Chapter 4 • DFO overview: organization, science, policies

This chapter provides an overview of the management structure and organization of the Department of Fisheries and Oceans (DFO), both nationally and regionally, as well as an introduction to its governance structure and budget. In addition to this general overview, I have provided in this chapter a more detailed discussion of the organization and management of DFO's science programs, as well as a discussion of some of its policies relevant to my Terms of Reference.

To an outsider, DFO's elaborate organizational structure rarely seems obvious or intuitive. The structure seems to change regularly, reflecting shifts in DFO's priorities; for example, during the life of this Commission, DFO's national science sector was renamed twice, from "Science," to "Oceans and Science" for 2010 and most of 2011, and to "Ecosystems, Oceans, and Science" in late 2011.

To understand how DFO manages the Fraser River sockeye salmon fishery and to make meaningful recommendations for changes to improve the fishery's sustainability, it is important to understand how DFO works. The aim of this chapter is to describe its organizational structure, including its management of science, and some of the policies that guide it.

National and regional structure and organization

Like all federal government departments, DFO follows the administrative and financial policies established by the Treasury Board of Canada Secretariat (Treasury Board). It requires that all departmental reporting conform to its Policy on Management, Resources, and Results Structure, which contains three elements:

- "clearly defined and measurable strategic outcomes …";
- a "program activity architecture … that is explained in sufficient detail to reflect how a department allocates and manages its [human

and financial] resources to achieve their intended results"; and
- a "description of the current governance structure, which outlines the decision-making mechanisms, responsibilities and accountabilities of the department."[1]

The Treasury Board measures the performance of departments using its Management Accountability Framework[2] and issues reports reflecting its assessment of the department.[3] DFO's current deputy minister, Claire Dansereau, described the Management Accountability Framework as an extremely important document and the "basic management tool," since it is a tool used by the clerk of the privy council to measure the performance of deputy ministers.[4]

DFO reports annually to Parliament, tabling the following documents for approval in the format prescribed by the Treasury Board, which are posted on DFO's public website:

- Report on Plans and Priorities;
- Departmental Performance Report; and
- Departmental Plan.[5]

Ms. Dansereau described these three documents as "fundamental planning documents" for DFO, stating that the department organizes its human and financial resources around a set of strategic outcomes, identified in the annual Report on Plans and Priorities.[6] This report summarizes the department's plans for the coming year, setting out its "priorities and the key strategies for achieving them."[7] The Departmental Performance Report, in contrast, reviews the department's performance over the previous year.[8] DFO's sectors and regions (described below) prepare business plans for the coming 12 months, as well as outlining the human and financial resources required. "The *Departmental Plan* takes the priorities set out in the *[Report on Plans and Priorities]* and the human resource implications outlined in the individual business plans and integrates them into a high-level summary of Department-wide and priority-specific challenges, as well as the strategies for addressing them."[9]

Strategic outcomes and program activity architecture

DFO's programs are organized to correspond with one of the stated strategic outcomes, creating the department's "program activity architecture" in compliance with Treasury Board reporting requirements and as illustrated in DFO's Report on Plans and Priorities. The deputy minister said that DFO's priorities "flow from a series of higher level statements made by the Prime Minister … [including] from the speech from the throne … [and] from the budget documents.[10]

DFO has established three strategic outcomes (adhering to the Treasury Board's structure), which are currently set out in the *Report on Plans and Priorities, 2011–2012*, as follows:

- economically prosperous maritime sectors and fisheries;
- sustainable aquatic ecosystems; and
- safe and secure waters.[11]

Prior to 2011–12, DFO's three strategic outcomes were stated as follows:

- safe and accessible waterways;
- sustainable fisheries and aquaculture; and
- healthy and productive aquatic ecosystems.[12]

Figures 1.4.1 and 1.4.2 illustrate the programs and underlying activities for the relevant strategic outcomes, as set out in the DFO *Report on Plans and Priorities, 2010–2011,* and *2011–2012*, respectively.

DFO organizational structure – the functional matrix model

The organizational structure of DFO is complex, with both national and regional offices responsible for integrated programs and policies operating as a "functional matrix," described below. DFO has six regional centres of operations: Pacific, Central and Arctic, Quebec, Gulf, Maritimes, and Newfoundland

2010-11 Program Activity Architecture

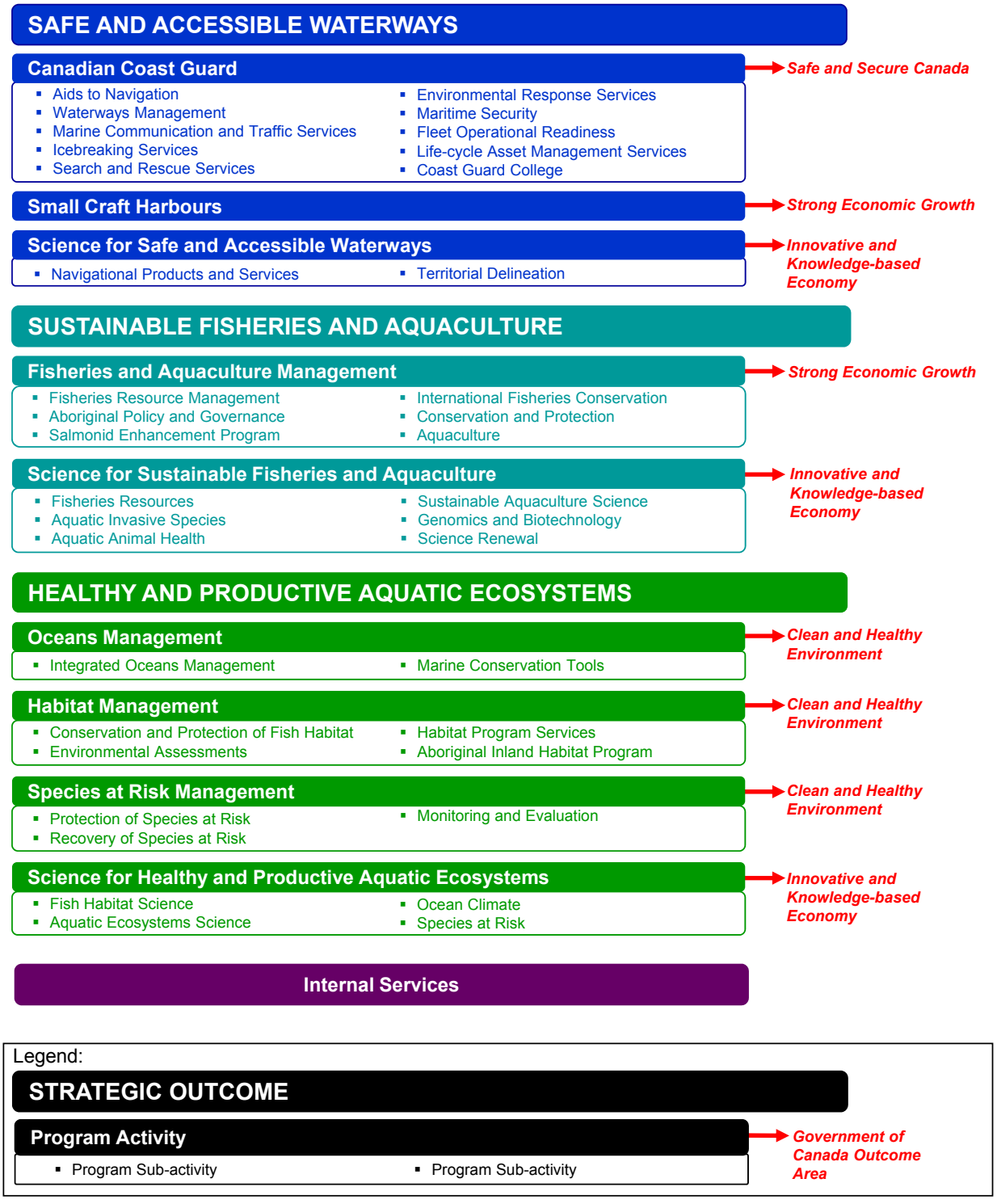

Figure 1.4.1 Strategic outcomes and program activities, 2010–2011

Source: DFO, *Report on Plans and Priorities, 2010–2011.*

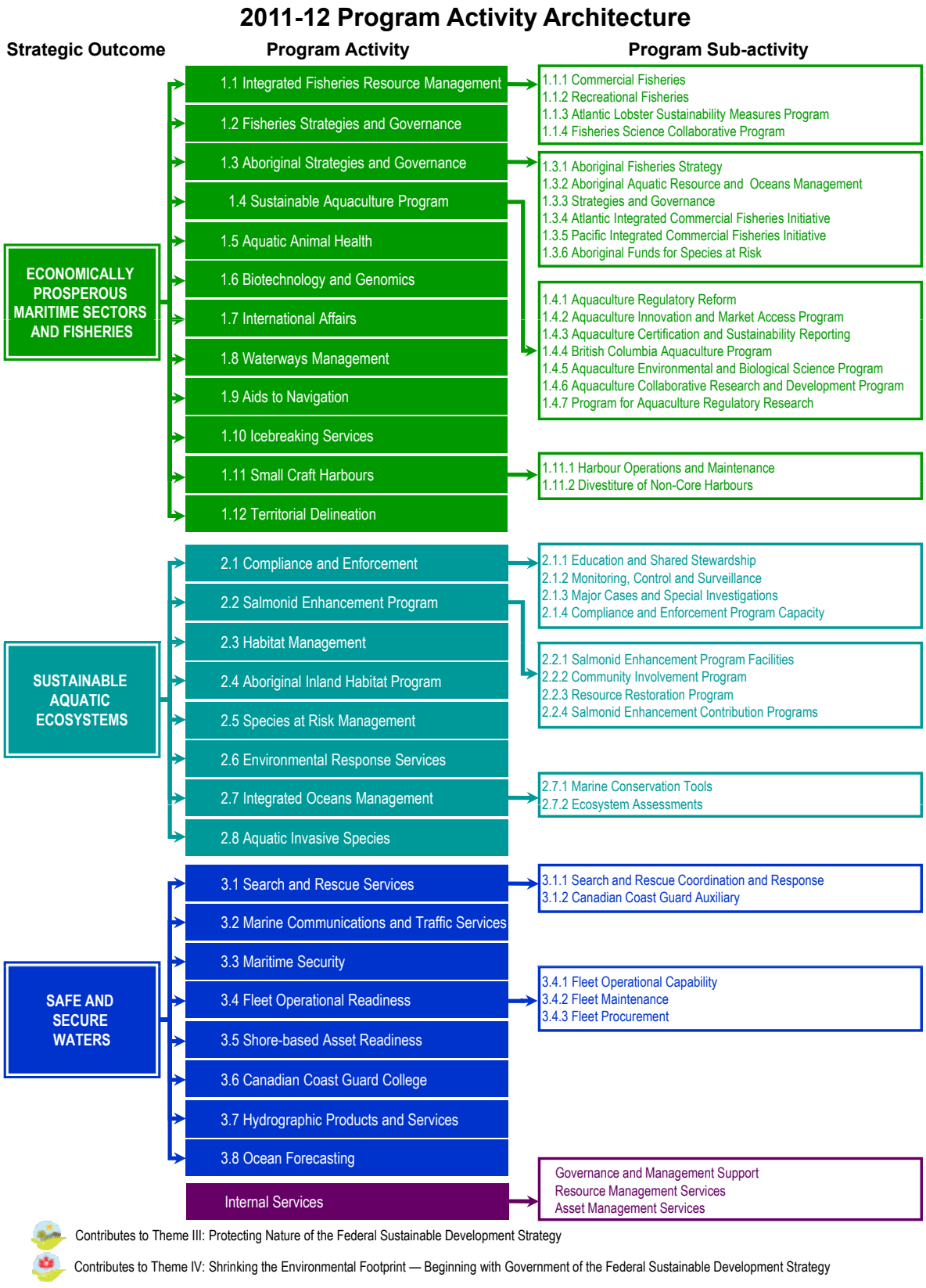

Figure 1.4.2 Strategic outcomes and program activities, 2011–2012

Source: DFO, *Report on Plans and Priorities, 2011–2012.*

and Labrador. More than 85 percent of DFO's resources are located in the six regions, three of which are located east of the province of Quebec. The Pacific Region encompasses all of British Columbia and the Yukon.

In emailed submissions, as well as during presentations at the forums held throughout the province in fall 2010, I was told that "many members of the public have lost confidence in DFO as presently constituted"[13] and that there should be less "political interference" from Ottawa in the operations of DFO's Pacific Region offices.[14] A presenter at the Prince Rupert public forum said:

> Many people out there accuse mismanagement by DFO and their inability to effectively manage and protect salmon, DFO's lack of sufficient baseline research for such protection and their ineffective management regime seems to be high on the list. I believe that DFO is too centralized and that regional staff need the autonomy and flexibility to make decisions that make sense locally, decisions that can respond to fluctuations and changes.[15]

The minister of fisheries and oceans has overall responsibility for the management and direction of DFO under the *Department of Fisheries and Oceans Act* and oversees the administration of the *Fisheries Act* and other pertinent legislation. The prime minister appoints the deputy minister, who is the accounting officer and the most senior public servant in DFO; the deputy minister advises and provides the minister with the necessary support to fulfill his or her responsibilities. The deputy minister is responsible for the day-to-day management of DFO, assisted by an associate deputy minister. DFO encompasses the Canadian Coast Guard, a special operating agency, whose commissioner reports to the deputy minister.

