



First Session, 38th Parliament

REPORT OF PROCEEDINGS
(HANSARD)

SPECIAL COMMITTEE ON
SUSTAINABLE AQUACULTURE

Victoria

Wednesday, February 1, 2006

Issue No. 2

ROBIN AUSTIN, MLA, CHAIR

ISSN 1718-1054

**SPECIAL COMMITTEE ON
SUSTAINABLE AQUACULTURE**

Victoria
Wednesday, February 1, 2006

Chair: * Robin Austin (Skeena NDP)

Deputy Chair: * Ron Cantelon (Nanaimo-Parksville L)

Members: * Gordon Hogg (Surrey-White Rock L)
Daniel Jarvis (North Vancouver-Seymour L)
* John Yap (Richmond-Steveston L)
* Gary Coons (North Coast NDP)
* Scott Fraser (Alberni-Qualicum NDP)
* Gregor Robertson (Vancouver-Fairview NDP)
* Shane Simpson (Vancouver-Hastings NDP)
* Claire Trevena (North Island NDP)

**denotes member present*

Clerk: Craig James

Committee Staff: Brant Felker (Committee Research Analyst)

Witnesses: Randy Alexander (Ministry of Environment)
Lynn Bailey (Ministry of Environment)
Al Castledine (Ministry of Agriculture and Lands)
Dr. Joanne Constantine (Ministry of Agriculture and Lands)
Jaclynn Hunter (Ministry of Agriculture and Lands)
Eric McGreer (Ministry of Environment)
Donna Martin (Department of Fisheries and Oceans)
Dr. Laura Richards (Department of Fisheries and Oceans)
Paul Sprout (Department of Fisheries and Oceans)
Andrew Thomson (Department of Fisheries and Oceans)

CONTENTS

Special Committee on Sustainable Aquaculture

Wednesday, February 1, 2006

	Page
Briefing: Ministry of Agriculture and Lands.....	4
A. Castledine	
J. Constantine	
J. Hunter	
Briefing: Ministry of Environment	21
E. McGreer	
L. Bailey	
R. Alexander	
Briefing: Fisheries and Oceans Canada.....	36
P. Sprout	
L. Richards	
A. Thomson	

MINUTES

SPECIAL COMMITTEE ON SUSTAINABLE AQUACULTURE



Wednesday, February 1, 2006

10 a.m.

Douglas Fir Committee Room
Parliament Buildings, Victoria

Present: Robin Austin, MLA (Chair); Ron Cantelon, MLA (Deputy Chair); Gary Coons, MLA; Scott Fraser, MLA; Gordon Hogg, MLA; Gregor Robertson, MLA; Shane Simpson, MLA; Claire Trevena, MLA; John Yap, MLA

Unavoidably Absent: Daniel Jarvis, MLA

Others Present: Brant Felker, Committee Research Analyst

1. The following witnesses appeared before the Committee and answered questions:

British Columbia Ministry of Agriculture and Lands:

- Al Castledine, Director, Aquaculture Development
- Jaclynn Hunter, Director, Fisheries and Aquaculture Licensing and Compliance
- Joanne Constantine, Fish Health Veterinarian

British Columbia Ministry of Environment:

- Eric McGreer, Senior Aquaculture Biologist, Vancouver Island Region
- Randy Alexander, Regional Environmental Protection Manager, Vancouver Island Region
- Lynn Bailey, Director, Regional Operations, Environmental Protection Division

Department of Fisheries and Oceans Canada:

- Paul Sprout, Regional Director General
- Andrew Thomson, A/Director, Aquaculture Division
- Donna Martin, Strategic Media Relations
- Laura Richards, Regional Director, Science

2. The Committee adjourned at 2:46 p.m. to the call of the Chair.

Robin Austin, MLA
Chair

Craig James
Clerk Assistant and
Clerk of Committees

WEDNESDAY, FEBRUARY 1, 2006

The committee met at 10:07 a.m.

[R. Austin in the chair.]

R. Austin (Chair): Good morning, everybody. I'd like to call this committee to order and begin by welcoming everybody here. I'm very excited at the prospect of chairing this committee. I think we have a very important job to do, a very difficult job to do, but one to which I think we bring the skills around the table. Hopefully, we'll be able to address what is a very complex problem here in British Columbia.

As people have noticed, in the last session there was a new tone in the House that many people alluded to — members of the press and members of the House — and it is my fervent hope that we will continue to bring that tone from the last session into this committee as we do our work. I would like to point out that it is the first time in British Columbia that a committee majority and Chair have been given to the opposition. I welcome that, and I think it shows that the government recognizes that the opposition can play an important role in trying to find solutions to this very complex problem.

Before I came to live in Canada 25 years ago, I remember reading and studying about this country, and one of the earliest memories I have was of the descriptions of some of the great natural resources this country had to offer. I arrived in 1980, just at what was the beginning of the destruction of one of those great natural resources. I refer here to the fact that at one time on the east coast of Canada we had a cod fishery that was the envy of the world. It was one of the great sources of protein around the world, and it had kept people alive for generations. It provided economic opportunities that helped the east coast of this country to succeed.

We are now at the point in our history where our job here is to recognize that we have another very important resource — namely, the wild fishery, the wild Pacific salmon stocks of this country. I think all of us around the table recognize that it is our responsibility to be a part of finding solutions so that our children and grandchildren will be there to benefit from this wonderful, great natural resource.

The dilemma, I think, in this situation is that we recognize an industry that has come about and grown in the last 25 years in British Columbia, that has enormous potential for growth, that can bring jobs — well-paid jobs — to areas of the province where traditionally it's very hard to find industry and to bring jobs to. At the same time, there are concerns — concerns of citizens, of government, of environmental groups, who are worried that current practices may have a detrimental effect upon that great wild resource.

[1010]

The dilemma here for us is to spend the next 18 months sifting through as much information as we can, in the hope that we can come up with some solutions that we will present to government and that will help

create a balance and bring the disparate groups in this society and in British Columbia closer together so that we can have both an industry that can thrive economically and an industry that can grow.

Obviously, we've seen a huge market for the product. The last sales figures I saw were that there is a quarter of a billion dollars in finfish aquaculture sales out of British Columbia. That is not an insignificant amount of money. It produces jobs, depending on who one wants to listen to, for between 3,000 and 4,000 people. So we have a very viable aquaculture industry. Our task here is to see if we can bring some improvements to how aquaculture is done in such a way that it can move forward while at the same time protecting these wild stocks.

As you can see before you, we have a very full agenda today. Before handing over the floor to our first witness, I would just like to ask members of the committee whether they are okay with allowing the witnesses to make their entire presentations and then asking questions afterwards. Is that okay with members?

Interjection.

R. Austin (Chair): Okay.

I'd like, first of all, to ask for a motion to accept the agenda.

Meeting agenda approved.

R. Austin (Chair): Without any further ado, I would like to begin the briefings by asking Al Castleline, the director of aquaculture development from the B.C. Ministry of Agriculture and Lands, to come forward and make his presentation.

R. Cantelon (Deputy Chair): Mr. Chair, I wonder if I might make a very few remarks in the spirit of cooperation.

R. Austin (Chair): I'm sorry. Certainly.

R. Cantelon (Deputy Chair): I echo your comments. I think this is quite a task we've been set with. I look forward to cooperation. This, of course, is sort of a reversal of traditional roles — it chokes me up somewhat — that we usually face in the House.

I think this will be a good experience for both sides here. It is, and it's become an important resource. Certainly, we're tasked and challenged with finding that delicate balance between environmental concerns and an industry that shows great promise and has shown great promise. Fish farms, the aquaculture industry. It's the largest agricultural export in British Columbia, so it's a significant contributor to the economy. It's urgent that we do find a balance and resolve some of the concerns that the public certainly has.

Also, aquaculture has great promise because the conversion of feed protein to food protein in fish is one of the most efficient — in fact, by far the most efficient.... Fish don't have to carry the large skeletal mass

that bovines and other types of agricultural feed do, so it does present great promise to a growing need, not just in B.C. but throughout the world, to feed people.

I'm sure that we can, and I look forward to working with all of the members of the committee to resolve this dilemma that we seem to be facing.

R. Austin (Chair): Now I would ask Al Castledine to come forward and make his presentation.

**Briefing:
Ministry of Agriculture and Lands**

A. Castledine: Thank you, Mr. Chair. I'd like to introduce my colleagues. On my left here is Dr. Joanne Constantine, who works out of the Courtenay office. She is the provincial fish health veterinarian, a position she's been in for, I think, at least a dozen years.

Also to my left is Jaclynn Hunter, who is the director of the licensing compliance and enforcement branch, also operating out of the Courtenay office.

What we would like to do today is provide you with an overview of the provincial role in governance of finfish aquaculture in British Columbia. I'll start, and then I'll be followed by Joanne, who will talk about fish health. Then Jackie will move on to talk about compliance and enforcement, and a conclusion.

What we've done is focused on finfish farming, specifically salmon farming. We'll not be talking about our role in development of management of shellfish aquaculture or in commercial fisheries, including our role in managing the wild oyster and marine plant fisheries. We're focusing on salmon farming today.

We also won't be talking about the industry itself in terms of its profile, value, jobs, etc., as that information would be best presented to you by the industry itself.

[1015]

Our presentation is meant to be informative and to stimulate discussion. I'm sure there'll be questions. What we've done is captured almost all of our comments on the slides that have been copied and distributed to you, so that's a take-away. In some cases these slides are pretty information-dense, but at least you have them. Certainly, we're available at any time to provide further information.

I've already introduced who we are and where we reside. An overview of the presentation. We'll be talking about provincial roles and organization; a bit of a history of aquaculture development, because I think it's instructive; some of the regulatory framework and approval processes — I think those are of considerable interest to this group; some detail on the fish health program, which has been developed particularly over the last five to six years; and then compliance and enforcement.

Who are the entities that provide governance in British Columbia? There's the Ministry of Agriculture and Lands, the branch that I direct, Jackie's branch and the branch that Joanne works for. We also have the integrated land management bureau, which provides access to Crown lands, and the Ministry of Environ-

ment has roles in environmental quality in terms of waste management regulation application. Also, the conservation officer service has a role in enforcement.

This is just a slide depicting the three agencies that are involved — ours, which is Agriculture and Lands. There are two streams in the ministry. One of them is through Daphne Stancil, who is with policy and legislation. That's who Jackie reports through. I report through Harvey Sasaki, who is ADM of the management and competitiveness division. You can have a look at this at your leisure. The integrated land management bureau has a role in providing access to Crown lands. They report up through Mike Lambert. Environment, of course, reports up through Chris Trumpy with those two roles I just mentioned.

This is the branch that I manage. We have a group in Courtenay as well as a group in Victoria. Again, this is for your general information about how we're structured.

Here's a bit of a synopsis about what we do as provincial agencies — access to Crown lands. We license farm operations. We specify certain conditions of operations under those licences. We provide monitoring, auditing, and we require reporting of the industry. We inspect. We enforce. We support research. We communicate publicly — for example, through the compliance and enforcement report. We continuously improve, and we encourage industry to continuously improve. I hope you'll see some of those actions reflected in the presentations as we go through them.

This slide is presented just as a reminder of what the provincial role derives from. We certainly know that the federal government has these four key roles: management of seacoast and inland fisheries; fish and fish habitat protection; navigation; and a responsibility for international and interprovincial trade — for example, seafood safety. That's a role for the Canadian Food Inspection Agency.

Provincial roles derive from four other responsibilities. One of them is provincial roles in private property; licensing businesses for Crown lands, once more; and then our role in managing waste or discharge, escapes and fish health.

[1020]

A bit of history in terms of aquaculture in general in the province. It started in the early 1900s with oyster farming. Salmon farming started in the '70s, based upon research that was conducted by DFO at the laboratories in Nanaimo. At that time facilities were licensed under something called the federal aquaculture enterprise licence.

In the '80s we saw an increase in the number of farms. In 1986 there was the first development moratorium and an inquiry by Dr. David Gillespie. At that time MAFF — now MAL — was established as the lead agency for aquaculture development. We had a bit of a halt in '86, a review. There was concern that far too many farms may be developing in inappropriate locations. That led to certain recommendations, which were accepted by government.

In 1988 we also had an Ombudsman's report. This was based on some complaints that upland owners had about farms apparently appearing overnight in front of their properties. That led into a bit more of a coastal planning approach to aquaculture development. In '88 we had the federal-provincial MOU on aquaculture development, which spelled out the primary roles of the two parties.

In '89 we introduced the first therapeutic use regulations, and aquaculture licensing authority in B.C. came under the Fisheries Act. There was no more aquaculture enterprise license through the federal government. We also introduced the aquaculture regulation.

In 1995 we had another suspension on new applications, and that resulted in a very important initiative called the salmon aquaculture review. A lot of what's been done since then has been as a result of the recommendations from that particular exercise. It was completed after two years, and a five-volume report was released. That resulted in something called the salmon aquaculture policy framework, and it was based on the 49 recommendations that came out of the *Salmon Aquaculture Review*.

In 2000 it was recognized that a number of farms were in inappropriate locations, either for environmental, social or economic reasons. An attempt was made to relocate those farms to better places. Some of them were actually taken out of production. Others were transferred to other uses. The escape regulations were developed, and there were significant enhancements that were started to the compliance and enforcement program. These were based on recommendations from the SAR.

In 2001 the fish health auditing and surveillance program was initiated through Joanne's group, and the first comprehensive compliance report was produced. In 2002 we had the waste control regulation developed — improvements to the escape regulations. At that time what was called the moratorium was lifted, and new applications started to be accepted.

When we started the suspension in '95, there were 121 licences — not all farms — in the water. There are now 132, so there has been a net increase of 11 since 1995.

Sea lice monitoring programs started in the Broughton, and fish health management plans were required of the industry in 2003. These fish health management plans are a very important part of our provincial approach to addressing fish health issues in salmon farming. In 2004 sea lice monitoring was expanded.

Just a reflection, again, on the *Salmon Aquaculture Review*; its significance; the major issues that it addressed — siting, marine mammals, waste management, escapes and fish health; its recommendations; and, again, the policy response, which was the salmon aquaculture policy framework. What came out of it was this policy framework. We developed new and consolidated siting guidelines, binding escape prevention and response plans, new waste management regs,

a new fish health program and an enhanced compliance and enforcement program.

Also, it was recognized in the *Salmon Aquaculture Review* that further research needed to be done to address issues that were brought up. Through that, we established what was called the aquaculture environment fund, which was set up to address some of these environmental concerns, and a chair in sustainable aquaculture was initiated at the University of British Columbia.

Some of the environmental research has taken place, and this is all done to inform management, either by industry or ourselves. Workshops have taken place on infectious hematopoietic necrosis virus, sea lice, shellfish waste, bloodwater management, waste monitoring techniques. That is to inform a review of the waste management regulation, which is scheduled to take place five years after it was brought into force, so it informs continuous improvement in industry operations and management.

[1025]

I probably touched on this. Our ministry grants authority to conduct the business of aquaculture. We monitor the state of compliance with regulations. We also have a major role in diagnosis, monitoring and assisting in the control and preventing of animal disease — in this case, fish disease.

The land management bureau issues tenures. Environment has the waste management regs and enforcement role through the CL service. Local governments also have a role in how aquaculture develops in this province through local land use zoning bylaws.

I'd just like to reflect a little bit on how someone actually gets in the door with an application. They're very, very detailed proposals that are submitted to the integrated land management bureau, which are then distributed to the other agencies — DFO, ourselves and Environment, for example. They also refer to local governments and other stakeholder groups, which include first nations referrals and open houses. Jackie can inform you later. There's a wide variety of stakeholder groups who receive these applications and are asked to comment — yacht clubs, vessel owners associations, coastal carriers. Multiple groups are consulted.

I think you've all seen this particular flow diagram. I'd just like to put it up here once again to show where the major decision points are in a proposal getting through the system. Of course, the proponents are very aware of the rigour that's applied to these applications in terms of the review. For that reason, the proposals we get are usually high-quality proposals.

It may seem that we have a very high success rate when proposals come in the door. Part of the reason for that is the homework that's done by the proponents. Part of that homework is that there is a review by a project review team of the proposals before they actually enter the system and move down through this. On the left are the roles for the federal government. On the right are the roles for the provincial government. Again, I'm not going to touch on this. Each of those boxes could take quite a while to go through.

What we do end up with after that process is the provision to an operator of a licence that contains a series of conditions. It refers to the site location, the area occupied, the operational layout and the improvements. This is what Crown lands refers to as anything that is on the site of a physical nature. It specifies the species and the maximum total production.

Also required as a condition of licence are waste management best management practices; a fish health management plan, which runs to a hundred-plus pages; and escape prevention and response plans.

Again, I mentioned that before someone gets in the door, they have to provide government with very detailed descriptions of site characteristics, and this can cost the proponents anywhere from \$100,000 to \$250,000. So they're not taking a flyer at sites. They're doing their homework. One of the things they have to do is provide us current speeds and detailed marine and freshwater inventory so that it can be assessed during the approval process.

Our staff also go out and look at these sites. These are not all of the siting guidelines. They're a synopsis. They reflect consideration for first nations reserves, salmonid-bearing streams, herring-spawning areas, proximity to other finfish aquaculture operations. We look at aboriginal, commercial or recreational fisheries; heritage significance; first nations cultural significance; sensitive fish habitat; marine mammals, etc.; and proximity to ecological reserves and parks. So it's a very, very significant process that it's gone through.

[1030]

Okay. There's a very quick run-through. I'd now like to hand it over to Dr. Constantine, who will run us through her fish health program.

J. Constantine: Just to start off, what I'll do is give you a quick overview and a breakdown of what's involved. I work for, as Al Castledine alluded to, Dr. Ron Lewis, who's the director and the chief veterinarian for the province of British Columbia. We have a section called the fish health section, and in that section there are several of us. There's a field veterinarian, which is my position. Dr. Gary Marty is a veterinary board-certified pathologist who does all of our analysis and handles all of our cases for us. We have several technicians in our laboratory in Abbotsford, which is recognized in Canada as only one of two certified laboratories in the country, and we have several field technicians. A couple of positions have recently been funded and have not yet been filled. We're hoping to fill them in the new and coming fiscal year.

There are sort of three program areas that I deal with under fish health. There's the fish health management plan that Al alluded to, which is a condition of licence, and that's what I would call our regulatory tool with which we can enforce actions that we take. It's a comprehensive program that goes through every activity on a farm and how that may affect fish health.

We have our auditing and surveillance program, which is the team of biotechnicians that I referred to that goes out to sites — I'll go into a little detail in a few

slides — and runs our fish health and disease program as well as our sea lice monitoring program.

We have a series of required reports that have arisen as a result of the recommendations from the review that are on our website and are posted for the public to look at in terms of what's happening out there on farms in terms of health and disease — as well as, again, sea lice, which is a specific issue of concern to the industry.

The fish health management plans are basically required for all government, private and public facilities. When I refer to public facilities... We do have a significant enhancement sector in the province, so they also are required to have fish health management plans. Each of these plans applies to the activities that occur within those facilities. Each company and each public facility must have standard operating procedures to show how they're going to address these activities as they relate to fish health.

Again, for private aquaculture facilities, these plans are a condition of licence, and as I said earlier, they're our regulatory tool. There are three documents that make up a fish health management plan. There's the required elements document, which is basically an overview of what the objectives are that we're trying to achieve with these plans. The template is basically... What we've done is we've set out for industry and our public facilities the areas that we want to see them address. These took approximately two and a half to three years to develop and had quite a lot of scientific input, and they're scientifically rigorous.

Then we have the manual of fish health practices, which is a document that I use to evaluate and approve plans. It gives me a set of guidelines to say, "Here's what the norms are and acceptable science around these practices," so that we can judge whether the operating procedures of each company are sufficient. I put the Web link in at the bottom if anybody would like to see them. Or if the committee wants, I can certainly provide copies of those to you.

Just a brief overview, because they are very extensive documents. There are four main areas that we talk about — again, forming objectives, characterizing the health of the facility. I like to talk about it as not just disease-oriented; it's health-oriented. The premise that I work under is that if you have healthy animals, then you're less likely to have disease. So we do look at everything from handling to water flow, tank materials. It's very, very comprehensive. We look at, again, specifically identifying and managing risks — things that'll put fish at risk of having disease or ill health, be that nutrition or any activity ongoing within the facility. Specifically, we look at different diseases as well — diseases that we know are of concern — and how we reduce exposure to those diseases, as well as how the diseases are managed and specifically related to drug and chemical use.

