



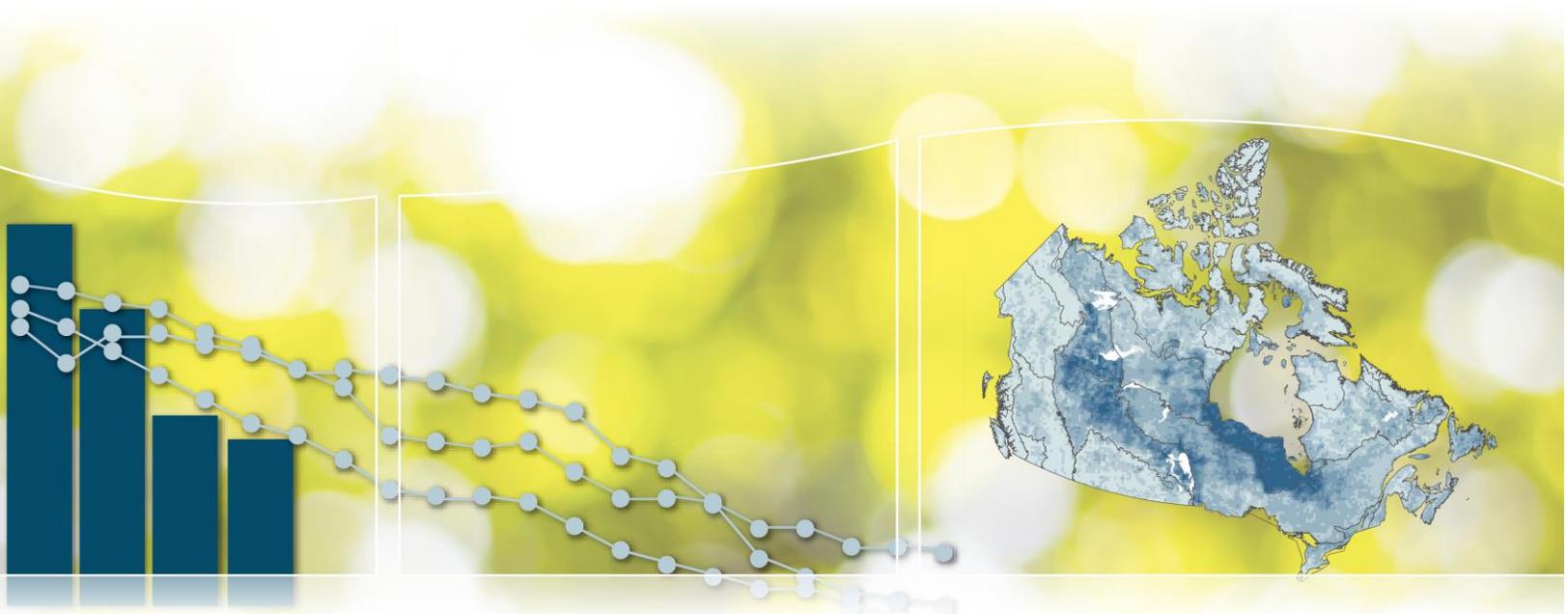
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# Canadian Environmental Sustainability Indicators

## Status of major fish stocks



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Environment and Climate Change Canada  
Public Inquiries Centre  
12th floor, Fontaine Building  
200 Sacré-Coeur boul.  
Gatineau, QC K1A 0H3  
Telephone: 1-800-668-6767 (in Canada only) or 819-938-3860  
Fax: 819-938-3318  
Email: [ec.enviroinfo.ec@canada.ca](mailto:ec.enviroinfo.ec@canada.ca)

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## Status of major fish stocks

August 2018

### Table of Contents

<b>Status of major fish stocks</b> .....	<b>5</b>
Key results.....	5
Status of major fish stocks, by stock group .....	7
Key results.....	7
About the indicator.....	7
What the indicator measures.....	7
Why this indicator is important .....	8
Related indicators.....	8
Data sources and methods.....	9
Data sources .....	9
Methods.....	9
Recent changes.....	10
Caveats and limitations .....	10
Resources.....	11
References .....	11
Related information .....	11
<b>Annex</b> .....	<b>12</b>
Annex A. Data tables for the figures presented in this document .....	12