In the functional matrix organizational chart, there are national "sectors" headed by assistant deputy ministers (ADMs) who report directly to the deputy minister. DFO's six regions are headed by regional directors general (RDGs), who also report directly to the deputy minister. During this Inquiry, DFO restructured its Ottawa headquarters and renamed several of its sectors. The national sectors are currently:

- Ecosystems and Fisheries Management (which has both a senior ADM and an associate ADM) (formerly Fisheries and Aquaculture Management);
- Ecosystems and Oceans Science;
- Programs (formerly Habitat and Species at Risk);
- Strategic Policy (formerly Policy); and
- Human Resources and Corporate Services.[16]

In the national sectors, directors general report to the respective ADM and are in charge of various activities or programs (some of which are unique directorates). In the Ecosystems and Fisheries Management sector are areas of responsibility such as Aboriginal Programs and Governance, Conservation and Protection, and Ecosystem Management, which are related to the regional branches. Under the Programs sector are Fisheries and Aboriginal Policy and Aquaculture Management. Figure 1.4.3 describes the national organizational structure, showing the positions that report to the deputy minister, which include the assistant deputy ministers and the regional directors general.

David Bevan, the current associate deputy minister and former senior ADM, Ecosystems and Fisheries Management, described the interaction in the functional matrix model:

> We have a matrix management model, policy and program directions set by the Minister based on advice provided through the Deputy Minister from the Department, and then implementation and program delivery are undertaken in the regions ... The sectors are headed by the ADMs so they are the ones responsible for program design in conjunction with regions, as well as the policies that guide the operations ... The intention here was ... to provide policy cohesion and ... an operational nimbleness in the regional operations so that they are able to tailor their operational realities to their socio-economic differences and to the geographical and biological realities that they face.
>
> The model includes both functional and line reporting relationships. Functional reporting ensures coordination and consistency that's done both at the Ottawa level and in the regional operations. And line authority ensures direct accountability for day-to-day decision making.

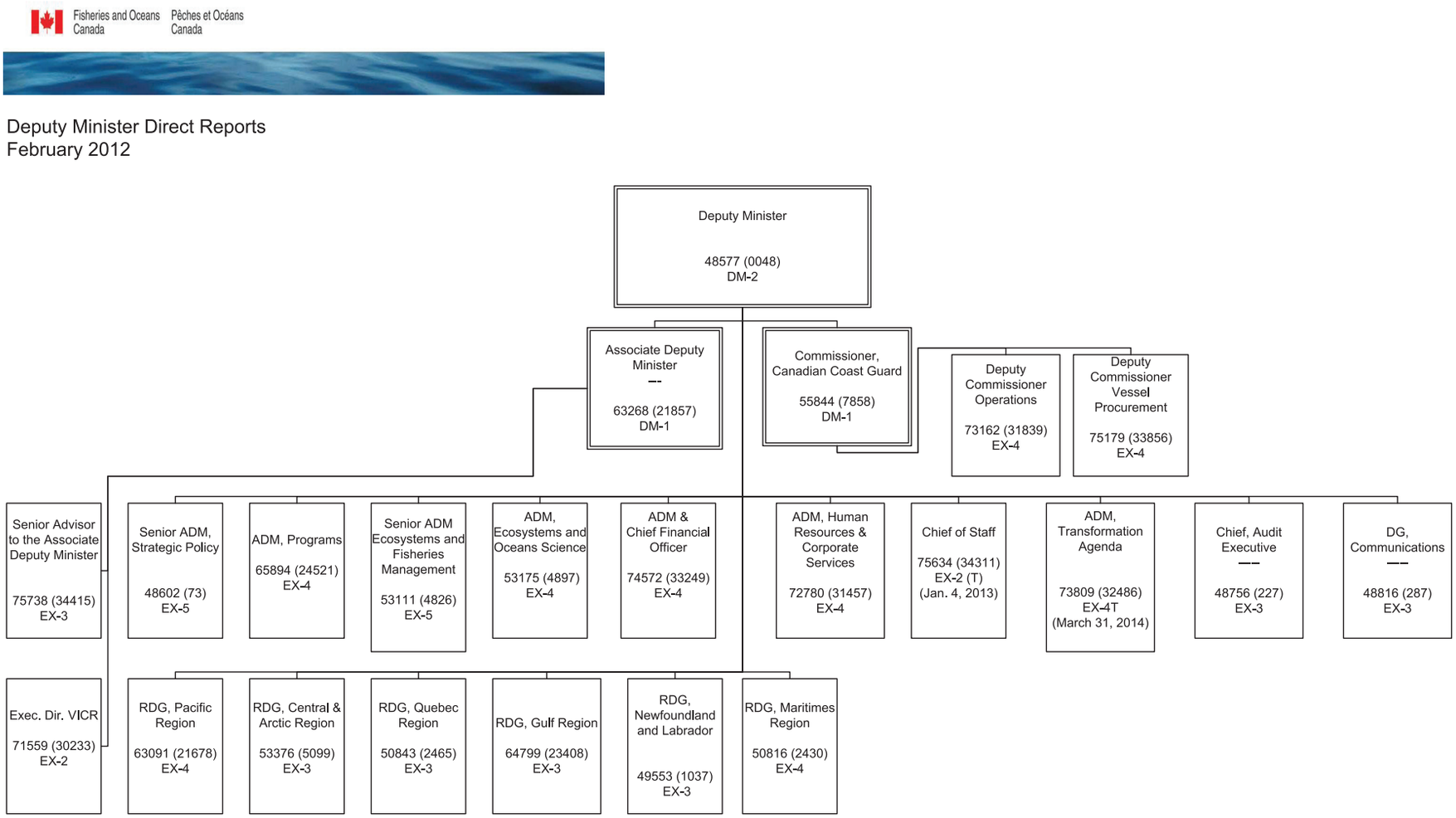

Figure 1.4.3 Department of Fisheries and Oceans organizational chart

Source: DFO 2012.

> The RDGs ... are responsible for delivering programs and activities in their regions in accordance with national and regional priorities, and within assigned resources and national performance parameters ... They receive resources ... through the [Departmental Management Committee] decision-making process from Ottawa, and Ottawa, of course, receives them from Parliament through the budget process. And they are responsible for achieving results from the use of those resources and delivering the outputs and outcomes in accordance with the program design, and demonstrating that through performance measurement.[17]

In the Pacific Region, there are "branches" headed by regional directors and "area offices" headed by area directors, all of whom report directly to the RDG Pacific. The six regional directors in the Pacific Region oversee the following branches:

- Fisheries and Aquaculture Management;
- Science;
- Ecosystem Management (formerly Oceans, Habitat, and Enhancement);
- Policy and Economic Analysis;
- Conservation and Protection; and
- Communications.[18]

The regional directors are responsible for the overall delivery of specific programs within the region, including providing direction and coordinating program delivery across the province, as well as managing the program's budget. Unique to the Pacific Region, the regional director of the Conservation and Protection Branch (which includes the fishery officers) reports directly to the RDG Pacific (see Chapter 7, Enforcement). In other regions, conservation and protection falls under the Fisheries and Aquaculture Management Branch.[19]

Similar to the national sectors, Pacific Region's branches also encompass various activities and programs, which are headed by directors. The Fisheries and Aquaculture Management Branch includes aquaculture management (headed by its own director, who reports to the regional director, Fisheries and Aquaculture Management); the Salmon Team (which is headed by a lead); and Treaty and Aboriginal Policy (headed by its own regional director, who reports to the regional director, Fisheries and Aquaculture Management, as opposed to the RDG). The division head of Salmon and Freshwater Ecosystems (SAFE) is located in the Science Branch.

There are five area directors who, are responsible for delivery of programs in their areas: the Lower Fraser River, North Coast, Yukon Transboundary Rivers, BC Interior, and South Coast. Figure 1.4.4 illustrates the organizational structure of DFO's Pacific Region.

Regional directors in the Pacific Region have both a line and a functional reporting structure involving regional and national management, whereas area directors report to senior regional management. Paul Macgillivray, associate RDG Pacific, described this reporting structure as follows:

> While the regional program directors ... have a line reporting relationship with the [RDG], they also report functionally to [ADMs]. So for example, the regional director of Science reports to the [RDG], [and] also reports functionally to the [ADM] of Oceans and Science and is responsible for the delivery of the science program throughout Pacific Region.
>
> Area directors are responsible for local delivery of most of the major programs within their geographic area and managing area staff. Area directors and their staff receive program direction from the regional program directors.[20]

National and regional governance models and setting DFO priorities

The national Departmental Management Committee* is chaired by the deputy minister, and all the ADMs and RDGs, as well as key directors general from the national sectors, sit on the committee. It is DFO's senior management decision-making body and is responsible for establishing overall goals, policies and procedures, and priorities for the department, as well as preparing ministerial briefings. The

* In 2011, the Departmental Management Committee was renamed the Departmental Management Board (Claire Dansereau, Transcript, September 22, 2011, p. 45). For the purposes of this Report, it will be referred to as the Departmental Management Committee.

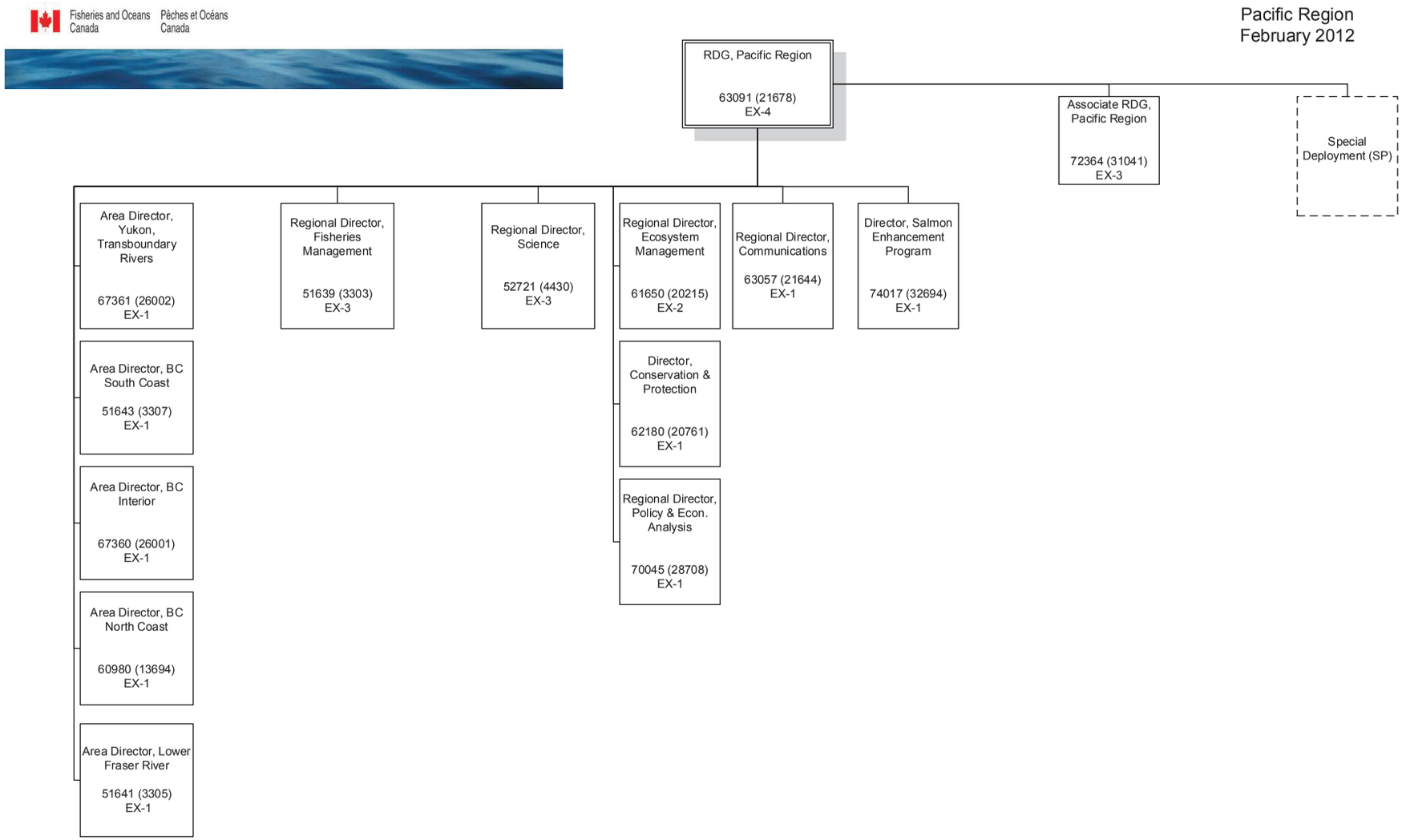

Figure 1.4.4 Department of Fisheries and Oceans, Pacific Region, organizational structure

Source: DFO 2012.

Departmental Management Committee is supported by a group of subcommittees:

- the science management board;
- the human resources subcommittee;
- the legal risk management committee;
- the finance subcommittee;
- the information management board; and
- the departmental evaluation committee.[21]

The Departmental Management Committee meets weekly by teleconference for regular management matters and approximately every two months in person. It also meets annually (typically in September) to establish DFO's priorities for the coming year; and these priorities and the key strategies for achieving them are then set out in the Report on Plans and Priorities.[22] The committee also reviews and approves the business plans prepared annually by the sectors and the regions.[23]

In the Pacific Region, the six regional directors and five area directors sit on the Regional Management Committee – together with the RDG, who chairs it. The Regional Management Committee serves a similar management function to the national committee. It meets every two weeks and is supported by several subcommittees.

