OFFICIAL REPORT
AITHISG OIFIGEIL

Rural Affairs and Islands Committee

Wednesday 25 February 2026

Session 6

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RURAL AFFAIRS AND ISLANDS COMMITTEE
8th Meeting 2026, Session 6

CONVENER

*Finlay Carson (Galloway and West Dumfries) (Con)

DEPUTY CONVENER

*Beatrice Wishart (Shetland Islands) (LD)

COMMITTEE MEMBERS

*Alasdair Allan (Na h-Eileanan an Iar) (SNP)
*Ariane Burgess (Highlands and Islands) (Green)
*Tim Eagle (Highlands and Islands) (Con)
*Rhoda Grant (Highlands and Islands) (Lab)
*Emma Harper (South Scotland) (SNP)
*Emma Roddick (Highlands and Islands) (SNP)
*Evelyn Tweed (Stirling) (SNP)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Professor Cathy Dwyer (Scottish Animal Welfare Commission)
Mairi Gougeon (Cabinet Secretary for Rural Affairs, Land Reform and Islands)
Ben Hadfield (Salmon Scotland)
Dr Amy Jennings (Animal and Plant Health Agency)
Edward Mountain (Highlands and Islands) (Con)
Peter Pollard (Scottish Environment Protection Agency)
Neil Purvis (Scottish Government)
Dr Alan Wells (Fisheries Management Scotland)

CLERK TO THE COMMITTEE

Emma Johnston

LOCATION

The Mary Fairfax Somerville Room (CR2)

Scottish Parliament

Rural Affairs and Islands Committee

Wednesday 25 February 2026

[The Convener opened the meeting at 09:00]

Decision on Taking Business in Private

The Convener (Finlay Carson): Good morning and welcome to the eighth meeting in 2026 of the Rural Affairs and Islands Committee. Before we begin, I ask everyone to ensure that their electronic devices are switched to silent. I will do that myself, because I forgot to do so earlier.

Our first agenda item is a decision on whether to take item 6 in private and to consider the evidence taken as part of our follow-up inquiry into salmon farming in Scotland in private at item 7 and at future meetings. Are we agreed to do so?

Members *indicated agreement*.

Salmon Farming in Scotland

09:00

The Convener: Our next agenda item is an evidence session for the committee's follow-up inquiry into salmon farming in Scotland. When the committee published its report, back in 2025, we made a commitment to review the progress made by industry and the Scottish Government after one year.

Today, we will hear from a panel of stakeholders before we take evidence from the cabinet secretary in a few weeks' time. I welcome to the meeting Professor Cathy Dwyer, who is the chair of the Scottish Animal Welfare Commission; Ben Hadfield, who is the director at Salmon Scotland; Dr Amy Jennings, who is the veterinary lead at the Animal and Plant Health Agency; Peter Pollard, who is the senior lead for projects at the Scottish Environment Protection Agency; Neil Purvis, who is the delivery lead for the fish health inspectorate, from the marine directorate of Scottish Government; and Dr Alan Wells, who is the chief executive of Fisheries Management Scotland. You are all very welcome.

You do not need to operate your own microphones, as the gentleman here will do that for you.

I also welcome to the meeting Edward Mountain MSP, whom I will bring in to ask questions at the end of the session. I invite Edward to make any declaration of interests.

Edward Mountain (Highlands and Islands) (Con): I remind committee members that I have an interest in a wild salmon fishery on the River Spey, which is on the east coast of Scotland. It is not directly—as far as I can see—affected by salmon farming.

I should also say that, in November of last year, I was voted on to the board of Fisheries Management Scotland as a director. However, as I am sure Dr Wells can confirm, I have had no input into any policy, decision or discussion on aquaculture, because I recuse myself from any such discussions and will continue to do so until the end of the parliamentary session.

The Convener: We have allocated around two hours for this session, and we have quite a few questions to get through. I therefore ask that questions and answers be as succinct as possible.

I will kick off. One of our committee's recommendations was that the Scottish Government should publish comprehensive, consistent and transparent mortality figures that include the number of fish at a farm and freshwater mortality and seawater mortality per facility, with

accurate numbers of dead salmon, wrasse and lumpsuckers per week, and with cumulative mortality totals at the end of each cycle.

We felt that that was a proportionate recommendation. I was therefore disappointed that Salmon Scotland suggested that it would add regulation, bureaucracy, cost and complexity. The Scottish Government also stated that mandatory reporting of mortality would

"represent significant burden for producers and regulators"

that would not be

"balanced by a sufficiently high benefit."

However, we regularly hear from campaigners about mortalities on fish farms and whether they are being accurately recorded.

For farms that already record mortalities on a daily basis, why would recording all mortalities, rather than those over a certain threshold, be burdensome or make their operations more complex?

Who would like to kick off?

Ben Hadfield (Salmon Scotland): I thank the committee for the invitation to speak.

We have made enormous progress in relation to transparency and reporting on mortality. People can look at individual sites, the percentage of mortality and mortality in freshwater.

The Convener: Sorry, Ben, but could you speak up a little bit? I am struggling to hear. Thank you.

Ben Hadfield: I hope that the committee recognises that it is now the most transparent of all animal production systems in the UK. I am quite pleased with what we have done, but, as I said, I am happy to look at going further.

The Convener: There is no question but that the committee believes that the figures that you publish are transparent. However, what is published is only above a certain threshold, despite the numbers being recorded. As you may well remember, the committee visited a salmon farm and saw the extensive records that were being held as part of good animal management, animal husbandry and so on. We were quite surprised when it was suggested that publishing the figures would add a burden and that the burden would outweigh improved public confidence. What would the extra burden be for farms that already record that data as part of their management process?

Ben Hadfield: You have to remember that the most important thing that fish farmers do is keep the fish alive and in good welfare. That is part of good business and is profoundly linked to the bottom line. The companies are, in the main, listed companies; they are well run in terms of inventory and bookkeeping, so their figures are accurate, real time and live. The reporting that is out now is comprehensive. If you want to look at what went on in a farm in February, for example, you can see by around mid-March what the mortality was in the whole industry, by sight. That is a big step forward, but, if the committee wants us to look at going further, we will take that on board.

Neil Purvis (Scottish Government): I would like to clarify that the information that the fish health inspectorate receives is what we need to do our job. We publish that information because of third-party interests and requests that we have had in the past, but we see a lot more information than what we publish as case information or mortality information. As Ben Hadfield has alluded, there are comprehensive records on site that we have access to and see during our visits, so it is not a question of the information not being there. We collect and record what we need to do our job, which is focused on the aquatic animal health surveillance programme, connected to the prevention and control of listed diseases. What we get for our purpose and what we publish is satisfactory for us to deliver on our regulatory responsibility.

The Convener: I put the same question to Professor Cathy Dwyer. Are you content that the level of reporting on mortalities is fit for purpose and gives the consumer confidence?

Professor Cathy Dwyer (Scottish Animal Welfare Commission): SAWC has not looked at that area specifically, so I cannot answer in depth, because we have not investigated the mortality reporting for salmon. We still have some concerns, particularly around the causes of mortality. We know that, in other sectors, the blanket figure of mortality is not enough to make progress on mortality. It might well be that companies have the figures, but it is not so transparent to other agencies. As I said, the level of mortality in salmon is not an area that SAWC has specifically investigated.

Alasdair Allan (Na h-Eileanan an Iar) (SNP): I have a question that is probably for Peter Pollard. One of the things that SEPA has looked at is a new digital regulatory platform. I am interested to know what the platform will mean for public access to information, how useful it will be to anyone with an interest in the subject and how it will improve clarity in the public mind about different companies' performance in environmental terms.

Peter Pollard (Scottish Environment Protection Agency): We are looking at a system to support separate projects, which is looking at co-ordinated consenting.

The Convener: I am sorry, but can I stop you? We are really struggling to hear you, so perhaps we will have to put the mics up or adjust the volume. I am certainly struggling.

That is better. Sorry, Peter—please continue.

Peter Pollard: The digital project that you referred to is linked to a project that all the regulators are working on with the Scottish Government to look at co-ordinated consenting, so that the regulators work in a much more co-ordinated way to determine applications. The digital project looks at three stages: pre-application, the application process and post-application. It will try to improve the assembly of information about the applications; the granted consents and the performance against those consents by including them in one place, which will make it easier for the public to see all the consents; how operators perform against the conditions of those consents; and the information that is available on the Scotland's Aquaculture website about sea lice, mortality and emissions of material into the environment.

The project's intention is to provide the public, as well as developers, with a much more open and transparent picture of what is going on.

Alasdair Allan: Is the platform live yet?

Peter Pollard: At the moment, it is at a very early stage. The consenting process is at a pilot phase—11 applications are going through a pre-application process. Four have already completed that process and are now at different stages of the application process.

The digital project is now at the discovery and prototyping stage. We hope to have a prototype by the end of March, and, if that proves effective, we will move to a build phase. The digital project is running in parallel with the practical testing of the pilot.

Alasdair Allan: Thank you.

The Convener: I will go back to my initial question. I appreciate Neil Purvis's response, which was that the data that he receives is sufficient for him to carry out his job. However, one of the issues that was clearly stated in the report's recommendations was the level of public confidence, and I have not received an explanation of why collecting additional data would be burdensome. Witnesses have said that they will look into it, but the response that we have had from the Scottish Government and Salmon Scotland is that it would be burdensome for producers.

When you collect the data, which might potentially be done as part of the new digital platform, why would it be burdensome for the figures to be recorded below the 10 per cent or 5 per cent threshold, whichever is set?

Ben Hadfield: I understand what you are asking. I still maintain that the industry has stepped forward to be the most transparent protein producer in the British Isles. Part of the issue is that, once you have collected additional data, you are just asked to go further and further. Common sense says that you should ask, "At what point is this beneficial?"

I have read all the submissions and have spent a lot of time with people who are concerned or in the activist community, and part of the issue is that the level of transparency is never considered to be enough. As a manager of a large company in Scotland, I see every single reason for a fish death and each environmental parameter. Copious well-formatted reports are available. You could publish the whole lot, but the level of transparency has to be reasonable.

The point at which we have arrived is that you can see the mortality rate per cycle and per farm, and you can see, in reasonable time, what the rate has been at the end of the month. My perspective is that that is a genuinely good place to be. If there are specific things that we can do to address cleaner fish mortality or to address whether culls take place in the industry, we will look at that. However, I hope that you understand that, even though we have become the most transparent producer, partly because we took on board the requests of this committee, it will never genuinely be enough for animal welfare charities or environmental activist groups.

Emma Roddick (Highlands and Islands) (SNP): Good morning. My questions are for Ben Hadfield.

We could probably debate, back and forth, for a very long time whether the mortality rates are acceptable, but I am concerned that you said that we can see the figures, because we cannot. The numbers still do not include mortalities in freshwater during transport, in that six-week transfer period, or in culling and cleaner fish, as you mentioned. If we still do not know how many fish actually die, how can we sensibly scrutinise the figures?

09:15

Ben Hadfield: I respect the question, but I will push back on it a bit. The mortality rate in the Faroe Islands, where it is relatively easy to farm salmon—the environment is very kind—is about 11 per cent. In Norway last year, the rate was 14.7 per cent. In Scotland, after tough years in 2022 and 2023, it dropped to around 20 per cent. We know the overall mortality rate and the rate for each site. The target must always be to get the

mortality rate as low as possible with the resources and production strategy that are available.

Emma Roddick: What about consumer choices? Should people not be able to understand the scale of mortality, given that you produce food that people buy?

Ben Hadfield: You have to go back to the fact that salmon as a species are strategists. On average, a female salmon produces between 10,000 and 15,000 eggs. Last year, the team spawned one that produced 30,000 eggs. That animal's strategy is fecundity, so that some survive. It is not a cow, which has one calf or two calves, so you cannot compare the two species.

Emma Roddick: Is that the industry's strategy as well? You are talking about percentages rather than how many fish—sentient beings—have died.

Ben Hadfield: It is the strategy of the species. Salmon farming mortality rates are very low compared with all other forms of marine and freshwater aquaculture. The rate is very low compared to wild salmon mortality, which is around 98 per cent in some cases. Given that the survival rate in salmon farming is 80 to 85 per cent, fish farmers are doing a good job and are doing everything that they can to get the best out of their crop. We should back salmon farming as an industry. It provides over £1 billion to the Scottish economy. It is a sustainable form of production, and salmon is highly nutritious and beneficial to your health.

Is the mortality rate in the Scottish sector still too high? Yes. I am working tirelessly—along with 11,000 other people—to bring the rate down through huge investment. The rate has fallen—perhaps not to the level that people would like—but we will do everything that we can to bring it down further.

Emma Roddick: Will you do so without reporting all the deaths?

Ben Hadfield: We report the mortality rates. At the moment, the mortality rate in my company is below 0.7 per cent a month. We have 24 million fish in farmed Scottish waters, and around 140,000 fish have died. In a couple of weeks, you will be able to see the mortality rate for the whole industry.

I am happy to honestly answer any of your questions about culls and cleaner fish, but we have done a lot in response to the committee's requests. If you want us to do more, we will take that on and try to deliver it.

The Convener: A lot of this is about public confidence. I understand that different animal production systems' mortality rates need to be viewed differently. If you have a wild salmon with 40,000 eggs, and two viable offspring, that is a success in nature. How can the industry—given that people are reluctant to quote mortality rates and want the sector to succeed—improve public confidence and convey the message that you just described, which is that fish mortality cannot be viewed in the same way as mortality in other animal production systems, such as sheep farming or dairy farming? Whose job is it to get that across in order to give the public confidence that the industry works to the gold-plated standards that the consumer expects?

Ben Hadfield: You have to start with the fact that the price achieved for Scottish salmon is significantly above that for salmon from all other origins worldwide. People want Scottish salmon because of its provenance and the way that it is farmed—with low stocking densities and high quality. In the marketplace, we see that it commands a significant premium compared with salmon from other origins. Verification by the Royal Society for the Prevention of Cruelty to Animals and the Aquaculture Stewardship Council and a lot of audits ensure that welfare and farming standards are as high as they can be.

You cannot get past the fact that this is a very large industry. The biomass of salmon in the sea is far higher than the combined biomass of all land animals in Scotland. The mortality numbers are big because of the number of fish in the sea. You also cannot get past the fact that the animal's strategy is to lay 15,000 or more eggs, which means that mortality is going to be higher than among cattle, for example.

We must be open and transparent, and, once you start that transparency journey, you must deliver in full. However, when I read some of the submissions, I question at what point that is actually valuable in comparison to directing money towards wild salmon conservation, for example. An extremely low amount is spent on actual conservation.

Professor Dwyer: I challenge the comparison between farmed salmon welfare and wild salmon welfare, which I do not think is fair because they operate in different systems. We have legislation that tells us that we have a responsibility towards animals that are under our care, and that does not apply to wild fish.

I appreciate that salmon have a different reproductive strategy, which we see in other species, too, but that does not mean that there is no welfare cost in the loss of a sentient animal.

