# fish stock name

The title must include the ‘Advice Year’ Name of the assessed stock (formal taxonomic treatments)

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| Context:  <<context paragraph>>  This Science Advisory Report is from the <<meeting date and title>>. Additional publications from this meeting will be posted on the [*Fisheries and Oceans Canada (DFO) Science Advisory Schedule*](http://www.isdm-gdsi.gc.ca/csas-sccs/applications/events-evenements/index-eng.asp) as they become available. | |

## SUMMARY

### Fish stock name

‘Advice Year’ Name of the assessed stock (formal taxonomic treatments); hyperlink to species overview document

### Science Advice

Mandatory. Include a summary of environmental and climate change factors affecting the stock that are **relevant for decision making,** the stock status, trends, expected outcome of harvest scenarios tested (include those that met measurable objectives for the stock if applicable), and probability of decline. Please refer to the guidance document for standardized language and examples, and what to avoid discussing in the summary of science advice.

Environmental and Climate Change Considerations

* State the environmental and climate change factors affecting the stock that are **relevant for decision making**

Status:

* Mandatory bullet(s) that state the prescribed major fish stock’s status relative to its PA reference points (LRP, USR, TRP and RR). With likelihood if available. Phrasing should be consistent with the wording in the guidance document.

Trends:

* Mandatory bullet(s) that state the prescribed major fish stock’s recent trajectory: increasing, decreasing, stable, or fluctuating without trend

Stock Advice

* Include a summary of the expected outcome of harvest scenarios tested (include those that met measurable objectives for the stock if applicable) or…….
* Include the risk of decline, with likelihood if available.

Other Management Objectives (if applicable)

* State the probability of achieving the objective for the stock and timeframe for evaluation. If no measurable objective has been defined, state the goal or report unknown. If the stock is subject to a rebuilding plan, what are the objectives for rebuilding.

## BASIS FOR ASSESSMENT

The following information: year approach approved, assessment date, assessment approach and assessment type are mandatory

**Year assessment approach was approved:** date and reference

**Assessment Date**

1. Last Full Assessment: date and reference
2. Last <interim year> Update: date and reference

**Assessment Approach:**

1. Pick one: Data-poor, index-based, stock assessment model, model ensemble, MSE(full or MSE-lite), other (specify)
2. Pick one or as many as apply: Index-based (fishery-dependent indices only), Index-based (including fishery-dependent and fishery-independent indices), Delay difference, Biomass dynamics, Virtual population analysis, Statistical catch-at-length, Statistical catch-at-age, State-Space, Sequential Population Analysis, Surplus Production, Potential Biological Removal, Other (please explain)

**Assessment Type:** (Pick One)  
Pick one: Full Assessment, Indicator Update, or Management procedure (MP) Update

Definitions:

Full Assessment: Full peer-reviewed stock assessment

Interim-Year Update: Science advice that is provided for years in-between full stock assessments. The content of an interim-year update report should include an update on indicator(s), assessments of indicators against trigger values, and the calculation of harvest decisions rules (or others) that were agreed upon at the full assessment. Interim-year updates may be produced annually or at less frequent intervals within the multi-year assessment cycle. The timing and number of interim-year updates are scheduled during the full stock assessment processes, but they could be requested due to exceptional circumstances ([DFO, 2016](https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/365593.pdf?_gl=1*1ravech*_ga*MTQ3MTgzODM1Ni4xNTUyMzIwMDQz*_ga_7CCSB32R7T*MTY3Mzg5MTc2Ny41LjAuMTY3Mzg5MTc2Ny4wLjAuMA)).

Harvest Decision Rule (HDR) Update: The stock has a Harvest Decision Rule that is currently being updated

### Stock Structure Assumption

Mandatory  
Briefly summarize the current assumptions regarding the stock structure and distribution of the stock being reported. Where the assessed stock distribution differs from the stock defined for management (i.e. there are mismatches between the biological unit and the assessment unit and/or the management unit), an explanation must be provided of how the assessed stock relates to the managed stock. Where there are LRPs for multiple sub-units, indicate, by name, the sub-units that have LRPs and those that do not (where possible).

### Reference Points

Mandatory

Include the description of reference point, current value (numbers or formulas), and reference. This section is mandatory. Include N/A if reference point/target has not been developed, with a brief explanation of why there is no reference point. If a USR hasn’t been accepted, and the resource manager asks science to provide advice with respect to a USR that hasn’t been fully accepted, or relative to multiple USR options, please make a note and incorporate requested USR(s).

* 1. Limit Reference Point (LRP):
  2. Upper Stock Reference (USR):
  3. Removal Reference (RR):
  4. Target (TRP): (if developed)

### Harvest Decision Rule (if applicable)

Include text and/or figure to describe the harvest decision rule (s) for the fishery if applicable.

