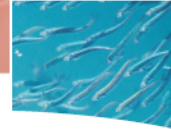




Environment
Canada

Environnement
Canada

www.ec.gc.ca



Data Sources and Methods: Sustainable Fish Harvest Indicator

April 2012

Cat.#: En4-144/34-2012E-PDF
ISBN: 978-1-100-20550-2

Canada 

1 Introduction

The Sustainable Fish Harvest indicator is part of the Canadian Environmental Sustainability Indicators (CESI) program, which provides data and information to track Canada's performance on key environmental sustainability issues.

The long-term maintenance of the ecological, social and economic value of fish stocks requires controlling harvest to avoid overexploitation. Fisheries and Oceans Canada, in partnership with industry, implements plans, policies and programs to protect stocks, assist in long-term sustainability, and provide for the fair allocation and distribution of harvestable surpluses among those dependent on the resource, in accordance with the precautionary approach.¹ This indicator measures compliance with harvest limits as a measure of pressures on wild fish stocks.

2 Description and rationale of the Sustainable Fish Harvest indicator

2.1 Description

The Sustainable Fish Harvest indicator compares harvest rates with established harvest limits. These limits are based on scientific information, providing a direct measure of whether we are managing the use of these resources within ecosystem limits.

The Sustainable Fish Harvest indicator has two elements:

- whether a maximum removal reference (maximum sustainable level of harvest) has been identified for a stock; and
- whether the actual harvest level was at or below the established maximum sustainable level.

Where removal references have already been set as a component of the precautionary approach, the indicator measures whether harvest is at or below the established removal reference. In the case of stocks for which removal references have yet to be set, the indicator measures whether stocks are being harvested within established harvest levels² established by Fisheries and Oceans Canada (DFO).

2.2 Rationale

Fisheries should consistently harvest at or below established limits to avoid overfishing. Two types of harvest limits exist. Traditionally, annual harvest levels were set on the basis of scientific and economic information and consultation with stakeholders and approved by the Minister. The Precautionary Approach Policy Framework is being implemented for an increasing number of major stocks. This is a more rigorous common approach, including use of the removal reference, for assessing whether harvests are sustainable. The precautionary approach

¹ Fisheries and Oceans Canada (2009) A fishery decision-making framework incorporating the Precautionary Approach. Retrieved on 11 January 2012. (<http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm>)

² Fisheries and Oceans Canada (2008) Fisheries Management Decisions. Retrieved on 11 January 2012. (<http://www.dfo-mpo.gc.ca/decisions/index-eng.htm>)

requires that a harvest strategy for a fishery contain a set of standard components (reference points and harvest decision rules, etc.). This approach will allow us to evaluate how we are managing harvests in a more consistent way.

3 Data

3.1 Data sources

Data are drawn from a number of Fisheries and Oceans Canada sources, including the Fishery Checklist (version 3), the Canadian Atlantic Quota Reports,³ Pacific quota reports, and fisheries managers.

The Fishery Checklist targets specific stocks. It is an internal, self-diagnostic tool that provides a systematic review of progress on conservation and sustainable-use objectives. Fisheries and Oceans Canada surveys the management of major fish stocks each year. Regional Sustainable Fishery Framework⁴ coordinators receive this comprehensive checklist, which provides them with assessments of fish harvest rates, bycatch, ecological impacts, stakeholder consultation and other activities, and includes the impacts of commercial, recreational and Aboriginal fisheries. This data provides a qualitative snapshot of a stock for a certain period, capturing how a fishery is addressing a range of factors considered necessary for sustainable management. The data with respect to removal references was drawn from the Fishery Checklist v.3. Different data are drawn from the same Checklist to generate the Status of Fish Stocks indicator.

Not all stocks have completely implemented the precautionary approach and there are many different fisheries management measures in place depending on the species, area, gear used, seasons, stock assessments, etc. that facilitate the tracking of harvest levels. The Canadian Atlantic Quota Reports track total allowable catches for species managed by quota and the catches/harvests against them. Some quota information for the Pacific Region is available⁵ online but details were received from fisheries managers. The data with respect to other approved levels was drawn from quota reports and fisheries managers.

3.2 Spatial coverage

National, for all major fish stocks.

3.3 Temporal coverage

The Fishery Checklist has been completed annually since 2007. Checklist questions have been refined over this time and data from previous years is not exactly comparable. Beginning in 2011, the Checklist questions were finalized and will be maintained going forward, allowing comparisons over time to be made.

³ Fisheries and Oceans Canada (2011) Commercial Fisheries Quota Reports. 2010 reports by Species. Retrieved on 11 January 2012. (<http://www.dfo-mpo.gc.ca/stats/commercial/qc-rc/2010/specalist10-eng.htm>)

⁴ Fisheries and Oceans Canada (2009) Sustainable Fisheries Framework. Retrieved on 11 January 2012. (<http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm>)

⁵ Fisheries and Oceans Canada (2009) Pacific Fisheries Catch Statistics. Retrieved on 11 January 2012. Retrieved on 11 January 2012. (<http://www.pac.dfo-mpo.gc.ca/stats/index-eng.htm>)

3.4 Data completeness

All 136 major stocks are included in the Fishery Checklist for 2010.