Your problem is selling the idea to the public, who are concerned about the loss of sentient animals. There is some discussion about the point at which sentience appears in those animals and whether that is when they first hatch out. It is without question that those animals are sentient

when smolts are put to sea and that we therefore have a responsibility to those animals—and not just to the percentage or tonnage of animals, but to each animal.

The Convener: How do you work out what would be an acceptable mortality rate in food production?

Professor Dwyer: That is a tricky question. We often talk about there being no acceptable rate, because having one would mean that we have become complacent. I work with a sheep farmer who tells me that the only acceptable mortality rate for his lambs is zero per cent. He knows that he cannot achieve that, but that is his goal.

I appreciate that there is a challenge for the industry, but we should all be aiming to reduce mortality to the lowest possible rate, because that is an unambiguous welfare indicator. If an animal dies, it has suffered, so we have a responsibility to keep the rate as low as possible.

The Convener: You have to accept that there will be mortality in the production of any animals for food. The salmon industry, like any other, will want to reduce mortality to the very minimum, but is it fair to point to that industry as one that does not perform as well as it should? Where is the degree of acceptance? You will never get a sheep or poultry industry with zero mortality, so where do you set the bar and at what point will the public understand that a level of mortality is acceptable as part of the animal's life cycle?

Professor Dwyer: That is an ethical rather than a scientific decision. If we keep animals under our control and produce them for food, then we, as a society, make a decision about whether it is okay for those animals to suffer or die. We must keep that in mind, because they are our responsibility.

I have visited salmon farms and see how hard people work, but one reason for asking for transparency in the data is that people want to see evidence of a continuing focus on reducing mortality. If we say that a 20 per cent mortality rate is okay, we will reach 20 per cent and stop thinking about how to improve mortality rates. It is a challenge to say whether the mortality rate is acceptable, but we can accept that there is a journey towards reducing mortality.

The Convener: Where there is a challenge in deciding what is acceptable, there is also a challenge in deciding what is not acceptable.

Ben Hadfield: I realise that it is an easy caricature, but the idea that we are not focused on the welfare of the sentient animal under our care is ridiculous. I am not saying that what you say is ridiculous, but I do find that concept ridiculous. I spend every hour of my working life thinking about how to reduce mortality, and I know that the vast majority of farmers, veterinarians and professionals do exactly the same. The comparison to wild salmon is important. The farmed fish are perhaps only 15 generations removed from the wild. If salmon lay eggs in a river, two-thirds of them will die. When we put eggs in a hatchery, 98 per cent of them will survive.

We are making gains in farming, but the environment, particularly in Scotland, has been quite tough. Most of the mortality is environmental. Professor Dwyer focused on how to create the perfect conditions in the pen, but, on the idea that people are not concerned about welfare and mortality, I do not see that in the sector at all.

Professor Dwyer: That was not really what I said. I have seen what you describe in the sector, but part of this discussion is about how we—or how you—show that to the public. That is where the point about transparency comes in. Maybe part of selling the story is to say that there is high mortality in the wild. However, to me, that is not a comparator. It is not enough to say that we do not have that in our farmed salmon, because that is a different scenario and we just cannot compare the two. It is not a fair welfare comparison.

Ben Hadfield: The fact that around 98 per cent die in the wild and that farmers can create a survival level of between 80 and 100 per cent on some occasions is testament to the care and the environment that they provide for the salmon.

Professor Dwyer: I have not argued against that. I just think that the transparency and the desire to keep moving forward are things that the public do not see.

Ariane Burgess (Highlands and Islands) (Green): I want to continue the line of questioning about public confidence and transparency. My sense is that wild fish and farmed fish exist in two completely different systems. One belongs to nature and the other is under human care—or so I would like to think.

I feel that the committee is not getting the sense that we have transparency and confidence in the data. I get the point that the fish health inspectorate has enough data to do its job, but this is about public confidence. An Aquaculture Stewardship Council audit states that input mortality was high during the previous production cycle at Scotasay, but Salmon Scotland reported 0 per cent mortality. I am hearing from one side that the mortality is high, but then we get a 0 per cent figure. Something is missing, transparency wise, in the way in which things are reported. Do you dispute that, Mr Hadfield?

Ben Hadfield: I am trying hard to understand it. You say that an ASC audit said that mortality was high, but then Salmon Scotland reported it as zero.

Ariane Burgess: It was zero input mortality.

Ben Hadfield: Zero input mortality of what fish?

Ariane Burgess: One side says that mortality was high, but the reporting from Salmon Scotland says that it was zero.

Ben Hadfield: I just do not see how that can be. If there is an audit where ASC has come to the site and observed high mortality, that will have been captured and reported with transparency in the Scottish Salmon database. The only way in which the figure might have gone to zero is if, for example, the audit took place in December, the site was fallowed out in January and we reported in February. Respectfully, I think that that might be a bit confused.

Ariane Burgess: Thanks very much for that. We will have to look into it more.

Ben Hadfield: I am happy to look into it and clarify it for you exactly.

Ariane Burgess: You said earlier, in response to the convener, that you are willing to go further. Emma Roddick talked about culls and the fact that there is no data on freshwater mortality. However, you are required to report to your shareholders on mortality, and the convener spoke about the burdensome nature of that. In relation to ensuring public confidence, would it be possible for the industry to state the full number of deaths of fish in totality across production as a whole—from freshwater through to the sea pens and the culls—for the public and not just for shareholders?

09:30

Ben Hadfield: First of all, we are deeply respectful of what the committee wants, and we have tried to deliver it. At the same time—and I think with reason—I would caution that, for some people and groups, it will never be enough. You are personally welcome to sit with me in the company that I run and go through all those figures. We will try to go further and satisfy the committee, in full, on reporting. However, as I told you earlier, mortality in the Scottish salmon sector has fallen to around 20 per cent. It is not as low as it is in Norway or in the Faroes, but that is because of environment, temperature and sea conditions.

You are getting precise figures. With Mowi, for example, I make it clear that the mortality of all its fish in the sea, which averaged from about 28 million down to 22 million in August, was 21 per cent in numerical terms and 17 per cent in biomass terms over the cycle.

Ariane Burgess: You are talking just about sea pens. I am interested in having transparency in data that takes us from fresh water all the way through the system.

Ben Hadfield: I think that you have that. The mortality in fresh water is much lower.

Ariane Burgess: I would just like to see all the numbers recorded and provided together.

It is concerning. You say that the numbers are low, but I see that in Gob na Hoe, for example, 583,942 fish died between September and November 2025 due to gill disease and jellyfish; 240,000 fish died in a single week; and 45 per cent died in October, with 35 per cent lost in November. I hear that that is now evening out, and that the number is lower, but we seem to be on a kind of rollercoaster ride with regard to what is happening, and it would be interesting to see what happens two years from now.

For me, the overall issue is the warming seas, which are a fundamental problem for the sector. However, I think that I am getting away from the issue of information management and data.

Ben Hadfield: I just want to come back on that briefly. I know the numbers for the whole sector, because I see and read them every month. They are transparent. Why do you not feel sorry for the salmon farmers who lost stock due to jellyfish and environmental conditions? It was not their fault; up to that point, they were farming them with the lowest density worldwide and to the highest standards, and they were looking after those fish to the best of their ability. It was the environmental conditions that caused that level of mortality. It is not that they did anything wrong—on the contrary. I know from personal experience that you do your absolute best to get the fish past those environmental conditions. I do not understand why there is not the same empathy as there would be for, say, a sheep farmer losing sheep in torrential rain, as happened earlier this year. I just cannot understand that. It is Scotland's largest salmon—

Ariane Burgess: I think everyone feels sorry for the workers on salmon farms—no one is calling that into question. However, there is a fundamental flaw here. We have an industry that is based in Scottish waters, and climate change is warming those waters, which is creating a type 1 error for your sector.

The Convener: We are talking about transparency on mortality. Given the figures that you have stated, there must be some transparency or you would not have been able to quote them.

We have covered quite an important part of the discussion, and I make no apologies for spending a little bit longer on it than we might have done otherwise.

We will now move on to a question from Rhoda Grant on fish health, welfare and cleaner fish.

Rhoda Grant (Highlands and Islands) (Lab): I totally get that, when mass mortality happens due to unforeseen circumstances, it must be heartbreaking for those who look after the fish. Because it happens in the sea, we perhaps do not empathise with it in the way that we did with foot-and-mouth disease, which was very much in our faces. We are all here to try to create some transparency and confidence and a better understanding of the industry.

We have been told by stakeholders that the Scottish Government's new analytic framework for identifying persistent high mortality uses thresholds and potentially inconsistent data that might not capture problem sites. How can regulators and the industry show that the method can meet its purpose and trigger action on sites where mortality remains persistently high? That might be slightly different from one-off events, as I am talking about sites that are perhaps not suitable because of persistently high mortality.

Neil Purvis: The cabinet secretary wrote on 13 March 2025 to the committee, explaining that the recommendation on that would be taken forward, and she gave an update on progress in September last year. That contained quite a lot of information about the specific recommendation concerning whether persistent elevated mortality exists. Of all the recommendations that the FHI has been involved with over the time of the committee, we have probably put the most significant resource into that one. That reflects the level of commitment to looking at the problem and the issue.

The robust model that we have developed to look at the issue of persistent elevated mortality is scientifically driven with FHI input, but also with policy input. A report on the matter is due to come to the committee very soon—I think that it will be in the next week or two; it will certainly be before the cabinet secretary's appearance before the committee on 11 March. At the moment, it is at a preliminary stage in terms of the outputs and results. It may be sensible for the committee to digest the contents of the report before further questions and queries are drawn up on that.

Rhoda Grant: Will the report show that the system is now better and more analytical? It seems that we have huge amounts of data but we are not really following trends. We are collecting data as lumps and being selective. Where a one-off event happens, it can be catastrophic, but are we following the underlying data to see where progress is or is not being made? Will the report show that we have made progress on explaining the figures better?

Neil Purvis: It will show progress on answering the question about persistent elevated mortality. That is based on the definitions that we have set as a group that is looking at the matter, and that is explained in the report. It has already been explained in the update.

Fundamentally, we have used historical data that was not necessarily collected for this purpose. We have used data sets to help to answer the question. It is a kind of screening tool to highlight sites. We then needed to go in and have a deeper dive into some of those situations. As Ben Hadfield and the convener have alluded to, some farmers have a vast amount of information, but we do not necessarily have all the information. Conversations with the sector about output will help us to learn more about the persistent elevated mortality question.

Ben Hadfield: Although Neil Purvis and his team do a fantastic job, they are involved at the very end, when mortality rises to a certain level. They will then investigate, or they can turn up at any point unannounced. The industry uses only a fraction of the consents that it has in Scotland, because it has already selected the best sites as the ones that it wants to farm in. There are many other sites that are dormant and unused. The first point in the process is to choose the best locations.

The innovation level is particularly high. We use tools such as artificial intelligence to identify jellyfish and algae coming in with the tides, so we can predict whether the fish are going to face an environmental challenge. We have developed a lot of vaccines very quickly—four or five vaccines have been developed in the past few years—and we use blood-chemistry processes along with polymerase chain reaction detection to identify diseases in their very early stages.

The industry is busy working on all that to try to minimise mortality. When mortality occurs above a certain threshold, the marine directorate will come in, analyse the causes and work with the companies to minimise it or instruct the companies to take action. Does that help?

Rhoda Grant: Yes, but this is about building public confidence and ensuring that people not only understand the data that they see but know that it is robust. We sometimes see headlines about one incident without an explanation of the underlying factors.

Ben Hadfield: It is not right to dismiss the public concern around the issue, but the demand for salmon—particularly Scottish salmon—is incredibly high. As for the idea that people worldwide do not have confidence in salmon as a product, the demand alone—which often increases by between 5 and 10 per cent per annum—shows that consumers have enormous confidence in salmon as a healthy protein. I respect that there are critics in this room, and more widely, who have a voice, but the production

systems, and particularly the regulation that we have in Scotland, are among the best in the world. There should be confidence in salmon, but that does not stop us attending the committee and answering questions. Confidence in salmon, particularly Scottish salmon, is rightly high.

Ariane Burgess: It was interesting to hear about the process that you described. I would be interested to understand how the industry or Mowi factors mortality risk into its decision making.

Ben Hadfield: I think that Edward Mountain asked that question in the committee's previous inquiry. We budget for a level of mortality. We set the bar as low as we think is possible, and then we work tirelessly to keep it at that level, investing enormously in that work. The sector has invested more than £1 billion in the past few years, mainly in treatment systems, particularly wellboats, leading to a massive reduction in sea lice to the point where I can honestly say that, in the past few years, sea lice have not been a concern in the company that I run. You have to measure them accurately and remain aware of them, but the change to freshwater treatments that address amoebic gill disease and sea lice has been revolutionary, although it has come at an enormous cost.

Ariane Burgess: I will ask the same question of the fish health inspectorate and of the Animal and Plant Health Agency. How do you, as a regulator, factor mortality risk into decision making?

Neil Purvis: The mortality information that we receive is really useful in helping to direct the surveillance that we undertake, because it could be a prime indicator of a significant or listed disease. That is the activity that we are mainly involved in and focused on. Having that information is really important from our perspective. I do not know whether that answers your question.

Ariane Burgess: I am asking about how you incorporate mortality risk into the decision making of the fish health inspectorate.

Neil Purvis: Do you mean in terms of the visits and inspections that we undertake?

Ariane Burgess: Yes.

Neil Purvis: We do not regulate mortality in any way from that perspective. We receive reports when mortality is above the threshold, which we monitor. We look at the trend and then make a decision that is based on the level of mortality, the reason behind it and the mitigations that are in place, perhaps on site. All that information is considered in the round. We also have a routine programme of fish health inspections, and we may bring forward the routine visit to deal with the mortality issue and conduct an inspection at the same time.

Ariane Burgess: You say that you do not regulate mortality in that way, so who does?

Neil Purvis: We do not regulate mortality. To my knowledge, mortality is not regulated with a set level that has to be met. That is part of what the committee is looking at in its recommendations.

Ariane Burgess: I will put the same question to the Animal and Plant Health Agency.

Amy Jennings (Animal and Plant Health Agency): We work very closely with the fish health inspectorate. When it gets reports of high mortality, or if it observes any issues that relate to mortality or that it is concerned about while doing on-farm routine or other inspections, it contacts us. All those reports then go through a triage process by our vets—

Ariane Burgess: Sorry—by whom?

Amy Jennings: By senior veterinary inspectors in the agency. They deal with all sorts of things, including welfare reporting for all production species, including fish.

As part of the triage process, the vets will contact the person from FHI who was involved in the report, as well as the company, and they might contact local authorities. They will collect as much information as they can. At the end of the process, if they identify an unresolved issue that requires an inspection, we will carry one out. Quite often, we take data from companies or FHI and assess it remotely. Part of our inspection process involves the remote inspection of data. We find that useful, especially because it can be very difficult to assess individual fish in sea nets, as has been mentioned.

On inspections, we do not regulate on the basis of a specific mortality rate, but we look for reasonable stockmanship—to the best of people's ability—and look for mitigations to be put in place to reduce mortality and any suffering among the fish.

