OFFICIAL REPORT
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DRAFT

Rural Affairs and Islands Committee

Wednesday 26 June 2024

Session 6

The Scottish Parliament
Pàrlamaid na h-Alba

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RURAL AFFAIRS AND ISLANDS COMMITTEE
19th Meeting 2024, Session 6

CONVENER

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

DEPUTY CONVENER

*Beatrice Wishart (Shetland Islands) (LD)

COMMITTEE MEMBERS

*Colin Beattie (Midlothian North and Musselburgh) (SNP)
*Ariane Burgess (Highlands and Islands) (Green)
*Rhoda Grant (Highlands and Islands) (Lab)
*Rachael Hamilton (Ettrick, Roxburgh and Berwickshire) (Con)
*Emma Harper (South Scotland) (SNP)
*Emma Roddick (Highlands and Islands) (SNP)
*Elena Whitham (Carrick, Cumnock and Doon Valley) (SNP)

*attended

THE FOLLOWING ALSO PARTICIPATED:

John Goodlad (Salmon Interactions Working Group)
Edward Mountain (Highlands and Islands) (Con)
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 26 June 2024

[The Convener opened the meeting at 09:04]

Decision on Taking Business in Private

The Convener (Finlay Carson): Good morning, and welcome to the 19th meeting of the Rural Affairs and Islands Committee in 2024. Before we begin, I ask everyone to ensure that electronic devices are switched to silent.

Our first item of business is to consider whether to take item 5, which is consideration of a draft report on petition PE1758 on ending greyhound racing in Scotland, in private. Do we agree to do so?

Members *indicated agreement.*

Salmon Farming in Scotland

09:05

The Convener: Under our next item of business, we will hear from two witness panels as part of our follow-up inquiry into salmon farming in Scotland. First, we will hear from John Goodlad, the chair of the salmon interactions working group, to discuss the group's report on addressing the interactions between farmed and wild salmon. Thank you for joining us, John. We have allocated about an hour for this session.

Also joining us is Edward Mountain, who will ask his questions after the committee members have asked theirs. Edward, do you have any relevant interests to declare?

Edward Mountain (Highlands and Islands) (Con): Yes. I reiterate that I have an interest in a salmon fishing partnership on the river Spey, which relies on wild salmon. Those salmon migrate around Scotland's coast as smolt, heading north. However, there are no salmon farms in the Moray Firth that could come into conflict with them.

I also declare that the salmon fisheries are normally members of salmon fishery boards, which represent proprietors' interests. I am not on the board in my area—the Spey Fishery Board—although my partnership contributes to it, and I believe that the board contributes to Fisheries Management Scotland, whose chief executive, Alan Wells, we will hear from later. However, I have had no interaction with that organisation through the fishery board or through my role as a proprietor.

The Convener: Thank you. John, as this is a follow-up inquiry, my first question is pretty obvious. What is your broad assessment of progress on implementing the recommendations of the reports of the Rural Environment and Connectivity Committee and the salmon interactions working group?

John Goodlad (Salmon Interactions Working Group): That is fairly easy to answer. Our group came up with around 40 recommendations and, as far as I am aware, the only one that has really been acted on is the one about the sea lice framework. We spent a lot of time and effort producing a lot of recommendations—you must bear in mind that it was not an easy group to chair, but we were able to get the wild fish sector and the fish farming sector together, and I pay tribute to both sides for working together constructively—so it is disappointing that so little progress has been made.

The Convener: That is a good foundation for us to move on to further questions. Emma Harper will lead on our first theme, which is research and collaboration.

Emma Harper (South Scotland) (SNP): Good morning. The salmon interactions working group report identified the importance of the sectors developing a

"professional and collaborative working relationship".

It also recommended the development of local engagement mechanisms between fin-fish farmers and wild fisheries management. What progress has been made on those points?

John Goodlad: The picture is mixed. I was asked to chair the working group, which I did, because I have a knowledge of fish farming, as I used to be a fish farmer, and I also have a knowledge of wild fish, having been involved in the sustainability movement for several years.

The recommendation calling for collaboration is just one of those commonsense recommendations. If there are two sectors that are in conflict, the more collaboration and joint working that you can arrange, the greater the level of mutual understanding there will be. It is one of the recommendations that perhaps does not depend on the Government for its implementation, as it can be implemented on a local level. My understanding is that it is working well in some places and not so well in others.

Emma Harper: Are you able to identify what is working well in the areas in which it is working well, so that we can transfer that approach to areas where it is not working well?

John Goodlad: I am the first to acknowledge that I am not the expert on every fish farm on the west of Scotland or every river, but I would say that, as with a lot of these things, it is down to people—that is, people in the companies and people who are managing the fisheries working well together. A couple of weeks ago, I had a call from John Gibb from the Lochaber District Salmon Fishery Board, and he explained that he was finding working with the salmon industry in that area to be quite good. However, I am sure that others would have a different view.

Emma Harper: Can I ask another wee quick question? I am thinking about areas that have wild salmon, such as the rivers that feed into the Solway Firth. Galloway Fisheries Trust manages a lot of the research around there. There are no wild salmon farms in the Solway or near the River Tweed, but research is being conducted to look at salmon in those rivers. Would such research help to inform what is happening to wild salmon in other areas? I know that there are issues with fish farms and wild salmon, but there is research to look at salmon outside of where the west coast fish farms are.

John Goodlad: Absolutely. Today, I will answer many questions in my capacity as chair of that interactions working group, which stretched over a period of months. However, to some extent, as in my response to the question that you have just asked, I will respond with my own views and thoughts, which are unrelated to that chair.

Your point is valid. There are fish farms on the west coast of Scotland and, undoubtedly, there is a level of interaction and conflict between wild salmon and those fish farms. However, there are no fish farms on the east coast or in the Solway Firth, so, if the wild stocks are declining in those areas, the logical conclusion is that, whatever the impact of salmon farming—people can argue about that—other factors must be at play. The research that is being done in those rivers will, hopefully, begin to answer some of those questions.

The Convener: Before we move on, it is clear that this topic can be very polarising. There needs to be a balance between commercial interests and the huge importance of the wild salmon population. In your report, you say that

"developing a professional and collaborative working relationship"

in that is really important. That does not appear to be working at the moment. Have you any ideas about how the arguments could become less polarised in the future?

John Goodlad: That is a very good question. To some extent, it could be asked about so many aspects of society, in which people talk to each other in different silos. It is indeed polarised. People tend to talk to the people with whom they agree and shout at the people with whom they do not agree. We have to find ways of breaking that down and trying to engage.

A lot is down to the individuals on both sides. I believe that enough people in the salmon farming and wild fish sectors are willing to sit down and have those difficult discussions. We saw that in the interactions working group. There were some very robust discussions around the table, but, eventually, it was a coalition of the willing.

We absolutely have to have greater discussion and try to find common ground. Salmon farming is an incredibly important industry and has a bright and prosperous future ahead of it. Wild salmon stocks are in a dreadful state; they are now on the endangered species list. However, the simple conclusion that one is causing the other is not the case. That may well be one of many factors that are leading to the decline in wild salmon, but only through speaking, discussion and debate will we

get down to what is really happening to the wild salmon stocks.

The Convener: Last week, we heard that one remit and two tasks of the Scottish Environment Protection Agency were to facilitate that better engagement. From what we can see, that has completely failed. Is SEPA on the wrong route to establishing better collaboration? In two or three years, will we find that we are still discussing the polarised arguments and that that professional and collaborative working relationship has not been achieved?

09:15

John Goodlad: Ultimately, the better relationship between the wild fish sector and the salmon farming sector has to come down to the people in those two sectors. Although I do not at all disagree that an intermediary or regulatory body such as SEPA can play a role, relying on such a body will not be central. It has to involve the people on both sides, who are directly involved. You cannot expect or rely on an independent third party to do it. There has to be willingness on both sides.

Elena Whitham (Carrick, Cumnock and Doon Valley) (SNP): Good morning. You have just painted a picture of how varied the reasons are for the possible decline in wild salmon populations. The picture is very complex. I am interested in the fact that the working group report called for the expediting of the Marine Scotland research to determine a baseline for current levels of genetic introgression—because we did not have an understanding of what the actual picture was across the country. In Ayrshire, I see the work that my father does, as a volunteer in the Ayrshire Rivers Trust, to look at the River Irvine—which flows in front of my house—to understand why the levels of wild salmon are decreasing so rapidly. Now that that report has been published, what does it reveal about the impact of interbreeding between farmed and wild salmon?

John Goodlad: I have not read that report, so I am unable to answer on the detail of it. More generally on genetic introgression and speaking to the wild fish sector, I think that the wild fish sector has two main concerns—which are legitimate—about fish farming. The first is sea lice. As smolts swim past fish farms, they may become infected with sea lice. Secondly, there is the risk of escapes and genetic introgression. It has been put to me that, given that wild salmon stocks are at such a low and, indeed, endangered level, genetic introgression is probably a worse potential problem than ever. However, on the other hand, I also believe that escapes are probably at as low a level now as they have been for many years. There is a problem, but I cannot say what its extent is.

Elena Whitham: We can see from the report that, where there is introgression, it is concentrated around where aquaculture is happening as opposed to the migration of smolts into some of the rivers, which was one major concern. Some fears may therefore be allayed, but there absolutely still is evidence of genetic introgression.

John Goodlad: That is very interesting. It seems to suggest that genetic introgression is very much a west coast issue, as that is where the fish farms are. I wonder whether there is any evidence at all of genetic introgression in the stocks on the east coast.

Elena Whitham: Is further research needed on introgression?

John Goodlad: Absolutely. The honest answer is that no one really knows why wild salmon have declined so drastically. Twelve reasons have been put forward, and we referred to those in our report. Clearly, fish farming is one that gets a lot of attention—rightly—but there are, perhaps, 11 other reasons. Much work needs to be done on all those areas.

In some ways, it is very easy to do work on what we can see. We can see fish farms at sea, but some of the other threats to wild salmon are much more difficult to see. They happen in the middle of the north Atlantic—way out to sea. That is much more difficult to research, but it is absolutely critical that that work is done so that we can really begin to understand what is happening to this iconic species.

Rhoda Grant (Highlands and Islands) (Lab): What thought has been given to climate change? One of the reasons put forward for the decrease in wild salmon numbers is heavy rain at the time of fish spawning in rivers.

In addition, in Norway, when numbers are low, wild fisheries on rivers are closed. Should we look at something like that, and should we look at better river management to protect wild salmon numbers?

John Goodlad: There are two questions there, I think, and I will take the second one first and then deal with the wider issue of climate change.

In Norway last week, several rivers were closed to angling. The point that has been made—and which I think will continue to be made with greater force—is about what kind of society continues to allow an endangered species to be fished for sport. That is a very big question. I know that people on the angling side will say, “Well, if we don’t have angling, we’ll not get the information that we need on wild stocks,” and so on, but as far

as river management is concerned, we have a stock that is an endangered species, and it is a big issue that the wild salmon sector will have to address and look at, should fishing continue.

