



Pacific Salmon Treaty
Southern Coho Reference Points and
Exploitation Rate Caps for
Canadian Management Units

Webinar engagement session – April 11 & 24, 2018





Overview of the Webinar



Webinar Objectives

1. Summarize material from discussion document and highlight key points
2. Provide opportunity for questions and clarification on material
3. Clarify the process for providing feedback



What Does Success Look Like?

1. Participants have better understanding of material in discussion paper
2. Participants are better equipped to provide feedback through question worksheet

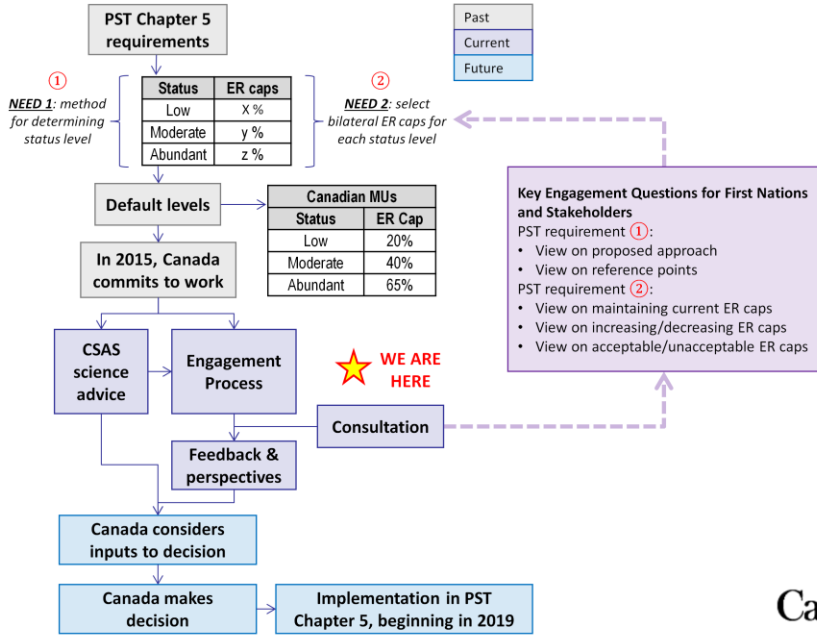


Agenda

Topic	Who
Start of webinar	
Overview of webinar	Alex Hall (ESSA)
Project background and context	Laura Brown (DFO)
Status reference points	Ron Kadowaki (DFO)
ER Caps: conservation considerations	Ron Kadowaki (DFO)
ER Caps: management and implementation considerations	Jeff Grout (DFO)
Engagement questions	Alex Hall (ESSA)
Next steps – how to provide feedback	Alex Hall (ESSA)
End of webinar	



Where are we in the overall process?







Engagement Questions

In Discussion Paper:

- Questions in worksheet in Appendix A
- Questions inserted throughout document

?	<i>Engagement questions</i>	?
	<i>Additional questions to think about</i>	

Core Question:

*What are your views on the current ER caps for each status level?
Do you think they should be maintained, reduced or increased?*



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Background



Background

- Objective of bilateral PST Southern Coho Management Plan to:
 - “produce Maximum Sustainable Harvest (MSH) over the long term, while maintaining the genetic and ecological diversity of the component populations”, and to “improve long-term prospects for sustaining healthy fisheries in both countries”.
- Current PST coho chapter requires development of escapement goal or exploitation rate (ER) that achieves above objective, as well as, ER caps for 3 status categories: *Low*, *Moderate* and *Abundant* for each Management Unit (MU).
- Work to meet this obligation for Canadian MUs has 2 main components:
 - Part 1: Establishing status reference points
 - Part 2: Establishing ER caps associated with each of the 3 status categories
- Any new bilateral ER caps will only come into effect beginning with the 2019 fishing season.



Current PST status and ER cap levels for Canadian Management Units (default levels)

Condition of Canadian MUs	Bilateral ER caps	US ER caps
Low	Up to 0.20	0.10
Moderate	>0.20 to 0.40	0.12
Abundant	>0.40 to 0.65	0.15

Table 1 – discussion document




Project Status

Phase 1 – Science advice (Completed)

- CSAS Working Paper (approved subject to final revisions)
- CSAS Science Advisory Report (approved and available)

Phase 2 – Consultation (On-going)

- Engagement plan has been distributed to First Nations and stakeholders (January 2018)
- Canadian Southern Panel members are providing guidance.
- Two webinars and a workshop have been scheduled.
- For those who would prefer to submit their feedback electronically, a web-site has been set up for this purpose.
- A discussion paper was developed to compliment the CSAS SAR.
- Input from consultations will inform the required decisions by Canada which will be forwarded to the US by the end of the year. 