Ariane Burgess: What is the framework for "the best of people's ability"?

Amy Jennings: It is what is usually expected from a stockman, or stockwoman, who is well qualified to look after a species. Anybody who has an animal under their care is responsible for maintaining its care. We use lots of information to support us with that. We use the RSPCA Assured scheme, and—this is slightly off the topic of mortality at sea—we also have guidance on welfare at the time of killing. In addition, all of our inspections staff receive training via a University of Stirling course on fish health and welfare.

The Convener: I remind members to try to stick to the topic of their initial question when asking supplementaries, or we will end up all over the place. It is not easy for witnesses and not fair on other committee members if we stray too far from the original question.

Emma Harper (South Scotland) (SNP): I am interested in what Ben Hadfield said about innovative tech—vaccines, for instance. There has been a lot of research, development and innovation during the past few years. I have been on the rural committee, on and off, for the past two sessions of Parliament and I have been interested to hear about research and innovation during that time.

Ben Hadfield: I have been in the sector for 25 years and this is the fastest pace at which I have ever seen innovation happen. It is happening in a lot of areas—vaccines, wellboats and treatment systems, for example.

Recently, we have seen a move from licensed veterinary medicines such as Slice and azamethiphos, to control sea lice, to a dominant freshwater filtration system, often referred to as FLS, to remove sea lice. That has changed the situation and the medicine use level has dropped by about 70 per cent. Those systems have been refined so that the mortality during the handling process—there is always some mortality—has reduced to well below 0.5 per cent. It is often about 0.2 per cent for the entire population that is treated.

Vaccine development has been strong, too. We have a vaccine against a bacterium called rickettsia that is being deployed this year, which will hopefully take the level of antibiotic use in Scottish aquaculture, which is already incredibly low, down to zero. Antibiotic use is highest, first and foremost, in humans and then in companion animals. In other forms of production, the level is incredibly low already. The hope is that that vaccine means that we can get it to zero.

The Convener: To drag the conversation back to how the analytic framework has been developed, I have a very brief question, which I am looking for a brief response to. I appreciate that the industry has invested significant sums of money into research to develop tools for animal husbandry, but have you done that in conjunction with the Government? I am aware that we do not want to reinvent the wheel, and we were quite critical of the Government not pushing things on, but has there been a joined-up approach between the industry and regulators to the new analytic framework that builds on the investment that industry has made in improving animal husbandry in conjunction with the Government's role as a regulator?

Ben Hadfield: The quick answer is yes. There is a great prize to be had here. Scottish salmon puts more than £1 billion into the economy, and, if we can take the mortality level down further and improve the average weight by, say, a kilo, that will rise substantially. The Government has been front and centre with regard to what needs to be done. I think that £183 million has been injected from various Government agencies and the private sector, and the industry itself has put £1 billion into those systems. The approach is working and the mortality level has fallen considerably, but it is still too high.

The Convener: You are saying that Government and industry have worked together. The investment from industry and the investment from Government have worked in conjunction, rather than in isolation.

Ben Hadfield: Yes. It is one area of the Government's work that has been quite refreshing to see.

Emma Roddick: Dr Jennings, you touched on what happens when FHI refers something to you. Can you take us through the key decision points in that process from complaint to inspection to care notice to referral for prosecution? Can you explain why, to date, there have been no formal warning letters or referrals to prosecutors for farmed fish despite the on-going welfare concerns?

Amy Jennings: Complaints or referrals from FHI are all processed through what we call a duty vet system. They are dealt with urgently on the day that they are received. I do not want to be bold, but I would say that they are usually addressed within an hour. They are treated as urgent.

An initial triage is carried out on them and there is an assessment of whether somebody needs to rattle out the door immediately, within 24 hours or within another timescale—I cannot remember exactly what the thresholds are. At that point, the issue is then passed to a local team—for APHA, most of the fish farms and the fish facilities are within the areas of three of our offices, in Inverurie, Inverness and Perth. A fish-trained vet will assess the issue and, at that point, further information will be sourced from, as I said, the local authority, FHI and other people who may have been involved in issues relating to the farm already. If it is possible, and it usually is, the team will contact the local manager for that site.

At that point, a decision is made about whether the team will visit the site. Sometimes, that visit can be substantially delayed. That can be because, by the time that we receive the report, especially if the report has come from the public, the action that has been observed is no longer happening. Additionally, sometimes the places are fallow, sometimes there is bad weather, and

sometimes the sites are quite inaccessible. We get to them as quickly as we believe is necessary.

Once the inspection is in place and the person is on farm, we have a right to visit, a right to access data and a right to access to inspect. To be clear, we have not had any issues relating to access on any of the sites.

On a visit to the farm, or during a remote inspection, we will look at data and assess what has caused the issue—it might not involve mortality, as we receive reports of other issues. We will then assess whether the issue has been resolved already—it almost always has been, if the company is aware of it—or whether work is being done to resolve it. We record all of that information on a specific form for fish welfare, and elements will be marked as compliant or not compliant. If there are things that are non-compliant and work is being done on them, summary letters can be written, and those will potentially be circulated to the local authority, the local manager and anybody else within the system that needs to receive those, and they are recorded on our system.

In the vast majority of cases, when dealing with salmon farms and salmon facilities, it is evident that what is within the capability of the people within that site to make a change has already been done. If, on a rare occasion, we turn up, something is awry and it appears that nothing has been done, we will supply a letter that requires things to be done. There is a separation between a letter that advises people of what we have found and a care notice. A care notice is given when we see no progress and we require somebody to do something within a certain time period.

It is vanishingly rare that we have to get to that point with salmon farms. They are incredibly compliant. We have not had to take anybody to prosecution or refer anybody to the procurator fiscal, because the co-operation and the aim to move towards compliance are good. I do not want to say that it is “excellent”, but it is adequate for our requirements as a regulator.

Emma Roddick: Last year, there were 13 site visit reports for APHA. Are you able to share with us how many of those were conducted physically and how many were remote?

Amy Jennings: Give me a second. I have it written down somewhere.

Emma Roddick: Sure. Could you also explain how a remote visit happens and how you are able to assess fish welfare and what is taking place on the ground?

Amy Jennings: For remote visits, we will access all the data that we can get our hands on that are useful, including feed availability and mortality. We are also sometimes able to access remote cameras, which is often an efficient way for us to look at fish—much more so than standing in a boat or on a dock and trying to look in.

Emma Roddick: So, were most of the site visits remote?

Amy Jennings: I do not know off the top of my head. I will have to look it up.

Emma Roddick: In November 2024, the cabinet secretary, Mairi Gougeon, stated that APHA was increasing capacity and adding staff to undertake more work. How have those staff been deployed and how has that changed your capacity to go out and see what is happening?

Amy Jennings: I will have to look up numbers. We had eight trained fish vets. To get vets to the point where they can do the initial triage, all of our vets would have to be trained to the point where they can do welfare generally. At the point where a vet is doing the duty vet rota, they would be expected to be able to manage the initial triage process and they would be supported by a veterinary adviser.

Our aim is to change from having a small number of vets trained to having all the vets who are in areas where they could be deployed to fish farms being trained. That requires them going on a two-day course in Stirling and doing a sea safety training course. Almost always—I cannot think of a recent vet who has not done this—we get them to go out with FHI on one of its routine visits, to familiarise themselves with different facilities.

Does that answer your question?

Emma Roddick: I think so. I am still trying to understand why there are so few visits compared to the high mortality. Since 2022, salmon mortalities have approximated to one in-person visit per 4.6 million fish deaths. Are we getting a full picture of welfare? If, as you say, by the time you get there, the issue has been dealt with, it feels like it is job done.

Amy Jennings: We can do a lot of assessment using information that we can acquire from businesses. Your question is why we are not going out. It is because we can see that something is being resolved without a requirement for us to go out. Often, by the time that we could get there, none of the fish that were involved in the mortality incident are still there. Does that make sense?

Emma Roddick: Does there need to be more proactive visualisation of what is happening if you do not know what happened at the beginning and, by the time a report has been made, the matter has been dealt with and is no longer an issue, which does not mean that it was not an issue?

10:00

Amy Jennings: As we have been saying, it is inevitable that incidents will happen. How we work to enforce welfare legislation, which is available to us with regard to farmed fish, is by ensuring that people act in a way that prevents that sort of thing from happening again and reduces the suffering on site as much as possible. It is often possible to assess that without having to go and see the next batch of fish.

Emma Roddick: Okay. Thank you.

Tim Eagle (Highlands and Islands) (Con): I see from our papers that Salmon Scotland has questioned why the committee has not looked more into anti-salmon farming campaign groups and what that means. When we talk about complaints and such, do you think that there are more vexatious complaints that are trying to close down the industry than there are perhaps genuine complaints—if that makes sense?

Amy Jennings: I really do not want to comment on that. We treat all complaints completely neutrally and take all of them at face value. If complainants are willing to have further conversations with us, we will speak to them.

I do not think that we value-judge complaints; we take them as they are presented to us and ask, "Does this appear to be a risk? Does there appear to be animal suffering at this moment? Did there appear to be animal suffering? Do we need to get out there very quickly and deal with it, or does it appear to have been resolved?" We might then conclude, after looking into it, that there is no problem. I do not think that we take any part in deciding whether the complaint that we have received is vexatious.

Tim Eagle: I appreciate that. I guess that every complaint has to be taken on its merits, but it would be interesting to know whether the majority of complaints come from, say, local people who might have seen something whilst out walking their dog or whether most of them come from larger groups acting on behalf of a certain group, individuals working for a lobby group or whatever. However, you are not aware of that. When a complaint comes in, you do not look at that or analyse it in that way.

Amy Jennings: We do not. I can see who has submitted the complaint, but I do not think that what you have suggested would be appropriate. I want people—the public—to feel extremely welcome to contact APHA if they believe that there are animal welfare concerns relating to production animals, because that is our remit. I would rather have more reports that we triage out and be able to calm ourselves that there is no problem than not have people reporting.

Tim Eagle: I would agree. We do not live in a simple world, do we?

Amy Jennings: No.

Tim Eagle: I know that there is a complexity behind this, because we have had reports and various responses to consultations from certain groups arguing strongly against the salmon farming industry. It would just be interesting to know the sort of thing that I have been asking about, given some of the online media responses that we have seen over the last couple of years.

Ben, did you want to come in?

Ben Hadfield: I just wanted to help with an answer to your question and support what has been said. Having a system in which anyone can make a complaint, and in which that complaint is instantly triaged and taken seriously, is an important safety net, and we would support it. Obviously, the vast majority of the complaints that we are discussing, and which we have seen in the media, come from animal welfare charities or wild fish associations, not from individual members of the public seeing something and voicing concern.

As for the amount of resource spent on this, I recently saw a report that tracked and traced the flow of money into activism against salmon farming, and it said that the global spend being directed into that activity was more than $250 million. Therefore, I think that we have a problem. Ninety-four per cent of the citizens of the British Isles want to eat animal protein that is healthy and that is produced in the best possible way, as we do in Scotland, but a small minority—although I respect the life choices that they make—want to channel their energy and resources into influencing that. The activism directed at salmon farming lost any form of balance several years ago.

We have to do our best in that landscape, and I would just ask that the committee be aware of the huge amount of resource that is being focused on this. It makes me sad, because I think that that money should go into conservation and the environment. The balance was lost a long time ago.

Tim Eagle: Okay.

The Convener: I guess where I am coming from as well is the fact that APHA has not issued any formal warning letters, care notices and so on has been taken by some groups as being some sort of cover up or conspiracy. However, it is not that at all—from what we hear, you investigate every complaint at face value, you go through the process, and the reason that you have not sent any letters is that there has been no need to do that.

Amy Jennings: I never want to cite figures without having them directly in front of me, but I think that there have been one or two letters. I do not know whether we have sent a care notice that would have a time period placed on it. I think that that is a success. It is not that APHA does not undertake formal proceedings—well, we do not do that, but we take evidence to the local authority. Luckily, we only have to do that fairly infrequently—but it is not that we do not do it. It is not by any means the motivation of our officers to not take issues forward if we were to observe them.

We always hope that we will get farmers, stock people and those involved in caring for their animals to move towards compliance. In the main, our experience with Scottish salmon farmers is that they have already moved themselves towards compliance. However, we are aware that we need to keep an eye on it, and we do that.

Ariane Burgess: My question is for Amy Jennings. One of the committee's recommendations was that the Scottish Government make additional regulations and official guidance under the Animal Health and Welfare (Scotland) Act 2006. In the absence of species-specific statutory welfare guidance for farmed fish and cleaner fish, how does APHA interpret and enforce the Animal Health and Welfare (Scotland) Act 2006 in practice on salmon farms? You might have covered some of that in your conversations with Emma Roddick. Also, does the lack of official guidance hinder APHA's ability to take enforcement action?

Amy Jennings: The description in the Animal Health and Welfare (Scotland) Act 2006 places the responsibility on the keeper to provide care that would be expected from somebody who knows what they are doing. If we were to find that people were not doing that, we would compile evidence and provide it to the procurator fiscal.

To counter that, in relation to the guidance on welfare at the time of killing that we have received, last week, I went with one of our senior veterinary inspectors to a harvesting site, and it was extremely useful for me to be able to read that guidance before we went and to have some tramlines on which we could operate.

For the other species that are farmed, for some situations, there are detailed explanations of what is and is not acceptable. As yet, we have not had to try it, but if we were at the point at which we wanted to take forward a prosecution, we would collate the evidence that was available to us. I do not know whether the lack of guidance would hinder us, but there is information that we would carry through. We would record what we found as we normally do, through the normal evidential process, and we would take forward what we had.

Alasdair Allan: We have talked around the issue of the extensive data that is out there and its importance in reassuring the public. My question is for Amy Jennings or Peter Pollard—or possibly others. Are the categories of the data being collected likely to change? Are there new areas of data gathering that will be necessary in the future and are there gaps in the current data? I am thinking of things that usually get attention such as in relation to culls, stocking mortalities and transport. I have no idea whether it is necessary, but will the data that is gathered, or the categories of data, change in the future?

Amy Jennings: We find that the data that we have available to us is adequate for our requirements. I would not want to comment on what would be needed for tracking through time. We deal with each incident as it is presented to us at each individual unit.

Alasdair Allan: When there are things such as unreported calls, I am not going to know about that.

Amy Jennings: If issues are not reported to us, that would not affect us, because we have a right to access any data that the companies have. We do not need that to be in the public domain to do our job. I hope that that answers your question.

Alasdair Allan: It does. Thank you.

Peter Pollard: My answer is similar. At the moment, the data that we need to do our job is collected by us and made available, including on the Scotland's aquaculture website. However, the industry is very dynamic and innovative. If it changes in the future and we need to get other information, we will respond to that in due course.

Neil Purvis: As I said at the beginning, the data that we get in the FHI is suitable for our purposes. To deliver the surveillance that we do, it is not necessary for data on things such as culls and mortalities in the first six weeks of stocking to be reported to us. We see that data and information when we do our inspections and check all the records on site.