**List of Figures**

Figure 1. Status of major fish stocks, Canada, 2011 to 2016 ..... 5  
Figure 2. Status of major fish stocks, by regional management office, Canada, 2016 ..... 6  
Figure 3. Status of major fish stocks, by stock group, Canada, 2016 ..... 7

**List of Tables**

Table A.1. Data for Figure 1. Status of major fish stocks, Canada, 2011 to 2016 ..... 12  
Table A.2. Data for Figure 2. Status of major fish stocks, by regional management office,  
Canada, 2016 ..... 12  
Table A.3. Data for Figure 3. Status of major fish stocks, by stock group, Canada, 2016 ..... 13

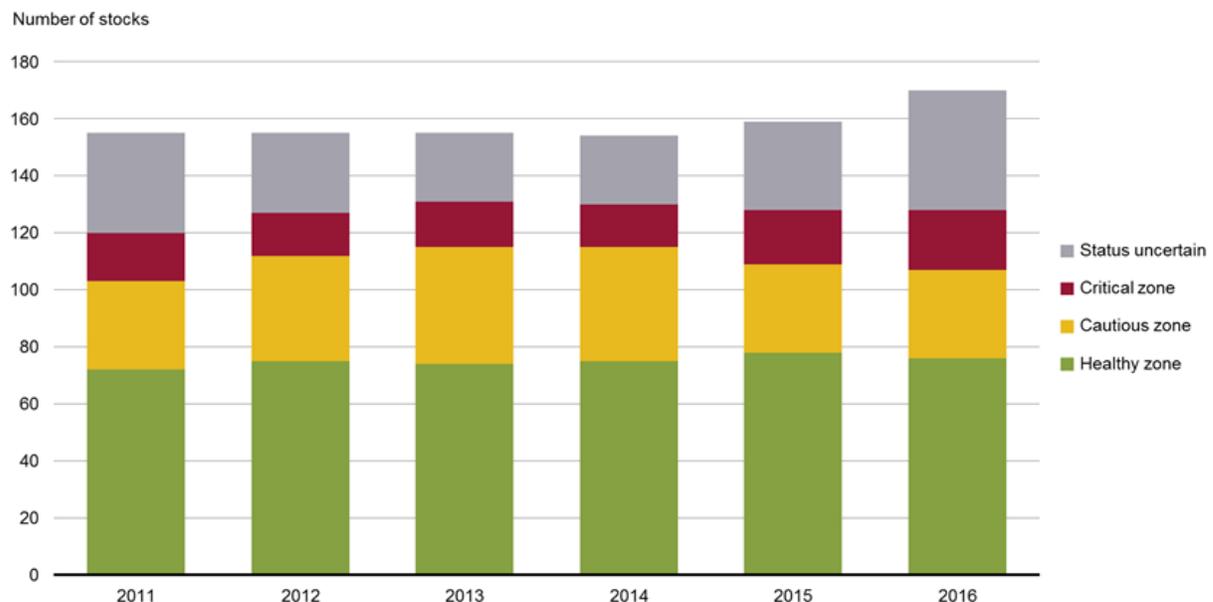
## Status of major fish stocks

Environmental conditions and human use of the oceans affect the abundance and health of fish stocks, at national and global levels. In order to protect fish stocks for future generations, it is important to track their condition and adjust management, such as harvest limits, accordingly. The indicator reports the status of major Canadian fish stocks.