Point of Emphasis

- Within each PST status level, explicit limits on the ERs for Canada and the US are established under the PST.
- Within its portion of the PST ER cap, Canada will continue to implement its own annual domestic planning processes (i.e. through the salmon Integrated Fisheries Management Plan (IFMP) development process) and determine fishery-specific, domestic management actions to implement.
- Domestic annual ER targets may be set less than or equal to the maximum ER permitted under the Southern Coho Management Plan.



Questions and clarifications?



Synopsis of Science Advice

(see CSAS SAR and discussion Paper for more details)

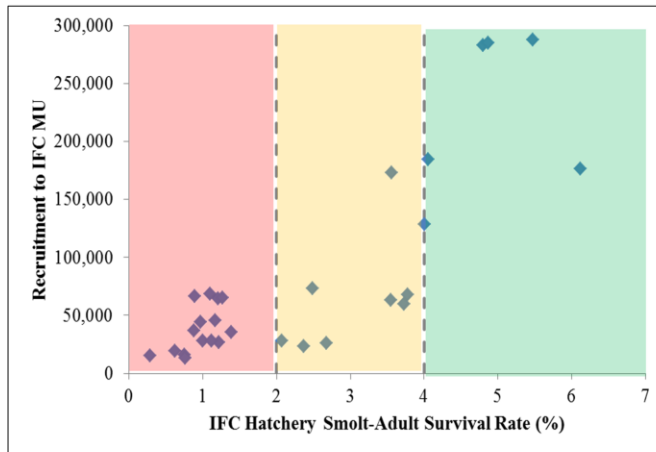
1. Data to complete the full analysis were only available for the Interior Fraser River (IFR) MU.
2. Two analytical methods for determining survival rate based management reference points to determine PST status for the IFR MU were proposed and not accepted. The authors noted that visual examination suggested 2% and 4% to demarcate Low, Moderate and Abundant status categories.
3. For a range of survival rates, 50-year forward simulations for IFR MU using 3 alternative stock-recruit models provided estimates of the probability of achieving 3 possible conservation objectives (Appendix 3) over a range of potential exploitation rates (0-70%). Similar analyses were not possible for the SoG and LFR MUs.
4. Results are summarized in a series of tables and figures as an appendix to the Discussion Paper for illustrative purposes with samples provided in this presentation.



Part 1. PST Status Reference Points



Proposed Management Reference Points of 2% and 4%



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← Low Moderate Abundant →



- Figure 2 – discussion document
- Note that recruitment is positively related to survival rate.
- Low and Abundant status seem to be well defined by 2% and 4% reference points.
- Moderate status is more equivocal. Visually the data might support 2 status zones but PST management plan requires 3 with associated ER caps.
-



Historical survival rates for 3 Canadian MUs

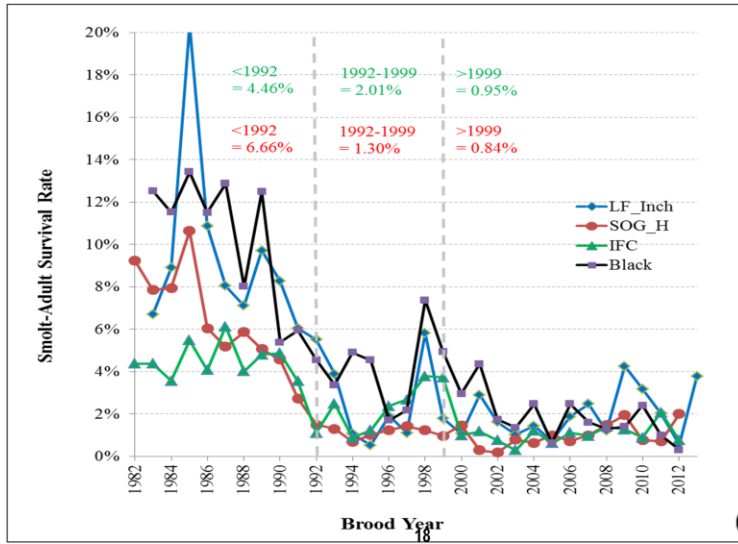


Figure 2 – discussion document

Note synchronous pattern among MUs indicating similar survival influence. Supports using IFR MU as a proxy for status of LFR and SOG MUs. However, catch distribution differences still means that fisheries management must still be responsive to the needs of all MUs.

