Chapter 20

Fisheries and Oceans

Pacific Salmon: Sustainability of the Fisheries

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Fisheries and Oceans

Pacific Salmon: Sustainability of the Fisheries

Main Points

20.1 The Pacific salmon fisheries are in trouble. Catches have declined overall, but the commercial catch has plummeted. The long-term sustainability of the fisheries is at risk because factors like overfishing, habitat loss, and declining ocean productivity have eroded the resource base. The result is a fisheries management crisis that has cast a cloud of uncertainty over the future of the salmon fisheries. Salmon fishing will continue, but more stringent controls are needed in the short term to ensure that salmon survive for the benefit of future generations.

20.2 The management challenge for the Department of Fisheries and Oceans is to conserve existing stocks and rebuild those that are at low levels, while maintaining the viability of the fisheries. It will have to adapt its management regime to the new realities and gain the acceptance and support of stakeholders if it is to be successful. These will be difficult tasks to accomplish.

20.3 The Department now needs to:

- identify information needs and priorities;
- review the consultation process and identify areas for improvement;
- implement integrated fisheries management plans;
- complete the downsizing of the fleet as a priority;
- establish an independent allocation board; and
- develop a better working relationship with the Province of British Columbia where fishery issues are concerned.

Background and other observations

20.4 The Department has already taken the first steps to address the challenges it faces. It has affirmed conservation as its primary objective to protect existing salmon stocks and rebuild the resource base. In 1998 it announced a new policy, *A New Direction for Canada's Pacific Salmon Fisheries*, to direct its management activities in the future. The regional office has developed and is implementing its strategic plan for 1998–2001 based on this policy.

20.5 In addition to the management of larger stocks targeted primarily by the commercial fishery, the regional office has begun to focus more on the conservation of smaller stocks that are important to the Aboriginal and recreational fisheries. It has taken a conservation-based approach to fisheries management and is testing selective fishing methods and gear, in addition to implementing special programs such as fleet reduction and restructuring. However, there are areas that need attention if policy objectives are to be attained. The most important are improving regional databases and information management to enable it to manage Pacific salmon on a stock-by-stock basis, and resolving consultation problems to improve stakeholder relations and move toward forming partnerships to share management responsibilities and offset costs.

20.6 The Department will need time to adjust to the new management regime. During this time, fisheries will be subject to closure to allow stocks to recover. Improvements cannot be expected to occur quickly, given that

salmon life cycles can extend to five years or longer and salmon need time to adjust to changes in their freshwater and marine habitats. Finally, the future sustainability of the fisheries will depend not only on the Department's ability to implement its New Direction policy but also on its success in enlisting the help of stakeholders and the provincial government to share the workload.

The responses of Fisheries and Oceans to our recommendations are included in this chapter. The Department agrees with all 13 recommendations and notes that initiatives are under way in several areas.

Introduction

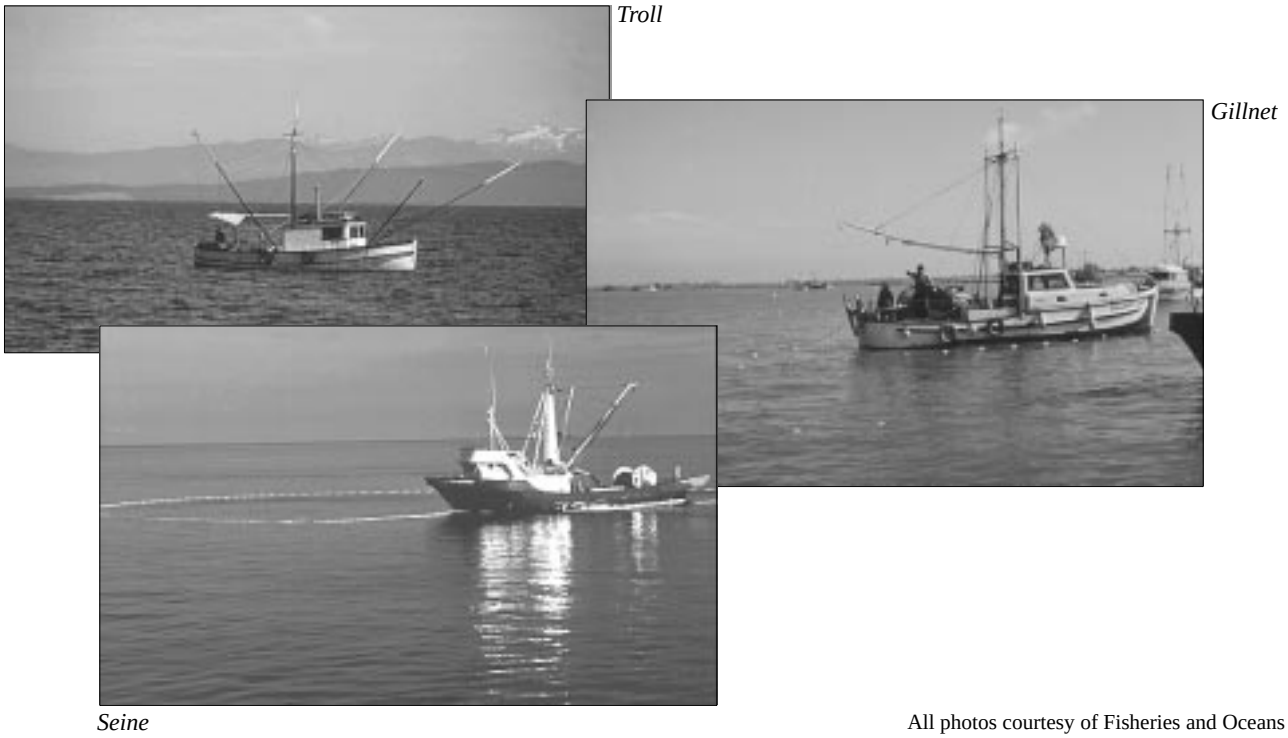
20.7 Salmon are important to Canadians and, to British Columbians, serve as a powerful symbol of the quality of life. They generate a wide range of economic, social and cultural benefits for a broad spectrum of interests — the commercial and recreational fishing sectors together with the processing and service industries, First Nations, the federal and provincial governments, environmental groups and the public.

20.8 Pacific salmon are caught in commercial, recreational and Aboriginal fisheries by a variety of methods and gear. Commercial fishers use seine and gill nets or lures drawn along behind the boat (trolling). Recreational fishers use rod and line; Aboriginal fishers use various means including dip nets, gillnets and traps. Exhibit 20.1, Glossary, defines these and other terms used in this chapter.

20.9 Five species of salmon under federal management are taken in the fisheries — sockeye, pink, chum, chinook and coho. They have similar life histories in that all use both freshwater and marine habitats and all die after spawning. Each species comprises a number of distinct populations or stocks, which are spread throughout the streams, rivers and lakes of British Columbia. These stocks have different spawning areas and spawn at different times; the juvenile salmon that result use different feeding and rearing areas.

20.10 Such differences are inherited and have produced a wide diversity of stocks, each adapted to local conditions. This genetic diversity provides a "safety net," which is an important defence for salmon against the impacts of natural and man made changes to their environment. While the strengths of individual stocks will vary over time according to the nature and location of such impacts, their

Gear Types in the Commercial Fishery



Troll

Gillnet

Seine

All photos courtesy of Fisheries and Oceans

diversity enhances the ability of the species to respond to change and ultimately to survive. The conservation of diversity is an objective of the *United Nations Convention on Biodiversity* (1992), to be implemented through the *Canadian Biodiversity Strategy* (1995).

20.11 The focus on biodiversity has occurred at a time when salmon fisheries in British Columbia are in serious trouble. Natural factors (such as the effects of global warming on marine and freshwater temperatures, and fluctuating ocean productivity); human factors (such as

Exhibit 20.1

Glossary

Abundance. Number of fish in a stock or fishery.

Allocation. The number of fish assigned or allotted to a particular group or individual.

Assessment. Evaluation of the productivity of a stock as a basis for deciding how many salmon should spawn and what harvest rates should be.

Biodiversity (biological diversity). The variability among living organisms, including the terrestrial and marine ecosystems and the ecological complexes of which they are part. This includes diversity within species, among species and of ecosystems. See genetic diversity.

Capacity (harvest). Related to the discussion of overcapacity. The Department defines "harvesting capacity" broadly to include the number of vessels in the fleet, the mobility of vessels, fishing technology, the quantity and type of gear used, and the skill of individual vessel operators.

Closure. Official end to a period of legal fishing.

Co-management. Sharing of management responsibilities among two or more agencies or parties.

Conservation. The management of salmon stocks to ensure that adequate numbers of salmon spawn each year, that spawning is successful, and that genetic diversity is maintained.

