.g. if a company creates a new 5000 tonne site by closing three 1000 tonne sites, then the payment would only be calculated on the additional 2000 tonnes;
- That a separate tonnage payment be agreed for existing sites once consolidation is complete;
- Who makes the collection and distribution of the payment to be agreed by all regulators including Crown Estate Scotland, the latter which should be an integral part of the process;
- There is an allowance in the licence charge for local community benefit for the area where the site is situated. It's my belief that a significant amount of what is collected (similar to Norway) goes back to the communities in whatever form so that they can also benefit from the economic prosperity that the farms will bring. Decisions will have to be made on whether this part of the payment should be collected by Government for redistribution or whether the operator should be legally obliged to disburse that payment themselves directly to the community;
- Part of the licence cost is used to fund further scientific and other research in areas which are mutually agreed through the new composite scientific body;
- The payment be designated for accounting purposes in a way that allows it to be treated in a way that it can be taken out of annual EBITDA calculations, and
- It should cover the costs of the new licencing and consents unit as well as the costs and fees of other bodies involved in the process.

This has to be agreed as part of the new process at the outset. Without it, each of the bodies involved would have to look at their own charges and more specifically the resource they have to deliver it in light of the new recommended process.

**Finally, the process should encourage innovation and development across all three sectors with special consents or licences aligned to innovation including the length of validity and costs.**

## Conclusions

I believe that these are a sensible set of recommendations that will allow sustainable aquaculture development in Scotland.

Prudent management and timely delivery is key, although if primary legislation is required this will hinder the speed at which it can be delivered.

My final recommendation is that **a short term project board is established which oversees, drives, and guides all the varying parts, so that all the above can be put in place, where possible, within a 12 month period.**

The project board should contain representatives from industry, regulators, Local Authorities, and other interested parties including someone to represent the communities involved. It should be chaired by someone who is independent and understands how to make new processes work. The new multi-lateral consultation process should be able to be put in place very quickly.

The contents of this report relate to process and consensus. The work recommended will need to be driven by someone who understands the challenges and can steer the direction required even when others try to defend the status quo when it has been agreed it no longer exists.

## References

Åm, H., 2021. A critical policy study on why introducing resource rent taxation in Norwegian salmon aquaculture failed. *Marine Policy* 131, 104692

CES. 2021. [Seaweed asset profile](#). Crown Estate Scotland.

DoF (Directorate of Fisheries). 2021. [Aquaculture Fund](#). Directorate of Fisheries

Iversen, A., Asche, F., Hermansen, Ø and Nystøyl, R. 2020 Production cost and competitiveness in major salmon farming countries 2003-2018. *Aquaculture* 522, 735089

## **Annexes**

- A. Participants
  
- B. Sector Production Data
  - B.1 Salmon
  - B.2 Rainbow Trout
  - B.3 Mussels
  
- C. Aquaculture Farm Locations
  - C.1 Map of Active Finfish Farm Locations Around Scotland
  - C.2 Map of Active Shellfish Farm Locations Around Scotland
  
- D. Planning Applications and Decision Times by Authority for 2020/21
  
- E. Norwegian Application Process
  
- F. Scottish Application Processes
  - F.1 Finfish scenarios
  - F.2 Shellfish scenarios
  
- G. External Audits Data
  
- H. The Salmon Lifecycle
  
- I. Anonymised Comments by Theme
  - I.1 Formal Written Contributions
  - I.2 Formal in person contributions
  
- J. Seaweed Marine Licence Applications

## Annexe A Participants

Those I Met	Written Submissions (representatives)	Visits
Fisheries Management Scotland	SIFT	Scottish Sea Farms
Crown Estate Scotland	Lochaber District Salmon Fishery Board;	Organic Marine Harvest
Scottish Seaweed Association	Scottish Salmon Think Tank/ CCN/ SARNS	Shore Seaweed
Chief Planner, Scottish Government	Marine Conservation Society	Loch Fyne Oysters
Scottish Salmon Company	Grieg seafood	-
Salmon Scotland	Western Isles District Salmon Fisheries Board (WIDSFB)	-
Association of Scottish Shellfish Growers, Inverness	Citizen Scientists	-
Mowi Scotland	Wester Ross Area Salmon Fishery Board	-
SEPA	Regional Inshore Fisheries Group (RIFG)	-
NatureScot	Argyll DSFB, Argyll Fishery Trust, Fisheries Management Scotland	-
Sustainable Aquaculture Innovation Centre	RSPCA	-
Board Member Crown Estate Scotland	Scottish SPCA	-
British Trout Association	Argyll District Salmon Fishery Board	-
NASCO	Concerned individual	-
Ace Aquatec	Argyll District Salmon Fishery Board	-
Gaelforce	Orkney Fisheries Association	-
COSLA	Senior Partner, Cromarty Mussels	-
Marine Scotland	Coastal Communities Network (CNN)	-
SalScot Prescribing Vets Group	Kames	-
Highlands and Islands Enterprise	Scottish Fishermen's federation	-
Aquascot and Shore seaweed	Royal Yachting Association	-
Dawn Fresh	Skye and Lochalsh rivers trust	-
Head of Planning (Orkney)	Loch Long Salmon	-
Local Authority Planners	Orkney Island Council (written submission)	-
Isle of Skye Oysters	North Ayrshire Council Planning	-
Marine Scotland (Planning Statutory Consultee)	Fish Legal	-
Marine Scotland (Licensing)	Kyle of Sutherland District Salmon Fishery Board (KSDSFB)	-
Shetland Mussels	SGA Fishing group	-
Scottish Shellfish Marketing Group	Simply Blue	-
Marine Scotland (Director)	Humane League	-
Marine Scotland (MARLAB)	Argyll and Bute Council	-
Environment and Forestry (Director) and SG Head of Water environment team	Fidra	-
Argyll and Bute Council	Royal Town and planning	-
Callander McDowell	Cooke Aquaculture	-
Seafood Shetland	OneKind	-
Shetland Islands Council	SAMS	-
Coastal Communities Network	Maritime and Coastguard Agency	-
Marine Scotland	Northern Lighthouse Board (NLB)	-