One of the recommendations that the Scottish Government has agreed to take forward is about more transparency and data on mortality and unexplained losses among cleaner fish. That work has been slightly delayed, as we were waiting for the Scottish Animal Welfare Commission's report to come out. It was sensible to look at the recommendations of that, so that what we take forward complements and matches it. The cabinet secretary will probably be able to say more on that recommendation going forward.

Dr Alan Wells (Fisheries Management Scotland): We might want to come back to this point later, as it relates to escapes reporting, but, since the committee last met to consider the issue, there was a situation in which approximately 80,000 fish escaped from a wellboat at sea but that was not recorded in the aquaculture database alongside other farm fish escapes. That is because only escapes from farms are recorded in that database. To our knowledge, no district salmon fishery boards or fishery trusts were notified at the time of that escape, although there is a requirement in the industry code of practice and a recommendation from the fish health inspectorate that boards and trusts be notified. That is an issue of transparency that we would like to be resolved. It does not really matter to the wild environment whether fish escape from a farm, a boat or something else, so that issue should be addressed.

The Convener: That is helpful. That is certainly an identified gap. We will come back to escaped fish in a later question.

Emma Roddick: Neil Purvis's comments lead nicely on to my question, because I was going to raise the Scottish Animal Welfare Commission's report, which highlights very high cleaner fish mortality and likely poor welfare. It recommends keeping better records of the numbers deployed and recovered and, ultimately, phasing out the use of cleaner fish altogether. Without mandatory reporting of the losses, do the fish health inspectorate and the APHA face regulatory obstacles in ensuring that farms meet their welfare standards? What practical obstacles does the industry face in adopting alternatives to cleaner fish?

Neil Purvis: We see the information and data on mortality through our inspection process. In some situations, it is difficult for the farm to manage the cleaner fish stock. There is almost a disappearance of fish at the end of a cycle without a full understanding of why or how that has happened. There is big variation between companies on cleaner fish survival and the care and effort that they put into looking after their stocks, so there might be things that can be learned across the sector from that perspective.

10:15

We need to get into that conversation with the sector to know what data it has and what it can provide on a more regular basis, if that is the route that we go down. There may be practical difficulties in recognising the loss of fish because of the system that is used to remove dead fish from a cage. The cleaner fish can perhaps be hidden in terms of the other mortalities on site, and there may be practical issues around that that need to be explored.

Amy Jennings: We would treat them in the same welfare framework that we would use for any other farmed fish. We would welcome any extra information that would support us to regulate that.

Ben Hadfield: From our point of view, we treat them with the same care and attention with which we treat every salmon. They do a very valuable biological sea lice control job for us. Everyone has seen sharks and rays that go to a specific part of a reef to benefit from cleaner fish. It is the same in salmon pens. It works.

I am uncomfortable with the level of mortality in cleaner fish. The development of the use of cleaner fish started in early 2000, and, when AGD came in, you needed to use fresh water to treat it, but it is difficult to separate the cleaner fish from the salmon when you apply fresh water. A lot of innovation and investment has gone into separating them.

To update that, because of the development of fresh water as a dominant, effective and environmentally friendly treatment for AGD and sea lice, cleaner fish have become less important from a cleaner fish control perspective, particularly lumpsucker, which are difficult to separate. The industry in Scotland has almost entirely moved away from stocking lumpsuckers. We have suspended our breeding operation for them and have diverted it to ballan wrasse.

Ballan wrasse are very effective, and you can separate them quite easily to maintain welfare through treatment. The survival of ballan wrasse is much higher, and, when we harvest salmon at the end, there is a lot of wrasse left over that we need to either humanely dispatch or take back to the farms, with disease checks and everything else in place. Survival is increasing a lot, but mortality is still high.

We need to get to a situation where the survival is increasing quicker, and we are farming ballan wrasse so that we are not increasing the catch of ballan wrasse from the wild. I assure you, as a farmer, that a biological tool to control sea lice that really works is very important.

Professor Dwyer: I want to provide a bit of context, because we reported on this at the end of last year. The use of cleaner fish is unique in a production system where we take a sentient animal and use it as a way of managing another animal. There are ethical issues with that, and when we looked at the cleaner fish information that was out there, we found that there is a separation between welfare, which is what the animal experiences, and the care and attention that people put into looking after them. I do not doubt

that: we saw high levels of people working really hard to look after animals and dedicated cleaner fish stock people on farms. That has been effective in looking after animals, and their mortality has dropped. We visited farming sites, so we have seen the level of input. However, the fact that people are working really hard does not mean that these animals do not have welfare issues; it is about finding that balance.

We were concerned about the cleaner fish because of that ethical issue and because the use of this animal is relatively new. A lot of work is being done, and there is a lot of movement in understanding the behavioural needs of these fish, which are complex. They have complex social behaviours and complex environmental preferences and needs, and it is hard to provide that in a sea cage where the needs of the cleaner fish may be harder to meet. I accept that you care about these fish as well, but surely the primary purpose is to grow salmon—that is your business.

We did not recommend that cleaner fish should not be used because of the issues around the welfare of salmon with sea lice. Even low levels of infestation causes welfare problems for salmon. It is great that other methods are now more widely used that perhaps make cleaner fish less important. However, from the welfare of the salmon perspective, when we weigh up the welfare of the cleaner fish and the welfare of the salmon, having cleaner fish is, as a biological control means, the least aversive for salmon.

If other methods are becoming more effective, we would like to see the use of cleaner fish phased out. However, we did not call for them to no longer be used, because we were concerned about the potential welfare impact for the salmon in the longer term. However, there is an ethical concern around the use of a sentient animal to manage another animal.

The Convener: I will add another question before I bring in Ben Hadfield to respond to Cathy's comments.

Is it the industry's preference to move away from using cleaner fish and find other ways to reduce the impact of sea lice? You have talked about wellboats and thermolicers and so on. I am also aware that the fish that are put into cages tend to be bigger now, because they spend more time onshore. Is the general view of the industry that you want to move away from cleaner fish? If so, is that compatible with reducing emamectin and chemical treatments and so on, which you are also looking to do?

Ben Hadfield: A move away from cleaner fish would be premature and unjustified, because they work. It is no different from keeping bees in an orchard to fertilise apples. It exists in many other forms of farming. However, it is right to emphasise that they are sentient animals and that welfare therefore has to be at the highest level and that mortality should fall.

Salmon farmers are trying to get a broad suite of treatment tools, including biological, licensed veterinary medicines, fresh water—that is increasingly the case—artificial intelligence and even lasers to shoot sea lice. That is really starting to work and is being deployed throughout farms in Norway. We want a very broad suite of treatments.

I understand, and share, the concerns about cleaner fish. However, the direction of travel with cleaner fish is very positive.

Emma Roddick: I will go back to Cathy Dwyer. Does the commission believe that mandatory, standardised reporting of cleaner fish mortalities should be brought in? Should there be a requirement within that to record the cause of death, rather than having the "unknown cause" reporting that we have at the moment?

Professor Dwyer: The fact that lack of data is a big issue in relation to understanding welfare problems and where they occur—whether that is mortalities or other issues—is a general point that we would make across all livestock production systems. It would make it clearer and easier to progress if we had mandatory data reporting. The voluntary reporting can often be really good, but mandatory reporting would move the bar up a little bit. Understanding where and why those mortalities occur is important if we are to be able to make progress in tackling the causes of mortality and, therefore, in improving welfare.

Ben Hadfield: In the interests of timekeeping, I am happy to ask Salmon Scotland to write a letter to the committee, reporting on the current state of cleaner fish and development and on what can be done in relation to reporting voluntarily. We have a productivity challenge as a country, so voluntary reporting, rather than mandatory legislation, would be a good move.

Neil Purvis: We have in place the voluntary agreement in relation to salmon and salmonid mortalities across sites. People report on those levels, and that works really well. There are some situations in which reports are missed or are late, but those represent a low percentage in the context of the total number of reports that we receive. That is good evidence that a voluntary reporting system works, which might also be an option in relation to the cleaner fish information, as we take that recommendation forward. Obviously, however, all options are on the table for the cabinet secretary to decide on and take forward.

Ariane Burgess: This question is for Ben Hadfield and Peter Pollard in the first instance. I

am interested in getting a sense from industry as to whether it thinks that the current regime for monitoring sea lice is satisfactory.

The Convener: Just before you respond to that, we are aware of on-going legal proceedings and appreciate that you may not be able to answer the questions as fully as you might like.

Ben Hadfield: I will try to speak freely about it. The idea that you would have a model that predicted the accretion of lice pressure on a wild salmon smolt going through a sea loch, a fjord or an estuary, and that you would end up with a tool like depomod, which essentially is—

Ariane Burgess: A tool like what?

Ben Hadfield: Depomod—depositional modelling. Have you heard of that?

Ariane Burgess: No.

Ben Hadfield: Many years ago, there was a big debate about the extent of the impact of carbon enrichment on the seabed. SEPA, along with the industry, developed a tool showing the spatial extent on the seabed, which was reasonably accurate and validated. It took the debate right away—it took the heat right out of it. We wanted to have a model that would do the same.

Unfortunately, the model architecture was set at such a precautionary level that it overpredicted by a factor of four or five. We tried to work with SEPA and Fisheries Management Scotland, but they were hellbent on making that architecture unreasonably and unrealistically precautionary. Eventually, the industry, much to my regret, had to appeal against that, because the model was so inaccurate that no reasonable person would have been able to accept it.

That is unfortunate, because it would have been a big step forward if we had just taken what was ministerial advice. I was in a meeting in which two senior ministers suggested to SEPA that it should have a pilot study, go through a thorough validation, show that it was accurate and then roll it out as regulation. SEPA, I think because of pressure from other organisations, decided to go straight to full regulation with a model that was grossly inaccurate and that no one could accept. It is a shame.

Peter Pollard: I apologise, but I will not be able to comment on that specific question, because of legal proceedings. I provided some information in our written submission. That does not address your particular question. I can talk with my legal team back at SEPA and respond in writing if there is anything we can add on that at this time.

Ariane Burgess: I want to confirm that you cannot respond to my question on whether you think that SEPA's current regime for monitoring sea lice is satisfactory.

Peter Pollard: The current regime is under appeal.

Dr Wells: I am not going to comment on the substance or the legal merits of the appeals, but I want to talk a bit about the downstream effect of the appeals, because they have practical and ecological consequences.

As a sector, we do not feel that adequate protection is in place at the moment to minimise the risk that farm-derived sea lice pose to wild fish. The appeals could take many months or even years. During that time, wild salmon and sea trout remain exposed to sea lice pressures during the smolt run. No material effort has been made to reduce risk, for example through interim protection measures during the prolonged legal processes. Wild salmon and sea trout smolts continue to migrate past farms—both last spring and, most likely, this coming spring. In the context of a species in crisis, inaction during the appeals is not a neutral position at all. It carries ecological consequences, and we need to be cognisant of that.

One of the things that were really regrettable was that the salmon farming sector did not proactively engage with us at all prior to submitting those appeals. Indeed, it took more than four months for it to meet us to explain the rationale behind the appeals. We are a key stakeholder and we have a key interest in what is happening. It shows a lack of regard for the wide range of interests in this space.

Ben Hadfield: Alan Wells and I have discussed this many times in great detail over many years, and I think that that is a deliberate exaggeration and a very polarised view. The architecture was deliberately made so that it was unrealistic and highly penalising. To reference ecological consequences when sea-lice levels have dropped year on year and control has improved vastly is misleading. Yes, we had an escape last year, but the level of escapes is at the lowest point for decades, as is that of sea lice, so the risk is minimal. Exaggerating this and trying to force through models that are unrealistic is unhelpful, and that is primarily why we are in this situation.

10:30

Rhoda Grant: Further to that, if we control sea lice properly and diminish the number of sea lice, concerns about smolts going past and picking up sea lice will hopefully not be an issue in the future.

Ben Hadfield: Yes. The prize in managing the potential environmental hazards of the sector is to get escapes down to zero, to find a way to sterilise

farmed fish such that there is no interaction or to keep sea lice levels so low and to farm in the right locations so that there is no measurable hazard to wild fish. The model, if done properly, would have really helped with that.

The farmers have taken sea lice levels down to unnaturally low levels. A wild fish will have five or 10 sea lice when it returns to a river. A farmed fish has 0.4, from the data that we see at the moment, so they are already at unnaturally low levels. Of course, to be fair to Alan Wells, we should note that there are a lot more farmed fish than there are wild fish.

The farmers are taking sea lice levels down as quickly as possible. That has previously increased mortality, but the new innovation and development around wellboats and freshwater has slowed that mortality. What we really need is an accurate model that can take the heat out of the situation. It may lead to some very practical discussions on, for example, whether fish farms should be relocated, whether areas should not see any further development or whether they should be managed differently.

A big change that has come in is the one year at sea—the post-smolt period—that the convener referenced. That has changed things dramatically. The fish are at sea for 11 months and they are then harvested at 5kg. Sea lice just do not get time to establish and become an issue, because that doubles the amount of fallowing that we had previously.

Dr Wells: I will come back on some of those points. I do not think for a second that we are exaggerating the situation. I accept what Ben Hadfield says about sea lice control in that lice per fish are reducing, but, as he suggested, it is not lice per fish that is important to the wild environment. As I mentioned the last time I was in front of the committee, it is the overall burden of lice that are released into the environment that is important. With more and more farmed fish in the sea, we need to take that very seriously.

There is another downstream effect of the appeals that I want to bring to the committee's attention. A while back, the Scottish Government took a decision to advise local authorities not to impose environmental management plans on farms that are consented. The logic behind that is sound. There should not be double regulation. However, we do not have a sea lice framework in place at the moment because of the appeals. New consents are being granted without environmental management plan conditions, which include monitoring of sea lice and things along those lines. SEPA's full national monitoring framework is not yet operational, and there has been a judicial review in relation to that, as we found out from the SEPA letter to the committee. There is also no clearly articulated contingency mechanism to ensure that equivalent protections are in place.

I do not want to speculate on where we will end up with the appeals, but if they result in the sea lice regulatory framework being quashed, Scotland could find itself in a position where there are fewer protective measures in place for wild fish because environmental management plans have been taken away. We are seeking an assurance that, irrespective of the outcome of the appeals and the judicial review, we will not end up with reduced monitoring, weaker policy oversight and diminished safeguards for wild fish, compared with the situation before SEPA took responsibility for sea lice. At the moment, we do not have that assurance.

The Convener: Thank you. I am minded to suspend the meeting for a comfort break. We will return at 10.40.

10:34

Meeting suspended.

10:41

On resuming—

The Convener: We will now take questions from Beatrice Wishart.

Beatrice Wishart (Shetland Islands) (LD): We have already touched on the impact of warming seas and how climate change is affecting disease outbreaks, harmful algal blooms and parasite infestations on salmon farms. Is the Scottish Government doing enough to support scientific research into how climate change is affecting issues that impact salmon farms?