### Data

Mandatory

Short summary of main data inputs. Longer summary in Research Document/ or if unchanging Species Overview Document

## ASSESSMENT

### Historical and Recent Stock Trajectory and Trends

Mandatory

The recent fish stock trends should be reported in terms of stock size and fishing intensity (or proxies for these), respectively. Observed trends should be reported using descriptors such as increasing, decreasing, stable, or fluctuating without trend. Where it is considered relevant, mention could be made of whether the indicator is moving towards or away from a limit, target, or long term average. Note if fishing mortality includes total catch (including bycatch) or only commercial catches. If the mortality rate is not for all the fisheries on this stock, please indicate so. This paragraph is mandatory. Include:

**Abundance** - a value(s) has been calculated for the abundance for the target species in the stock of focus.

**Biomass** - a value(s) has been calculated for the biomass for the target species in the stock of focus.

**Density** - a value(s) has been calculated for the density for the target species in the stock of focus.

**No** – Values have **NOT** been calculated for the abundance, density or biomass for the target species in the stock of focus.

Provide the **exploitation rate(s)**, exploitation rate index or relative F (i.e., survey biomass/landings) calculated for fisheries on this stock. If the exploitation rate is not for all the fisheries on this stock, please indicate so. Provide links to any online documents that reference these values.

**Recruitment –** a values (s) has been calculated for recruitment for the target species in the stock of focus

**Natural Mortality –** a value(s) has been calculated for natural mortality (M) for the target species in the stock of focus.

Panel of Images

(confidence intervals should be presented graphically with shading that includes fading edges at more extreme probabilities in order to better characterize improbably but high consequence events). Figures in greyscale. Font on axes (x). Use standardized graphs templates.

* 1. Catch vs Total Allowable Catch (DFO must account for the total catch and/or associated uncertainty on the prescribed major fish stock, consistent with the PA Policy as well as the Policy on Managing Bycatch and the Fishery Monitoring Policy.)
  2. Stock indicator, e.g. Spawning Stock Biomass (SSB) or proxy, in relation to the Limit Reference Point (LRP) – e.g. B/BLRP or other reference points as needed.
  3. Fishing Mortality (F) or proxy in relation to the Removal Reference (RR) – F/Flimit . On the opposite side include Natural Mortality (M) if available
  4. Recruitment or other indicator – estimated recruitment deviations as a function of year…..or if not available, possibly size distribution, age composition for the 4th image, or other indicator that contributes to evaluating fishery objectives and science advice.

(Optional)

Add an additional optional panel of 4 indicators, if relevant to developing advice.

### **History of (Landings/Harvest/Effort), TAC (& Catch Advice)**

Mandatory

Table of landings/harvest or effort if applicable, total allowable catch (TAC) and (optional) catch advice, over the recent historical period. Identify whether landings are based on fishing year or calendar year and the units of landings, TAC and catch advice. This section is mandatory, include N/A if not available or applicable with text description indicating why the information is not available.

### Projections or Simulations

Mandatory

This section is used to report the available information on likely future trends in biomass. Indicate the projected outcome under the current, or range of, catch levels (provide the short or long-term projections if available, or a qualitative statement based on past experience/expert judgement, etc.).

Include: years of projection, the probability of tested and current catch causing biomass to remain below, or to decline below the reference points (probability of being below the LRP and below the USR) and probability of increasing above the Removal Reference. Include probability of stock growth next year if the stock is in the Critical Zone. Include ‘risk tables’ if possible. This section is mandatory, include N/A if projections are not available.

### Harvest Decision Rule Update (if applicable)

Any figures or text necessary to incorporate related to updating a Harvest Decision Rule, that haven’t already been included.

### **Evaluation of Exceptional Circumstances/Assessment Triggers (if applicable)**

Evaluation of any exceptional circumstances to push for a re-evaluation of a management procedures in an MSE context, or triggers that would prompt an assessment earlier than the pre-agreed assessment cycle (as per SAR 2016/020).

## **ECOLOGICAL AND CLIMATE CHANGE CONSIDERATIONS**

Mandatory

Describe the environmental and climate change considerations affecting the fish stock. Focus on tactical 1-3 year advice and any long-term strategic considerations for the stock if available. Focus on more recent changes and how they represents a change from the overall ecosystem context. i.e. this is driving changes in mortality. Use plain language, and talk about the consequences/ impacts on the stock. Incorporate implications of trends in ecological and/or climate change drivers on the future state of the stock to help with development of tactical and strategic goals.

Include the method the environmental or climate change variable was included:

**Parameterization** – Environmental variables are included as parameters within the stock assessment model

**Implied** – For example, the model incorporates time varying M, without clear knowledge of the specific environmental factors affecting the observed changes in M.

**Linked** – The effects of the environment on the stock were evaluated outside of the stock assessment model. This independent information was used to condition the assessment results and provide an assessment of the environmental drivers that are affecting the stock status.