Scottish Wildlife Trust	West Sutherland Fisheries trust	-
Fidra	Animal and Plant Health Agency (APHA)	-
-	Clyde Marine Planning Partnership (CMPP)	-
-	Compassion in World Farming (CIWF)	-
-	RSPB	-
-	Orkney Trout and Fishery Association (OTFA)	-
-	Scottish Anglers National Association (SANA)	-
-	Shetland Mussels	-

## Annexe B Sector Production Data

### B.1 Salmon ([Scottish fish farm production surveys](#))

Year	Tonnes produced	Producing sites	Active sites	Value (£mill)
1990	32351	-	-	-
1991	40593	-	-	-
1992	36101	-	-	-
1993	48691	-	-	-
1994	64066	-	-	-
1995	70060	-	-	-
1996	83121	-	-	-
1997	99197	-	-	-
1998	110784	-	-	-
1999	126686	-	-	-
2000	128959	-	346	-
2001	138519	238	320	-
2002	144589	197	328	-
2003	169736	201	326	-
2004	158099	293	315	-
2005	129588	166	278	-
2006	131847	157	252	-
2007	129930	158	247	-
2008	128606	139	257	-
2009	144247	104	254	-
2010	154164	140	249	-
2011	158018	148	254	£691
2012	162223	142	257	£622
2013	163234	145	257	£769
2014	179022	143	260	£801
2015	171722	139	254	£701
2016	162817	136	253	£835
2017	189707	133	226	£1,119
2018	156025	121	221	£919
2019	203881	146	226	£1,099
2020	192129	131	232	£932
2021	236000*	-	232	-

\*- correct as of September 2021

B.2 Rainbow Trout ([Scottish fish farm production surveys](#))

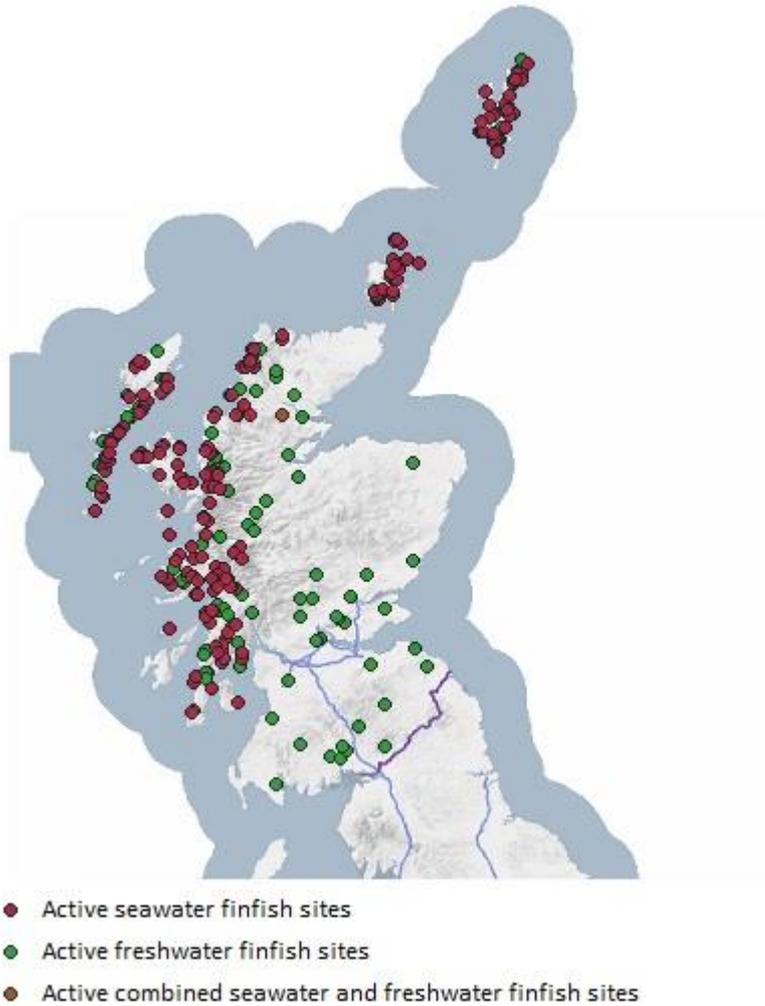
<b>Year</b>	<b>Tonnes produced</b>	<b>Active sites</b>
2000	-	-
2001	-	-
2002	-	-
2003	-	-
2004	-	-
2005	-	-
2006	7492	-
2007	7414	-
2008	7670	-
2009	6766	-
2010	5139	-
2011	4619	33
2012	5670	34
2013	5611	30
2014	5882	31
2015	8588	30
2016	8096	32
2017	7637	28
2018	6413	29
2019	7405	28
2020	7576	32
2021	9303	-