I am glad that you asked about the wider issue of climate change, because if I was asked to place my bets on the main factor leading to wild salmon decline, I would say that it is happening in the north Atlantic. The salmon smolts go to sea and feed in the waters between the Faroe Islands, Iceland and Greenland; however, something is happening out there. I discussed this at great length with the late Orri Vigfússon from Iceland, who probably did more than any other individual to protect wild salmon stocks through his programme of persuading the Faroese, Icelandic and Greenland commercial fishermen to stop catching them in the 1980s and 1990s, and he and I agreed that climate change has resulted in two things happening with the western mackerel stock.

First, the western mackerel stock biomass is now at record levels. What had been 2.5 million tonnes of western mackerel historically is now around 4 million tonnes. Secondly, the stock has moved northwards. The mackerel fishery used to be off Cornwall and the Western Isles, but now Shetland is the southern part of the main fishery, with the fishery itself mostly around the Faroe Islands and Iceland. That huge 4 million-tonne biomass has moved north. Mackerel eat exactly the same things that salmon eat—capelin and crustaceans—while large mackerel also eat small salmon. In my opinion, the relationship between the huge mackerel biomass and the wild salmon stock has never really been fully explored, and I believe that it is part of the very complex set of reasons why wild salmon are in such a precarious state.

Rhoda Grant: Thank you.

Rachael Hamilton (Ettrick, Roxburgh and Berwickshire) (Con): I want to go back to the collaboration and engagement between the two sectors. I am interested in whether the current interactions group has improved on or is doing anything different from what the previous group did. When you looked at how you would take forward actions, did you commit to doing anything specific that had not been done before? Has the relationship improved or declined since the announcement to double salmon farm production by 2030?

John Goodlad: I understand what you are saying, but I am not sure whether I can fully answer. What you are asking me—

Rachael Hamilton: We, as a committee, did not have anything to do with the previous salmon interactions working group, and obviously you took on the leadership of a new working group. I was just wondering why a new interactions working group was set up. Had you picked up from the previous group anything that needed to be improved with regard to engagement and collaboration, or did you just start with a clean slate?

John Goodlad: My understanding is that the Scottish Government has identified a number of potential reasons for the decline in wild salmon, including climate change in rivers and at sea, predation by birds and mammals, and the degradation of rivers. There is a huge range of potential issues, including salmon farming. In recognition of the fact that there were many potential problem areas for wild salmon populations, the interactions working group dealt with just one of them, and I think that it was the group's understanding that, once it had finished its deliberations, the Scottish Government would move on and do similar work on the other pressures. To a large extent, that work has not really happened.

Rachael Hamilton: Going back to my question on the Scottish Government's announcement on the commitment to doubling salmon production by 2030, what sort of impact has that had? Has it had a negative or positive impact on the relationship between the salmon farming sector and the wild fish sector?

John Goodlad: I imagine that most people in the wild fish sector are probably hugely disappointed that the salmon farming industry, which they perceive as being one of the problem areas for wild salmon, is going to increase, whereas I am sure that those in the fish farming sector welcome the increase. After all, it is a great business that brings great prosperity to the west coast of Scotland.

The announcement has probably not helped the level of collaboration between the two sectors—although I would point out that part of the proposed expansion in Scotland will be the same as has happened in Norway and the Faroe Islands: there will be bigger sites that are further offshore and less likely to be near the mouths of rivers. Although the expanded capacity will still mean more farmed salmon in the water, fewer problems might arise because the farms are not located so near wild salmon coming back to rivers or smolts going out to sea. However, that has yet to be seen.

Rachael Hamilton: Thank you.

The Convener: Our next theme is sea lice regulatory reform.

Beatrice Wishart (Shetland Islands) (LD): Good morning, John. Both the REC Committee's and the interactions working group's reports identified the need for a lead agency to take

responsibility for interactions between farmed and wild salmon. As we know, SEPA took responsibility for managing sea lice and wild salmon interactions from the beginning of February and, next March, it will take responsibility for managing sea lice and sea trout interactions. Has the identification of SEPA as the lead regulator addressed that gap, and has it led to more positive outcomes?

John Goodlad: The identification of SEPA to undertake that work is a good first step, but it is too early to say whether it has been or, indeed, will be effective.

Beatrice Wishart: Are you satisfied that SEPA has the capability to effectively regulate the interactions between wild and farmed salmon?

John Goodlad: I honestly do not know.

Beatrice Wishart: Okay.

The Convener: I call Emma Roddick.

Emma Roddick (Highlands and Islands) (SNP): My question has been answered, convener.

The Convener: Okay—good. I call Ariane Burgess.

Ariane Burgess (Highlands and Islands) (Green): Good morning, John, and thanks for joining us.

I have a question on the precautionary principle. The REC Committee's and interactions working group's reports recommended the need for a precautionary approach to mitigate any impacts of sea lice infestation on wild salmon. I am interested in getting from you a sense of whether SEPA's sea lice risk framework applies such an approach, given that, as I think you said, it is the only one of your recommendations that has been put in place since you produced your report.

John Goodlad: I guess that the general principle of the precautionary approach is well established and accepted—the difficulty is that what the approach is to one person can be completely different to what it is to somebody else. It covers a huge area. As a result, whether the sea lice risk framework is a sufficient application of the precautionary approach will, I think, depend on your perspective on what that really means.

09:30

Ariane Burgess: We have discovered that during our inquiry. There is a Scottish Government definition—well, it is not a definition but it is about when we apply the principle. It states:

"Decision makers should apply the precautionary principle when there is both a good reason to believe that serious or irreversible environmental damage could occur, and a lack of scientific certainty around the consequences or likelihood of the hazard and associated risk."

In this case, we are talking about the risk to our endangered wild salmon. My understanding is that the SEPA sea lice framework is about taking data but not about taking any action and that there will be a five-year process of looking at data while our wild fish are on the endangered species list. Is SEPA taking an approach that really addresses the risk that we might see the end of wild salmon in Scottish waters?

John Goodlad: My heart sinks when a Government agency, or any other agency, says that it will take five years to analyse data. However, without data we have no evidence, only people's opinions. Data is important and my understanding is that levels of sea lice, which are being reported to SEPA as we speak, are the lowest that the industry has seen in a long time.

That gives rise to the question of what more needs to be done in sea lice management, given that there are very low levels of lice and that it is my understanding that they have been low in most farms on the west coast of Scotland for the past two or three years. That lower level of sea lice is a reflection of the wide range of treatments that are now being used and the great innovation of using cleaner fish as a non-chemical intervention to keep sea lice numbers low.

Ariane Burgess: That brings its own problems of overharvesting and mortality.

Regarding sea lice, SEPA has the idea of ensuring no deterioration. I hear that we are having problems with our wild fish, and I want to understand what no deterioration means in relation to wild salmon. Can you say a bit more about that?

John Goodlad: I am sorry—is your question about problems with wild salmon?

Ariane Burgess: Our wild salmon are endangered and SEPA has an approach of monitoring that there is no deterioration. However, I understand that that is about no deterioration of farmed fish rather than of wild fish, and I think that we should be addressing the fact that we are going to be seeing deterioration of wild fish.

John Goodlad: I think that that is right. The evidence from the past few years is that sea lice levels on fish farms are the lowest that they have been for some years, but I am not sure what research is being done on the level of sea lice being picked up by salmon smolts as they proceed to the sea.

That research is difficult to do because the smolts are small fish swimming out from rivers and into the sea, but the information is really important. Likewise, it would be interesting to see whether

smolts leaving east coast rivers, where there are no fish farms, pick up sea lice naturally. Sea lice are natural. They are not a result of fish farming, but they have been exacerbated by fish farming, just as all intensive farming increases parasites. The relationship between sea lice and wild salmon has existed for as long as wild salmon have been there.

Ariane Burgess: That is certainly the case, but I have heard anecdotally that there are curtains of sea lice in lochs where there are fish farms, so it seems that the presence of fish farming causes an increase in sea lice, hence the need to use chemicals or cleaner fish to mitigate that and keep lice numbers down.

John Goodlad: Data is important and evidence is important. I hear anecdotal evidence from all kinds of people every day, but that is what it is—anecdotal.

The Convener: I am sorry, Ariane, but I will have to hurry you.

Ariane Burgess: I have one last question about the measurement of the amount of sea lice, which is related to the precautionary approach. Last week, we heard from SEPA that it is taking a case-by-case approach to the levels of sea lice on fish farms, but we know that Norway has taken an approach that involves a limit of 0.2 sea lice per female salmon. What are your thoughts on whether a broad approach like Norway's or a case-by-approach is the appropriate one for Scotland?

John Goodlad: I suggest that a case-by-case approach is best, because the circumstances of each fish farm are different. It might not be appropriate for fish farms that are nowhere near any rivers that are used by smolts to have a limit of 0.2 sea lice or whatever applied to them, although that limit might be appropriate for a fish farm that is in the mouth of a river where there are wild fish populations going up the river and coming back down the river.

In the fishing industry, including the fish farming and wild fish sectors, a blanket approach applied by the cold, clammy hand of Government rarely works when dealing with complex situations. Each river mouth is unique, each salmon farm location is unique and each wild fish population is unique, and I think that better results are achieved by dealing with each situation on a case-by-case basis.

Colin Beattie (Midlothian North and Musselburgh) (SNP): Good morning. The salmon interactions working group's report recommended that the reformed regulatory system should be fully resourced and meet the tests of being robust, transparent, enforceable and enforced. Have those tests been met?

John Goodlad: Given that there has been little change since the working group made those recommendations, I would say no.

Colin Beattie: Have any of the tests been met?

John Goodlad: I am not as close to the regulatory situation as others might be, but I know that Salmon Scotland, which represents the salmon farming sector, believes that the regulatory system is cumbersome and that it takes a long time to get a decision on the siting of a fish farm, and that the wild fish sector believes that the taking into account of wild fish populations in determining the location of a fish farm is far from satisfactory. There continue to be criticisms from both sectors.

Colin Beattie: Given the current state of the regulatory system, is what we have in place being adequately enforced?

John Goodlad: I do not know the answer to that—that is my honest answer.

Colin Beattie: You talked about the regulatory system being cumbersome. By that, do you mean that there is a lack of transparency in how it operates? Is there a difficulty in implementing it?

John Goodlad: The Griggs report suggested that there should be a streamlined process for considering new salmon farming applications. That does not mean that the approach should be any less rigorous; it is simply an acknowledgement that the process requires various permits and licences to be acquired from SEPA, the Crown Estate and the local authority, and that different organisations ask for different things, which all means that the process takes a long time. There must be a way of ensuring that the process of granting permissions for fish farms is less cumbersome. I stress that that does not mean that it should be any less robust in terms of its ability to ensure that only fish farms that meet certain criteria should be licensed to operate.

Colin Beattie: You described that the process of achieving a licence involves having to apply for multiple licences from various bodies. Are those licences applied for concurrently or consecutively?

