

2016 Fall Reports of the Commissioner of the Environment and Sustainable Development

Report 2—Sustaining Canada's Major Fish Stocks—Fisheries and Oceans Canada

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Introduction

Background

Threats to Canadian and global fish stocks

2.1 The global fishing industry is worth \$164 billion annually. In Canada, fish and seafood exports were worth \$6 billion in 2015; recreational fishing was worth a further \$8 billion in 2010. The industry is facing significant threats, both worldwide and in Canada. According to the United Nations Food and Agriculture Organization, more than 30 percent of the world's fish stocks are likely being exploited at an unsustainable rate. Increasingly efficient fishing methods have made it easier to overfish; warmer and more acidic oceans associated with climate change have also had an impact.

2.2 These effects are being felt in the approximately 600 Canadian communities that depend on fishing or processing industries for their livelihood, and in Indigenous communities that rely on fish for food, social, ceremonial, and commercial purposes. Fisheries and Oceans Canada (the Department) has classified fewer than half of Canada's major fish stocks as healthy.

Milestones in Canadian fisheries management

Groundfish—Species of fish that live on or near the bottom of the ocean. Examples of ocean groundfish are cod, flounder, halibut, and haddock.

Precautionary approach—An approach to decision making that requires caution when scientific information is uncertain, unreliable, or inadequate. It also implies that the absence of adequate scientific information cannot be used as a reason to postpone or fail to take action that could prevent serious harm to a resource.

2.3 In the early 1990s, Canada's Atlantic **groundfish** fishery collapsed, leading Canada to declare a moratorium on northern cod fishing. (The moratorium was still in effect for the key cod fisheries in 2016.) In 1995, Canada signed the United Nations Fish Stocks Agreement, committing to use a **precautionary approach** to manage its domestic and shared fish stocks. In 2009, Fisheries and Oceans Canada developed its Sustainable Fisheries Framework. This framework outlined a series of policies and tools to ensure the continued health (abundance) and reproductive levels of Canada's fish stocks, and to protect biodiversity and fisheries habitats.

Federal roles and responsibilities

Fish stocks—Groupings of fish usually based on genetic relationship and geographic distribution.

2.4 Fisheries and Oceans Canada is the federal department responsible for managing and regulating fisheries. Its mandate is to manage Canadian fisheries in a manner that supports conservation and sustainable use and to foster economic prosperity for those who depend on fisheries for their livelihoods.

2.5 The Department carries out its responsibilities through its headquarters and its six regional offices: Pacific, Central and Arctic, Quebec, Gulf (of St. Lawrence), Maritimes, and Newfoundland and Labrador. For Canada's inland waters, the Department shares responsibilities and powers with the provinces. In Canada's coastal and tidal areas, where most of Canada's major **fish stocks** are found, the Department is responsible for managing the fisheries. In some cases, it does so together with international regional fisheries management organizations or with partners, such as Indigenous organizations.

2.6 The Department experienced significant budget cuts between 2011 and 2016. The budget for its Integrated Fisheries Resource Management Program was reduced by more than 25 percent, and the budget for its Fisheries Resource Science Program was reduced by almost 20 percent.

2.7 In 2014, recognizing that its ability to fulfill its mandate was diminishing, the Department began an assessment of its capacity to carry out the scientific activities necessary to support fisheries management. In May 2016, the government announced that Fisheries and Oceans Canada would receive a budget increase of \$197 million over five years to support its ability to deliver on its responsibilities, including oceans and freshwater science activities, fisheries monitoring, and research on the health of fish stocks.

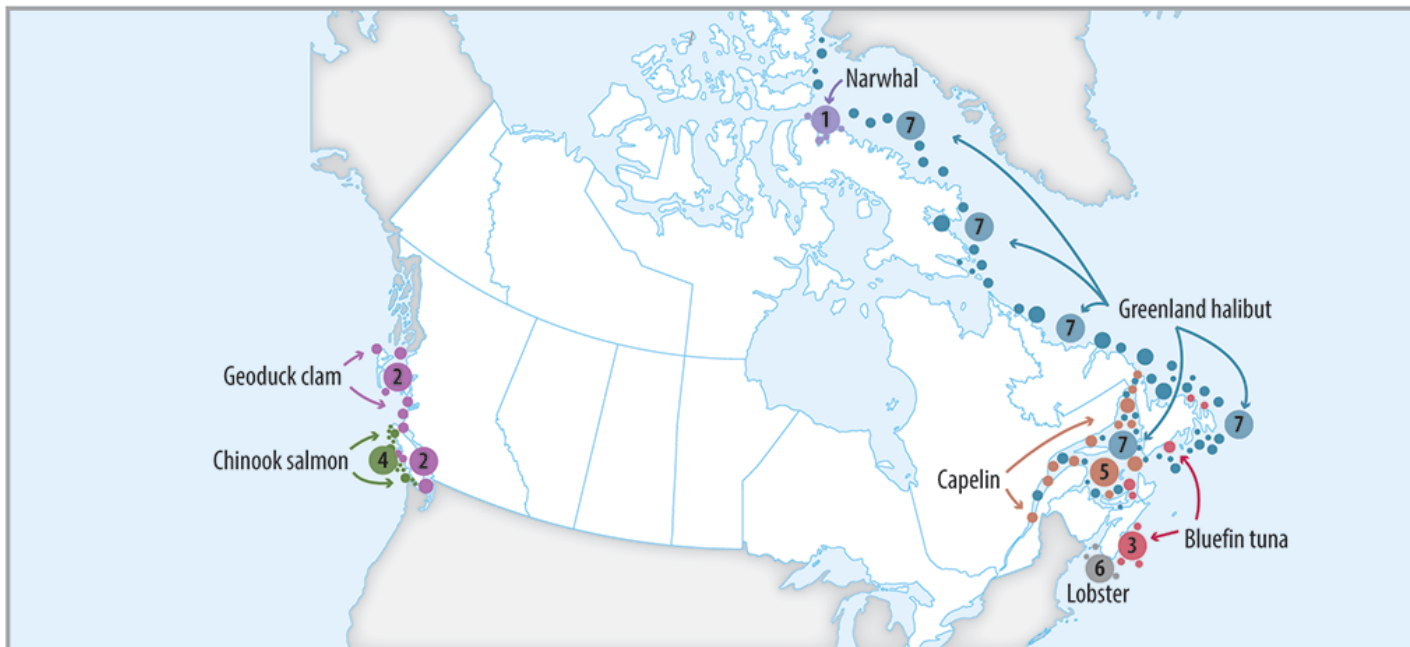
Focus of the audit








2.8 This audit focused on whether Fisheries and Oceans Canada had identified and put in place selected key elements needed to manage Canada's fisheries for conservation and sustainability, such as management planning and the collection and analysis of information about the state of fish stocks and how many fish are caught. To determine this, we looked at the 154 major fish stocks that the Department is responsible for managing.

2.9 We also examined the following selected fish stocks in closer detail: geoduck clam; and certain stocks of Greenland halibut, narwhal, bluefin tuna, capelin, chinook salmon, and lobster.

2.10 Exhibit 2.1 presents information about these stocks. Our findings on Greenland halibut are shown in a case study at the end of this report. Findings related to the other six stocks are in the relevant report sections.