Major stocks are determined by regional managers and include all stocks that meet one or more of the following criteria:

- they have an annual landed value greater than \$1 million
- they have an annual landed weight greater than 2,000 tonnes
- they have an Integrated Fisheries Management Plan (<http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/index-eng.htm>)
- they are highly migratory or are transboundary stocks that are internationally managed, and/or
- they have been assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, <http://www.cosewic.gc.ca/>) as being of special concern and subject to a directed fishery.

Additional stocks may be included if they are deemed to be of regional significance. These stocks include finfish, shellfish, marine mammals and other marine invertebrates.

3.5 Data timeliness

Data for the Fishery Checklist is reported by April 1 for the previous year. The indicator is current to the end of 2010. The “year” is defined variably, depending on how fishing seasons and closures are defined for individual stocks, and may not align exactly with the calendar year.

4 Methods

Stocks are subpopulations of a particular species of fish, for which factors such as growth, recruitment, natural and fishing mortality are the only significant factors in determining population dynamics. Other factors such as immigration and emigration are considered to be insignificant.

The *limit reference point* is the stock level below which productivity is sufficiently impaired to cause serious harm to the resource but above the level where the risk of extinction becomes a concern.

The *upper stock reference point* is the stock level threshold below which the removal rate is reduced. As such, it applies to exploited populations. This reference point is determined by productivity objectives for the fishery. These objectives will vary among species and fisheries and include biological, social and economic factors. The Removal reference is the maximum acceptable removal rate. The removal rate is the ratio of all human induced removals and total exploitable stock size.

The *removal reference* is adjusted depending on the stock’s abundance and its location in the three stock status zones (i.e. healthy, cautious and critical zones; see Fish Stock Status indicator for more information on stock status). In the cautious zone, the adjustment of the removal reference does not have to follow a linear relationship with stock abundance, but a progressive reduction in removals is required. Managers report whether the harvest rate is above or below the reference level, or if the information is unknown.

In cases where a removal reference has not been determined, harvest rates are determined by DFO based on science assessments, the condition of the stock, and economic and social considerations. The overall goal is always conservation, responsible and sustainable harvesting practices, and equitable distribution of the resource among user groups.

The indicator is a simple tabulation of whether harvest levels are within removal reference levels, within other harvest limits, over harvest limits, or whether information is incomplete.

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 comprises species with similar life history characteristics. For example, groundfish spend their adult life at or near the bottom of the ocean. These same groupings are used in the Status of Fish Stocks Indicator.

5 Caveats and limitations

- The Fishery Checklist program was initiated in 2007. A number of changes have been made as the program has developed. In particular, the stocks included in the Checklist program have been changed and questions have been revised. A standard list of stocks and checklist questions are being established. Year-to-year comparisons should not be made until the stock list and questions have been finalized. This will start with 2011.
- The Checklist is completed with the best available information. Given the challenges and expense of monitoring mobile fish in a large volume, comprehensive information is not always readily available.
- The Fishery Checklist summarizes information across a wide variety of species, management regimes, types of fisheries, geographic regions, and socio-economic contexts. Results should be interpreted with this in mind.
- DFO takes actions, such as implementing moratoria on fishing when necessary, and adjusting future year harvest limits, to assure conservation is not compromised.
- Established harvest limits can be exceeded due to a number of factors, including short time-frame competitive fisheries and unforeseen bycatch. These factors are monitored by DFO and corrective actions are taken to address these situations as they arise.
- Quota reconciliation provides that any overharvest of a stock in one year is deducted from the harvest limit established for the following year.

6 References and further reading

6.1 References

Fisheries and Oceans Canada (2009) A fishery decision-making framework incorporating the Precautionary Approach. Retrieved on 11 January 2012. (<http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm>)

Fisheries and Oceans Canada (2008) Fisheries Management Decisions. Retrieved on 11 January 2012. (<http://www.dfo-mpo.gc.ca/decisions/index-eng.htm>)

Fisheries and Oceans Canada (2011) Commercial Fisheries Quota Reports. 2010 reports by Species. Retrieved on 11 January 2012. (<http://www.dfo-mpo.gc.ca/stats/commercial/qrrc/2010/speclist10-eng.htm>)

Fisheries and Oceans Canada (2009) Sustainable Fisheries Framework. Retrieved on 11 January 2012. (<http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm>)

Fisheries and Oceans Canada (2009) Pacific Fisheries Catch Statistics. Retrieved on 11 January 2012. (<http://www.pac.dfo-mpo.gc.ca/stats/index-eng.htm>)

6.2 Further reading

Fisheries and Oceans Canada (2009) Resource Management. Retrieved on 11 Jan 2012. (<http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/index-eng.htm>)

Fisheries and Oceans Canada (2010) Quota Reconciliation. Retrieved on 2 March 2012. (<http://www.glf.dfo-mpo.gc.ca/e0012110>)

Fisheries and Oceans Canada (2010) Gulf Quota Report 2010 Final Report. Retrieved on 9 March 2012. (www2.glf.dfo-mpo.gc.ca/fam-gpa/rm-gr/qm-sc/qr-rc/query-e.php)

Fisheries and Oceans Canada (2010) Canadian Atlantic Quota Report. Retrieved on 9 March 2012. (<http://www.qc.dfo-mpo.gc.ca/peches-fisheries/statistiques-statistics/index-eng.asp>)