John Goodlad: I would imagine that they are applied for consecutively, although each fish farm will have its own methods. Do they go to the Crown Estate or SEPA first, or do they talk to the local authority first? It will depend on what each company's priorities are.

Colin Beattie: I suppose that what was in my mind was whether companies have to apply to SEPA before they can apply to—

The Convener: Colin, can I stop you? We are jumping ahead to an issue that will come up later. I ask you to restrict your questions to sea lice

regulatory reform, and we will move on to planning and consent at the end of this evidence session.

Colin Beattie: Okay. Grand.

Mr Goodlad, you say that the current regulatory system is a bit cumbersome. Is it robust in any way? I am grasping at straws here to try to tease out where the strengths and weaknesses are in the existing system.

John Goodlad: I chaired the interactions working group and I am aware of the criticisms of the existing system by the fish farming and wild fish sectors. On the specific question, I am probably not the best-qualified person to talk about robustness or enforcement. You are probably better asking people in the fish farming and wild fish sectors. Although those sectors disagree about many things, I think that you will find a degree of commonality there in that neither of them thinks that what we have at the moment is the best, possibly for different reasons.

Ariane Burgess: My question is about recommendation 22 in the REC Committee's report, which urges

"enhancement in the way sea lice data ... is presented"

and calls for

"a comprehensive, accessible reporting system".

I am interested in your thoughts about the way in which the data is currently presented and whether you think it is comprehensive and accessible.

John Goodlad: Is that the data that the fish farms provide to SEPA?

Ariane Burgess: I believe so. The recommendation is that,

"in order to increase transparency, there needs to be a significant enhancement in the way sea lice data and other key information related to the regulation of salmon farming is presented."

John Goodlad: Again, I chaired the interactions working group four years ago and that was one of our key recommendations. It is my understanding that that is being done now, but I am not that close to it. I am sure that it is being done better in some places than in others, but my understanding is that it is being done.

Ariane Burgess: Whom could we talk to who could give a definitive answer on that?

John Goodlad: I guess that SEPA would be able to tell you whether it is getting all the data that it needs. In SEPA's opinion, are the individual farms complying with what is expected? You will hear from Fisheries Management Scotland later. I think that you have to ask it whether, in its view, what is happening is suitable.

The Convener: We will move on to the theme of escapes.

Emma Roddick: Has the Scottish Government made sufficient progress on the salmon interactions working group's recommendations regarding escapes? Are you aware of any progress on providing a mechanism for monetary penalties to be applied and invested in wild salmon conservation work?

John Goodlad: That is a very good question. Of course, all of the recommendations of the interactions working group were regarded as important, but I would highlight the recommendation on escapes as being particularly important. The group represented the salmon farming and wild fish sectors, as well as others, and it recommended that, in the future, monetary penalties should be applied to escapes. It is a powerful recommendation from the working group, especially as the fish farming industry was represented in that group. It was hard fought for, and credit has to be given for that. Unfortunately, however, it appears that very little—if any—progress has been made in that respect.

09:45

With regard to your point, the thinking is that, if a monetary penalty is applied, it will be yet another deterrent to prevent escapes. Of course, from a business point of view, no fish farmer wants to have their fish populations escape—if your livestock escapes, you lose a lot of money—but a monetary penalty would be another layer of deterrent.

More than that, if such a penalty was to be introduced, rather than the money going to Government, it should be deployed in the wild fish sector for improvements to rivers, wild fish restoration and all the things that you mentioned.

It is an important recommendation, but the simple answer to your question is no—there has been very little progress on that.

Emma Roddick: Thank you. I appreciate everything that you said there.

I am thinking that the simple act of the fish escaping should be a deterrent in itself that encourages farmers to prevent escapes. We have had witnesses before the committee who have struggled to state what could prevent fish escapes. Given the volatility of the numbers year on year, do you believe that there are enough ways and means open to farmers to prevent escapes to justify putting a liability on them if fish end up escaping?

John Goodlad: I think that the deterrent is that they are running a business and, if their livestock escapes, that is a huge financial blow to the

business, quite apart from the environmental problems that escaped fish are causing. The deterrent is undoubtedly there.

I think that the fact that the numbers of escapes, and number of fish escaped, are now at much lower levels than they were 10 or 20 years ago is a reflection on how well the industry is managing to contain escapes. Technology has a huge role to play. The quality of nets on fish pens is now so much better than it used to be. There is often double netting on fish pens and the nets are weighed down.

There are two main reasons for escapes. One is storm damage: when there is a storm and the waves and swell place pressures on the net, it can tear. That is now much less frequent because of the higher quality of the netting that is used.

The other main cause of escapes is mammals, especially seals, attacking the nets and tearing a hole in them, allowing the salmon to escape. All the things that we have now—the acoustic deterrent devices, the much better net quality and the weighting on the nets to make the netting almost a wall rather than a curtain that a seal can push up against—have worked incredibly well.

Farmers will never, in any industry—whether it is fish farming or the farming of cattle or sheep—be able to say, “My fences are completely secure and I can guarantee that an escape will never happen ever again.” Huge progress is being made, and escapes are much more unlikely than they used to be. Nonetheless, we are dealing with a population of fish at sea in some of the most challenging environments.

Emma Roddick: Okay. Thank you for that.

Your report identified good practice in Norway by an organisation called OURO, which is responsible for removing escapee farmed fish from bodies of water. Can you explain to the committee how that process works and whether a similar practice could be implemented in Scotland?

John Goodlad: To be honest, I had forgotten about that discussion that we had at the interactions working group. In the Norwegian fjords, there are various ways, using netting, in which they can try to catch escaped fish—based, I guess, on the principle that farmed fish behave differently from wild fish. They are fed twice a day, so they will, after they escape from the pen, maybe hang around for a bit in the hope that somebody will continue to feed them.

I do not know whether that happens in reality or whether it could be transferred from Norway to Scotland. Everything that can be done to prevent an escape happening in the first place or to recover any escaped fish should, of course, be done.

Emma Roddick: Have you seen any ways of preventing escapes that are more successful than others and that Scotland should consider?

John Goodlad: The Scottish industry is at the forefront of the global salmon farming industry, and there is nothing technological out there that Scotland is not already doing. There is no silver bullet that the Norwegians, the Canadians or the Faroese are using to prevent escapes and that Scottish fish farmers are not using to prevent escapes.

The Convener: Other than the economic impact of fish loss on salmon farmers, is the main issue with escapes the genetic introgression, which is the genetic interaction between wild and farmed salmon? Is that the number 1 issue, or can escaped fish cause other problems for the wild salmon population?

John Goodlad: My understanding is that genetic introgression involves interbreeding between wild fish and a population of domesticated fish, whose behaviour is quite different to that of wild fish. Somebody once said that the situation with salmon is similar to that with wild boar and farmed pigs. That may not be an exact comparison, but it is similar. You do not want the two to interbreed, taking away the genetic uniqueness of the wild salmon population. That is by far the main problem.

The Convener: I understand that the aquaculture industry is looking at some sort of genetic modification that would mean that farmed salmon would be sterile and would be unable to breed with wild salmon. Are you aware of that? Is enough progress being made on that front or could more be done?

John Goodlad: I am aware that work has been done on that and is being done in many parts of the world, but it comes with a lot of caveats. Many people are very sensitive about taking that step, which is a form of genetic modification. Quite rightly, there is a lot of opposition, so it should be investigated and carefully talked about. The obvious advantage is that it would stop any escapees breeding with wild salmon, which would solve that problem, but the genetic modification of farm stock might create other problems.

The Convener: Beatrice Wishart has some questions on our final theme, which is consenting and planning.

Beatrice Wishart: John Goodlad, in your response to Colin Beattie, you touched on the streamlined approach as outlined in the report from Professor Griggs. Your report recommended that consenting of new developments should be

managed with an adaptive spatial planning model. Will you say a bit more about what you envisage?

John Goodlad: I think that that refers to the long discussions that the interactions working group had about how the industry should develop. If it was easier to get a fish farm site consented for an area further offshore, the fish farming industry would willingly give up river-mouth sites. When it comes to adaptive spatial planning, the whole consenting regime must be attuned to being flexible, to allow the fish farming industry to develop and move offshore.

It might be that we will have larger bodies of farmed salmon further offshore but far fewer farms in Scotland, with many smaller farms being removed from the mouths of rivers. That would be good news for wild salmon, because they would not have fish farms so near river mouths, and it would be good news for the fish farming industry.

The example of the Faroe Islands is pertinent. It used to be like Shetland and the rest of Scotland, with lots of small fish farms, but it has moved to having a small number of large farms on quite exposed sites that are separated by huge distances. I feel that that is the way that the industry will develop—from a fish farming point of view, the economics point to that. From the point of view of interactions with wild fish, that has to be good news, because it involves taking the fish farms away from river mouths, where they pick up sea lice.

Beatrice Wishart: Has there been any progress on moving towards that consenting model?

John Goodlad: Again, I am not as close to the issue as others, but, from speaking to people in the fish farm sector, I know that their response would be, “Absolutely not.” I do not think that there has been a lot of progress, unfortunately.

Emma Roddick: Your report also recommended that there should be local engagement mechanisms between fin-fish farmers and wild fishery managers. Has there been any progress in improving engagement on consenting decisions?

John Goodlad: As, I think, I said earlier, it very much depends on whom you are talking about and which locations you have in mind. In some areas, there are good relations between fishery managers and fish farms—I mentioned a conversation that I had quite recently with John Gibb of the Lochaber District Salmon Fishery Board about the good relationships in his area. However, I know that, in other areas, fish farmers and wild fish managers are poor neighbours to each other.

The situation is very good in some places and pretty good in others, but, in certain places, there is a lot of progress still to be made.

Emma Roddick: The committee has discussed how local communities can have their views represented in terms of appropriate sites for fish farms and what activity can go on in their areas. How far do we have to go in that regard, and what early steps would you like to be taken to improve that engagement?

John Goodlad: One response to that is that people living in a community have the opportunity to express their views when applications are made to the local authority for a works licence, to SEPA for tonnage consent or to the Crown Estate for a lease. At that point, people can say that the proposal is a good idea or a bad idea, or that it should be moved somewhere else. That mechanism exists already.

Community engagement is incredibly important, but it is also important to remember that the views of a vociferous group of people in a community can be mistaken for the overwhelming body of opinion of people who are not saying very much.

Emma Roddick: Absolutely.

Edward Mountain: I have read your report, which I think was published in May 2020. You will be as proud of it as I am of the Rural Environment and Connectivity Committee’s report, which had 65 recommendations. Do you think that I am right to be disappointed that few of those recommendations have been implemented?

John Goodlad: As someone who chaired a committee that produced a report whose recommendations have largely not been implemented, I am disappointed, so I imagine that you are absolutely right to be disappointed, too.

Edward Mountain: One of the things that has come out of the process that we have been engaged in is the fact that salmon farmers, wild fish interests and other users of the sea need to be good neighbours. Do you think that salmon farmers are good neighbours?

John Goodlad: In some cases, yes; in some cases, probably not.