Exhibit 2.1 – We selected some of Canada's major fish stocks to examine



 <p>Narwhal Eclipse Sound ARCTIC MAMMALS</p>	<p>1 The narwhal is a tusked marine mammal that lives in Canada's North. It is managed by the Central and Arctic region with the involvement of the Nunavut Wildlife Management Board. It is fished exclusively through an Indigenous subsistence fishery, with narwhal tusks harvested from this fishery sold commercially. There were 135 Eclipse Sound narwhal caught in 2014, and it is classified in the healthy zone.</p> <p>Photo: © Linda Bucklin/Shutterstock.com</p>
 <p>Geoduck clam MOLUSCS</p>	<p>2 The geoduck clam supports one of British Columbia's most profitable fisheries, with a landed value of \$40.5 million in 2014. It is managed by the Pacific region. The geoduck clam can reach more than 150 years of age and is among the world's longest-lived animals. Fisheries and Oceans Canada classified it in the healthy zone.</p> <p>Photo: © sasaken/Shutterstock.com</p>
 <p>Bluefin tuna Western Atlantic LARGE PELAGICS</p>	<p>3 Bluefin tuna is managed through an international management regime with participation from Department Headquarters as well as the Newfoundland and Labrador, Quebec, Gulf, and Maritimes regions. This tuna has a wide geographic range, reaching Newfoundland in the west Atlantic. The Department classified it in the cautious zone. The landed value of the catch was about \$6 million in 2014.</p> <p>Photo: © holbox/Shutterstock.com</p>
 <p>Chinook salmon West Coast SALMONIDS</p>	<p>4 The Chinook salmon is the largest and longest-lived of the Pacific salmon species. The West Coast of Vancouver Island aggregate abundance-based management (WCVI AABM) Chinook salmon stock is managed by the Pacific region jointly with the United States under the Pacific Salmon Treaty. The Department classified this stock in the critical zone. The landed value of the catch was about \$13.9 million in 2014.</p> <p>Photo: © Dan Thornberg/Shutterstock.com</p>
 <p>Capelin 485T Area SMALL PELAGICS</p>	<p>5 Capelin provide a significant link in the food chain of the Estuary and Gulf of St. Lawrence. This species is caught primarily for its roe (eggs). It is managed mainly by the Newfoundland and Labrador region with the participation of the Gulf region. Because of information gaps, the Department was unable to classify this stock in either the healthy, cautious, or critical zone. The landed value of the catch was about \$1.8 million in 2014.</p> <p>Photo: © D7INAMI7S/Shutterstock.com</p>
 <p>Lobster LFA 34 CRUSTACEANS</p>	<p>6 The Lobster Fishing Area 34 lobster stock is managed by the Maritimes region and is classified in the healthy zone. It is Canada's most commercially valuable stock, with the landed value of the catch being about \$310 million in 2014.</p> <p>Photo: © Alexander Rathsh/Shutterstock.com</p>
 <p>Greenland halibut 75000T GROUNDFISH</p>	<p>7 Greenland halibut is managed through the Central and Arctic, Newfoundland and Labrador, and Quebec regions. It is a highly migratory groundfish, with some portions managed jointly with the Northwest Atlantic Fisheries Organization. The Department has classified the northern and Gulf stocks in the healthy zone. Because of information gaps, the Department was unable to classify the Atlantic stock in the healthy, cautious, or critical zone. The Greenland halibut fishery is Canada's most valuable groundfish fishery, with a landed value of \$102 million in 2014.</p> <p>*Our audit examined three stocks of Greenland halibut.</p> <p>Photo: © Fisheries and Oceans Canada</p>

Source: Information from Fisheries and Oceans Canada

▼ Exhibit 2.1 map—text version

The map of Canada shows the locations of the major fish stocks examined.

The narwhal stock is found in the Eclipse Sound area off the eastern coast of Nunavut.

The geoduck clam stock is found off the coast of British Columbia.

The Bluefin tuna stock is found in the Western Atlantic.

The Chinook salmon stock is found off the west coast of Vancouver Island.

The capelin stock is found in the Gulf of St. Lawrence.

The lobster stock is found off the south coast of Nova Scotia.

Three Greenland halibut, or turbot, stocks are found off the eastern coast of Nunavut, the northeastern tip of Quebec, and the coasts of Newfoundland and Labrador.

Sustainable fishery—For the purposes of the report, a fishery that is harvested at levels that support current needs without compromising the needs of future generations.

2.11 This audit is important because healthy fish stocks are necessary for fisheries to continue to provide economic and social benefits to Canadians, including livelihoods in remote Canadian communities. It is critical for Fisheries and Oceans Canada to have a strong fisheries management program in place to ensure **sustainable fisheries**.

2.12 We did not examine the Department's enforcement activities or how it allocates fishing quotas among commercial, recreational, or Indigenous fisheries, or among fishing fleets. We concentrated our examination on management planning for individual stocks of commercial fisheries, which have the greatest impact on stock levels in most fisheries.

2.13 More details about the audit objectives, scope, approach, and criteria are in **About the Audit** at the end of this report.

Findings, Recommendations, and Responses

Planning for sustainable fisheries management

Fisheries and Oceans Canada had Integrated Fisheries Management Plans for most major fish stocks, but many were outdated or incomplete

Overall message

2.14 Overall, we found that Fisheries and Oceans Canada had determined which tools and information it needed to plan for the sustainable management of Canada's major fish stocks. It had identified Integrated Fisheries Management Plans for each stock as its key tool. We found that up-to-date Integrated Fisheries Management Plans were in place for 110 of Canada's 154 major fish stocks, but were missing or out of date for the remaining 44 major stocks. Further, some of the plans that were in place included vague objectives to measure how well the Department was managing the stocks. We also found that for 12 of the 15 major fish stocks that were in the critical zone and required rebuilding plans, the Department had neither plans nor timelines for developing them.

2.15 This is important because the Department requires Integrated Fisheries Management Plans for all major fish stocks—and rebuilding plans for those in the critical zone (where serious harm to the stock is occurring)—in order to manage fisheries sustainably.

2.16 Our analysis supporting this finding presents what we examined and discusses

- elements of fisheries management planning,
- plans for achieving sustainable fisheries,
- objectives for each fishery,
- review of performance,
- rebuilding plans, and
- accessibility of Integrated Fisheries Management Plans.

Context

2.17 The intent of Fisheries and Oceans Canada's Sustainable Fisheries Framework is to provide the basis for ensuring Canadian fisheries are managed in a manner that supports conservation and sustainable use. The Framework includes policies as well as planning and monitoring tools. It is the Department's key instrument in maintaining sustainable fisheries that support economic prosperity in the industry and in fishing communities. Integrated Fisheries Management Plans are the Framework's most important management tools for achieving its objectives.

Recommendation

2.18 Our recommendation in this area of examination appears at paragraph 2.28.

Analysis to support this finding

Major fish stocks—Fish stocks that have an annual landed value greater than \$1 million or an annual landed weight greater than 2,000 tonnes; have an Integrated Fisheries Management Plan; are highly migratory or transboundary; are of special concern according to the Committee on the Status of Endangered Wildlife in Canada; and/or have regional significance.

Source: Fisheries and Oceans Canada

Fish stock health—A measure of the abundance of fish (also referred to as "stock status").

2.19 **What we examined.** We examined whether Fisheries and Oceans Canada had identified the key elements necessary for fisheries management planning, and whether it had completed management plans for conservation and sustainable use for each of Canada's **major fish stocks**.

2.20 **Elements of fisheries management planning.** We found that Fisheries and Oceans Canada had identified the key elements necessary for management planning through its Sustainable Fisheries Framework. The Department had committed to developing Integrated Fisheries Management Plans for each of Canada's major fish stocks in 1995, and it confirmed this commitment in 2009. The Department had also identified other key elements for fisheries management, including scientific surveys, third-party fisheries observer programs, stock assessments, and reference points for establishing **fish stock health**. Integrated Fisheries Management Plans are discussed below; the other elements are discussed later in this report.

2.21 **Plans for achieving sustainable fisheries.** Fisheries and Oceans Canada requires Integrated Fisheries Management Plans for all major fish stocks. The plans are developed in consultation with the fishing industry, other stakeholders, and partners such as Indigenous organizations and the provinces. The term "Integrated Fisheries Management Plan" refers to both the management planning process and the resulting document.

2.22 We found that up-to-date plans were in place for 110 of 154 fish stocks, including those with the greatest economic value. However, there were no plans in place for 26 stocks; and for another 18, the plans were out of date, with no timeline for completion. Officials told us that although the Department required Integrated Fisheries Management Plans for all major stocks, it sometimes relied on conservation harvest plans as an interim measure. We found conservation harvest plans to be an inadequate substitute because they were not required to articulate or commit to objectives for the fishery. In addition, they were developed for individual fishing fleets that use a certain type of gear rather than for the fishery as a whole. There was no specific guidance as to what should be included in conservation harvest plans, and no commitment to make them public.

2.23 **Objectives for each fishery.** The Department requires that Integrated Fisheries Management Plans include specific and measurable short- and long-term objectives for the management of a fishery, addressing conservation, ecosystems, and social, economic, and cultural issues. Where up-to-date Integrated Fisheries Management Plans were in place, we found that all of them included objectives. However, for the selected stocks we looked at more closely (geoduck clam and certain stocks of Greenland halibut, narwhal, bluefin tuna, capelin, chinook salmon, and lobster), the objectives of many Integrated Fisheries Management Plans were neither specific nor time-bound. Objectives also varied widely, from outcome-based goals—for example, "Maintain vital, healthy narwhal populations capable of sustaining harvesting needs"—to planned actions, such as "Conduct ongoing surveys and research to improve information on geoduck stocks, bed location, and biological characteristics."

2.24 **Review of performance.** The Department also requires performance reviews of each stock's objectives to be completed annually, and summaries of these reviews to be included in the Integrated Fisheries Management Plans. We found that only 21 of 110 up-to-date plans included an evaluation of the extent to which the objectives had been met.