B.3 Mussels ([Scottish shellfish farm production surveys](#))

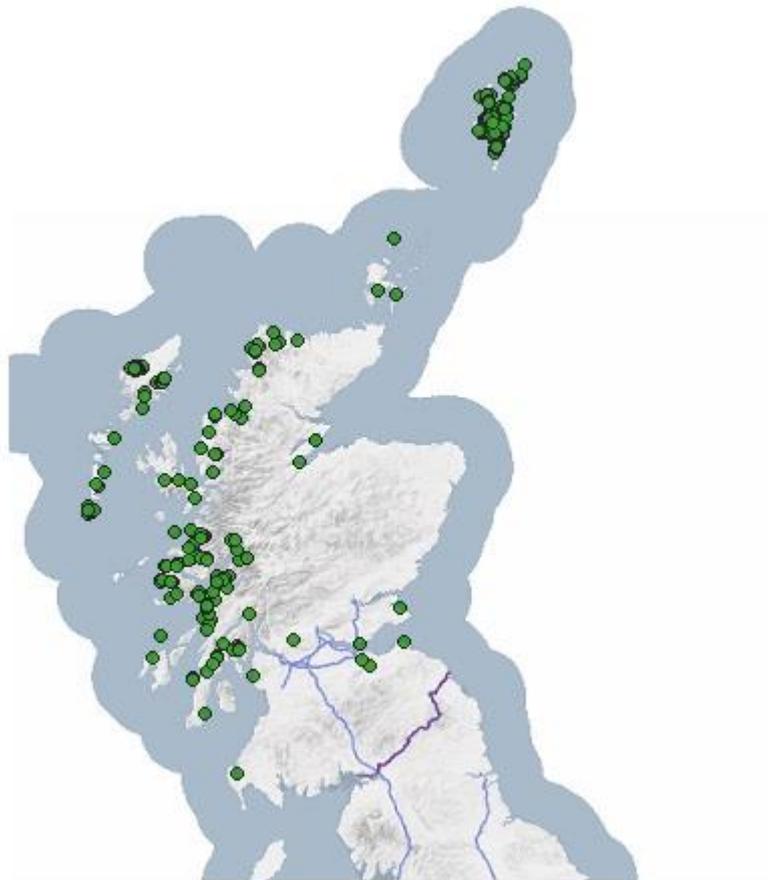
<b>Year</b>	<b>Tonnes Produced</b>	<b>Value (£)</b>
2002	3236	-
2003	3632	-
2004	4223	-
2005	4135	-
2006	4219	-
2007	4806	-
2008	5869	-
2009	6302	-
2010	7199	-
2011	6996	9759420
2012	6277	8,687,368
2013	6757	9,203,034
2014	7683	10,279,854
2015	7270	9,734,530
2016	7732	10,963,976
2017	8232	10,742,760
2018	6874	8,186,934
2019	6699	6,303,759
2020	5661	5,049,612

## Annexe C Aquaculture Farm Locations

C.1 Map of Active Finfish Farm Locations Around Scotland ([Scotland's Aquaculture | Map](#))



C.2 Map of Active Shellfish Farm Locations Around Scotland ([Scotland's Aquaculture | Map](#))