Edward Mountain: My final question is a simple one. We have heard from industry on numerous occasions that some of the most vulnerable times are when young smolts are put to sea to be put into cages. They have soft skin and often need to prophylactically medicated before they go out, in order to give them long-lasting protection against sea lice. Let us say that a wild smolt from a river swims past a fish farm where there are sea lice. If the smolt picks up two or three sea lice, will it survive?

10:00

John Goodlad: I do not know the answer. As I said earlier, sea lice are a natural feature of wild salmon. Like many people in Scotland, I remember catching salmon when I was a young man. It was very rare that we caught salmon without sea lice. That was long before fish farming ever became a thing, so sea lice are natural. Whether two sea lice on a smolt going to sea is too much or perfectly normal, I do not know.

Edward Mountain: My problem is that there is no monitoring of wild fish when they go past fish pens, so we have no idea of the effects. I absolutely take your point that wild fish have always had sea lice on them. Animals have always had liver fluke and various types of worms, but the more intensively that they are farmed and the closer that they are kept together, the more they have to be treated for those conditions. If other animals have liver fluke and other worms, farm animals are more likely to pick those up in paddocks.

Looking at the salmon farming and wild fish sectors, what would be the one thing that salmon farming could do that would make the biggest difference to both of them getting on better?

John Goodlad: That is a very good question. The two main problems that the wild fish sector believes that salmon farming is contributing to are sea lice and escapes. The fish farming industry is currently limiting the numbers of sea lice, through a variety of treatments, through better locations of fish farms and through the use of cleaner fish. The industry is already keeping sea lice to as low a level as possible and trying to minimise, and hopefully eliminate, escapes. Those are the two main things that the fish farming industry can do to help wild fish stocks.

However, in an impossible-to-achieve world in which there were no sea lice or escapes whatever, I think that the wild salmon stock would still have a problem. That is why we have to look beyond salmon farming at what is really causing the wild fish stock to decline in such a precipitate fashion. My goodness—wild salmon are on the critical, highly endangered list. I come back to a comment that I made earlier. The solution to that fundamental problem does not lie on the west coast of Scotland; it lies out in the north Atlantic, where the salmon are feeding and where that huge biomass of mackerel now swims.

Edward Mountain: I probably agree with you. If you look at the North Esk counts, returning smolts used to be about 25 per cent. They are down to about 2 per cent now, which indicates a wider problem.

You question whether people should be fishing for an endangered species. I know for a fact, because I follow the issue regularly, that, on the Spey, 96 per cent of salmon are returned—a very small number are killed. If salmon fishers should give up, could it not be argued that salmon farmers should give up, on the basis that they are probably damaging more fish than fishermen are?

John Goodlad: If I could go back to what I said, I was not suggesting that angling should be stopped. I raised it as something that other people might suggest: should we still be catching highly endangered species for sport? I was not suggesting that; I was making a point.

You ask whether salmon farming should be stopped. It is an industry that employs thousands of people, makes a huge contribution to the economy and helps lots of people stay in remote areas. It is an industry that produces food. Is that the same as something that people do for sport? I do not think so. I am not suggesting that angling should be stopped, but I think that the comparison is not a valid one.

Edward Mountain: Okay, so that is where you and I agree. I think that salmon farming should definitely continue—it is important—but, as a good neighbour, as far as salmon fisheries are concerned, you probably ought to look at the Government's latest report on salmon fishing and the number of jobs and amount of money that the industry brings into local economies, which are probably as significant in remote areas as salmon farming.

Emma Harper: On collaboration and professional engagement, I am reading information from the National Oceanic and Atmospheric Administration in America and looking at what is happening in Canada. Pacific salmon are in decline as well. Whether you are in Pacific waters or Atlantic waters, wild salmon are in decline. Therefore, I go back to the point about collaboration and professional working: we need to work together globally to look at why wild salmon populations are in decline. Do we need to highlight the fact that professional working needs to happen globally and that Scotland needs to be part of that?

John Goodlad: Yes, absolutely. In the Atlantic, there is only one species of salmon. In the Pacific, there are five species, all of which are at different levels of decline. Of course, it is different in the Pacific, where there is a huge commercial fishery for salmon; the smolts going to sea in the Pacific are nearly all farmed. Fish farming is a big part of the commercial fishery in the Pacific—there are hatcheries that release all those small salmon to sea—so it is a different picture from the Atlantic.

However, there is certainly something happening to the Pacific salmon. It might be different to what is happening to the Atlantic

salmon. I have highlighted that the answer lies in the middle of the north Atlantic, which is very difficult to research. It is not clear whether what is happening is similar to or quite different from what is happening to Pacific salmon. However, clearly, all salmonoid species in the northern hemisphere are in a terrible state. The more collaborative research that can be done with various institutions in Canada, the United States and all the European countries, the better, and Scotland should play its full part in that.

The Convener: The salmon farming industry would suggest that there is a disproportionate focus on aquaculture and, specifically, on salmon farming in relation to the decline of wild salmon. You have made it clear today that quite a number of different factors are affecting the population of Atlantic salmon. Are we in this situation because salmon farming is an easy target? Is it the case that, actually, if we want to address the issues with wild salmon, we need to be realistic, look at all the challenges, not focus too much—as some would suggest that this committee is doing—on aquaculture specifically and consider the other issues that the species is facing?

John Goodlad: Yes, I think so. There is a huge sense of disappointment on the part of the interactions working group that there was this focus on the interaction between wild salmon and fish farming. It is quite right that that is a focus, but there are all those other pressures that really have not been addressed or looked at.

To some extent, people can see fish farms. When they drive up and down the west coast of Scotland, they see them. The fish farms are very obvious—they are very there—so people say, "Well, you know, there's bound to be some impact there." However, nobody can see the 4 million tonnes of mackerel biomass that is swimming between Iceland, Greenland and Faroe with a vociferous appetite. How many smolts does 4 million tonnes of mackerel biomass eat in a year? The mackerel used not to be there, but climate change has pushed them north into the area where salmon feed. They used to be located much further south in Europe. In my view, that is probably the main reason for the decline in salmon, but it is out of sight and out of mind and very difficult to ascertain, whereas fish farming is very obvious and very much in people's sight.

The Convener: Thank you, John. It has been a hugely helpful evidence session. I wish you a safe flight back to Shetland. Thank you for taking the journey down to join us in person—it is very much appreciated. I suspend the meeting for 10 minutes to allow for a change of witnesses.

10:09

Meeting suspended.

10:17

On resuming—

The Convener: Welcome back. To continue our discussion about wild salmon populations in Scotland, we will now hear from Fisheries Management Scotland. We are joined by Dr Alan Wells, the chief executive of Fisheries Management Scotland, and I welcome him. We have approximately an hour for this session.

I will kick off with a nice, simple opener. What is your broad assessment of the progress that has been made in implementing the recommendations that were made by the REC Committee and those in the report from the salmon interactions working group?

Dr Alan Wells (Fisheries Management Scotland): Thank you for inviting me. It is great to be here in person. I really appreciate the opportunity.

My answer is pretty similar to what John Goodlad said. It is disappointing that there has been so little progress on those two reports. I sat on the salmon interactions working group and thought that it was a really good and useful process with the potential to take us a long way towards dealing with some of the issues. It was an excellent example of collaboration between the wild and farmed sectors.

As John said, after a slow start, we got the right people round the table, with a shared determination to come up with recommendations that were designed to improve the situation. If you had said to me before that process that we would reach unanimous agreement on 42 recommendations, I might not have believed you, but we did that. Although I am not arguing that our final report was perfect, I am strongly of the view that, once delivered, those recommendations would greatly improve the situation. Unfortunately, despite an initially positive response to the report, the Scottish Government has not taken the opportunity to act on the majority of those recommendations, which is pretty disappointing.

The Convener: Your recommendations had unanimous support, which suggests that nothing was unreasonable and that there were no unreasonable asks of Government or the industry in implementing those recommendations. Why have we seen such a poor response to the recommendations and so little progress? Is there a lack of resources or ambition? Why have we made little or no progress on most of the recommendations?

Dr Wells: A number of things are mixed into all of that. It is not an easy question to answer. Obviously, things have happened that were outside everyone's control. The Covid pandemic

came about around the time that the salmon interactions working group's report was published. There was a series of issues, and there were things that needed to be taken forward that were, in many people's view, more important.

We have also seen some pushback on some issues. There have been barriers to delivery of the REC Committee's report and the report of the interactions working group. Those barriers fall into three categories. First, there is a lack of an holistic assessment of the regulatory system in the round. I think that the committee has heard lots of examples of that in evidence from other people. Secondly, there remains a lack of trust between the two sectors. Finally, behaviours can be an issue as well. I am happy to expand on those examples.

At the moment, it is clear that regulation is disjointed. We have not fixed that issue. You have heard from the fish health inspectorate, which looks at sea lice only from a farmed fish perspective and does not look at what sea lice mean from a wild fish perspective. We recommended, through the salmon interactions working group, that there should be a single regulator. We talked about that earlier. There is not a single regulator. SEPA has been given powers only on sea lice; the escapes issue is still not being dealt with. There is a whole series of things that are not being dealt with holistically.

There is a lack of trust, but I think that that is partly to do with the fact that we are not operating within a regulatory framework that facilitates the discussions that John Goodlad mentioned earlier. It is not reasonable to expect one small sector and one very large sector to sort these things out between themselves. For that to happen, it needs to be done within a suitable framework.

There is a whole series of things going on. That requires leadership, and it requires matters to be taken forward at a national level to deliver the framework within which those sorts of discussions can take place.

The Convener: We heard from some witnesses who were almost back-patting and saying that there was no overlap. That does not tie up with an holistic approach or joined-up thinking; it sounds very much like silo working. Is that one of the issues? If SEPA, NatureScot and whoever are not working together and have no overlap, does that mean that they are not taking an holistic approach?

Dr Wells: I am not sure that it is quite as black and white as that. The regulators get together quite regularly, but they are trying to deliver some of these things within regulatory structures and frameworks that are maybe not best designed for that. The marine environment is incredibly dynamic and complex. We plan fish farms using a terrestrial planning system that is simply not designed for that purpose. SEPA is trying to use controlled activities regulations to deliver the sea lice risk framework. I am sure that we will come on to that later.

We also try to address issues in silos. One of the things that this committee and the REC Committee have been very interested in is the mortality rate in the farmed fish sector. That is not, strictly speaking, a big issue for us—we are more interested in sea lice and escapes—but, if we look at farmed fish health through the farmed fish health framework, without considering what that means to the wider environment or to wild fish, we are looking only at one small part of the problem in isolation. We have to look at it in a much more holistic manner if we are going to deal with these issues properly.

The Convener: We will move to our first theme, which is research and collaboration.

Elena Whitham: Good morning, Dr Wells. The REC Committee's report noted scientific uncertainties regarding the impact of farmed salmon on wild salmon populations. We have heard a bit about that this morning. In every evidence session, we have asked about the uncertainties, because we know that the issue of what is impacting so greatly on wild salmon is a complex picture. Has scientific understanding improved at all since the REC Committee's report came out?