Conservation unit. A group of one or more local populations that share a common genetic lineage and that can be managed effectively as a unit by virtue of their common productivity and vulnerability to existing fisheries. Similar to the evolutionarily significant units (ESUs) used for the U.S. *Endangered Species Act*. Distinct population segments; a geographic area containing genetically related or similar groups.

Escapement. Number of mature salmon that pass through (or escape) the fisheries and return to their rivers of origin to spawn.

Genetic diversity of salmon. The separation of individual stocks of a salmon species based on inherited characteristics. This results, for example, in adults using different locations and times for spawning. See biodiversity.

Gillnet. A type of commercial fishing gear — a net set upright in the water to catch fish by entangling their gills in its mesh.

Habitat. Area in which an organism would naturally be found; the place that is natural for the life and growth of an organism.

Landing. Salmon caught in the commercial fishery that are delivered to fish processors.

Observer. Enforcement staff placed on board fishing vessels to monitor by-catch and use of selective fishing techniques.

Overfishing. Excessive fishing; fishing to depletion.

Pacific Scientific Advice Review Committee (PSARC). The Committee provides internal and external clients with scientific information that is reliable, relevant, timely and comprehensive. It advises the Resource Management Executive Committee chaired by the Director General and other bodies (like the newly formed Pacific Fisheries Resource Conservation Council) on stock and habitat status and potential biological consequences of fisheries management actions and natural events.

Precautionary approach. See Exhibit 20.5.

Risk-averse management. Management system weighted to conservation of a stock.

Seine. A type of commercial fishing gear — a large fishing net with floats along the top edge and weights along the bottom.

Selective fishery. Conservation-oriented management approach that allows for the harvest of surplus target species or stocks while aiming to minimize or avoid the harvest of species or stocks of conservation concern.

Stock. Fish returning to a general geographical area for spawning. Part of a fish population whose use is under consideration.

Sustainable development. Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable use. Management aimed at passing on a robust, healthy and abundant salmon resource for the enjoyment of future generations.

Test fishing. Fishing activity designed to provide data from which an estimate of run size can be generated.

Troll. A type of commercial fishing gear — a line trailed behind a moving boat.

overfishing and loss or deterioration of habitat); and economic factors (such as commercial fleet overcapacity and competition in the marketplace from a growing salmon-farming industry), are contributing to a decline in fishing opportunities, success rates, and value of the catch. The Department's challenge is to conserve existing stocks and rebuild those that are at risk, while maintaining viable fisheries.

Focus of the audit

20.12 This is the second of three audits of Pacific salmon management. The first, reported in 1997, examined the Department's management of the resource base, concentrating on the conservation of salmon habitat. The third audit will examine the Department's role in the salmon-farming industry and the industry's impact on the conservation, production and management of wild salmon.

20.13 The objective of the current audit was to determine if the Pacific salmon fisheries are being managed to ensure the conservation of the resource base and the sustainability of the fisheries. The audit reviewed existing problems and actions taken by the Department to respond to the new management challenge in three major areas: policy development and planning, fisheries and information management and government-stakeholder consultations. At the request of the Public Accounts Committee, we also incorporated into the audit a follow-up of the Department's response to the recommendations contained in our 1997 chapter, Fisheries and Oceans – Pacific Salmon: Sustainability of the Resource Base.

20.14 Further details on the audit objective and criteria are found at the end of the chapter in the section **About the Audit**.

Observations and Recommendations

The Troubled Pacific Salmon Fishery

The Department's challenge is to conserve existing salmon stocks.

Catches have declined

20.15 Statistics show that the commercial catch has dropped dramatically and the recreational catch is declining; however, the Aboriginal catch appears to be relatively stable (see Exhibit 20.2). There has been a rapid drop in the value of commercial catches since 1995 (see Exhibit 20.3).

The resource base is being eroded

20.16 The fisheries draw on a diversified resource base of over 8,000 individual stocks of sockeye, pink, chum, coho and chinook salmon. A 1996 review of Fisheries and Oceans data, published by the American Fisheries Society, found that sufficient information was available to assess the status of only 60 percent of these stocks; the status of the remaining 40 percent was undocumented. Of the stocks assessed, over 15 percent were in some degree of danger. Coho stocks were the most affected overall, with 20 percent at risk.

Information is unavailable for 40 percent of salmon stocks.

20.17 In spite of the Department's efforts, the fish habitat loss we reported in 1997 is still occurring. This contributes to the continuing decline of many salmon stocks.

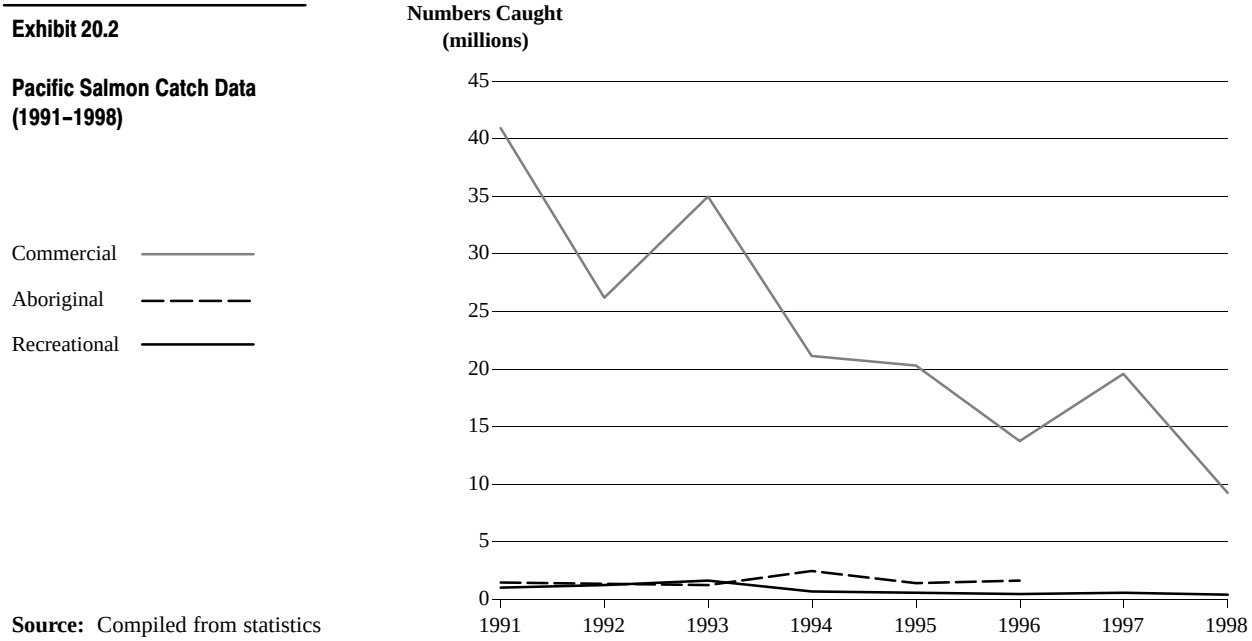
20.18 A new factor has recently come to the attention of Fisheries and Oceans scientists — apparent changes in ocean productivity, which have resulted in unforeseen declines in the numbers of salmon returning to spawn. This has made it necessary to restrict or close fisheries to conserve stocks. The most recent closures occurred in August of this year in the Fraser River, when the regional office's pre-season estimate of sockeye expected to return had to be adjusted from 8.2 million to 3 million.

Habitat loss is still occurring.

20.19 The availability of salmon to the fisheries has been affected by the ongoing dispute between Canada and the U.S. Pacific Coast states, especially Alaska and Washington, over their respective shares of salmon originating in British Columbia streams. Although Canada and the U.S. signed the Pacific Salmon Treaty in 1985 to deal with conservation and equity issues, from 1992 until recently they disagreed on annual fishing arrangements. In 1992, both countries began to fish coho heavily. Some progress toward resolving the dispute was made in 1998 when arrangements were negotiated with the northern U.S. states to share catches and

Exhibit 20.2

Pacific Salmon Catch Data (1991–1998)



Source: Compiled from statistics provided by Fisheries and Oceans and Edwin Blewitt and Associates

Note: Commercial, recreational and Aboriginal catch data after 1994 are preliminary.

Exhibit 20.3

Pacific Region Commercial Salmon Catch Values (1991–1998)

Source: Fisheries and Oceans

Note: Statistics for 1996 to 1998 are preliminary

exchange information on salmon stocks. Finally, in June 1999, a new agreement on conservation and equity issues under the Treaty was announced. The agreement provides for improved conservation and scientific co-operation. Bilaterally agreed fishing arrangements are now to be based on abundance instead of on numerical limits. The future impact of these arrangements on Canada's fisheries has yet to be seen.