The second portion of our program is what I like to call our auditing and surveillance program. Essentially, it has two programs. One's related to fish disease, which relates to viruses and bacteria and things that

occur in the fish. The other relates to sea lice, which is a parasite of fish.

[1035]

Essentially, what we do is audit the programs to ensure that the data in the required reports that we have from industry is accurate. So my staff go out to sites. They actually look at the fish on those sites. We run a series of diagnostic tests to determine the health of those animals, and we report that back through our Web information.

We require the industry to provide us with a comprehensive overview of what the health status is of their facilities, and by comparing these reports, we can look at whether or not they're accurately reporting the health of their animals. We have on-site knowledge — our own testing, which is done through our own laboratory facilities, that audits the information that's provided to us. This is an approach consistent with other government activities.

Essentially, as I said, we have people who go out on site. They look at fish. Our diagnostics are all done in-house at our Animal Health Centre. The basis of our program is scientific. Because we're subselecting a sample portion of the industry to audit, we try to do that in a scientifically rigorous way, so we do it based on established fish health zones. Again, we examine tests for specific mortalities, but we also, through the process of this examination, look at the overall health of the animals.

When we're choosing farms, we have a computer-generated program that allows us to randomly select them, so we audit them based on a random selection to get a good representation of what's out there. We weight our sampling to make sure that if there's more production at any one area, those areas get sampled at an equal rate. Basically, it's an equal opportunity, but they're weighted towards the amount of production that's in that zone.

What this basically relates to is that we sample about 30 farms in every quarter. When I talk about a quarter, it's a calendar-year quarter — January to March, April to June and so forth. We test up to 30 fish a quarter, depending on how many animals and mortalities there are in the particular day that we're on that farm. We look at the mortality population, because our sampling is actually biased to look at disease, so we're actually trying to target to see if disease is there, as opposed to simply looking at the healthy population where it's much more difficult to detect disease.

We look at about 120 farms a year and upwards of about a thousand-plus animals a year. The numbers of animals we sample, again, will depend on what's actually at the farm on the day that we're there. To date we haven't detected any diseases in B.C. that aren't native to here, that we haven't seen in wild species.

The second portion of our program is our sea lice monitoring program. This was developed a little later in our addressing of the *Salmon Aquaculture Review* recommendations. Essentially, what happened was that sea lice became an issue — I'm sure you're all aware of the issue in the news — in 2002. Initially, we

started our program specifically in the Broughton, which was the area of concern. What we did in the following year is that we expanded our program to the entire industry, because I'm responsible for the industry and where it operates, not just in the Broughton.

What we do is have the industry report to us on a monthly basis what their sea lice levels are for the areas and the zones that we have established, again, for fish health. We developed them in conjunction with DFO, so they're based on watershed, loosely related to the fish diseases. What we do is audit about 25 percent of the farms from July 1 to March 1 and 50 percent from March 1 to July. The reason for the separation is that the March-to-July period is considered to be the time when the pink and chum salmon in particular are out-migrating from the rivers, so that's our target area of concern when interaction occurs. We want to make sure that we know what's going on during that time, so we increase our auditing at that time.

We compare our audit data to the industry data, and we statistically analyze it to look at it to make sure that, again, what they're providing us on an industry-wide basis is accurate. We set our trigger levels at three mobile lice. This is an international approach to management of sea lice on farms. Essentially, the countries involved in aquaculture have set levels based on what the data is from their countries, so there's a series of levels out there in countries like Norway or Chile. We've set ours at three mobile lice per fish, and what that means is the actual motile stages of the lice. I don't have a slide of the life cycle of the lice, but if you'd like, I can certainly provide that information. What it is, is the section of the life cycle that can actually cause damage to the fish, so that's what we're looking at.

That trigger basically means that at certain times of year the farms have to take actions to make sure that the lice levels are dealt with. During the migration time that means that they have to treat to make sure that the levels are below three. For the remainder of the year it may mean that they increase monitoring or that they treat or that they harvest. They have other options as well.

[1040]

Some of the public information that we provide... One of the things that came out of the SAR review was the lack of information out there available on the status of the health of the industry as well as a lack of public transparency. To address both issues, what we've developed is a couple of databases. The industry has the database that does all the reporting to us, and we have an audit database, again, which provides information to the public. We basically have that information on our website for the public to see. It's for fish, health and sea lice.

What we have is... The industry report is for their sites — average mortality rate, proportional mortality rate and fish health events. What that means is that we know what the average mortality rate is for both fresh water and salt water on these farms for each of the quarters that we're looking at — again, a calendar quarter. Also, we know the proportional mortality rate,

which is a series of standardized reasons for loss. They may be infectious or non-infectious causes of loss, so it might be related to predators. For example, in a marine site or in a freshwater site, it may be that they've had a breakdown in their system and there were some fish that were killed. There's a standardized procedure for reporting so that we know that these rates are based on actual similar diagnoses.

Then we have what's called the fish health events. Fish health events are veterinary-reported interventions. These are based on what the farms themselves have done to deal with the health issues. They're based on reports from the veterinarians who work in the aquaculture industry in B.C.

For sea lice, we report monthly lice levels. As I alluded to earlier, we audit those monthly lice levels as well.

Just sort of as a synopsis, the aquaculture industry is the only industry in B.C. that publicly reports reasons for all the mortalities, both infectious and non-infectious. It's the only agrifood industry that publishes the infectious causes of loss, and it reports all the drugs as well. We track the drugs through the feed mill. One of the unique things about aquaculture is that in order to provide treatment to the animals, it has to be milled into a feed. As a result, our system can track the feed levels of the drug that's incorporated into the feed. Basically, we have 100 percent of all the treatment that goes in food animals as compared to, say, a pig or a cow where a veterinarian can inject an animal with a drug for treatment of disease and there's no system or mechanism for tracking those things. For B.C. we're the only ones who complete audits on our industry's data that's reported publicly.

Lastly, the business rules for reporting. I just want to give you a sense of what the requirements are and how we do a little bit of our compliance monitoring. I haven't gone into a lot of detail about it, but basically all the industry farms must report to the database — and that's their database — by the 10th of the month. There is a database manager who reports the information to me by the 20th of the month. They also provide me with a compliance report which allows me to know if there's a company that is out of compliance so that I can take actions, if required, against that company. That action would be taken through fish health management plans. These things are prescribed as required under the fish health management plan, which is a condition of their aquaculture licence.

Again, all of our information is posted on the website. If anybody has any specific questions, I'd be more than glad to answer them. Hopefully, I didn't run through that too fast. My east-coast accent sometimes gets me in trouble, so I apologize if that was a bit quick, and I'll pass it over to Jackie.

J. Hunter: Good morning, and thank you. What I'd like to do first of all is just highlight the structure of the fisheries and aquaculture licensing and compliance branch. We have a compliance and monitoring unit which is headed by a section head. There is a total of

eight staff in the compliance unit. Six of those inspectors are in Courtenay, one in Campbell River and one in Prince Rupert. I have a manager of shellfish program planning and two first nations' staff that carry out consultation with first nations on aquaculture applications, and finally, the licensing section that actually does the adjudication of shellfish and finfish aquaculture applications.

What I'd like to do this morning is just give you a brief overview of both the licensing unit and the compliance and enforcement unit. In terms of licensing as it applies specifically to salmon aquaculture — as Al went into detail earlier — considerable review is completed to determine if an application meets the identified criteria. All of our licensing decisions are based on principles of administrative law and natural justice.

[1045]

Some of the general principles that are guiding the deliberations on our salmon farm applications include fairness, transparency, efficiency and accountability. The key values that are applied and considered by statutory decision-makers include protection of the environment, sustainable economic development and ensuring public health and safety values are maintained. This licensing policy material is available on our MAL website, but I would certainly be happy to provide copies to Mr. Chair, if you would like to see that level of detail.

Al talked earlier about the one-window application process for finfish and shellfish aquaculture, so we have a close relationship with staff in the integrated land management bureau who are accountable for the tenuring process.

In terms of some of the general factors that are considered by MAL licensing officials, aside from the biological information that Al was talking about earlier, they are, again, the adequacy of information presented, compliance with legislation and related regulations, suitability of the proposed site with respect to the proposed operation, and the past performance of the applicant. That would involve, for example... If a statutory decision-maker was considering an application for an existing company, he or she would go to the section head of our compliance unit and say: "What is the compliance history of this proponent? Are there any issues?" If there are, oftentimes we will attach conditions of licence.

We consider comments from referral agencies, again, that Al referred to earlier — a whole range of referral agencies, including Council of Marine Carriers, prawn fishers, a great number of them — the nature and adequacy of public input and comments, community support or opposition, potential economic and employment benefits from the application and, of course, results of all first nation consultation for those sites for assorted traditional... Excuse me; for sites where first nations are in... Sorry. We'll just carry on. I'll come back to that. I'm getting mixed up with my words here.

Just to give everyone an overview of licensing activities for 2005 — and this is all branch activities — on

average, we issue annually 1,337 licences for finfish aquaculture. That's 133 marine water, 125 fresh water and for shellfish aquaculture approximately 102. That was for 2005. Then we have marine plant harvesting, wild oyster harvesting, commercial fisheries and Crown land tenures.

Now I'm going to get into the compliance program. For aquaculture, we're operating under a comprehensive MOU that we ratified in 2002. Our partners include Agriculture and Lands, conservation officer service and integrated land management bureau.

Some of the goals of our service agreement include efficient use of staff resources to minimize duplication, one-window approach, a goal of securing and maintaining high levels of compliance, early intervention to avoid non-compliance, effective enforcement and prosecution where required — that's with our partners at the Ministry of Environment — public confidence and, finally, transparency.

Some of our key functions in the compliance program. We monitor, inspect and enforce commercial fisheries, finfish and shellfish aquaculture, marine plants and wild oysters. The compliance and enforcement regime for our inspections staff includes application or promotion of the following elements: promoting industry best practices, monitoring and inspections, conducting investigations on alleged legislative or licensing violations — and, again, a lot of that is in partnership with the Ministry of Environment, pursuant to our interagency service agreement — public reporting on the compliance status of salmon farm inspections — that's our annual report on C and E inspections — and maintaining good relationships with stakeholder and first nation communities.

A couple of examples that I can think of are in Tofino, our inspectors will contact the Ahousat First Nation and let them know when they're going out to a site, to invite. They have a good working relationship. Similarly, up in the north Island.

Some enhancements. Al talked earlier about the enhancements to the compliance and enforcement program. In the last five years we have enhanced joint agency regular inspections, as I talked about, with our agency partners at MOE and integrated land management bureau.

[1050]

Implementation of a secure and confidential compliance and enforcement case file tracking system. We now have a 24-7, toll-free escape reporting line. In 2001 we received our first conviction through the courts relative to our ministry statutory framework. The senior inspector is an ex-RCMP officer with 22 years of law enforcement experience, and he has been in our unit for just two years. Our MAL inspectors have been designated as special conservation officers pursuant to our interagency service agreement. In the last year and a half we've hired two new fisheries inspectors, and we have expanded cross-compliance working relationships with Department of Fisheries and Oceans, MOE and land management staff.

The purpose of this is just to give you some background for the committee on the number of files. For example, in 2005 we opened 652 files in the compliance and monitoring unit. That's tracking all activities of the inspectors in the compliance unit. To give you an idea of breakdown, we had 177 files pertaining to finfish aquaculture. That included inspections, any necessary follow-up out of inspections and any investigations or escape incidents. We had 159 cases pertaining to shellfish inspections and investigations. I believe 84 of that 159 were, in fact, shellfish inspections. We had 233 cases pertaining to commercial fisheries-related issues, and that also includes some of the licensing requirements such as doing truck buying inspections; 34 wild oyster files which would include, for example, beach controls and those kinds of issues; and 49 marine plant files.

To give you an idea of compliance rates for the industry, these are the results of the 2004 compliance rates. As I mentioned earlier, 100 percent of all active finfish farms are inspected annually. Generally speaking, that's between 75 and 80 sites a year are active at any given time of the 133 licensed sites. For finfish aquaculture, when we had our first annual public report, which was in the year 2001, we have documented, based on annual comparisons, increased compliance rates year to year.

Compliance rates for the 2004 inspection sites. These are just some examples of categories that we inspect when we are on site. For the Ministry of Agriculture and Lands, full compliance with BMP requirements: 78 percent. The lower compliance for this particular category was not that they didn't have the necessary best management practices, it was the fact they didn't have an endorsement signature on their plan on the farm. Full management plan compliance, 87 percent; escape response plan category, 94 percent; containment nets inspection maintenance and record keeping at the farm site, 94 percent; and inventory records compliance, 97 percent.

As I mentioned earlier, we inspect on behalf of the Ministry of Environment and integrated land management bureau. Some examples of compliance rates for 2004 for those categories that we inspected: sewage treatment and disposal maintenance records, 81 percent — and again, the issue with respect to that lower level of compliance was around the presence of maintenance records, not around sewage treatment issues themselves — full compliance with best management practices requirements, 84 percent; spill equipment management, 96 percent; water use and licensing, 97 percent; and refuse storage and disposal, 100 percent. I will make sure that I provide Mr. Chair with copies of the 2004 report when it's published, which should be in the next two to three weeks.

In terms of some of the enforcement sanctions for 2005, I talked about our interagency service agreement. Fisheries inspectors in the Ministry of Agriculture and Lands are responsible on our compliance continuum for issuing verbal written violation tickets. If we believe that our investigation deems further action, then

we refer to our partners at the Ministry of Environment.

In 2005, 94 violation warning tickets or letters were issued to various finfish, shellfish and commercial licence holders. For aquaculture itself, we had 34 documented verbal or written warnings, 20 for finfish and 14 for shellfish; commercial fisheries, marine plant and wild oysters, 66 enforcement sanctions noted. In terms of referrals to our partner agencies and DFO, the total 2005 referrals for follow-up or possible charge consideration: for finfish, we referred five files; shellfish, 14 files; and commercial fisheries, 16 files.

[1055]

I talked earlier about our first convictions through the courts was in 2001. Just to give everyone a synopsis, the number of finfish aquaculture court convictions to date, 2001-2005, is 18.

I wanted to talk briefly about escape prevention. Prevention is the most effective strategy, as we know, to address environmental risks from escapes. Al talked earlier about changes to the aquaculture regulation. The latest amendment to the regulation in 2002 now requires binding escape prevention and response plans, minimum net-strength testing and monitoring requirements, monthly net pen inspections, daily system checks, anchor inspections, records of fish inventory inspections, staff training and escape events and best management practices plans guide farm activities. Both the Ministry of Environment and our ministry require that, and that's a series of standard operating procedures that addresses how they will handle certain activities on the farm site.

Carrying on, operators are required to report within 24 hours any known or suspected incidents. That is in the aquaculture regulation. I talked earlier about the 24-7 manned line. In general, escape numbers are declining compared to earlier years. The exception to that is last year. We had a total of 43,969 fish lost, primarily due to a single escape incident in Nootka Sound. We did refer that file to the Ministry of Environment, and it is still open pending consideration of charges.

The ministry placed a high priority on escape prevention measures, and our objective is to achieve zero escapes. This is just a graph to highlight year to year, and it does include the numbers for 2005. We just analyzed those figures last week, where we had a total reported loss of 61 fish.

In conclusion, Al put this slide up at the beginning of our presentation. We hope that we've provided you at a high level some food for thought. To highlight what we do: basically, we provide access to Crown lands, we license farm operations, specify conditions of licence, monitor, audit, require reporting, inspect, enforce, support research, communicate publicly and, finally, continuously improve.

Thank you very much.

R. Austin (Chair): Thank you very much.

I'd now like to open the floor for members to ask questions to any of the witnesses.

S. Simpson: Yes, and I have a series of questions. But I'd like to start with a matter that's related to this, but not specifically. Could somebody confirm whether in fact there is a new farm licence pending? It's my understanding.... I've heard that as soon as in the next week or so, when a navigable waters permit is received, from DFO possibly, that Greig Seafoods may have a new licence in the Broughton? Could you confirm, or tell me whether that's accurate?

J. Hunter: Well, what I can tell you is that Greig does have an application for Bennett Point in the Broughton Archipelago, and it's still under adjudication at this stage of the game. I mean, Al, I don't know if you have anything to add on that front?

A. Castledine: No, it's still under adjudication. There's been some discussion about it. It was an application that was in process for over a year.

J. Hunter: It's been in process for, yeah, well over a year.

S. Simpson: Well okay, I guess I'm glad to get that information. I heard it was a little farther along than that and that they're hoping to have 600,000 fish in a plant by March.

Now, what I'd like to know, and this relates to the work of the committee.... Mostly, I am concerned that this application is close, if it is. I'm told it's fairly close to a decision — though it may be in adjudication, it's very close to a decision being made. I'm a little concerned that that activity is going on — not the merits of that application, but that that activity is going on while we're doing the work we're doing.

[1100]

My concern is we know that the work of this committee has been.... There's been some scepticism about it. Whether it's scepticism about whether we have predetermined views on this side, or the other side has predetermined views. I'd like to think that everybody's working hard to set all that aside and try to come to some resolve here. If there are applications being approved during the time that we're working — and without at least my knowledge as a committee member that it's pending when we're sitting for the first time as a committee — that's of concern to me.

So I would very much like to know from somebody, whether it's from others in the ministry or from the minister himself, whether, in fact, this application is going forward. I'd also like to know whether we might anticipate any other applications going forward or being approved while we're doing our work, and I think it's important that we know that now. It will affect our business plan. It will affect what we do as a committee, and quite honestly, I think it begins to affect the credibility of the committee and its ability to do its job if we have farms being approved while we're doing what we're doing, particularly if that's going on without our knowledge. It's not our job to decide whether it's a good idea or a bad idea, but without our knowledge

that those things are pending particularly, I have a concern with that.

So I raise that concern primarily for the Chair and for the committee — that we need to get some certainty from the ministry and from the minister as to what is or isn't occurring there so that we can, in good faith, go forward and do our work and clearly see that the government is taking the work of this committee seriously in terms of the decisions it may be making about applications that are in front of it.

That's a concern that I have that I would like our committee, possibly through the Chair, to deal with quite expeditiously, since we're now into our work, and then we'll move on to doing the other work that's in front of us.

R. Austin (Chair): Can I ask if there are any other comments with regards to Shane's concern?

R. Cantelon (Deputy Chair): Well, I think to address it, one of the considerations in setting the terms of reference was whether or not a moratorium would be imposed during the considerations and deliberations of this committee. That was not considered and not put as part of our mandate, and I think that your comment was: "It's not ours to decide whether or not it's a good idea or a bad idea." I think a moratorium in some ways would imply that we would have some sort of jurisdictional authority over pending applications.

I don't think it's clear we do not, but I think you raised a very, very good point that, certainly, we should be made aware and well-informed of the procedures and pending applications, what state they're in, so that we can either offer comment or at least review them in the context of our overall review. It might be very informative for us, in fact, to sort of walk through those approval points that they've gone through as a learning exercise, but as you pointed out, it is not for us to say yes or no. That was not given to us as one of our mandate criterion, but I agree to the point that we should examine and review that application just from an information point of view, which might be a very good idea.

S. Simpson: Just very briefly, and I agree that there is no moratorium in place and that that's not what we're doing here, but I also know that the minister was very cognizant of the fact that it would be very difficult for this committee to do its work if there were a significant number of applications being approved during the term of the work. There may be reasons why some may or may not be approved, and that's a matter that, I think, we need to understand when they are going ahead.

But what I do think is it's very important that we know that. I also would like to have some sense.... I'm sure that from now through the next year to 18 months that we're working.... You know, planning, as we've been told, starts very early in this process, and it's not a brief process to get a farm. So we probably could get a pretty good idea relatively quickly about whether, first of all, this farm is, in fact, going to be licensed and

whether it is or isn't. But might we anticipate two or ten or 20 over the period of the next 18 months that would be possibly in the hopper to be considered for approvals? I'd like to know what we're talking about here, because people from either side of this debate should have some idea what the expectation is for what the ministry will be doing while we're doing our work.

[1105]

That doesn't mean we get to say yes or no to those, but it at least goes back to.... I think the comment from the staff was around transparency. Obviously, it becomes an even bigger issue with us working as a committee. So I'd like a little additional transparency and for the ministry to tell us how many applications are potentially in the hopper to be given serious consideration during the anticipated 18 months of our work.