Among the subcommittees that report to the Regional Management Committee are the operations and the strategic directions committees, two subcommittees initially created to deal with the implementation of the Wild Salmon Policy (WSP – see Appendix B).[24] The operations committee deals with "day-to-day" issues; according to Mr. Macgillivray, it serves as the Pacific Region's "principal forum for monitoring progress and providing direction on the implementation of key cross-sectoral initiatives."[25] The strategic directions committee, in contrast, provides long-term direction on Pacific Region issues. According to Paul Sprout, former RDG, Pacific Region, it "deals with issues that are in early stages that typically require a concerted effort over a long period of time to develop responses to."[26]

DFO sets its priorities through the Departmental and Regional Management committees in a process described by the deputy minister as follows:

> We really have a top-down bottom-up and lateral process for setting our priorities ... priorities are set in the region depending on regional priorities. Those are fed into a national process. But at the same time we receive priorities from the Prime Minister and from the Minister of Finance through either the Speech from the Throne or from the budget process ... At the same time though, priorities come from the ground ... through various processes where it's clear that our stakeholders are unhappy with a policy suite or we feel from a science perspective that some objectives are not being met and so there's a constant iterative setting of priorities, however our general direction, it doesn't change all that much over time ... our mandate is very clear and the priorities can simply shift within the mandate.[27]

Susan Farlinger, current RDG, Pacific Region, described the regional process as follows:

> Priorities are set in much the same way a level down. We understand the Government of Canada priorities that come to us through a set of departmental priorities. At the same time, we're putting together the contextual and scan information of the situation here in Pacific Region that would make one item a particular priority in a particular year and then we factor at the Regional Management Committee those priorities that we understand from the context of issues and challenges that are going on in the region into the departmental priorities that we have from the Departmental Management Committee to arrive then at a set of regional priorities, which is a subset of the departmental priorities.[28]

The deputy minister told me that, at the national level, the people, positions, and programs that are of particular relevance to Fraser River sockeye are the senior ADM and associate ADM, Ecosystems and Fisheries Management; the ADM, Science; and the chief financial officer.[29]

Ms. Farlinger identified the following key positions at the regional level with responsibility for Fraser River sockeye: the RDG; three of the area directors (BC Interior, South Coast, and Lower Fraser River); the regional directors of Fisheries and Aquaculture Management; Oceans, Habitat,

and Enhancement; Science; and Conservation and Protection; as well as the director of special projects. The RDG also indicated that the regional directors of Policy and Economic Analysis and of Communications play supporting roles.[30]

DFO budget

DFO's budget is determined at the national level and is made up of funding for ongoing core operations, referred to as A-based funding, as well as limited-term funding dedicated to specific programs, known as B-based funding.[31] The deputy minister testified that the 2011/12 annual budget for DFO is $1.82 billion.[32] The RDG Pacific testified that the annual expenditure for 2009/10 for the Pacific Region was approximately $404 million: $271 million allocated to DFO activities, and $134 million to Coast Guard activities. In 2010/11, DFO's Pacific Region expenditures were similar: approximately $284 million on DFO activities, and $126 million on Coast Guard activities.[33]

DFO generally allocates its budget by program, so it is difficult for the department to identify the funds it allocates to the management of Fraser River sockeye on an annual basis. DFO estimates that at least $50 million per year is spent in managing salmon and that, for the years from 2005/6 through 2009/10, it spent between $17.9 and $23.3 million on Fraser River sockeye. For 2010/11, the department estimates that the base number of $64 million was spent on salmon directly (but that does not take into account portions of programs not attributed specifically to Pacific salmon).[34]

Throughout the hearings, I learned that many of DFO's programs are funded through limited term, B-based funds. For example, the Pacific Integrated Commercial Fisheries Initiative (PICFI), which was to expire in 2012 but has been extended at least through 2012/13,* funds some catch-monitoring programs (in addition to other things); test-fishing programs have been funded through "*Larocque* relief funding," which was to expire at the end of 2011;† and scientific research projects are funded through B-based funds.[35] Witnesses expressed concern that B-based funding for programs expires (or "sunsets") before DFO has assessed the merits of the program and/or committed ongoing funding for it.[36] The deputy minister defended the use of B-based funding:

> [W]e've heard a few times this morning the idea that because something is sunsetting it will disappear. And the approach of sunsetting and [B-based] money, I realize that for some people in the bureaucracy it's nervous-making for them, that programs are time limited. But, in fact, what time limited money does is ensure that at a certain point there is a serious evaluation of the usefulness, the utility of all the elements of that program, and if they're no longer useful, they should stop being done.
>
> So it's almost a mini strategic review of each program as it reaches its end point. Some are truly designed to be five-year programs and come to an end; others are designed to be reviewed and for us to go and seek additional funds to either continue – discontinue some parts or continue some others. So we have no position, at this table, at this point, that the money is either going to be there or not be there.[37]

A-based funding is subject to reductions in government spending through strategic review, which is a process mandated through the Treasury Board requiring government departments to review all program spending on a four-year cycle and to identify 5 percent of program spending to be reallocated from "lower-performing, lower-priority" programs to other Government of Canada priorities.[38] In 2010, DFO was subject to a strategic review. The deputy minister testified that this strategic review resulted in a budget reduction of $56.8 million, or approximately 3 percent of DFO's budget, and that this reduction will be implemented over three years (2010–12).[39]

DFO is also subject to an additional reduction in its budget as part of a government-wide strategic

* Canada's 2012 Economic Action Plan: Jobs, Growth and Long-term Prosperity, tabled in the House of Commons on March 29, 2012, proposes $33.5 million to DFO for AICFI and PICFI (p. 150) (see www.budget.gc.ca).

† I note that Part 4, Division 18, of Bill C-38, *An Act to implement certain provisions of the budget tabled in Parliament on March 29, 2012 and other measures*, which received royal assent on June 29, 2012, amends the *Fisheries Act* by adding a new section 10, "fish allocation for financing purposes," which is directly relevant to test-fishing funding (see discussion of test fishing in Chapter 5, Sockeye fishery management).

and operational review, the Deficit Reduction Action Plan.[40] The deputy minister testified that the deficit reduction plan will result in a 5–10 percent reduction of DFO's budget over the years 2012–15.[41] The 2012/13 budget directs a 5.8 percent reduction.[42] These reductions will affect DFO's A-based funded operations.

DFO's working relationships

As stated in the Pacific Region's 2010–11 business plan, "The Pacific Region would not be able to achieve its interests without developing and maintaining strong relationships and collaboration with key partners, organizations, and governments that engage in fisheries planning, allocation planning and scientific cooperation[.]"[43]

As described in Chapter 3, Legal framework, the Pacific Salmon Treaty requires that Canada (DFO) work with the United States in managing the fishery in the designated geographic area assigned to the Fraser River Panel. The relationship between DFO and the Pacific Salmon Commission and Fraser River Panel in the management of the fishery is explained in greater detail in chapters 5, Sockeye fishery management, and 8, Salmon farm management.

DFO representatives sit on the North Pacific Anadromous Fish Commission, an international commission established under the 1992 *Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean* (sockeye are anadromous fish) whose member states are Canada, Japan, South Korea, Russia, and the United States. DFO is also involved with the North Pacific Marine Science Organization (PICES), an intergovernmental scientific organization established to promote and coordinate marine research in the northern North Pacific Ocean. Member states are Canada, Japan, China, South Korea, Russia, and the United States.

The Government of Canada has constitutional authority for seacoast and inland fisheries. The Government of British Columbia has authority over property and civil rights in the province. Thus DFO (as the federal agency) must work together with provincial ministries, particularly in the management of fish habitat.* Canada and British Columbia often use a memorandum of understanding (MOU) or letter of agreement to set out their respective responsibilities and describe their working relationship. Several of DFO's agreements with British Columbia are described in Chapter 6, Habitat management.

DFO is also involved with British Columbia's municipalities and regional districts. The department is a party to an agreement regarding the implementation of British Columbia's *Riparian Areas Regulation* (RAR) and participates in the Shuswap Lake Integrated Planning Process (SLIPP), which involves regional districts, municipalities, First Nations, and the province (the agreement and SLIPP are discussed in detail in Chapter 6, Habitat management).

As well, DFO works with other federal government departments, primarily Environment Canada, but also Transport Canada, Parks Canada, and Indian and Northern Affairs. Although the minister of fisheries and oceans is responsible for the implementation of the *Fisheries Act*, Environment Canada is responsible for the administration of section 36 of the *Fisheries Act.* The relationship between DFO and Environment Canada and the role of Environment Canada regarding fish habitat are explained in chapters 6, Habitat management, and 7, Enforcement.

As discussed in Chapter 5, Sockeye fishery management, DFO also works with individual First Nations and Aboriginal fishing organizations.

National and regional organization of DFO Science

During the hearings, many issues were raised regarding DFO's use of science and the interaction between DFO management and its scientists in managing the fishery. The following section describes the organization of DFO Science, providing background and context for my analyses, findings, and recommendations set out in Volume 3 of this Report.

I received public submissions stating that DFO Science is underfunded and lacks adequate human

* I note that Bill C-38, *An Act to implement certain provisions of the budget tabled in Parliament on March 29, 2012 and other measures,* received royal assent on June 29, 2012. In Part 3, Division 5, Bill C-38 contains proposed amendments to the *Fisheries Act*, creating new sections 4.1–4.4. These sections afford the minister the authority to enter into agreements with the provinces and others to further the purposes of the *Fisheries Act* and to implement programs and projects for the purposes of the Act. I discuss the implications of Bill C-38 in Volume 3, Chapter 3, Legislative amendments.

resources.[44] I also heard from the public that DFO's scientists should be more independent of DFO; that they should not be "muzzled" but should be free to discuss their research with the public; and that an independent science advisory board should be encouraged.[45] In its public submission, the Pacific Fisheries Resource Conservation Council urged me to endorse its January 2010 advisory report calling for a "new science strategy and a transition to ecosystem-based management to support a comprehensive salmon sustainability strategy."[46]

In one public submission, the writer attached an article (later tendered as an exhibit during the hearings), "Is scientific inquiry incompatible with government information control?"[47] This 1997 article focused on the collapse of the Atlantic cod fishery and the Kemano Hydroelectric Project in British Columbia. The authors, who included witness Dr. Carl Walters, a professor at UBC Fisheries Centre, criticized DFO's fisheries science:

> The present framework for linking science with management can, and has, lead to abuses that threaten the ability of scientists to understand fully the causes of fish declines, to identify means of preventing fishery collapses from recurring, to incorporate scientific advice in management decisions, and to communicate research in a timely fashion to as wide an audience as possible. The existing framework of government-sponsored fisheries science needs to be replaced. It has failed to ensure viable fish resources and thereby sustain the fishing people and fishing communities upon which successful fisheries management depends.[48]

Another public submitter, referring to this article, wrote:

> Beyond the provision of knowledge, we need a structure that allows the public to know what the scientific findings and advice are. We need a structure that permits thoughtful public response and feed-back to such information.
>
> If political people must over-ride science for reasons of "greater societal good", which they have every right to do, let them do so openly. Then let them also explain it openly, rather than trying to shape and manipulate science, through the bureaucracy, to serve political or business ends.[49]

In her public submission, Ms. Vicky Husband, a well-known environmentalist, commented:

> This inquiry cannot just be about science ... but it must be about how government responds and manages in the face of scientific information and traditional knowledge – knowing things is great, but it is what we do with that knowledge that matters.[50]

DFO considers itself a "science department" – the deputy minister testified that science is critical for DFO's decision making.[51] DFO witnesses stressed that the role of its scientists is not to recommend action to management, but to provide scientific advice on which management decisions may be based:

> DFO Science does research based on the needs of management.[52]

> The role of Science is to provide the state of the science, and what is known about the issue, to management.[53]

> [T]he role of Science ... is not to recommend that we take action. The role of science ... is really to give a description of the state of the system as best as we know it, and ... it's the management arm of the Department whose role it is to then take that information and to then make any management-related decisions[.][54]

> Science provides advice. Science provides risk frames and we at the senior level will determine what risks are tolerable and make recommendations on that. It is an iterative process throughout the Department.[55]

> [DFO Science provides] scientific advice, but that scientific advice needs to be grounded in the – in research and [in] factual evidence ... the scientific advice is only one piece of the advice that goes into the department, so it may or may not impact on any final decision that's taken in any particular situation ... [DFO Science's] role is to provide the scientific piece of the story which is then combined with other factors that would then influence a final decision.[56]

> I'm in Science Branch and our role is to give science-based advice to managers and to ensure that Science decisions are made on sound factual information. And that advice is hopefully considered by managers, along with social, political and economic factors in, ultimately, making management decisions.[57]

> What is the role of a government scientist? ... I think the number one thing is to provide sound advice to the government of the day. And to do that, I think in science, you want your scientists working at the edge ... [DFO scientists] do not make decisions on government priorities or Departmental priorities. Having said that, we do have mechanisms, briefing notes and discussions to inform our management about what we see as urgent issues.[58]

Organization of DFO Science

DFO's functional matrix organization model is reflected in its Science staff. At the national level is the Science sector, headed by an ADM.* At the regional level, there is the Science Branch, headed by the regional director, Science. In the reporting structure, the regional director, Science, in Pacific Region has a line reporting relationship with the RDG Pacific, as well as a functional reporting relationship with the ADM, Science, in Ottawa.[59]

DFO has approximately 1,700 employees in its Science sector, which includes 466 full-time employees working in the Pacific Region.[60] Of the Pacific Region's scientific employees, 55 are classified "scientist"; they are research scientists engaged in science work and possessing doctoral degrees (PhDs). There are also scientific employees classified as "biologists," all of whom have science degrees and some of whom have post graduate degrees in science, including PhDs. Dr. Laura Richards, the current Pacific regional director, Science, explained the distinction between the classifications of scientist and biologist:

> [T]he scientists have a clear progression scheme, which is based on their ability to do research and the impact and influence of that research and the amount of innovation that they're able to bring to the program, [whereas the biologists'] ... classification is determined by the job that management asked them to do.[61]

The Pacific Region's Science Branch employees also include scientific technicians who have specific technical expertise but may not have a degree in science.