20.20 Coho stocks declined dramatically in the 1990s as a result of overfishing, habitat loss and other factors. Stringent measures have become necessary to conserve these stocks for the long-term sustainability of the fisheries. The coho "story" is a good illustration of how the management crisis in which the Department finds itself developed (see Appendix A).

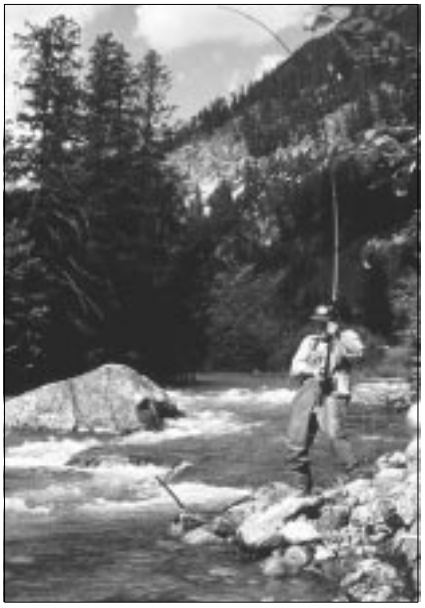
Sustainability Will Depend on Sound Planning

The Department's planning record at the national level is poor

20.21 In the absence of a strategic plan, the Department has been struggling over the last decade to deal with threats to

The Department's strategic planning record is poor.

Examples of Recreational and Aboriginal Fisheries



Freshwater recreational fishery

Ocean recreational fishery

All photos courtesy of Fisheries and Oceans

Aboriginal fishery – dip net

Aboriginal fishery – beach seine

biodiversity and declines in the resource base. Its record of strategic planning has been poor, as indicated in our reports and its own internal evaluations. The Department did not, until this year, have a national strategic planning framework in place that would allow it to respond in a coherent way to internal and external challenges.

20.22 In October 1998, the Department finalized a departmental Business Plan for the period 1999–2001. The Business Plan provides a frank discussion of the challenges facing the Department, but lacks specific targets to be met in this period. For instance, the Department has not set priorities and targets for protecting the various salmon stocks.

The regional office has developed a strategic framework for salmon management.

20.23 Fisheries and Oceans has now re-initiated strategic planning at the national level and has completed the first two stages of a department-wide strategic planning process. It has identified external and internal factors that are likely to affect its operations over the next two to five years and has developed an overview of the long-term strategic issues it faces. An integrated departmental strategic plan is being developed, with fall 1999 the target date for its completion.

20.24 Fisheries and Oceans is spearheading a government-wide strategy for the protection of marine areas — the *Oceans Strategy* — which will integrate all ocean-related programs including fish management, science, enforcement, and habitat protection. This will add to the complexity of its strategic planning activities.

20.25 The Department has also begun to develop strategic plans at the national level for each of the three operational sectors involved in salmon management. The plan for the Fisheries Management Sector has been stalled, however, while an overlapping of responsibilities with the newly formed Oceans Sector is sorted out. While no strategic plan has yet been completed for the Science Sector, some areas have been addressed — for example, data management.

Implementing a new management regime

20.26 The Department's lack of follow-through on its national and sector planning processes forced its regional office to move forward to address urgent issues in the area of Pacific salmon management. The regional office developed its own strategic framework in the spring of 1998 — *New Directions for Fisheries & Oceans in the Pacific: A Departmental Strategy for 1998–2001* — in part to direct the Department's focus away from crisis management. As well as contributing to implementing the *Oceans Act*, the strategic framework focusses on conservation and sustainable use of the resource, on changes in decision making (participation, involvement and co-operative management), and on communications. The framework highlights the need for an integrated policy to direct the Department's actions. The regional office has since worked on delegating responsibility for activity areas under the strategic framework, and has set timelines for making progress in these areas.

20.27 The strategic framework is being implemented, in part, through a new departmental policy announced in October 1998 — *A New Direction for Canada's Pacific Salmon Fisheries* (New Direction policy). The policy reconfirms the Department's commitment to sustainability and biodiversity, and introduces new elements into the management regime (see Exhibit 20.4). It is important to note that it relies heavily on a sound science base to drive decision making.

20.28 The New Direction policy builds on work begun earlier on coho salmon conservation, fleet reduction and restructuring, selective fishing, habitat conservation and protection, and economic adjustment. Many of the

Department's requirements for sustainable fisheries as stated in the policy have been validated by experts in both the public and private sectors (see Appendix B).

20.29 The New Direction policy sets in motion significant changes in the way the Department will do business in the future: it identifies three objectives for salmon fisheries management — conservation, sustainable use and improved decision-making — together with principles to guide the policy's implementation.

20.30 The New Direction policy identifies clear goals and guidelines for developing operational policies and thereby provides a framework for measuring the Department's future performance in:

- protecting genetic diversity of stocks;
- meeting the scientific and operational requirements of the precautionary approach (explained in Exhibit 20.5);
- conserving the productive capacity of habitat;
- applying selective fishing techniques to protect weaker stocks; and
- involving stakeholders and the provincial government, in decision making, while moving toward the ultimate objective of fisheries co-management through the use of regional management boards.

20.31 The Department has moved forward, releasing discussion papers on allocation and selective fishing and asking the public, governments and stakeholders to comment on them through a consultative process. Discussion papers on salmon management and improved decision making are being prepared for release before the end of the year.

20.32 The regional office has completed an Integrated Regional Business Plan for 1999–2000 — the first major integrated planning effort under the strategic framework and a response to the New Direction policy. The regional office has informed us that there were extensive consultations between national and regional headquarters during the development of this business plan. It remains unclear, however, how the Department's New Direction policy, together with the strategic framework and business plan of the regional office, will be integrated with or affected by its national strategic plan and the *Oceans Strategy*.

The New Direction policy provides an accountability framework for assessing departmental progress.

20.33 The regional strategic framework creates a made-in-British Columbia solution to Pacific regional problems in the context of national priorities. It recognizes that the regional office must address problems of internal integration — including a lack of integrated program delivery at the local level — and develop

Operational policies will be developed in consultation with stakeholders.

Exhibit 20.4

Elements of *A New Direction for Canada's Pacific Salmon Fisheries*

	Old Principles Restated	New Principles Added
Conservation	• More emphasis on genetic diversity • Net gain in productive capacity of habitat	• Precautionary approach • Ecological approach
Sustainable Use	• Priority allocation to First Nations	• No trade offs • Selective fishing • Recreational fishery's priority for coho and chinook • A diversified and viable commercial fishery
Improved Decision Making	• Provision of information to public • Improved stakeholder consultation process/ structure	• Shared accountability with stakeholders • Input to decision making • Proposed regional/watershed management boards

Source: Fisheries and Oceans. *A New Direction for Canada's Pacific Salmon Fisheries*. October 1998.

plans for organizational changes to address them.

20.34 Internal co-ordination problems have impeded policy development and planning. The Department recognizes that there has been a lack of policy co-ordination between regional and national headquarters because of differing priorities and that this poses a threat to the effectiveness of its salmon management policies. The downstream effects are problems in integrating internal planning, communicating a clear and consistent message, evaluating results, and building evaluations into the planning cycle. The Department appears to be making progress in integrating national and regional policies.

Future success in salmon management will depend on a sound science base.

The New Management Challenge

Biodiversity-based conservation

20.35 Regional managers developed fisheries management regimes in the past that focussed on the largest or most productive stocks in the Fraser and Skeena River systems. Now the regional office has begun to widen its management focus to include smaller stocks in order to protect biodiversity.

20.36 Given the need to satisfy conservation requirements while optimizing fishing opportunities, a better understanding of the genetic diversity of stocks is essential. The focus on biodiversity and the example of the coho crisis have served to illustrate the shortcomings of current management systems, procedures and practices. The success of the new salmon management regime under the New Direction policy will depend largely on the scope and depth of the Department's science base.

20.37 The regional office has indicated that to protect genetic diversity it will manage salmon on the basis of conservation units — groupings of stocks with related genetic characteristics — similar to those adopted by the U.S. It has done some work on major stocks and has developed proposed conservation units for coho, but much remains to be done before the stocks of all five salmon species are classified in this way. Fisheries management plans will need to recognize these conservation units and ensure their continued integrity.

20.38 To protect the genetic diversity of salmon stocks, Fisheries and Oceans should move quickly to determine conservation units for all five species.