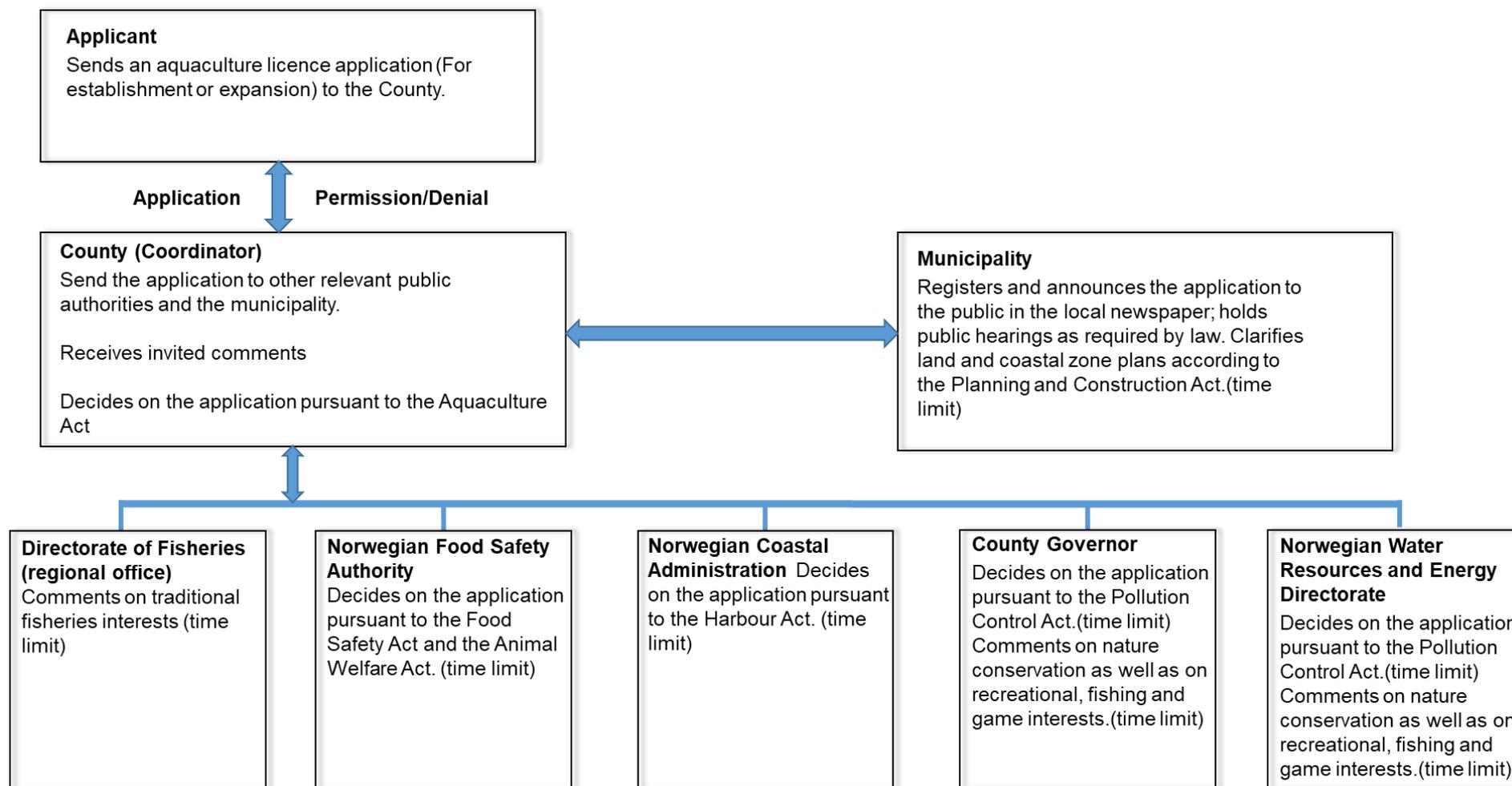


● Active shellfish sites

## Annexe D Planning Applications and Decision Times by Authority for 2020/21

Location	Number of applications not subject to processing agreements	Average Time [Weeks]	Number of applications subject to processing agreements	Percentage of applications with processing agreements concluded within agreed timescales [%]	Total Number of Decisions
<b>Scotland</b>					
Freshwater Fish Farming	3	26.8	1*	1*	4
Marine Finfish Farming	25	14.0	0	-	25
Marine Shellfish Farming	14	13.1	0	-	14
<b>Argyll and Bute</b>					
Freshwater Fish Farming	0	-	0	-	0
Marine Finfish Farming	4	8.7	0	-	4
Marine Shellfish Farming	2	9.1	0	-	2
<b>Highland</b>					
Freshwater Fish Farming	3	26.8	0	-	3
Marine Finfish Farming	7	19.4	0	-	7
Marine Shellfish Farming	4	12.1	0	-	4
<b>Na h-Eileanan Siar</b>					
Freshwater Fish Farming	0	-	0	-	0
Marine Finfish Farming	5	15.7	0	-	5
Marine Shellfish Farming	3	21.8	0	-	3
<b>Orkney Islands</b>					
Freshwater Fish Farming	0	-	0	-	0
Marine Finfish Farming	2	20.0	0	-	2
Marine Shellfish Farming	1	18.9	0	-	1
<b>Shetland Islands</b>					
Freshwater Fish Farming	0	-	0	-	0
Marine Finfish Farming	7	8.6	0	-	7
Marine Shellfish Farming	4	8.1	0	-	4
Notes					
* = North Ayrshire council had a single major development application subject to a processing agreement under "Marine finfish farming" but no developments for any finfish or shellfish farming.					