2.25 **Rebuilding plans.** Where a stock has been assessed as being in the critical zone (where serious harm to the stock is occurring), and is still being fished, the Department requires that a rebuilding plan be developed as part of the Integrated Fisheries Management Plan. Rebuilding plans normally focus on restoring a stock's abundance, but may also include ensuring that there are a sufficient number of fish of breeding age, or restoring a stock to the geographic areas where it once existed. Of the 15 major fish stocks that needed rebuilding plans—certain stocks of cod, rockfish, redfish, plaice, flounder, mackerel, herring, scallop, and beluga—the Department had not developed rebuilding plans for 12, nor had it established timelines. Not having a rebuilding plan in place increases the risk that these depleted stocks may not recover.

2.26 **Accessibility of Integrated Fisheries Management Plans.** Integrated Fisheries Management Plans are required to be public. They are used to communicate basic information about fisheries and their management to fishers, as well as to partners such as wildlife management boards. They are also intended to communicate information across the Department. We found that the plans were often not made public and were hard to access. As the

Department did not have an up-to-date list of Integrated Fisheries Management Plans, either centrally or regionally, it could not readily provide us with all completed plans or current information on their status. It took several months and multiple follow-ups to obtain the current plans and determine which major fish stocks were covered by which plans.

2.27 Without up-to-date Integrated Fisheries Management Plans that contain clear long-term objectives and that are readily available to the public, Fisheries and Oceans Canada is missing tools that are important to the sustainable management of Canada's major fish stocks.

2.28 **Recommendation.** Fisheries and Oceans Canada should set out priorities, targets, and timelines for putting in place Integrated Fisheries Management Plans for all major fish stocks. These should include long-term, specific, measurable objectives, performance reviews, and rebuilding plans for stocks in the critical zone that are still being fished. These plans should also be made publicly accessible.

The Department's response. Agreed. Fisheries and Oceans Canada will develop a plan with priorities, targets, and timelines for completing Integrated Fisheries Management Plans (IFMPs) for all major stocks that currently do not have these plans, and for updating existing plans that are out of date. Development of the IFMPs will be consistent with the departmental guidance on IFMPs, which includes a requirement for clear fishery objectives and a performance review. The Department's plan will include priorities and timelines for making IFMPs not already posted accessible to the public through the departmental website.

The Department will also develop a plan with priorities, targets, and timelines for completing rebuilding plans that are in line with the Department's Guidance for the Development of Rebuilding Plans under the Precautionary Approach Framework for stocks that are in the critical zone.

The Department will develop both plans by the end of the 2016–17 fiscal year.

Gathering, analyzing, and managing information on fish stocks

Overall message

2.29 Overall, we found that Fisheries and Oceans Canada was missing key information needed to manage Canada's fish stocks sustainably.

The Department was not carrying out all of the scientific surveys it had planned, and it did not have adequate controls to ensure that it gathered reliable and up-to-date data from third-party fisheries observers. Further, because of information gaps, the Department was unable to classify all its major stocks as being in the healthy, cautious, or critical zone. The Department's difficulties in obtaining data were aggravated by aging and incompatible information systems that hindered the sharing of data among regions.

2.30 These findings are important because sustainable fisheries management is based on current, reliable monitoring information and scientific analysis of the amount of fish in the ocean and their biological characteristics (such as age, sex, growth, and reproduction), as well as on factors such as changes in ocean temperature.

Context

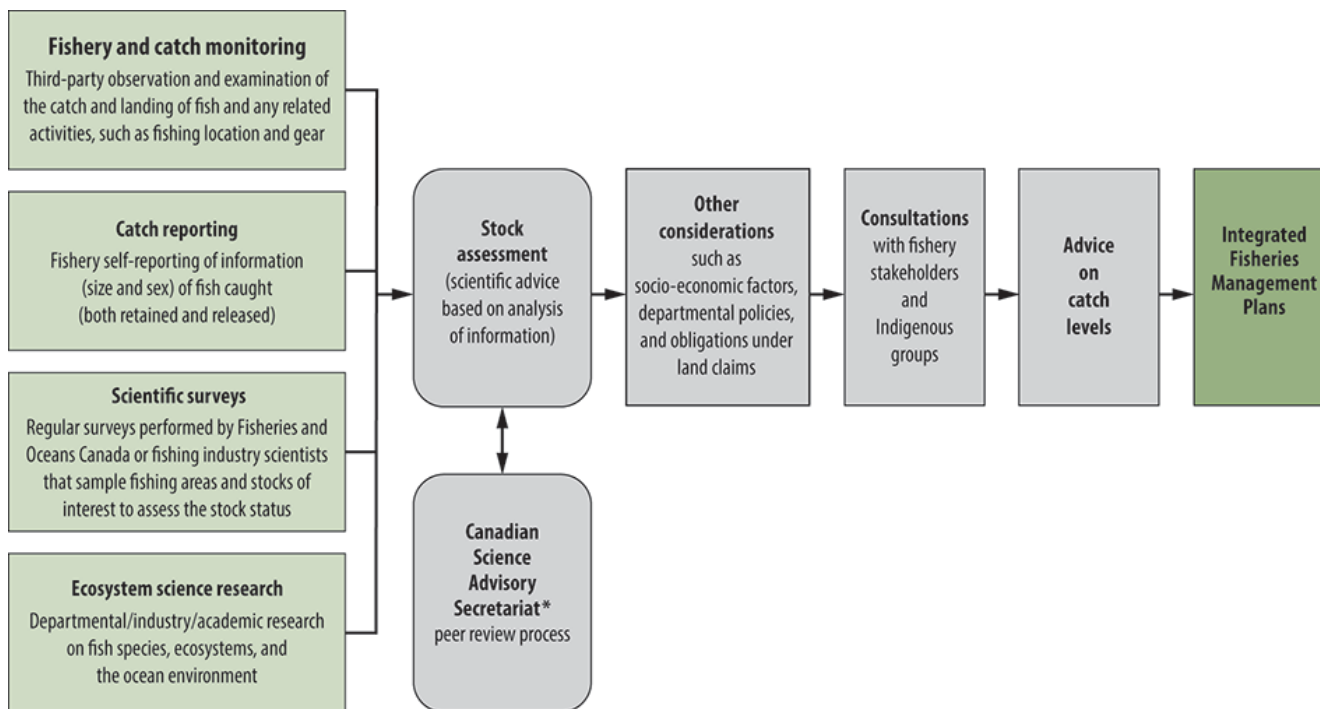
2.31 There have been significant changes in the amounts of fish caught in Canada since the collapse of the Atlantic groundfish fishery in the early 1990s. Between 1990 and 2014, for example, catch of the 88 marine fish stocks fell by 70 percent, but catch of the 51 shellfish stocks rose by 81 percent.

2.32 To gather data about the abundance of fish in the sea and the amount of fish being caught, the Department depends on data from

- scientific surveys, which the Department conducts to gather data about the abundance of fish in the sea as well as biological data, such as length, weight, and maturity;
- third-party fisheries observers, who verify catch and landing data and provide scientific information;
- surveys carried out by industry in collaboration with the Department using industry vessels;
- fishers' logbooks, which contain information about what they catch; and
- research carried out by the Department, industry, and academics.

2.33 Departmental scientists compile and analyze information from these sources to assess a fish stock's status—whether it is healthy or needs to be managed more cautiously: for example, by reducing catch levels. Based on the status, the assessment provides advice on the amount of fish that can be caught sustainably. All of this is required to be included in the Integrated Fisheries Management Plans for each stock (Exhibit 2.2).

Exhibit 2.2—Fisheries management planning depends on a variety of information sources and analyses



* The Canadian Science Advisory Secretariat, within Fisheries and Oceans Canada, reviews scientific analysis only for domestically managed stocks. Where stocks are managed through international organizations, scientific advice is peer reviewed by the regional fisheries management organization.

Source: Based on discussions with Fisheries and Oceans Canada

▼ Exhibit 2.2—text version

This flow chart shows the fisheries management process.

The first stage of the fisheries management planning process involves fishery and catch monitoring, catch reporting, scientific surveys, and ecosystem science research. The fishery and catch monitoring involves third-party observation and examination of the catch and landing of fish and any related activities, such as fishing location and gear. Catch reporting involves fishery self-reporting of information (size and sex) of fish caught (both retained and released). Scientific surveys involves regular surveys performed by Fisheries and Oceans Canada or fishing industry scientists that sample fishing areas and stocks of interest to assess the stock status. Ecosystem science research involves departmental, industry, or academic research on fish species, ecosystems, and the ocean environment.

The second stage involves developing scientific advice based on analysis of information. This includes the Canadian Science Advisory Secretariat, which conducts a peer review. The Secretariat, within Fisheries and Oceans Canada, reviews scientific analysis only for domestically managed stocks. Where stocks are managed through international organizations, scientific advice is peer reviewed by the regional fisheries management organization.

The third stage involves taking into account other considerations, such as socio-economic factors, departmental policies, and obligations under land claims.