Department's response: *Fisheries and Oceans agrees with the need to continue efforts to determine conservation units for Pacific salmon. Work on coho salmon stocks is most advanced at this point, reflecting immediate conservation concerns. Initial plans for conservation units for all species will be completed in priority sequence, as quickly as resources permit, then continually upgraded as new information becomes available.*

20.39 To evaluate the status of conservation units, managers and stakeholders will need comprehensive, integrated and understandable reports on the status of both stocks and habitat. The reports published by the U.S. on threatened salmon stocks in the northern states are good examples. Alternatively, the regional office could pattern its status reports on the format developed by the Committee on the Status of Endangered

Exhibit 20.5

Precautionary Approach to the Management of Fisheries

- Protect living marine resources and preserve the marine environment.
- Be more cautious when information is uncertain.
- Improve decision making by sharing best scientific information and adopting ways to deal with risk and uncertainty.
- Adopt stock specific reference points for conservation (limits of exploitation) and for fisheries (targeted catch levels).
- Take into account uncertainties (all types), as well as impact on non-target species.

Source: Chapter 14 of the 1997 Report of the Auditor General – Fisheries and Oceans – Sustainable Fisheries Framework: Atlantic Groundfish

Wildlife in Canada (COSEWIC). Its reports would then likely meet the requirements under proposed endangered species legislation for registering stocks at risk, and would form the basis of detailed plans for recovering those stocks.

20.40 The Department should produce comprehensive, integrated status reports on stocks and habitats based on the new conservation units for each salmon species. The reports should be updated annually and used in developing, implementing and evaluating fisheries management plans.

Department's response: *There is a need to improve the integration of stock and habitat assessment information to help guide fisheries management decisions. This is consistent with the ecological approach to fisheries management to which the Department is committed, and will be implemented in a staged manner. The Department agrees that integrated reports should be produced on a regular basis, with more frequent reviews in special circumstances, but it questions whether annually is the appropriate time frame for regular reporting.*

Basic information on stocks and habitats is incomplete

20.41 Data on escapement and catches are vital information for assessing the status of stocks. To date, however, the regional office's data collection has been weighted toward the larger stocks originating in the major salmon production areas (for example, Skeena coho, Fraser sockeye and pink salmon).

20.42 A 1996 report by the American Fisheries Society indicated that a significant lack of information exists on the status of Pacific salmon stocks. The report reviewed the status of over 8,000 sockeye, pink, chum, coho and chinook stocks in British Columbia, based on available escapement data (that is, information on the number of salmon that arrived on the spawning grounds). There was not enough information to assess the status of 40 percent of those stocks. A continuous record of stock assessment data is available on larger stocks traditionally used in commercial fisheries and on many stocks in the Fraser and Skeena River systems. However, basic information on coho is limited to approximately 50 percent of known stocks, and almost no information is available on the smaller stocks of all species.

Stocks will be managed within conservation units.

20.43 The regional office's Salmon Escapement Database is a primary source of information to assess the strength of a stock. Along with reliable or scientifically supported observations, it contains a mixture of unqualified estimates of escapement that require expert interpretation. Data therefore cannot be accessed directly by the user, who must go through the Database manager. The inaccessibility and incompleteness of the data limit their usefulness to fisheries managers, and preclude easy access by stakeholders. This database has remained essentially unchanged for 20 years, but the regional office now has plans to develop a new escapement database that will classify data by level of quality and provide Internet access.

Good escapement and catch data are vital for conservation management.

20.44 There are data on the productivity of freshwater habitats but not enough on those used by individual stocks to provide a comprehensive picture of their health. Reporting on stock and habitat status is neither comprehensive nor

Spawning salmon

Photo courtesy of Fisheries and Oceans

integrated, which poses problems for the regional office in protecting the genetic diversity of salmon stocks.

Recent developments in Canada–B.C. relations are encouraging.

20.45 In addition, there is a lack of historical information on relationships among habitat status, habitat change and fish production. This prevents experts from being able to define the productive capacity of habitats, and to protect critical habitats.

20.46 Despite the Department's efforts, the loss of fish habitat is contributing to the continuing decline of many salmon stocks. The *Canada–British Columbia Agreement on the Management of Pacific Salmon Fishery Issues* (1997) has generated collaborative efforts at the working level in several areas, including habitat protection, but progress has been limited. Efforts by the two governments to produce standardized information on habitat inventory are continuing, as we noted in 1997. Still, significant improvements in the habitat information database likely cannot be expected for some time. A positive development in this area was the May 1999 signing of the *Sub-agreement to the Canada–British Columbia Agreement on the Management of Pacific Salmon Fishery Issues Respecting Fisheries Information Co-ordination and Sharing.*

Improvements to databases are being initiated.

20.47 In following up on our previous recommendations, we noted that the Department has made progress in habitat protection. In 1998 the Department and British Columbia signed an agreement respecting work on coastal and marine areas. However, it is still in the early stages of such initiatives as regional and community-based planning.

20.48 The regional office has since begun to develop a process of assessing the extent of habitat loss but has not yet completed the framework for carrying out the review. In the meantime, it has announced the hiring of 15 Habitat Auxiliary staff to help in monitoring habitat.

20.49 Improvements are needed in the collection of catch data. Commercial vessels make approximately 70,000 landings annually, and fish can be sold fresh to buyers up and down the coast. Large processing companies supply generally reliable sales-slip data electronically. However, it is difficult to obtain similar data on salmon sold directly to the public by fishers or small operators.

20.50 Fishers recognize the Department's problem. They believe that independent, accurate catch monitoring and observer programs are critical to any future fishery under the management regime established by the New Direction policy.

20.51 It is an offence under the *Fisheries Act* to fail to provide catch data or to provide inaccurate catch data. In areas that are not frequented by fisheries officers, fishers are required to report their landings to the nearest departmental office by phone. However, the regional office's 1998 report on phone-ins by commercial fishers revealed low compliance for seines (49 percent) and gillnets (43 percent).

20.52 An onboard observer program to document numbers of coho captured and released was initiated in the 1998 fishing season. According to the regional office's data, however, in some areas only 2 percent to 13 percent of the total boat-days for sockeye and chum were monitored. Further, a lack of coverage by observers of packer vessels collecting fish from commercial seine fishing boats

Commercial fishing: seine boats

Photo courtesy of Fisheries and Oceans

created problems in getting accurate counts of coho salmon taken in the fishery. Seiners account for as much as 50 percent of the coho taken accidentally while fishing for other species.

20.53 A recent Supreme Court ruling upheld the requirement that the recreational fishing industry report catch data, and this should improve compliance in the future. In 1998 the regional office observed a mixture of good and bad reporting of catches by sport lodges and charter operations. Furthermore, it believed that in some cases recreational fishers underreported their encounters of coho by about half the actual number. We found that the regional office survey coverage of the recreational fishing effort was limited overall, which raises questions about the accuracy of the data.

20.54 Managing for biodiversity will create a new set of problems in data collection. More precise catch data will be needed in 2000 to manage fishing opportunities in special management zones, where controlled fishing can occur. Under these conditions, in-season sampling of numbers of returning salmon (test fishing) is important. In 1998, management of the commercial fishery relied heavily on test fishing results.

20.55 The Department has acknowledged that further improvements in its catch, escapement and habitat databases are needed. The Data Management section of the Department's Science Strategic Plan 2005 initiative called data an "extremely valuable and irreplaceable resource", and stated that "data accessibility and integration have become serious concerns." The Plan raised such needs as data centres for regional directors, adequate resources for data management, and new technology for distributing data internally and externally.

20.56 The Department should assess its information requirements in the areas of data collection, analysis, and management, in order to meet its long-term needs and identify priorities under the New Direction policy.

Department's response: *Fisheries and Oceans concurs with this recommendation, and is preparing assessment frameworks for all species of Pacific salmon. These frameworks will define the information required to ensure conservation and effective management, and will be used to determine priorities for allocation of resources under the New Direction policy. The Auditor General cites some progress under the* Canada–British Columbia Agreement on the Management of Pacific Salmon Fishery Issues. *This work has already resulted in significant improvements in salmon information management, and work to achieve further improvements will continue.*

Catch reporting remains a problem.

Managing for genetic diversity will require better data.

The Department is not making best use of the Aboriginal Fisheries Strategy (AFS)

20.57 The AFS has assumed a major role in data collection. The Department relies on Aboriginal communities to collect escapement and other data. In fact, figures obtained from the regional office indicated that 30 percent of new data being input to the Salmon Escapement Database come from this source. Through the AFS, moreover, First Nations are developing a pool of expertise that will assist the Department in managing salmon resources as land claims settlements are negotiated.

20.58 The AFS contributes to knowledge of salmon stocks through a variety of fisheries management activities, including catch monitoring and stock and habitat assessment. Aboriginal conservation officers (fishery guardians), who are mainly involved in enforcement activities, receive formal training in data collection. However, usually only on-the-job training is provided to technicians and stream-walkers, who are

The Aboriginal Fisheries Strategy plays a major role in data collection.

largely responsible for stock and habitat assessment.