Ben Hadfield: To be fair to the Government, it has done quite a lot on that. We are all having to face the climate resilience issue. Parasite levels have dropped massively. Disease levels, both bacterial and viral, are down considerably in the Scottish industry. The big challenges in recent years have been micro jellyfish and algae, which are a factor of warming seas, particularly in summer. There is also amoebic gill disease, which is a problem because, up until this year, temperatures have not dropped below 8ºC for a while, and AGD goes dormant at 8ºC. It does not go away, but it stops multiplying.

The situation is currently much better because the temperature in the sea is about 7.5ºC, mortality is very low and AGD is stationary. However, more research on how to predict challenges from algae and jellyfish would be beneficial. Salmon is the UK's largest food export, putting £1 billion into the economy and with an average annual wage of

£44,500, so it is really important to the economy of the islands and the west coast of Scotland that we get ahead of those issues and take mortality down further.

Beatrice Wishart: What about early warning tools? Are you aware of any research into those?

Ben Hadfield: Yes, there is a lot of research into those. Some people use AI to check water quality daily, twice daily or hourly, and that is really helping to predict when those things arrive at low levels.

Neil Purvis: To add to what Ben said, I note that, last year, the Scottish Government published its "Areas of Research Interest: Marine & Freshwater" document, which covers a lot of the themes that Ben just mentioned, including the health of aquaculture animals, jellyfish and algal blooms. It is a document that seeks collaboration in research. It identifies areas that are important to the Government and in which more answers are required or more research is required to be undertaken, and it seeks agreement and uptake from third parties in order to co-ordinate and collaborate on those.

10:45

Rhoda Grant: On the same subject, we are aware of some threats, especially from warming waters, but what research is being carried out on future threats that might not have appeared yet? Are there any algae, toxins or whatever present in waters further south that might have an impact on salmon in the future, given that the waters are warming? Is any of that work being done, or are we just dealing with threats as they appear?

Ben Hadfield: We have to accept that fish species are moving further north faster than changes are happening in the land environment. Fifty years ago, it was a curiosity if you caught mackerel in Iceland—now that is the largest mackerel fishery in the world. Wild salmon is, for sure, under pressure in the British Isles and Europe, but its range is actually moving further north into places such as Greenland, Iceland and the Kola peninsula.

The same pressures that affect wild stock are affecting farmed stock, with species from the channel—I am talking about jellyfish—becoming prevalent on the west coast for most of the summer. A lot more work is required if we are to understand such things as their spatial extent, their concentration and their toxicity, in order to predict them and to help fish survive in these new challenging conditions. That said, we have made positive steps and we are now able to mitigate the mortality from jellyfish to a greater extent through the use of exclusion barriers and by moving fish when the jellyfish come in.

Rhoda Grant: Thanks.

The Convener: Our previous work identified significant investment in innovation, science or whatever to improve the situation and reduce mortality and disease, but one criticism was that the industry might not be keeping pace with the rapidly changing environment in which fish farms find themselves. Does the industry now have the tools to keep up with the rate of change in the environment, and will we, in the future, see a reduction in mortality from jellyfish, micro jellyfish, fungal disease or other events arising from warming waters?

Ben Hadfield: I have confirmed this to you before—and I am happy to write to you again on it and reference it with evidence—but viral, bacterial and parasitic challenges have come down quite considerably in recent years.

The change was quite rapid. Between 2022 and 2023, the marine heatwave that was documented off the west coast of Scotland led to an increase of 4ºC in the sea temperature. I do not think that anybody expected the increase to be so extreme so rapidly, and so the industry has had to invest in moving extremely quickly to innovate and get resources in place. However, there has been a lag time. After all, it takes three years to build a modern wellboat, and it then costs around £10 million per year to lease it.

It has taken time for that equipment to be deployed, but it is now being deployed on a greater and greater scale. The results are encouraging, but mortality does need to be lower.

The Convener: One scientific improvement that offers a huge number of positives for transparency is DNA-based seabed monitoring, which we hope will be rolled out this spring. How many more sites will SEPA be able to monitor through the advancements in DNA-based monitoring, thereby improving its ability to act on non-compliance?

Peter Pollard: DNA-based monitoring of the seabed will pick up the impact of deposition and make sure that it is within the allowed mixing zone levels. At the moment, the existing method is quite limited and applies only to certain muddy seabed types, but the new method will apply to pretty much all seabed types that you can get in a grab, and we will be able to use that method to assess compliance on the majority of sites.

The big advantage of the new method is that the analytical time is much reduced. It normally takes us approximately three days to analyse one grab sample. With the new method, the sky is almost the limit—in three days, we can analyse as many as the machine can hold. Therefore, it really speeds up the assessment and allows us to get

back in touch with the operator very quickly if there is an issue.

The Convener: Can you give an indication of the scale of the improvement? There were concerns that, given the number of sites that were being sampled and how long the process was taking, we did not have a proper view of what was happening. Can you give us an example of the scale of the improvement and an idea of the sort of figures that we are looking at?

Peter Pollard: Previously, once our boats had collected the samples from the farms and had brought them back to the lab, most of the analysis would probably be done in the winter time, and it would take three or four months. The analysis can now be done within three weeks of collecting the sample, so the time that it takes to get results has been significantly shortened.

The Convener: How is that reflected in the number of sites that you are able to monitor, rather than how quickly you can do the analysis?

Peter Pollard: The monitoring still requires us to go out to the sites. This year, we have sampled 26 of the active sites. We aim to sample about that number each year. The new method does not affect that. There is still a constraint in relation to going to the sites, but we think that that figure—10 to 15 per cent of active sites—is the right one to allow us to do the detail.

Operators also have to carry out monitoring, and the new method will be open to them by the spring. We hope that it will be adopted widely and used extensively by operators, because it will shorten the time that it takes them to get results.

The Convener: The new method should be positive in providing a bit more transparency in how the industry operates, so it should be welcome. Will DNA sampling bring any other insights to help with the assessment of sites and the siting of fish farms in the future?

Peter Pollard: In parallel, we are working on another method. At the moment, the method is not applied to all seabed types. For example, it does not work if the seabed around the farm is rocky or if there is a protected species such as maerl that we do not want to grab at all. However, we have received funding through round 11 of the Scottish Government's CivTech challenge programme to allow us to fund a researcher to develop a method that will work almost regardless of the seabed type, which will, I hope, allow us to address a wider range of seabed types.

The two methods would give us coverage across all sites. The second method might allow us to better understand the effects on things such as maerl beds, because we do not have a good way of monitoring those at the moment.

The Convener: Is what we have been talking about a positive move forward from the industry's perspective? Will it help to build public confidence?

Ben Hadfield: With respect, I maintain that public confidence is high in relation to demand for salmon and so on, but anything that can be done to reduce the environmental impact of salmon farming is a good thing.

Even during Covid, when salmon farmers were allowed to hold more biomass on farms so that they could get through that difficult period, compliance relating to the seabed improved. However, given the backlog, when SEPA changed the regulations to massively increase the number of samples that had to be taken in a fixed period, that just could not be done. Therefore, unfortunately, a number of farms were forced into non-compliance simply because of the changes in capacity.

If the new methods unblock those problems and speed up the whole process, that will show what we know to be the case: salmon farms on the seabed are increasingly compliant. That will further support public confidence.

Ariane Burgess: The committee recommended that the Scottish Government should establish a research project that focuses on testing and improving the modelling of environmental conditions that are known to cause high mortality events. The Government has started work on that through its areas of research interest paper, which identifies priority research needs. Can you give us a sense of what has changed on the ground as a result? Can you help us to understand, for example, how closely that work influences day-to-day farm management decisions?

The Convener: That could be a question for industry or the regulator.

Ben Hadfield: I will help with that and give Neil Purvis time to think about his answer. We have talked a little bit about how fish farmers use a relatively small fraction of their allowed consent.

Ariane Burgess: A fraction of their what? I did not hear you.

Ben Hadfield: A fraction of the consent for production biomass. Fish farmers are using a relatively small amount of that because they are already selecting the best farms that they believe give the highest water quality, welfare and rearing conditions. That situation is on-going. If the Government and marine directorate can home in on farms that have consistently high mortality that is shown to be as a result of environmental conditions and not farming practices, that exonerates the farmer to an extent and there should be a bit more empathy around fixing that situation. A slightly more flexible regulatory system

would allow a farmer to look for a better location to farm, which would be highly beneficial.

Ariane Burgess: Okay, but what you are talking about is in the future, so nothing has actually changed on the ground since we made that recommendation, more than a year ago.

Ben Hadfield: Ms Burgess, this is a very fast-moving industry. Everything changes on the ground very quickly. Everyone is focused on trying to improve the situation urgently, so there is a lot of change here.

Ariane Burgess: You were talking about something that could happen in the future. We made a number of recommendations and we are having this inquiry more than a year since we did that work. I am just trying to get an understanding of what is actually happening on the ground; it was helpful that you described what you would like to see happening on the ground. I just wonder whether the other witnesses can say whether anything is actually happening yet, or whether targeted research into modelling environmental conditions that lead to high mortality events will happen in the future? Are we actually doing anything on that yet?

Neil Purvis: From a fish health inspectorate perspective, we have been involved in the persistent elevated mortality analysis work, but we are not actively involved in other research processes. I would have to defer to the cabinet secretary for updates on those specific recommendations.

Earlier, I gave a bit of a description of where we are at with the persistent elevated mortality. We have worked at pace to produce something that is robust and scientifically driven, involving FHI policy and science colleagues, but we need to ground truth the output of that by having conversations with the sector. We need more information about mortality to answer the question of persistent elevated mortality. We are at that point now, and we are almost at the point of the report on that going to committee.

It will be for the cabinet secretary and the Scottish Government to determine how we use that output and what it means practically for fish farms in any location, and that conversation is still to be had.

The Convener: I will bring in Evelyn Tweed, because I know that she has a question on this exact topic.

Evelyn Tweed (Stirling) (SNP): Yes, I have a question for Peter Pollard on the enhanced seabed monitoring. What will the format of the published results look like? Will they be easy for communities and stakeholders to understand and get to grips with rather than being just a report on compliance or non-compliance? You are smiling—that is interesting.

Peter Pollard: We can look at that. At the moment, we generally report on whether the seabed survey is compliant or non-compliant. We can look at whether there are options to provide different types of information on that as part of the digital project that we mentioned earlier when we talked about looking at how to improve the accessibility of information to the public. I had not heard that there was a need for that, but, as you have mentioned it, we will explore it as part of the process, to see whether going beyond straightforward pass/fail information would be valuable.

Evelyn Tweed: It is important that stakeholders and communities understand exactly what is going on, so, if you could look at it, that would be helpful.

Peter Pollard: That is fine. I will take that away.

Alasdair Allan: I am aware that the industry has been working to reduce antibiotic use—that might have been alluded to earlier. There have been instances of individual companies having to report and then re-report figures about levels of antibiotic use. Could any of you say a bit more about the direction of travel on antibiotic use and about what enforcement steps would normally follow any dispute about returns in that area?

11:00

Ben Hadfield: We need to start with the context that there is absolutely minimal antibiotic use in aquaculture. As I said before, the use of antibiotics is at a lower level than for humans, companion animals, sheep, beef cattle and so on. Such use has been falling, but a mistake was made last year—this was indicative of the level of scrutiny that the industry is under—whereby some numbers were missed. However, that was swiftly corrected.

The rate of vaccine innovation and development in Scotland is high. We are making various vaccines, including autogenous vaccines, which you will probably know is when you culture from an animal or a serum. Therefore, I expect antibiotic use to fall markedly in the coming years. It would further improve public confidence if Scotland could get down to a level of zero antibiotic use, as is the case in the Faroes and Norway. However, antibiotic use is at a minuscule level, and all fish that are harvested have levels of multiresistant organisms that are low or, very often, non-detectable.

Microbial resistance is obviously an area of concern that we need to look at, but it is not a big area of concern compared to other uses of antibiotics.

Peter Pollard: I confirm what Ben Hadfield said—2024 had the lowest level of reported antimicrobial use of any year. I have not yet got the full data for 2025, but reported antimicrobial use looks to be at a similarly low level.

Alasdair Allan: Thank you.

Ariane Burgess: I hear what Ben Hadfield is saying about the underreporting being acted upon swiftly, but it is a concern. We talked earlier about reporting issues regarding mortality, and there is now another reporting issue. How can the committee have 100 per cent confidence in the reporting? That issue was found out through work that was being done, but can we be confident that we are getting an accurate picture of all the reporting?

Peter Pollard: The information that was reported to and published by SEPA through the Scotland's Aquaculture website did not have errors in it; that information was correct.

Ariane Burgess: But there was reporting by the sector that was inaccurate.

Ben Hadfield: It was a simple mistake in a large data set that was released, and it was quickly accepted and corrected. I think you should—

Ariane Burgess: Okay—that is enough. Thank you.

The Convener: Did you want to continue, Ben?

Ben Hadfield: Scotland leads the world in transparency in aquaculture. That can be seen with regard to densities, medicine use and antibiotic use. I understand and respect the fact that you want improvement, but we should take stock for a minute and understand that we lead the world in transparency in salmon farming, because that is a good thing.

Did you want to come back to me?

Ariane Burgess: My sense is that we may lead the world in a kind of transparency, but what is coming up in this meeting—and it came up in the previous work that we did—is that there are points at which responsibility ends and something does not get picked up. I have concerns about that. We made many recommendations in our report, but, as we are having this conversation, I am not getting the sense that enough has changed over the course of a year.

Emma Roddick: I have a question for Dr Wells about escapes, which came up earlier. The Scottish Government is a signatory to the North Atlantic Salmon Conservation Organisation's commitment to achieve 100 per cent containment of farmed salmon. However, revisions to the 2015 technical standard and the introduction of financial penalties are not expected until 2026-27 and 2027-28. How does that pace of action in Scotland compare to action by other NASCO signatories, and is it consistent with our international obligations?

Dr Wells: That is a difficult question to answer. We have a new reporting system through NASCO that is just kicking off this year. It is fair to say that most signatories to NASCO that have aquaculture in their jurisdiction are unable to show adequate progress in the NASCO reporting on the international goals regarding either escapes or sea lice. Scotland is the same as everywhere else in that regard.

Obviously, we are concerned about escapes. We absolutely accept that the number of farm escapes is lower than it has been, but it is still high in comparison with the number of wild fish that we have in the environment. That is the proper metric: the number of escaped farmed salmon relative to the abundance of wild salmon, and then the downstream impacts of those escapes.

We do not necessarily see impacts every time that there is an escape. It depends on what stage of production the fish in the cages are at and whether they are ready to move into rivers and to breed and all the rest of it. As, I think, we reported to the committee previously, the national electrofishing programme for Scotland has already demonstrated widespread presence of genetic material from farmed fish in wild populations. We find that in the areas of Scotland where there is fish farming and we do not find it in the areas where there is no fish farming. That includes freshwater production in rivers on the east coast—those are the only areas on the east coast where we see a level of genetic introgression. However, it is not just about genetic introgression; it is about competition for space and resources. Even if you do not have interbreeding, the fact that there are farmed fish in the environment is not a good thing. It is not good for the farmers and it is not good for wild fish. Therefore, we absolutely want more action on that.