## Annexe E Norwegian Application Process

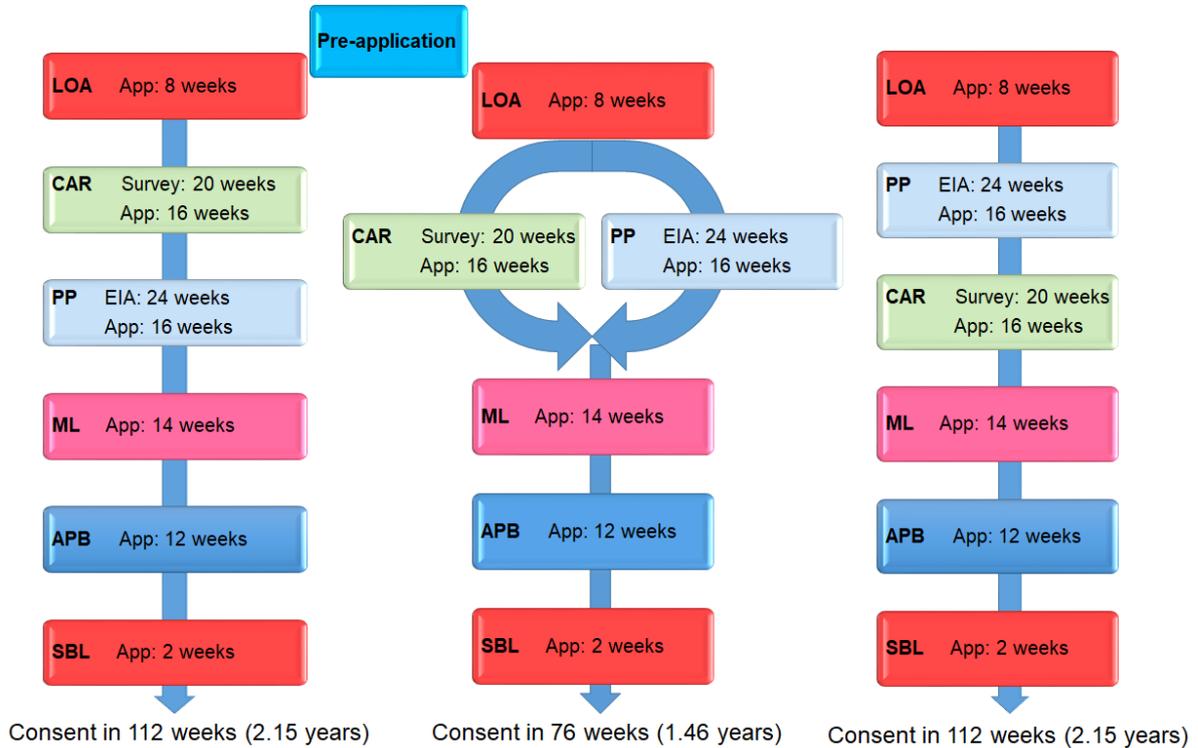


Note: Taken from NASCO implementation plan for the period 2019-2024 (Norway), 2020