### Key results

- Of the 170 [major stocks](#) assessed in 2016:
  - 76 stocks (45%) were classified as Healthy
  - 31 stocks (18%) were classified as Cautious
  - 21 stocks (12%) were classified as Critical
  - 42 stocks (25%) could not be classified with current information
- There has been little change in the overall status of stocks since 2011. This is as expected as changes in stocks happen gradually over a long period of time

**Figure 1. Status of major fish stocks, Canada, 2011 to 2016**



[Data for Figure 1](#)

**Note:** Fish stocks are classified by comparing the size of stocks to reference points. Stocks include a variety of harvested marine animal species, not only finfish. Comparisons between years should be made with caution, as the list of major stocks has changed.

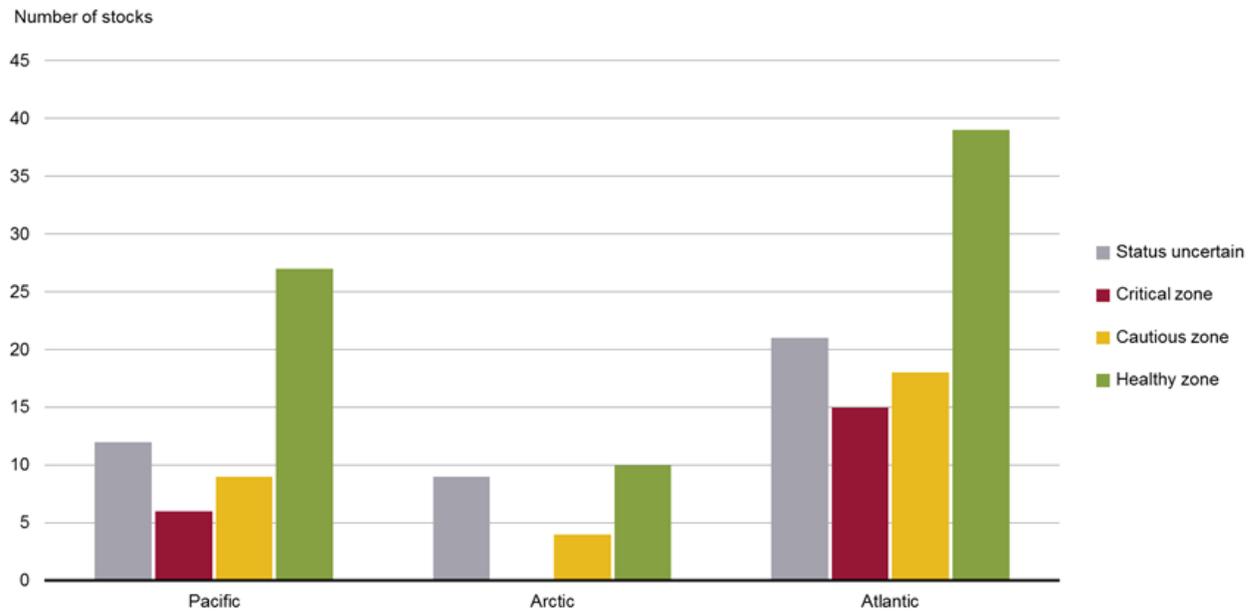
**Source:** Fisheries and Oceans Canada (2017) [Sustainability Survey for Fisheries](#).

Changes in stock status typically happen slowly. Recovery time depends on the biology of the stock, environmental conditions, and management actions. For example, environmental changes such as shifts in climate and ocean currents may cause some stocks to reproduce more slowly. It may take many years for biological systems to respond to changes in management practices such as limiting annual fish harvest.

Harvest rates are adjusted to help rebuild stocks that are not in the Healthy zone. Stock assessments for major stocks are peer-reviewed and made publicly available through [Science Advisory Reports](#). The stock status is reported as part of the [Sustainability Survey for Fisheries](#), which is a key planning and monitoring tool.

Stocks can be divided into regions based on the managing office. The Pacific management region has the highest proportion of healthy stocks. A greater proportion of stocks have uncertain status in the Arctic region.