**Not Used**- There was no consideration of the environmental considerations affecting stock status.

## INDIGENOUS CONTRIBUTIONS

(Mandatory or optional; guidance or no?)

## (OPTIONAL SECITONS): BYCATCH

(guidance)

## Other Management Questions

Placeholder for management questions included in the terms of reference that produce science advice **relevant for decision making**. (Examples)

## SOURCES OF UNCERTAINTY

Necessary explanations to avoid misinterpretation of information presented in the sections above.

## LIST OF MEETING PARTICIPANTS

Mandatory

The list is to include the name of each participant and their affiliation.

## SOURCES OF INFORMATION

Mandatory

The following paragraph is optional for the Context and **MANDATORY** for the Sources of Information.

This Science Advisory Report is from the [meeting date and title (The meeting process, date and title **MUST BE EXACTLY** as they appear for the meeting on the Science Advisory Schedule]. Additional publications from this meeting will be posted on the [Fisheries and Oceans Canada (DFO) Science Advisory Schedule](http://www.isdm-gdsi.gc.ca/csas-sccs/applications/events-evenements/index-eng.asp) as they become available.

[References must be formatted according to the *[Guide for the Production of Fisheries and Oceans Canada Reports](https://waves-vagues.dfo-mpo.gc.ca/Library/333125.pdf)*[.]](https://waves-vagues.dfo-mpo.gc.ca/Library/333125.pdf)

[References listed in the References Cited section should be publically available when the report is posted on the website. The only exception is for books or articles that have been accepted for publication (page proof stage or where there is an acceptance letter). These can be listed followed by the notation “in press”. All others should be included in the text as unpublished data.]

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## TOOLKIT

Please refer to the checklist in the [CSAS Publications Toolkit](http://intra.dfo-mpo.gc.ca/csas-sccs/index-eng.html) located on the CSAS Intranet site.

## LAYOUT REQUIREMENTS (FORMATTING AND STYLES)

## HEADING 2: ARIAL, SIZE 14, BOLD, LEFT ALIGNED, ALL CAPS, PARAGRAPH SPACING 12 PT (0.17 IN, 0.42 CM) BEFORE AND 6 PT (0.08 IN, 0.21 CM) AFTER

### Heading 3: Arial, 12, bold, left-aligned, paragraph spacing 12 pt (0.17 in, 0.42 cm) before and 6 pt (0.08 in, 0.21 cm) after

#### Heading 4: Arial, 11, bold, left-aligned, left indentation 18 pt (0.25 in, 0.63 cm), paragraph spacing 6 pt (0.08 in, 0.21 cm) before and after

Body Text: Arial, size 11, left-aligned, paragraph spacing 6 pt (0.08 in, 0.21 cm) before and after

* List Bullet: Arial, size 11, left-aligned, hanging indentation 18 pt (0.25 in, 0.63 cm), paragraph spacing 0 pt before and 6 pt (0.08 in, 0.21 cm) after
* List Bullet 2: Arial, size 11, left-aligned, left indentation 18 pt (0.25 in, 0.64 cm), hanging indentation 18 pt (0.25 in, 0.63 cm), paragraph spacing 0 pt before and 6 pt (0.08 in, 0.21 cm) after

Examples of List number:

1. List Number: Arial, size 11, left-aligned, numbering style: 1, 2, 3, hanging indentation 18 pt (0.25 in, 0.63 cm), paragraph spacing 0 pt before and 6 pt (0.08 in, 0.21 cm) after
2. List Number
3. List Number 2: Arial, size 11, left-aligned, numbering style: a, b, c, left indentation 18 pt (0.25 in, 0.63 cm), hanging indentation 18 pt (0.25 in, 0.63 cm), paragraph spacing 0 pt before and 6 pt (0.08 in, 0.21 cm) after
4. List Number 2

Caption – Table: Arial, size 10, italics, left-aligned, paragraph spacing 12 pt (0.17 in, 0.42 cm) before and 6 pt (0.08 in, 0.21 cm) after, keep with next paragraph, keep with next paragraph, keep lines together. Table caption goes above the table.

Caption – Figure: Arial, size 10, italics, left-aligned, paragraph spacing 6 pt (0.08 in, 0.21 cm) before and 12 pt (0.17 in, 0.42 cm) after, keep lines together. Figure caption goes below the figure.

citation: Arial, size 11, left aligned, hanging indentation 18 pt (0.25 in, 0.63 cm), paragraph spacing 6 pt (0.08 in, 0.21 cm) before and after, keep lines together.

Blockquote: Arial, size 11, left-aligned, left indentation 36 pt (0.5 in, 1.27 cm), paragraph spacing 6 pt (0.08 in, 0.21 cm) before and after

## ALL MANDATORY SECTIONS ARE INCLUDED AND LISTED IN THE CORRECT ORDER