# Annexe F Scottish Application Processes

## F.1

### Finfish scenarios



#### Notes:

App = Application

EIA – Environmental impact assessment

LOA = Lease option agreement

CAR = Controlled activity licence

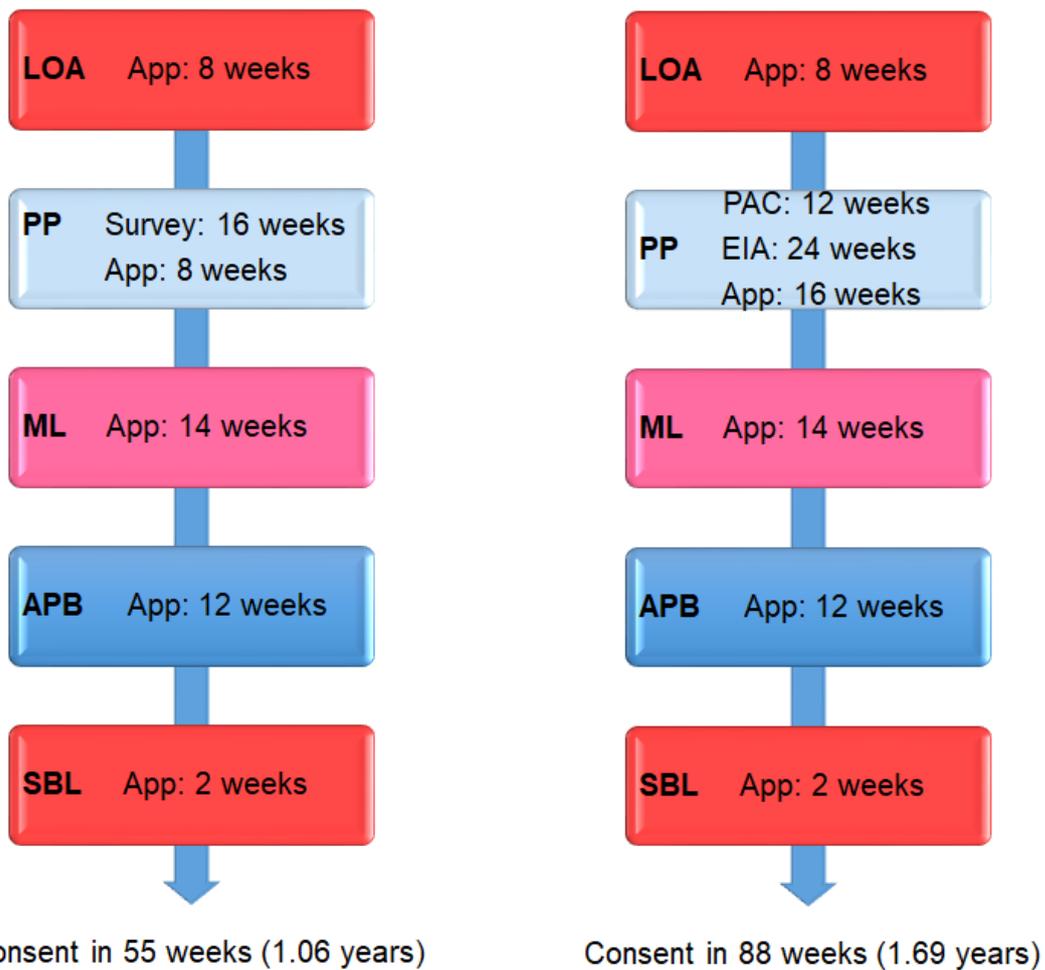
PP = Planning permission

ML = Marine Licence

APB = Aquaculture production business licence

SBL = Seabed lease

## F.2 Shellfish scenarios



### Notes:

App = Application

EIA – Environmental impact assessment

PAC = Pre application consultation

LOA = Lease option agreement

PP = Planning permission

ML = Marine Licence

APB = Aquaculture production business licence

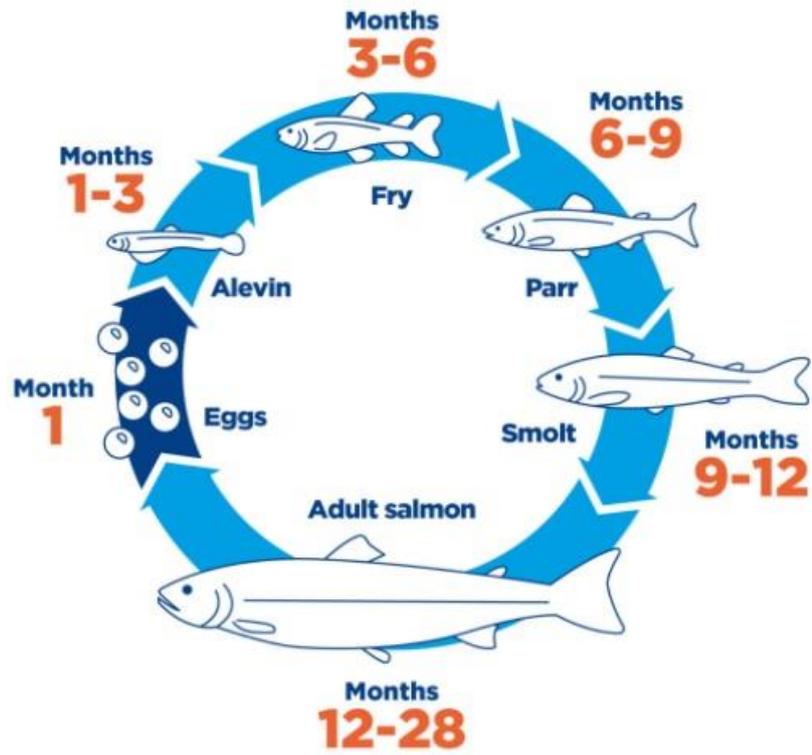
SBL = Seabed lease

## Annexe G External Audits Data

<b>Auditing Body</b>	<b>Number of Visits</b>	<b>Time taken (hours)</b>
Charity	34	226
International Body	8	28
International Body	5	40
International Body	2	16
Consortium	36	309
Retailers	18	208
Government	35	305
<b>Total</b>	<b>138</b>	<b>1132</b>