Dr Wells: As I said, we are operating in a pretty dynamic environment that is quite difficult to understand. However, a lot of research is already there. The Scottish Government published a summary of science in 2021—it was by no means a full literature review, but it was a summary of the relevant science. A number of literature reviews have also been taken forward in that area.

The information is relatively clear that salmon farms have the ability to impact wild fish, but that is not to say that that happens at every location where there is a salmon farm. However, we know from that data that salmon farms are a much more important contributor of sea lice into the environment than wild fish are. To put that into context, one farm on the west coast houses more farmed salmon than there are wild fish returning to the entire west coast of Scotland. The number of fish that can be infested and therefore act as a reservoir of sea lice is way out of kilter with anything that we have seen in a natural perspective.

With support from the Scottish Government and through the environmental management plans, we have been looking at sea trout in particular. It is very difficult to sample wild salmon, because,

when they leave the rivers, they head off into the north Atlantic. Sea trout remain in coastal areas, so you can sample them. The monitoring data—I think that there was a question on that the other week—has been used and has been analysed by Marine Scotland science to understand the association between the abundance of sea lice colonising farmed salmon and the occurrence of sea lice on wild trout. That paper was published earlier this year. Marine Scotland found a significant positive association between adult female sea lice abundance on farms and juvenile sea lice on wild trout, which is totally consistent with a causal relationship in which increases in the number of sea lice on farmed fish cause an increase in sea lice on wild trout.

The information continues to come forward. There is a pretty clear scientific consensus that there is the potential for an impact on wild fish from sea lice on farmed fish, and that is before we get on to escapes and genetic introgression. However, the reality is that we do not currently know exactly what that will mean for a particular population of wild fish if a farm is put in a particular location. That is where the sea lice framework has the opportunity to address some of the evidence gaps and give us a much greater understanding, although we would much rather see that come forward a lot quicker than is planned at the moment.

Ariane Burgess: Good morning. Recommendation 44 of the RECC report was that

"mechanisms to encourage ... collaboration between the sectors should be further developed and introduced."

The report also recommended that

"the Scottish Government's wild salmon interactions group should, as part of its work, address this matter as a priority".

Is it your sense that there has been improvement in relation to collaboration and the transparency aspect of collaboration and information sharing between the two sectors since 2018? If you have any examples of good practice, it would be great to hear them.

Dr Wells: John Goodlad mentioned examples of collaboration and shared working at a local level. That is not new; it was happening before 2018. What we were talking about in the salmon interactions working group—and, I guess, what the RECC report was talking about—was formal mechanisms that would help to facilitate that. I am afraid that that has not really moved forward to any great extent.

We have done quite a lot of work at a local level. We had funding from Crown Estate Scotland to look at new methods of monitoring sea lice on wild fish. One of the ways in which we did that was by using coastal fyke nets, which are similar to the nets that commercial fisheries used to use. They allow you to sample sea trout. The sea trout swim around in the net, you can sample them and release them, and it is a very low-impact way of sampling those fish.

The nets are big and unwieldy, so we needed help to get them into the water. The local fish farm companies were a fantastic help in doing that. They provided boats and personnel not only to get those nets into the water but to go along with the biologists so that, when they were looking at the lice on the fish, the fish farmers were also seeing the lice on the fish. That gave them a much clearer understanding of what was going on. That was a really beneficial and useful way of going about things.

We also have environmental management plans, which are a condition of planning. Through those plans, there is often wild fish monitoring as part of the process. Again, that has led to discussions happening at a local level.

10:30

One of the problems that we have had has been in turning those discussions into actions on the ground. What we really want at a local level is a forum for engagement in which concerns are genuinely listened to, addressed and acted on. That is what is missing at the moment.

Ariane Burgess: That forum is the formal mechanism that you are asking for. Who should take that forward?

Dr Wells: All of these things could usefully be delivered as part of a reformed regulatory system. In the mechanism that we had through the environmental management plans, the EMPs required there to be an end-of-cycle review meeting in which the performance in relation to the farmed fish and what was happening with the wild fish were discussed. The idea was to look at what was happening and to try to come up with means of ensuring that, if there were any issues, they did not happen in the next production cycle. I think that that could easily be built into a regulatory system. I think that it could be built into SEPA's new sea lice framework.

Ariane Burgess: Okay. Thank you.

Rhoda Grant: What consideration has been given to the impact of climate change on wild salmon numbers? Earlier, we heard about Norway closing rivers for salmon fishing to protect salmon numbers. Should we be considering that?

Dr Wells: There are two questions there. Climate change has a big impact on salmon. It has an impact at sea and in our rivers. I think that, in 2018, around 70 per cent of Scottish rivers reached a temperature at which stress starts to act

on salmon. Climate change is acting on our wild salmon populations now.

On how we address that, we are doing a lot of work through our membership, the district salmon fishery boards and the fisheries trusts to plant trees next to rivers in order to provide cooling shade. That can reduce the temperatures of rivers by a few degrees, to keep them below the really difficult thresholds.

At sea, there is a completely different scenario for us. We have to focus on the impacts on wild salmon that we can address. That includes sea lice and escapes. It also includes pollution, barriers to migration and a whole series of other things. We look at all of those things in the round.

We have a wild salmon strategy in Scotland—I do not know whether John Goodlad was aware of that earlier. We also have a delivery plan that looks at a wide range of pressures that wild salmon face. From our perspective, there is not a focus purely on salmon farming.

You mentioned that some rivers in Norway have closed. I suspect that, with the International Union for Conservation of Nature designating Atlantic salmon across Great Britain as endangered, many people wonder why angling is permitted for an endangered species. However, it is also important to recognise that we need to avoid unintended consequences from any action that we take. Anglers have been leading the way for many years when it comes to salmon conservation through a range of voluntary measures and self-imposed behaviour changes, to ensure that their actions are carried out responsibly. That includes changes to gear types and the practice of catch and release. In Scotland, 98 per cent of fish are returned. That is the highest level of any party to the North Atlantic Salmon Conservation Organization.

We voluntarily cease fishing at times of high water temperatures. Not only that, anglers are the eyes and ears on our rivers, and they regularly report illegal fishing, pollution incidents and invasive species. Indeed, if we did not have anglers on our rivers, we would not have known that we had invasive pink salmon in our rivers a few years ago. We rely on anglers to do that.

Although the IUCN has designated Atlantic salmon as endangered, it has recognised in its accompanying information the work that Fisheries Management Scotland—we were name-checked—and our members and anglers are doing to make things better. Yes, we could call for the cessation of angling, but that would not address the issues, including the conservation issues that Atlantic salmon face. In the case of illegal fishing it might make things worse, because we can see from the experience in Ireland and other places where fishing has been banned on some rivers that, if we do not have anglers on the banks of rivers, illegal fishing goes up massively.

Rhoda Grant: So, can—

Dr Wells: If I could finish the point, please.

To put it in context, the best estimate of the impact that angling might have on Atlantic salmon is that it might result in a loss of less than 1 per cent of the population. If the committee genuinely feels that there is a threshold for ceasing activity as low as 1 per cent, I would point out that there are an awful lot more activities across Scotland that would not be happening in Scotland either.

Rhoda Grant: You quoted a figure for salmon returns. Did you say 97 per cent? Is that adult salmon, or is that smolts? The figure does not seem to fit with—

Dr Wells: Sorry—that is adult salmon that are caught by rod and line and then released back into the river to continue their spawning migration.

Rhoda Grant: Not smolts, though.

Dr Wells: No.

The Convener: I have a further point to make before we move on from the subject of research and collaboration. Everything seems to revolve around sea lice and the potential impact of increased sea lice load on wild salmon. Has any research been done to examine the impacts of the use of chemicals or antibiotics, or to consider how the biomass created by fish farms might impact on wild salmon? Is that impact significant, and is it something that we should be considering aside from focusing on sea lice?

Dr Wells: At the moment, our focus is primarily on sea lice and escapes. We pay attention to what is happening with gill health, mortality and other aspects of disease, but we do not really have a good enough understanding of the potential for that to impact on wild salmonids. In many cases, those are issues for the farm fish. We know from discussions with industry representatives that it is only an individual pen, in some cases, that is impacted by some things. We are certainly not complacent about that, but we have significant issues to deal with on sea lice and escapes, which are our primary focus at the moment.

The Convener: We will now move on to sea lice regulatory reform.

Rachael Hamilton: Good morning, Dr Wells. First, is your organisation happy that SEPA is the lead agency?

Dr Wells: Yes. We are comfortable that SEPA is the lead agency. There are elements of the sea lice framework that we have concerns about, but

there are also elements that we are quite positive about. I am happy to discuss both.

Rachael Hamilton: Indeed: I was looking for examples of what you might have deemed positive or negative regarding that designation of responsibility.

Dr Wells: First, it is very helpful indeed to have a single regulator responsible for the impacts of sea lice on wild fish. That has been a massive gap in the regulatory system for the past 50 years, and we have been flagging it up. I have sat in front of various committees of the Scottish Parliament flagging that up since 2012, when the Aquaculture and Fisheries (Scotland) Bill was going through Parliament. It is great that there is a single regulator, and it would be even better if that single regulator also dealt with escapes and everything else to do with wild fish—but we should take things one step at a time.

We think that the framework, now that it is in place, will help to steer developments away from areas of high risk, which I think is a good thing. It will introduce additional requirements to report the number of fish and lice, increasing transparency and enabling a better understanding of the total number of lice. Crucially—this might not have come through in previous evidence sessions as strongly as I would have liked—the sea lice risk framework recognises that it is the total number of infective-stage lice in the environment that is important to wild fish. It is not the average number of lice per farm fish that is important. That is pretty irrelevant to wild fish. We can double production and stay at the same number of lice per farmed fish, but the number of lice in the environment is massively greater.

We have to consider the situation holistically. We have to consider the total number of lice in the environment. We also have to remember that the lice are planktonic. Where we have an impact is not necessarily where the farm is. There is a period of days before the infective stage is reached, and SEPA is considering that through its modelling, to understand where the impacts will happen.

Rachael Hamilton: Among the various witnesses who have come before us, some organisations are not happy that SEPA has the capability to effectively regulate wild and farmed fish interactions. Although you are quite positive about the responsibility in relation to sea lice that SEPA has as the single lead body, are you concerned that it does not have the capability to regulate effectively?

Dr Wells: We were very strongly in favour of the salmon interactions working group recommendation that the framework should be robust, transparent, enforceable and enforced. Those are the tests that we will use to assess that process. When we responded to the two consultations on the salmon interactions working group, we tested the framework against those principles, and we felt that it fell short. Other stakeholders have told the committee why that was. I can give you some of those reasons now.

The approach is based on a number of wild salmon protection zones in which the number of lice needs to be managed. However, it is not a cumulative approach. A wild fish may pass through several wild salmon protection zones on its way to sea, but it is only the first wild salmon protection zone—the one that is nearest the natal river—that is assessed. I think that that is a big issue.