Decline from high survival regime to a lower regime since the late 1990's is similar.



Historical frequency of status levels corresponding to 2% and 4% survival reference points

Interior Fraser Coho MU		Time Period (brood years)		
		1982 to 1991	1992 to 1999	2000 to 2012
The number of years falling into each status level.	Abundant	8 years		
	Moderate	2 years	5 years	1 years
	Low		3 years	12 years
	Average Survival Rate	4.53%	2.29%	1.05%

Table 3 – discussion document – plus last row to indicate trend in average survival rates



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Part 2. PST Exploitation Rate Caps for Canadian Management Units



Key Considerations in Setting PST ER Caps

1. Conservation Considerations – Evaluation of the probability of achieving 3 conservation objectives from forward simulation analysis for the IFR MU using 3 alternative stock-recruit models over a range of potential exploitation rates provides an estimate of the degree of conservation risk associated with alternative ER caps.
2. Fishery Considerations – Qualitative descriptions of potential fisheries management measures under the 3 PST status categories provide an indication of social and economic benefits associated with each status level.
3. Implementation Considerations - Reliability of pre-season forecasting and fishery planning tools, as well as the availability of resources for stock and fishery monitoring are important factors in assessing and managing the risk of a fisheries management regime.



1. Conservation Considerations



Conservation Objectives Used in Simulation Analysis

Conservation Objective	Basis of Conservation Objective
MU escapement > 20,000 spawners (3-year geometric mean)	IFCRT short-term recovery goal (CU based) – the escapement to each CU that leads to a 95% probability that escapement to at least half of the sub-populations will meet or exceed 1,000 spawners. This translates to an MU escapement of approximately 20,000 spawners.
MU escapement > 40,000 spawners (3-year geometric mean)	IFCRT long-term recovery goal (CU based) – the escapement to each CU that leads to a 95% probability that escapement to all sub-populations will meet or exceed 1,000 spawners. This translates to an MU escapement of approximately 40,000 spawners.
ConObj1.5 (MU escapement > ~25,000 spawners) (3-year geometric mean)	From CSAS paper. ConObj1.5 (MU based) – the escapement to each CU that leads to a 95% probability that escapement to at least half of the sub-populations will meet or exceed 1,000 spawners in the same year. This translates to an MU escapement of approximately 25,000 spawners.

Table 4 – discussion document



Stock-Recruit Models Used in Simulation Analysis

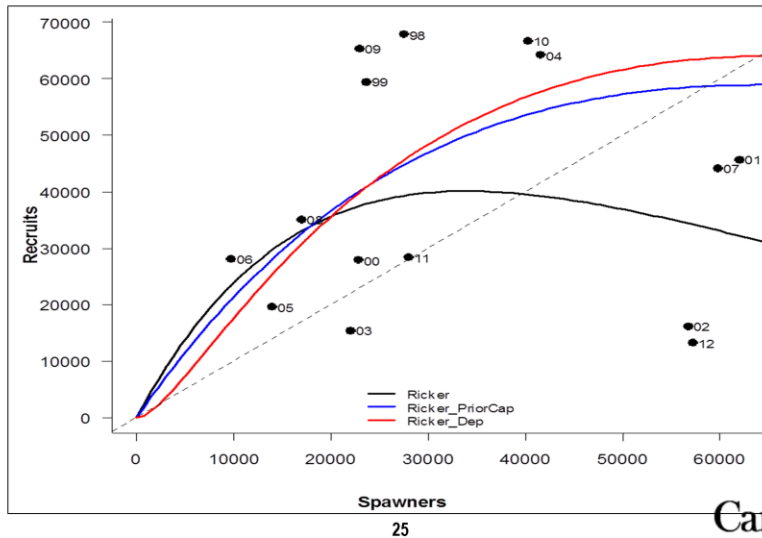


Figure 4 – discussion document

Base Ricker – This model, which does not include consideration of additional information on the nature of the stock-recruit relationship, has been used in previous analyses of IFR coho and fit the data the best.