R. Austin (Chair): For the information of the witnesses, maybe what I could do is request for us to get that information from the ministry officials. That information could then be given to the Clerk of Committees and distributed to all members of this committee so that we are at least aware of where applications stand and exactly what will happen during the next 18 months. Does that sound fair?

G. Robertson: Is a motion required to direct the Chair around that? I certainly support — as the member for Vancouver-Hastings has suggested and the Chair echoed, and the member for Nanaimo-Parksville as well — that we have clarity around the applications that are in process from the minister, so that we as a committee can be informed around which may or may not affect the work that we do over the coming 16 months, particularly around the definition of "sustainable," and that our work is not potentially undermined by licences that move forward contravening our mandate.

R. Cantelon (Deputy Chair): There's the other side of it too. As a member of the caucus agriculture committee, I've become aware that the fish farm has been moved, and this is on the environmental side. On one side we have the production side; here we have a response to environmental concerns, which we're certainly dealing with. I understand that the ministry has contributed \$500,000 to assist in moving a fish farm from the Broughton Archipelago. I don't know if all the members are aware of this, but we should all be made aware of this. I would invite the ministry's comments as to what led to that, the effects, the costs, so that we can again make that part of what we know in our considerations as we move forward.

Life goes on, it would seem, and that shouldn't detract from our work, but we should be fully informed of what's going on.

S. Simpson: And then we can determine what we think about that after we find out.

R. Cantelon (Deputy Chair): Exactly. We can determine, as Mr. Simpson just said, what goes on afterwards.

C. Trevena: Just, I think, maybe a point of clarification on this. I quite agree; it would be very good to be informed. If I can ask either Jaclynn or Al: there's an adjudication process happening now; what time frame is this...? How long will the adjudication take?

J. Hunter: It really quite depends on the range of issues. You know, Bennett Point has been in the system probably close to two years. I can't give you a definitive time line of when the statutory decision-maker — in this case it's not me — would be ready for a decision. It can range based on first nations consultation, any biological issues — those kinds of things.

On average, if you were to ask me....

Interjection.

J. Hunter: Sorry, go ahead.

C. Trevena: What level, what stage in the process is it at? Has it started the adjudication process? Have you had any consultation at all? Just so we can get a sense of time frame on this specific one.

J. Hunter: Oh, I'm sorry. Most of the consultation on this particular application has been completed. Right now the statutory decision-maker is reviewing the file in its entirety. When she will make a decision — I don't know the answer to that, but we will certainly commit to providing you with a list of those applications in process and where they are in that, so that you are well aware.

R. Austin (Chair): I appreciate that. Thank you. Any other questions?

S. Simpson: Getting back to the presentations that were made — and I'd like to thank the staff for that — I have a couple of questions in regard to some of them. And if these are questions better placed with the Ministry of Environment officials who are coming a little bit later, tell me and I'll save them for them.

It seems, around the question of sea lice.... Obviously, the issue of sea lice is a very big piece of what we're doing, and issues related to that. Does the province do original research around questions related to sea lice, or does it look to garner that analysis from others?

[1110]

J. Constantine: I could probably best answer that question. We do do some in terms of.... I was actually involved in some research looking at the information that we collected on farms and trying to coordinate with our sister agency at DFO, who was doing the wild fish data. So we were looking at both the wild and farm fish data. That was done under federal funding — ACRDP, which stands for aquaculture collaborative research and development project.

So we do do some, but we do, I think, a combination of funding, primary research, with research agen-

cies like the Department of Fisheries and Oceans. That's really their forte. We get involved from a science perspective in terms of providing information and support and field data in terms of the farms. I hope that answers your question.

S. Simpson: Partly. I guess the second piece of that, then.... Has there been direct research done, then, on the linkages between sea lice, the lice on farms and the high lice loadings on juvenile salmon?

J. Constantine: There's a lot of research in progress right now. Like anything, it takes time. One of the things that we struggle with is when you're looking at things like sea lice, which are a natural parasite of wild fish, you have to look at inter-annual variation, because there are a number of oceanographic factors involved — abundance of animals. There are many risk factors involved with that, so it's taken a number of years.

That data is really coming to accumulation right now. I think there is going to be a series of papers that are published in the next year or so — both of which, again, the ministry has been partnered with, as I referred to — as well as primary publications from DFO looking at those questions. And there is continued research going on — looking at that, as far as I'm aware — with Fisheries and Oceans over the next year.

S. Simpson: Just one more question related to that specific issue. Are there others outside...? You talked about DFO and work they're doing. I'm sure there are other academics out there...

J. Constantine: Yes, absolutely.

S. Simpson: ...doing work, who have completed work or who have published on these questions.

J. Constantine: Yes, there are.

S. Simpson: Is that information taken into consideration? Are the results of that information around the relationships between lice, farms and juvenile salmon available? Do we know what...? Is there any consistency in what it's telling us?

J. Constantine: There's a fair bit of information that's been published out there. I think there's some more information coming. There's certainly a lot of work going on at UBC as well.

Let me just think. Is there anyone else I'm missing now? Al was involved in the funding of some of this research and these programs. I'm involved on the ground level, so we can probably add to this question together.

A. Castledine: There is work done at the University of Victoria as well. Sometimes the research proposals are funded and they don't pan out. I think that happened in that particular case.

I think the focus of Joanne's attention and the ministry's attention is managing sea lice on the farms. The interactions.... There's been a lot of work done on that. Of course, the scientists who are involved read those reports and try and interpret them in the context of British Columbia, which has some differences.

I'd say that there have been publications, and you may be referring to those by Dr. Routledge at SFU, Alexandra Morton. Certainly, they're all reviewed by the scientists who are involved, DFO scientists included.

J. Constantine: There is a concerted effort on sea lice research to look at interactions, and as I said, there are multiple year-to-year variations on that. That is certainly stuff I deal with on a daily basis. I mean, sea lice takes up a significant portion of my job duties and what I do, and certainly the science....

We try to continuously evolve with our program. When you look at the history.... Maybe this will give you a bit of an idea, Mr. Simpson. In 2002 when we started, we had no data. We had no program, really. We started that program. We've tried to adapt based on what the science from that program on a farm management level has told us. At the same time Fisheries and Oceans, which is responsible for the wild fish in terms of the monitoring, started a concurrent program.

We've made an effort to try and integrate that information so that we are informing the decisions that are made with the independent research that's going on out there as well. Certainly, the Pacific Salmon Forum has taken that on as well, and I'm involved in that. That information is integrated into what we do as best we can — absolutely.

S. Simpson: Just one last.... You mentioned the Routledge-Morton work, and I've not seen it, but I've heard about the work. Was that peer-reviewed work by people in the science community? Is that an important consideration for you? Because there's a ton of stuff out there on both sides of this argument, I'm sure. Is it important for you that it be peer-reviewed so that you're looking at what other scientists who have credibility are saying, "Yeah, this is legitimate research, and it should be considered," versus stuff that's promotional on either side of the debate?

[1115]

J. Constantine: Absolutely, and certainly peer reviewed is one portion. From a management perspective, I think we also.... As an agency that's responsible for on-the-ground management of the industry, to make sure they're being responsive.... The data, too, that's in progress.... Peer review takes quite a long time.

What I try to do is actively stay on top of who's doing what research and how that may influence how we manage the industry in a more responsive way sometimes than the peer-review process can allow for. I mean, it does take time to do research; it takes time to publish. I like to think we're a little more responsive to data and what we learn. Certainly, that's part of the process as well. So it's an integrative process.

S. Simpson: I have other questions, but I'll wait.

J. Yap: Thank you to our presenters for your excellent presentation.

I'd like to go back to the section on the fish health management plan. I believe, Joanne, you had made reference to accepted science, and I wonder if you could expand on what that refers to when you say that the guidelines that you use, your approach, is based on accepted science. How is that established? What is accepted science?

J. Constantine: Again, this sort of relates, I think, to Mr. Simpson's comments. When we started the process of developing fish health management plans, we hired an independent consultant who deals, actually, with public health as well. He's a veterinarian. He spent probably well over a year and a half looking at the peer-review literature, at other agrifood industries, at approaches to disease management, and he incorporated that into a guideline template for us.

That process then was developed into these management plans. As I said to you, there's the theory and objectives of what we're trying to achieve, there's actually how we do it, and then there's, "How do I actually look at it and assess whether that plan is sufficient or not?" before we approve it.

That process has an annual review process. What we do is we require the industry to go through their plans to make sure that they're keeping up with changes in production or changes in species — things that may happen in the course of the production of their business. We also go through that process and look at the literature.

We have an advisory committee, which is an independent committee that is made up of scientists in the fish health field. If we have questions about things — activities that are ongoing, whether they are meeting the science or whether there's incomplete science out there and we're uncertain as to how to approach that — I can then refer that to that committee and ask for their feedback and input so that that allows me the process of saying: "Hey, well, I'm not really certain about this; this is a new way of doing business." The science on this may not be quite where we need it to be, so I have an ability to put it to other scientists and ask for their input as well.

We also use that committee to look at other species. Because this process hasn't been very well accepted on a federal level, they'd like to, on a national level, move towards what British Columbia is doing. We've looked at this now for other species like trout and sablefish as well. So there is that process of integration and review.

J. Yap: You referred to a committee. This is a committee of academics, scientists — in British Columbia or across the country or around the world?

J. Constantine: Just in B.C. There are two academics on there. One's from Malaspina University; one's an independent academic. There is me; I'm not from gov-

ernment. There is industry representation, depending on the industry we're dealing with — it could be the trout growers; it could be the shellfish growers — again, to get their input on the industry side of things. There is a representative from the province and the environment side, two from Fisheries and Oceans, because our fish health management plans, again, also apply to our federal facilities. All of the reporting that's done through the industry database also includes the federal Fisheries and Oceans enhancement facilities in the province, so it's quite comprehensive. It's not just finfish aquaculture.

J. Yap: Right. Thank you. On compliance audits, there was a reference to the fact that you do random selection and that basically every fish farm is inspected once a year.

J. Constantine: At least, yeah.

J. Yap: That's what I heard. Do you, in your model for deciding who to pay more attention to or which farm to visit sooner rather than later, bring in risk assessment, past performance, other issues? Or is it entirely random?

J. Constantine: When we do the process of selecting sites, because we want to be able to detect disease, we don't want to.... Our initial surveillance is to look at auditing to say whether they are providing us with accurate information. The industry provides us with, essentially, 100 percent of all of their records. What we do is audit a snapshot of that.

[1120]

It also has a dual purpose in that it's surveillance. If we go out there and look and we see anything unusual, we have the ability to go back and look again at that site further or take action or require the company to deal with a management issue. There is an interactive basis there, so it's not just a matter of going out there and looking and then that's it. We do have that ability to focus, and that's what we will do.

Just so you understand, we do 120 farms a year, but in each quarter those 30 farms are randomly selected from what's active. In some quarters there are only 50 farms active, because they come in out of production. It could be more significant than just, you know, 50 percent or whatever. It's quite a lot of looking.

We also look, in addition to that, to the sea lice. So we're out there twice sometimes on these farms — once to look at the lice levels, where we look at actually live fish, and then to look at the dead mortalities and the health records. We inspect at that time, too, drug treatment records. We also look at animal welfare issues in terms of handling, and anaesthesia. It's an involved process.

J. Yap: Yes. Another question. Moving to escape management, I believe the reference was that every operator has to comply with a binding escape plan. I believe that was the reference — binding.

J. Constantine: That's right.

J. Yap: I'm wondering: what does that mean — binding? It's a regulation.... Is there any particular significance to binding?

My second question relating to this is the unfortunate loss of 43,000 fish because of one escape — if you could comment further on that. I'm interested in how that link was made — that one fish escaped and therefore we know that 43,000 fish died because of that.

J. Constantine: Okay. Well, I'll try to answer your first question. Each farm site has to have an escape prevention and response plan. So when we say it's a binding escape plan.... If a company has an escape incident where they lose, you know, one fish, for example, an inspector will go on site and determine whether or not the fact that they've had an escape was due to an infraction or non-compliance issue associated with their escape prevention and response plan. That is what binding means.

In response to your second question, the 43,900 fish for 2004 — that wasn't just one single escape incident, but three-quarters of that number was attributed to a single escape incident in Nootka Sound. Was your question: how did we arrive at that particular number? If that's the question, it would be due to a number of factors, including looking at feed inventory records, when they harvested — those kinds of issues. We try to come to a calculation of how many fish were in fact lost due to that one incident.

J. Yap: I believe the reference was, in the presentation, in 2004, that 43,969 fish were lost, primarily due to a single escape event.

J. Constantine: That's correct.

J. Yap: A single escape event doesn't mean one fish; it could be....

J. Constantine: No, no. I'm sorry. One large escape incident in this particular....

J. Yap: So the fish escaped, and then the 43,969 are....

J. Constantine: That particular figure is all fish lost for 2004, but three-quarters of that number was due to one single incident that happened in Nootka Sound.

J. Yap: And these were farm fish that died?

J. Constantine: That's correct — farm fish that escaped.

J. Yap: Okay. That's the clarity I wanted. These are fish that died....

J. Constantine: No, no, no — fish that escaped.

J. Yap: Fish that escaped. Okay — "lost" meaning escaped, not....

J. Constantine: Yes.

J. Yap: Okay. All right. Thank you.

R. Austin (Chair): Okay. Can I just ask Al to maybe speak to that for a second?

A. Castledine: I just wanted to follow up on the discussion. One of the things that's still going on is something called the Atlantic salmon watch program. It was started about 13 years ago essentially to try and keep an eye on what might be happening if salmon got out of the net pens. Its focus is on Atlantic salmon because you can tell what they look like if you find them in rivers or in the marine environment.

What we've seen is that the Atlantic salmon watch program is backing up this trend to fewer escapes, resulting in fewer fish being captured in the wild. The numbers are very low for the last few years. Now that program has been criticized in that it's largely a passive program. It requires people who catch fish to report them. But the records are fairly good for those that are captured in the wild commercial fishery. There is also an active swim program on the west coast of the Island that's conducted by DFO every year. We think that those numbers are backing up this trend to reduced escapes.

[1125]

The other thing I should tell you is that in the Nootka Sound incident, where perhaps 35,000 fish escaped, there has been monitoring of the major river there — the Gold River there — and I don't believe any fish have been recovered. So in general, most of these fish end up dying and not coming back. I don't know if that gives you any comfort. It's just a comment.

S. Fraser: Thanks Joanne, Jaclynn and Al for the overview on this. And thanks for being high-level at this early stage. It keeps it easier for us.

A question, first of all, about the application process — specifically, with first nations. Is there a requirement to consult with first nations who are maybe not necessarily coastal but are, say, inland but associated with a river system traditionally, traditional territory or cultural reasons — with a river that might be linked to, potentially, the fish farms that are near the mouth of the river?

J. Hunter: I'll try to answer that question. That's when I got my words mixed up earlier. What I was trying to say was that any proposed application.... We consult with any first nations where the site is in the asserted traditional territory.

In answer to your particular question, yes, there are instances when we do that. For example, we're in the process of dialogue with the Gitksan with respect to an application up in the north coast, which I'm sure you're all familiar with. So yes, if there are concerns, we certainly want to have that dialogue. With the Gitksan watershed authority, for example, we've been in many, many months of dialogue. We do listen to the concerns.

Joanne has, in fact, gone up to Terrace on two occasions to meet with some of their scientists and talk about some of those issues.

S. Fraser: Thank you very much. But it is not a requirement of the application process at this time, necessarily, that a first nation associated with a river system that doesn't happen to be coastal...? The incident.... I'm glad to hear that, but that's not part of the application process as it stands?

J. Hunter: It's not. If we get a particular application for a particular area, we don't consult with every first nation. For example, where we will consult.... If there are overlap issues with respect to asserted.... Yes, we absolutely do. But no, the first nations groups we consult with are strictly in that particular territory — unless, as I mentioned earlier, we become aware of concerns by other first nations.

S. Fraser: All right. Thank you.

If I may, just switching gears here.... There are some initiatives being taken, I know in the Maritimes, with polyculture. I thought that was growing parrots at one point, but now I've been clarified on that. Is there any application process in place in B.C. that deals with that? Are there applications going forward dealing with multispecies, either with kelp or shellfish associated with finfish?

A. Castledine: There's experimental work going on, and I think that's what you refer to on the east coast. They're trying to see whether growing kelp and mussels in proximity to a salmon farm will increase the productivity of those two species and whether they can benefit from some of the nutrients that come from the farm.

We've had a bit of that. Steve Cross did some work, I think, deploying kelp and perhaps shellfish near farms. It's the sort of thing that.... All of a sudden you're managing for two different animals, so the complexity of the system increases. But there's certainly a lot of interest in seeing if there are synergies in growing more than one species of plant or animal in one location.

There are no issues in terms of an application. There is a requirement, currently, that shellfish not be harvested within 125 metres of a dock or an installation, but I'm not sure that's an impediment. Some people think polyculture is illegal in British Columbia, but I think it's not. There are ways of doing something if someone wanted to.

[1130]

S. Fraser: Well, along with that, the tenuring, if I may, not specifically with polyculture. I mean, the role of the ministry was pointed out quite clearly. It's not just finfish. The tenuring process is a rigorous one, and it also involves.... It's the same process, give or take, for shellfish or finfish in a lot of ways. A lot of the many angles of requirements are there for both. I think

we need to be mindful as a committee that as recommendations come forward, if they affect the tenuring process, they may have farther-ranging implications with oyster farms, shellfish operations, that we may not have anticipated. If we start crossing any boundaries, I hope you would be keeping us in check there, just keeping us mindful of the fact that that's happening.

G. Robertson: I'll just follow up on Scott's question, and it's a question about the approval of additional species, particularly exotic species, and what the process is there, maybe specifically around sablefish and how that is progressing in terms of the development of that species as a farmed species on the coast.

J. Hunter: Al, do you want to talk about it from a policy perspective?

A. Castledine: For exotic species in general, if someone were to want to bring in a species that's not native to British Columbia into the province, I'd say it's almost impossible, with the exception that one could do it if one had a fully contained system. We do have one tilapia farm in the province. It's a warm-water species, and it's a fully contained system. There's a very rigorous review process that one would have to go through to try and get approval for new shellfish, invertebrates or finfish in the province.

In terms of black cod, I think you are aware that there's one hatchery that's produced about 100,000 juveniles last year. There are three sites that have small numbers — when I say small, probably 50,000 fish or fewer. There is a process for people to apply to grow sablefish. Currently, there aren't enough juveniles to satisfy the demand for the fish.

I'm not sure if I'm getting what you're asking. We do have a large number of salmon farms that are also licensed for sablefish, but this has happened over a period of about ten years. People have come in and said: "Well, can we add sablefish to our licence?" There's been no reason not to do that. That's why we have those 48 or so that people keep pointing out, that there's a gold rush on sablefish, but a lot of these have had it on their licences for ten years or so.

J. Hunter: Yeah, and in fact, they are not culturing that particular species. We can certainly provide you with more information in that regard if you would like a snapshot in time, recognizing that it's fluid, depending on what particular species a company is culturing.

J. Constantine: I think this is relevant to that question, if I could add it. They fall under our program, so when we go to farms, if they have multiple species, from a fish health perspective, we also examine those. They have to have management plans as well.

G. Robertson: Maybe to get more specific around this issue with the question: are there other native species on the table that are being considered by the minis-

try? If so, is there a rigorous set of criteria around adding new species to the aquaculture industry in B.C.? And maybe rewinding a bit, in terms of exotics, are Atlantic salmon considered grandfathered in as an exotic species to be farmed on this coast?

A. Castledine: They've been here in commercial cultures since 1985, and I think you're aware that people tried to bring them over here in the early '20s, and they didn't take. They're now here in captive populations. The industry, I think you're aware, is.... About 80 percent of their production is Atlantic salmon, so they're here. They're certainly not naturalized. That is, they don't have self-sustaining populations. I'm not aware of any imports for years of eggs, so one could call them an exotic, and until they become.... If they ever became naturalized, which I don't think is likely, you could still refer to them as an exotic species. They're not native to British Columbia.

[1135]

Neither is the Japanese oyster nor the Manila clam, both of which support the shellfish industry, but they have become naturalized.

G. Robertson: So again, that process carries forward for other species?

A. Castledine: Any species of finfish that someone would want to raise here would have to go through the same type of process as we go through for salmon. It would have the same requirements in terms of escape prevention, health management, etc. I'm not aware of any native finfish species in the wings. Sturgeon are fresh water, but they're currently being raised. They're not an exotic species; they're indigenous, but we have at least one farm growing sturgeon. In the marine environment, people have tried sockeye salmon. We'd had chinook and coho. People come up with ideas like wolf eel or kelp greenling or things like that, but they rarely go anywhere. They are evaluated before someone is allowed to actually license it.