Over the past five years, around 150,000 fish have escaped from cages. Unfortunately, the majority of those have come from Mowi farms. We need to understand why that is happening. We have storms and things like that. However, given climate change, which we talked about earlier, that is the environment in which we will increasingly be working. We acknowledge that, last year, when there was a large incident, Mowi responded very quickly and went on to fund substantial post-event monitoring and work to understand what is going on, which is great. Obviously, we do not want escapes in the first place, but that sort of response is what we would like to see as an industry standard.

We have talked about escapes in the marine environment, which is very often the focus. However, at the meeting in 2024, we also talked about failures in the freshwater environment. We think that that is a real and on-going issue, and we have not seen significant progress to address some of the issues. There have been discussions with Highland Council about a particular point that we mentioned, and there has been a little bit of progress on that, but it took a formal complaint to Highland Council from one of our members to make that happen.

With regard to the penalty system, at the previous evidence session, we highlighted the lack of progress on the salmon interactions working group recommendations, and, early last year the Scottish Government established a steering group to explore possible options. We were part of that group, and it was a good, inclusive and collaborative process that provided an opportunity for stakeholders to come round the table on that basis. Unfortunately, with some staff moving on, that work has halted, although we are encouraged that the commitment is still there. In the interim, we have committed to work with the salmon farming sector to try to develop a mutually agreed approach to introducing a voluntary penalty system for farm fish escapes. We want to do that together. We want to come up with a mutually agreed approach that both sectors can buy into, and we will see how we get on with that.

Emma Roddick: I have a question about the escape that took place last October on the Gorsten farm. Since that escape, have structural failures been identified to allow the industry and regulators to look at preventing something like it from happening again?

Dr Wells: I should maybe let Ben Hadfield answer that.

Emma Roddick: Interesting.

Ben Hadfield: Would you like me to answer it?

Emma Roddick: Go for it.

Ben Hadfield: In terms of damage, it was the worst storm that I have seen in Fort William. We acted quickly and apologised for the escape. I called Jon Gibb on the Saturday morning, within minutes of finding out that it had occurred. There were strong winds and a tidal surge, which pushed the group on to a flotation tube, and the tube made a hole in the pen. We tried to get the pen up and recover it, but, by the time we did, 75,000 out of some 82,000 fish had escaped.

The fish were 960g, so they were immature. Some of them went into the rivers and have since come out. I spoke to Jon Gibb about that. None can be seen in the river now. We suspect that the predation levels will be extremely high and that very few of them will return. It will probably look a bit like Carradale. However, we have put in place a two-to-three-year genetic study to measure the level of introgression. It was a bad day. It was a significant storm.

As you have heard, many of the escapes have been from Mowi farms—I accept that. Because Mowi has the most fish and the most farms, that would be common sense. However, we have also had a policy of not expanding into or developing new farms in what we agree with our wild fish neighbours are sensitive locations, so we have gone to open-sea locations. Although such environments are beneficial for lice control and water quality for the fish, they are very challenging during a storm. We have therefore had to balance that, and the main way of doing so is investing in equipment and putting in the highest-specification kit we can.

Neil Purvis: Just to confirm, under the Aquaculture and Fisheries (Scotland) Act 2007, the fish health inspectorate has powers to inspect farms in relation to containment, escapes, risk of escape and so forth. We did an inspection of the site to which you refer and made some recommendations on the design and installation of equipment. Those recommendations were put to Mowi and have been met.

Emma Roddick: Has the fish health inspectorate assessed the potential impacts on wild salmon of the fact that the farmed salmon were being treated with antibiotics, such as the risk of antimicrobial resistance transfer and predator exposure?

Neil Purvis: From the antibiotic perspective, we do not have a regulatory remit. That falls more to the veterinary medicines directorate—the VMD—and perhaps to SEPA. We undertake residue testing on behalf of the VMD. We have the contract to do purely that sampling and to submit it to the VMD for analysis, and we inspect medicine records on site as part of that process. We do not collect a comprehensive record of all the medicines that have been used; we check that farmers are maintaining the appropriate records on site.

With regard to those specific fish, I would have to go back and check our notes.

Emma Roddick: It would be good to hear from Peter Pollard whether any such review or assessment, or an overall ecological assessment of the impact of that escape, has been made.

Peter Pollard: We have not carried out any ecological assessment to date, other than the work that Alan Wells and Ben Hadfield have referred to, which we would be interested in seeing the findings of.

We do not have a direct role on antimicrobial resistance. There is a Scottish AMR strategy. I would point out that salmon are cold-blooded animals, so the bacteria that they support are not normally expected to be pathogens of warm-blooded animals such as humans. I can provide further information on that if it would be helpful.

Emma Roddick: Does it feel right that the onus and the responsibility for regulating those matters seems to be falling on the industry rather than on anybody else?

Peter Pollard: Do you mean for regulating escapes?

Emma Roddick: Yes, I mean escapes, their potential antimicrobial resistance impacts, and their impacts on wild salmon and the ecology of the wider area.

Peter Pollard: The regulation and enforcement sit with the marine directorate's fish health inspectorate.

Emma Roddick: Both you and Neil Purvis have said that the issues of antimicrobial resistance and antibiotic use do not fall to your organisations.

Peter Pollard: I am not sure that there is an issue with antimicrobial resistance. We will need to get back to you on that, but we are not aware of a big pathway of AMR risk to humans.

11:15

Ben Hadfield: I say with a great deal of respect that it has already been explained that the risk of any antimicrobial resistance is either minuscule or non-existent. The fish on site had been treated with antibiotics, but it was calculated that the level of antibiotics was below the maximum residue level, or MRL, and—

Emma Roddick: But calculated by whom? I suppose that is my question.

Ben Hadfield: Calculated by professional veterinarians who are able to do that, working within the company. In addition, the fish that remained in the pen—there were 5,000 left, remember—were tested and were significantly below the maximum residue level. It is not an issue, but I can understand why activist campaigning organisations would try to present it as an issue. I think that what is being said is that, after checks and balances were done, proper steps were taken and thorough analysis was carried out, it was found not to be an issue.

Emma Roddick: Can you understand why it sounds to me, as somebody who is trying to scrutinise the impact of regulation on the industry and the industry's best practice, as though you are marking your own homework here?

Ben Hadfield: Respectfully, again, I have to say no, I cannot understand why you think that it is such a big issue. I am happy to write to you and set out in detail the analysis and what was done. I hope that, after receiving that letter, you, too, will understand that it is a non-issue. I respect your right to ask questions about it—that is fine.

Emma Roddick: I am not stating that there either is or is not an issue; I am just not seeing any oversight or independent view of this.

Ben Hadfield: What you can see is that there is huge oversight and scrutiny of the industry. It has its challenges, but it is steadily improving. We welcome scrutiny when it is balanced, but accusations of risks of microbial resistance from this have, I think, been hammed up to the point of not being credible. However, I respect your right to ask those questions, and I am happy to write and take you through all the detail, in the hope that that will be sufficient for you.

Emma Roddick: Great.

Peter Pollard: On the antimicrobial resistance issue, there is a UK and Scottish action plan that is looking, and has looked, at the risk pathways for AMR to people. I do not have that information with me—I can provide it to you—but it has looked at different routes through livestock, including not only fish but land-based animals. As I have said, I can provide that information, and it is the evidence base that we would look to.

Neil Purvis: Just to pick up on Ben Hadfield's point about antibiotic use, I should make it clear that that work is done under veterinary advice. Vets follow appropriate codes of practice in that respect, so it is really controlled from that perspective.

I should also say that, with regard to the sampling that we do, all the results on residue testing in relation to farmed fish are published by the veterinary medicines directorate and are available on its website. It is really very rare for a residue to be picked up and, if it is, why it has been found is often explainable.

The Convener: I call Ariane Burgess.

Ariane Burgess: I am going to direct my question initially to Dr Alan Wells. Dr Wells, you said earlier—I am paraphrasing—that wild salmon are a species in crisis and that inaction is a not a neutral position. There are many measures arising from the recommendations of the 2018 Rural Economy and Connectivity Committee report, as well as additional recommendations from this committee, from our work on wild and farmed salmon interactions, that could be considered work in progress. For example, we recommended

"an immediate end to the siting of farms in the close vicinity of known migratory routes for wild salmon",

but the Scottish Government did not accept that. I am interested to hear what you think should change to deliver meaningful risk reduction for wild salmon, a species that you have said is in crisis.

Dr Wells: There is a lot in that question. The last time that I sat in front of this committee, I talked about the sea lice risk framework, including some of the things that we thought were good about it and some of the things that we had concerns about. A proper regulatory system that meets the test set out in the salmon interactions working group report of being robust, transparent, enforceable and enforced is key. We can have all sorts of discussions about what that looks like, but SEPA was broadly along the right lines in trying to manage the overall number of lice within the environment.

The recommendation about migration routes is interesting. I can understand it and see where it comes from. I am coming at this from the perspective of thinking about sea lice. Because they have a planktonic stage, the point at which the interaction takes place can be quite distant from the farm, depending on local sea conditions, for example. Therefore, understanding through modelling where those lice go and managing the risk at the point when they go is another important element of the framework.

One of the things that we like about the framework, should it go forward, is that it will allow us to identify lower-risk sites for farms and, we hope, avoid high-risk sites for new farms. If it goes forward, once the appeals are through, the sea lice risk framework will, in some ways, help to address those issues. At the moment, because of the situation in which we find ourselves, there is no progress towards that.

Ariane Burgess: You keep saying “if it goes forward”. What is preventing the framework from going forward?

Dr Wells: There are 260 appeals of conditions in licences.

Ariane Burgess: Specifically in relation to the framework?

Dr Wells: Yes.

Ariane Burgess: Is there anything else that needs to change?

Dr Wells: There is a host of things. We will submit some written evidence, probably next week, and I am happy to cover that in there. If we can get a suitable regulatory framework for sea lice in place, that will address an awful lot of the issues that have been identified at the committee.

Ben Hadfield: I am a fisherman and care about wild fish. Alan Wells knows that. We want to work with you. We prefer a situation in which we can work together to having bureaucratic legislation.

FMS should put more into conservation. A rod licence is important, as are index rivers. Much more should be done on that. However, we are happy to work with you on our sector.

Dr Wells: It is almost becoming a little bit of a meme here. I would be happy if the committee decided to recommend in its legacy report that there should be a further investigation into how we manage wild salmon. I would be very open to such a discussion in the next session of the Parliament. I am very happy to lay all of that stuff out.

The idea of a rod licence has been mentioned. As part of the wild salmon strategy, we have just made some recommendations to the Scottish Government that include the introduction of a rod licence. There is a host of processes that the sector often seems to ignore or misunderstand and that are taking place across the piece to address all the pressures that wild salmon face, but I am talking about sea lice and escapes because that is the scope of the inquiry.

The Convener: I assure you that there was a desire for the committee—and, if I remember rightly, the previous Environment, Climate Change and Land Reform Committee, in which I was involved—to do a piece of work on wild salmon, because we all appreciate that the pressures come from different places and, as the convener, I was keen to ensure that the focus was not on one aspect of the pressure. However, as I am sure you are aware, the committee has come under significant pressure to deal with other issues and pieces of legislation, so we could not do that this year. I am sure that, when we go on to discuss our legacy report at the end of the meeting, we will bear that in mind.

Before we move on to our final theme, which is on spatial planning, consenting and community benefit, I put on record my extreme disappointment that, although Highland Council and Shetland Islands Council, given how important their role is in the consenting of farms, were asked to take part in the round table to give a local authority perspective, neither sent any representatives. That, unfortunately, is a bit of a gap in the evidence that we could have taken today.

I invite Beatrice Wishart to ask her question.

Beatrice Wishart: My question is about the consenting pilots that SEPA, the industry and Shetland Islands Council have been involved in. What has improved for applicants? What changes might still need to be made to make the process more efficient and co-ordinated?

Ben Hadfield: Progress has been disappointingly slow, because the pilots were

supposed to increase scrutiny and speed up the process. There are people in Mowi and other parts of the sector who know more about the pilots than I do, so could I write to the committee to clarify our full view on the issue?

Beatrice Wishart: That would be helpful.

Peter Pollard: The idea of co-ordinated consenting followed from the Griggs report, which identified that it can take a long time for an application to get through, because a developer might apply first to the planning authority and then, subsequently, to SEPA and the fish health inspectorate. The thinking was that we should create a process in which the pre-application and application processes are co-ordinated and start at the same time, so that there is less duplication and much more co-operation between public bodies and their advisers.

As I said, 11 pilots are under way and four have completed the pre-application stage. One of the companies, Scottish Sea Farms, told us the other day that it thought that the approach had shaved about a year off the timescale for getting an application through.

We want to ensure that, at an early stage, when a developer is just starting to think about a proposal, we identify whether there are any show-stoppers. If we identify that a development will not be suitable in a certain location, that avoids wasting the time of the developer and the public sector. If we get everything right, that allows sustainable projects to move through the process later on. The approach ensures that we get the right decisions as quickly as possible and avoid work being done on applications for developments in the wrong locations.

Beatrice Wishart: Are you aiming for something similar to the Norwegian model, which involves a one-stop shop?

Peter Pollard: We are trying to get developers to engage with the various parts of the public sector as though they were one. We all have our different regulatory roles, but we want to work collaboratively so that we almost get a combined answer from the public sector.

Dr Wells: District salmon fishery boards are statutory consultees in the aquaculture planning process, but, unfortunately, the first two pilots were in areas without those boards, so the fundamental issue was that the full process could not be tested in those areas.

Ben Hadfield: That is the point—we are expanding in areas that are not close to wild fisheries, which is why there are no district salmon fishery boards in those areas. The expansion is taking place away from fisheries.

Dr Wells: One of the pilots was in Loch Carron. It does not happen to have a district salmon fishery board, but it is not that there is no wild fishery.

Ben Hadfield: The point is that the sector's focus is on development in open-sea areas away from fisheries. It would be nice if you just accepted that.

The Convener: Okay.

Ariane Burgess: I have a couple of questions on theme 5, which is on spatial planning, consenting and community benefit.

The committee recommended that there should be a spatial planning exercise to inform strategic guidance on areas that are suitable or not suitable for salmon farming. However, the consultation on the national marine plan has been postponed, which makes it harder for us to consider how strategic planning will evolve. How should we understand the relationship between the national direction and the emerging regional marine plans, such as those for Shetland and Orkney, in shaping future farm locations? I do not know who wants to answer that question first.

The Convener: Who wants to kick off?

Ben Hadfield: I am sorry, but I did not follow the question. Could you try again?

Ariane Burgess: We recommended that there should be a national spatial planning exercise, but the national marine plan 2 has been delayed, so we are not getting a national view. In the meantime, regional plans are coming in. How can the committee determine what is going on? How can we understand—you might not, either—the relationship between the national direction and the emerging regional plans? Shetland has one, Orkney has one and other areas have to come forward with such plans.