In the Pacific Region, of the 466 full-time Science employees, approximately 120 work in the region's area offices under area directors, as opposed to in the Science Branch reporting to the regional director, Science.[62] Dr. Richards described the work of these area Science staff as largely doing the programs on salmon stock assessment. She said that they are the "people who are out in the field collecting data on numbers of returning sockeye," as well as engaging in consultation processes.[63]

Most Pacific Region scientists work within the Science Branch at DFO's four research laboratories in British Columbia: the Institute of Ocean Sciences in Sidney, the Pacific Biological Station in Nanaimo, the West Vancouver Laboratory, and the Cultus Lake Laboratory. In addition, some DFO scientists work at other sites (at the University of Victoria in the Centre for Climate Modelling and Analysis, and at the Cooperative Resource Management Institute at Simon Fraser University).[64]

DFO Science renewal / reform

During her tenure as ADM, Science, Dr. Wendy Watson-Wright directed DFO Science through a "renewal program" in recognition of the increased demand for scientific advice in the department as a result of new legislation (*Canadian Environmental Assessment Act*, *Oceans Act*, and *Species at Risk Act*), coupled with the depletion of financial resources and attrition of the scientific staff.[65]

According to Dr. Watson-Wright, through its renewal process DFO Science discovered that there was a lack of adequate priority-setting mechanisms, a lack of efficiency in delivering its programs, an accelerating loss of staff, and fairly severe funding pressures.[66] Dr. Watson-Wright also commented that "science was not that well understood by the other sectors who we were trying to serve, and by

* As mentioned earlier, it is now called the "Ecosystems, Oceans and Science" sector, but will be referred to as Science in this Report.

senior management."[67] The objective of the science renewal work, as well as the approach set out in the documents resulting from the science renewal process, was to structure, focus, and prioritize the work being done by DFO Science.

The Science Management Board and setting priorities for science

In its first document in the renewal process, *Science at Fisheries and Oceans Canada: A Framework for the Future* (Framework for the Future), there is an assertion that DFO Science "needed to establish a transparent priority-setting process based on integrated risk management,"[68] which Dr. Watson-Wright explained as follows:

> [Under] the transparent priority-setting process ... it was not so difficult to set priorities in conjunction with [fisheries management]. But with the *Oceans Act* and with the *Species at Risk Act* ... we had more clients, so we also had to service the *Species at Risk* program and the oceans program and any environmental programs, and we didn't have a mechanism for having all the clients in the same room at the same time, or having some sort of a forum whereby all those who we were trying to serve would understand, you know, others had needs as well.
> ...
> So that's what we were attempting to put in place, and we began that with the establishment of the Science Management Board.
>
> [A]cross the country we sat down with the science regions and in headquarters to determine, what are the greatest risks for science, and by "risks" we mean ... not being able to perform the science, not being able to serve clients' needs, and all those sorts of things.[69]

DFO Science's Framework for the Future was the genesis for science renewal – the umbrella document that sets out DFO Science's strategy in the context of four science "pillars": relevant, effective, affordable, and valued.[70]

As a result of the science renewal program, DFO established the Science Management Board in 2005. The membership of the board includes the deputy minister; the ADM, Science; the ADM, Ecosystems and Fisheries Management; two RDGs (one from an eastern region and one from a western region, sitting for two-year terms); senior scientists (initially one, later increased to two); and the chair of the Science sector's external science advisory council. As stated in the minutes of the first meeting of the Science Management Board, it "is responsible for identifying issues of importance to the achievement of the mandated objectives of the Department, selecting and assessing departmental and government-wide priorities needing science support, and providing strategic direction of the work planning of DFO Science."[71]

Dr. Watson-Wright described the Science Management Board as a decision-making board, which "morphed into something that would then take things to the [Departmental Management Committee]."[72] The Science Management Board is one of the subcommittees reporting to the Departmental Management Committee.[73] Mr. Bevan said that the board "looks at the broad directions for the science program, and that's been a key body as we've tried to move from very precise counting of fish ... to a broader perspective."[74] In Dr. Watson-Wright's understanding, the Science Management Board was to meet twice per year, which it did during the process of science renewal.[75] However, it has not met since the fall of 2009 (with the departure of Dr. Watson-Wright and the appointment of Dr. Siddika Mithani as ADM in February 2010).[76]

During the science renewal process, the Science Management Board produced a *Five-year Research Agenda, 2007–2012* (Research Agenda).[77] Dr. Watson-Wright testified that the Research Agenda was an attempt to improve the relationship, understanding, and communication between the Science sector, its client sectors, and senior management within DFO.[78] The Research Agenda contains the following 10 research priority areas, which reflect research that DFO Science considered essential to address Canada's and DFO's priorities for five years, starting in 2007:

- fish population and community productivity;
- habitat and population linkages;
- climate change / variability;
- ecosystem assessment and management strategies;

- aquatic invasive species;
- aquatic animal health;
- sustainability of aquaculture;
- ecosystem effects of energy production;
- operational oceanography; and
- emerging and enabling technologies for regulatory and policy responsibilities.[79]

Dr. Watson-Wright told me that

> [it] took a number of months to put [the Research Agenda] together. In the end, the very last draft went to every single person in science in the department ... And ultimately it was approved by the Science Management Board and by the Departmental Management Committee.[80]

In conjunction with the Research Agenda, the Science Management Board also produced the *Five-year Research Plan (2008–2013)*[81] (Research Plan).

> This plan provides a rationale for *what* research is conducted in support of priority areas, especially ecosystem-based management, and *how* this research will be delivered to ensure federal and departmental priorities are addressed while accounting for regional differences. This living document will guide DFO Science through the next five years. Twenty initiatives are underway within DFO Science to ensure the department can deliver on priorities outlined in the *Five-Year Research Agenda*. It is expected that both the Research Agenda and this accompanying Research Plan will be revisited and revised accordingly in five years to ensure changing priorities are adequately addressed. Further, the twenty initiatives will require realignment of regional resources to ensure priorities are addressed.[82] [Emphasis in original.]

According to DFO Science, the Research Plan is intended to implement the Research Agenda with the following 20 specific initiatives:

- seven ecosystem research initiatives
  - Newfoundland Shelf;
  - Gulf of Maine;
  - Northumberland Strait;
  - Lower St. Lawrence Estuary;
  - Lake Ontario;
  - Beaufort Sea; and
  - Strait of Georgia [discussed below].
- climate change science initiative
- 12 centres of expertise
  - aquatic animal health and research diagnostics;
  - aquatic biotechnology regulatory research;
  - aquatic risk assessment;
  - marine mammals;
  - environmental research on pesticides;
  - hydropower impacts on fish and fish habitat;
  - integrated aquaculture science;
  - ocean model development and application;
  - offshore oil, gas, and energy research;
  - aquatic chemical analysis;
  - arctic habitat research; and
  - aquatic habitat research.[83]

Dr. Watson-Wright testified that the Research Agenda and Research Plan "seemed to be going well" when she left DFO in late 2009.[84] The current ADM, Science, Dr. Mithani, testified that DFO Science "will be working on these particular documents to see how we can refine them further[,]" but could not confirm that the Research Agenda and Research Plan were in the process of being formally revisited and revised as set out in the documents themselves.[85] Dr. Mithani testified that the priorities determined by the Science Management Board and set out in the Research Agenda required "tweaking," and this fact explained why the board had not met since the fall of 2009. She stated:

> What we now need to do is to go one step further, identify what the Science priorities need to be, to actually validate them and say is this where we still need to be? Has anything changed? Does it need tweaking?
>
> So we haven't met yet because what you need to do, from my perspective, is you have to be very clear on the kind of advice, recommendation that you would want from a Science Management Board. And at this point in time there's work underway in looking at exactly what we would want to bring the Science Management Board for, and what kind of

advice we would want from that Board so that we can move forward.

[W]hat Dr. Wendy Watson-Wright at the time had done was established certain priorities, certain Science priorities. And what the next step is, is to look within those priorities and further refine those priorities so that we have some good tangible deliverables in terms of what Science needs to do when we move forward.[86]

The Research Agenda and the Research Plan are designed to guide allocation of funding. However, I heard that little, if any, new funding has been allocated for the research priorities identified in these documents. A discussion of funding for Science follows below.[87]

Prioritizing science advice to DFO management

DFO has developed a process for determining and prioritizing requests for science advice made to its national Science sector by managers through the national Centre for Science Advice Secretariat (CSAS) and to its Science Branch in the Pacific Region, through the Centre for Science Advice, Pacific (CSAP, previously known as the Pacific Science Advice Review Committee or PSARC).

Alan Cass, the former regional head of CSAP, testified about the development of the annual schedule. As described by Mr. Cass, the regional director, Science, each year sends out a "request for advice" to the other regional directors, which sets out the "objectives, rationale, timing, urgency, [and] importance of the particular issue" requiring scientific research.[88] The regional directors send their requests to the CSAP office. The requests are received by the Science Branch and prioritized based on the perceived risk.[89]

The Regional Management Executive Committee* reviews and assesses the list of requested research again, prioritizing the requests based on the region's fiscal planning and delivery capacity, as well as legal obligations, setting out a "business plan for conducting the assessments within Science over one or possibly two years."[90]

The mandate of DFO's Science Branch and the role of the Regional Management Executive Committee expanded in the past few years to emphasize the need to have a process to prioritize the growing and diverse list of requests, which had

expanded beyond the traditional role of providing science advice for fisheries management to a range of other issues, in particular to the *Species at Risk Act* where the focus moved from managing fish stocks to ... advising in terms of the legal obligations on the ... health of species that were considered by COSEWIC [Committee on the Status of Endangered Wildlife in Canada] to be endangered ... or threatened.[91]

Once completed, the review and "challenge" of its scientific research projects continues at CSAS and at CSAP, using a peer-review process, the product of which was described by Mr. Cass as follows:

[W]e have a number of products in the peer-review process that are outcomes of meetings, and one of them is called a research document which is a finalized version of ... a working paper which is a draft submission to ... [CSAP] ... if that's approved and based on revisions following the review, then that becomes a research document which ... could be a rather intensive technical document that presents the information as far as the analyses and results and recommendations ... and that is authored by the key people who actually did the analysis and write the report ...

Then there's also what's called the Science Advisory Report, which is a DFO product. It's not authored by an individual, but [is] the key document which summarizes the advice that goes forward from the reviews. There are proceedings documents which are essentially now minutes of the individual review meetings. But those are documents that come from the peer review process.[92]

The peer-review process engaged in at CSAP meetings includes both DFO scientific staff and external participants. Dr. Richards, Pacific regional director, Science, commented:

* This was also referred to as the resource management executive committee by some DFO witnesses.

> At that [CSAP] peer review meeting, we do invite external people to come as full participants. We do have a record of advice from that meeting. That advice is then tabled and presented to the managers who requested that advice. That advice is – we try to arrive at that advice by consensus, but it may be that you can't arrange or arrive at consensus, in which case we try to ensure that we provide alternative points of view with a justification around that so that we can ensure that we hear different sides of the story and that we can make sure that we portray the full picture to the decision [maker].[93]

I heard evidence, however, that the CSAS and CSAP processes do not include the provision of science advice from DFO to other government departments, such as Environment Canada, on issues in which DFO Science may have expertise.[94] I also heard evidence (as discussed further in chapters 6, Habitat management, and 9, Fish health management) that individual DFO scientists do not necessarily determine the nature of the research they pursue.