J. Constantine: In terms of exotic species, the federal government has an extensive review process as well that we participate in, in terms of bringing animals into the province. We have an introductions and transfers committee, and as you know there's an exotic species....

So there is, first, an upfront process of actually getting them into the country and into the province, and then the provincial licensing level. I think our DFO colleagues may allude to that a little bit, and you might want to ask them in some detail what they do in terms of that approval. I spent a number of years on the introductions and transfers committee. It has a risk assessment process associated with it that's documented under the national transfer code.

G. Robertson: Thank you, and just one final question. I'm thinking this may not be the right setting to address this, but I want to make sure that the commit-

tee is abreast of the total cost of administering aquaculture relative to the commercial activity of the industry.

Coming from a farming and food business background, the amount of support that I remember for land-based agriculture seemed significantly smaller than what is in place now for the aquaculture industry, but I don't know the numbers. I think that it would be very valuable for the committee to know what the ratio is of taxpayer expense to actually support an industry that has many complex issues to juggle relative to the economic output of that industry. If you have any comments as to where we could get that specific information, that'd be great.

A. Castledine: Well, certainly the budgets are a matter of public record — what it costs my branch. Now Jackie covers more than just aquaculture, so there would have to be some sort of a split-out. For the other agencies that were mentioned — ILMB, MOE — it's a fraction. They use parts of people to service the file. Our agency would have the most attention.

I understand what you're saying, and it's a very valid thing to assess. I would say, though, that there are no subsidies to the industry in British Columbia and there are no business risk management programs either. If one were to make a fair comparison between agriculture and aquaculture, you might want to have a look at those sorts of elements. There may not be as many people on the ground dealing with farmers on a pro rata basis, but you may find that the support to the agriculture industry far outweighs government expenditures on the aquaculture industry. You may find that out — that's just what I've got off my head, but we'd need to check it out.

R. Austin (Chair): Thank you. I'm going to ask Gary, then there are three more questions, and I'm going to cut it off after that if it's okay. We're getting a little bit behind here.

G. Coons: I'd like to send my appreciation to Al, Jaclynn and Joanne for coming in today. I'm really pleased being on the committee and look forward to some really positive results coming out of here and making sure that we find solutions that enhance and grow the aquaculture industry and, more importantly, ensure the protection of our wild stocks. I want to come back to that briefly at the end here.

[1140]

Three questions — one about the salmon aquaculture review, some more about fish health and something about wild stocks. First off, Al, as far as the 49 recommendations from SAR — were they all implemented?

A. Castledine: What happened was that the 49 recommendations actually were not all within the provincial purview. Also, there was overlap in the 49. We believe that the 49 recommendations, the intent of them, was substantively completed, and we have an assessment of that on our website — what the recom-

mendation was and what the provincial response has been. So again, I think there may be three that were impossible. Out of 49 that might actually happen. But substantively, they were completed, and we can provide that information directly to you, if you wish.

G. Coons: And as far as that at the federal end also — they were basically all completed?

A. Castledine: Well, part of it was that some of these were recommendations that were better handled by the federal government. What we've done on our end.... They were recommendations made to us. But I think the best thing to do is for us to get you that assessment, and then you can come back with further questions if you have them.

G. Coons: Thank you. A second comment on the fish health management plan. As far as licensing and compliance, there were eight staff. How many staff are there involved with the management plan for health?

J. Constantine: Fish health management plans?

G. Coons: Yes.

J. Constantine: Currently, there's me and two biotechnicians, and as I indicated in my review, there's a position that just came available, another veterinarian and another technical person. So that would be five.

G. Coons: So five staff that are doing the inspections, collection of the specific diagnostic evaluation, auditing and....

J. Constantine: Right on the farm itself — absolutely. In terms of the analysis and stuff, I put in, you know, directly our fish pathologist. But when I send samples to our lab in Abbotsford, obviously, if we're doing virology, they go to our veterinary virology section. They don't differentiate between whether they're testing for AI or for fish health, other than when AI is being tested for. My fish health samples probably take a little longer. They essentially do all animals, so we do everything there.

There are a number of support staff who don't get included directly in fish health, who obviously are in the background of what supports my testing and diagnosis and who we didn't list.

G. Coons: Thank you, Joanne. Is there an advisory committee that you have?

J. Constantine: Yes. I didn't list it. It's called a fish health advisory committee. Basically, that's the committee I was referring to that had the academia, industry and government and talks about the issues related to health. As I mentioned, if we have questions, we can certainly ask the advisory committee their opinion on what they think.

G. Coons: How many are on that committee?

J. Constantine: There are one, two, three, four.... I think there are eight. Please forgive me if I'm wrong, but I believe there are eight. I'll have to go back and check, because we do change skin depending on the topic. You know, we may ask people to come in or out, depending on their expertise.

G. Coons: Are those people listed somewhere?

J. Constantine: Yes, they are on our website. There are the terms of reference for that, as well, on the website.

G. Coons: The last comment I want to make, especially since part of our mandate is focusing on the interaction between aquaculture, wild stocks and the marine environment.... I want to refer back to an Auditor General's report of October 2004 as a tripartite with New Brunswick and the federal Auditor General. There were concerns about where we're heading with our wild stocks, especially since the management of wild salmon and salmon aquaculture is a joint federal-provincial responsibility.

I'm just wondering: who is looking after the wild stocks? Who is responsible for that provincially?

A. Castledine: If I can speak to that. The province has a strong interest in the health of wild stocks, and that's reflected in environmental regulations around streams, etc. DFO has the primary responsibility for the health of wild fish.

What we didn't talk about in our presentation was.... We left DFO right out of our presentation. We do engage with DFO a lot. I know that Joanne does on the science side. We also.... The feds are in the process of moving forward on our national aquatic animal health program, so we're engaged with them in terms of managing health on farms. They'll be doing surveys on the health of wild fish and looking at the relationships of these things.

We didn't talk DFO. That's probably something we might want to talk about down the road — how we relate. But if you had to say which jurisdiction has the final authority on the health of wild salmon, it's DFO.

[1145]

G. Coons: Okay. Is there a lead provincial agency?

A. Castledine: Environment. That would be the oceans and fisheries division, which has been newly established and is the prime point of contact with the federal government on wild fisheries issues.

G. Coons: Thank you.

R. Austin (Chair): Al, just a reminder: the information you're sending back to the committee — if you could make sure that it goes to Mr. James here, so that he can distribute it to the rest of us.

C. Trevena: I'll be very brief. I think mine are quite basic questions, really, on the inspections of the sites. There are inspections by the veterinarian side, the fish health side and the licensing side. What sort of coordination is there between the two branches on this?

J. Constantine: We all work out of the one office, and there's on-the-ground coordination simply from a staffing issues perspective, going to sites, boats, ensuring biosecurity — those kinds of issues.

From my perspective, what happens is that we do what I would call the initial compliance. Because of the involvement of the veterinary side of things, the technical involvement in assessing these things, my staff and I are the front-line staff that do that. If there's a concern with fish health management plans where an activity is not happening, and with how we want to manage it, we generally go to the company directly and try to resolve that issue. If we can't get resolution, then I involve Jackie's staff.

Then I leave it to them, because then it becomes a compliance and enforcement issue. I provide the science support to them as to what my concerns are — details — and technical support as well.

There is a good working relationship between us on the ground as well as on the branch basis.

C. Trevena: With the companies, do you give them notice that you're going to be coming out, or do you just sort of get a water taxi and go?

J. Constantine: Most times we have to give them notification that we're coming. It's difficult just to show up on site, because we're coordinating with dive staff; we're coordinating with on-farm staff. The farms themselves will do their activities on a regular, routine basis. They may dive two or three times a week. So we do coordinate with their fish health staff. It's very difficult not to do that.

In terms of Jackie's staff, maybe she could comment a little bit on that aspect from her perspective.

J. Hunter: There's no hard-and-fast rule. Generally speaking, I think that probably most inspectors do, particularly if there are any biosecurity issues that they need to be aware of before they show up on site. But there are occasions when inspectors show up unannounced.

Having said that, generally speaking, we will tell farms a day or two in advance. In terms of discovering anything by showing up, the likelihood is very, very small, whether or not we contact them two days before or show up unannounced.

C. Trevena: The member for Vancouver-Fairview asked about the financial cost. I just want to know very simply: how many inspectors are working out of your one office? How many inspectors are there for all the ministry?

J. Hunter: There are a total of seven inspectors and one section head. Of those, one is in Campbell River,

and one is in Prince Rupert. But just to add to that, aside from their finfish and shellfish inspection accountabilities, we are also accountable to monitor the commercial fishery sector that I spoke of earlier, as well as the marine plant fishery and the wild oyster fishery.

If you were to ask me how many people were dedicated simply to finfish aquaculture, if we were to prorate it — probably one to two inspectors, total. But each of them, of course, have their own accountabilities based on geographic area.

C. Trevena: Sure. So it's one prorating it, and it's one to two for the province whether it's....

J. Hunter: That's correct, yes. All of those sectors that I mentioned earlier.... We are accountable to regulate on a provincewide basis.

C. Trevena: My final question. Again, it might seem quite simple. When a company gets a tenure in a specific location, how long is that tenure for?

J. Hunter: Well, I think it depends. I'm not with the integrated land management bureau. They can be five years. They can be ten years.

Al, do you know on average how long they are?

Generally speaking, they're certainly more than one year.

[1150]

A. Castledine: They're generally ten, which is a licence of occupation, and then they can be as much as 20. There have been occasions when tenures have been issued for shorter durations...

J. Hunter: That's right, to see if there are any particular issues.

A. Castledine: ...to see if there are any issues around it. There's no hard-and-fast rule, but I would say that ten would be the norm — ten years. Now, our licence is annual. It is reissued on an annual basis.

A Voice: That's correct.

C. Trevena: So it's a ten-year tenure, with an annual...

J. Hunter: Aquaculture licence.

C. Trevena: ...aquaculture licence.

R. Austin (Chair): I think that for the purposes of our work here, when we're referring to other members' questions, let's just use first names. I think that's fine here.

The last person on the list, and then I think that after that we should break for a washroom break.

S. Simpson: Just a couple of quick questions. On the question of the sea lice management plan, I believe

you said that when you're determining these questions, you use what is an international standard of.... Is it three lice per fish?

J. Constantine: Sorry if I confused you. Our standard's set on, basically, B.C.'s information. We use three mobiles. Other countries will use their information. Norway's figures are 0.5 and four, and two and ten. We use different standards based on the data that we have from each of the areas. That's ours in B.C.

S. Simpson: I'm curious as to how you determined that number.

J. Constantine: It is curious. When we first started, we really had no idea because we had no numbers, and we started off with three and six. We looked at what other countries did. We looked at the scientific information out there, and we wanted to take a precautionary approach, taking into consideration the abundance of wild salmon and the data that we had out there, or the lack thereof. In some cases, there was a lack of data.

We evaluated that first-year data, and then in 2004 we decreased our number to three, particularly during the out-migration time — again, based on the integration of the information from the Department of Fisheries and Oceans and ourselves. We continue to monitor and look, and based on the science that's done, we'll re-evaluate that as we go along in terms of what the interaction is. What do we know about what lice's implications are for farm stock, for wild stock and about the interaction of those two?

A. Castledine: Can I just ask Joanne...? You threw three and six out quickly...

J. Constantine: Sorry. I changed the subject.

A. Castledine: ...and three. Norway has a total of six mobiles and three gravids — right? You explain....

J. Constantine: The figures are done based on the significance of the species out-migration time. In Norway, their species of concern are Atlantic salmon and trout. That's what they have as a native species. Their migration times are estimated between December and.... I believe it's July 1; it might be June 1 for them. So they have lower levels, again, during their migration time and higher levels for the remainder of the year. That's what they do as their motile lice trigger levels, where action has to be taken.

In B.C., what we do is we use a one-level. We use three during the out-migration time, which again relates back to the life cycle of the parasite. "Motiles" means the gravid females, which are the females that actually produce the egg strings that produce the infectious part of the life cycle of the lice. It's a combined figure for when the out-migration times are, for us, for pink and chum salmon, which would be from roughly March 1 to July 1. For the remainder of the year, again,

our levels are set based on what our knowledge is of what the lice background levels are out on wild stocks.

Sorry. I'm trying not to get too technical for you.

S. Simpson: Good.

J. Constantine: Sorry. It's hard, because of course, those numbers come from a science basis of the parasite life cycle and the interaction with its native host and the farm species.

S. Simpson: When you look at this, do you consider the size of, for example, juvenile salmon versus Pacific salmon, or pinks versus the size of the Atlantics, which I take it are a larger fisher than the juvenile pinks? And do you consider the size or the vulnerability of the fish, based on what science tells us, to say: "This is how many lice we might consider on a fish, based on the resiliency of that species"?

J. Constantine: Absolutely. There was some very good data out of Norway on what the susceptibility of Atlantic salmon and trout were to sea lice. That's been documented, and that's how they developed their figures. In the absence of that information in the last few years, we chose our numbers based on what we were seeing in the wild. Again, that's why there's a lower number during the out-migration time — because that is when those susceptible species and portions of the life cycle of the fish are happening.

[1155]

In the interim there has been some work at UBC — and it's just in the process of being completed, as far my understanding is — looking at infection levels on those very small-sized fish. So yes, that data's being done, and that will be incorporated into the process of deciding what an appropriate trigger level is.

S. Simpson: So it's not completed, but it's in progress.

J. Constantine: Yeah. Again, that comes back to your earlier question of trying to make sure that I keep in touch with these scientists that are doing this work so that we can be responsive, because it may take time to get that peer-reviewed process through the literature.

But you know what? I want to make sure we know what's happening during the process so we can respond.

S. Simpson: One more question in relation to that particular issue around sea lice management. How does the monitoring get done, who does it, and who on your side gets that information to make those determinations?

J. Constantine: The way the monitoring gets done is that each farm is required to monitor monthly during the July-to-March period and then twice monthly during that migration period. Those farm staff are trained to do that. That's the industry's own farm staff.

We audit in parallel with them. My staff go out. We run a seine through the net pen. We take a subsample

of fish. We break that sample in half. I count ten fish; they count ten fish. Then those numbers are taken back on the farm level and compared — what they report to me across the levels — so I can look at all the farm numbers.

We've also audited our auditors, which means we've validated our auditors. What I did initially when we started the program, to ensure that we were getting good accuracy of reporting of what the species of lice was, plus the counts of lice.... When we started our program, we sacrificed fish from the farm. We took all the lice off them, and we sent them to a parasitologist for enumeration as well as speciation to make sure we were comfortable that our auditors were properly identifying the lice.

That gives me a level of credibility of my own staff in terms of.... They know what they're doing, and we had extremely good success in looking at them. They're very good at what they do — right? They're trained for that reason.

S. Simpson: That's great. Thank you. I'll just make a couple of information requests, and I'm done.

Maybe you could just tell us where we can get, or you could provide for us — not right now — information on the annual inspection reports that are done, how we get the most current information over the last number of years, up through this year, and where we'd find that information. Also, information on whether you have the data on incidences of disease on farms over the last number of years. If you could make that information available to us.

J. Constantine: Yep.

R. Austin (Chair): Can we get that?

J. Constantine: Oh, sorry. Absolutely.

R. Austin (Chair): So that will also just be sent to Mr. James?

J. Constantine: Absolutely.

R. Austin (Chair): I'd like to thank Al, Joanne and Jackie for coming here and making this presentation today. It was very informative. Thank you, also, for answering all those questions.

Now, noting the time, I think what we'll do is combine a personal comfort break with an attempt to get lunch. My understanding is that we continue just to work around the table while we have our lunch. Maybe we should do that for the next ten minutes. Then we'll move on with the Ministry of Environment's presentation. Thank you.

The committee recessed from 11:58 a.m. to 12:15 p.m.

[R. Austin in the chair.]

R. Austin (Chair): I'd like to bring this committee back to order and invite Eric McGreer from the B.C. Ministry of Environment to make a presentation.

R. Cantelon (Deputy Chair): If I may make one small point of order. In these committees we are allowed to use a given name. It's quite proper to use given names as long as you don't append any colourful adjectives to them.

**Briefing:
Ministry of Environment**

E. McGreer: Thank you very much. I appreciate the opportunity of being invited here. Actually, to start our presentation I'm going to turn it over to Lynn Bailey, our director of operations branch. The other person who is sitting beside her is Randy Alexander, and he's the regional manager for Vancouver Island for the environmental protection division.

L. Bailey: Thank you to the committee members for inviting us here to speak today. We know that you've just heard from the Ministry of Agriculture and Lands, so we'll work not to repeat anything that you've heard from them. But we'll certainly talk about the linkages that our ministry has with other agencies within and outside of the provincial government.

As requested, we'll provide an overview of what we do, and we'd be pleased to answer questions as we go, on specific slides, as well as at the end, of course. If the question pertains to something that we do plan to cover, we'll just ask to defer it until the end of the presentation. Of course, we'd be happy to return any time to speak to you.

I'm going to start the presentation and then turn it over to Randy and Eric for the rest. I wanted to give you just a little bit of an overview of the entire Ministry of Environment. All three of us are from one division in the ministry, so I did bring a ministry organization chart.

Before I get into that, very briefly, I want to speak to the ministry's vision, mission and goals. These have been revised since the ministry was formed in June of 2005, and they will be finalized with the release of the ministry's service plan later this month.

As you can see, our vision is a clean, healthy and naturally diverse environment. Our mission is to lead, inform, involve and support British Columbians to achieve the best environmental stewardship and sustainability. We have a very key role in the great goal number four: the best air and water quality and fisheries management, as well as the best environmental stewardship, bar none.

Our goals. The first one is clean and safe water, land and air. The second is healthy and diverse native species and ecosystems. There were some questions about native salmon earlier, and we definitely do have a role in habitat, in ecosystem management. The third is a very new goal that we feel is essential: that British Columbians understand that we all share responsibility

for our environment. The fourth is sustainable use of the province's environmental resources. And finally, a high-performance organization.

If you are interested in our organizational structure.... Part of the ministry came from the former Water, Land and Air Protection, part from Sustainable Resource Management and part from Land and Water British Columbia. We became Environment, and we added two new divisions to this ministry. One, the division of oceans, which has contact with the federal government on marine fisheries. It's government's link to the federal ocean strategy, and it's responsible for commercial seafood development. It is a very new addition. I confess I'm not all that knowledgeable beyond what I've already said about their role. The other new division is the water stewardship division, bringing responsibility for much of the water resource under us. The three of us here today are from the environmental protection division.

[1220]

We are the regulators of any discharges to air, land and water. As requested, we'll be focusing our presentation on the ministry's role in aquaculture.

The ministry is responsible for managing waste generated by the fish farm industry. We develop environmental standards and protocols. We have a finfish aquaculture waste control regulation under our Environmental Management Act that you will hear more about. We are responsible for that regulation. As I indicated earlier, the oceans and marine fisheries division works with the federal government to implement the oceans strategy, and we understand you're hearing from the DFO later today.

Within the environmental protection division, the responsibility for aquaculture is concentrated on Vancouver Island in our Vancouver Island region, which Randy Alexander is the regional manager for.

We had a slide on Agriculture and Lands, but we figure that you know everything about them now, so we're going to skip that one. I will pass it off to Randy.

R. Alexander: What we've done today is prepared a pretty high-level overview of what we do, what our ministry and our division's role is with respect to regulation of aquaculture in British Columbia. Our primary role is administering the finfish aquaculture waste control regulation. I'm going to talk in a little more detail about what that is.

We also undertake field audits of company monitoring programs. The photo up there is of a ministry vessel that we use to go out and do monitoring of sediments in the benthic community at and around fish farms on a regular basis.

Our role is also to update scientific protocols and methodologies that are part of the regulation. The other role that we undertake is to revise the regulation on a regular basis. We're moving into that cycle over the next few years, where we'll be undertaking a review of the regulation.

We also work with industry and stakeholders to identify and resolve issues. I think this is an area where

we've been very successful over the last few years in developing and improving relationships with industry, moving compliance forward, resolving a lot of issues that were outstanding. We're quite proud of the progress we're making in that area.