Data quality could be improved.

20.59 The Department acknowledges the value of involving Aboriginal peoples in monitoring, research, enhancement and habitat conservation, but it has concerns about the quality of data provided under some agreements. We found that it has no clear system for collecting information from First Nations and forwarding it to the Science Branch for compilation. It also lacks uniform standards to ensure that information from different sources can be compared. This has resulted in significant gaps in the data, and problems with their reliability and timeliness.

20.60 At the time of our audit the Science Branch had received catch data for 1997 from fewer than 15 percent of the bands that were required to collect it. In 1998, the regional office reported that some First Nations on the north coast submitted either no catch data or data that were unusable. The regional office told us that some bands refuse to provide catch reports on salmon because of complications in treaty negotiations. We also learned that the involvement of Fisheries Officers in obtaining data from bands and submitting them to the Science Branch is highly inconsistent across districts. The regional office is now working to update its reporting systems and to better delineate the responsibilities of everyone involved in the process.

The regional office's process for evaluating scientific advice is open and transparent.

Spawning salmon

Photo courtesy of Fisheries and Oceans

20.61 The Department should evaluate the comprehensiveness and quality of data collected under the Aboriginal Fisheries Strategy (AFS) and the adequacy of the standards and procedures that guide data collection, compilation and reporting, with a view to improving and expanding the role of the AFS in this area.

Department's response: *The role of First Nations, through the Aboriginal Fisheries Strategy, in data collection and reporting is evolving. First Nations are becoming more proficient at collection and reporting of data. The Department acknowledges the need to more rigorously define data quality standards and methods, and to establish reporting procedures. Fisheries management staff are working with the Science, Stock Assessment and Habitat and Enhancement branches to integrate the process of collecting and reporting the data.*

Improved process for reviewing scientific information and advice

20.62 Fisheries managers receive advice from the regional Pacific Stock Assessment Review Committee — recently renamed the Pacific Scientific Advice Review Committee (PSARC). This committee is the regional body responsible for the review and evaluation of all scientific information on salmon stocks and their habitats. This information is critical to the development of sustainable fishing plans.

20.63 However, the PSARC does not deal specifically with traditional knowledge — the knowledge acquired over time by participants in the Aboriginal, commercial and recreational fisheries. Yet the Department does recognize this as an important consideration in the development of fishing plans to ensure that all relevant information has been taken into account.

20.64 Scientific information undergoes peer review to ensure its reliability, and advice generated by this review is

forwarded uncensored to senior management. PSARC reports are made available to the public. The process is both open and transparent, and stakeholders can participate in it.

20.65 The PSARC was restructured in 1999, when a Habitat Sub-Committee was added. PSARC is now required to provide reports on stock status, although only on the major stocks, and in the future it will also issue reports on habitat status. However, there is no requirement to integrate the two reporting responsibilities on a stock-by-stock basis. PSARC's stock status reports are public documents that summarize, in lay terms, scientific and technical information on *major* commercially harvested species. In our opinion, more comprehensive reports are needed on individual stocks, or on groups of stocks within the proposed conservation units, to facilitate salmon fisheries management under the New Direction policy.

20.66 The Department should ensure that the responsibilities of the Pacific Scientific Advice Review Committee are in line with the needs outlined in *A New Direction for Canada's Pacific Salmon Fisheries,* by:

- **requiring the Committee to produce comprehensive integrated reports on stock and habitat status, taking into account traditional knowledge; and**

- **expanding the Committee's area of reporting to cover individual salmon stocks or groups of stocks under proposed conservation units.**

Department's response: *Fisheries and Oceans agrees with this recommendation. The Department will be moving to ensure that PSARC salmon stock status reports incorporate habitat status information. The Committee is already responsible for incorporation of traditional knowledge in its assessments, and for reporting on the status of individual stocks or groups of stocks. Stock status reports will be aligned with conservation units, once defined.*

Toward integrated fisheries management planning

20.67 Management strategies and policies, together with the information on stock assessments, are translated into practical actions through annual fishing plans. The regional office's present fishing plan process is based on a salmon management model that has remained essentially unchanged for many years. There are ingrained problems in the existing system. Over 10 years ago, in our 1986 Report, we noted that the regional office's work plan did not co-ordinate science, habitat and enforcement activities to ensure that they were consistent with the regional office's objectives. In 1998, the Department's Review Directorate identified continuing problems among departmental sectors in co-ordinating and following the fisheries management planning process in all regions. Post-season evaluations of fishing plans have not been documented. Currently, the incorporation of any lessons learned into the next year's fishing plans depends on the continuity of the people involved.

Better reporting on the status of stocks and habitat is needed.

The importance of Integrated Fisheries Management Plans

20.68 The Department is committed to moving from the existing fishing plan process to a long-term planning process for salmon management. Integrated Fisheries Management Plans (IFMPs) were not implemented for salmon in 1998, despite the Department's intentions to do so. However, in its Integrated Business Plan for 1999–2000 the regional office has indicated that one salmon IFMP will be developed in 1999. The Department has used IFMPs in other fisheries since 1996, but has had difficulty using them in salmon fisheries. The IFMP process integrates the activities and specialized knowledge of every departmental sector involved, and uses broader consultation with stakeholders beyond those with direct

Integrated Fisheries Management Plans are essential to success.

The Department has adopted the precautionary approach to salmon management.

fishing interests. The goal of the process is to produce fishing plans that are more comprehensive and longer-term than the annual plans currently in use. In our opinion, IFMPs are essential to the successful implementation of the new management regime.

20.69 IFMPs will incorporate the precautionary approach, which is an internationally accepted approach to managing declining fisheries. It provides direction to managers who have limited scientific information, while recognizing the need to expand the knowledge base (see Exhibit 20.5). The Department has not yet decided how it will apply this approach to managing the salmon fisheries. A critical element of IFMPs is the development of stock reference points that indicate acceptable catch levels (targets) and levels beyond which no fishing will occur (conservation limits). Targets will be influenced and held in check by economic considerations, but the conservation limits will have to be rigidly enforced if biodiversity is to be protected. While the available information on some stocks is sufficient to set such limits, there is little or no information on the majority — especially smaller stocks. Under the precautionary approach, closures may therefore be necessary to protect individual stocks while their status is determined.

At present, recovery plans for threatened stocks are not mandatory.

20.70 In 1998, the Department announced its plan for the recovery of coho stocks. However, the IFMP process at present does not require comprehensive recovery plans for threatened stocks, although they will likely be mandatory under proposed endangered species legislation to meet the requirements of the Canadian Biodiversity Strategy.

20.71 The Department should ensure that Integrated Fisheries Management Plans include formal recovery plans for stocks at risk.

Department's response: *The Department agrees in principle with the recommendation to include formal recovery plans for stocks at risk in Integrated Fisheries Management Plans. We are developing a coho plan for recovery of upper Skeena and Thompson coho. Fishery restrictions were introduced starting in 1998 that curtail harvest by all sectors, involving fishery closures and adjustments to the area, timing and gear specifications of permitted fisheries. Salmon habitat improvement initiatives have also been authorized and projects in support of selective fishing practices have been conducted. The Department will develop recovery plans consistent with these specifications when available, and include them in IFMPs.*

20.72 The Department should facilitate the application of the precautionary approach to salmon fisheries management by establishing catch levels and conservation limits for individual stocks or groups of stocks.

Department's response: *This recommendation is consistent with the Wild Salmon Policy now under development by the Department. The Policy, which is based on the precautionary approach, will establish escapement levels and target harvest rates that will ensure long-term sustainability. This work goes hand-in-hand with the requirement to establish conservation units and will be a central feature of departmental science input to fisheries management.*

The use of selective fishing methods

20.73 Selective fishing methods will be an important element of the new Integrated Fisheries Management Plans. Salmon are often harvested in mixed-stock fisheries, where fish from different stocks and species intermingle. Selective fishing limits the harvesting of weaker stocks, while allowing the harvesting of stronger stocks by requiring non-targeted salmon to be released. Thus, conservation is promoted while fishing is allowed to continue. Selective fishing is recognized

internationally as a management tool to promote sustainable fisheries.

20.74 The February 1999 *Selective Fisheries Multi-Stakeholder Workshop* report provided information on the results of selective fishing to date. The effectiveness of selective fishing in reducing the mortality rates of fish taken accidentally and then released has yet to be proved. For example, the one experiment that took place in the Alberni Inlet in September 1998 raised questions about the long-term survival of released salmon. Short-term mortalities were low, but departmental data on long-term mortality rates was inconclusive. The Pacific Scientific Advice Review Committee raised the concern in 1995 that selective fishing relies on uncertain and still unproved technologies. We are concerned that, to date, there is still no conclusive evidence that most of the released salmon survive to spawn.