The approach does not apply wild salmon protection zones in all relevant areas. There are some rivers that, historically, had salmon populations but that no longer have them. We should be looking to get those salmon populations back, so we should have protection zones in those areas.

In addition, some of the zones do not make intuitive sense to us. I will give an example. The fish that come out of the River Endrick, which is a special area of conservation river in the Loch Lomond system, will pass through a wild salmon protection zone. If they come down the coast of Ayrshire, they will go through little semicircles around the river mouths, but we are not protecting the migration route of fish that come down through that area. Therefore, I think that the zones need to be looked at again.

I am sorry—did you want to come in?

Rachael Hamilton: Is that what you meant by a holistic approach? Ultimately, should this committee recommend that the REC Committee's recommendations be updated to reflect that?

Dr Wells: Potentially. That is one part of a holistic approach, although I think that that is a much bigger thing. Different parts of Government and different agencies look at different elements of regulation, and those elements of regulation do not always align with one another. The committee has already heard about the inherent tension between what needs to be done as regards sea lice control to protect farmed fish health and what needs to be done to protect wild fish health, which is extremely different. The point at which it is a problem that wild fish are infected with sea lice is when they are leaving the rivers as smolts. A smolt cannot handle a large number of lice in the way that an adult salmon on a fish farm can. There are inherent tensions in what we are trying to do in different parts of the regulatory system.

Another concern that we have about the framework relates to the fact that the relative risk

assessment that SEPA has carried out is based on self-reported data from the industry, but that data extends back only a few years. In other words, data from only two or three years has been used. Does that provide enough information to enable us to really understand the sea lice situation? It is also important to note that that SEPA assessment is based on everything working as it should. It is not based on a worst-case scenario in which lice get out of control.

As I said, there is a big difference between managing sea lice numbers well for the purpose of farmed fish health—which is the basis on which the sea lice data is collected by the fish health inspectorate—and managing sea lice numbers for the protection of wild fish.

Earlier, we talked about the timeline. We are extremely concerned about the five-year timeline and the fact that it is likely to take that long to determine whether the sea lice limits are appropriate. That means that some farms that may be causing an impact now will continue to cause an impact for the next five years. The stand-still condition that SEPA uses relates only to the number of lice that are on the farms, but it is based on two or three years' worth of lice counts.

Rachael Hamilton: As a committee member, I find it very difficult to understand the interaction between the responsibilities of the fish health inspectorate, NatureScot, local authorities and the other bodies that make key decisions, which all seem to operate underneath the single regulatory body. I would like more clarity about how all those organisations interact, because it seems, at the moment, that certain organisations blame—if I can use such a strong word—others for certain areas that they do not have responsibility for. Is that a fair assessment?

10:45

Dr Wells: People will blame some people more than others. Most people who are involved in the regulation of the industry are trying to do a good job, but they have one hand tied behind their back because they have powers only for certain things. When Charles Allan from the fish health inspectorate was telling you about sea lice, he was speaking in the context of the powers that he has and the approach that he can take, which is very different from what someone might do if they were trying to protect wild fish from sea lice.

I do not know where blame sits in all of that, but the regulatory system that we have at the moment is not fit for purpose, so we need to fix it—and fast.

Emma Roddick: It was interesting to hear that what is important to wild salmon is the overall number of sea lice, not the number per fish. It seems to follow that the risk to wild salmon will become greater as the industry grows. Do we need to see better management of lice within the farmed setting before that growth can be justified?

Dr Wells: That is what the sea lice risk framework is designed to do. It is designed to keep sea lice concentrations below a threshold that was derived in Norway to manage the impact on wild fish. If the number of sea lice within wild salmon protection zones was already at that level, we would expect no further development of open net pen technology in those areas. It might be possible to use other technologies, such as close containment, to develop there, but that is our understanding. It is about managing the overall number of infective-stage lice in the environment, to keep it at a level that will not have an impact on wild fish.

In a previous life, I worked as a postdoctoral research fellow at the University of St Andrews. My work there was about the interactions between wild and farmed fish. We derived the threshold levels at which lice cause problems for wild fish. There is good information and we know what the levels should be, but the problem is that we are working in a complex and dynamic environment. Lice can move up to 30km before they reach the infective stage, so we need to understand where the interaction takes place and where the fish are. We are working with colleagues in the Atlantic Salmon Trust and in the marine directorate to get a far greater understanding of fish movement through the coastal environment. We are trying to deal with a complex situation.

The Convener: Is the work that you did in line with the work done in Norway to set out what number of lice would be impactful? Do you align on that?

Dr Wells: As with anything, there are slight differences between the two, but they are in broad alignment. The project I was working on was funded by a European Union grant to Norway, Scotland and Ireland, so we were working closely with the researchers who were doing that work.

The Convener: My apologies, Emma—do you want to come back in?

Emma Roddick: Thank you, convener.

Given that we have heard evidence that lice numbers per fish are fairly consistent—except in some circumstances where there has been an admission that those numbers are out of control and work is needed—would it be more realistic to aim for fewer lice per fish or to tackle the interaction between lice in farmed and wild salmon?

Dr Wells: Action can be taken in different parts of the system, but the idea is to keep the overall number of lice in the environment below a

threshold that will be protective of wild fish. If you cannot achieve that, there are certain things that you can do. You can reduce the lice threshold and reduce the biomass. SEPA has the power to do that, and, as you heard in a previous meeting, it has done so in a number of cases, largely in relation to benthic impacts.

The same powers would apply to the sea lice risk framework. There are lots of different levers that can be used, but ultimately we need the impacts of aquaculture to be kept at a level that is protective of wild fish. I genuinely believe that we can have an important salmon farming industry in Scotland and thriving wild fish populations working together, but for that we need to look at the matter holistically.

Emma Roddick: Sorry, convener, but can I clarify a final point?

The Convener: Certainly.

Emma Roddick: I am thinking about where the lice exist in high numbers. Are enough actions being taken in those circumstances—such as actions to reduce biomass, which you mentioned—or does there need to be more enforcement in reaction to growing numbers?

Dr Wells: It is important to recognise that, until February this year, we did not have a regulatory system that managed sea lice impacts on wild fish. We have not had any of that work, nor would I have expected that at this stage, because SEPA has brought the sea lice framework into play in such a way that the initial focus is on new farms. Until next year, only those farms will be under the framework. We will start the process of looking at existing farms next year, but that is due to have a five-year timescale, as I said, so it will be a while before we can expect any of these things to happen. That is really unfortunate, because there is good information out there that we could be using in the meantime.

Ariane Burgess: You have mentioned a couple of times SEPA's five-year approach to looking at the data and monitoring the situation. The REC Committee's and the working group's reports recommended a precautionary approach to mitigate any impacts of sea lice infestation on wild salmon, and I am interested in whether you believe that the sea lice risk framework applies such an approach. We have heard about the five-year timescale, but are there other aspects of what is being done that you can share with us?

Dr Wells: There are areas of the sea lice framework that are precautionary and areas that are not. It is a bit of a curate's egg in that respect.

From our perspective, we are not focused entirely on the precautionary principle. We are focused on the environmental principles more generally—that is, the principle of protecting the environment and integrating that into policy making; the polluter-pays principle; the prevention principle; and the rectification-at-source principle. There are issues with the framework across the piece, as it is currently designed, in respect of a number of those.

We have talked about the timeline that is being required and the fact that, in the meantime, all that SEPA is intending to do is have stand-still conditions with regard to the number of lice per farmed fish. That is just about keeping things at a certain level, and I do not believe that that is precautionary.

Moreover, we are not dealing with sea trout in the first instance. That is more complicated, because of the sea trout's life cycle but, again, work could be done on that in a more precautionary way to ensure that we understand and mitigate the issues with sea trout.

When Professor James Bron from the University of Stirling gave evidence to the REC Committee, he said that, in the past, some farms had an average of 100 lice per fish. The framework does not take into account those historical impacts. We talked earlier about rivers that lack salmon and so on, and the committee might want to consider whether the polluter-pays principle should apply to those historical impacts, too.

We have good data for only a few years, which is really unfortunate. We are in a very different situation from Norway.

Ariane Burgess: I asked our previous witness about the no deterioration approach. SEPA says that it can prevent deterioration of wild salmon populations by allowing the highest-risk farms to continue to have sea lice levels as high as their recent levels, instead of reducing them. Do you think that that will prevent wild salmon numbers from falling due to sea lice?

Dr Wells: It depends on the current lice levels, where those lice go and other factors. We do not know enough to answer that question in precisely the way that you might like me to. Monitoring is being put in place and we are working with SEPA to develop our approaches there. However, we need to understand what the monitoring information means. We monitor lice across Scotland. We see them on wild fish but we do not see impacts on such fish everywhere where there is fish farming. Equally, in some areas, we do see impacts on wild fish but they are presumably under the current lice levels on farms, so I suspect that the approach is not precautionary enough.

Ariane Burgess: I come back to your earlier comment that SEPA needs to take a cumulative approach. It has said that it is taking more of a

case-by-case approach. Can you say a bit more about why you think it needs to be cumulative?

Dr Wells: A salmon could leave a river and move into a wild salmon protection zone where, although the lice levels would be below the level at which SEPA would want to regulate, they would still be relatively high and quite close to that barrier. By the time that fish reached the end of the zone, its burden of lice would be just under the threshold, which would cause it problems. To get to sea, it would have to pass through four or five other wild salmon protection zones—or even one such zone—with elevated lice levels, which would be enough to take that fish over the threshold. If the lice levels were high enough, they would cause mortality.

Ariane Burgess: So, there is an issue with where we get the snapshot of information, because we are not seeing the full experience of that fish.

Dr Wells: Yes. We have raised that issue with SEPA regularly throughout the process.

Ariane Burgess: My final question is on the way in which data is presented. In its recommendation 22, the REC Committee said that there needs to be an

"enhancement in the way sea lice data ... is presented"

and it called for

"a comprehensive, accessible reporting system".

I am interested in your thoughts on how data is currently presented. Is it comprehensive and accessible?

Dr Wells: We have been pleased to see that the reporting order has helped to increase transparency since the REC Committee's report was published. Data on sea lice levels is now presented on a farm-by-farm basis, which helps a great deal. Indeed, I had been arguing for that for as long as I can remember.

We also understand that SEPA will introduce lice reporting conditions, which we hope will involve a streamlined and simplified process that increases transparency. The principle of collecting data once and using it multiple times is really sensible and would be useful from the perspectives of both farmed fish health and wild fish conservation. Sea lice data is currently published on the Scotland's Aquaculture website, but it is not particularly accessible. When we take that information from the site, we have to put it through Excel and into a format that makes it useful to look at, farm by farm, over time. That is not difficult to do, but it involves an extra step that should not be necessary.

Ariane Burgess: What would make it more accessible?

Dr Wells: The BarentsWatch system in Norway, which has come up a number of times in our discussion, is expensive, but it would be well worth following its example and having all the information in one place.