**Figure 2. Status of major fish stocks, by regional management office, Canada, 2016**



www.canada.ca/environmental-indicators

[Data for Figure 2](#)

**Note:** Stocks managed from the central National office were allocated to Atlantic and Arctic regions as appropriate.

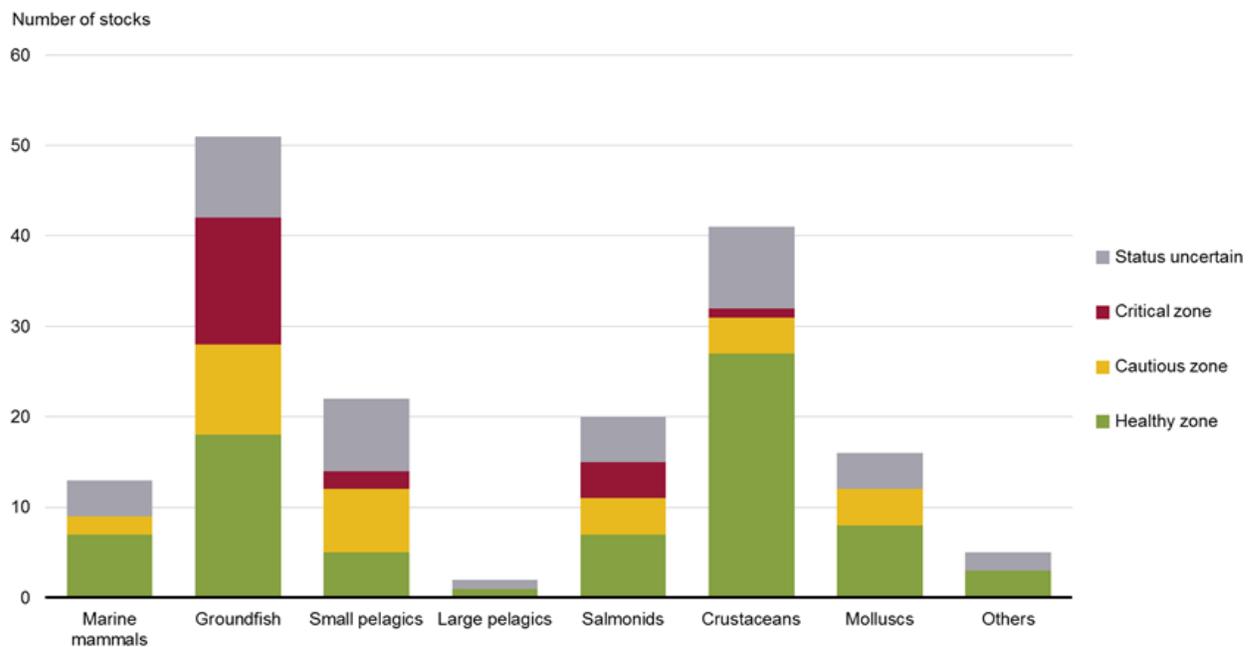
**Source:** Fisheries and Oceans Canada (2017) [Sustainability Survey for Fisheries](#).

## Status of major fish stocks, by stock group

### Key results

- Groundfish stocks, for example cod, halibut and haddock, have the highest proportion of stocks in the Critical zone
- Crustacean stocks, for example crab, lobster and shrimp, have the highest proportion of stocks in the Healthy zone

**Figure 3. Status of major fish stocks, by stock group, Canada, 2016**



www.canada.ca/en/environmental-indicators

[Data for Figure 3](#)

**Note:** The species in each stock group are listed in the figure's data table. Pelagic fish live in midwater or close to the surface, in contrast to groundfish, which live in deeper waters. Crustaceans are shelled animals with joints, such as lobster, crab and shrimp. Molluscs are the species we commonly think of as shellfish, including bivalve species like clams, oysters and mussels.  
**Source:** Fisheries and Oceans Canada (2017) [Sustainability Survey for Fisheries](#).

Groundfish stocks are more likely to be in the Critical zone, in part due to formerly high harvest levels and unfavourable environmental conditions in the 1990's. Recent improvements in some groundfish stocks may be attributed to low harvest levels and warmer conditions that are favourable for them.