The fourth stage is consultations with fishery stakeholders and Indigenous groups.

Fisheries and Oceans Canada then prepares advice on setting catch levels.

Based on the above sources of information and analyses, the final stage in fisheries management planning is the completion of Integrated Fisheries Management Plans.

Deficiencies in Fisheries and Oceans Canada’s systems and activities for gathering data on fish stocks resulted in information gaps and quality concerns

What we found

2.34 We found that Fisheries and Oceans Canada was unable to complete all of the scientific surveys of fish stocks that it had planned. This was partly because mechanical problems on some of the Canadian Coast Guard vessels it used meant there were not enough vessels available.

2.35 We also found systemic problems in the Department’s management of third-party observer programs. In some cases, information the Department obtained from third-party fisheries observers was of insufficient quality or was made available too late to be incorporated into fisheries management decisions. These problems call into question the reliability and usefulness of the data these programs provide.

2.36 Our analysis supporting this finding presents what we examined and discusses

- Fisheries and Oceans Canada’s scientific surveys, and
- information from third-party fisheries observers.

Why this finding matters

2.37 This finding matters because the information Fisheries and Oceans Canada gets from scientific surveys and third-party fisheries observers is critical to its ability to assess the abundance of fish stocks accurately. If this information is not available when needed, or if its quality is questionable, this increases the uncertainty in the Department’s assessment of stock health. This, in turn, increases the risk that the catch levels it sets may be unsustainable—even if they are set conservatively.

Recommendations

2.38 Our recommendations in this area of examination appear at paragraphs 2.45 and 2.52.

2.39 **What we examined.** We examined whether Fisheries and Oceans Canada had determined the key elements needed to assess fish stock health based on information about abundance and catch, and whether it had incorporated the results from its own scientific surveys into its stock assessments. We also examined the Department's process for obtaining timely and reliable information from third-party fisheries monitoring. We did not focus on other sources of information—such as industry surveys, fishers' logbooks, or industry and academic research—since the Department plays a minor role in verifying the quality of this information.

2.40 **Fisheries and Oceans Canada's scientific surveys.** The United Nations Food and Agriculture Organization identifies scientific surveys as one of the key components for monitoring trends in fish stocks and developing successful recovery plans for stocks that are in the critical zone. Fisheries and Oceans Canada considers its ability to conduct scientific surveys to be an integral part of its mandate to conserve and protect fish, as required by the *Fisheries Act*. The *Oceans Act* gives the Department the explicit authority to conduct such surveys. Many of the surveys it conducts provide data that allow for comparisons of stock levels over time.

2.41 Fisheries and Oceans Canada conducts surveys by taking samples from the ocean using Canadian Coast Guard or chartered vessels. Fish caught from these vessels are counted by species, and assessed for age, maturity, and reproduction. We found that a shortage of reliable vessels limited the Department's ability to conduct surveys. Fisheries and Oceans Canada acknowledged this problem, citing mechanical issues with aging vessels. In the Pacific region, for example, problems with the offshore survey vessel in 2014 prevented a survey of Queen Charlotte Sound for various stocks, and created a break in the long-term time series data on abundance. Another example is the survey of Greenland halibut (covered in the case study at the end of this report).

2.42 The lack of available vessels for surveys has been a long-standing issue. We reported on vessel shortages nine years ago in the 2007 Status Report of the Auditor General of Canada, Chapter 4—Managing the Coast Guard Fleet and Marine Navigational Services.

2.43 The Department plans its annual survey activities largely by carrying forward its plan from the previous year, with some adjustments. However, unanticipated events that require the Department to conduct unplanned surveys can hinder its ability to complete its planned work by diverting resources. For example, a comprehensive survey of all narwhal stocks was unexpectedly needed in the 2013–14 fiscal year in response to increasing demand to harvest narwhal. The Department carried out the survey, but it took resources away from other priorities.

2.44 The Department has long recognized that some survey work it deemed necessary to assess fish stocks was not being done. For example, a survey needed to gauge the abundance of the capelin area 4RST stock had yet to be completed, even though capelin is a key link in the food chain in the Gulf of St. Lawrence. In 2005, the Department committed to work toward confirming its survey priorities and adjusting its survey activities to reflect its priorities. It began assessing expenditures and shortfalls for its Fisheries Resource Science Program, including its survey activities, in 2014. However, it has still not completed this work.

2.45 **Recommendation.** Fisheries and Oceans Canada should review its current scientific survey activities to identify gaps, and adjust its activities to ensure they are fully aligned with departmental priorities.

The Department's response. Agreed. With the new funding received from Budget 2016, Fisheries and Oceans Canada will increase its monitoring coverage of key areas and species of marine mammals, fish, and invertebrates. The Department is currently developing a long-term plan that incorporates this new funding and provides the opportunity to further address knowledge gaps and align the Department's scientific monitoring activities with key departmental priorities. The plan will be developed by the end of the 2016–17 fiscal year.

2.46 **Information from third-party fisheries observers.** Fisheries and Oceans Canada's dockside monitoring and at-sea observer programs (together referred to as "observer programs") were designed to provide the Department with data on many aspects of fishing, such as fishing effort and catch, fishing gear type (such as trawls or gill nets), **bycatch**, and discarded fish. Observers collect biological data that is included in the Department's scientific analyses of fish stocks, which may include length, weight, and maturity. They also provide information on various other elements they may observe in the course of their work, such as lost nets, which can continue to catch fish that are never landed.

2.47 We found that the Department did not have adequate means of ensuring that observers provided timely and reliable information. The Department has the regulatory authority to designate companies to monitor fishing activities and the amount of fish caught, but due to changes to the at-sea observer program in 2013, it no longer has contractual relationships with them. The fishing industry now contracts with these companies directly. This means if a company fails to comply with program requirements, the Department cannot take formal measures other than to revoke the company's designation for monitoring fishing practices across all regions. However, doing so would disrupt the Department's access to catch data. As a result, revocation has never been used, leaving the Department with little recourse when observers are not compliant.

2.48 The lack of adequate means of ensuring compliance has had several impacts. First, we found that it hampered the Department's ability to mitigate potential conflict of interest issues for dockside monitoring companies. At the company level, we found that Fisheries and Oceans Canada did have a policy in place to limit potential or actual conflicts of interest, such as requiring that fewer than half of board members in fisheries observer companies could have ties to the fishing industry. However, the Department had not established any other measures to mitigate conflicts of interest. Further, it did not systematically verify compliance with the minimum requirements. For at least four dockside monitoring companies, the Department was aware of a serious potential conflict of interest, but took no action to ensure it had been mitigated.

2.49 We also found that in the at-sea observer program, some regions did not have specific time frames for providing data. In at least one case, data had still not been provided more than two years after the fishing season had ended. In several regions, departmental officials did not have timely access to third-party data on bycatch and discarded fish. This meant the Department did not have a complete record of total catch for the year, which compromised its ability to make timely fisheries management decisions.

2.50 Third, we found that the Department did not require a clear rationale for determining the target coverage for at-sea observers needed to provide information for managing fish stocks. (Coverage is usually defined as the percentage of vessel trips made with an observer on board.) In addition, it had not implemented systematic controls to ensure that observer companies met their coverage targets. These shortcomings limited the quantity and quality of information available from third-party observers.

2.51 Fisheries and Oceans Canada was aware of long-standing weaknesses in the fisheries observer programs. Our 1999 audits of the management of Atlantic shellfish and Pacific salmon found problems with the level and consistency of observer coverage. To increase the reliability of data from third-party fisheries observers—and determine when and to what extent the data was needed—the Pacific region developed a risk-based catch monitoring policy in 2012. However, it had not implemented the policy by the end of our audit period. In 2016, the Department was in the process of developing a national catch monitoring policy and a verification framework to assess whether observers were meeting program requirements. The catch monitoring policies and verification framework are important steps in improving controls in the observer programs.

Bycatch—Incidental catch of fish or other forms of marine life that are not the target of the fishery.

2.52 **Recommendation.** Fisheries and Oceans Canada should improve controls for third-party fisheries observer programs to ensure sufficient coverage of fishing vessels, timely data, and mitigation of potential or actual conflicts of interest on the part of observer companies.