Shift to ecosystem science

As discussed in several places in this Report, DFO is moving toward ecosystem-based management and its policies indicate a commitment to ecosystem science to support an ecosystem approach to management. Dr. Watson-Wright explained that one of DFO's overriding priorities is to move to ecosystem science, away from DFO's traditional focus of research on an issue-by-issue or species-by-species basis.[95] The Research Plan is intended to illustrate DFO Science's "commitment to ecosystem-based research."[96]

DFO Science produced its Ecosystem Science Framework[97] in 2007. It contains the rationale for an "ecosystem science approach and describes the proposed framework for realigning the DFO Science program to support an ecosystem approach to management and better reflect an ecosystem science program."[98] In the Ecosystem Science Framework, the key components that reflect the highest-priority management and policy challenges of both DFO and the Government of Canada and the "multi-functional nature of an ecosystem science approach" are listed as

1 risk assessment tools;
2 performance evaluation of ecosystem indicators;
3 tools for evaluating decision-support rules;
4 operationalize regime shifts;
5 apply knowledge of productivity changes;
6 recovery potential of depleted species;
7 key features of ecosystem structure and function;
8 knowledge access and spatial management methodologies; and
9 best practices for ecosystem assessments.[99]

Dr. Mithani testified that the Ecosystem Science Framework is still the guiding document for DFO Science.[100] The term, "ecosystem science" refers to science that attempts to look at a geographical location on an ecosystem basis. It looks at all the processes and species in that particular ecosystem that could affect the target species (for example, Fraser River sockeye) and each other.[101]

Dr. Watson-Wright stated that the merit of ecosystem science is that it recognizes that you cannot just look at one species of interest in order to understand what is going on, as everything is interconnected.[102] The Ecosystem Science Framework states that DFO's ability to implement an ecosystem science approach is limited because data do not exist for many aquatic habitat features and populations of importance and, where information does exist, it may not be organized in ways that allow DFO Science to access it efficiently and systematically.[103] Dr. Watson-Wright was then asked how realistic an ecosystem-based approach is, given the state of the science and resources. In her view, it is realistic and necessary to try to put all the information together for a given ecosystem in order to be able to make predictions and projections. She said that ignoring most of the data and focusing on one species is not helpful. Further, according to Dr. Watson-Wright, the international science community is struggling with this issue right now, and it behooves DFO to continue to improve upon this work.[104]

Ms. Dansereau testified that DFO is still in the early stages of implementing its ecosystem science approach and will be in the early stages for a "long time," although this fact does not mean that DFO is not making progress.[105]

DFO views the Strait of Georgia Ecosystem Research Initiative as a good example of an

ecosystem science approach.[106] The initiative is trying to understand how the Strait of Georgia ecosystem works, identify the drivers of change most likely to determine future conditions, and analyze the future response to the system under these influences.[107] Gordon McFarlane, DFO scientist emeritus, agreed that this research initiative is an example of an "ecosystem assessment" approach.[108]

According to DFO, ecosystem research initiatives are to serve as a pilot for its ecosystem-based approach by focusing on regional research priorities.[109] Peter Olesiuk, marine mammal biologist, DFO Pacific Biological Station in Nanaimo, said that the Strait of Georgia Ecosystem Research Initiative stands out as the example of a project that was not reactive to any issue, but was more visionary.[110]

There are three major research priorities: (1) determining what controls productivity in the Strait of Georgia; (2) assessing the importance of mismatches in the timing of physical and biological processes within the Strait of Georgia to ecosystem functioning; and (3) determining what properties of the ecosystem "provide resilience against major disruptions and collapses of the system."[111]

However, Dr. Andrew Trites (one of the authors of Technical Report 8, Predation) is critical of the initiative. Although the Strait of Georgia Ecosystem Research Initiative was, in his opinion, a wonderful initiative, he is concerned that academics are not involved in this work. In Dr. Trites's view, DFO as the management agency should be playing a greater leadership role in generating a coordinated approach to science and, in doing so, should be more inclusive of academics, environmental organizations, First Nations, and people concerned about sustainability.[112]

Funding of DFO Science and resulting "research gaps"

Dr. Richards, Pacific regional director, Science, testified that the Science Branch's average year-end expenditures for the previous five years from all sources were approximately $55 million per year.[113]

The Research Agenda identified priorities for DFO Science for 2007–12.[114] The Research Agenda and Research Plan were designed to guide allocation of funding rather than to specify funding.[115] Accordingly, the fact that a research priority is identified in the Research Agenda or in the Research Plan does not ensure that DFO allocated funding for it.[116]

The current research funding model for DFO Science is in limited-term, three- to five-year funding envelopes. Robin Brown, division head, Ocean Sciences Division, DFO Institute of Ocean Sciences, does not think that limited-term funding is a successful model for science research.[117] Other DFO witnesses agreed that short-term funding envelopes create inadequacies in scientific research. During the hearings on predation, Gordon McFarlane testified that two- to three-year funding envelopes are not ideal to implement ecosystem-based management for sockeye salmon.[118] I heard from several other DFO and Environment Canada witnesses that an integrated research program focused on Fraser River sockeye and long-term research and monitoring work would help ensure the long-term sustainability of the fishery, but that, given the limited-term nature of federal science funding, this kind of work is not currently possible.[119]

On climate change, DFO has never been considered a lead agency in Canada, and this fact limits the funding available to DFO Science to do this work in the marine environment.[120] Mr. Brown explained that DFO understands what its priorities are relative to other federal departments in part by whether it is allocated funding for an issue; therefore, if research is not funded, then DFO tends to take this as a signal that it is not important for the department to do this work.[121]

For example, there is no DFO program funding for research or monitoring of contaminant fate and transport within the environment, even in relation to anadromous fish (see Chapter 6, Habitat management), and DFO as a department (as opposed to individual researchers within the department) takes the position that it is not responsible for this work. However, it is the view of Environment Canada that population-level effects of contaminants, in particular the effect on anadromous fish and the marine environment, are within DFO's purview. DFO and Environment Canada witnesses testified that there are gaps in contaminant research and monitoring for Fraser River sockeye as a result of the differences between what each department thought was its responsibility.

As discussed further in Chapter 9, Fish health management, Dr. Richards testified that she is aware of the gap in research regarding the health of

wild fish, and that DFO is looking for opportunities to address it.[122] However, DFO's scientific research priorities are dictated by its clients (see discussion above about setting priorities).[123]

Aboriginal traditional knowledge and DFO Science and management

Aboriginal traditional knowledge (ATK), sometimes referred to as traditional ecological knowledge (TEK), was described to me as a "cumulative body of knowledge, practice and belief, handed down through generations by cultural transmission."[124]

Aboriginal witnesses and scientists described to me the significant value that they see in Aboriginal traditional knowledge and in its incorporation into DFO's management of the fishery. For example, members of the Chehalis, Heiltsuk, Tl'azt'en, Siska, and Métis nations, among others, have asserted the importance of incorporating Aboriginal traditional knowledge into fisheries management decision-making.[125] Thomas Alexis of the Tl'azt'en Nation believes that, "if traditional knowledge had been listened to, then [sockeye] stocks would still be abundant today."[126]

A number of scientists appearing before me agreed that Aboriginal traditional knowledge can contribute to current understanding of Fraser River sockeye. For example, Dr. Jim Irvine, research scientist, SAFE, DFO Pacific Biological Station, suggested that traditional knowledge, whether from First Nations or others living in a particular area, could assist in identifying Conservation Units (CUs) under the Wild Salmon Policy (see Chapter 10, Wild Salmon Policy) and observing fish distribution, migration, and spawning.[127] Dr. Carrie Holt, research scientist, DFO Pacific Biological Station, said that traditional knowledge could contribute to the overall assessment of CUs (red, amber, or green).[128] Dr. Brian Riddell, chief executive officer, Pacific Salmon Foundation, and former DFO division head, SAFE, and Dr. Scott Hinch, professor, Pacific salmon ecology and conservation laboratory, University of British Columbia, spoke about the importance of local observation, including Aboriginal observations, in assessing migration conditions.[129] David Marmorek, author of Technical Report 6, Data Synthesis, suggested that Aboriginal traditional knowledge is important because of the long time span it covers.[130] Dr. David Close, distinguished science professor of Aboriginal fisheries, UBC, said that both western science and traditional knowledge should be used to move conservation forward.[131]

A presentation prepared by DFO staff entitled "Considering ATK in the Implementation of the [Wild Salmon Policy]" summarized some of the benefits of traditional knowledge.[132] It suggests that Aboriginal traditional knowledge considers the ecosystem context; provides broad trends in species and stock distribution, abundance, and seasonal behaviour patterns; offers observations on a longer temporal scale; can save time and money on field work; and can help determine baseline data.[133] From a practical perspective, Captain Gary Ducommun, director of natural resources for the Métis Nation British Columbia, suggested that incorporating Aboriginal traditional knowledge into fisheries management also carries the benefit of engaging with Aboriginal people, which may lead to increased understanding and support by them of DFO decision making in regard to salmon.[134]

Difficulties in incorporating traditional knowledge

Witnesses identified several challenges to the incorporation of Aboriginal traditional knowledge into DFO decision making and the work done by DFO Science. The first challenge is in understanding what Aboriginal traditional knowledge is and what it is not. Although several scientists expressed support for Aboriginal traditional knowledge, it was not always clear whether they were referring to traditional knowledge or field observations more generally.[135] Mike Lapointe, chief biologist, Pacific Salmon Commission, distinguished his "science perspective" from traditional ecological knowledge, which he acknowledged as an important different perspective, but one about which he was not qualified to speak.[136] Mark Saunders, manager, SAFE, DFO, expressed his uncertainty this way:

> I feel very strongly that one of the most important linkages is to bring western science and the traditional – aboriginal traditional knowledge

> together. I don't pretend to understand, after having talked to a lot of First Nations people, and I find it very difficult as a western scientist to be able to understand exactly what ATK is.[137]

Although some forms of traditional knowledge may be readily transferred to others, some may not.[138] I am advised of potential difficulties in transferring regionally specific and tribally specific Aboriginal traditional knowledge from the person with the knowledge to someone else who is the decision maker.[139] Some sacred traditional knowledge is dearly held and not shared beyond an Aboriginal community.[140] In some cases it may take years or decades of relationship and building trust before traditional knowledge is shared and concerns about intellectual property, privacy, and misuse of data are overcome.[141]

With the decline of the fishery, some Aboriginal traditional knowledge itself has been lost. Traditional knowledge is held by a limited number of individuals, often elders, and may be passed on through fishing.[142] As fewer fishing opportunities arise, it has become more difficult for elders to pass on this knowledge. For example, Chief Fred Sampson of the Siska Indian Band spoke of the difficulty he had in passing on traditional fishing knowledge to his son.[143] Similarly, Rod Naknakim of the Laich-kwil-tach Treaty Society suggested that, given the importance of limited fishing opportunities, more experienced fishers are called on for the fishery instead of teaching the "greenhorn" younger generation.[144] Dr. Ronald Ignace of the Skeetchestn Indian Band testified that, as a result of the declining fishery, "we have lost so much of our … knowledge of the fishery," especially among the young people today.[145]

Changing ecosystems and fishing practices have also affected the applicability of traditional knowledge. Chief Sampson explained that certain biological indicators are now less reliable than they were in the past, perhaps because of shifts in biodiversity that have occurred since the knowledge was acquired.[146] Joseph Becker of the Musqueam First Nation also suggested that traditional knowledge may need to evolve because fish and methods of fishing have changed.[147]

According to a report prepared by Dovetail Consulting, a further difficulty exists in verifying the accuracy of traditional knowledge.[148] However, it appears that DFO currently advises against challenging the accuracy of Aboriginal traditional knowledge. A DFO presentation on Aboriginal traditional knowledge in the context of the WSP states that the "PSARC review process creates a challenge function that is advised against when dealing with ATK."[149]

Current approaches to incorporating traditional knowledge

According to Ms. Farlinger, DFO is "very interested in [Aboriginal traditional] knowledge because of the contribution we think it can make to the management of Fraser sockeye,"[150] and DFO has "done some work with First Nations on the integration of traditional knowledge" although "there is much work to be done[.]"[151] For example, DFO currently has not formalized any specific processes regarding incorporation of traditional knowledge.[152]

According to a DFO presentation, Aboriginal traditional knowledge may be transferred to DFO through its general engagement with Aboriginal groups.[153] On a more structured level, DFO's National Centre of Expertise in TEK, the Aboriginal traditional knowledge subcommittee of COSEWIC, and the National Aboriginal Council on Species at Risk appear to be other venues for incorporating Aboriginal traditional knowledge.[154] The consideration and incorporation of such knowledge is also one of the key directions in DFO's WSP[155] and, according to Kaarina McGivney, former regional director, Treaty and Aboriginal Policy Directorate, DFO Pacific Region, is found in other policies and practices.[156] As an example, in WSP implementation, Dr. Hyatt testified that regional DFO employees have expressed interest in using traditional ecological knowledge and working with First Nations to identify and test biological indicators.[157] The WSP states that resource management decisions will reflect best science, including ATK, and provides that the delineation of Conservation Units will include ATK.[158]

DFO's approach to Aboriginal traditional knowledge has been criticized. Marcel Shepert, coordinator, Upper Fraser Fisheries Conservation Alliance, testified that traditional knowledge has been given "lip service" in the past 15 years.[159] Mr. Saunders told me that he was unaware of any funding for engaging traditional ecological knowledge or for gathering traditional ecological knowledge, and Chief Sampson testified that traditional knowledge is not currently

respected or recognized by contemporary scientists and biologists.[160] He said that Aboriginal traditional knowledge ought to be treated equally with other forms of knowledge.[161] Chief William Charlie of the Chehalis Indian Band added that all Aboriginal traditional knowledge should be incorporated into management practices, without "picking and choosing" when to consider using it and when not to.[162]

Proposed approaches to incorporating traditional knowledge

Several witnesses suggested that Aboriginal traditional knowledge might be incorporated into management by greater involvement of Aboriginal groups in scientific and decision-making processes. Dr. Holt suggested that traditional knowledge could be brought closer to the scientific process using "a more concrete consultative process."[163] Mr. Saunders suggested that First Nations should take the lead role in explaining their position or their understanding of how best to incorporate traditional knowledge.[164]

Other witnesses proposed co-management between DFO and Aboriginal groups as a means to incorporate traditional knowledge into fisheries management. Several Aboriginal witnesses described the importance of bringing Aboriginal traditional knowledge to the decision-making table,[165] and Neil Todd, operations manager, Fraser River Aboriginal Fisheries Secretariat, said that the only way to do so is through a joint-management process.[166] For effectiveness, Mr. Alexis of the Tl'azt'en Nation suggested that each nation or sub-region in the watershed could feed their local and traditional knowledge into larger Aboriginal organizations.[167]

The First Nations Coalition submitted that First Nations should develop a set of best practices or guidelines for the use of traditional knowledge and science and that DFO should support this endeavour.[168]

Findings

I accept the testimony of Aboriginal witnesses that certain members of their communities hold Aboriginal traditional and ecological knowledge relevant to the conservation and management of Fraser River sockeye. Several scientists and Department of Fisheries and Oceans (DFO) managers also recognized the significance of this information, which may include a long time-series of local observation of the environments and species within traditional Aboriginal territories. I agree that this information is valuable and should inform the management of the fishery and fish habitats.