I will give the committee another example. Partly because of the Covid pandemic and partly because of cyberattacks affecting SEPA, sea lice data sits on a different part of the Scotland's Aquaculture website from other data. Until recently, there was not a single field of information that was common between the two data sets, so we could not look at sea lice in relation to biomass or any of the other information that is out there. We want to be able to look at that information in the round, so that we can have a holistic understanding of what is happening.

Ariane Burgess: Having the various sectors work together seems to be an important part of what we are trying to do here, such as in the collaboration that we discussed earlier. Everyone should have access to the information that we have, so that we are all looking at the same picture.

Dr Wells: Absolutely. We have talked about that collaboration and we want it to happen. We want to work with the industry, but we want to do so framed within a fit-for-purpose regulatory system. It is not our job to fix the issues; it is our job to work together and come up with innovative solutions that make things even better.

11:00

The Convener: We will move to our third theme, which is escapes. We have a question from Emma Roddick. [*Interruption*.] I beg your pardon—I have jumped Colin Beattie. My apologies. We will go back to Colin for questions on sea lice regulatory reform.

Colin Beattie: Alan Wells, you have twice mentioned the regulatory system and used the phrase "not fit for purpose". Let me ask you a direct question on that. The salmon interactions working group's report recommended that the reformed regulatory system be

"fully resourced and meet the tests of being robust, transparent, enforceable and enforced".

Have the tests been met?

Dr Wells: For the sea lice framework, that remains to be seen. We operate across a whole range of pressures that wild salmon face, and we have concerns about SEPA's approach to enforcement in particular. It tends to be quite reluctant to go down an enforcement route, but we would like that to happen.

One example that has come up relates to how SEPA deals with agriculture and its discussions at

a local farm level. That approach was entirely appropriate in the first round of river basin management planning, and it was potentially appropriate in the second round of river basin management planning, but we are now in the third round of river basin management plans and there is still a lack of enforcement to ensure that general binding rules for agriculture are met. We see issues elsewhere, too.

We will continue to look at the tests that you have mentioned and assess the regulation of sea lice against them. However, we will also consider the regulation that SEPA does across its regulatory remit, because we are in the middle of a biodiversity crisis now. This is not just about wild salmon; it is about our environment more generally. We cannot keep doing the same things and expect a different result.

Colin Beattie: You talk about enforcement. Are you aware of the number of times recently that SEPA has taken any sort of enforcement action?

Dr Wells: Do you mean in relation to wild/farmed fish interactions or more generally?

Colin Beattie: In connection with sea lice generally.

Dr Wells: The sea lice framework came into play only in February, so there has been no enforcement action whatsoever by SEPA. To be honest, though, I would not have expected any by this stage.

Colin Beattie: Do you consider the regulatory system to be transparent?

Dr Wells: No, not in all cases. One of the issues that we have with the sea lice framework is the way in which regulation against sea lice will take place. I think that the Rural Economy and Connectivity Committee made a recommendation on the number of thresholds for sea lice, saying that the situation was confusing and so on. SEPA intends to use a rolling average of sea lice over a period of weeks to determine whether sea lice thresholds have been breached. That will be utterly impossible to understand for stakeholders who are interested in this, and I think that it fails the transparency test, too.

Colin Beattie: Thank you. Back to you, convener.

The Convener: We will now move on to escapes.

Emma Roddick: Has sufficient progress been made by the Scottish Government and its agencies on reducing the number of escapes?

Dr Wells: No, but I guess that it depends on what you mean by your question. The incidence of escapes has gone down, but we should put that in some sort of context. At the moment, it is not illegal to have an escape; it is only illegal not to report that you have had an escape or not to report a circumstance that might have led to an escape, so there is no basis for dealing with the issue. As John Goodlad said earlier, it was agreed by the salmon interactions working group that appropriate fines should apply, that they should be proportional to the scale of the escape and that they should be invested in wild salmon conservation work.

The incidence of escapes has gone down and, in what has been reported, the number of escaped fish has reduced markedly over the years. We operate an app for reporting suspected fish farm escapes. Anyone can feed into that app, but 52 of the past 55 reports that were submitted were made by district salmon fishery boards and fishery trusts—people with the expertise to identify and tell the difference between farmed and wild salmon, which not everyone can do. However, with freshwater escapes, which are a particular issue from our perspective, there is no ambiguity; the fish have a vaccination mark on their belly, so it is very easy to tell the fish apart.

With that in mind, the self-reported data that the fish health inspectorate collects indicates that there have been no freshwater escapes since 2020, but that is simply not the case. We have evidence from 18 reports in which escaped juveniles were identified between 2022 and as recently as 1 May this year, so it is an on-going issue. There is a big difference between the number of reported escapes and what we actually find in the rivers. The numbers that we have will be an underestimate, because we will not catch all of them.

Emma Roddick: As you say, escapes must be reported, so where has the reporting fallen down? People are obviously not reporting, so what needs to change in how that is officially reacted to and in enforcement?

Dr Wells: That depends on whether the fish farm is aware that there has been an escape. Something could happen that the farm was not aware of and a few fish could get out—I am not a fish farmer, so I do not know the specific ways in which that might happen—so it is possible for fish to get into the wild.

That appears to be a particular issue in fresh water. I will give an example from the Kyle of Sutherland about the lack of regulation. The salmon interactions working group suggested that there should be a condition on all fish farm licences that farms meet our international requirement under the North Atlantic Salmon Conservation Organization that we maintain 100 per cent of farmed fish in the farms. That does not happen at the moment, so conditions have come

through things such as planning requirements instead, in an attempt to address the issues.

For example, we have a situation in which a condition for protection of wild salmonids from an environmental management plan has not been followed through. A farm on Loch Shin, in the Kyle of Sutherland, has now been in breach of a planning condition to have an EMP for six years. The planning condition in question is designed to assess and, ultimately, address risk to local wild fish populations, so it is extremely concerning that no action has yet been taken, despite there being evidence of escapes of farmed fish occurring on an annual basis. That evidence has been substantiated by Marine Scotland science, which has taken genetic samples not only of wild fish but of fish from both of the farms that operate on Loch Shin and has identified fish from both farms.

Emma Roddick: We have talked a lot about penalties for fish escapes. I am interested in what farms can do to prevent them. Where do you see the line between escapes that were not preventable and negligence or liability? If some farms are having escapes without realising it, that points to a more concerning picture than simply a storm having torn a net.

Dr Wells: I emphasise that I do not know the circumstances in which farmed fish are in the environment. I am concerned that escapes as they are currently regulated—or, indeed, not regulated—are discussed as though they are inevitable and an acceptable outcome, and as though it is unreasonable to expect zero escapes. There does not appear to be a clear position across public bodies regarding how escapes should be handled.

You have heard that the fish health inspectorate has powers to ensure that farmers are taking the appropriate measures to mitigate escapes, but escapes still happen. Planning authorities often scope fish escapes in environmental impact assessments, in which farmers talk about how they will mitigate the risk of escapes in order to get their planning consent approved, but escapes still happen. It is clear that mitigation is not working, as escapes are still recorded. Therefore, does Scotland take the position that escapes are inevitable and acceptable? We know that farmers do not want to have escapes—as John Goodlad said earlier, it is not in their interest to lose fish.

It is difficult to understand what process the FHI follows and what the environmental impact assessments are doing if the mitigations do not prevent escapes. However, thanks to work that was done by the Scottish Government in 2021, which was mentioned earlier, we know that in all areas where fish farming occurs, genetic introgression—farmed fish genes turning up in wild fish populations—has been identified. Is it Scotland's position that the evidenced impact of escapes, which is an impact on wild salmon, is also acceptable? I do not believe that that is the case, and I certainly do not believe that it should be the case.

We need a system in Scotland that enables salmon farming and thriving wild salmon populations to exist in harmony. The issue around escapes is a clear example of our not having moved away from the status quo at all.

Emma Roddick: You mentioned the FHI asking farms to take appropriate measures. Do you think that there is enough clarity and agreement on what "appropriate measures" are? Do you know what they are? Would your position be the same as that of the FHI, individual farms and Marine Scotland?

Dr Wells: We have a Scottish technical containment standard that is pretty out of date. Our understanding of the existing standard is that the industry is, essentially, using a Norwegian standard. It is being updated at the moment, but I genuinely do not believe that we should be regulating on the basis of process. I am not a fish farmer or an engineer—there are lots of people out there who are far better placed than I am to tell you what needs to be done to contain fish in a fish farm, but I am sure that it is absolutely possible to do that if enough investment and effort are put into it.

What we need to regulate on, particularly from a wild fish perspective, is environmental outcomes. If farmed salmon are getting out of cages and interbreeding with wild fish, that is a poor environmental outcome and it needs to be addressed. I do not know how that should be addressed from an engineering or fish farming perspective, but we should be focusing on outcomes, not on process. That is my view on regulation across the board.

Emma Roddick: Thank you. That is helpful. Do you agree with the FHI that the salmon farming industry has a good record on containment?

Dr Wells: I think that that is probably the case if we look at containment from the perspective of farming fish. If we look at it from the perspective of what is happening in the wild fish population and what the work of the marine directorate has shown, we know that genetic material from farm strains is present in wild populations pretty much everywhere that fish farming goes on, including in east coast rivers, where there is only a small amount of production. Where there is no fish farming, there is very little genetic introgression.

As I understand it, Marine Scotland uses quite conservative means of measuring genetic introgression, so the measure will be a minimum. The data was collected using an entirely unbiased

survey system. The samples were taken by fisheries trusts all around Scotland for the national electrofishing programme for Scotland, and the data was analysed by the Scottish Government. The data that we have at the moment is from, I think, 2021. Marine Scotland has another two years of data under analysis, so the picture will develop over time.

The Convener: In the previous session, I touched on environmental outcomes. The prime objective in preventing escapes, other than in relation to the economic impact that it has on the farmers, is to avoid introgression. What role does fish breeding play in that? If we could prevent fish that escape from being able to breed with the wild population, would that not knock the problem on the head and result in the best environmental outcomes?

Dr Wells: The primary concern is genetic introgression, but it is not the only concern. What you suggest would go a long way towards addressing that. Rainbow trout are farmed in Scotland. Rainbow trout cannot breed in the wild, but a big escape of rainbow trout—we have had a number of those over the years—can swamp a habitat and cause all sorts of issues for wild fish, including by outcompeting them.

11:15

Farmed salmon fall into the same category. In the past—maybe 10 or 20 years ago—if there was an escape from a local salmon farm, we would expect a high number of escaped farmed fish in rivers. That is not as apparent now as it was. We had a big escape a few years ago in which that was the case, but in most cases now we are not seeing large numbers of farmed salmon in our rivers. That might be to do with how farmed fish are bred—I do not know—but, regardless of the fact that we are not seeing large numbers in rivers, we are still seeing genetic integration, as we have mentioned a couple of times.

Elena Whitham: I have found everything that you have said to be quite fascinating. It has answered some of the questions that we have been asking all along.