We do joint annual compliance monitoring reporting with the Ministry of Agriculture and Lands, and I believe that Jackie told you about some of the details of that. We also are involved with funding for research on aquaculture wastes, and Eric, who's here today, is our senior aquaculture scientist. He's involved with a lot of research groups that are looking at moving forward the state of scientific knowledge — aquaculture-based and so on. We also play a role in identifying emerging waste-related issues as they're related to aquaculture.

I'm going to talk a bit about our regulation and how it was developed. It was developed to address the recommendations of the *Salmon Aquaculture Review*, which you heard about this morning. I believe there were nine recommendations in there that are related directly to the Ministry of Environment's mandate, and eight of those have been implemented. The other one was not directly relevant, I think.

Can you remember what the other one was?

E. McGreer: I believe that the ninth recommendation talked about polyculture. Seven or eight years ago there was a theme about growing different types of species on one site and potentially using strings of shellfish to somehow clean the water and clean up waste from the finfish. I don't believe.... Really, that concept has not gone ahead.

R. Alexander: When that aquaculture review was published and there was a moratorium on new sites, we set about developing a performance-based regulation that would ensure that the environment was protected at sites.

[1225]

The science that was collected was collected over several years, and there was intensive physical, chemical and video data-gathering by industry, by the ministry and by academia to try and characterize what happens under these farms in terms of impacts on the environment and on the benthos. We compared with other jurisdictions worldwide. There was an independent scientific advisory panel made up of representatives from various universities in the area. Also, there was a consultation process with the NGOs and first nations as part of that.

The regulation that came out of that is based on what we call a chemical surrogate that tells us what's happening in the environment. In an ideal situation, what you'd want to do is go down underneath. I've tried to demonstrate on this graph what's happening. In an ideal situation you try and go down underneath, and you try and identify how the life forms on the bottom of the ocean are being affected by what's coming out of the net pens. That's a very expensive and long process. It takes several months, once you grab a sam-

ple, to have it analyzed to determine how many organisms are there and so on.

There is a very clear relationship with a chemical constituent of the sediments that's a result of salmon aquaculture: sulphides. There's a very direct relationship between how big a concentration of sulphides there is and what the impact is on the life on the bottom. We use that as our basis of an effective mechanism that's cost-effective.

You can grab a sample on the bottom of the ocean, measure right there on the spot what the sulphide levels are and therefore have a good indication of what's going on, on the bottom and whether you are affecting the environment. Then there are certain triggers that are set. If you exceed a certain level of sulphides, then the fish farm has to go in and do biological monitoring. They're not allowed to restock the site until these levels of sulphides have been reduced below a certain level.

That's kind of the fundamental basis of the science behind the regulation. We measure, you can see, at 30 metres. That's the trigger point where certain levels of sulphides trigger certain activities. Also, the regulation doesn't allow any effect — any increased level of sulphides or effect on the environment — outside the edge of tenure. That's another component of the regulation. I hope that's clear, because that's kind of the fundamental basis of how we regulate — whether or not there's an impact on the environment under the farms.

The regulation has a number of components in it. The first component is that all fish farms have to register. They have to provide quite a bit of information to us as part of the registration process: currents in the area, what they're planning to do in terms of the amount of feed, the number of fish, what the configuration is going to be. For hard-bottom sites, they have to provide a video survey of the bottom as a base point before they start stocking.

There are monitoring and reporting requirements that are part of the regulation. On an annual basis, fish farms need to report to us what materials they've used, what chemicals they've used, how much feed they've used. On a regular basis, within 24 hours, they have to notify us if there's a significant death of fish on a site — mortalities. They have to undertake monitoring at the site at peak production to determine what the level of sulphides is, to see if they've surpassed any triggers. They also have to survey or monitor, before restocking, to make sure they've dropped down below acceptable levels, if they exceeded them in the first place. If there are issues of elevated sulphides and so on, then a remediation plan may be requested from the fish farms.

The regulation also deals with environmental standards. What are those chemical triggers? What are the levels? When do you measure it? How do you measure it? All of those things are spelled out in our regulation. It also covers requirements for domestic sewage discharges. These farms have people living at them, working at them. They have small sewage systems. They have to be operated in compliance with, basically, the requirements of our municipal sewage regulation.

Best management practices. They're also required to have detailed best management practices developed and on site and the staff familiar with them.

[1230]

Those components of best management practices, documents or manuals are how they're going to meet waste standards; how they're going to continuously reduce waste discharges; what they're going to do to improve the waste management practices they've got.... Also, operating practices: how are they going to improve spill prevention and handling of fish mortalities, and how do they prevent and minimize impacts on wildlife? Those are some of the major components of the best management practices documents.

I think these are becoming quite valuable and useful documents. The regulation came into effect in 2002. This has been a bit of a learning process for everyone in terms of what needs to be in these documents and how they can be most effective. I think they're coming along quite well.

I just wanted to summarize very briefly. What we see from our perspective are some of the key issues that we're addressing or that are coming at us in the near future — just some of the emerging and key issues.

First is first nations issues and consultation. First nations are becoming much more interested in issues around aquaculture. We work with first nations communities in educating what our regulation is. We invite them on the boat when we're out doing inspections, and we participate with other government agencies when there are consultations and those sorts of things.

Another key issue is transferring scientific knowledge to industry. The regulation is new. It's somewhat complex, and the procedures you need to follow to comply with the regulation are somewhat complex, so we've spent a lot of effort over the last few years building that knowledge and ability in the industry to understand the protocols and procedures and how to do them.

There's a trend over the last few years of consolidation of the industry into fewer, larger companies and larger sites, deeper sites. Our regulation was developed on a model where there were a number of smaller companies. Sites were smaller and not necessarily in as deep of waters. There's an issue there where we have to adapt and anticipate how those changes are going to happen and how it affects our regulation.

Assessing cumulative impacts and environmental capacity. The regulation deals with what's happening under one fish farm. Well, in an area where you've got several fish farms, addressing potential cumulative impacts is going to be an important issue.

Contingencies for disposal of mass mortalities. On occasion there are large losses of stock at fish farms, and those mortalities have to be dealt with. Normally they're sent to composters on Vancouver Island. We can handle that; the capacity is there. There is a concern that if mortality issues become larger, then there may be a capacity concern about how you deal with those materials.

Federal-provincial harmonization is something that we work very hard at, and the other agencies do as well. The aquaculture industry has a number of different regulations and requirements that they have to comply with, and these agencies have different requirements, different timing and different information they have to collect. We're trying to move towards harmonizing that somewhat so that we can be consistent and more efficient and effective.

Developing hard-bottom standards. When I talked about sulphide standards, that applies to soft bottoms, mud — basically, where the ocean floor is mud. An increasing number of sites are hard bottoms, rocky bottoms. You can't sample them and test for sulphides, so we don't have specific standards in the regulation for looking at a survey video and determining what the threshold is for impact. We're developing those. Those need to be standardized, and that's something we're working towards right now.

[1235]

Discharges from net-washing activities. The fish farms.... Their nets are normally coated with a copper compound to reduce the amount of growth and so on, on the nets. Once every 12 to 18 months those nets have to be hauled out and cleaned and recoated. That used to be done, to some extent, at the farm. Now it's all done in remote locations on land. We're developing, with those companies that do that, standards for how that needs to be done to make sure we're not just moving the issue from one place to another, that we're addressing how those wastes are managed properly.

I also wanted to mention.... This is kind of following up on our working with other agencies in industry and stakeholders. Over the last few years we've developed an aquaculture technical committee to address technical issues — not policy issues, but technical issues — that we're faced with in administering our reg and operating and so on, and it's been extremely successful. Our objective was to get a small group of representatives from different agencies together that would get a reputation for getting the job done and solving problems and working well together, and I think we've been very effective in that. DFO has joined that committee, and it's quite an effective mechanism for solving technical issues. So we're kind of proud of that.

Over the next couple of years we're embarking on a review and update of the regulation. Some of the intent there.... The goals are to increase the accuracy of the information we collect, increase the efficiencies — make it as effective and cost-effective as possible — and apply up-to-date science. Some of the key issues we're addressing are: updating our protocols and standards to reflect new science, and looking at this sulphide standard. Does it still make sense to use it, or can we identify some indicator species that you could sample in the environment easily and quickly and get a better indication of what's happening to the life on the bottom of the ocean? Assessing that — are there new ways and better ways of finding out what the impacts are?

We're going to improve the monitoring and sampling processes and protocols, increase the harmonization between agencies and finalize some hard-bottom standards. So those are the key issues we're addressing in updating the regulation. These issues have been developed and prioritized by this aquaculture technical committee, which has representatives of various agencies and the aquaculture industry as well.

I believe Jackie Hunter talked about the joint compliance strategy we have between our two ministries. That's been very effective at building good working relationships between our agencies and in, I think, presenting more of a one-window approach. Basically, the Ministry of Agriculture and Lands and their inspectors undertake facility inspections on our behalf. They have a checklist, basically, of information they have to gather that checks compliance with our regulations and requirements. They issue tickets for minor violations. For more serious or major non-compliance incidents, our ministry is tasked, through the conservation officer service, with doing investigations and following up and determining the appropriate enforcement activities as a result of that.

We also undertake environmental monitoring for impacts on the ocean floor, which I've mentioned. As Jackie described, some of the details of the joint annual compliance report that we publish....

Our focus on compliance is trying to build compliance with a new regulation as quickly as possible. We find that the best way to do that, the most effective way, is to promote compliance — so work with industry; monitor what they're doing; verify that they're doing the right thing — and then work with the industry to improve that. Where we're not successful in that, then we move on to investigation and enforcement activities. But we find this is a pretty effective model for getting results.

What we found, if I can give you a really high-level snapshot, is a good overall level of compliance with respect to how facilities are operated — that's both on the MAL and the MOE side — and good overall compliance with the benthic standards of our regulation for.... You know, you don't restock unless you're below a certain trigger. So we're finding good results with that.

[1240]

The compliance process is inspection, monitoring and review, both by the Ministry of Agriculture and Lands and our own staff who review the records, go out and do the monitoring in the field, develop reports, notify the companies and initiate correction.

I've just identified some of the key compliance components: reporting requirements; peak biomass and pre-stocking monitoring; best management practices; bloodwater disposal; net treatment; cleaning and disposal; disinfectant use; storage and disposal of mortalities; water use and licensing for farms that use fresh water; wildlife predator trapping and management; fuel use, storage, containment and spill contingency plans. Those are the major components of what we check for compliance.

Eric, would you mind speaking to the research aspect of our involvement?

E. McGreer: Certainly.

Traditionally, aquaculture and salmon farming have been treated very separately in the province compared to ocean technology — two different streams, two types of development — and the two parties never really have joined together until now.

What we've found by talking to other professional people like geologists.... There are some experts in programs at University of Victoria and UBC that are funded by these Canada Research Chairs that come with half a million dollars of federal money for these researchers to spend over five years, and they want to look for matching funding. So having tapped into that source, my approach has been to say: "Well, this is what we do in the fish farming. Is there any technology you have that would help us do things cheaper or better or faster or increase its accuracy?" We've had tremendous response.

Let me go to the wording first. When the moratorium — I'm assuming that committee members have some familiarity with the background leading up to the moratorium — was lifted, what everyone heard was: "Well, all the science is not there."

What the government said at that time was: "We realize that, but we'd like to lift the moratorium. We will fund and do the science starting now." So they did. They initially put in \$5.1 million provided by the Ministry of Agriculture and Lands; \$1.3 million went to a UBC chair for sustainable development, and the B.C. Aquaculture Research and Development Committee was formed. I've sat on that committee as our ministry's representative. They had \$3.8 million, and it's now being administered by the B.C. Innovation Council to fund various projects.

What the committee attempts to do for the province is to prioritize what areas of research should be funded. It includes both federal and provincial representatives, first nations and NGOs, and it deals with both finfish and shellfish.

In the top right-hand corner, the yellow missile is actually what is called an autonomous underwater vehicle. It doesn't have a cable, it's totally self-propelled, and it's about three to four feet long. Rather than having a large boat with crew and expenses, which probably runs \$1,500 a day to go out to do a lot of the sampling, if we can adopt one of these instruments, it would be a lot cheaper for industry to do monitoring, and we would probably get real-time data as opposed to the traditional approach we're using now with having to collect physical samples, send them to a lab and wait weeks or months for response. So that has promise.

The one underneath it is a graph of a geographical information display system, and it shows a three-dimensional view of a proposed fish farm on the west coast of Vancouver Island. With the computer modelling that's been done — MAL have staff who look at this, and now that they have the integrated land man-

agement bureau in them looking at sites, whether or not a fish farm site could go in — they have now progressed to the point of being able to run models in three dimensions.

When this comes to us for review — and Randy mentioned that in terms of the registration — we're now.... Rather than looking at two-dimensional, flat-surface maps to figure things out, we can now get a three-dimensional picture. Looking at that one, I can see.... If it was enlarged, you'd see the red area shows that a moderate concentration of waste is right under the net pen. It does not reach the 30-metre distance that Randy mentioned, a way that triggers our response. So my quick interpretation of that would be that I don't see a problem at the production level that I have been asked to review. It don't see a problem with putting a fish farm in that area, with respect to our regulation.

[1245]

There are a number of other projects that BCARDC is funding. Again, where we've been working together, both in terms of people within the province and trying to draw on the federal government, I think it's been very successful. That's the background to that side.

R. Alexander: I'm not going to speak to this in detail, but what we are trying to accomplish with this slide is just to demonstrate the number of agencies, organizations and connection points that we have from our perspective and our small part of this puzzle in administering our regulation. You can see that there are a lot of agencies, a lot of stakeholders, a lot going on here. It's quite complex. A lot of it is making sure that we are communicating properly, and we're trying to address concerns and issues of all of these groups.

We're coming to the conclusion. I just wanted to show some photos of some of the creatures that we find in the hard-bottom sites. Eric has also brought a jar of creatures that we find in mud for your consideration.

E. McGreer: One of the challenges we have is that the fish farms now are probably in water depths of, say, 100 to 250 feet. But where it's shallow, if they have a lot of production, the wastes start to build up. They want to move to deeper water. Because we're only dealing with organic waste — no chemical toxins, nothing like that — the more water you have, the more oxygen, it will dissolve in a natural fashion.

In trying to protect it.... The slide shows some of the ones over the hard bottom, including coral. In the upper right-hand corner.... There is coral off B.C. These are really important to protect. But if they're in 500 feet of water, who sees them? Many groups in B.C., including the NGOs and first nations, want these things protected. If we go that deep, we're going to have to learn how to monitor at those levels.

These are just some pictures by some of the consulting firms from the archipelago. We're really fortunate in the province to have ocean expertise, particularly in this city, of a world-class nature. I'm really promoting we use that to help resolve our issues.

The soft-bottom ones.... I'll pass these around again. If you take sand or mud from the bottom of our coastal areas, you pick out a wide range.... There are probably 250 different species of clams and worms and things. What I have here are specimens from three samples we took in the Broughton Archipelago. This is diversity. These are what we're trying to protect.

R. Alexander: That concludes the presentation component. I would certainly be happy to....

R. Austin (Chair): Thank you very much. I will open up the floor to questions.

S. Fraser: I have to apologize. I have to sneak out in a few minutes, so I'm trying to get on here first.

I know that the work is daunting. There's a large and challenging set of criteria you have to work under and a lot of different categories you have to work under. You had a picture of a boat — I assume it was a ministry boat — and these innovative sort of small submarine-type models, which fascinate me also. What kind of numbers do we have in the province from the ministry to do compliance work as far as vessels, personnel or maybe more innovative technologies?

R. Alexander: We have three full-time people in the ministry who work on aquaculture and administration of the regulations. Those are in our Nanaimo office. Eric's the senior scientist. We have an aquaculture marine biologist, Bernie Taekema, as well, and an officer in that group.

Those are the three full-time people, and a supervisor who has a number of other responsibilities as well. The conservation officer service provides the compliance and enforcement activities for our ministry. They don't have full-time people assigned to that, but they have conservation officers in the field who do aquaculture work as part of their other duties as well. Those are the full-time resources we have. We also have a budget of approximately \$150,000 a year for the costs of sampling, studies that we need to do and that sort of thing.

[1250]

The boat you saw is the ministry boat, but it's used for a number of compliance activities. It's operated by the conservation officer service, but it's outfitted and used probably two months of the year to do sampling at fish farm sites.

S. Fraser: Thank you for that. Considering the geographic nature of the B.C. coastline where salmon farms are.... I know I've spent a lot of time on the west coast of Vancouver Island. They're pretty challenging locations to get to. I assume.... I mean, those resources are quite limited, so this compliance work would be complaint-driven? It doesn't sound like there's enough staff to monitor it, as such.

R. Alexander: What we do is.... All of the fish farms are out doing their annual monitoring and send-

ing us the information. We select 10 percent to 15 percent of the sites a year that we go out to and actually do confirmatory auditing of their results. We find high agreement between our audits and what the aquaculture industry is sending us. We've also got the Ministry of Agriculture and Lands inspectors who do the on-site inspection at all of the farms every year on our behalf.

So yes, we'd love to have more resources, but I think we manage things pretty well. Although I'd be happy to have more resources. I think you could do a lot more with more on the ground.

S. Fraser: Okay. And just one final, if I may. Assuming, say, in a hypothetical situation, where you've determined there were issues of high levels of sulphide, maybe — or the one that you mentioned — over the level that's acceptable, potentially affecting the benthic layer.... You mentioned remedial action. Besides maybe holding off on restocking, or I assume that a fallow would be a.... Is that the remedial action you're referring to?

R. Alexander: Up until now that's been sufficient. They fallow the site. It's all organic material, so it decomposes over time, and what we find is that the ocean bottom returns to its normal condition over time. Our regulation sets standards in terms of: you can't go out and put more fish in that farm until you're under a 1,300-micromolar sulphide level. That's been effective in terms of compliance with our regulation. Fish farms haven't had to try any other techniques to remediate underneath the farms to this point.

S. Fraser: Thank you very much.

J. Yap: Thank you for your presentation, Randy and Lynn and Eric. A question regarding your slide on how we compare to other jurisdictions in terms of our environmental regulations and controls — you know, the entire regime. How do we compare? I notice you had on your slide a reference to a comparison with other jurisdictions worldwide. How does B.C. rank?

R. Alexander: That was related to developing the regulation. We looked at other jurisdictions and what they do in terms of how they measure and manage. We took, I think, the best pieces from that to try and develop a regulation that would identify what the environmental impacts are. So I think we compare very well. Unfortunately, I can't tell you the specifics of, you know, Chile does this, and we do that. Eric may be able to give a bit more information on that.

E. McGreer: I think that from what we've looked at in general terms, B.C. is ahead of many other jurisdictions in following up on the results of the monitoring and in taking some action in terms of enforcement. Some of the issues we have here, in terms of both sea lice issues and some of the waste issues such as the hard bottoms.... We're probably at the leading edge of the world, of other countries. My impression is that

many other countries have certain rules but that they kind of rely on industry to do self-monitoring; there isn't really the follow-up to check that that's being done well. So I think we are safe in saying that we are certainly one of the leaders in the world in terms of the evolution of our programs.

[1255]

J. Yap: Thank you. A question on your slide on compliance and how different levels of violations.... For a minor violation you might get a ticket — I assume that's a warning or a fine — right down through the most extreme, where there would be licence suspension and/or cancellation. Are those results published on an ongoing basis so we have a sense of how industry is complying and what price you're paying for violating the rules?

R. Alexander: Yeah. The annual joint compliance report lays that out in terms of how many non-compliances there were, what the actions were, what the follow-up was. That lays it out pretty well.

We have not had to undertake any court action or charges to this point with respect to our regulation. We've been able to achieve correction of issues through other means.

J. Yap: Is the information to the extent that we can identify who the violators are so that repeat offenders would be known, or is there a privacy issue there?

R. Alexander: To my knowledge it's not published in that report, and I don't know whether there are privacy issues related to that or not. Yeah, that's not identified in the report — who the offenders were and that sort of thing.

J. Yap: I'm just wondering: in terms of the transparency as another incentive for industry to do well in this area....

R. Alexander: Yeah. Certainly that information, I think, is probably publicly available upon request. I may be wrong, but I'm not aware of a place where that information is published.

J. Yap: In reference to the waste issue, that's one that I've often wondered about. I hear that we're moving towards deeper waters, so there would obviously be greater space for the natural environment to, I guess, filter the waste substances.

With the existing fish farms that are not in deeper waters.... I know you do monitoring. You keep an eye out for the concentrations of sulphides. Would it be fair to say that the natural environment, with the ebb and flow of tides, would take care of flushing the waste concentrations in the normal course?