The Department's response. Agreed. Fisheries and Oceans Canada will undertake the following:

- Finalize a national policy on fisheries monitoring (currently under development). The policy will introduce a risk-based method to establish fishery monitoring coverage, to ensure consistency across fisheries, and to make reliable and timely data available for fisheries management. The goal is to complete the fishery monitoring policy in 2017.
- Implement a program to verify compliance of observer companies with the National Dockside Monitoring Program Policy and Procedures and the At-Sea Observer Program Corporation Designation Policy and Procedures. Based on the analysis of the verification results, the Department will identify key findings and recommendations, if applicable. Outcomes of the verification process may be used to inform decisions about the national at-sea observer and dockside monitoring programs. The Department launched the verification process in July 2016 and will continue this process on an ongoing basis.
- Develop and implement interim guidelines for mitigation of conflicts of interest. These guidelines will remain in effect until the Department revises its dockside monitoring program policy and at-sea observer policy. Development of interim guidelines will begin immediately and remain in effect until the revisions of the dockside monitoring program policy and the at-sea observer policy are finalized.
- Revise the dockside monitoring program policy and at-sea observer policy to incorporate the interim guidelines for mitigation of conflict of interest, and a set of graduated measures to manage non-compliance issues, such as quality and timeliness of data. Revisions of the dockside monitoring program policy and the at-sea observer policy will begin in early 2017; this process is expected to take 12 to 18 months.

Fisheries and Oceans Canada's means of classifying the health of fish stocks did not always provide a high degree of certainty

What we found

2.53 We found that in part because of shortcomings in the data from scientific surveys and third-party observers, the Department could not always define the reference points necessary to classify stocks as being in the healthy, cautious, or critical zone. The Department reported that it did not have these reference points for 80 of 154 major fish stocks.

2.54 We also found that the Department had not identified the triggers specific to each stock that would signal that a full stock assessment would be needed sooner than scheduled. Knowing when such assessments are needed is essential since stock assessments have become less frequent.

2.55 Our analysis supporting this finding presents what we examined and discusses

- determining stock health,
- measures to react to changes in the health of the stock,
- data collected on fisheries management, and
- frequency of stock assessments.

Why this finding matters

2.56 This finding matters because scientific analysis and advice are needed to understand the status and trends of fish stocks and make sound fisheries management decisions.

Recommendations

2.57 Our recommendations in this area of examination appear at paragraphs 2.63, 2.65, and 2.71.

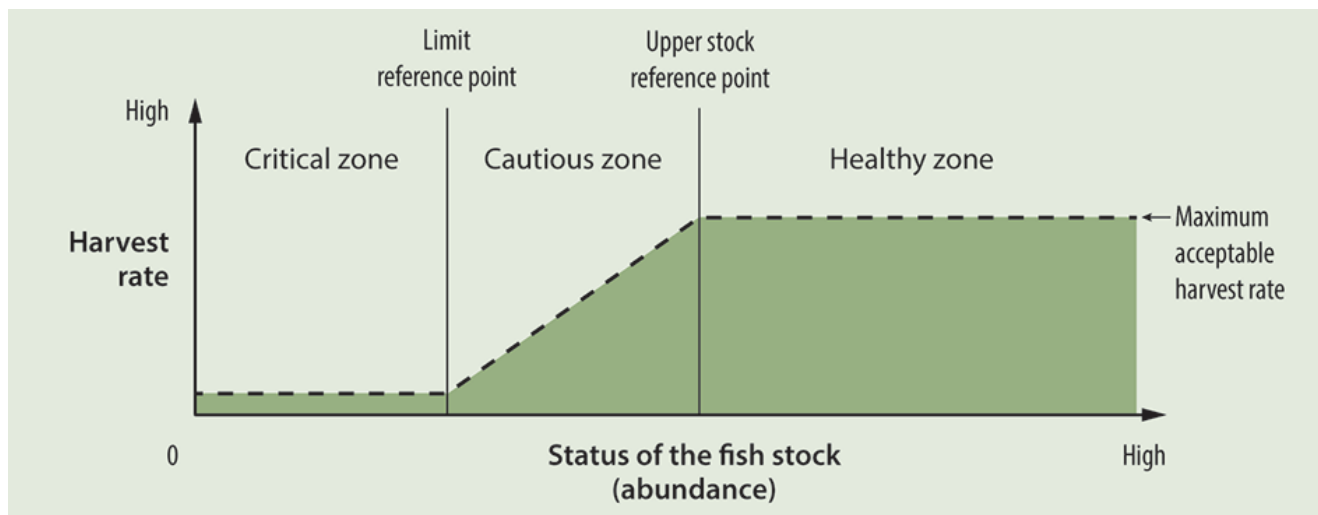
Analysis to support this finding

2.58 **What we examined.** We examined whether Fisheries and Oceans Canada had completed the necessary stock assessments for Canada's major fish stocks, including defining the reference points it needed to classify a stock as being in the healthy, cautious, or critical zone. We also examined changes to the frequency of stock assessments.

2.59 **Determining stock health.** The Department develops stock assessments using sources of information that include its own scientific research, academic and industry research, scientific surveys, fishing logbooks, and third-party observation of fishing vessels. Scientific experts from various disciplines within and outside government review the Department's assessments through the Canadian Science Advisory Secretariat using a peer review process.

2.60 A required component of stock assessments is a determination of the health of fish stocks, which has an impact on fisheries management decisions, such as setting fishing limits. The Department's application of the precautionary approach (Exhibit 2.3) includes placing each major fish stock into one of three categories, or zones:

- healthy,
- cautious (where fishing should be reduced), or
- critical (where serious harm to the stock is occurring).



Source: Based on information provided by Fisheries and Oceans Canada

▼ Exhibit 2.3—text version

This is a graphic showing the approach to determining the abundance levels at which fish stocks would be considered to be in the healthy, cautious, or critical zone.

When the abundance of a fish stock is low and its harvest rate should be set at a lower level, Fisheries and Oceans Canada classifies the fish stock in the critical zone.

When the abundance of a fish stock is between its limit reference point and its upper stock reference point, its harvest rate should be set at a higher or lower level, depending on the stock abundance between these points. At this level of abundance, the Department classifies the fish stock in the cautious zone.

When the abundance of a fish stock is higher, above the upper limit reference point, its harvest rate is set at the maximum acceptable level for the stock. At this level of abundance, the Department classifies the fish stock in the healthy zone.

2.61 According to the Department’s precautionary approach framework (A Fishery Decision-Making Framework Incorporating the Precautionary Approach), the reference points for defining the healthy, cautious, or critical zones should be established using current data from scientific surveys, third-party fisheries observers, and fishers’ logbooks. However, where this data is limited, the reference points may be based on available information about the fish’s biology and historic catch levels.

2.62 In 2014, the Department reported that it had established reference points for 74 of the 154 major fish stocks. For the remaining 80 stocks, the Department reported that it had not established the points that defined the cautious and critical zones. This indicates a higher level of uncertainty about the health of these fish stocks. When reference points had not been established, the Department either provided a less certain estimate of the health of the stock or indicated that the health of the stock fell into the “unknown” category. The health for 24 stocks was unknown.

2.63 **Recommendation.** Fisheries and Oceans Canada should set out priorities and timelines for establishing the reference points at which the major stocks it manages can be considered healthy, in the cautious zone, or in the critical zone.

The Department’s response. Agreed. Fisheries and Oceans Canada will develop a plan with priorities, targets, and timelines for establishing precautionary approach reference points, where technically feasible, for key stocks under the Department’s management control, where the reference points do not exist. A plan will be developed by the end of the 2016–17 fiscal year.

2.64 **Measures to react to changes in the health of the stock.** Once reference points are established, the Department’s precautionary approach framework requires that it identify the measures that will be taken if a stock falls below a certain level. However, the Department reported that these measures had not yet been identified for 63 of the major fish stocks. This means that if abundance levels drop, any mitigation measures may be ad hoc rather than planned.

2.65 **Recommendation.** Fisheries and Oceans Canada should set out priorities and timelines for identifying the measures to be taken if a major stock falls below a certain level, where this has not yet been done, so that sustainable fishing limits can be determined with greater certainty.

The Department’s response. Agreed. Fisheries and Oceans Canada will develop a plan with priorities, targets, and timelines for establishing precautionary approach harvest control rules, where technically feasible, for key stocks under its management control, where the harvest control rules do not exist. The plan will be developed by the end of the 2016–17 fiscal year.

2.66 **Data collected on fisheries management.** For four of the fish species we examined in greater detail, Department officials reported data quality issues related to the age of the fish, the **harvest rates**, or the assessment model. These species were bluefin tuna, WCVI AABM chinook salmon, capelin in the 4RST area, and Eclipse Sound narwhal. For lobster in the LFA 34 area, reference points were set based only on available information about lobster biology and historic catch levels. The assessment for this lobster stock did not take into account recent changes in the ecosystem or the impact of new, more efficient fishing methods. Fisheries and Oceans Canada recognized that these issues existed and made efforts to consider them in the advice it provided to fisheries managers.