## Annexe H The Salmon Lifecycle

### The salmon lifecycle



© Scottish Sea Farms

## Annexe I Anonymised Comments by Theme

### I.1 Formal Written Contributions

Themes from written submissions				
Why the sector needs regulation in the first place	Why has that regulation to be in the form of legislation rather than self regulation by the industry	What are the issues with the current regulatory framework	What could be done to improve the current framework and importantly the process	Are there any examples that might provide useful insight on how this is done elsewhere
Environment	Guarantee compliance	Too complex	Coordinated approach/Streamline the process/Simplify the process/Introduce a coordinator	Norway
Other marine stakeholders	Accountability	Lack of resources	Clarify responsibilities/ More accountability/Have a clear framework/ Have clear guidelines	Faroes
Wild Fish	Enforcement	Lack of accountability	Increase resources/ Appropriate resourcing/Investment	Electricity Act
Fish Welfare	Confidence for trade	Limited expertise	Increased transparency	Offshore wind
Society	Encourage innovation	Fragmented/ duplication of information/ Lack of coordination	Increase knowledgebase/Build expertise/Increase research and development	USA, Canada, Denmark, Australia (Phasing out open net farms)
Public resource	Ensure equal weighting of wild fish	Lack of knowledge (science)	Increase monitoring/ Apply EIA/ Utilise Marine Spatial planning/ Investigate carrying capacity of marine areas	Argyll and Bute
Rural economy	Fairer industry	Lack of monitoring	More robust enforcement/More powers of enforcement/ Tangible sanctions	Canada*
Reputation	Fish Welfare	Sanction and enforcement inadequate	Implement SIWG recommendations	Denmark*
Social responsibility	Instil trust	Wild fish not accounted for	Use adaptive management/Allow disused licences to lapse	Australia*
communities	Legislation is there	Cost	Apply the precautionary principle	-
Socio-economic	No suitable legislation for seaweed	Lack of transparency	Implement a feedback mechanism/ More local democracy	-
Visual	Public perception	Time taken	Strengthen regulation around welfare for slaughter and transport/fish welfare	-

Environmental/ economic balance	Reputation	Doesn't account for cumulative effects/ carrying capacity	Separate frameworks for each sector	-
public health	Self Defence	Lack of clarity of remit (regulators)	Move to single licence approach	-
Fair usage	To deal address excessive fees	Duplication of information	Encourage innovation	-
-	-	Lack of protection for slaughter and transport	Centralise database	-
-	-	Not sector specific	Move to closed containment	-
-	-	System not adaptive	Use pre application consultation	-
-	-	Fish welfare not front and centre	Have and appropriate/single body for wild fish	-
-	-	Anchorage not accounted for	Cut fees	-
-	-	Failure to use Precautionary principle	introduce independent regulator	-
-	-	Gaps in legislation	Regulation should be strengthened	-
-	-	Irregularity in planning process	Include the supply chain	-
-	-	Lack of information available to decision makers	Protect anchorages	-
-	-	Light touch	Have an international review of impacts and monitoring	-
-	-	No statutory code for welfare of fish	-	-
-	-	Permanence of licences	-	-
-	-	Town and Country planning act not suitable	-	-

Notes

EIA = Environmental impact assessment

SIWG = Salmon interactions working group

\* = phasing out the use of open net pen aquaculture

## I.2 In Person Contributions

<b>Themes from meetings</b>				
<b>Why the sector needs regulation in the first place</b>	<b>Why has that regulation to be in the form of legislation rather than self regulation by the industry</b>	<b>What are the issues with the current regulatory framework</b>	<b>What could be done to improve the current framework and importantly the process</b>	<b>Are there any examples that might provide useful insight on how this is done elsewhere</b>
Environment	Accountability	Limited expertise/experience	Coordinated approach	Norway
Safeguard Reputation	Guarantee compliance	Limited resources/ Limited Funding	Increase resources/ Increased funding	Shetland
Sustainability	Safeguard local democracy	Time	Build expertise	Faroes
Other marine users	Markets miss things	Fragmented/ duplication of information/ Lack of coordination	Add flexibility/ Use adaptive management/ Options for innovation	Orkney
Public resource	Level playing field	Inconsistency	One stop shop (single consenting)/ One stop shop (document not licence)	Offshore wind
Trust	Enforcement	Science out of date/ Lack of clear data/ limited science/ Conflicting Science	Better enforcement/ utilise continuous monitoring/ have and auditing system/ FHI inspections to include more regulatory issues	-
Wild fish	Build trust in industry	Too complex	Increased transparency/ Clear and transparent decision making/ Introduce a feedback system	-
Local democracy	Safeguard seaweed from finfish	Inflexible	Use up to date science/ Use independent science	-
Brand enhancing	Defence from anti-aquaculture lobby	Lack of clear guidance (applicants and regulators)	Quicker responses	-
Communities	Public perception	Lack of transparency	Clear accountability (Industry and regulators)	-
Disease management	To protect wild salmon	No accountability	Separate frameworks for each sector	-
Impacts	Legislation not required	Doesn't address historic siting of farms/ Carrying capacity not accounted for	Introduce a coordinator/ Utilise pre-application consultation	-