R. Alexander: It depends a lot on the site. Different sites will remediate more quickly or nature will take its course more quickly, and other sites would be more of

a concern. It depends a lot on where you locate a fish farm. That's something that's considered in the process of siting those farms. But that's the idea. Over time nature takes its course.

What you're doing is.... It's fish poop — right? It's concentrated rather than spread out. So that's the issue. You have a concentration of organic material, and does that concentration of organic material overwhelm the environment's ability to deal with it?

J. Yap: Is that why we put farms in fallow? We allow the natural environment to take care of the concentration.

R. Alexander: That's correct, yeah.
Do you want to add anything to that, Eric?

E. McGreer: Yes. The process is one of which.... You want to leave some of the animals there, because there are some whose job it is to revert the sediment — bring the oxygen back into it and make it recover. So that's the kind of thing. Yes, it is a natural process.

J. Yap: My last question. Has there been any research on the effects of a concentration of waste substances in a shallow area? What would those scientific studies show?

E. McGreer: There's about a 30-year history of looking at organic waste from different sources. Because, again, we're comparing organics to organics, we can use a history of sewage effluent, pulp mill effluent.

There is a four-part model that's been developed. A succession occurs from a clean area to slightly polluted to moderately polluted to really anoxic — the action is all gone; everything is almost dead. So in comparing our biological results to that model, we're kind of bang on. You can track where it is.

In reverse, the same thing happens. If you let it alone, it starts to recover. You'll move back through those four stages, which was a really good history on this soft-bottom, mud-and-sand part. There's nothing comparable for the hard substrate. That's where normally we'd put the hard numbers or criteria initially. That's what ongoing research has been looking at.

Now, can we have something similar or develop something similar for all the corals and hard-bottom things?

[1300]

G. Coons: Thank you, Randy, Lynn and Eric for coming in and giving the presentation.

Just a couple of questions. When we're looking at the impacts on the environment and the sulphates that are building up, you're basically using a closed-field type of situation versus a far-field effect?

R. Alexander: Yes, that's correct. We're looking at what's happening on the fish farm as part of our regulation.

G. Coons: That's taking into account currents and whatever may come into effect and the number of fish that are being put in and all relying upon the best management practices that are put forth to you with the information?

R. Alexander: Yes, that's correct.

G. Coons: I guess, through DFO.... You didn't mention the habitat compensation bank for finfish aquaculture. Does that come into play at all with your ministry?

R. Alexander: We don't deal directly with that in terms of our administration of the waste regulation. I think that's probably more in the licensing end of things. DFO is involved in environmental assessments — assessing sites. Eric may be able to....

E. McGreer: It would be solely part of DFO's approval process. When an application comes in to the Ministry of Agriculture and Lands, to the lands bureau, it's processed. It's sent out to all the agencies, including DFO, to look at. They would use that as a tool to determine their approval of a site — a new farm site. We don't have any connection.

G. Coons: Okay. Thank you. I guess I'll put those questions towards the DFO personnel when they come in.

My key reason for being here is coming from my community on the North Coast — key ties to the fishing industry not only in my region but the whole coast. I still have to come back to the wild salmon policies that we have provincially and federally and how they tie in with our mandate here, especially when we're looking to the interaction between aquaculture, the marine environment and wild fish.

Does DFO keep you up to date on fish stocks and predictions for future years?

R. Alexander: They do, but once again, we're not.... Our group in our ministry isn't the lead on this issue. It's the Ministry of Agriculture and Lands. We participate in these groups and so on, and the answer to your question is yes, but I don't want to give the impression that we're somehow the lead agency on this particular issue.

G. Coons: Okay. Because earlier I was referring to Ministry of Agriculture and Lands, and they sort of said.... They're sort of passing the buck, I guess, here. We don't really have somebody taking a lead role, it seems, and I think that's a major concern.

What I would really like to see is a presentation like we're seeing, dealing with our wild stocks — seeing a presentation on how we are looking at having technical committees for solving operational issues and how we are, as a province and as a federal government, looking after our wild stocks. I think this is a real dilemma in this province.

Again, I want to refer back to the Auditor General's report that looks at.... We were talking about regulations earlier and existing legislation and regulations. The Auditor General in 2004 indicated that existing provincial legislation and regulations do not provide adequate protection for salmon habitat because some key provisions are either not in force or not being acted on.

I'm sure our committee will look at regulations and how we relate to all the issues and my concerns about wild stocks. I would hope that somebody from the province here would do a presentation on how we are looking after wild stocks and how it affects issues — the marine environment and aquaculture — so that we can get a full view of what's happening provincially.

L. Bailey: Mr. Chair, could I just comment on that?

R. Austin (Chair): Certainly.

L. Bailey: I think it is important for the committee to explore that explicitly with the Department of Fisheries and Oceans, because this is a jurisdictional question. The federal government is responsible for wild salmon stocks. Once you've heard from them.... I mean, the province can talk about the kind of habitat protection activities we carry out, for example, on rivers and streams, but the fish themselves are a federal responsibility. This new oceans division — which I'm afraid I can't tell you more about; someone would have to come back — is our ministry's way of liaising with the federal government on marine fish issues. So that's probably something that we should follow up on with you.

[1305]

S. Simpson: A couple of questions.

Thank you very much for the presentation. I found it informative.

Can you tell me a little bit about how the standards...? Maybe another question first. In the previous presentation by the folks from Ag and Lands, we talked about science in a number of areas and about peer-reviewed research that's in progress. My sense from that is that while there certainly is some science that is there and completed, there's a whole lot of science that's in play right now where there's work being done by researchers, by academics, by government — whether it's DFO or our government.

I guess the question I have is: from the perspective of the Ministry of Environment, do you believe that the science we have today is sufficient to make these determinations about impacts of these farms? Or are we short...? Is there a body of information that we haven't got yet that's essential for us actually to make the determination about, to deal with, these big questions around aquaculture that are debated from the two perspectives? Are we missing a significant body of science here that maybe is in progress but isn't there today for us to be able to make determinations?

E. McGreer: Can I try to speak to that?

Two of the publications we've put in the CD we've given you address that to some extent. One is a result of an international workshop that the B.C. Aquaculture Research and Development Committee put on. We brought experts from all around the world to list out the priorities that we need to do.

It is a work in progress. Some of that science is available; some is still being collected. I think that in terms of today's discussions, yes, we have what we need to protect the environment, but as Randy mentioned in his slide, everything evolves. The environmental sector is evolving to say: "We want to see more than just your results from one fish-farm site at a time. We want to see what's happening in a bay with ten fish-farm sites." For that, there aren't a lot of standard methodologies.

Our approach, I think, has been to say: "If we have one that's in compliance and all the other nine are in compliance, then we think we're relatively safe." But there are new questions, new things, being raised all the time that people want to look at.

One of the other documents we provided is a document from the United Nations, from the fisheries and agricultural organization and a group of marine experts that looked at this question globally about four years ago. It's very up to date, very easy to read, with a section on policy-makers and a section for scientists. As you look through that, they ask and sort of answer the same question.

It's a moving target, if you like. Here and now, we're okay, but it's not going to stay there. It's going to be moving. What about, you know, the one that's ten years down the road?

S. Simpson: To follow up on the comment you made, what you're saying is that at this point in time — and there's obviously more work to be done — you have some confidence about the science, the standards that are set, when you look at individual farms and say, "Okay, what's the impact of waste from this individual farm?" but if you look at an area like, say, the Broughton, where there may be a whole number of farms in a relatively small area, we don't have adequate science today to say: "What is the cumulative impact of all of those farms, and does it change what we know, and should our assumptions be different?"

E. McGreer: The question is, if I were asked: "Is there a cumulative impact?" Then we don't know.

S. Simpson: We don't have an answer to that question.

E. McGreer: We don't have an answer, and one of the reasons is that there are no really well developed, agreed-upon methods for doing that. You'd probably go to individual scientific papers from various universities or groups, but the scientists probably wouldn't agree on exactly how you would actually go about that, so that's the uncertainty.

S. Simpson: That seems to me like a pretty important question.

Coming back to this question about wild salmon stocks, I appreciate that it's a DFO issue, but could you tell me then: when you're looking from an environmental point of view...?

[1310]

Maybe I'll preface this by saying that my sense of this was that when we look at the role of the provincial government in relation to aquaculture, Ag and Lands has responsibility for the farms; Environment has responsibility for the impacts.

R. Alexander: With respect to the waste produced.

S. Simpson: With respect to waste. But the way you measure those impacts, presumably, to some degree, is: what are those impacts on other organisms and other things like wild fish or other organisms? I mean if it's benign, it's benign. So you have to kind of determine how it is impacting wild stocks.

Do you do any of that analysis? Or do you take DFO's analysis and say: "We'll accept what DFO tells us in order to set our standards"?

E. McGreer: I can speak to that. What we found initially in looking at how to set up a regulation: 98 percent of the material coming out of a fish farm drops right to the bottom within probably 30-odd metres of the edge of the net cage itself. It's gone. Any measurement in the water is limited to two to three metres away. There was no evidence of any of the standard parameters measured in the water column from the waste that actually went farther than a few metres. So there's no real a priori reason why it would affect anything to do with wild stocks. The real link comes with things like sea lice. That's a different category and is, fortunately for me, the responsibility of the Ministry of Agriculture and Lands.

From the waste point of view, there's nothing in the water or in the habitat that would affect wild or migrating salmon. The effects we would be concerned with in populations would be in things like crabs, prawns, the bottom-feeding fish — flounder, those types of things.

S. Simpson: But it would affect those kinds of bottom feeders, potentially.

E. McGreer: Potentially, yes. Because if we have an impact that's too great, we'd be using up the food organisms they would eat.

S. Simpson: Right.

One last question, and it relates to staffing levels and the level of resources that the ministry has to be able to do its work. Maybe it's a two-part question.

I know that in many areas of the ministry, it uses a results-based approach, where it asks industry.... It sets standards and asks industry to meet those standards in any of a variety of ways and then does a re-

view to make sure that those are met. I certainly have some questions around that. I understand the process.

What is the level of support that you have to do audit and oversight? You mentioned a couple of staff who have responsibility for that: yourself and other officials. Is it the two or three people who essentially have responsibility for audit and oversight of 132 or 133 farms?

R. Alexander: With respect to the monitoring of the environment at those farms, yes. Now, it is a performance-based regulation that we have, so the aquaculture industry does the sampling and monitoring. We go out and audit. We review the results of their data. We audit 10 to 15 percent of the farms a year — that sort of thing. But yeah, it is a performance-based regulation.

S. Simpson: So that whole function for 133 farms around the coast is the responsibility of two or three people.

R. Alexander: Full-time staff.

S. Simpson: Absolutely. So obviously, you need to structure the audit function in a way that allows these people to have a life over and above their job.

R. Alexander: Yes, and draw on resources from other ministries. Like the inspectors at Agriculture and Lands — they're the ones that go out to each of the farms every year and do their inspections, and they do that on behalf of us as well. The conservation officer service — we have conservation officers around the province who also participate. But yes, it is three staff that administer that regulation.

S. Simpson: Do you produce annual reports for this?

R. Alexander: The annual reports are part of the joint Agriculture and Lands. We're also finalizing annual reports on the results of our monitoring over the last three years, so they should be ready in the next couple of months.

S. Simpson: The next couple of months, those reports on the monitoring will be....

E. McGreer: We've been fortunate to have had a significantly large budget, and that's how we augment staff; we augment our work. We hire qualified professionals. As I've mentioned, there are some very good people on Vancouver Island that we use. They do a lot of work for us, including writing up these annual reports. So that's how we kind of get our work done.

S. Simpson: Thank you.

[1315]

R. Cantelon (Deputy Chair): I'd like to offer a comment firstly to Mr. Coons's eagerness to learn every-

thing about the business, and I appreciate that there is. I just want to say on behalf of the executive committee that set this up, what we're trying to do is present today all three jurisdictions that affect this. I think the interjurisdictional mix was about as clear as that sample that was passed around earlier.

I appreciate your frustration, but I think we'll get to it all in time. One of them will be the Pacific Salmon Foundation we'll be talking to, whose focus is the effect on wild salmon. Ours is more looking from the aquaculture tank outward, and how that affects it. I think it's going to be a big enough task to do that.

But having said that and coming to other comments about regulations, I have a question too. The regulations started in 2002, I heard you say. I'd like to know what happened before 2002. Were there regulations in place? What regulations, specifically, were put in, in 2002? Any changes since? Then I have a follow-up on that.

R. Alexander: We call it the finfish waste control. The finfish aquaculture waste control regulation was put into effect in 2002. That's the regulation that's our primary piece of regulation in the Ministry of Environment to protect the environment with respect to aquaculture activities. Prior to that, there was a regulation in place. It was called the aquaculture waste control regulation. I'm not familiar with the details of that regulation, but I think it didn't have the teeth and the structure that this one does.

R. Cantelon (Deputy Chair): So this one has some teeth to make the industry comply. Is that correct?

R. Alexander: Yes.

R. Cantelon (Deputy Chair): Now, one of the issues. It refers to other comments we're adding — in controlling the environment. Here, principally, you've referred to it as fish poop — which is, I'm sure, fairly accurate — but we're always concerned for the environment and with adding things that weren't in the environment before.

I'm coming to the question: what do we do about monitoring feed? My understanding was, from previous situations, that there was an excess of feed being put in, which isn't native to the environment and which now drifts to the bottom, and that now we've got something that wasn't by nature there before. What do we do in terms of monitoring that?

R. Alexander: Eric, do you want to talk about the type of monitoring we do?

E. McGreer: Sure, when we go out and take.... We actually take bottom samples in and around the farms. When I first started doing it about five years ago, yeah, there were obvious — every second grab — uneaten feed pellets. The industry has evolved since that time to use underwater cameras and very sophisticated

measures to only feed precise amounts when the fish are hungry and actually active and feeding.

So we've seen that go to virtually zero. I would say that in the last year when we were out, we didn't see any excess feed pellets. That's a case, certainly, where we fed back to industry. Our recording forms are required, then, to report that. If we see it, then we get back to them, either by letter or phone or whatever, and say: "Look, we've got all this waste feed here." We feel that we've certainly worked with them to drive that change in their operational practices. Plus, for them, if they're wasting feed they're paying for, then they're going to save money by not having it lying around on the bottom of the ocean.

R. Cantelon (Deputy Chair): A last question. Mr. Simpson, I think, raised a point about the 10 percent and the number of people that monitor it. I would comment, of course, that it was earlier mentioned that of the 133 farms, there are only 70 or 80 or something that are active at any given time, because of fallow or other reasons, so you'd have two people for.... Let's say 40 each. We do a 10-percent audit, and I'm wondering: in other environmental controls or studies — or regulation, I guess, is what you do — is a 10-percent audit an acceptable norm in the department of the environment, generally speaking — not just in aquaculture? What would be the monitoring level?

R. Alexander: I would think that it's probably reasonable or the norm, I think, of the other types of permits and authorizations we have and the audits we do. We try to get out and inspect what we call our high-risk authorizations — or pulp mills and things like that — at least once a year. With a number of regulations where it's medium- or low-risk, we don't get out to all of the sites every year, so I think this is probably comparable to how we deal with other types of authorizations and regulations.

R. Cantelon (Deputy Chair): And many of those would be self-regulating, too, I presume?

R. Alexander: Yes. Performance-based regulations.

R. Cantelon (Deputy Chair): And then, of course, as you mentioned, you worked with the department of agriculture, who are out there quite a bit more. I think they said that 75 percent of the time they are out there.

I guess just a general comment. We're trying to achieve balance. I think any time we change or alter the environment.... We'd all prefer to have it in a pristine condition, but we seem to tolerate breathing air from gasoline emissions and other things.

[1320]

The real thing that we're tasked with achieving here is a balance. What is acceptable? It gets to an issue of risk management, and I don't think we'll ever get definitive answers to some of the questions Mr. Simpson has. There just isn't enough research, nor will there ever be enough research. But as mentioned, the targets

move, as they do with all emissions. We tighten them up every year, and that's what we're here to do — tighten them up.

C. Trevena: I have a few questions. One is, if I may harp on a little bit on the numbers of inspectors.... There are three of you in science-based who are there and who are available to go out. You also mentioned the conservation officers. How many conservation officers on Vancouver Island — because obviously, they have other tasks — are dedicated to, or working part-time on, inspections for the ministry on this?

R. Alexander: On a part-time basis, probably five to ten would be involved. But that would be a small proportion of their activities. Does that sound reasonable, Eric?

E. McGreer: Yes, I think so.

C. Trevena: Really, as a point of clarification, I just wanted to make sure that I completely understand your ministry's role in this. Your ministry's role in the aquaculture area is solely to look at waste management related to the industry, whether it's on nets or, as you say, fish poop or whatever?

R. Alexander: That's our responsibility, yes — regulatory responsibility.

C. Trevena: Effectively, up to the point of the farm up and running and the potential for the waste to be there, your role is very limited. You're not looking at the impact of the siting of the farm on the environment around or...?

R. Alexander: No, we're not primarily involved in the siting of those sites.

E. McGreer: But we do require baseline work to be done before we register them. A new application goes through all the other provincial and DFO's federal processes. So in that case, if the DFO habitat scientists say, "No, we think this is okay to have a farm of this size there," we rely on their judgment. We require physical and chemical baseline studies to be done. Through that, if there were something very rare or critical there, we would know that, and we could have input. But generally, we use the modeling to relate the amount of production versus the current flows and the physical-type oceanography to determine if it's a reasonable site. That at least gives us some idea of what's there before a farm goes in.

We don't routinely get involved in those decisions. If we have real concerns, then we have an ability to express them.

C. Trevena: To follow up on Mr. Cantelon's question about the feed and the amount of feed left, do you also monitor what is in the feed — the actual makeup

of the feed? Because that would obviously have an impact on what is being excreted.

E. McGreer: Yes. January 31 of each year the farms are required to report to us all chemicals and materials used. There are things like vitamin packs that get put by the commercial feed companies. Yes, that's all reported to us.

C. Trevena: I understand that you have the area where you can look at the soft bottom or the hard bottom and what the impact is directly beneath the pens and beyond the pens. Do you have any resources or availability to look at what's happening beyond, where the flush has happened and there has been an environmental impact noticed by people in the area on areas beyond the farm itself?

E. McGreer: Not routinely; not within our reg. But there are some research studies looking at that. Sitting on the B.C. Aquaculture Research and Development Committee, I would use that route to see.... We tend to use university scientists to look at that. So for far-field effects, I would see it through the research route. Also, some of the DFO fisheries scientists are looking at far-field effects as they might affect fisheries, shellfish beds onshore. First nations have concerns about that, so it tends to be more of their science looking at that area, and we restrict ourselves to the specific geographical limits like at the edge of tenure.

C. Trevena: So to find out more about the far field, it would be to talk with DFO about that rather than yourselves?

[1325]

E. McGreer: Yes. I'm not sure if you're going to talk to the B.C. Aquaculture Research and Development Committee or the research side of things. Someone could present from there. Al Castledine, who was here from MAL, is also on that committee, so you could have a rollup just on research, ongoing projects and results to date.

C. Trevena: That's my question. Thank you very much.

G. Robertson: Overarching question, I guess, to start with: is there a measurement of the total output in terms of waste from the industry on the coast right now? Is there a cumulative total that's added up, or is it all isolated — case-specific to farms?

R. Alexander: Do you mean how much waste is produced in total? I don't think we've ever totalled up that number or tried to put a tonnage to it. No.

E. McGreer: Industry would probably have those figures, because they know how much their loss is, and they know the conversion ratios of how much feed they put in to how much the fish use. One could ap-

proach the companies to get the data to calculate that if one wanted to. We haven't done it.

G. Robertson: I think I raised it just in the bigger picture that the Ministry of Environment, if anyone, should be charged with looking at that total cumulative impact of an industry on an entire coastline. But I have yet to hear that there's clarity around that. Maybe it would be useful for the committee to understand what that all adds up to and how it compares to other forms of agriculture, particularly given that it's dispersed in its entirety.

A specific question around the release of pesticides, synthetic chemicals, antibiotics: are the amounts of all those chemicals being tracked as well?

R. Alexander: Yes, those are annual reporting requirements as part of the reg. Any chemicals and materials that they use have to be reported.

G. Robertson: Is that available on the public record?

R. Alexander: Yes. It's not up on a website anywhere, but we have had requests for that information, and we've delivered that to people who've requested it.