Ricker-PriorCap – This model includes an adjustment for larger carrying capacity that eliminates overcompensation over the range of escapements observed since 1998.

Ricker-Dep – This model includes adjustments for both larger carrying capacity as in the Ricker-PriorCap model and depensation, which reduces productivity by half when escapement to a CU falls below 1,000 fish



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Explanation of Simulation Results in Discussion Paper

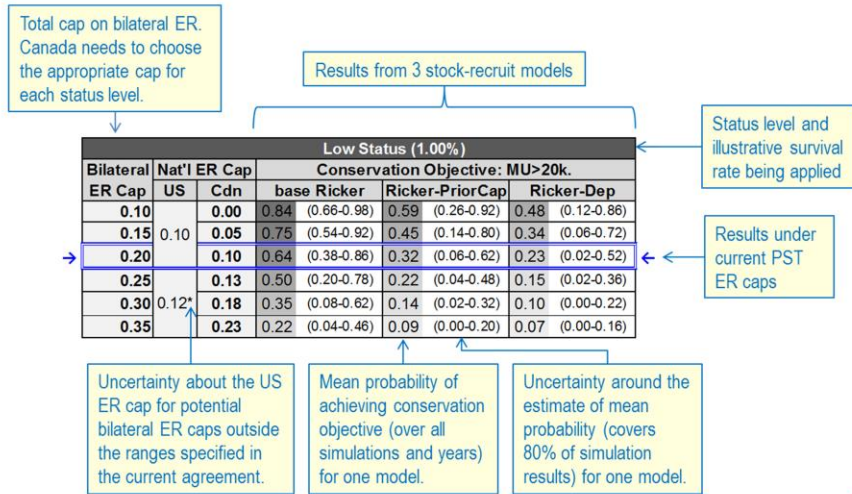


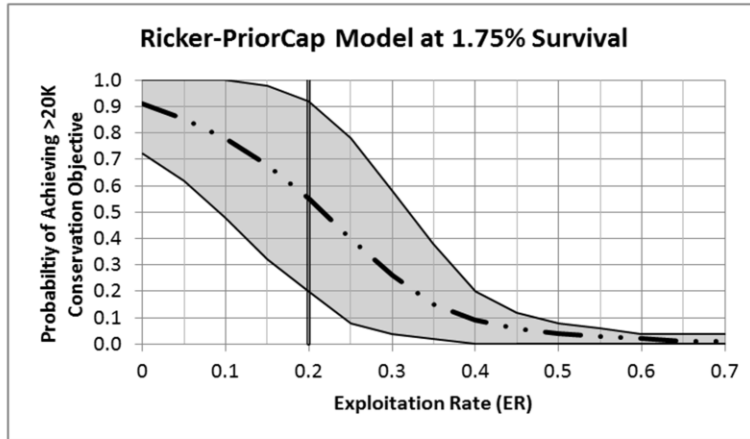
Figure 5 – discussion document

NOTE: This example is for a survival rate of 1.0%.

The Discussion Paper presents results from SAR for survival rates of 1.75% and 3.75% as examples for low and moderate status (respectively) because they represent survival rates at the upper end of the range for each status level if using 2% and 4% as reference points. Given that the focus is on setting caps, it is appropriate to look at the best case scenario under each status level. However, the Discussion Paper also presents example results for a survival rate of 1% under low status because that is consistent with recent survival rates.



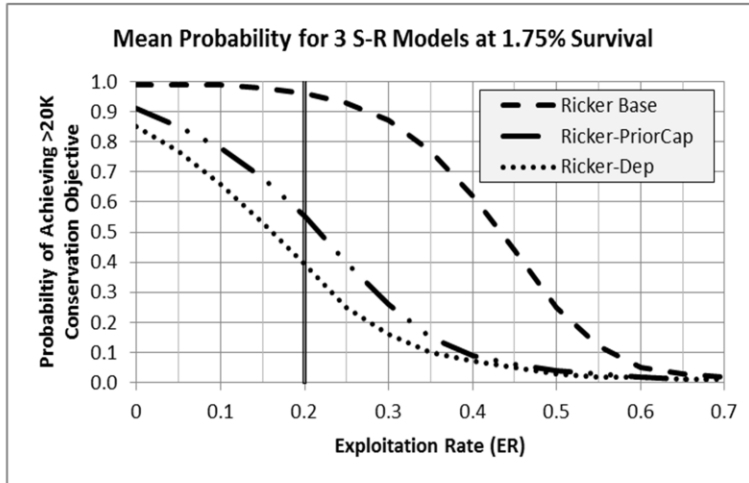
App C. Fig. 7. Mean probability and 80% credible intervals of achieving MU>20K spawners for 1 S-R model at 1.75% survival



Example – Low status – intermediate productivity model, current ER cap of 20% is the vertical line, note very wide range in the 80% credible interval area.