20.75 In 1998, based on short-term mortality rates, the regional office estimated coho mortalities at 93,000 in all fisheries. However, if significant numbers of released salmon are in fact dying before

Selective Fishing Methods

On-deck sorting (seine)

Fish wheel (Aboriginal)

Catch and release (recreational)

Brailing (seine)

All photos courtesy of Fisheries and Oceans

they reach the spawning grounds, this estimate would be too low, with severe consequences for the conservation of the species.

Data on long-term mortality rates of released salmon are inconclusive.

20.76 In many British Columbia recreational fisheries, there is a lack of information on the effects of fishing gear and methods on short- and long-term mortality rates. There is also little information on the survival of coho that are hooked and then released. Without this information, it is difficult to assess the impact of recreational fisheries on the conservation of weak stocks. However, we acknowledge that the collection of data on long-term mortality in the fisheries may be both difficult and costly.

20.77 The Department should assess the risks to conservation of allowing selective fishing in the commercial and recreational fisheries, given the lack of reliable information on long-term mortality rates of released salmon. It should then build adequate safeguards into fishing plans to protect stocks at risk.

Department's response: *The Department is continuing studies to improve understanding of the mortality of salmon released following capture in commercial, recreational and First Nations fisheries. The knowledge gained through these studies will be incorporated into future fisheries management plans. Current management plans take account of expected mortalities based on existing knowledge.*

Reducing the size of the commercial salmon fleet

Fleet overcapacity has been a problem for more than a decade.

20.78 Fleet overcapacity has had an impact on both the conservation and the economic sustainability of the commercial fishery. Fisheries and Oceans had been advised of overcapacity problems in the salmon fishery for over a decade before taking action under the Pacific Salmon Revitalization Strategy in 1996. The initiative introduced several strategies for decreasing harvesting capacity, such as reducing the size of the fleet through a voluntary vessel buy-back, and reducing the mobility of vessels and quantity of gear through changes in licensing for areas and gear. The Department aimed to reduce fleet capacity by 50 percent over the long term. However, it could not adequately measure the effects of this reduction on fish catches; instead, it measured the numbers of licences it retired or the number of vessels fishing in a given area. This meant that it could not evaluate the Strategy's contribution to conservation objectives or determine what further restructuring would be necessary to achieve them.

20.79 The restructuring continued in 1998 under the Pacific Fisheries Adjustment and Restructuring (PFAR) Program. By the summer of 1999, two rounds of licence buy-backs had been conducted — one in the fall of 1998 and one in the spring of 1999. At least one more round of buy-backs was planned for the fall of 1999, when fishers would have more complete information about the Department's plans for the fishery of the future and its new management regime. The first two rounds of buy-backs offered compensation in line with what was offered in 1996, and almost the same number of licences were retired: 746 in fall 1998/spring 1999, compared with 797 in 1996 (see Exhibit 20.6). There are now 2,557 licences remaining in the salmon fleet that are eligible for buy-back.

20.80 The Department has committed itself to reducing capacity in the seine, gillnet and troll fisheries, thus conserving stocks, reducing dependency on the resource, and increasing the economic viability of the industry. But it has not measured its progress toward the first two outcomes, and has therefore set no conservation-based targets for fleet reduction. However, it has set specific targets based on calculations of the licence reductions needed to create the conditions

for the commercial fishing industry to become economically viable.

20.81 Changes in the fishery and in the Department's management approach have implications for the size of fleet that would be economically viable. The Department based its licence buy-back target on calculations that reflected its risk-averse management strategy. However, these calculations did not anticipate any significant changes in fish harvesting or management, such as the potential for widespread closures where salmon from weaker stocks cannot be sufficiently avoided or released unharmed through selective fishing.

20.82 The Department's intention to transfer management costs to the commercial fishery depends on the fishery's economic viability. Fishers must first be earning enough income to support themselves and the activities that are required to manage the resource effectively. While the Department's economic target for the buy-back initiative under PFAR was reasonable given the status quo, the target is not in keeping with current management changes. However, the buy-back attempts to address this problem by encouraging fishers to expand their interests beyond salmon.

20.83 As well as providing a more sustainable livelihood for those who remain in the fishery, the buy-back is meant to enhance the prospects for achieving salmon conservation objectives. But the Department remains unclear on the extent of reductions needed. Furthermore, it has not yet integrated the buy-back program with other fleet management programs, such as selective fishing. However, in spite of the problems that we have indicated, fleet reduction and restructuring are helping the Department to move toward a sustainable commercial fishery.

20.84 The Department should specify a fleet reduction target and timetable that are consistent with its objectives of conservation, selective fishing and cost recovery, and work to complete fleet reduction according to this timetable.

Department's response: *The Department agrees with this recommendation. In 1996, a multi-year salmon fleet reduction target of 50 percent was established. This target will be reviewed taking into account various factors, in particular the requirement to fish selectively in order to meet conservation objectives, and harvest diversification opportunities.*

A significant reduction in the number of licences has been achieved.

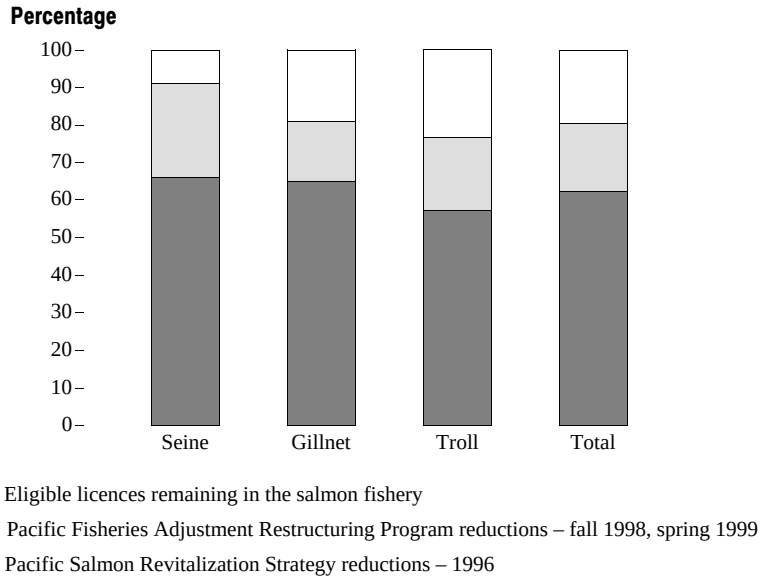
Allocation issues persist

20.85 The absence of an allocation policy has created problems in relations between the Department and fishers. Before 1990, the Department had no formal policy for the allocation of fish to various users. In that year the Supreme Court of Canada, in the Sparrow decision, affirmed the constitutional right of Aboriginals to fish for food, including fish consumed for social and ceremonial purposes. The Court held that the Department had to give such fisheries top

Allocation has been a perennial problem.

Exhibit 20.6

Pacific Commercial Fleet Reduction Since 1996



Source: Fisheries and Oceans

priority after implementing valid conservation measures. No action was taken to resolve the issue of allocations to the commercial and recreational fisheries until 1998, when the New Direction policy was announced.

20.86 In conjunction with the policy, the Department released in December 1998 *An Allocation Framework for Pacific Salmon 1999–2005*, a discussion paper that proposes to formalize changes in the allocation process and to establish an independent allocation board. The board would advise the Minister of Fisheries and Oceans and assist him in implementing the allocation policy in an open and transparent way. This would likely remove a major source of friction between the Department and the stakeholders.

20.87 The Department should act on its proposal to establish an independent allocation board as soon as possible.

Department's response: *The Department agrees and is developing an implementation plan for the establishment of an allocation board. The final draft of* An Allocation Policy for Pacific Salmon *will be released soon. It provides for the establishment of an allocation board and outlines the board's basic goals.*

Problems with stakeholders are not new.

The Support and Participation of Stakeholders Are Essential

20.88 The Department sees consultation as a first step toward a closer working relationship with its stakeholders, as documented in its *Framework and Guidelines for Implementing the Co-Management Approach.* The New Direction policy commits the Department to broadening and enhancing input to decision-making, through regional boards.

20.89 The Panel Studying Partnering, appointed by the Minister of Fisheries and Oceans, highlighted issues surrounding current relationships with stakeholders. The Panel found that even though the Department was making strong commitments to partnering, in practice it was still taking a "business-as-usual, top-down approach to fisheries management". It concluded that the Department was ''trying to deal with too many issues on the back of partnering" and pointed to the challenges of overworked staff, limitations in stakeholder capacity, and the time and energy involved in negotiating agreements. Because of the Department's poor record of transparency in its consultations, stakeholders are wary about the possibility that it will give preferential treatment to certain interests; they are also skeptical about the workability of partnerships in fisheries management.