2.67 Fisheries and Oceans Canada collects information on each major fish stock annually from fisheries managers and scientists through its Fishery Checklist. In 2015, the Department revised the checklist to focus on key measures to implement its Sustainable Fisheries Framework. This new Fishery Sustainability Survey provides a useful consolidation of information on its progress toward achieving its sustainable fisheries objectives. In our view,

Harvest rate—The proportion of fish in a fishery that are caught.

some of the questions that were on the checklist before the 2015 revision could also be useful to give the Department a more complete picture of the issues that fisheries managers face across regions. These include questions about data quality and about the categorization of stocks in the healthy, cautious, or critical zones when there are no reference points.

2.68 **Frequency of stock assessments.** In 2010, Fisheries and Oceans Canada began a transition to less frequent stock assessments for most fisheries, due in part to budget cuts. The Department indicated that this would provide greater predictability and stability to fishers. Some stocks that had formerly been assessed every year moved to a frequency of every two to five years, with less comprehensive “stock status updates” sometimes planned for interim years. New schedules for stock assessments were developed based on an analysis of criteria such as fish lifespan.

2.69 Some stock assessments were deemed high risk given significant ecological or other impacts. However, we found that the Department could not carry out all of the assessments that its own scientists deemed high risk. During our audit period, 51 high-risk assessments were planned, but 19 were not carried out in the year in which they were requested. Others had yet to be started by the end of our audit period. For two Pacific rockfish stocks (longspine thornyhead and rougheye rockfish), the Department had not completed a stock assessment in 15 years, despite a minimum planned frequency of every 10 years.

2.70 Fisheries and Oceans Canada had also not evaluated the likely impact of less frequent stock assessments on fisheries management. However, it recognized that there could be situations that would require a full assessment to be completed sooner than scheduled. In 2016, the Department published peer-reviewed guidance on this, and stated its intention to develop triggers identifying the conditions when it should proceed with full assessments earlier than scheduled for stocks slated to be assessed on a multi-year basis.

2.71 **Recommendation.** For each major fish stock, Fisheries and Oceans Canada should identify the indicators and values that would trigger a full stock assessment earlier than scheduled.

The Department’s response. Agreed. As each major stock is assessed, Fisheries and Oceans Canada will establish the indicators and values that would trigger an earlier full assessment during interim years. The Department’s Ecosystems and Oceans Science sector will engage with its advisory arm (that is, the Canadian Science Advisory Secretariat) to ensure that all terms of reference for full assessments include the setting of triggers for early assessments. This action is effective October 2016 for every future full stock assessment.

Fisheries and Oceans Canada did not have adequate systems to manage information on fisheries

What we found	<p>2.72 We found a lack of integration across the different regional information systems for fisheries management, and problems with timeliness and completeness of information. Fisheries and Oceans Canada had begun the process of integrating and streamlining its information systems to enhance data quality and support information sharing, but this was not due to be completed until 2020.</p> <p>2.73 Our analysis supporting this finding presents what we examined and discusses</p> <ul style="list-style-type: none">• Fisheries and Oceans Canada’s systems to manage fisheries information.
Why this finding matters	<p>2.74 This finding matters because timely, integrated, and accessible information about the health of fish stocks is the foundation for Fisheries and Oceans Canada’s fisheries management decisions.</p>
Recommendation	<p>2.75 Our recommendation in this area of examination appears at paragraph 2.80.</p>
Analysis to support this finding	<p>2.76 What we examined. We examined whether Fisheries and Oceans Canada had systems in place to properly manage the fisheries information it collects.</p> <p>2.77 Fisheries and Oceans Canada’s systems to manage fisheries information. In our previous audit of fisheries in 1999, we noted a lack of integration among systems for fisheries management, and problems with the timeliness and completeness of compiled information. At that time, we also noted that the Department had a five-year plan to replace these systems. By 2006, the Department still had not replaced them. It acknowledged at that time that management systems for its scientific data had grown in a largely uncoordinated way, and reported that it had subsequently made several attempts to update and consolidate its information systems.</p> <p>2.78 In this audit, we found that the six Fisheries and Oceans Canada regions still operated with regional and, in some cases, stock-specific information systems for fisheries management that did not communicate with one another. For example, in one region, fisheries managers were unable to use relevant information from fishers’ logbooks or third-party fisheries observer reports because the information was contained in separate, incompatible data systems held by other regions. Fisheries observers in two neighbouring fishing regions used different codes for the same species. In another case, the data within one regional database had a 66 percent error rate, which was largely the result of outdated software and connection difficulties between regional offices.</p> <p>2.79 Fisheries and Oceans Canada acknowledged that it had no consistent way to manage fisheries management data across the Department, and that its ability to access historical data was limited. This put the Department at risk of not having access to sufficient information to make effective and timely decisions. At the time of our audit, the Department was in the process of integrating and streamlining its fisheries management information systems to enhance data quality and support information sharing. The budget for the project was \$24 million over five years. However, given the scope of the project, the Department anticipated that the budget might not be adequate. In our opinion, because the project is not due for completion until 2020, current issues are likely to persist for several more years.</p> <p>2.80 Recommendation. Fisheries and Oceans Canada should ensure it has allocated adequate resources to develop a system or systems that allow for data availability and comparison to enable more effective and efficient fisheries management.</p> <p>The Department’s response. Agreed. As part of its Application Rationalization Initiative, Fisheries and Oceans Canada launched the Ecosystems and Fisheries Management Systems Integration stream of work in 2015, with the objective of consolidating and integrating systems nationally to fully support business requirements and comply with enabling technology standards by 2020.</p> <p>The project will involve reviewing and analyzing all data requirements, including national availability, sharing, and reporting capabilities to develop integrated systems that will improve data quality and information management to support decision making. The project will also build a foundation for ongoing Application Portfolio Management and Application Lifecycle Management to improve planning and the ability to meet changing needs.</p>

Preliminary project approval (approximately \$24 million over five years) was officially granted in May 2016. The Department will regularly review the adequacy of the project budget and refine cost estimates as the project moves through each approval gate in accordance with the guidelines of the Treasury Board of Canada Secretariat.

A project governance structure has been put in place, and monthly dashboard reports including budget forecasts and expenditures will be submitted for review by departmental senior management.

Consolidated systems will be migrated to new IT infrastructure by 2020. The Department will begin ongoing application portfolio management, optimization, and maintenance in the 2020–21 fiscal year.

Case Study: Fisheries and Oceans Canada's management of Greenland halibut (turbot) stocks

Information gaps increased the risk of unsustainable fishing for some Greenland halibut stocks

Overall message	<p>2.81 Overall, we found data gaps that increased the uncertainty in assessments of the health of some of the Greenland halibut stocks. We found missing or vague fisheries management objectives, incomplete scientific surveys, and problems with the Department's ability to obtain third-party monitoring data. Further, we found that incompatible information systems caused poor communication among regions.</p> <p>2.82 These findings are important because without this data, Fisheries and Oceans Canada may not have sufficient information to determine stock abundance quantitatively or to manage the Greenland halibut fisheries sustainably. If these management issues are not addressed, Fisheries and Oceans Canada will be limited in its ability to anticipate and prevent declines in Greenland halibut stocks.</p> <p>2.83 Our analysis supporting this finding presents what we examined and discusses</p> <ul style="list-style-type: none">• Integrated Fisheries Management Plans,• scientific surveys,• third-party data,• information for stock assessments, and• communication and knowledge-sharing among regions.
Context	<p>2.84 Greenland halibut, also known as turbot, is a migratory groundfish that supports the most valuable groundfish fishery in the Atlantic. Worth \$102 million annually, it represents about 50 percent of the landed value of all Canadian Atlantic groundfish. The domestic Greenland halibut fisheries in Canadian waters are managed by three regions:</p> <ul style="list-style-type: none">• Central and Arctic (northern stock, categorized as healthy, and Cumberland Sound stock, categorized as "unknown");• Newfoundland and Labrador (Atlantic Stock, whose health is categorized as "unknown"); and• Quebec (Gulf of St. Lawrence Stock, categorized as healthy). <p>2.85 Because a portion of the Atlantic stock is also present in international waters, it is managed together with the Northwest Atlantic Fisheries Organization (NAFO). The northern stock crosses the boundary between Canada and Greenland, and is managed bilaterally with Greenland. While NAFO is responsible for conducting stock assessments and setting catch limits for both of these stocks, Fisheries and Oceans Canada provides critical information to support this.</p>
Recommendation	<p>2.86 Our recommendation in this area of examination appears at paragraph 2.93.</p>
Analysis to support this finding	<p>2.87 What we examined. We examined whether Fisheries and Oceans Canada was managing the northern, Atlantic, and Gulf Greenland halibut stocks for conservation and sustainability. We did not examine the Department's management of the Cumberland Sound stock, or the Northwest Atlantic Fisheries Organization's role with respect to the other stocks.</p> <p>2.88 Integrated Fisheries Management Plans. We found that Fisheries and Oceans Canada had completed an Integrated Fisheries Management Plan for all Atlantic groundfish, but had no objectives specific to the Atlantic Greenland halibut stock. For the Gulf stock of Greenland halibut, the Integrated Fisheries Management Plan remained in draft. For the northern stock, a Plan was in place, but many of the objectives were neither measurable nor time-bound. Without measurable and time-bound objectives specific to the fishery, Fisheries and Oceans Canada cannot assess how well it is managing the stocks.</p> <p>2.89 Scientific surveys. The Newfoundland and Labrador region could not conduct all of its planned annual surveys for Greenland halibut stocks in some years because vessels had mechanical problems, resulting in missing data. The surveys that the region did carry out did not include the deeper waters that are home to the Greenland halibut. In addition, there were contradictory signals from three separate surveys. In the Central and Arctic region, surveys of the northern stock did not gather information on mature female fish because the gear on the vessel used could not capture these larger fish.</p> <p>2.90 Third-party data. At-sea observer coverage was below the required target for portions of the northern stock. This is particularly important because the Department does not have access to dockside monitoring information for much of the catch and therefore relies heavily on at-sea observers for information about this stock. Fisheries and Oceans Canada had limited data on issues such as lost nets or nets left in the water for periods longer than allowed (leading to spoilage of fish). These gaps combined to amplify the uncertainty about the amount of fish caught for the northern stock, compared with the other Greenland halibut stocks.</p> <p>2.91 Information for stock assessments. Given the uncertainty about fish abundance and fish being caught created by the data gaps described above, Fisheries and Oceans Canada acknowledged that it was unable to provide the Northwest Atlantic Fisheries Organization with enough information to support a quantitative assessment (for the northern stock) or an assessment with an adequate level of certainty (for the Atlantic stock). The missing information is necessary for developing models robust enough to accurately predict changes in stock abundance.</p> <p>2.92 Communication and knowledge-sharing among regions. The two regions responsible for managing the northern and Atlantic stocks were limited in their ability to share fisheries information on Greenland halibut fisheries because they used incompatible information systems. As a result, decision makers could not always access relevant information when they needed it. For example, the Central and Arctic region did not have access to timely information from vessels licensed through the Newfoundland and Labrador region in order to determine when catch levels exceeded limits. In 2015, communication problems resulted in a component of the northern fishery catching almost 50 percent more fish than allowed. The extent of overfishing came to light only after the fishery was closed.</p>