Most crustacean stocks are doing well due to factors such as favourable environmental conditions in the 2000's, low predation rates and effective stock management. However, warmer conditions and high predation in recent years have negatively impacted many stocks of shrimp and Snow Crab.

## About the indicator

### What the indicator measures

The indicator reports the status of major fish stocks. Federal biologists use a variety of scientific methods to assess fish stock levels and assign 1 of 3 [stock status zones](#) (Healthy, Cautious or Critical) by comparing the size of the stocks to reference points. If there is insufficient information to be able to determine the stock status zone, the status is uncertain.

Stock status is an important element of the precautionary approach.

### Why this indicator is important

The status of the stock affects management decisions, including harvest rates:

- for stocks in the Healthy zone, fisheries management decisions (including harvest strategies) are designed to maintain fish stocks within this zone, while providing sustainable benefits
- for stocks in the Cautious zone, management promotes stock rebuilding to the Healthy zone
- for stocks in the Critical zone, stock growth is promoted and removals are kept to the lowest possible level

Successful management leads to sustainable stocks that maintain our food supply, bringing health and economic benefits.

The parties to the [Convention on Biological Diversity](#), among them Canada, have set an aspirational target to manage and harvest all marine stocks sustainably, avoiding adverse impacts on species and ecosystems, by 2020. This is the sixth of 20 targets collectively known as the [Aichi Biodiversity Targets](#), established in October 2010. It aligns with target 8 of the [2020 Biodiversity Goals and Targets for Canada](#).

The state of fish stocks is a key measure of ocean health, used to measure progress toward the [Sustainable Development Goals of the 2030 Agenda for Sustainable Development](#). The indicator is directly linked to the desired outcome of Target 14.4: "By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics." It also indirectly supports other goals and targets.

### Related indicators

The [Sustainable fish harvest](#) indicator reports the rate of overharvesting of major stocks.

The [Canadian species index](#) has a marine sub-index that shows the population trend of monitored marine vertebrate species.



#### Healthy coasts and oceans

This indicator supports the measurement of progress towards the following [2016–2019 Federal Sustainable Development Strategy](#) long-term goal: Coasts and oceans support healthy, resilient and productive ecosystems.

## Data sources and methods

### Data sources

Data for 2015 and 2016 are from the annual [Sustainability Survey for Fisheries](#) (the survey). The survey replaces the Fishery Checklist, which was used from 2011 to 2014. The survey provides a systematic review of national progress toward conservation and sustainable-use objectives.

#### More information

The survey is conducted each spring and captures data for the previous year. The same survey supports the [Sustainable fish harvest](#) indicator.

The data provide a qualitative snapshot of how a fishery is addressing a range of factors for sustainable management. The data also give an indication of progress in implementing sustainable fisheries policies. Fisheries managers and scientists include results from the most recent stock assessments in their response to the survey.

The survey includes major stocks used by commercial, recreational and Indigenous fisheries.

- A fish stock is a population of individuals of one species found in a particular area. It is used as a unit for fisheries management
- Major stocks are identified by regional managers within Fisheries and Oceans Canada and include all stocks that meet at least 1 of the following criteria:
  - have an annual landed value greater than \$1 million
  - have an annual landed weight greater than 2 000 tonnes
  - have an [Integrated Fisheries Management Plan](#)
  - are highly migratory or are a transboundary stock that is internationally managed
  - have been assessed by [Committee on the Status of Endangered Wildlife in Canada](#) as being of special concern and are subject to a directed fishery
  - are deemed to be of regional significance
- Fish stocks include marine mammals, finfish, shellfish and other marine invertebrates
- A year is defined based on fishing seasons and closures for individual stocks. It may not align exactly with the calendar year and may vary between stocks

### Methods

A variety of scientific methods are used to assess fish stock levels and assign one of 3 stock status classifications (Healthy, Cautious or Critical). The indicator is a simple count of the stocks in each status zone. The number of stocks that cannot be assigned to a status zone is also reported.