Consultation problems have not been addressed adequately

20.90 Reports going back as far as 1982, when the Commission on Pacific Fisheries Policy issued *Turning the Tide, A New Policy for Canada's Pacific Fisheries*, have documented dissatisfaction with the Department's consultation process. In 1998, the process was still being criticized in reports such as the *West Coast Report* by the Standing Committee on Fisheries and Oceans.

20.91 The regional office made promises throughout the 1990s to improve its consultations and its consultation process, but it has not yet done so. The regional office did take steps to strengthen its relationships with stakeholders in developing the 1998 salmon fishing plans, but problems remain. Although the regional office consults extensively on the development of fishing plans, the way it participates in the consultation process has been criticized: there is a perception that the Department has already decided on the fishing plans before consultations begin. While this criticism could be a reflection of flaws in the consultation process, it could also indicate disagreement with the outcome.

20.92 The regional office acknowledges its ad hoc approach to consultations. It notes that consultation structures are not well integrated or well designed to deal with the full range of issues involved in managing the salmon fisheries. Shortcomings in its consultations on annual fishing plans and on such larger issues as restructuring and allocations have added to the Department's loss of credibility.

20.93 Several studies of the Department's interactions with stakeholders and of stakeholder satisfaction with its consultation processes have noted the following widespread problems:

- exclusion of stakeholders from consultations;
- dissatisfaction with the transparency of the overall process;
- failures to notify stakeholders about consultations, and holding consultations too late to affect decision-making; and
- stakeholders' perceptions that their input is not reflected in decisions and subsequent actions.

20.94 From a list of 82 advisory groups that the regional office provided, we contacted 41 groups by telephone to see if they were satisfied with current consultation methods. Only 6 of the groups (15 percent) said they were. We did not look at the regional office's consultations with Aboriginal advisory groups, with whom the Department has a legal obligation to consult.

20.95 Although stakeholders continue to complain, the regional office has completed no evaluation of the consultation process. It has not developed a complete list of stakeholder contacts, and is not clear on whether various groups play an advisory or a consensus-building role. It is therefore not surprising that the process is not as effective as it could be. In fact, regional managers told us that they think they consult too much.

20.96 We recognize that it is not always possible to reach agreement with stakeholders on issues that are contentious. Sometimes the Department may have to take action without consulting further. When it does, however, we would expect it to give stakeholders an opportunity to discuss how to minimize such situations in the future.

Shortcomings in the present consultation process have been documented.

20.97 If its relationship with stakeholders does not improve, the Department will find it difficult to move forward with partnership arrangements and co-management, as discussed in its *Framework and Guidelines for Implementing the Co-Management Approach* and its New Direction policy. Part of the Department's plan for partnering is to transfer some costs of fisheries management to users of the resource. For instance, it expects salmon harvesters to assume by 2001 the full costs of testing and experimenting with new selective fishing gear, and to eventually bear the costs of all catch monitoring and reporting.

20.98 The Department has recognized the need for a fundamental review and revision of its present approach to public involvement in salmon fisheries management. As a first step, it plans to soon release a discussion paper on improved decision-making that will propose improvements to the consultation process. This will give it an opportunity to continue its efforts to regain public confidence. The improved decision making framework it proposes includes five elements — a Pacific Fisheries Policy Forum, an independent Pacific Fisheries Allocation, Licensing and Appeal Board, updated advisory processes for salmon management, ideas for the potential role of Area-Based Multi-Stakeholder Boards, and a Consultation Secretariat to support the decision-making process. It is an ambitious framework, proposing changes

We confirmed a high degree of stakeholder dissatisfaction.

to stakeholder involvement in advisory roles and partnering arrangements.

20.99 The Department should evaluate its consultation process, with the input of stakeholders, to identify where improvements are needed before it finalizes its improved decision-making policy.

Department's response: *Consistent with this recommendation, the Department is planning to obtain stakeholders' and public input on how to improve the consultative process before finalizing the improved decision making policy, which is being drafted.*

Canada–British Columbia relations

Improved relations with the Province of British Columbia is essential.

20.100 It is important for the Department to have a good working relationship with its major partner, the Province of British Columbia. Canada and the Province have overlapping responsibilities for the fisheries. Under the *Canada–British Columbia Agreement on the Management of Pacific Salmon Fishery Issues*, the two governments agreed to work together on Pacific salmon fishery issues, with the Province involved primarily in the area of habitat protection.

20.101 In view of the provincial government's role in habitat protection and its interest in promoting economic and cultural well-being, its co-operation and support are crucial. The Agreement calls for them to form joint advisory and administrative bodies, yet each party has acted unilaterally to establish its own (the Department's Pacific Fisheries Resource Conservation Council and the Province's Fisheries Renewal B.C.). While there is co-operation at the working level, the two governments have not yet agreed on joint goals for fisheries management that incorporate both conservation and economic objectives. Problems with implementing the Canada–B.C. Agreement have made the management of the resource base more difficult. However, the recent *Agreement on Interjurisdictional Cooperation with Respect to Fisheries and Aquaculture* signals an improvement in Canada–British Columbia relations.

Spawning salmon

Photo courtesy of Fisheries and Oceans

20.102 The Department should intensify its efforts to develop common objectives and integrated strategies with the Province of British Columbia to conserve the resource base and promote sustainable fisheries.

Department's response: *The federal and B.C. governments have been working actively and jointly to implement the* Canada–British Columbia Agreement on the Management of Pacific Salmon Fishery Issues. *In the two and a half years since the agreement was signed, the two governments have fulfilled many of the requirements of the agreement. Additional work on co-ordinating our efforts in enforcement and habitat management and restoration are under way. Also, new areas for co-operation are constantly under consideration.*

Identifying costs and setting priorities

20.103 There is a gap between the Department's high-level policy commitments to sustainable development, biodiversity conservation and stakeholder partnerships under the New Direction policy and its ability to meet those commitments. The Department continues to make strong claims about what it is trying to accomplish. For example, it sees itself as working toward achieving "the highest possible standards of scientific excellence" and achieving "no net loss of habitat". Yet the Department has

recognized that these demands create workload pressures that it is ill-equipped to meet.

20.104 The Department has not identified the incremental costs of the New Direction policy or set priorities for the spending of existing funds. Funding sources include the Pacific Fisheries Adjustment and Restructuring Program ($80 million to be spent from 1999–2000 to 2001–02 on selective fishing, diversification, habitat and adjustment assistance projects); the Aboriginal Fisheries Strategy (approximately $16 million annually); and the Canada–U.S. Treaty (a share of the $209 million available). The Department does not appear to have set priorities for the allocation of these funds to the several programs it has initiated for habitat conservation and protection and for adjustment assistance. Funds under the Canada–U.S. Treaty are to be administered jointly by both countries to invest in habitat, stock enhancement, science and salmon management. However, the identification of stocks at risk, which is urgently needed to set spending priorities, has not yet been completed.

20.105 The regional office has not determined how it will cover funding shortages in key areas like scientific support. We have noted that a risk assessment has not been done in order to prioritize funds to meet the objectives of the New Direction policy, such as managing for biodiversity. The Department has identified potential sources of new funds, such as funding for the implementation of the proposed endangered species legislation, and is counting on obtaining them. However, it has not yet assessed how much money it must allocate to salmon under the New Direction policy, and how much will be required for the other species under its jurisdiction.

20.106 The Department anticipates that management costs could be offset in the future by partnering with stakeholders from the commercial fishery, as indicated in its 1996 *Fisheries Management Partnering Policy Principles*. However, the regional office has trouble identifying costs that are directly attributable to the fishing industry and therefore potentially transferable. While it is still unable to determine costs by species, the regional office estimates that approximately $85 million of its total budget of $230 million in 1998–1999 was spent on salmon, including habitat, enhancement, science and fisheries management. The regional office's dilemma is that it is putting a significant amount of money into managing the Pacific salmon commercial fishery, for a declining economic return.

The Department has not identified the new costs of doing business.

20.107 The Department recognizes that the Aboriginal Fisheries Strategy is assuming a greater role in fisheries management because of the land claims treaty process. Treaty settlements will provide money to First Nations to participate more fully in the management of their fisheries. Aboriginal participation in fisheries management will have an impact on the way the fishery is managed in the future. The evolving role of First Nations in fisheries management could thus be an important agent of change. However, we have not yet seen how the Department plans to co-ordinate fisheries management functions with treaty settlements under its goal of establishing regional management boards.