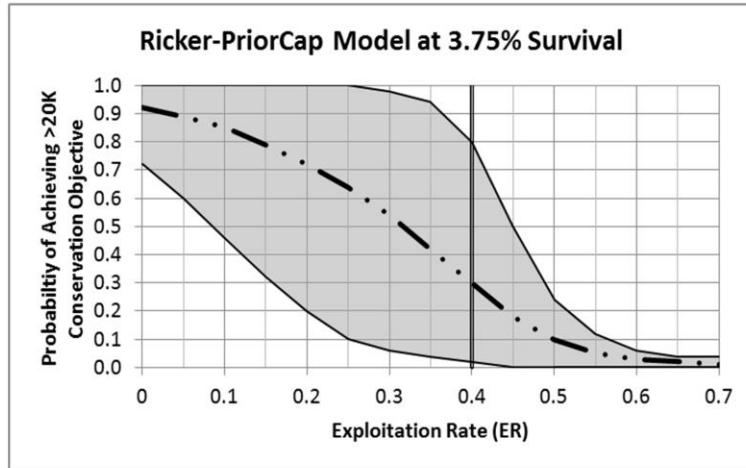


App C. Fig. 7. Mean Probability of achieving MU>20K spawners for 3 S-R Models at 1.75% survival





App C. Fig. 8. Mean probability and 80% credible intervals of achieving MU>20K spawners for 1 S-R model at 3.75% survival



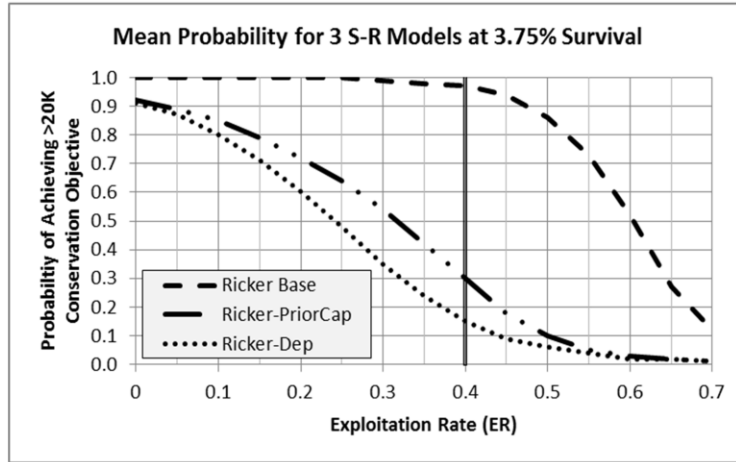
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Example – Low status – intermediate productivity model, current ER cap of 20% is the vertical line, note very wide range in the 80% credible interval area.



App C. Fig. 8. Mean Probability of achieving MU>20K spawners for 3 S-R Models at 3.75% survival





Questions or clarifications?



2. Fishery Considerations



Table 5. General Fisheries Management Approaches – First Nations

	Current Management	Low Status	Moderate Status	Abundant Status
Survival Rates (as proposed)	0.5% to 1.5%	<2%	2% to <4%	≥ 4%
Bilateral ER cap (current PST)	20%	20%	40%	65%
US ER cap (current PST)	10%	10%	12%	15%
Cdn ER cap (current PST)	10%	10%	28%	50%
Implemented Cdn domestic ER	3% to 5%	From annual domestic planning	From annual domestic planning	From annual domestic planning
First Nations Food, Social and Ceremonial	Incidental catch or non-retention in fisheries directed on other species. Small tributary harvests where abundances are identified.	Incidental catch or non-retention in fisheries directed on other species. Small tributary harvests where abundances are identified.	Additional harvest opportunities considered including retention of wild coho bycatch in fisheries directed on other species, relaxation of the coho window closure dates and possible directed fisheries depending on allowable impacts.	Directed fisheries for wild coho.