G. Robertson: Are there mitigation efforts in place similar to integrated pest management or land-based agriculture measures to reduce the amount of synthetic chemicals released?

R. Alexander: Primarily through best management practices and the economics of operating the industry and also the effect on their fish stocks. It's in their interest to reduce the amount of those materials that they use. So through best management practices.... That's how it's approached.

G. Robertson: On the ministry side, are there limits that are set or created for sites specifically or for regions, as in the Broughton, where a certain load of chemicals will be beyond that area's ability to disperse it or accept it?

E. McGreer: I think that what we did initially, within a couple of months after our regulation was passed, was we went to the fish farm, a number of sites, together with DFO and said: "Don't put this stuff in the water." There's a whole range of insecticides, disinfectants that are related to bio-security protocols. They don't want fish disease spreading from farm to farm. We said: "Don't throw it in the water. Don't dispose of it there." It's a violation of our principles. It's a violation of the federal Fisheries Act. We work with them to have it put into other waste streams, so most of it doesn't get into the ocean.

The big exception is this sea lice pesticide, commercial name SLICE. Environment Canada has done a recent report on that and rolled it up very well. I put a copy of that on your CD. That's the state of the art right

now for SLICE. That's the big one that people are concerned about. Environment Canada was concerned because nationally it started to appear on their radar screens as a chemical of concern. That's the exception right now because it has to be.... The way it's put in as a pharmaceutical, it actually gets into the fish feces and then into the water.

G. Robertson: Is that the only involvement that Environment Canada has right now with the industry, or are there additional...? It's the first mention of them today.

[1330]

E. McGreer: That's the main involvement I know right now locally, at least out of the Vancouver office. They have had a larger involvement in freshwater aquaculture. They've started at that end. My understanding is that they plan to look at marine fish farming perhaps in the next few years. That's the major involvement they have locally, yes.

G. Robertson: So we can anticipate some more jurisdictional....

E. McGreer: Sorry. There is another element in, as Randy mentioned, contingencies for mass mortalities where you have natural fish kills due to plankton in the water. They've been getting more severe in recent years. There was a case of a potential loss of life on a farm on the west coast where the whole farm was sinking because all the fish were dying within about 24 hours. At that point the company had to apply to Environment Canada for an ocean disposal permit. That's the other area they're now involved with, and we will be dealing with them in terms of ocean disposal in an emergency situation for fish deaths.

G. Robertson: Policies for issues like that — mass mortality or introduction of pesticides, potentially toxic pesticides — are federal policy. Do they set the policy on what's allowable in terms of those releases?

E. McGreer: I think in most cases in the province — going back to the Slice — it's governed through veterinarians who have to prescribe it. They have regulations surrounding that. They would look at the input, not actually the output in the water. They wouldn't look at that aspect of it. There are no strict water quality regulations for that. There aren't really a lot of other pesticides used on the farm sites with the fish and things like that, which would get into the water, so no limits apply.

The other major one is disinfectants like Virkon. Virkon is toxic to fish, and DFO has worked with them again. This is the provision of foot baths. If you're out on a farm and you want to go from one farm to another, you have to dip your feet or boots into this disinfectant so you're not spreading disease. We said, "Don't just throw it over the side," so they dispose of it differ-

ently. Really, nothing else that I can think of in terms of an insecticide gets in the water directly.

G. Robertson: And antibiotics? Are they in their own category — the release and content in the feed?

E. McGreer: Yes, and, again, I rely on people like Joanne Constantine, who's here from MAL. They deal with more of the antibiotics and the things that are input. We do have a record of them, but.... I guess people would look more at the concentration in the fish as opposed to what gets in the water, so I don't have any standards for antibiotics in the water per se.

G. Robertson: Okay. A final few questions around slaughter and the release of blood into the marine environment and how the ministry is regulating or monitoring all the potential introduction of offal and blood into the marine environment.

E. McGreer: Most of the bloodwater.... The fish are actually killed on the transport vessels going to the fish processing plant. All of that's disposed of at the fish processing plant. In terms of the normal water quality variables — suspended solids, dissolved oxygen coming out of the effluent — yes, we have staff within Randy's group who look at that. We'll get reports from the fish processing industry. The glitch there is if the fish are being taken away because they died of some disease.

We had the instance a few years ago in Steveston where fish were being hauled from the Broughton Archipelago down to a process in Steveston. Somebody said: "What about...? They died of disease. Is disease getting into it?" In that area B.C. Aquaculture Research and Development Committee is into a phase 2 research project to look at disinfection and to know whether or not you're getting disease transfer. Again, we would go to our Ministry of Agriculture and Lands, like Joanne Constantine, to advise us on any type of disease-related vectors that might be in an effluent.

R. Alexander: The industry is required not to release bloodwater, so if the fish are harvested and killed on site, then they have to contain that bloodwater and dispose of it somewhere other than in the ocean. One of the main ways they do this is transport the fish live and either kill them en route or at the processing plant, so the bloodwater is contained, and it's not released directly into the environment at the fish farms or into the ocean.

[1335]

G. Robertson: So the ministry monitors and ensures that bloodwater is not released into the environment, and that is regulated?

R. Alexander: That's part of the annual compliance report, and the Ministry of Agriculture and Land's inspectors are the ones who do those inspections to make sure that's being done. They do that on our behalf.

G. Robertson: When it's not, are there...? What happens on the enforcement side of that?

R. Alexander: It's very rare that it's not, at this point, so there hasn't had to be a lot of enforcement in that area. I think the first step is warnings and tickets. If you have repeat offences, then you escalate the enforcement activity and go from there.

G. Robertson: Okay. Thank you very much.

G. Hogg: Aquaculture is a comparatively new venture. I was interested in you saying that you were able to garner bits of information and data to apply from other experiences. You made reference to soft bottom versus hard bottom, which I'm still struggling with, saying that some of the effluent from some of the mills and other places — we have 30 years' worth of experience from that.... We're able to learn and extrapolate from that — the impact that might have.

Do we have any experiences with hard bottoms? Do we have any aquaculture farms on hard bottoms? Do we have experience there, or have any been proposed to be approved?

E. McGreer: Yes, probably about 40 percent of them now are over hard bottoms. We would expect that trend to increase over time as industry moves into deeper sites or expands into the north coast. When the regulation was going through the consultation process and through the government machinery, that was an obvious question.

We've got all these sulphides and these numbers and standards for the mud and sand type. When you get to the rock, you've got nothing, so what we put in there was visual observation. We now require extensive videoing of the bottom, both at the baselines — so before any farms go in — and during peak production and a few other times with changes. We have a video record. Right now, we're primarily relying on our visual observations from those tapes to see if there is any impact.

We also have some additional contracts being done with Archipelago Marine Research here in Victoria to quantify if there are animals we can actually pick out and count. The world leader there is probably New Zealand. New Zealand has software, and they use software to process their videos.

That's one of the leading-edge things we're looking at. We're probably a while away from that, but yes, we're moving towards trying to make it more quantitative. Right now, it's simply a visual record of two videotapes.

G. Hogg: Presumably one of the criteria that we apply is the flushing action, so ideally you're not going to see anything when you go and look there. That's a good thing, I'm assuming, yet we're able to look at the cumulative impact.

I'm flashing back to my days on the Greater Vancouver regional district and the air quality and airshed

issues that we had there with approval of different plants that were emitting effluent into the airshed. We had standards for each one of them. Yet we didn't have a cumulative standard, like what the impact is going to be on our airshed. With the wind in the GVRD blowing up towards Chilliwack and plumbing everything up the valley, we've just been dealing with a number of applications along the U.S. border wanting to introduce things such as SE2, which will put more effluent into it.

In the airshed model we've been starting to find some ways of looking at cumulative impacts and saying that we can't continue to approve individual sites that may be putting effluent into the airshed, because of the cumulative impact.

Is there any work being done locally, internationally or anywhere with respect to what those cumulative impacts might be in a place like British Columbia, where we have more sheltered inlands? Is there a way of looking at and/or monitoring the broader-based impact?

Using the example that you provided of hard-bottom sites, presumably if we put 10,000 hard-bottom sites in and there was an all-wash, it would all go away. Therefore, the process we use for monitoring would say that things are fine, yet we wouldn't know what the cumulative impact might be in Delta or Vancouver or somewhere that it was washed to. Do we have some system, or is there any thought or process or practice or idea about how, in fact, we get our head around what that might be?

[1340]

E. McGreer: You've touched on a number of things. I like your air analogy, and I think that's a good benchmark to use, perhaps as you're going through work with the committee. I might ask: where is the aquaculture monitoring relative to what we do in air? I can't answer that. Randy might later, because he has some ideas. It's good that you've got that experience.

The United Nations has looked at this, and they have published some documents. It's in the documents on your desk, but it's primarily sort of conceptual. From my knowledge, it's a really broad-scale approach. In other words, there's a general concern about too many nutrients going into the ocean — scientists have a concern about that — from sewage treatment plants, from agricultural runoff, from a number of things including any nutrients from a fish farm. But I haven't seen any studies if someone has actually looked at that or tried to put that together, either on a small, regional scale or a larger scale.

G. Hogg: Is there some leadership we might be able to show or somewhere we might be able to go with respect to that? Looking not just at the impact coming from the aquaculture industry but perhaps global warming, perhaps all of the things that impact what happens within the context of our ocean and inland waters that we have some responsibility for.... It seems to me that that would be an important big-picture item

to be able to measure the quality of air and water, which are two of the things that I think the people of British Columbia and indeed Canada highly prize.

It's one of the challenges we look at in this industry — how do we balance that? How are we able with some scientific or empirically based data to say, "Here's how we're measuring it," so that I can have some confidence that as we go forward, we're saying: "Here's how we're testing this in a bigger sense"? It doesn't seem, just looking at the edge of tenure, as we saw in these.... The issues don't just exist within the areas that we're measuring. They seem to be existing more broadly, and I think it's important that we have some sense of that as well.

E. McGreer: It is our responsibility. As we mentioned, our regulation has to evolve. There will be a next version of the reg. A fair question might be: will you be looking at this in the next version of the reg?

G. Hogg: Will you be looking at this in the next version of the reg?

E. McGreer: I would say no, because the methodology of how to do it has not been developed. So then the question is: who's going to look at that? I would take that as a member of the B.C. Aquaculture Research and Development Committee — raise that at that committee level. This is one of our concerns: why I have to lobby with the other priorities in that. I would work it through there to get research for B.C. That's kind of what we're talking about. It's good to borrow some globally, but we need what we want to do here in B.C. Which issues do we want to advance first? What are some priorities?

G. Hogg: Mr. Chair, is it fair...? I know that some of our last witnesses — it seems like such a bold word.... Some of the last people who spoke to us talked about being able to provide us with some information. Is it a fair question to ask if they are able to look at that and provide us, from a technical point of view, with some ways that might be further pursued?

R. Austin (Chair): I think it's perfectly fair. There's nothing wrong with us asking them to provide us with any kind of information. That's a good idea.

G. Hogg: I so ask.

E. McGreer: So it's on the broader topic in terms of cumulative impacts and....

R. Austin (Chair): Yeah.

E. McGreer: Okay. I will do that.

G. Hogg: Thank you.

E. McGreer: The time frame, I guess....

G. Hogg: Sometime in the next 18 months would be great.

E. McGreer: Roughly, I'll say in the next six. I'll try to target that.

R. Austin (Chair): Perfect. Thank you.

G. Hogg: Great. And you mentioned something about being able to take that to a committee and discuss that with the committee. I'd be interested in that and in their response. Then if there's something, certainly this committee can look at it and see whether it's something that we see as being within our interest and purview to pursue any further.

R. Cantelon (Deputy Chair): It comes partly to my question that's been raised — the cumulative effect of the total amount of biomass that we're adding to it. Albeit, it's not like car exhaust. It's something that wasn't there before. I think the question was raised.... We'd like comments on how much tonnage there is.

I'd also be interested, as a side comment: how does that compare with the amount of human tonnage that we add in terms of effluent from all our communities? I think it's a matter of balance and how much we're pumping into the ocean quite happily. How does that compare in toxicity and in biomedical terms to what fish farms are doing? I think it's a matter of balance and comparison. I'd like to frame that with a bit of reference.

[1345]

I have a question. It comes back to — and I think it's an important consideration — your monitoring of waste. Two of the things in your report indicate that you do it at peak production and also during restocking. I'd like to know specifically: do you then go out when it is peak production — just when the fish are mature, I presume? You want to make sure that this would be, I presume, the time of highest concentration of waste on the bottom. Do you then have to give them a clean bill of health so that this bottom is cleaned out again before you allow a second restocking of fish? How does that work? What do you do?

R. Alexander: Yeah, that's basically it. You choose peak production, because that's when you're going to be having the most waste produced, so that the regulation sets triggers on what level of sulphides you're allowed to have on the bottom at that point. If you exceed that, then you have to leave that site fallow. You can't restock it until you fall back below the standard.

R. Cantelon (Deputy Chair): How long would that typically be — the fallow?

R. Alexander: It's a matter of months.

R. Cantelon (Deputy Chair): So that would be one of the main reasons that only 75 or 80 fish farms are

operating compared to the 133? Is that the principal reason, or is it economic reasons as well?

R. Alexander: I think it's probably more likely economics.

R. Cantelon (Deputy Chair): Okay, thank you.

S. Simpson: Just quickly on this, and I appreciated Gordon's comments around cumulative impact. I'm happy that you're going to see what you can provide us on that. I think that is a very large, unanswered question.

Just in reference again, and this is back to raise comment about the audit. I appreciate the limited audit — the 10 percent or whatever — but I found it interesting that the Ag and Lands folks, when they talked about fish health and that, said they do 120 farms a year in an audit. They do 30 a quarter, and they do over a thousand fish, so they clearly see, on the question of lice, the importance to do that and have the resources. I appreciate you don't have those resources in the Ministry of Environment, but it would seem to me that maybe it is a bigger issue than the 10-percent question. We'll sort that out over time.

The question I had really relates to — I know this isn't your division, and you may or may not be able to answer this — the new division within the ministry. I know you referenced this before — the oceans and marine fisheries division. What role will they play? Or do you know if they will have any role to play in relation to aquaculture and the relationship to wild fish? I believe they, in fact, do have a more active role to play within their mandate around the wild fish question.

When I look here, it talks about seafood industry development, marine fisheries, so clearly that's part of their mandate there. Is there an expectation that they will work with you in the future to look at these questions of aquaculture versus wild fisheries, since that falls within their mandate?

L. Bailey: I wonder whether we could come back to a response to that question. I'm not comfortable answering it with what I know about that division.

S. Simpson: That would be fine. Maybe you could just get somebody from there to tell us what their role is and how they see the relationship between their responsibilities around the marine fishery and aquaculture, if any, and how they're going to work on this now that they're part of the scene.

E. McGreer: I believe they have an excellent website, but I don't have the address. Perhaps that's part of that. They can refer to that when they return.

R. Alexander: Can I just comment on the audits and the points you raised there? We do visit all sites every year. It's the Ministry of Agriculture and Lands inspectors that do that on our behalf. We sit down with them and say: "Here are the things you need to inspect

on our behalf there." They go out and look at that, and they make sure that the reg is being complied with. So all of the sites are visited every year on our behalf. We only audit — actually go out and do physical sampling on the ocean floor — at 10 percent of the sites through the year.

S. Simpson: I'm pleased to hear that. Then to follow up on that: what things would you ask them to audit on your behalf, which they would then bring information back from all of these sites?

R. Alexander: We've developed a checklist based on our regulation: "Here are all the components that you have to comply with in our regulation." We've developed that checklist. That's what they use as their basis to go out and go: "Are they doing all of these things? Do they have these things in place?" They use that as the basis.

S. Simpson: Then you publish that somewhere?

R. Alexander: Yeah, in the annual report. That's the joint annual report.

S. Simpson: Those are the most recent ones? When do they come out?

R. Alexander: The 2003 is on the Agriculture and Lands website now, and the 2004, I think, should be on there shortly. I think Jackie gave you some results from that report.

S. Simpson: Right. Okay, so the 2004 report should be out soon with all of that information.

R. Alexander: That's correct.

E. McGreer: One example is the best management practices documents. We mentioned that they have to be on site, so when inspectors arrive, we want to see a fish-kill contingency plan. Where is it? Then we'll look through it. So they check off that yes, they've got these specific documents there as one aspect they look at.

S. Simpson: Great. Thank you.

[1350]

R. Austin (Chair): On behalf of the committee, I'd like to thank you, Randy, Lynn and Eric, for coming and making this presentation today. As we lie awake tonight processing all of this information, should we come up with some other questions, I would hope that we'll set up a process where we can send you written questions later on through the Clerk. Those questions would be distributed to all members so we know what questions are being asked. Then, when your answer comes back, you'll redistribute that to all of us once again.

I would hope that later on, as we discover more.... This is only day one, and I think there have been a lot

of great questions today, but there's an awful lot to learn. As we find out more, hopefully it'll be appropriate for you to come back later in our 18 months so that you can sit with us again and explain some other things that we've discovered.

Thank you very much. I now will call for a recess for ten minutes, until two o'clock, when we will reconvene.

The committee recessed from 1:51 p.m. to 2:07 p.m.

[R. Austin in the chair.]

R. Austin (Chair): I'd like to recall the committee. We will begin now with a presentation from members of DFO. I'd like to thank DFO, on behalf of the committee, for coming here today. This, of course, is a provincial committee, and we really appreciate members from the federal department coming here today to present and to help us learn more and, hopefully, come to some solutions to a very complex problem. Thank you very much for being here.

I now will hand over the floor to Paul Sprout, regional director general.

Briefing: Fisheries and Oceans Canada

P. Sprout: Thanks very much. I'd like to start off by thanking the committee for the invitation. We appreciate the opportunity to speak with the committee and to address questions or thoughts or observations on this important subject.

I'd like to start off first, though, by introducing my two colleagues who have accompanied me today. On my right is Andrew Thomson, who's the acting director for aquaculture in our fisheries and aquaculture management group. On my left is Dr. Laura Richards, who is our regional director of science for the Pacific region.

I recognize that you're on a bit of a journey. You're starting off going up a curve, and you have my sympathies. When I returned to the region last year to take over responsibility for the RDG position — the regional director general position — one of the first issues that I became painfully aware of was aquaculture. We probably generate more media coverage, more communication issues, more letters to the editor and more controversy with this subject than pretty much anything else we do. Frequently we find ourselves as a department the centre of the attention, along with others. This is an important subject, and we are pleased to be here to talk with you about it and to provide some thoughts.

In terms of my presentation today, I want to start off by saying that my presentation is going to be at 50,000 feet. If you're looking for the rubber to hit the road, it's not going to happen with my remarks today. What I'd like to do today is position you from the federal perspective. I want to give you a sense of our views of aquaculture, where we think we are going and our views on that. In order to do that, I'm going to

talk to you a bit about our mandate, our role in aquaculture. I'm going to highlight a few of the principles that are guiding our thinking, the objectives that we have for aquaculture. Then I want to talk a bit about some of the actions that we're putting into place to complement the objectives and the principles that I will note.

[1410]

I would also say at the beginning — and I'll conclude with this as well — that we would be very open to opportunities to return to the committee to provide more detailed presentations on elements of the federal role that you think would be relevant — science or any other matter that would help your journey and your deliberations. To that effect, I will conclude with that as well.

I'm on slide two. I'd like to start off first, though, with acknowledging the current context that we're operating in. I take it that all the committee members have a copy of the presentation that I'm speaking from.

First of all, aquaculture is represented by a number of species in many different locations in British Columbia, but salmon aquaculture is the one that draws most of the attention and the one that has highly polarized views. We have groups that have strong views. They're frequently divergent — very difficult to change views — and it's principally around the issue of salmon aquaculture.

The current issues affect or are primarily around the potential for impacts on wild salmon, mainly sea lice and disease impacts, the effects of farm waste on the environment and the expansion of farming. We're also noting, as part of the operating context, that we're in an environment where there's increased public scrutiny of the industry and government actions to mitigate any impacts. We also note that governments, both federal and provincial, are often criticized for appearing to either promote aquaculture at the expense of the environment or, conversely, to be overly conservative at the expense of the industry.

The industry itself has become a very important economic driver in coastal communities. At the same time, the value of the commercial salmon harvest — the wild harvest — has declined. In the past decade production from salmon aquaculture in B.C. has expanded threefold, and it now exceeds substantially the value of wild production of commercial salmon. In the global context aquaculture is expected to continue to expand, particularly as the traditional capture fisheries reach their sustainable levels.