I heard that DFO has taken some steps to consider Aboriginal traditional and ecological knowledge but that it has faced challenges in doing so. I accept that it may be difficult to gather, translate, and apply Aboriginal traditional knowledge in the context of changing environmental conditions and other scientific analysis. Improved working relationships between DFO and First Nations may be required to encourage broader sharing and recognition of Aboriginal traditional knowledge. DFO should continue to strengthen these relationships in order to address these difficulties and realize the potential value of Aboriginal traditional knowledge, including in the implementation of strategies 1, 2 and 3.

Several witnesses and participants suggested an increased Aboriginal role in the management of the fishery so that Aboriginal traditional knowledge may be brought to bear. One of the management processes described in this Report is the strategic and integrated planning process under Strategy 4.2 of the WSP (described in greater detail in Chapter 10, Wild Salmon Policy, and Volume 3, Chapter 2, Recommendations). Strategy 4.2 envisions a principal role for First Nations in that planning process, a role which should include the opportunity to apply Aboriginal traditional knowledge.

DFO policies

Introduction

I heard a great deal of evidence about DFO's policies and their role and importance to the department, to resource users, and to the Canadian public. I also heard evidence about DFO's implementation of and adherence to their policies.

Canada's fishing policies govern DFO's management of the fishery,[169] and it is through its policies that DFO articulates its priority of

conservation.* DFO uses written policies to provide direction and guidance regarding its operations to its own employees, to those involved in the fisheries, and to the public. Ms. Dansereau told me that a policy continues to direct DFO's operations in the given subject matter until it is replaced by a new policy. The deputy minister testified that DFO is working to integrate its various policies wherever possible so that they are linked in a coherent fashion.[170]

Although the impetus for a given policy may occur at the regional level (see, for example, the development of the WSP), DFO's national policy sector develops and produces the department's policies, which are then approved by the Departmental Management Committee. The deputy minister also referred to a new "deputy minister's policy committee," which is responsible for revising departmental policies and, presumably, for developing them.[171]

Some DFO policies have national application (such as the 1986 Policy for the Management of Fish Habitat, discussed in Chapter 6, Habitat management); some are specific to the Pacific Region (for example, from 1999, An Allocation Policy for Pacific Salmon, discussed in Chapter 5, Sockeye fishery management). According to senior management, regional policies are "nested" within broader national policies, but they are not developed in isolation from DFO's national headquarters.[172] The responsibility of regional management is "to implement the programs of the Department in line with the policies of the Department," and Ms. Farlinger agreed that, as the most senior DFO official in the region, she would be involved more in the development of policy than in overseeing its operation or implementation.[173]

According to Ms. Dansereau, the minister is the "key policy maker for the Department," and although the deputy minister advises the minister about the department's policies, it is the minister's prerogative to decide whether to become involved in the development or approval of policies.[174] The 1998 statement of then Minister David Anderson, in response to declining coho salmon stocks – which became DFO's *A New Direction for Canada's Pacific Salmon Fisheries* (discussed below) – illustrates a minister's involvement in the development of policy.

DFO often develops its policies in reaction to new legislation (for example, the *Oceans Act* required the creation of Canada's Oceans Action Plan), or a court decision (the Supreme Court of Canada's 1990 *Sparrow* decision prompted the creation of DFO's Aboriginal Fisheries Strategy), or a report critical of its practices (Pacific Fisheries Reform: Building a Sustainable Fishery is identified by DFO as a response to the external reports, *Treaties and Transitions: Towards a Sustainable Fishery on Canada's Pacific Coast* and *Our Place at the Table: First Nations in the B.C. Fishery*).[175]

The terminology used by DFO to describe its policies is confusing: witnesses described "frameworks," "initiatives," "discussion papers," "programs," and "visions," and there may well be others. I found it difficult to assess the weight or import of a given DFO policy in comparison to other policies, and this confusion was acknowledged by at least one DFO employee.[176] I sought clarification of the differences between the various documents and their roles. I was able to determine that, generally speaking, a framework represents "an overarching approach, as opposed to the detail and the application [of a policy]," and contains "more process and rules and responsibilities" than a policy.[177] A framework might also enunciate objectives and key principles.[178] I was also told that although a framework "would be at the top of the pile ... there can be smaller frameworks within an overall program."[179]

A program is funded (that is, it has a specific budget), has ascertainable goals, and is considered the operation of the policy.

> [A] program generally has the attributes that there will be specific deliverables, there will be a budget attributed to those deliverables and there will be timelines ... A policy, on the other hand, is directional and may or may not have funds associated with implementing it ... [A policy is] intended to change behaviour, and it is not only the behaviour of how we operate our programs and regulations inside the Department, but it's also intended to change the behaviour of people who use the resource or people who do development on habitat, anyone who is affected by that regulation.[180]

* For example, Policy for the Management of Aboriginal Fishing, and Wild Salmon Policy.

> [A] policy should set out the broad principles, set out the direction, and a program will tell or describe how we do things and how we measure things.[181]

> The distinction between program and policy ... is really the primary one. It's probably useful to know that policy comes in a number of forms, and it has sometimes come in the past as a form of Ministerial announcement. It has come as a documented policy ... And more recently we have seen collectively the attempt to bring those policies together, update them and make them coherent.[182]

> [P]olicies are hierarchical in the sense that they need to become more detailed as they are applied more specifically, and programs are things that go on and are influenced and directed by the policies.[183]

An initiative is similar to a program and was described to me as an action that is taken congruent with a policy.[184]

A discussion paper may be an initial draft of a policy (or of a program) and is the means through which DFO will consult on the anticipated policy.[185] A policy sets out "on the ground implementation."[186]

> A discussion paper would be used very often in the development of a policy, or even in the development of a program. So it would be something that we would generate or have generated for us to think about and talk about, or even for a committee to think about in the development of a program or policy.[187]

In its final written submissions, Canada offered the following context for DFO's policies:

> DFO policies come in a variety of forms, depending on the audience and intent of the policy. Several different terms are used by DFO in the development and presentation of policies. For example, a "discussion paper" is often written to help facilitate consultation on a proposed policy. Once consultation has been completed and a policy is approved, it often is encompassed in documents referred to as a "vision", "reform", "new direction" or "framework" to help explain its purpose. Generally speaking, policies are hierarchical in the sense that they become more detailed [as] they are applied more specifically.
> ...
> Departmental policy development related to the management of fisheries and their ecosystem is guided by a range of considerations that include legislated mandates, judicial guidance, and international and domestic commitments to promote biodiversity and a precautionary, ecosystem-based approach to the management of marine resources. While the policies themselves are not subject to annual changes, annual implementation details are continually reviewed and adjusted to meet current needs in the ever-changing environment in which DFO operates.[188]

Overview of selected DFO policies

In this section I describe DFO's broad policies, applicable to multiple topics covered in this Inquiry. In the chapters of this volume that follow, I provide more detailed descriptions of other policies; for example, the 1986 Habitat Policy, which is discussed in Chapter 6, Habitat management, or the Aquaculture Policy Framework, which is discussed in Chapter 8, Salmon farm management.

The Mifflin Plan

In 1996, then Minister Fred Mifflin instituted the Pacific Salmon Revitalization Strategy,[189] commonly referred to as the "Mifflin Plan." The Mifflin Plan was specific to DFO's Pacific Region, focusing on the commercial fishery,[190] and it was based on the "economic [reality]" that "salmon fishing will not provide economic benefits for individuals and communities unless the size of the fleet is reduced."[191]

Under the Mifflin Plan, DFO – to achieve its objectives of conservation and sustainability – promoted area licensing and reduction of the fleet through licence retirement and buy-back.[192] The Mifflin Plan acknowledged the issue of allocation among the sectors and within the commercial fishing sector, noting that Dr. Art May and Stephen Kelleher were going to address this issue.[193] May and Kelleher's work would later lead to the

1999 Allocation Policy for Pacific Salmon, developed under DFO's New Directions policy series discussed below and in the section on allocation in Chapter 5, Sockeye fishery management.

The Mifflin Plan "was a significant step in recognizing the challenges both for those people who were harvesting the fish and also for the managers in reducing the fishing power of that community to deal with the conservation issues."[194] It accompanied the Canadian Fisheries Adjustment and Restructuring Plan, which instituted a commercial licence buy-back program.[195]

A New Direction for Canada's Pacific Salmon Fisheries

In October 1998, then Minister Anderson announced *A New Direction for Canada's Pacific Salmon Fisheries*[196] (New Directions policy series), arising out of concerns about the declining coho stocks.[197] Stemming from the New Directions policy series, DFO created several discrete policies over the next four years, which together form what DFO refers to as the "New Directions" policy series or the "New Directions" policy framework.[198] These policies are: An Allocation Policy for Pacific Salmon (1999),[199] A Framework for Improved Decision-Making in the Pacific Salmon Fishery Discussion Paper (2000),[200] A Policy for Selective Fishing in Canada's Pacific Fisheries (2001),[201] and the Pacific Region Fishery Monitoring and Reporting Framework (2002).[202] All but one of these policies, the Framework for Improved Decision-Making (2000), are discussed in greater detail in Chapter 5, Sockeye fishery management.

As part of the New Directions Policy, DFO committed to creating what became in 2005 the Wild Salmon Policy (see Chapter 10, Wild Salmon Policy).[203] The deputy minister described the WSP as an essential policy for DFO, "a priority policy on the West Coast," and DFO's "guiding document for the management of Fraser sockeye."[204] Ms. Farlinger described these related policies as the "core" policies that are directly implemented in the Pacific Region.[205] The New Directions Policy was also described as "extremely pivotal in terms of [DFO's] management and assessment of Pacific salmon."[206]

In the New Directions Policy, DFO identified three key components as the "new direction" for the Pacific salmon fisheries: conservation, sustainable use, and improved decision making.[207] Ms. Farlinger considers that the New Directions Policy identified conservation as the primary goal of fisheries management, and that it states its priority as conservation "in a much clearer way than had been set out in the past."[208] The New Directions Policy specifies:

> The need for a new conservation ethic for our salmon resources and their habitat is widely accepted. Fish and habitat must be protected from irreversible depletion and the diversity of species conserved for future generations. Therefore, sound scientific advice will continue to guide fisheries and habitat management decisions.[209]

The New Directions Policy sets out 12 principles grouped under the three key component subject areas, which provide direction to DFO and guide its operation and management of the salmon fishery:[210]

Conservation

Principle 1: Conservation of Pacific salmon stocks is the primary objective and will take precedence in managing the resource.

Principle 2: A precautionary approach to fisheries management will continue to be adopted.

Principle 3: Continue to work toward a net gain in productive capacity for salmon habitat in British Columbia.

Principle 4: An ecological approach will guide fisheries and oceans management in the future.

Sustainable Use

Principle 5: The long term productivity of the resource will not be compromised because of short term factors or considerations – tradeoffs between current harvest benefits and long term stock well-being will be resolved in favour of the long term.

Principle 6: All sectors – First Nations, recreational and commercial – will use selective methods to harvest salmon.

Principle 7: First Nations requirements for food, social and ceremonial purposes will

continue to have first priority after conservation requirements.

Principle 8: Whenever possible, the recreational fishery will be provided with more reliable and stable fishing opportunities.

Principle 9: The commercial fishery will be a more diversified (less dependent on salmon) and economically viable sector, better able to withstand fluctuations in the cycles of the resource and the market.

Improved decision making

Principle 10: Clear, objective and relevant information on major issues requiring decisions will be provided to the public with sufficient time and opportunity for review, comment and feedback. Periodic review of progress and achievements will be initiated to facilitate accountability for the sound management of the salmon resource and its habitat.

Principle 11: Government and stakeholders will together be responsible and accountable for sustainable fisheries.

Principle 12: Enhanced community, regional and sector wide input to decision making will be pursued through a structured management and advisory board system.