Table 5. General Fisheries Management Approaches – Recreational

	Current Management	Low Status	Moderate Status	Abundant Status
Survival Rates (as proposed)	0.5% to 1.5%	<2%	2% to <4%	≥ 4%
Bilateral ER cap (current PST)	20%	20%	40%	65%
US ER cap (current PST)	10%	10%	12%	15%
Cdn ER cap (current PST)	10%	10%	28%	50%
Implemented Cdn domestic ER	3% to 5%	From annual domestic planning	From annual domestic planning	From annual domestic planning
Recreational	<p>Non-retention of wild coho in fisheries directed on other species or marked coho.</p> <p>Retention of unmarked coho only in areas and times where impacts on Interior Fraser Coho are minimal.</p>	<p>Non-retention of wild coho in fisheries directed on other species or marked coho.</p> <p>Retention of unmarked coho only in areas and times where impacts on Interior Fraser coho are minimal.</p>	<p>Subject to allowable impacts, consideration of increased retention of wild coho in areas with low Interior Fraser coho impacts, additional retention of marked coho and/or relaxation of coho window closure dates.</p>	<p>Directed recreational fisheries for wild coho permitted, however, recreational limits for these fisheries will be determined by relative abundance. (Even in high abundance scenarios, recreational limits will not exceed 4 per day with a possession limit of 8.)</p>



Table 5. General Fisheries Management Approaches – Commercial

	Current Management	Low Status	Moderate Status	Abundant Status
Survival Rates (as proposed)	0.5% to 1.5%	<2%	2% to <4%	≥ 4%
Bilateral ER cap (current PST)	20%	20%	40%	65%
US ER cap (current PST)	10%	10%	12%	15%
Cdn ER cap (current PST)	10%	10%	28%	50%
Implemented Cdn domestic ER	3% to 5%	From annual domestic planning	From annual domestic planning	From annual domestic planning
Commercial, including First Nations economic	Non-retention of wild coho in fisheries directed on other species or stocks.	Non-retention of wild coho in fisheries directed on other species or stocks.	Non-retention of wild coho in fisheries directed on other species or stocks. Additional fishing effort/times may be permitted (i.e. additional release mortality).	Subject to abundance, non-retention of wild coho in fisheries directed on other species or stocks, retention of wild coho by-catch, or, potential for directed fisheries if allowable impacts/abundance are high.





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3. Implementation Considerations

1. Forecasting survival rates
 - Status determination depends on a pre-season forecast of survival rate
 - Forecasts for the IFR MU within the current low survival regime are uncertain.
 - The quality of pre-season forecasts should be considered in annual status assessments and pre-season fishery planning.
2. Fisheries planning tools
 - Different planning tools/models are used in annual fisheries planning at the bilateral and domestic levels
 - Some of these models will require further scientific peer review (e.g., through the CSAS process, Canadian Science Advisory Secretariat)
3. Resources for stock assessment and fisheries monitoring
 - Limited funding has been allocated to IFR assessment as a priority
 - Additional funding has been requested to address current gaps in information



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Core Question – PST ER Caps

Core Question:



*What are your views on the current ER caps for each status level?
Do you think they should be maintained, reduced or increased?*

Engagement Questions Worksheet:

- Breaks down core question into multiple pieces
- Questions on rationale and important factors
- Other questions provide support



Engagement Questions

- Questions in Discussion Paper:
 - Worksheet of engagement questions (Appendix A)
 - Questions inserted throughout document  
- Questions address:
 - Proposed approach and choice of reference points
 - Maintaining current ER caps vs. potential changes
 - Critical gaps in information and/or additional information that DFO consider
 - Overall comments



Next Steps

1. Read through the Discussion Paper and SAR
2. Review and answer the engagement questions
3. Submit answers and feedback by May 11, 2018
 - Email to Cynthia.Johnston@dfo-mpo.gc.ca
 - Partial responses are welcome
4. Feedback will be compiled and made available
 - 2 Webinar options (April 11 and 24) – same presentation
 - Workshop (May 1-2) – technical focus; invitations being prepared



Further Information

DFO Consultation Website

<http://www.pac.dfo-mpo.gc.ca/consultation/smon/pst-coho-tsp/index-eng.html>

Discussion Paper

<http://waves-vagues.dfo-mpo.gc.ca/Library/40673972.pdf>

CSAS Science Advisory Report

http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2018/2018_016-eng.html

DFO Contact

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Thank you for joining today!