11:30

Ben Hadfield: This committee, and the Griggs report, have made recommendations that the process should be akin to a one-stop shop and that it should be sped up, and that developments should be away from sensitive locations, whether wild fisheries or other habitats, which are increasingly well mapped. The industry is following that advice, and the majority of developments are away from those locations.

Alan Wells referenced Loch Carron. However, I assume that what is happening there is not a big expansion but relates to a change of equipment or something. It is very much the case that expansion is focused on open sea areas. The guidance from regulators, the committee and the Griggs report has been to speed the process up, and that is happening. If the information was captured in an

overall document or a geographic information system, that would be helpful. However, I am not seeing that, and it sounds like you are not seeing it either.

Ariane Burgess: Would it be helpful if it also showed up in the national marine plan?

Ben Hadfield: I think so. However, there are things that would be more helpful than that.

I hope that members can see that the advice from the committee and from regulators is bearing fruit in relation to expansion—to the extent that there is any. We should not forget that the industry has been the same size for a long time now, at between 150,000 and 200,000 tonnes. Therefore, there is no real expansion. However, there is a process of trying to make the site mix better and to move sites. That process is being directed by this committee and by regulators, and it is happening. If that information could be summarised so that it is absolutely clear, that would be beneficial.

Dr Wells: In a previous role, I worked on the Marine (Scotland) Act 2010 and on national marine plan 1, and I am part of the steering group that is looking at national marine plan 2.

One of the failings of marine planning in Scotland is that it sets out a series of sector-based policies but does not think properly about how those policies interact or manage the needs of the various sectors. It also does not articulate Scotland's priorities for the marine environment.

As I said the last time that I was in front of this committee, we need a more holistic approach. At the moment it is a case of first come, first served; if you put in an offshore wind farm somewhere, or whatever it is you want to put in, you are, in essence, setting the direction there. We need to take a much more holistic approach.

From my perspective, the fact that we have a sectoral marine plan for offshore wind demonstrates the failure of marine planning in Scotland. You should not need to have a sectoral plan if the actual plan is working properly.

Ariane Burgess: How do we get to that more holistic approach? What needs to happen?

Dr Wells: I suspect that we need a proper tiered system.

It has been mentioned that there are a couple of regional marine plans. However, the bill was passed in 2010, and the expectation at that point was that there would be a series of regional marine plans nested under the national marine plan, which is nested under the UK marine policy statement. That system is not functioning in the way that was anticipated.

As I said, there are only a couple of regional marine plans. In areas without regional marine plans, I guess that the planners are simply looking at the national marine plan, which does not give the level of resolution that is required to make decisions.

Ariane Burgess: You are saying that we need a marine plan that is about broad brushstrokes and that will allow regional plans to be nested within it that take a more nuanced, local approach to what is happening in the waters in an area.

Dr Wells: Yes, and we need full coverage of regional plans.

Ben Hadfield: That is all helpful. However, you can write as many documents and plans as you like, but more needs to be done on actual conservation and on coalface projects on the rivers.

Ariane Burgess: Unfortunately, we have a system of national marine plans and all the other things that happened before I got into this role.

I have another question about community benefit. The committee recommended clearer good-practice principles for community benefit rooted in local priorities. I will go to Ben Hadfield and Dr Wells first, and then to anyone else who would like to come in. I am interested to understand what meaningful community benefit looks like in practice and how it should be weighed against considerations of economic production.

Ben Hadfield: For me, meaningful community benefit is about providing high-quality well-paid jobs and long careers in the economy. Those are the basics that I would expect. It is also about salmon farming companies being embedded within the infrastructure of communities, supporting schools and low-cost housing. There are more than 65 examples of those things.

The ultimate test is when communities invite you in and have a fairly business-like discussion with you about supporting aquaculture. Trust me, when that happens—and it happens for the majority of companies—it is quite refreshing when the community says that it is open to the idea of a salmon farm in a particular location and asks what the company will bring to the community, which is a fair question.

From a tax perspective, it ticks the box, because salmon farms pay additionals to the Crown Estate. The discussion with communities about what companies can bring in terms of community benefit is very clear now, and I am pleased to play a part in that.

Ariane Burgess: On our trip to Oban, we met members of the community who had salmon farms in their area but did not want them. I hear the bit

about places where salmon farms are accepted and embedded in the community, but what about situations where they are not?

Ben Hadfield: The majority of people on the west coast and in the Highlands and Islands want salmon farming because of all the economic benefits that it brings as an intrinsic part of the community. I say respectfully that I think that you spend more time with people who do not want salmon farms, but they are in the minority. They are organised, well funded and vocal. I do not diminish their concerns. I spend a lot of time engaging with those people and answering their concerns, but the majority of people are absolutely clear that salmon farming is an economic powerhouse in remote rural areas. It is a sustainable operation with a highly desirable Scottish provenance product. They want to invite it in, but they also want to ask the fair question what is in it for their community.

I am no different from any of the other managing directors or leaders. I enjoy answering the question what is in it for the community. It is a fair question that should be answered early on, and we try to do as much as we possibly can while making our business more profitable.

The Convener: We will move on to questions from Edward Mountain.

Edward Mountain: It is always frustrating to come in at the end, having listened to all the evidence, because you know that you are going to go back to questions that have already been asked.

I must just make one or two comments at the start, if I may, convener. One is on the issue of Loch Carron, which has been mentioned. The Carron is a very small river with three proprietors that does not need a fishery board, and the proprietors are heavily stocking.

The other issue is one that, as a farmer, I find really difficult. I support farming and aquaculture—Ben Hadfield might be surprised to hear that—but where there is farming, there is always an element of dying. It is not fair to say that salmon die in greater numbers in farms than anywhere else. In the wild, there are wild problems such as predation, flooding, drought and water temperatures, to mention but a few, and that is why there are huge numbers of deaths. In hatcheries and fish farms, however, all those things are controlled, so there should not be the same level of death, and it is slightly disingenuous to compare the two.

Ben Hadfield, if I may, I want to take you back to 2 May 2018. I have no doubt that you re-read the evidence that you gave to the committee in those days—I love looking back. I want to look at the figures that we mentioned at that stage when we were talking about numbers and reporting. You said:

> "I work globally in Marine Harvest, where a 7 per cent mortality rate in the seawater phase would be top of the pile".—[*Official Report, Rural Economy and Connectivity Committee*, 2 May 2018; c 34.]

Could you give me the figure for mortality in the seawater phase in 2023, 2024 and 2025 for Mowi?

Ben Hadfield: I have looked at and scrutinised that evidence again, and I think that you quoted out of context. I told you at the time that the mortality in the best year that I had ever experienced in Marine Harvest Scotland, as it was at the time, was 5.2 per cent. That was biomass. The actual mortality in terms of numbers of individuals was around 12 per cent. I also said that the best in class at that time was the Faroes, which was at around 7 per cent. The figure for the Faroes has gone up slightly because it has also experienced environmental challenges such as AGD, but it is still best in class at around 11 per cent.

I do not think that there is anything wrong with what I have said and I do not know why you are raising it as an issue.

Edward Mountain: Ben, with respect—

Ben Hadfield: Let me finish my answer.

Edward Mountain: Ben, with respect, I asked you a direct question and gave you a direct quote. I will read it to you again. You said:

> "I was about to clarify the figure. I work globally in Marine Harvest, where a 7 per cent mortality rate in the seawater phase would be top of the pile"—[*Official Report, Rural Economy and Connectivity Committee*, 2 May 2018; c 34.].

That is a direct quote—that is what you said to the REC Committee.

Ben Hadfield: And there is nothing wrong with that.

Edward Mountain: I am not asking you to qualify it—I am just asking you to give me the figures for Mowi in 2023, 2024, and 2025. I am entitled to do that, and I expect an answer.

Ben Hadfield: Okay. I was coming to that, but you interrupted me.

As I have said, best in class at that time was the Faroes, and the figure was 7 per cent on an annual basis, not a cycle basis. In other words, 7 per cent of the fish held in that business unit at that time succumbed to mortality. That figure has now moved to about 11 per cent.

I already gave you the figures, if you were listening. The Faroes is 11 per cent, and Mowi was 14.7 per cent. In Scotland, last year, Mowi was 21 per cent in terms of numbers and 17 per cent in

biomass terms. It was a major improvement on previous years, but I am not happy with it. I still think that it is too high—

Edward Mountain: Can you give me the figures for 2024 and 2023, please?

Ben Hadfield: For Mowi?

Edward Mountain: Yes, please.

Ben Hadfield: I can give you the figures from the industry, which I am representing today, and I have actually—

Edward Mountain: I cannot believe that, as the senior representative, you do not know those figures off the top of your head, given that you are saying that mortality is the most important thing.

Ben Hadfield: Given the time, I can write to you and clarify that within a few hours, or I can get my laptop and look at it now, but the level has come down.

I have to say that 2022 and 2023 were difficult, and the level was high—above 25 per cent. Now it is around 20 per cent in terms of numbers.

Edward Mountain: I have read the *Official Report* very carefully and you never mentioned the Faroes in anything that you said.

Secondly, you said:

"Having worked in the industry in a scientific and farming capacity for 18 years, my observation is that if you farm in the seawater stage, which lasts about 18 to 20 months, and you have below 5 per cent mortality, you can count yourself as among the best in class."—[*Official Report, Rural Economy and Connectivity Committee*, 2 May 2018; c 41.]

That is exactly what you said—you did not quantify anything or say where that was in the world. At the time, we were talking about 5 or 7 per cent, and I think that, in 2024, the industry was talking about somewhere between 21 and 25 per cent. Therefore, the figures have risen from between 5 and 7 per cent to almost four times that.

Ben Hadfield: Convener, I have to protest. What you are doing, Mr Mountain, is taking my honest delivery of fact to you, which was about the best in class that I have ever seen, and applying it to the sector average, and you are about to suggest that somehow what I am saying is wrong, or that the sector is out of control. That is not balanced; it is not fair; and it is certainly not accurate. I am happy to meet with you and go through it, and I am happy to write to you and clarify it, but the way that you are putting it across is not balanced, in my view.

Edward Mountain: In fairness, Mr. Hadfield, the figures that I am giving you are the figures that you gave the REC Committee on 2 May 2018 for its inquiry into aquaculture in Scotland—not the Faroes or anywhere else.

Lastly, on the issue of spatial separation that you were talking about, recommendations 45 to 49 in the REC Committee's report in 2018 were about moving fish farming away from areas where it would conflict with wild salmon. Since 2018, how many farms have been moved away from areas where there is such a conflict? I can think of one, if it helps you, but I cannot think of any more.

Ben Hadfield: Please proceed.

Edward Mountain: Well, Poolewe is, I think, one example. I cannot see any more.

Ben Hadfield: There was Loch Eil, and then we looked at whether we should move Loch Duich, but the sea lice control at Loch Duich improved so much that we deemed that not to be necessary and the mortality fell.

Edward Mountain: Yes, but this is about spatial planning to do with wild salmon, and Poolewe is the only one.

Ben Hadfield: No—I have just told you about others. There was Poolewe, but, for Mowi, there was Loch Eil, then we looked at Loch Duich.

Edward Mountain: Did you move Loch Eil?

Ben Hadfield: Yes.

Edward Mountain: And did you move Loch Duich?

Ben Hadfield: No. The sea lice control improved to a level where it was absolutely minimal, and we are satisfied with that.

Edward Mountain: So, how many farms has the industry, which you are representing now, moved?

Ben Hadfield: The first iteration of the sea lice risk framework came out with only 19 sites out of more than 250 that had a theoretical risk to wild salmon on a model that overpredicted by a factor of four to five. If only 19 sites have that theoretical risk, that is really quite a good thing, and you should be able to manage them.

On your line of questioning, Mowi has been proactive in moving sites and working with wild fish, and we continue to be so. Any expansion that we have is in areas of open water, where there is reduced conflict, which I think is good, and there are examples of that throughout the sector.

I will yield, for reasons of time.

11:45

The Convener: Do you have further questions, Mr Mountain?

Edward Mountain: I will ask one more question, if I may, just so that I understand this. Despite the problems at the Kishorn A, B and C sites with

disease, deaths and mortality, they continue to operate. The report says that, in areas where there are high mortality rates, re-siting or removal should be the chosen option. You mentioned Loch Duich as an example of where you thought about doing that but have got on top of the issues. Across the industry, how many sites have closed because of constantly high mortality?

Ben Hadfield: Are you talking about Loch Kishorn, where the wild rod catch on the river has increased dramatically?

Edward Mountain: That is not what I asked. The question that I asked—

Ben Hadfield: I am just clarifying with you. It is the same location.

Edward Mountain: Yes, but I am asking how many sites have closed in the industry since 2018 because of high mortality or high sea lice numbers.

Ben Hadfield: Less than half of the available consent is currently farmed. The industry has not expanded. It is somewhere between 150,000 and 200,000 tonnes, so there is not the expansion that you like to portray.

The farms are constantly trying to get the best locations. Kishorn A and B have had some high mortality, but I am absolutely confident that the managers and every employee in that company are doing their best to minimise that. Possibly, they are looking at a relocation. If the regulatory policy supported that and sped it up, that would be a good thing.

However, you are talking about an area where—although those problems exist and are being managed by the farmers—because of the conservation work that has been done, the rod catch on the River Carron has gone to its highest level in recent years. That goes back to my point that it is great to talk and write reports but, actually, fish need coalface conservation.

Edward Mountain: I have not been given an example of a fish farm that has moved or closed because of high mortality. That was the question. I will happily meet Ben Hadfield any time that he wants to come into my office. I am happy to say on the record that I have invited him, so that he does not need to make a declaration on the lobbying register. I am happy to meet him and to discuss those issues, because it does not appear that I am getting an answer.

Ben Hadfield: I, too, am happy to write to you and give you a list of farms that have been relocated.

Edward Mountain: I am looking for information on farms that have been relocated because of wild salmon and because of disease across the whole industry. It would be better for that information to go to the committee rather than me, as I am not a member of the committee.

Ben Hadfield: I am happy to supply that. From rough memory, over the course of the past decade or so, there have been more than a dozen. I just cannot think of them under pressure, so I will write and clarify that.

Rhoda Grant: I have a wee point to put on the record. Edward Mountain seemed to dismiss the work that is going on on the River Carron. If we are leaving a legacy report, we should tell the next committee to look at the award-winning work that is going on there to conserve wild salmon. I would not dismiss that. I do not think that Edward meant to, but it was the way that he phrased it.

Edward Mountain: I put on record that I am absolutely not dismissing the work that goes on on Loch Carron. There is a huge amount of work, and I know all the people who are involved. If they thought that I was dismissing that work, I would probably be strung up from a lamppost in Lochcarron village. A huge amount goes on, but the issue is what happened with the fish farm on Loch Carron, and the only way out of the River Carron is past the fish farm.

Dr Wells: I do not want to dismiss the work that is going on, either. However, just as a point of fact, from memory, the rod catch on the River Carron last year, according to the official statistics, was one grilse and 13 salmon, so it is nothing approaching the maximum levels that they have been at.