#### More information

Fish stock levels are impacted by a number of factors, including the amount harvested, environmental conditions, and the amount of predation.

- A stock is in the Healthy zone when its biomass is above the upper stock reference point. The upper stock reference point is determined by the productivity of the stock, broader biological considerations, and the social and economic objectives for the fishery
- A stock is in the Critical zone if it falls below the limit reference point. The limit reference point is the stock level below which productivity is sufficiently impaired to cause serious harm to the stock
- Between these 2 points, the stock is in the Cautious zone

If reference points have not yet been established, zones are assigned based on the best available information on the fish's biology and its historic levels. If zones cannot be determined with current information, the stock is assigned an uncertain status.

Stock assessments are conducted in a variety of ways and use many types of data, including abundance estimates and biomass estimates. Many sources of data contribute to assessments, including data from fishery monitoring (such as catch rates and fish body-size distribution), research surveys, community knowledge and directed research.

### **Regional information**

Regions are defined based on the managing office. Stocks managed from the Pacific regional office of Fisheries and Oceans Canada are assigned the Pacific region. Stocks managed from the Central and Arctic office are assigned to the Arctic region: this region contains some freshwater stocks. Stocks managed from the central National office were allocated to Atlantic and Arctic regions as appropriate. All remaining regional offices are assigned to the Atlantic region: Gulf, Maritimes, Newfoundland, and Quebec.

### **Stock groups**

Stock groups used for reporting on this indicator are marine mammals, salmonids, groundfish, large pelagics, small pelagics, crustaceans (crab, lobster and shrimp), molluscs, and others. Each group is comprised of species with similar life history characteristics. For example, groundfish spend their adult life at or near the bottom of the ocean. The same groupings are used in the [Sustainable fish harvest](#) indicator.

## **Recent changes**

The [Sustainability Survey for Fisheries](#) (the survey), previously called the Fishery Checklist, has been revised over time to improve its usefulness as a management tool. In 2011, the checklist and a set of 155 major stocks were finalized for the period 2011 to 2014, allowing comparability between years. The Porbeagle Shark was classified in the Critical zone in 2013 and the fishery was subsequently closed. The stock was therefore removed from the list in 2014, leaving a total of 154 stocks.

In 2015, changes were made and the checklist became the annual Sustainability Survey for Fisheries. The list of major stocks was revised to a total of 159:

- 3 Snow Crab stocks were merged (-2)
- 1 Northern Shrimp fishery was closed and the stock removed from the list (-1)
- 6 stocks (3 shrimp, 1 Elver, 1 Redfish and 1 Witch Flounder) were added (+6)
- Pacific Ocean Perch was split into 3 stocks (+2)

In 2016, additional changes were made to the survey. The list of major stocks was revised to a total of 170:

- 2 lobster stocks were merged (-1)
- 3 stocks with no commercial fishery in 2016 (Pink Salmon, Coho Salmon, whelk) were removed from the list (-3)
- 3 salmon stocks (1 Chum, 2 Sockeye) were split into revised management units (+5)
- 10 commercially fished stocks (6 Snow Crab, 2 seal, 1 shrimp and 1 scallop) were added to the list (+10)

A view of the information by region is now provided.

## **Caveats and limitations**

The [Sustainability Survey for Fisheries](#) (the survey) is completed with the best available information. The criteria used to assign a stock status to a stock for which no reference points have been identified have changed over time. This has resulted in revisions to the reported stock status for a

number of stocks between 2011 and 2016, so comparisons between years should be made with caution.

Small changes in the set of surveyed stocks occur due to changes in the way stocks are assessed or managed. Results should be interpreted with this in mind.

Stock status assessments are not conducted for every stock every year, meaning that recent changes in status may not be captured for every stock.

The indicator includes major stocks of fish, invertebrates, and marine mammals. Seaweeds and other aquatic plants are excluded.