Under the "next steps" section of the New Directions Policy, the following is set out:

> The federal government recognizes that the salmon fisheries of the future will be very different from those of today and that a number of people will be affected by such change. Therefore, the federal government is making a new investment of $400 million to increase efforts in protecting and rebuilding salmon habitat; restructure the commercial fishing industry by moving to selective harvesting, diversifying fishing income, and further reducing the fleet; and, assisting people adapt to the changing fishery.
> …
> This document sets out the broad policy direction associated with a new approach to the Pacific salmon fisheries. Based on this direction, a detailed set of operational policies for the management of the salmon resource will be developed. Consultations with the public, communities and stakeholders will now begin. The Government of British Columbia will be included in this process. These policies will cover the full range of activities involved in the management of the resource, including salmon allocation, selective fishing, and a wild fish policy.[211]

In June 1998, in conjunction with the New Directions Policy, the federal government announced the $400 million Pacific Fisheries Adjustment and Restructuring (PFAR) program, which was to be invested over a five-year period. The purpose of PFAR was to assist those involved in the fishing industry to adjust to the changes occurring in the Pacific fishery.

The shift to ecosystem-based management

When asked about the shift in DFO's priorities over the last 25 years, the deputy minister highlighted the department's move to ecosystem-based management.[212] During 2010 and 2011, DFO renamed some of its national sectors and regional branches to reflect its commitment to ecosystem-based management.

According to DFO senior management, an ecosystem-based approach involves managing individual programs (fisheries, aquaculture, and habitat) while taking the broader ecosystem into consideration.[213] In contrasting an ecosystem-based approach to the previous way of managing fisheries and oceans, Mr. Bevan testified:

> We don't know the details of how each ecosystem works and people say it's not rocket science and it isn't. It's way more complex … You've got to be cautious and you've got to understand that you don't know. And I think that's one of the huge issues in the past; we assumed we knew. We assumed we knew how much fish was there. We assumed we knew that if you've harvested at a particular fishing mortality, the fish could be maintained at maximum sustainable yield. And that presupposes a stable state in the ecosystem, so we assumed the ecosystem was stable, constant, and the only variable that we needed to con-

> trol was the fish harvesting and we assumed, as I said, that we knew with some degree of certainty the population. And we didn't know the population with that level of certainty and we certainly didn't understand how that population was reacting in the ecosystem and we've paid the price for that hubris.[214]

In 2007, as part of its science renewal process (discussed above), DFO Science produced the document *A New Ecosystem Science Framework in Support of Integrated Management* (Ecosystem Science Framework).[215] The Ecosystem Science Framework confirmed that the highest priority for DFO Science is providing scientific support for ecosystem-based management.[216]

DFO has stated its commitment to ecosystem-based management in several of its policies. Principle 4 of its 1998 *New Direction for Canada's Pacific Salmon Fisheries* states that "an ecological approach will guide fisheries and oceans management in the future" and provides:

> The definition and practical implementation of an ecological approach to fisheries and oceans management is complex. Work has been initiated to clarify its application. However, it is clear that an ecosystem approach involves understanding and providing for the complex interactions between the different species and requires a move away from the current single species management.[217]

The 1997 *Oceans Act* expressly requires the minister to develop a national strategy for managing "estuarine, coastal and marine ecosystems" in Canada's oceans.[218] It led to the 2002 Canada's Oceans Strategy,[219] which introduced a nationally coordinated "integrated management" system for marine ecosystems and called for a "commitment to planning and managing human activities in a comprehensive manner while considering all factors necessary for the conservation and sustainable use of marine resources and the shared use of ocean spaces."[220] Dr. Villy Christensen and Dr. Andrew Trites, authors of the Commission's Technical Report 8, Predation, equate this commitment in the Oceans Strategy to ecosystem-based management.[221]

Some witnesses expressed reservations about ecosystem-based management. Trevor Swerdfager, former director general, Aquaculture Management Directorate, DFO, stated that, although he endorses the general concept of ecosystem-based management, he has reservations about its practical implementation. In Mr. Swerdfager's view, the idea has "tremendous theoretical allure … [and] understanding [an ecosystem] on a broad-based multi-disciplinary scientific perspective makes an awful lot of sense."[222] However, translating the theory into specific management decisions and actions is, in his opinion, much more difficult. He cited as an example the difficulty in translating fish farm licensing decisions, which are yes-or-no decisions, into broad-based ecosystem approaches.[223]

In contrast, Dr. Kim Hyatt, ecosystem research scientist, SAFE, DFO Pacific Region, is of the opinion that ecosystem-based management is not something that is implemented or not implemented. According to Dr. Hyatt, many aspects of ecosystem-based management are already incorporated in the management of wild salmon, some of which were initiated well before the WSP. However, Dr. Hyatt acknowledged that ecosystem-based management is not an all-or-nothing proposition: it is incremental and becomes increasingly complex and informative as it evolves.[224]

In its final submissions, the First Nations Coalition expressed concern about DFO's move toward ecosystem-based management, submitting that DFO has no consistent agreed-upon definition or framework to guide its ecosystem approach to management.[225] In a presentation to the strategic directions committee, DFO acknowledged that there is currently a lack of common understanding of the ecosystems-based management terminology, and no consistent agreed-upon definition or framework to guide its implementation.[226]

In Technical Report 8, Predation, Dr. Christensen and Dr. Trites note a trend toward ecosystem-based management of fisheries over the last decades.[227] According to the authors, ecosystem-based management entails developing an understanding of "how the environment, humans, and other ecosystem components impact ecosystems – which is exactly where the [traditional stock] assessment of Fraser River sockeye falls short."[228] In their view, it is particularly relevant to salmon managers and their need to incorporate information on predator-prey relationships.[229] Dr. Christensen explained that fisheries have

traditionally been managed on a single-species basis and tend not to fully include considerations of the ecosystem and the environment, whereas there is a strong scientific "almost consensus" that including these considerations will minimize the risk of failure of a species like sockeye.[230]

Technical Report 8, Predation, concludes that Canada has not moved far toward ecosystem-based management.[231] Dr. Christensen testified that, in principle, DFO has embraced it; however, in his view, the actual implementation is wanting or lagging far behind.[232] He also said that we do not yet know enough to enable managers to start incorporating ecosystem knowledge and values into decision-making processes.[233]

Dr. John Ford, program head, cetacean research, Conservation Biology Section, DFO Pacific Biological Station, identified the Strait of Georgia Ecosystem Research Initiative as an example of the move within DFO to ecosystem-based management (see below and Chapter 6, Habitat management).[234] However, Dr. Christensen and Dr. Trites expressed the view that the funding for ecosystem research initiatives "is insufficient to ever meet the goals of integrated management."[235] Dr. Christensen also stated that the initiative has good intentions, but the way the funding has been broken up into "piecemeal practice" indicates no clear strategy.[236]

On April 26, 2012, after this Inquiry's evidentiary hearings had concluded, the government introduced Bill C-38, *An Act to implement certain provisions of the budget tabled in Parliament on March 29, 2012 and other measures* (it received royal assent on June 29, 2012). Part 3, Division 5, of Bill C-38 proposed amendments to the *Fisheries Act* (in particular, sections 2, 6, 32, 35, and 43), the purpose of which is stated in the summary of Bill C-38 "to focus that Act on the protection of fish that support commercial, recreational or Aboriginal fisheries and to more effectively manage those activities that pose the greatest threat to these fisheries." I discuss the implications of Bill C-38 on DFO's ecosystem-based management in Volume 3, Chapter 3, Legislative amendments.

Pacific Fisheries Reform

In 2004, the Supreme Court of Canada released its decision, *Haida Nation v. British Columbia (Minister of Forests)*, in which the Court confirmed the government's duty to consult with First Nations.[237] That same year, the external reports of the Joint Task Group on Post-Treaty Fisheries, *Treaties and Transition: Towards a Sustainable Fishery on Canada's Pacific Coast*, and the First Nations Panel, *Our Place at the Table: First Nations in the B.C. Fishery*, examined the state of the Pacific fisheries and recommended reform.[238]

In April 2005, the minister announced Pacific Fisheries Reform,[239] which is referred to as a "blueprint for change in the management of Pacific fisheries" or a "management reform initiative"[240] and which was the government's response to *Treaties and Transition* and *Our Place at the Table*. Ms. Farlinger described the impetus for Pacific Fisheries Reform:

> There were reports that had come out at that time from various sources from First Nations about their view of moving forward in Pacific fisheries and their share and their participation in fisheries. There were reviews, again, of allocation in the salmon fishery and how it might move forward post-treaty in B.C. There was a need to implement the conservation aspects, including elements of the Wild Salmon Policy [which had just been announced].[241]

In the announcement, the minister described four "themes" for reform in Pacific fisheries, "to guide Pacific fisheries for years to come":

> First – we need to define conservation objectives through the Wild Salmon Policy. The Wild Salmon Policy, which is now being finalized, will put forward a comprehensive, flexible and co-operative approach to conserving Pacific salmon in the years to come.
>
> Second – we need to strengthen our programs to protect habitat, assess stocks, monitor catches, and enforce the rules of the fishery. We need to find new and innovative ways to deliver these programs with all of our partners.
>
> Third – we need to increase First Nations access to economic fisheries. We want to do this by increasing commercial access for First Nations through voluntary licence-retirement programs ...
>
> And fourth – we need to improve the fishery's economic performance, and give all users the cer-

tainty and stability they need. We need to work together with First Nations and other resource users to develop a flexible management regime that makes co-management a top priority, with more shared decision making than ever before.[242]

In September 2005, DFO released *A Discussion Paper on the Implementation of Pacific Fisheries Reform*, which "elaborated on the Minister's vision of a reformed management system by identifying and discussing the various aspects of fisheries management that require change."[243] Like the New Directions Policy, Pacific Fisheries Reform set out a series of principles with which the introduction of changes to the management of Pacific fisheries would be consistent, articulated as follows:

- Conservation is paramount (e.g. consistency with Wild Salmon Policy)
- Consistent legal framework
  - Pacific fisheries resources are a common property resource managed by the Minister of Fisheries and Oceans
  - Fisheries must be conducted under an integrated management plan authorized by the Minister, and
  - Commercial participants fish under the same priority of access and similar rules
- Aboriginal and treaty rights of First Nations
  - First Nations access to food, social and ceremonial fisheries will be respected, and
  - First Nations interests in increased economic access will be addressed in a manner consistent with Canada's treaty process
- Fair transfer of fishing opportunity
  - Transfer of economic fishing opportunity to First Nations will be accomplished through voluntary licence retirement from willing sellers, and within existing programs, to mitigate impacts on established fishers
- Stable resource access and allocation
  - Certainty will be provided for allocations between harvest sectors (First Nations, recreational and commercial)
  - Allocation policy as it pertains to Chinook and Coho salmon will be maintained
  - Certainty of harvest shares will be provided to commercial participants, and
  - Commercial harvesters will enjoy a similar level of certainty regarding fisheries access
- Responsibility and accountability
  - First Nations and stakeholders will assume a greater role in operational decision-making and program delivery through effective co-management processes
- Management regimes for commercial fisheries
  - Fleet will be enabled to self-adjust
  - Resource management practices will be designed to optimize economic performance while meeting conservation objectives
  - Fleets will have the capacity to assume a larger share of the cost of management of their fishery
  - Catch monitoring and independent validation will be implemented, and
  - Measures will be adopted to provide confidence that adequate compliance is achieved
- Transition and adjustment
  - Existing government programs will be coordinated to best meet the needs of those impacted by change[244]

In conjunction with Pacific Fisheries Reform, DFO implemented the Pacific Integrated Commercial Fisheries Initiative (PICFI)[245] in July 2007, a five-year funded program designed principally to transfer commercial licences from non-natives to First Nations "and in doing so offset and actually improve conservation by reducing fisheries in areas where the stocks are ... mixed ... transferring those opportunities to First Nations."[246] The federal government committed $175 million to PICFI. [247] (See Chapter 5, Sockeye fishery management, where PICFI is discussed in greater detail in the section on Aboriginal fishing policies and programs.)

Oceans Strategy and Oceans Action Plan

Dr. Watson-Wright, former ADM, Science, acknowledged the challenges faced by the department's Science sector and regional Science branches in the

1990s and 2000s with the enactment of legislation affecting the department's activities, in particular the *Canadian Environmental Assessment Act* of 1992; the *Oceans Act* of 1996; the *Canadian Environmental Protection Act*, enacted in 1999; and the *Species at Risk Act* (SARA), enacted in 2002.[248]

The *Oceans Act* expressly requires the minister to develop a national strategy for the management of "estuarine, coastal and marine ecosystems" in Canada's oceans.[249] In 2002, DFO produced Canada's Oceans Strategy,[250] a national policy flowing out of the *Oceans Act*, providing guidance on the oceans' ecosystems[251] and reflecting the point at which DFO began to document the concept of requiring an ecosystem approach to management in the salmon fishery.[252]

Canada's Oceans Strategy lists multiple activities, grouped under its main policy objectives, which DFO was to implement over a four-year period and, although I heard some evidence regarding the department's progress in one of the areas – "improved scientific knowledge base for estuarine, coastal and marine ecosystems" – DFO has not implemented the activities.[253]

In the October 2004 speech from the throne, the federal government stated that it would

> move forward on [the] *Oceans Action Plan* by maximizing the use and development of oceans technology, establishing a network of marine protected areas, implementing integrated management plans, and enhancing the enforcement of rules governing oceans and fisheries, including rules governing straddling stocks.[254]

In 2005, DFO released *Canada's Oceans Action Plan: For Present and Future Generations* (Oceans Action Plan), which "serves as the overarching umbrella for coordinating and implementing oceans activities, and as the framework to sustainably develop and manage our oceans."[255] The intent of the Oceans Action Plan is to develop ecosystem-based management objectives so that human activities can take place in a way that is conserving and sustaining the use of the fisheries resources.[256] Canada's Oceans Action Plan (2005) sets out the following commitment to ecosystems-based, integrated management, marking the point at which DFO began "to document the concept of requiring an ecosystem approach to management":[257]

> Integrated management is a comprehensive way of planning and managing human activities so that they do not conflict with one another and so that all factors are considered for the conservation and sustainable use of marine resources and shared use of ocean spaces. It is an open, collaborative and transparent process that is premised on an ecosystem-approach. It involves planning and management of natural systems rather than solely political or administrative arrangements, and is founded on sound science that can provide the basis for the establishment of ecosystem management objectives.[258]

The Oceans Strategy and Oceans Action Plan are discussed in Chapter 6, Habitat management.