Ben Hadfield: That is the figure for one year and is absolutely selective. I hope that that is not deliberate. If you look at the catch statistics on the River Carron—

Dr Wells: We have looked at them in some detail.

Ben Hadfield: Bob Kindness has done fantastic work on hands-on coalface conservation. I admire him, and it is very disappointing that you do not accept that that is the way forward.

The Convener: Okay. I think that I have an appropriate question to draw this session to a close.

The idea today was to take evidence on the progress that is being made on implementing the recommendations from our 2025 report. That report concluded:

> "although the 'status quo' has changed to some extent since 2018, the slow rate of progress in improving the regulation and enforcement of the industry needs to be addressed as a matter of urgency to future-proof the industry and to enable it to grow sustainably."

My question is this: 12 months on, do the witnesses who are stakeholders or regulators

believe that we have seen progress and that the rate of progress is acceptable? We have seen progress, but will the rate of improvement future proof the industry and enable it to grow sustainably?

We will start with the witness on my right and move left.

Professor Dwyer: That is a challenging question to ask. From a welfare perspective—which is my jurisdiction—there are significant welfare concerns about the industry. Our definition of welfare is about what the fish experience. It is not about how much the industry has worked to deal with that; it is about the experience of the fish in those environments.

There are still considerable areas of concern, and they are potentially a barrier to sustainability. It is hard to say exactly how much of a barrier they are, but they are a barrier. Welfare is always a barrier to sustainability.

When there are high levels of mortality—perhaps they are coming down, but they are still high—that is a concern from a welfare point of view. I would therefore say that, from a welfare perspective, there are still very significant concerns.

The Convener: Is the rate of progress acceptable? While we accept that, as some believe, there are different levels of impact on fish welfare, is the rate of progress acceptable?

Professor Dwyer: I find that a very hard question to answer. On one hand, there is the industry, and I accept that the industry works hard, but some of the challenges that it faces are not things that have easy fixes. Therefore, progress will take a long time.

There are issues around where farms are sited that contribute to welfare problems. Perhaps we need to see faster progress on recognising that there are places where fish cannot be farmed in good welfare.

The Convener: This whole meeting is about progress and, ultimately, the rate of progress. Given everything that you have said and the challenges that you have mentioned, what do you think about the rate of progress? That is what we are reporting on today.

We wanted to come back 12 months after the report and decide whether the rate of progress was acceptable. Given everything that you know about the challenges that the industry has, is the rate of progress acceptable or does it need to speed up, and is the industry able to do that?

That clarification goes for everybody—I just wanted to make the question clearer.

Professor Dwyer: From a welfare perspective, I would like to see the rate of progress be faster.

The Convener: Thank you.

Ben Hadfield: We take that on board. From my perspective, the rate of progress has been acceptable. We can do more. We respect the right of the committee to demand more—that is fair and we will look at it.

We have a social licence, and communities invite us in to talk about the benefit of having a salmon farm in their area—which happens often, and it is healthy. We are incredibly humbled to have that level of social licence. However, we are cognisant of the increased activity and scrutiny, particularly from animal welfare, vegan and vegetarian charities. I have no problem with that other than that it does not represent what the majority of UK or Scottish residents want to have. They want to have locally produced proteins, produced to the highest standards.

That is what we do in Scotland. We have the highest standards. You have frequently asked us to go further and faster. We respect that and we take it on board. The Government needs to speed up on its recommendations; we are there to help with that and to work with all the stakeholders to try to move to a better place even quicker.

Amy Jennings: I started working for APHA in February 2023. In the time since then, we have had the publication of the guidance on welfare at the time of killing in relation to fish. We have recently agreed with the Scottish Government a programme for routine inspections of harvesting sites and fish farm facilities, which we did not have in place when I started. We are now supported to train more of our vets to have specific skills in fish health and welfare.

I do not know whether it could go faster but, from my point of view, we have made progress since I joined APHA—that is not because of me, but it is what I have been able to observe since I started working there.

Peter Pollard: SEPA is very ambitious in how we want to improve our regulatory services and to protect and improve the environment. When you are ambitious, progress is never quick enough—you can never move fast enough. However, we are absolutely committed and working hard to improve every aspect of how we work—not only how we regulate but how we work with other regulators, advisers and the public.

There are always headwinds—some of them are matters of legal proceedings at the moment—but we are very ambitious and we will keep moving fast.

Neil Purvis: From a fish health inspectorate perspective—and on the back of Amy Jennings's comments on the welfare aspect—we have improved our communications with APHA and we are looking to do that further and in a more structured manner.

In relation to the recommendations that the FHI has been involved in, we have made significant progress. I have already referred to the recommendation in relation to persistent elevated mortality: it has taken a large chunk of our resource to deliver on that, and I hope that, when the committee receives the report, it will see that we have taken that really seriously.

We have delivered on other things, too, including the recommendation on the no-count issue—we have not touched on that today—and improving the text on our website in relation to that. That text has not yet been published, but it will be published soon.

Although the cabinet secretary did not agree to take forward the recommendation about having more mortality data and information, we have improved the narrative around the existing data sets. The committee has been provided with a draft of that, or will be provided with it soon. That helps to explain the information that is out there, its significance, how it can be used and applied, and what its limitations are.

Dr Wells: In the specific areas within our locus, no—things have not moved fast enough. However, if you were to ask me the same question in relation to a series of other pressures that wild salmon face, you would probably get the same answer. It is a species in crisis and we need to see concerted action across the board, including on sea lice and escapes.

The Convener: That concludes our evidence taking this morning. I appreciate that we have run nearly an hour over time, but it has been hugely helpful in updating us on the progress that the authorities and the industry have made over the past 12 months.

I suspend the meeting to allow for a changeover of witnesses.

11:58

Meeting suspended.

12:03

On resuming—

Subordinate Legislation

Marine Licensing (Exempted Activities) (Scottish Inshore Region) Amendment Order 2026 [Draft]

The Convener: The next item on our agenda is consideration of a Scottish statutory instrument. I welcome to the meeting Mairi Gougeon, the Cabinet Secretary for Rural Affairs, Land Reform and Islands, and her officials from the Scottish Government: Jill Barber, the head of aquaculture development; and Joseph Triscott, the aquaculture policy manager.

I invite the cabinet secretary to make a short opening statement.

The Cabinet Secretary for Rural Affairs, Land Reform and Islands (Mairi Gougeon): Thank you, convener. The SSI that is in front of the committee today amends existing exemptions to marine licence requirements for the purpose of reducing duplication in the aquaculture consenting framework and providing clarity and transparency while ensuring robust environmental protection. The SSI is introduced alongside the Environmental Authorisations (Scotland) Amendment Regulations 2026, which identify SEPA as the regulator for fish farm environmental discharges between 3 and 12 nautical miles. The Scottish Government is committed to clarifying the consenting process for aquaculture between 3 and 12 nautical miles, to ensure an effective approach to the regulation and consenting of aquaculture development and activity across Scotland's inshore region.

This latest package of SSIs seeks to transfer regulatory responsibility for fish farm environmental discharges between 3 and 12 nautical miles from the Scottish Government's marine licensing operations team to SEPA, which will make SEPA the lead regulator for that activity across the Scottish inshore region. It also introduces amendments to existing marine licence exemptions by extending the exemption on the deposit of farm substances from 3 nautical miles to 12 nautical miles, clarifying the scope of the exemption on the deposit of farm equipment and strengthening prerequisites for its use.

We have carefully considered which regulator is best placed to manage environmental discharges from fish farms between 3 and 12 nautical miles. Identifying SEPA as the lead regulator for fish farm discharges builds on the previous work that we have undertaken to consolidate SEPA as the independent environmental regulator of fish farms.

The Environmental Authorisations (Scotland) Amendment Regulations 2026, which the committee is also considering today, identify

SEPA as the lead regulator, and the provisions of the Marine Licensing (Exempted Activities) (Scottish Inshore Region) Amendment Order 2026 mean that a licence from the Scottish Government's marine licensing operations team will not be required for the same activity, which mirrors the existing discharge requirements between 0 and 3 nautical miles.

The changes will ensure that we have robust environmental protections in place, identify a consistent lead regulator in Scotland's inshore zone and avoid duplicating resources between the marine directorate's licensing operations team and SEPA. It will also ensure that developers are not required to seek separate consents for the same activity, which will reduce the regulatory burden and cost to businesses.

Amendments to an existing exemption on the deposit of fish and shellfish farm equipment are also being introduced to clarify that the exemption applies to all equipment that is used directly in fish and shellfish farming, provided that the relevant conditions and requirements are met. A new requirement for the use of the exemption has been included to ensure that any equipment that is eligible for the exemption must have planning permission in place before the exemption can be applied.

The changes will result in a fully consistent approach to fish and shellfish farm consenting in Scotland's inshore waters, with a single regulator responsible for each of the consents that are required to develop and operate a farm in a region.

I am happy to take any questions from the committee.

The Convener: Thank you. Do members have any questions?

Ariane Burgess: We have just had an extensive session on salmon farming. One of my concerns about the marine licensing SSI is that it is potentially premature. We are aware of an on-going appeals process in which SEPA is involved, and the SSI will expand its workload. I am concerned about how much resource SEPA has available to implement the changes. Although some who responded to the consultation said that they agree with the changes, the key concern that comes up in the responses is about whether SEPA has the capability and capacity. Given the appeals process that is tying up SEPA, I wonder whether the SSI has been laid a bit too soon.

Mairi Gougeon: I do not believe that it is happening too soon. Ultimately, we need to provide clarification on how discharge is regulated in the 3 to 12 nautical mile zone, which is why we have introduced the package of SSIs for the committee's consideration.

I understand that concerns were raised in the consultation about SEPA's resources, but we discussed that with SEPA, which does not have that concern. Even the number of applications that SEPA expects to see—I do not think that it expects to see huge numbers—and the fact that it already does such work in the 0 to 3 nautical mile zone, or in the inshore region, supports our approach.

If anything, the approach works out better, because if the marine licensing SSI is not supported today but the negative SSI—the environmental authorisations SSI that the committee will consider next—passes, the marine directorate will have to licence the same activity while still having to look to SEPA to provide the same evidence and information.

That will be a heavier resource burden for SEPA, because it will not be able to claim the cost back for the charges in the way that it would if it were the regulator, and it will not be able to implement cost recovery on any applications for that activity. It will negatively impact SEPA and duplicate the regulatory requirements, which is why we are streamlining them today.

Beatrice Wishart: Do you have any sense of how many applications there might be further out to sea?

Mairi Gougeon: We know from some operators that they are not looking at that space, but, as we set out in the "Vision for sustainable aquaculture" report, we know that it is an area of interest for other operators. It is important that we have the regulatory framework in place to deal with any potential applications that are made, which is why we have laid the SSIs.

Emma Harper: To clarify, SEPA already extends the framework to 3 nautical miles, and the SSIs will extend it to 12 nautical miles. You are seeking to ensure simplification and avoid duplication of legislation, so that we have a framework that is more manageable and easier for people to follow—is that right?

Mairi Gougeon: Yes, you are absolutely right. All that we are looking to do today is mirror what happens in the 0 to 3 nautical mile range by extending the framework to cover up to 12 nautical miles.

The Convener: We move to formal consideration of the motion to approve the instrument. As the cabinet secretary has nothing to add, I invite her to move motion S6M-20638.

Motion moved,

That the Rural Affairs and Islands Committee recommends that the Marine Licensing (Exempted Activities) (Scottish Inshore Region) Amendment Order 2026 [draft] be approved.—[*Mairi Gougeon*]

The Convener: Do any members wish to debate the motion?

Ariane Burgess: The evidence in the consultation raises concerns. The Scottish Fishermen's Federation said:

"The Scottish Fishermen's Federation's (SFF) position remains that we do not support the extension of aquaculture from 3 nm to 12nm … we recognise the benefits of making the process more consistent across the entire 0-12nm, but we are uncertain whether SEPA has sufficient resources or expertise to cope with the additional region. The same concern is held for MD-LOT remaining as the regulatory body."

Although the proposal in the consultation might appear to be administratively coherent on paper, I am concerned that it is premature in practical terms. The central issue remains the well-evidenced failure of the current regulatory system to enforce environmental standards effectively, despite already having the legal powers to do so.

Simply consolidating responsibilities under SEPA without first addressing the underlying enforcement gap risks creating a more streamlined system that still fails to prevent environmental harm and, in fact, could make harmful activity easier to progress rather than strengthening oversight.

I am concerned that expanding the scope of regulation without providing a corresponding increase in resources, capacity and, where necessary, powers is unlikely to achieve the stated objectives. Without tackling enforcement and funding head on, structural reorganisation alone will not deliver the meaningful improvements that we desperately need.

This morning, we heard from Dr Alan Wells that wild salmon are a species on the edge and in crisis, and that not enough is being done. Therefore, I have great concerns about expanding SEPA's remit. As I said, such regulations will be needed at some point—once the 0 to 3 nautical miles range is regulated, we will be in much better shape.

Mairi Gougeon: I want to be clear, because a number of issues were raised by the panel in the previous session, and I do not want us to conflate them with what we are discussing in relation to the SSIs.

I emphasise the point that not passing the SSI today will have additional resource and capacity implications for the marine directorate because of the duplication of legislation, as well as for SEPA, which will still be a consultee for any applications that are processed through the system. It will not be able to recover the costs for that work, compared with what it can do as lead regulator.

I am more concerned about the resources and capacity issues that SEPA will face if the SSI is not agreed than if it is. We have engaged in discussions with SEPA, which is comfortable with the proposals.

The Convener: Are all members content to recommend approval of the instrument?

Members: No.

The Convener: Members are not content. There will be a division.

For

Allan, Alasdair (Na h-Eileanan an Iar) (SNP)
Carson, Finlay (Galloway and West Dumfries) (Con)
Grant, Rhoda (Highlands and Islands) (Lab)
Harper, Emma (South Scotland) (SNP)
Roddick, Emma (Highlands and Islands) (SNP)
Tweed, Evelyn (Stirling) (SNP)
Wishart, Beatrice (Shetland Islands) (LD)

Abstentions

Burgess, Ariane (Highlands and Islands) (Green)

The Convener: The result of the division is: For 7, Against 0, Abstentions 1.

Motion agreed to,

That the Rural Affairs and Islands Committee recommends that the Marine Licensing (Exempted Activities) (Scottish Inshore Region) Amendment Order 2026 be approved.

The Convener: Is the committee content to delegate authority to me to sign off on our report on the instrument?

Members *indicated agreement*.

The Convener: That completes consideration of the instrument. I thank the cabinet secretary and her officials for attending but ask them to remain at the table—do not panic—because we do not expect the next agenda item to take very long.

Environmental Authorisations (Scotland) Amendment Regulations 2026 (SSI 2026/55)

The Convener: Our next item of business is consideration of a negative instrument. As members do not wish to make any comment on the instrument, are we content with it?

Members *indicated agreement*.

The Convener: That concludes our business in public. I now move the meeting into private session.

12:15

Meeting continued in private until 12:52.

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