2.93 **Recommendation.** Fisheries and Oceans Canada should improve coordination between regions so that it can better share the fisheries monitoring information needed to manage the northern and Atlantic Greenland halibut stocks.

The Department's response. Agreed. In June 2016, Fisheries and Oceans Canada implemented a plan to improve communication and quota management between its regions that manage the Greenland halibut Northwest Atlantic Fisheries Organization (NAFO) Division OB fixed gear competitive fishery. As a result, there were no quota overruns in 2016.

The Department will develop and implement a plan to improve sharing of logbook data between Fisheries and Oceans Canada regions to enhance the monitoring of the NAFO Subarea 0 Greenland halibut fishery. The Department will also develop and implement an overall plan to improve the sharing of fishery monitoring information between regions for the management of these stocks. Both plans will be developed and implemented by June 2017.

Conclusion

2.94 We concluded that Fisheries and Oceans Canada had identified the key elements it needed for fisheries management: Integrated Fisheries Management Plans, scientific surveys, third-party fisheries observer programs, stock assessments, and reference points for establishing stock health. However, the Department had not put these elements in place for all major stocks.

2.95 We also concluded that Fisheries and Oceans Canada did not always apply these key planning elements to ensure management decisions for selected fisheries were focused on conservation and sustainable use.

About the Audit

The Office of the Auditor General's responsibility was to conduct an independent examination of fisheries management planning, to provide objective information, advice, and assurance to assist Parliament in its scrutiny of the government's management of resources and programs.

All of the audit work in this report was conducted in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada (CPA Canada) in the CPA Canada Handbook—Assurance. While the Office adopts these standards as the minimum requirement for our audits, we also draw upon the standards and practices of other disciplines.

As part of our regular audit process, we obtained management's confirmation that the findings in this report are factually based.

Objectives

The objectives of the audit were to determine whether

- Fisheries and Oceans Canada had identified and put in place selected key elements necessary for fisheries management planning for conservation and sustainable use, and
- Fisheries and Oceans Canada had applied key planning elements in making management decisions for conservation and sustainable use for selected fish stocks.

The elements assessed under the audit objectives are defined in the criteria, below.

Scope and approach

The audit examined the identification and development of Integrated Fisheries Management Plans and their associated performance reviews. It examined the identification and development of key elements of stock assessments as inputs to Integrated Fisheries Management Plans. It also examined selected key inputs for stock assessment, including third-party fisheries observation and Fisheries and Oceans Canada's own scientific surveys.

The audit also examined the application of key fisheries management elements to inform fisheries management decisions. Management planning for a selection of six fish stocks was examined, along with a detailed case study of three Greenland halibut stocks. These fisheries were selected judgmentally based on criteria including

- regional diversity across the Department's regions;
- the presence of key management tools in relation to the fishery;
- the stock type (for example, groundfish, molluscs);
- the stock status; and
- the economic value of the fishery.

The nine fish stocks selected were

- three stocks of Greenland halibut (northern, Atlantic, and Gulf of St. Lawrence);
- geoduck clam;
- Eclipse Sound narwhal;
- bluefin (red) Western Atlantic tuna;
- capelin in the 4RST area;
- WCVI AABM chinook salmon; and
- lobster in the LFA 34 area.

In addition to reviewing documents and conducting interviews, we used the results of Fisheries and Oceans Canada's 2014 Fishery Checklist—a questionnaire completed by fisheries managers and fisheries scientists for each of the 154 major fish stocks—as a key source of information. At the end of our audit, Fisheries and Oceans Canada revised its major stocks listing and now identifies 159 stocks as major stocks.

Criteria

To determine whether Fisheries and Oceans Canada had identified and put in place selected key elements necessary for fisheries management planning for conservation and sustainable use, we used the following criteria:

Criteria	Sources
Fisheries and Oceans Canada has identified the key elements necessary for fisheries management planning.	<ul style="list-style-type: none">• United Nations Fish Stocks Agreement, Food and Agriculture Organization of the United Nations, 1995• Sustainable Development Strategy 2013–14, updated in the Report on Plans and Priorities 2015–16, Fisheries and Oceans Canada• Sustainable Fisheries Framework, Fisheries and Oceans Canada
Fisheries and Oceans Canada has management plans for conservation and sustainable use in place for each of Canada's major fish stocks.	<ul style="list-style-type: none">• Sustainable Development Strategy 2013–14, updated in the Report on Plans and Priorities 2015–16, Fisheries and Oceans Canada• Sustainable Fisheries Framework, Fisheries and Oceans Canada
Fisheries and Oceans Canada has completed performance reviews to determine the effectiveness of management measures and to identify areas for improvement overall for each of Canada's major fish stocks.	<ul style="list-style-type: none">• Sustainable Development Strategy 2013–14, updated in the Report on Plans and Priorities 2015–16, Fisheries and Oceans Canada• Sustainable Fisheries Framework, Fisheries and Oceans Canada

Criteria	Sources
Fisheries and Oceans Canada has completed the necessary stock assessments for Canada's major fish stocks.	<ul style="list-style-type: none"> United Nations Fish Stocks Agreement, Food and Agriculture Organization of the United Nations, 1995 Code of Conduct for Responsible Fisheries, Food and Agriculture Organization of the United Nations, 1995 Sustainable Development Strategy 2013–14, updated in the Report on Plans and Priorities 2015–16, Fisheries and Oceans Canada
Fisheries and Oceans Canada has systems in place designed to ensure that data from third-party monitoring is timely and reliable.	<ul style="list-style-type: none"> United Nations Fish Stocks Agreement, Food and Agriculture Organization of the United Nations, 1995 <i>Fishery (General) Regulations</i> Policy for Scientific Data, Fisheries and Oceans Canada, 2013

To determine whether Fisheries and Oceans Canada had applied key planning elements in making management decisions for conservation and sustainable use for selected fish stocks, we used the following criteria:

Criteria	Sources
Fisheries and Oceans Canada has applied the key required fisheries management planning measures for selected fish stocks.	<ul style="list-style-type: none"> Sustainable Development Strategy 2013–14, updated in the Report on Plans and Priorities 2015–16, Fisheries and Oceans Canada Sustainable Fisheries Framework, Fisheries and Oceans Canada
Fisheries and Oceans Canada has incorporated the results of catch reporting from third-party catch monitoring and information from other sources (including its own surveys and industry or academic studies) into its stock assessments for selected fish stocks.	<ul style="list-style-type: none"> United Nations Fish Stocks Agreement, Food and Agriculture Organization of the United Nations, 1995 Code of Conduct for Responsible Fisheries, Food and Agriculture Organization of the United Nations, 1995 Sustainable Development Strategy 2013–14, updated in the Report on Plans and Priorities 2015–16, Fisheries and Oceans Canada <i>Fishery (General) Regulations</i> Policy for Scientific Data, Fisheries and Oceans Canada, 2013 New Emerging Fisheries Policy, Fisheries and Oceans Canada, 2008
Fisheries and Oceans Canada has applied its systems to ensure it has received timely and reliable information from third-party catch monitoring for selected fish stocks.	<ul style="list-style-type: none"> United Nations Fish Stocks Agreement, Food and Agriculture Organization of the United Nations, 1995 <i>Fishery (General) Regulations</i> Policy for Scientific Data, Fisheries and Oceans Canada, 2013

Management reviewed and accepted the suitability of the criteria used in the audit.