The regional breakdown is based on the managing office, not the location of the stock, except in the case of the National office where stocks were allocated to Atlantic and Arctic regions as appropriate.

## Resources

### References

Fisheries and Oceans Canada (2009) [A Fishery Decision-Making Framework Incorporating the Precautionary Approach](#). Retrieved on October 24, 2017.

Fisheries and Oceans Canada (2016) [Sustainability Survey for Fisheries](#). Retrieved on October 24, 2017.

### Related information

[Aquatic species](#)

[Fisheries](#)

[Science Advisory Reports](#) (includes Stock Status Reports)

[Sustainable fish and seafood](#)

## Annex

### Annex A. Data tables for the figures presented in this document

Table A.1. Data for Figure 1. Status of major fish stocks, Canada, 2011 to 2016

Year	Healthy zone (number of stocks)	Cautious zone (number of stocks)	Critical zone (number of stocks)	Status uncertain (number of stocks)	Total (number of stocks)
2011	72	31	17	35	155
2012	75	37	15	28	155
2013	74	41	16	24	155
2014	75	40	15	24	154
2015	78	31	19	31	159
2016	76	31	21	42	170

**Note:** Fish stocks are classified by comparing the size of stocks to reference points. Stocks include a variety of harvested marine animal species, not only finfish. Comparisons between years should be made with caution, as the list of major stocks has changed.

**Source:** Fisheries and Oceans Canada (2017) [Sustainability Survey for Fisheries](#).

Table A.2. Data for Figure 2. Status of major fish stocks, by regional management office, Canada, 2016

Status	Pacific (number of stocks)	Arctic (number of stocks)	Atlantic (number of stocks)
Healthy zone	27	10	39
Cautious zone	9	4	18
Critical zone	6	0	15
Status uncertain	12	9	21

**Note:** Stocks managed from the central National office were allocated to Atlantic and Arctic regions as appropriate.

**Source:** Fisheries and Oceans Canada (2017) [Sustainability Survey for Fisheries](#).

**Table A.3. Data for Figure 3. Status of major fish stocks, by stock group, Canada, 2016**

<b>Stock group</b>	<b>Species included</b>	<b>Healthy zone (number of stocks)</b>	<b>Cautious zone (number of stocks)</b>	<b>Critical zone (number of stocks)</b>	<b>Status uncertain (number of stocks)</b>
Marine mammals	Whales, walrus	7	2	0	4
Groundfish	Halibut, rockfish, cod, flounder, hake, redfish, dogfish, haddock, lingcod, perch, plaice, pollock, sablefish, skate, thornyhead	18	10	14	9
Small pelagics	Herring, mackerel, whitefish, capelin, sardine, striped bass, gaspereau, eulachon	5	7	2	8
Large pelagics	Tuna, swordfish	1	0	0	1
Salmonids	Salmon, char, trout	7	4	4	5
Crustaceans	Crab, lobster, shrimp, prawn, krill	27	4	1	9
Molluscs	Clam, scallop, whelk, geoduck	8	4	0	4
Others	Sea cucumber, sea urchin, eel and elver	3	0	0	2
<b>Total</b>		<b>76</b>	<b>31</b>	<b>21</b>	<b>42</b>

**Note:** Pelagic fish live in midwater or close to the surface, in contrast to groundfish, which live in deeper waters. Crustaceans are shelled animals with joints, such as lobster, crab and shrimp. Molluscs are the species we commonly think of as shellfish, including bivalve species like clams, oysters and mussels.

**Source:** Fisheries and Oceans Canada (2017) [Sustainability Survey for Fisheries](#).

Additional information can be obtained at:

Environment and Climate Change Canada

Public Inquiries Centre

12th Floor, Fontaine Building

200 Sacré-Coeur boul.

Gatineau, QC K1A 0H3

Telephone: 1-800-668-6767 (in Canada only) or 819-938-3860

Fax: 819-938-3318

Email: [ec.enviroinfo.ec@canada.ca](mailto:ec.enviroinfo.ec@canada.ca)