20.108 The Province of British Columbia is potentially a large external source of funds for achieving habitat conservation goals held in common with the Department. The Province of British Columbia has created its own organization, Fisheries Renewal B.C., to invest public funds in the revitalization of the fishing industry. In 1999, Fisheries Renewal B.C. contributed several million dollars to projects aimed at restoring habitat, diversifying the fisheries and

External funding sources are needed.

creating fisheries-related employment. The establishment of a joint Fisheries Renewal Advisory Board under the *Canada–British Columbia Agreement on the Management of Pacific Salmon Fishery Issues* would, however, increase the effectiveness of the development and delivery of both parties' salmon habitat and enhancement programs.

20.109 As a basis for setting priorities in the allocation of resources to meet the demands of the New Direction policy, the Department should complete risk assessments in areas where management information is incomplete or lacking.

Department's response: *Fisheries and Oceans agrees. The salmon assessment frameworks being prepared (see response to paragraph 20.56) will be critical to identify priorities. In addition, the Department is initiating a review of the salmon management process. Resources, both from budget reallocation and from other sources, will be directed in accordance with priority.*

Conclusion

20.110 The past management of Pacific salmon and its habitat, together with factors beyond the Department's control, have resulted in serious declines in many stocks. This has posed a threat to the future sustainability of the fisheries. The Department has responded by releasing a new sustainable fisheries policy that focusses on conservation and the protection of diversity of salmon stocks. It is taking action to overhaul its fisheries management regime, but needs to overcome obstacles such as a limited information base and poor relations with stakeholders. The Department's challenge is to conserve stocks while providing opportunities for harvesting. Appropriate action to protect the genetic diversity of existing stocks will likely mean that fisheries will be curtailed in the short term in the interests of rebuilding the resource base to sustain fisheries in the future.

About the Audit

Objective

Our audit objective was to determine whether the Pacific salmon fisheries management process and practices of the Department of Fisheries and Oceans are ensuring the conservation of the resource base and the sustainability of the Aboriginal, commercial and recreational fisheries that depend on it.

Criteria

We expected that the Department would have:

- adopted an appropriate sustainable approach, including acquiring and applying the necessary scientific information and contemporary knowledge, to fulfil its mandate to conserve and protect the Pacific salmon resource base and, where necessary, restore its abundance and the diversity of stocks;
- ensured that all sectors were co-ordinating their operations and communications in the development and implementation of management plans for the Aboriginal, commercial and recreational fisheries, using resource conservation objectives to achieve sustainable development; and
- negotiated agreements or entered into arrangements with stakeholders, both international and domestic, to ensure the conservation and protection of Canada's Pacific salmon resource and the equitable distribution of fish that are surplus to spawning requirements.

Approach

Our audit included meetings or conversations with departmental staff in headquarters in Ottawa, in the regional office in Vancouver, and in district offices and research facilities. We reviewed Fisheries and Oceans files and documentation, and made formal requests for specific information from departmental staff in headquarters and the regional office. A large amount of material was obtained through the review of external and internal reports.

Audit Team

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Appendix A

Coho Case Study — The Development of a Fisheries Management Crisis

Declines in coho stocks first became apparent in the mid–1970s to mid–1980s

The Department of Fisheries and Oceans has documented the coho problem since the 1970s. Activity in the coho fisheries was intense back then, with exploitation rates often exceeding 70 percent. Declines in wild escapements were noted by the Department, particularly in the early-run Skeena River stock. The Department took some measures, such as the closure of directed net fisheries in the Skeena and Fraser Rivers, but otherwise coho fisheries were not closely regulated. Coho research focussed on freshwater habitat and environmental concerns, as it was widely believed that coho was a suitable indicator species of habitat impacts.

Further declines in coho stocks in the mid–1980s through the mid–1990s increased concern about their conservation

The Department noted that the abundance of wild coho was clearly declining throughout southern British Columbia during this period. Declines in the upper Skeena River were described as a conservation concern. However, assessment advice based on information at the time indicated that the aggregate stock in southern British Columbia was only moderately over-exploited.

Catch and escapement records revealed the dramatic decline in wild coho. For example, the Department noted that recreational and commercial catches of wild coho dwindled by an average of about 66,000 fish per year between 1976 and 1989. Overfishing and habitat loss were believed to be responsible for this decline. The proportion of Strait of Georgia coho being caught (the exploitation rate) averaged 10 percent higher than the 65 to 70 percent considered optimal for sustaining stocks.

During the late 1980s there were increasing concerns about coho abundance in populations around the Strait of Georgia and in the upper Skeena River. There was a growing recognition by the Department that exploitation rates nearing 80 percent of southern British Columbia stocks were not sustainable. These concerns led to the initiation of a coho conservation program in southern British Columbia and some further management actions in northern sockeye fisheries.

In 1989, the Department formed the Coho Steering Committee to address this major problem of declining coho stocks. The wild coho rebuilding plan was designed to balance environmental effects through a program that would integrate habitat management, harvest management and enhancement. Together with fishery advisors, the Coho Steering Committee began to develop a plan for rebuilding wild coho stocks. However, in 1992 the Committee stated that wild coho stocks in the Strait of Georgia and the Fraser River were still declining.

In 1995 the Department's scientists warned managers of serious problems with coho

It was not until 1995 that departmental managers began to pay serious attention to coho stocks off the south coast of British Columbia. Even then, not enough was done to address the rapid declines in survival rates. For example, exploitation rates for coho stocks in the south of the province were 70 to 80 percent before 1994. In 1995, the rate was reduced to 60 percent.

The Department's Pacific Stock Assessment Review Committee (PSARC) recommended that the exploitation rates for Strait of Georgia coho be cut from between 65 and 70 percent to below 65 percent for the 1996 fishing season. Fishery managers were warned of continuing low survival rates for Strait of Georgia coho stocks.

The PSARC continued to warn management about the low marine survival rate expected to continue in 1997. Some coho stocks were not expected to achieve conservation goals, even with no fishing. The PSARC urged caution in exploiting southern British Columbia coho stocks. As a result of the advice, there was no directed commercial coho fishery in southern British Columbia for the 1997 fishing season. In the north, the harvest rate was reduced to 53 percent. The recreational fishery remained open with reduced daily catches of coho. These actions brought the exploitation rate for coho down to between 20 and 40 percent overall.

Calls in 1998 for drastic action to conserve coho

The PSARC advised managers to use extreme caution in applying forecasts of coho abundance in 1998. The Skeena and Thompson River coho stock aggregates were extremely depressed, and would continue to decline under current marine survival conditions even in the absence of any fishing mortality. Some individual spawning populations were at high risk of biological extinction. The status of the Strait of Georgia and lower Fraser stock aggregate was also deteriorating because of continuing low marine survival rates.

Action finally taken to conserve existing stocks and develop a recovery plan for those stocks at risk

On 19 June 1998 the Minister of Fisheries and Oceans recognized that a coho crisis existed. He announced the Salmon Management Plan to respond to the decline in abundance. The Plan was based on protecting upper Skeena and Thompson River coho. Fishing was stringently limited in areas where these coho were prevalent, in effect closing the recreational and commercial coho fishery. The new policy, *A New Direction for Canada's Pacific Salmon Fisheries*, makes selective fishing mandatory. If this is ineffective, fisheries will be closed.

Source: Based on documentation of the Department of Fisheries and Oceans and the Pacific Fisheries Resource Conservation Council.

Appendix B

Conditions Necessary to Achieve Sustainable Fisheries

- An ecosystem-based management system has been adopted. As a result, the watershed is the essential stewardship unit and local watershed interests are directly involved in fisheries and environmental management decisions.
- Salmon escapement goals (how many fish must return to a stream to sustain the run) are established by using a habitat-based conservation approach and consider non-human uses of salmon and the ecosystem (biodiversity, wildlife, etc.). In addition, managers recognize the inherent variability in the productive capacity of freshwater, estuarine, and marine habitats, and the impact of this variability on salmon populations.
- Resource managers have adopted a risk averse approach to harvest management, which minimizes the potential for not achieving escapement goals.
- Salmon fisheries have been restructured to reduce mixed-stock fisheries, increase terminal fisheries, emphasize selective harvesting methods, and expand stock-specific fisheries.
- Decisions on the allocation of surplus salmon and steelhead production are independent from biological decisions that establish the total allowable harvest of these resources.
- The emphasis of artificial propagation has shifted from salmonid production (to support harvests) toward salmonid restoration (helping to rebuild weaker stocks).
- The social and political environment has changed to focus decision-making authority in watersheds, to provide incentives for stewardship initiatives, and to establish regional and international oversight for salmon production.

Source: Sustainable Fisheries Foundation. *Towards Sustainable Fisheries: Building a Cooperative Strategy for Balancing the Conservation and Use of West Coast Salmon and Steelhead Populations*. 1996.