Following the questions about escapes, I have a couple of questions about sanctions. Notwithstanding the desire to have 100 per cent containment, the Rural Economy and Connectivity Committee's report said that there are

"strict penalties ... in place in Norway ... and recommends that appropriate sanctions should be developed and introduced in Scotland."

Do you consider the current sanctions on escapes to be appropriate, or should we have stricter measures in place?

Dr Wells: No, we do not consider the sanctions to be appropriate. The salmon interactions working group made a similar recommendation. We said that fines should be proportional to the size of the escape and that they should be ring fenced and spent on wild salmon conservation.

Emma Roddick made reference to OURO. My understanding was that the context in which we were talking about OURO was not so much about recovering escaped fish as that OURO was a mechanism through which the fines could be held. In Scotland, ring fencing of fines does not happen, generally—fines go into the Scottish consolidated fund and into general taxation. The reference to OURO was about having a mechanism through which fines could be paid and then put into wild salmon conservation projects.

Elena Whitham: You just answered my next two questions, which were about OURO. I wanted to understand how it works in practice—how it is financed by the industry and its being compulsory for farmers to be members of it.

This my final question. Is any of the ring-fenced sanctions money going where it is supposed to go, which is into conservation?

Dr Wells: No—there is no money coming in. For that to happen, we would need a system or licence conditions that meant that an offence would lead to a fine.

The Convener: You touched on the fact that there is a discrepancy between what you understand to be the number of escapes in fresh water and those that are reported. However, there is a legal obligation to report escapes. What is your understanding of what happens when the regulatory body investigates a river board or trust when farmed salmon are found in fresh water but no report of an escape has been made by local fish farms, despite their being aware that it took place?

Dr Wells: I can give you one example. In August 2020, a district salmon fishery board reported approximately 28 escaped juvenile farmed salmon to the fish health inspectorate. They were genetically tested by the board. The fish health inspectorate did not conduct a farm visit until November 2022, and no audit report from the FHI has been shared with the district salmon fishery board.

The situation is mixed, and it is not what it should be, as far as we are concerned. Again, that applies to all regulation. Lots of people in our sector regularly report incidents of pollution and other things. People who take the time to do that want to understand what has happened after the report was made, which is reasonable.

The Convener: We will move on to our final theme, which is consenting and planning. The first question on the theme is from Emma Harper.

Emma Harper: It has been very interesting to hear everybody's questions so far. Recommendation 41 from the Rural Economy and Connectivity Committee is that a precautionary approach should be taken to the siting of salmon farms to avoid wild salmon migratory routes. We have already talked a little bit about those migratory routes, but does the siting of new farms since 2018 indicate that a precautionary approach has been adopted? Have you seen any sites close to migratory routes?

Dr Wells: I do not think that a precautionary approach has been adopted since 2018. I hope that the sea lice framework will help with that process, because it is looking at wild salmon protection zones in a spatial manner. As I said earlier, we have been working to better understand what the migration routes might look like.

I do not think that it is a good analogy to think that wild salmon follow precise routes through the marine environment. The routes differ between years because of water conditions, wind-forcing conditions and things like that. Sometimes, fish coming out of Loch Linnhe go through the Sound of Mull and, at other times, they go south of Mull and round that way. The routes vary between years. We cannot be precise in saying, "This is the migration route and that's what we need to protect."

There are probably wild salmon in most areas of the Scottish coastal environment, but some areas will be more important than others. To be fair to SEPA, it focuses on those areas by designating them as wild salmon protection zones.

Emma Harper: Have any fish farms been relocated on the basis of evidence of sea lice? It is fascinating that, as you said earlier, sea lice can move 30km before they find a host. It is interesting to hear about the interaction between wild salmon and farmed salmon, but I am also interested in whether any sites have been relocated.

Dr Wells: I am not aware of that happening. That is another example of a holistic approach not being taken. We have been developing the sea lice risk framework since the REC Committee's report was published. The salmon interactions working group recommended that there should be a mechanism whereby biomass can be relocated from more sensitive areas to less sensitive areas. It would have been fantastic if we had made that recommendation at the same time as we were dealing with the sea lice framework. If we identified a mechanism for quickly moving some of that biomass out of, for example, the six areas that SEPA sees as high risk, that would be fantastic.

I keep banging on about it, but we have not done this in a holistic way. We are taking a piecemeal approach, and it is like playing whack-a-mole—we are trying to deal with something over here and something pops up elsewhere.

Emma Harper: As a bit of a segue, I know that what Norway is doing with research and development on the siting of pens is not the answer to everything, but I have been reading about these giant ships—big hulls that are floating fish farms—that can be sited in areas of deep water and can resist storms and high waves. Should we be thinking about that emerging technology instead of net pens that are fixed to the sea bed?

Dr Wells: We should absolutely be looking at emerging technology across the board. Indeed, the industry is doing that, particularly in Norway, because it is incentivised to look at it to a much greater extent.

I am not an expert on what is happening in Norway, but some fish farmers in Scotland are looking at growing smolts to a larger size within closed containment, so that they spend only one year at sea. We look forward to seeing the results of that, because we think that it promises to reduce the impact of sea lice on wild fish, which is generally worse in the second year of production than in the first year. There has been a lot of investment in Scotland in producing smolts in closed containment, and I would certainly like that to be prioritised.

I have already mentioned our significant concerns about open-net pen farming in freshwater lochs.

Rachael Hamilton: What is the process that allows your members to have a sufficient say in any consenting process?

Dr Wells: That is a real area of concern at the moment. District salmon fishery boards are statutory consultees in the planning process, but NatureScot, SEPA and the marine directorate also respond. Often, it is quite frustrating for our members who do not feel as though the concerns that are expressed by the statutory consultee that has responsibility for managing wild fisheries are taken as seriously as some of the other issues.

Now that the sea lice framework is in place, we are working with the Scottish Government to develop the approach that all statutory consultees will take, but there is still a great deal of uncertainty about what that will look like. We do not know how that will fit in. Will SEPA's approach be followed? NatureScot has responsibility for the conservation of various species, and it tends to

focus only on special areas of conservation for wild salmon or for freshwater pearl mussels, which rely on salmon to complete their life cycle.

The committee should be aware of another issue relating to the protection of wild salmon. It is not specific to fish farming; it relates to anything that happens in the marine environment. Salmon and sea trout have both been designated as priority marine features, but the only mechanism by which that can manifest is through one of the general policies in the national marine plan. The plan says that a development should not impact the national status of a priority marine feature, but I cannot think of a single development in Scottish waters that could affect the national status of the Atlantic salmon population or the sea trout population. In essence, that protection is utterly meaningless, so that issue needs to be urgently addressed in order to give NatureScot a stronger role in the planning process, given that those species are endangered.

Rachael Hamilton: To be clear, how does describing the national status of a species differ from recognising that a species could become endangered?

Dr Wells: To be honest, that is just the way that it is expressed in the national marine plan. The plan includes a list of designated priority marine features, and that is how those species are protected.

Rachael Hamilton: Earlier, you talked about the monitoring that is done through the app when fish escape. Out of interest, does that have any status? For example, if your members wanted to make a point about certain applications, could they use that as evidence?

Dr Wells: Absolutely. That information is in the public domain and is shared directly with the fish health inspectorate, which gets an automatic update every time that there is a recording on the app. We have a similar app for diseases that are evident in wild fish, such as pink salmon. The information from the app is integrated into the process.

Rachael Hamilton: How are the statutory consultees weighted when an application is granted? You said that the process is about the salmon farm rather than about interaction with wild fish, so how does the weighting work for the risk assessment?

Dr Wells: The conservation of wild salmon is a material consideration in planning. When local authorities make planning decisions, they have to take that into account, as well as the visual impact and all sorts of other things, so their biodiversity duty comes into play. Local authorities have put in place environmental management plans to try to understand what is happening with wild fish, in recognition that they are trying to fill a gap in the regulatory system. It is not that the environmental management plans are not part of the system, but everyone recognises that they are a bit of a sticking plaster, and there would be no means to enforce them properly if anything were to go wrong.

Rachael Hamilton: When WildFish gave evidence on 5 June, it said that it takes SEPA a long time to gather evidence of harm caused to wild salmon. The representative from WildFish said:

> "SEPA estimates that it will take five years to collect that evidence. That is the opposite of precautionary."—[*Official Report*, *Rural Affairs and Islands Committee*, 5 June 2024; c29.]

Is there a problem with the time that it takes to collect evidence of any harm caused by specific farms?

11:30

Dr Wells: Yes. It is our understanding that SEPA's powers do not enable changes to existing licensed activities without there first being evidence that environmental harm is occurring. SEPA can prevent further deterioration only from the point at which the new regulation is applied, so that is where the standstill lice threshold comes from. Ultimately, that means that any deterioration that was already occurring will continue to occur at that level, so it is not in line with the precautionary principle.

Rachael Hamilton: Okay, and—

The Convener: Please be brief.

Rachael Hamilton: Because of the fairness of the whole situation—the Government wants to see the doubling of salmon farms by 2030 and we also want wild fish to be protected—do you think that the lack of transparency in the data on the website, which you spoke about earlier, has a detrimental impact on adopting the precautionary principle in relation to the evidence that you gather before you rubber stamp a site?

Dr Wells: I am not sure that I understand the question.

Rachael Hamilton: How will the evidence be gathered if there is no transparency on SEPA's website?

Dr Wells: I would expect that, as the new framework comes forward, the information will develop. A lot of the issues and a lot of the tension relate to the planning system. As I mentioned, with the planning system, people are trying to use a terrestrial system for something that is really quite dynamic. It is not like putting an extension on your house or building a factory, for example. When an

application for a farm is made, there is basically a single point in time when everyone says either that it should go ahead or that it should not. What is important, particularly from a wild fish perspective, is everything that happens after the point of consent. The question becomes binary—whether consent is given or not—but, if SEPA's approach is to work properly, it would potentially be useful to consider the on-going impact of a development over time and to change conditions in order to try to manage the situation as things go forward. That might be worth discussing with the cabinet secretary when she comes before the committee.

I do not think that the Scottish Government has a policy to double salmon farming. I think that the salmon farming industry has a policy to grow. The Scottish Government's policy is to support sustainable growth, but I do not think that it has targets in mind, and I do not think that we should be setting targets without doing a proper strategic environmental assessment of what those targets would mean.

Rachael Hamilton: Thank you.

The Convener: Thank you, Dr Wells. That has been fascinating. We could probably have kept you here for another couple of hours, and I appreciate that you have spent a bit of extra time with us.

Subordinate Legislation

Windsor Framework (Retail Movement Scheme: Plant and Animal Health) Regulations 2024

11:33

The Convener: Our third item of business is consideration of a UK statutory instrument consent notification. Do members wish to make any comment on the instrument?

As there are no comments, are members content to agree with the Scottish Government's decision to consent to the provisions that are set out in the notification being included in UK rather than Scottish subordinate legislation?

Members *indicated agreement.*

The Convener: That concludes our business in public.

11:33

Meeting continued in private until 13:02.

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