Improve reputation	Industry can't be trusted	Precautionary principle applied with little experience	Licences not permanent permission	-
Instil confidence	Ensure public health	Regulation not tailored to each sector	Clear remit for regulators/ Definitive framework for decision makers	-
level playing field	-	No plan or vision/ No clear remit for regulator	Disused sites brought back into use/ tidy up redundant marine sites/ consolidate industry	-
local economies	-	Permanent consents with no accountability	Use regional management plans/ Use SEA	-
Not required	-	TCPA not fit for aquaculture	Reduce the process	-
public health	-	Wild salmon falling through gaps	Local presence	-
sector growth	-	Limited local democracy	Go digital/ Clear information for applicants	-
Social Licence	-	PDR cost too low	Use precautionary principle/ Factor in true sustainability	-
Social responsibility	-	Anti fish farming lobby having larger voice	Limit requirement for public consultation on farms under a certain size	-
Traceability	-	Cost to high	Centralise planning, Local Authorities as Statutory Consultees	-
-	-	Connectivity	Economic case should be made	-
-	-	Applicants not supplying the correct data	Risk assessment over precautionary principle	-
-	-	No feedback mechanism	Social licence should be included	-
-	-	-	Bring marine licence in line with crown estate licence	-
-	-	-	Introduce a code of conduct	-
-	-	-	Have clear vision for growth	-
Notes FHI = Fish Health Inspectorate SEA = Strategic environmental assessment TCPA = Town and Country Planning Act				

## Annexe J Seaweed Marine Licence Applications

Seaweed Licence Applications			
Account Name	Licence Start Date	Site of Application	Status
Scottish Sea Farms Ltd (change of use to shellfish farm)	17/02/2017	Sandsound South, Shetland	Licence Active
58 N Scottish Seaweeds	23/08/2017	Outer Loch Broom, Wester Ross	Licence Active
Muckairn Mussels Ltd	09/05/2018	Site 1, Loch Etive, Argyll	Licence Active
New Wave Foods	12/10/2018	Aird na Cuile, Site A & B, South East Kerrera, Argyll & Bute	Licence Active
Michael Francis George Walford and James Anthony Walford (Partnership)	30/04/2019	Camas Na Fisteodh, Isle Of Scalpay	Licence Active
Scottish Association for Marine Science	24/09/2019	Cutter's Rock, Port An T-Struthian	Licence Active
The Highland Seaweed Company	08/01/2020	Covesea Skerries, Hopeman	Licence Active
Jack MacGregor & Sons	18/06/2020	East Balvicar Bay, Seil Island	Licence Active
The Highland Seaweed Company	01/08/2020	Burghead Bay, Findhorn	Licence Active
The Highland Seaweed Company	01/08/2020	Culbin, Findhorn	Licence Active
Sea02 Ltd	14/12/2020	Dubh Thob, Loch Erisort, Isle of Lewis	Licence Active
Hebridean Wildfoods Ltd	16/12/2020	Sgeir na Muirsgian, Loch Erisort, Isle of Lewis	Licence Active
GreenSea Solutions Ltd	22/01/2021	Loch Sunart, Lochaber	Licence Active
KelpCrofting Ltd	16/02/2021	South of Pabay, Isle of Skye	Licence Active
Southwest Mull and Iona Development	15/06/2021	Aird Fada, Mull	Licence Active
Kilchoan Management Ltd	13/10/2021	Kilchoan Bay, Loch Melfort	Licence Active
Sgurr Services	18/12/2021	Lochalsh, Sgeir na Caillich	Licence Active
Scottish Association for Marine Science	-	Port-A-Bhuiltin, Lynn of Lorn	Application
Stronsay South Limited	-	Mill Bay, Stronsay	Application
Stronsay South School Trust	-	Bay of Holland, Stronsay	Application
Lochnell Seaweed	-	Lynn of Lorn, Sgeir Liath Point to Eilean Riabhach	Application



Scottish Government  
Riaghaltas na h-Alba  
gov.scot

© Crown copyright 2022

**OGL**

This publication is licensed under the terms of the Open Government Licence v3.0 except where otherwise stated. To view this licence, visit [nationalarchives.gov.uk/doc/open-government-licence/version/3](https://nationalarchives.gov.uk/doc/open-government-licence/version/3) or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: [psi@nationalarchives.gsi.gov.uk](mailto:psi@nationalarchives.gsi.gov.uk).

Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

This publication is available at [www.gov.scot](http://www.gov.scot)

Any enquiries regarding this publication should be sent to us at

The Scottish Government  
St Andrew's House  
Edinburgh  
EH1 3DG

ISBN: 978-1-80435-022-5 (web only)

Published by The Scottish Government, February 2022

Produced for The Scottish Government by APS Group Scotland, 21 Tennant Street, Edinburgh EH6 5NA  
PPDAS1023978 (02/22)

W W W . g o v . s c o t