Period covered by the audit

The audit covered the period from January 2013 to May 2016. Audit work for this report was completed on 29 July 2016.

Audit team

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List of Recommendations

The following is a list of recommendations found in this report. The number in front of the recommendation indicates the paragraph where it appears in the report. The numbers in parentheses indicate the paragraphs where the topic is discussed.

Planning for sustainable fisheries management

Recommendation	Response
2.28 Fisheries and Oceans Canada should set out priorities, targets, and timelines for putting in place Integrated Fisheries Management Plans for all major fish stocks. These should include long-term, specific, measurable objectives, performance reviews, and rebuilding plans for stocks in the critical zone that are still being fished. These plans should also be made publicly accessible. (2.19–2.27)	<p>The Department's response. Agreed. Fisheries and Oceans Canada will develop a plan with priorities, targets, and timelines for completing Integrated Fisheries Management Plans (IFMPs) for all major stocks that currently do not have these plans, and for updating existing plans that are out of date. Development of the IFMPs will be consistent with the departmental guidance on IFMPs, which includes a requirement for clear fishery objectives and a performance review. The Department's plan will include priorities and timelines for making IFMPs not already posted accessible to the public through the departmental website.</p> <p>The Department will also develop a plan with priorities, targets, and timelines for completing rebuilding plans that are in line with the Department's Guidance for the Development of Rebuilding Plans under the Precautionary Approach Framework for stocks that are in the critical zone.</p> <p>The Department will develop both plans by the end of the 2016–17 fiscal year.</p>

Gathering, analyzing, and managing information on fish stocks

Recommendation	Response
2.45 Fisheries and Oceans Canada should review its current scientific survey activities to identify gaps, and adjust its activities to ensure they are fully aligned with departmental priorities. (2.39–2.44)	<p>The Department's response. Agreed. With the new funding received from Budget 2016, Fisheries and Oceans Canada will increase its monitoring coverage of key areas and species of marine mammals, fish, and invertebrates. The Department is currently developing a long-term plan that incorporates this new funding and provides the opportunity to further address knowledge gaps and align the Department's scientific monitoring activities with key departmental priorities. The plan will be developed by the end of the 2016–17 fiscal year.</p>

Recommendation	Response
<p>2.52 Fisheries and Oceans Canada should improve controls for third-party fisheries observer programs to ensure sufficient coverage of fishing vessels, timely data, and mitigation of potential or actual conflicts of interest on the part of observer companies. (2.46–2.51)</p>	<p>The Department's response. Agreed. Fisheries and Oceans Canada will undertake the following:</p> <ul style="list-style-type: none"> Finalize a national policy on fisheries monitoring (currently under development). The policy will introduce a risk-based method to establish fishery monitoring coverage, to ensure consistency across fisheries, and to make reliable and timely data available for fisheries management. The goal is to complete the fishery monitoring policy in 2017. Implement a program to verify compliance of observer companies with the National Dockside Monitoring Program Policy and Procedures and the At-Sea Observer Program Corporation Designation Policy and Procedures. Based on the analysis of the verification results, the Department will identify key findings and recommendations, if applicable. Outcomes of the verification process may be used to inform decisions about the national at-sea observer and dockside monitoring programs. The Department launched the verification process in July 2016 and will continue this process on an ongoing basis. Develop and implement interim guidelines for mitigation of conflicts of interest. These guidelines will remain in effect until the Department revises its dockside monitoring program policy and at-sea observer policy. Development of interim guidelines will begin immediately and remain in effect until the revisions of the dockside monitoring program policy and the at-sea observer policy are finalized. Revise the dockside monitoring program policy and at-sea observer policy to incorporate the interim guidelines for mitigation of conflict of interest, and a set of graduated measures to manage non-compliance issues, such as quality and timeliness of data. Revisions of the dockside monitoring program policy and the at-sea observer policy will begin in early 2017; this process is expected to take 12 to 18 months.
<p>2.63 Fisheries and Oceans Canada should set out priorities and timelines for establishing the reference points at which the major stocks it manages can be considered healthy, in the cautious zone, or in the critical zone. (2.58–2.62)</p>	<p>The Department's response. Agreed. Fisheries and Oceans Canada will develop a plan with priorities, targets, and timelines for establishing precautionary approach reference points, where technically feasible, for key stocks under the Department's management control, where the reference points do not exist. A plan will be developed by the end of the 2016–17 fiscal year.</p>
<p>2.65 Fisheries and Oceans Canada should set out priorities and timelines for identifying the measures to be taken if a major stock falls below a certain level, where this has not yet been done, so that sustainable fishing limits can be determined with greater certainty. (2.58, 2.64)</p>	<p>The Department's response. Agreed. Fisheries and Oceans Canada will develop a plan with priorities, targets, and timelines for establishing precautionary approach harvest control rules, where technically feasible, for key stocks under its management control, where the harvest control rules do not exist. The plan will be developed by the end of the 2016–17 fiscal year.</p>
<p>2.71 For each major fish stock, Fisheries and Oceans Canada should identify the indicators and values that would trigger a full stock assessment earlier than scheduled. (2.58, 2.68–2.70)</p>	<p>The Department's response. Agreed. As each major stock is assessed, Fisheries and Oceans Canada will establish the indicators and values that would trigger an earlier full assessment during interim years. The Department's Ecosystems and Oceans Science sector will engage with its advisory arm (that is, the Canadian Science Advisory Secretariat) to ensure that all terms of reference for full assessments include the setting of triggers for early assessments. This action is effective October 2016 for every future full stock assessment.</p>
<p>2.80 Fisheries and Oceans Canada should ensure it has allocated adequate resources to develop a system or systems that allow for data availability and comparison to enable more effective and efficient fisheries management. (2.76–2.79)</p>	<p>The Department's response. Agreed. As part of its Application Rationalization Initiative, Fisheries and Oceans Canada launched the Ecosystems and Fisheries Management Systems Integration stream of work in 2015, with the objective of consolidating and integrating systems nationally to fully support business requirements and comply with enabling technology standards by 2020.</p> <p>The project will involve reviewing and analyzing all data requirements, including national availability, sharing, and reporting capabilities to develop integrated systems that will improve data quality and information management to support decision making. The project will also build a foundation for ongoing Application Portfolio Management and Application Lifecycle Management to improve planning and the ability to meet changing needs.</p> <p>Preliminary project approval (approximately \$24 million over five years) was officially granted in May 2016. The Department will regularly review the adequacy of the project budget and refine cost estimates as the project moves through each approval gate in accordance with the guidelines of the Treasury Board of Canada Secretariat.</p> <p>A project governance structure has been put in place, and monthly dashboard reports including budget forecasts and expenditures will be submitted for review by departmental senior management.</p> <p>Consolidated systems will be migrated to new IT infrastructure by 2020. The Department will begin ongoing application portfolio management, optimization, and maintenance in the 2020–21 fiscal year.</p>

Case Study: Fisheries and Oceans Canada's management of Greenland halibut (turbot) stocks

Recommendation	Response
<p>2.93 Fisheries and Oceans Canada should improve coordination between regions so that it can better share the fisheries monitoring information needed to manage the northern and Atlantic Greenland halibut stocks. (2.87, 2.90–2.92)</p>	<p>The Department's response. Agreed. In June 2016, Fisheries and Oceans Canada implemented a plan to improve communication and quota management between its regions that manage the Greenland halibut Northwest Atlantic Fisheries Organization (NAFO) Division 0B fixed gear competitive fishery. As a result, there were no quota overruns in 2016.</p> <p>The Department will develop and implement a plan to improve sharing of logbook data between Fisheries and Oceans Canada regions to enhance the monitoring of the NAFO Subarea 0 Greenland halibut fishery. The Department will also develop and implement an overall plan to improve the sharing of fishery monitoring information between regions for the management of these stocks. Both plans will be developed and implemented by June 2017.</p>