Sustainable Fisheries Framework

In 2009–10, DFO developed a national Sustainable Fisheries Framework, which is not a discrete policy but a group of national policies, including:[259] Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas,[260] Policy for New Fisheries for Forage Species,[261] The Sustainable Fisheries Checklist[262] (part of the revised Integrated Fisheries Management Plan – discussed in greater detail in Chapter 5, Sockeye fishery management), a proposed bycatch policy, and A Fishery Decision-Making Framework Incorporating the Precautionary Approach.[263] DFO situates the Sustainable Fisheries Framework within the context of "fisheries renewal":

> Fisheries renewal is the Department's national initiative to achieve sustainable fisheries, economic prosperity and improved governance that ensures greater stability, transparency and accountability in fisheries management. Central to this initiative is the Sustainable Fisheries Framework (SFF) established in 2009 to consolidate existing and new fisheries sustainable development policies and tools. The SFF embodies a precautionary, ecosystem-based approach to management and seeks to stabilize fishery allocations through new sharing arrangements between harvesting sectors. This move to defined shares, in turn, requires enhanced catch accountability for each sector

to ensure that all removals of target species and by-catch are properly considered.[264]

DFO maintains that its recent Sustainable Fisheries Framework (2009–10) provides the foundation of an ecosystem-based and precautionary approach to fisheries management in Canada. DFO identifies one of the two main elements under the Sustainable Fisheries Framework as "conservation and sustainable use policies," the purpose of which is to incorporate precautionary and ecosystem approaches into fisheries management decisions to ensure continued health and productivity of Canada's fisheries and fish stocks, while protecting biodiversity and fisheries habitat. The policies, according to DFO, demonstrate Canada's commitment to the principles of ecosystem-based fisheries management.[265]

Precautionary principle / approach policies

In 2003, the Privy Council of Canada produced *A Framework for the Application of Precaution in Science-Based Decision Making about Risk*[266] (Federal Framework), which Dr. Watson-Wright described as a "kind of a bible document in the Government of Canada."[267] In Dr. Watson-Wright's opinion, the Federal Framework set the stage for DFO's subsequent policy work incorporating the precautionary approach.[268] The Federal Framework is expressly referred to in the WSP[269] and in DFO's Fishery Decision-Making Framework Incorporating the Precautionary Approach.[270] In the Federal Framework, the question, "What is the application of precaution?" is answered in the following way:

> The application of "precaution", "the precautionary principle" or "the precautionary approach" recognizes that the absence of full scientific certainty shall not be used as a reason for postponing decision where there is a risk of serious or irreversible harm.
>
> The application of precaution is distinctive within science-based risk management and is characterized by three basic tenets: the need for a decision, a risk of serious or irreversible harm and a lack of full scientific certainty.[271]

I note that several variations of the precautionary principle or approach have been expressed in international law, as discussed in Chapter 3, Legal framework. The Federal Framework contains five general principles of application (also reproduced in the WSP) (explanatory language omitted):

> 4.1 The application of precaution is a legitimate and distinctive decision-making approach within risk management.
> 4.2 It is legitimate that decisions be guided by society's chosen level of protection against risk.
> 4.3 Sound scientific information and its evaluation must be the basis for applying precaution; the scientific information base and responsibility for producing it may shift as knowledge evolves.
> 4.4 Mechanisms should exist for re-evaluating the basis for decisions and for providing a transparent process for further consideration.
> 4.5 A high degree of transparency, clear accountability and meaningful public involvement are appropriate.[272]

The Federal Framework also contains five principles for precautionary measures (explanatory language omitted):

> 4.6 Precautionary measures should be subject to reconsideration, on the basis of the evolution of science, technology and society's chosen level of protection.
> 4.7 Precautionary measures should be proportional to the potential severity of the risk being addressed and to society's chosen level of protection.
> 4.8 Precautionary measures should be non-discriminatory and consistent with measures taken in similar circumstances.
> 4.9 Precautionary measures should be cost-effective, with the goal of generating (i) an overall net benefit for society at least cost, and (ii) efficiency in the choice of measures.
> 4.10 Where more than one option reasonably meets the above characteristics, then the least trade-restrictive measures should be applied.[273]

In May 2006, DFO Science released a paper, *A Harvest Strategy Compliant with the Precautionary Approach.*[274] The "context" section of this paper provides the following background for the document's creation and purpose, referencing the Federal Framework:

> Canada has been a strong proponent of the management principles outlined in the United Nations Fish Stock Agreement (UNFSA – also commonly referred to as UNFA) that it ratified in the fall of 1999. The Agreement came into effect in December 2001, and amongst other things, it requires countries to use the Precautionary Approach (PA) in the management of fisheries. At about the same time, the Privy Council Office (PCO) of the Government of Canada developed the Federal Framework for the precautionary approach to ensure that precaution would be applied consistently across disciplines in the government. The framework became government policy in 2003. Over the last few years, there have been some initiatives in Canada to define the precautionary approach in a fisheries context, to identify benchmarks that would be consistent with the approach and to apply it in fisheries management. As risk based decision-making frameworks for Canadian fisheries are being developed, numerous meetings of the Science Sector National Working Group on the Precautionary Approach have been held. At its October 2005 meeting, the Working Group described the minimal requirements for harvesting strategies in these fisheries management frameworks to be compliant with the Precautionary Approach.[275]

In its introduction section, it says:

> The Precautionary Approach is a general philosophy to managing threats of serious or irreversible harm where there is scientific uncertainty ... Good risk management compels us to use caution and to take uncertainty into account when making decisions. The application of precaution requires increased risk avoidance where there is risk of serious harm and uncertainty is great. These conditions often apply in fisheries; therefore precaution should be incorporated in fisheries management.
>
> The Precautionary Approach is applicable to all fisheries management strategies. This report only considers application of the Precautionary Approach to the harvest strategy, one of many management strategies aimed at meeting conservation objectives. It outlines the minimal elements that a harvest strategy for fisheries on exploited species must have to comply with the Precautionary Approach.[276]

The document then sets out a removal reference for three stock status zones delineated by a limit reference point and an upper stock reference point. According to the later DFO policy, the 2009 Fishery Decision-Making Framework Incorporating the Precautionary Approach,[277] this paper outlined the minimum requirements, from a science perspective, for a harvest strategy to be compliant with the precautionary approach.[278]

Ms. Farlinger described the document, A Fishery Decision-Making Framework Incorporating the Precautionary Approach, as one of DFO's "principal conservation policies." It sets up, she said, a similar framework to the WSP

> that says there is a point below which there will be no fishing … there is an area between that point and a point of healthy fisheries in which fisheries will be restricted in order to support rebuilding of the stocks. And then over that healthy stock size, there is a point where fishing will be able to go on in a less constrained manner, not completely unconstrained, but less constrained.[279]

This framework also sets conservation as DFO's first priority and "says we're going to manage on an ecosystem basis[.]"[280] As stated in this Fishery Decision-Making Framework:

> In resource management, the [precautionary approach] is, in general, about being cautious when scientific information is uncertain, unreliable or inadequate and not using the absence of adequate scientific information as a reason to postpone or fail to take action to avoid serious harm to the resource.[281]

As noted earlier, DFO's senior management consider the Wild Salmon Policy the embodiment of the precautionary approach to management

of wild salmon, and this is noted in the Fishery Decision-Making Framework.[282]

Wild Salmon Policy

DFO's senior management considers *Canada's Policy for Conservation of Wild Pacific Salmon* (2005) (Wild Salmon Policy or WSP) to be DFO's guiding document for the management of Fraser River sockeye. The WSP sets out objectives, establishes strategies to meet them, and presents a decision-making approach that seeks to ensure that choices made about salmon harvest and conservation reflect societal values. The WSP commits DFO to incorporating ecosystem-based management in the development of long-term management plans.[283] One objective of the policy is the maintenance of habitat and ecosystem integrity, and it stresses the importance of ecosystem values and monitoring.[284] Because the WSP is so important to the management of Fraser River sockeye salmon, I have devoted the entirety of Chapter 10, Wild Salmon Policy, to the WSP and its implementation.

Notes

1 This description of the components of the policy is available on the Treasury Board website, www.tbs-sct.gc.ca. See also Exhibit 1921, p. 2; Claire Dansereau, Transcript, September 23, 2011, p. 43.
2 Exhibit 21.
3 Exhibit 22.
4 Transcript, November 1, 2010, p. 42.
5 Exhibit 17; Exhibit 18; Exhibit 19. See also Claire Dansereau, Transcript, September 23, 2011, p. 44; Exhibit 1922.
6 Transcript, November 1, 2010, p. 28.
7 Exhibit 19, p. 2.
8 Claire Dansereau, Transcript, September 23, 2011, p. 44.
9 Exhibit 19, p. 2. See also Claire Dansereau, Transcript, November 1, 2010, pp. 40–41.
10 Claire Dansereau, Transcript, November 1, 2010, pp. 28–29.
11 Exhibit 1922, p. 3.
12 Exhibit 17.
13 Public submission 0086-Skipper, available at www.cohencommission.ca.
14 See, e.g., public submissions 0088-Burns, 0915-Brown, 0229-Cox, and 0234-Phillips, available at www.cohencommission.ca.
15 Public submission 0235-COONS, available at www.cohencommission.ca.
16 Information acquired from DFO website, www.dfo-mpo.gc.ca.
17 Transcript, November 1, 2010, p. 13.
18 Information acquired from DFO website, www.dfo-mpo.gc.ca.
19 Paul Macgillivray, Transcript, November 1, 2010, pp. 15–16.
20 Transcript, pp. 15–16. See also Susan Farlinger, Transcript, September 23, 2011, p. 45.
21 David Bevan, Transcript, November 1, 2010, pp. 8–10; Exhibit 15, p. 10.
22 Exhibit 17.
23 See, e.g., Exhibit 25.
24 Paul Sprout, Transcript, December 9, 2010, p. 22.
25 Transcript, November 1, 2010, p. 17. See also Transcript, December 9, 2010, p. 22.
26 Transcript, November 1, 2010, p. 78; Transcript, December 9, 2010, p. 22.
27 Claire Dansereau, Transcript, November 1, 2010, pp. 72–73.
28 Transcript, November 1, 2010, p. 74.
29 Claire Dansereau, Transcript, November 1, 2010, p. 24.
30 Transcript, November 1, 2010, p. 25.
31 Brian Riddell, Transcript, February 2, 2011, pp. 39–40.
32 Claire Dansereau, Transcript, September 23, 2011, p. 46.
33 Susan Farlinger, Transcript, September 23, 2011, p. 46.
34 Susan Farlinger, Transcript, September 23, 2011, p. 47.
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36 Jim Cave and Brian Assu, Transcript, January 31, 2011, pp. 53–54.
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38 This description of strategic review is available on the Treasury Board website, www.tbs-sct.gc.ca.
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43 Exhibit 25, p. 6.
44 See, for example, public submissions 0245-HUSBAND and 0175-BIAGI, available at www.cohencommission.ca.
45 See public submissions 0837-WARES, 0839-WARES, 0086-SKIPPER, 0727-SKIPPER, 0915-BROWN, available at www.cohencommission.ca. See also Aquaculture Coalition's written submissions, p. 11, available at www.cohencommission.ca.
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49 Public submission 0599-HARTMAN. See also 1157-WARES, available at www.cohencommission.ca.
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53 Wendy Watson-Wright, Transcript, November 4, 2010, pp. 13–14.
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59 Laura Richards, Transcript, March 17, 2011, p. 78.
60 Siddika Mithani and David Bevan, Transcript, November 3, 2010, p. 112.
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64 Laura Richards, Transcript, November 3, 2010, p. 111.
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77 Exhibit 40, p. 7 and following.
78 Transcript, November 3, 2010, p. 8.
79 Exhibit 40, pp. 7–12.
80 Transcript, November 3, 2010, pp. 19–20.
81 Exhibit 48.
82 Exhibit 48, p. 3.
83 Exhibit 48, pp. 5–16.
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88 Transcript, November 3, 2010, p. 66.
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135 For example, David Welch, Stewart McKinnell, and Richard Beamish, Transcript, July 8, 2011, p. 61; Kristina Miller, August 25, 2011, pp. 35–36; Don MacDonald, May 10, 2011, p. 69.
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150 Transcript, September 28, 2011, p. 60.
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265 This description of the Sustainable Fisheries Framework is taken from the DFO website, www.dfo-mpo.gc.ca.
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