In terms of our mandate — I'm on slide four — we're responsible for a broad array of programs and projects, but these are rooted or based in certain elements, starting with our overall responsibility for developing and implementing policies and programs in support of Canada's scientific, ecological, social and economic interest in oceans and fresh waters. This broad mandate is a national mandate, and this mandate is affected by jurisdictional issues that change from province to province to province.

Within B.C., though, we have certain legislation that we're particularly responsible for, which includes the Fisheries Act, the Oceans Act, the Canadian Environmental Assessment Act and the Species at Risk Act or SARA. These sets of legislation inform and provide our direction. These then get amplified by a series of policies, and in aquaculture there are two important ones. One is our habitat policy, and the other is our aquaculture policy framework.

Finally, we have individual strategies. For example, the Department of Fisheries and Oceans produces a national strategic plan every five years which lays out broad initiatives that it intends to implement, and this plan informs our thinking, as well, in this region. So the legislation, policies, strategies and regulations, then, are the basis of how it is that we think about our activities and, more specifically, about aquaculture.

[1415]

I want to turn to aquaculture. We have a vision, and we have principles, and these come from the aquaculture policy framework that was developed in 2002. The vision is that aquaculture should benefit Canadians through their culture of aquatic organisms, while upholding the ecological and socioeconomic values associated with Canada's oceans and inland waters.

We have some principles that help us reflect on that vision. Again, for example, we want to support the development that is consistent with ecosystem and integrated management. We want to address public concerns in a fair and transparent way. At the same time, we must respect the constitutional protection afforded to aboriginal and treaty rights. We recognize that aquaculture use is a legitimate use of the marine resource. We support responsible development of aquaculture. Finally, we also acknowledge the necessity to work with other levels of government — federally, provincially and locally — because of the overlapping jurisdictions and interests in realizing these objectives, these principles and this vision.

We have three major objectives in managing aquaculture. These are environmental sustainability, which is supported by a science-based management approach, which also is founded on appropriate decision-making; a socially responsible approach, which is based on clear management protocols or regimes that recognize aquaculture, as I've noted, as a legitimate user of the marine resource; and then an economically viable industry that can foster an internationally competitive industry that is robust, diverse, self-reliant and provides benefits, particularly to coastal communities.

Now I'd like to turn to the issue of jurisdiction briefly. From my experience in this file, it will probably take some time to come to understand or appreciate the complexity of aquaculture. Today is a start, and tomorrow is another, and so forth as you start to move up the curve and become more and more familiar with this file.

The jurisdictions do overlap. From the departmental perspective, I wanted to lay out four broad roles that we have with respect to aquaculture. Those are regulatory, research, management and communication.

On the regulatory side we have a responsibility for screening proposed farm sites under the Canadian Environmental Assessment Act or CEAA. We have a responsibility for enforcing regulations under the Fisheries Act to protect habitat. We also have a responsibility for licensing the movement of fish into pens, sites, and to monitor habitat impacts.

In terms of research, we are a science-based organization. We have a significant sector in our department comprised of scientists, biologists and technicians who are responsible for providing scientific advice in support of our use of the resource — in this particular case, aquaculture.

We also, as we've indicated, manage the industry as a legitimate user, which means that we have a responsibility, then, to coordinate our activities with other jurisdictions, which also have responsibility in this area.

Finally, as noted in our principles, we do need and want to obtain the views of the public and other interests to increase the understanding of issues around aquaculture and to influence our thinking, views, policies and strategies on aquaculture.

Now I want to turn briefly to some actions in these categories of responsibilities. This is not an exhaustive list. This is meant to give you a sense of some of the things we do in terms of individual actions under these broad roles that I outlined. For example, under the regulatory role, one of the things that we try to do is incorporate new, science-based tools. For example, we have developed or we use computer models to predict waste deposition to assist us in looking at siting requests, location of sites and also to assess the impacts of farms on those sites.

[1420]

We also standardize environmental assessment methods to ensure that each review of the farms is done in a more systematic and scientifically based way. We conduct risk assessments for the development of new aquaculture species.

In terms of research, as I've noted, we are responsible for and conduct a variety of developmental and ongoing research programs aimed at addressing a number of objectives: to determine, for example, the environmental interactions of aquaculture; to study the ecosystem effects of aquaculture and to better assess the cumulative impacts; and to improve the competitiveness and the sustainability of the industry.

For example, we have activities that we carry out in the Broughton Islands in terms of our pink salmon action plan that's been underway for the last several years. It's an example of research that the department is doing to try to answer some of the questions that people are posing about sea lice and salmon interactions.

In terms of management, as we've noted, what we would like to do is manage the industry consistent with the standards and approaches that we apply in other habitat development activities. We regard aquaculture as a legitimate use of the fishery, just as we regard the capture fisheries as a legitimate use of the fisheries. We want to look at aquaculture from that

perspective, to try to understand how it should be properly and appropriately managed. We recognize that aquaculture, by its siting, may have habitat impacts, just as when we construct bridges across rivers, locate highways or buildings. All of those have impacts, so we want to try to apply standards that are uniform as we address this use of the resource.

In proceeding in this way, we also are mindful of encouraging aboriginal support and involvement in the aquaculture industry. We believe that they're logically positioned to participate in this industry, and we have a number of groups that do participate.

We want, obviously, to collaborate with our provincial colleagues. It's clear that in order to appropriately manage this industry, we need to work together.

In terms of communication, as I've noted in our principles, we do want to increase the public awareness of how aquaculture is being managed. We will do this through a series of public activities. We have, as an example, our recently redesigned website to provide greater access, more transparency — to make it easier for people to follow this issue and to understand it. We work and meet with communities, aboriginal groups, environmental interests, and so on, to obtain thoughts and views on this matter, to provide them with our views, to clarify understandings and to assist as we think about the management and the strategies around the industry.

I wanted to talk briefly about where to from here, from a federal perspective. Now, I recognize that you're on a journey and that over the next months as you accumulate information, as you become more cognizant and more aware of the views and perspectives, you will be turning your mind to think about long-term approaches.

We think we have to put more emphasis on cooperation and coordination, particularly when it comes to promoting scientific research. We have a science program in our department. Other institutions and agencies also carry out or fund science — universities within the province. We think there are opportunities for us to encourage collaboration and cooperation in this area that will better support and reinforce the view of sound science behind this industry.

We think that there's room for more efficient and harmonized governance arrangements between the province and the federal government to properly manage this industry, to coordinate activities. We believe — although admittedly, it's challenging — that we need to encourage more collaboration among the interests, with the view to foster better understanding, to attempt to reconcile divergent views, but recognizing that this will be challenging.

[1425]

Finally, we feel that in moving forward, we have to improve the public understanding that even simple public meetings — where we explain the monitoring processes, the regulations, the stipulations and the constraints around how the industry is managed and controlled — are progressive and are useful for people as they consider their views on this important matter.

I'd like to conclude by noting the following. We think the aquaculture industry provides important benefits to B.C., particularly to remote communities, yet the aspects of the industry — those related principally to salmon — are highly controversial. Our direction is informed by legislation and policies which are underpinned by science to better manage and protect the resource. We think that as governments working together, DFO can support and explore ways to enhance transparency, increase harmonization and conduct more collaborative science activities.

Finally, regardless of these remarks, our overarching objective has to be to ensure that the industry is managed in an environmentally sustainable manner and that we have the programs and the policies and the strategies to achieve this end.

On the very last slide is a list, a schematic, of the number of presentations that one could make to this committee, as your understanding of this matter is enhanced over time. As I noted at the beginning, this presentation by me is a high-level review. This is designed to make the point that we have policies and legislation, we have a perspective, and we have objectives. We also recognize that there is a series of programs and projects and activities that take place that would require subsequent presentations.

As I noted at the outset, we'd be very pleased to come back to make presentations, for example, on science, or on regulatory activities, management or other activities that you think would be useful in your endeavours. We would be open and quite able to do that, and we'll look for any guidance that you may offer.

R. Austin (Chair): Thank you, Paul, for that very macro-level overview of the industry.

I'm now going to open the floor to questions. Bearing in mind that this has been a real overview, perhaps some of the questions today could be at that same macro level. We will have chances and opportunities in the future to go to some of the nitty-gritty details as we learn more. I'm going to open the floor for questions, and I'll ask if any of my members would like to speak.

R. Cantelon (Deputy Chair): I appreciate the approach, because we've been flying along at 50,000 feet, and every now and then we take a dive down to tree-top level, and it gets a little confusing at some times.

Interjection.

R. Cantelon (Deputy Chair): We've got to stay away from the fish analogies.

Mr. Sprout, if you had to prioritize that last page of suggested things that we could look at, where would you direct us?

P. Sprout: Listening to the discussion for a half-hour or 45 minutes when I came in, I would say we should probably start with science. We should probably explain what we do, why we do it and how we do it.

We should probably talk about the Broughton Island sea lice program — what we've been doing, what we've been finding. I think that would require us bringing together several of our scientists that are dedicated to this activity. I think that that in itself would be a separate presentation. That might be helpful for the committee to start orientating itself.

A presentation on the regulatory side from a federal perspective would also be helpful. The reason is that I think it would help you to negotiate the jurisdictional confusion that exists, and that would help further clarify, from your perspective, where solutions might ultimately lie and who would be responsible for those solutions.

Those are two areas that I think you might reflect on.

R. Cantelon (Deputy Chair): A follow-up. At Fisheries, you're also involved in the west coast, but would it be useful to know what's happening on the east coast of Canada with respect to the fishery generally, specifically fish farming over there?

[1430]

P. Sprout: Okay, that's a good point. If that is of interest to the committee, if you could flag that, we would maybe want to arrange a different group to come and present. If that's of interest, we'd like to know that.

S. Simpson: Thanks for the presentation. I would agree with you that science is a good place to start, and I'd be very interested in having that discussion with some of your science officers.

One of the things I'd be interested in is whether you think that there would be value.... Sometimes what happens with science, as you know, is that we'll get one group of scientists here who will tell us one thing, and then we could bring in another group of scientists who would tell us something else. I'm wondering whether you think there would be value in maybe having a few people come in a bit of a forum. Bring in recognized experts in the field — people from your ministry, and obviously there are people who have a different view who are pretty well recognized. Bring a small group together and have a discussion, for us to be able to have some of the discussion over differences — in a controlled environment, so to speak.

I would be interested in doing that, rather than having one group of scientists come and tell us one thing, and then another group come and tell us something else, and then have to go back and say: "Let's bring those first people back again because we have new questions."

I'm wondering whether you think there would be value in that kind of approach.

P. Sprout: My answer would be: it depends. I think it depends on who you're talking about inviting.

The fact is that this is a contentious issue. There are views and concerns and perspectives on this — and

that's, in part, why it is that we have different opinions. I think, from a committee perspective, what you're trying to do is get at the facts as best as possible and try to clarify and remove judgments and speculation from facts. The process that I would encourage you to set up and to think about setting up is something that would draw that out.

I think in the end you may still have a range of views, even within the scientific community. That being said, we're certainly prepared as a department to come and express our thoughts on our views based on the research we have done. I would like to feel comfortable that we're doing so in a peer environment in a way that's collegial and cooperative and that's designed to move this initiative forward consistent with your terms of reference.

My response would be: I would appreciate seeing what the suggestions would be, who might be there and how it might be structured before responding more firmly.

S. Simpson: I appreciate that, and I think absolutely it would be my desire that it be people who are peers in the scientific community and recognized as having made meaningful contributions to this discussion, who may differ in views but are prepared to have a discussion at a pretty respectful level about what those differences are and why they exist. I'm sure there are areas that aren't conclusive. Maybe we'll talk more about that as a committee.

One of the things that we discussed with some of the staff from the Ministry of Environment — and I believe you might have been here to hear a portion of this — was this question of cumulative impact in places like the Broughton. When you look at an individual farm, you may make certain assessments — whether about lice or waste or whatever — but there's another discussion when you bring 28 farms in — or however many of those may be in operation at any given time — and the cumulative impact. The folks from the Ministry of Environment said that there's really a limited amount of solid science on the cumulative impacts.

I'd be interested in your take on what the status of that analysis is. How best do we go about trying to get some answers to those questions on cumulative impacts?

P. Sprout: I'm going to refer this to both Andrew and Laura, but I would start off by saying yes — cumulative impacts is something that we are aware of. We are carrying out research to look at far-field effects. Also, in our environmental CIS screening process, cumulative impacts is something that is considered in the screening of individual sites. It is something that is explicitly acknowledged and looked at in making site decisions about farms.

[1435]

Additionally, from our perspective in the department, we actually are carrying out work related to try to further elucidate the issues around this and answer some of the questions. We think it's a relevant topic.

We're doing work on it. It is part of our assessment right now in the environmental screening process. So we already do make judgments about this, but we're trying to reinforce that with more science. I'm going to ask if Laura Richards wants to expand or not.

L. Richards: Not too much, other than just to reiterate that it is something that we do consider. However, as you stated, there isn't a lot of work specifically around the subject, in part because it's very complicated. Like much of the work we do, a lot of the answers depend on specific circumstances for specific sites, so it's really hard to design studies to give some really general answers to some of these questions.

If we are interested in some of these topics, when we do our science presentation, we can come back and flag topics like that and give you our understanding of the work we've been doing on that issue.

S. Simpson: One last question. It relates to sea lice, which is maybe the largest point of contention in this discussion. I'm wondering if you can tell me what research... I know you do a lot of research yourselves, which you've done directly or have had done for you, that really looks at those questions around concentrations and the effect of the concentrations on farms, and what effect there is or isn't on juvenile salmon.

This is, I know, a point of large debate, and I believe the research — I've not had a chance to read it — that Mr. Routledge and Ms. Morton have done takes a contrary view to some of the work that's been done. I'd be interested to know what work you have available that you've done on that directly and that begins to respond to those issues.

L. Richards: Well, I think as Paul explained, we should come back and give you a full presentation on sea lice...

S. Simpson: That would be great.

L. Richards: ...because it's big and it is complicated. Unfortunately, when you get into science, I'm sorry, but all the answers seem to be complicated. That's just the way it is.

We have been working, I think as you know, in the Broughton Archipelago, doing surveys there for the last three years. We have also been doing lab studies. We've been doing a range of different kinds of studies. I think you asked a very specific question, which wasn't precisely the way our studies were designed, but they do have some information around those questions. So I think it would be preferable if we came back with a full presentation of that.

S. Simpson: That would be fine. Thank you, and I look forward to that presentation.

C. Trevena: I, too, look forward to further presentations. But looking at this from a macro view, you've given us a very comprehensive view of DFO's role in

aquaculture. What percentage of DFO's specific portfolio is given to aquaculture compared to other priorities? What exactly are the other priorities, and how do they impact on your work with salmon and with aquaculture?

P. Sprout: I don't have the figures here. I can try to scope it for you broadly though. We have a very wide mandate in this region. For example, DFO also includes the Coast Guard. So we have responsibilities for search and rescue, aids in navigation and so forth.

Within DFO itself we have a science-based organization that's responsible for providing advice for the management of wild fisheries, capture fisheries. We also have responsibility for habitat protection. We have biologists that are responsible for assessing habitat implications and fishery officers who have enforcement responsibility to ensure that the Fisheries Act is respected, that Fisheries comply with regulations. We have a policy role and responsibility for developing policies. We have a communication function. So across the board, we are a large organization.

In terms of the proportion of resources that are invested in aquaculture, it would be principally the science activities that Laura would be in charge of. The management responsibilities would come under my colleague Andy, on my right. We have other staff that would have part of their responsibility associated with that. It would be a proportion of investment that would be probably less than 10 percent of our total budget that would go into it because of the fact that the other budget is going into the wild-capture fisheries and activities like that.

[1440]

That being said, a lot of the information that is used to discuss aquaculture — for example, the returns of pink salmon in Broughton Island.... Those are activities that we carry out that ultimately serve as a basis for helping us or allowing us to evaluate, for example, siting issues or other matters related to aquaculture.

The short answer is that it will be difficult to exactly tease out, but I could provide to you, if you're interested, the direct cost that we would attribute to aquaculture in our region. That would be principally the staff that direct 100 percent of their time toward aquaculture. I would have to acknowledge that there are a lot of other things that we do, peripherally, that indirectly support or provide information or understanding to that industry.

C. Trevena: That was going to be my next question. How much overlap is there that you encourage to happen — not just sort of segmenting off in departments: the wild fisheries and the stream protection and so forth.

P. Sprout: We try to operate in an integrated way. That's our objective. How well we achieve that is another question. But we try to work in an integrated way, so we recognize that the use of fish, whether it's aquaculture or capture fisheries or habitat.... All of

those affect fish. We try to organize ourselves in a way that individuals that have a specific responsibility liaise with others who have a different responsibility, because in the end it's one ecosystem, one integrated group.

My response would be that I think, structurally, we're organized in the areas in a way that encourages that integration. Although, I will admit that it is a challenge in our department to encourage that integration because of the tendency for people to split apart into their disciplines. That's a tension we try to manage.

G. Coons: Thank you, very much, Andrew, Paul and Laura, for coming in.

Yes, I can see through the strategic plan. It would also be nice to have a briefing on the oceans action plan where I read of 20 federal organizations with oceans responsibility. I can see it's pretty intensive, and in some areas, some part of the population may think that more should be spent.

I was just sort of wondering as far as regulations, as far as aquaculture.... Are there any federal regulations dealing with aquaculture, or is it basically provincial?

P. Sprout: I'll turn to Andy to respond to that.

A. Thomson: Certainly, we use the legislation that backs up our department and apply it to aquaculture. An example would be the federal Fisheries Act, which is our primary legislation. There are sections underneath the federal Fisheries Act that deal with the impacts of fish and fish habitat and under that the Fisheries general regulations, the transfer of fish into fish-rearing facilities.

There is no federal aquaculture act, but within the Fisheries Act, within the Canadian Environmental Assessment Act, within SARA and within the Oceans Act there are regulations and mechanisms that we apply to aquaculture management.

G. Coons: Do you do any monitoring yourselves through the feds?

A. Thomson: Certainly, farm sites can be monitored and are subject to the same requirements under habitat regulations to ensure compliance to our regulations.

G. Coons: Again, the role of this committee, as you see, is to try to balance the economic goals and environmental imperatives and to focus on the interaction between aquaculture, marine environment and the wild stocks. Again, I think personally that it would be very valuable if somewhere along the line you could give a brief about your wild salmon policy, where that fits in provincially and how you think that ties in with both the aquaculture and wild stock policies you have with the province.

P. Sprout: I think that would be fine. We'd be quite pleased to do that.

G. Coons: Thank you.

R. Austin (Chair): Well, seeing no further questions, I'm going to thank you for coming here and making this presentation today and recognize that I think you've made a very valuable suggestion, which is that you can return and speak to us about specific areas of concern. Once the committee members have had some discussions as to what exactly it is we'd like you to come back and address and the order in which that would be helpful to us and the timing of it, we'll contact you and, hopefully, set that up. Thanks, again, for coming here today. We appreciate all your help.

[1445]

P. Sprout: Thank you.

A. Thomson: Thank you.

R. Austin (Chair): Can you please also just ensure that any information that does come back comes through Craig James so that it can be distributed to all the members here.

Motion to adjourn, if there's no further business?

Okay. The committee is adjourned until tomorrow morning, 9 a.m.

The committee adjourned at 2:46 p.m.

HANSARD SERVICES

Director
Anthony Dambrauskas

Production Manager
Jill Ainsley

Assistant Production Manager
Robert Sutherland

Editorial Supervisors
Janet Brazier, Christine Ewart

Galley Editor
Heather Bright

Technical Operations Officers
Pamela Holmes, Emily Jacques

Research
Jaime Apolonio, Mike Beninger
Dan Kerr, Cristy McLennan

Editors
Shannon Ash, Andrew Costa, Heather Gleboff,
Margaret Gracie, Jane Grainger, Iris Gray,
Linda Guy, Bill Hrick, Paula Lee, Elizabeth Levinson,
Marg MacQuarrie, Constance Maskery, Jill Milkert, Lind Miller,
Lou Mitchell, Karol Morris, Dorothy Pearson, Erik Pedersen,
Janet Pink, Melanie Platz, Robin Rohmoser, Robyn Swanson,
Camilla Turner, Heather Warren, Arlene Wells

Published by British Columbia Hansard Services, and printed under the authority of the Speaker.

www.leg.bc.ca/cmt

Hansard Services publishes transcripts both in print and on the Internet.
Chamber debates are broadcast on television and webcast on the Internet.