



Ecology Action Centre

Ecology Action Centre Presentation on Objection to 3PS Cod MSC Certification

Information for Oral Hearing

February 10th, 2016 London

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1.0 About the Ecology Action Centre

The Ecology Action Centre has been active stakeholders in MSC assessments and certifications in Atlantic Canada since 2008. We support sustainable fisheries and sustainable fisheries management, and support the concept of eco-certification of fisheries as it has resulted in a new conversation regarding fishing industry responsibility for stewarding a renewable resource.

We have engaged in numerous MSC certification processes in Atlantic Canada as well as made submissions to the MSC policy consultations. We have objected once before, to the Atlantic Canadian Pelagic Longline Swordfish Fishery certification, because of its impact on bycatch species. We understand that the IA is familiar with this fishery and presided over the objection to the adjacent fishery in the US.

The EAC has conducted significant research and policy advocacy for marine conservation objectives, with a focus over the past three years on marine fish assessed as at risk in Canada, including peer reviewed paper McDevitt-Irwin et al 2015.

We have also contributed to Department of Fisheries and Oceans (DFO) policy consultations on the Sustainable Fisheries Framework, (PA Framework (2009), SBA policy (2009), Rebuilding Strategy (2013), Bycatch Policy (2013) and were an active member of the Species At Risk Advisory Committee (SARAC) between 2011-2014. As part of that engagement, we contributed jointly with the fishing industry on recommendations for the DFO Default Listing Policy (2014).

We are active members and participant of fisheries management advisory committees, including the Atlantic Large Pelagic Advisory Committee (ALPAC), Scotia Fundy Atlantic Large Pelagic Advisory Committee (SFALPAC), Scotia Fundy Groundfish Advisory Committee (SFGAC), Atlantic Mackerel Advisory Committee (AMAC) and we co-chair a quarterly meeting with DFO Maritimes Region with other ENGOS.

2.0 Context of the Objection

2.1 Status of 3PS Cod Population

Recovery of cod populations in the Canadian North Atlantic, after 22 years of moratoria is still in question. There is a continued lack of capacity at the science level in Canadian government to conduct full assessments, as is evidenced by the 3PS cod assessment. We recognize that the Fisheries Improvement Project (FIP) resulted in progress in the assessment and stewardship of this fishery, however we contend that the stock status and the importance of this particular certification warrant particular scrutiny.

3Ps cod was assessed as “threatened” in 2003. In 2006, the Government of Canada decided not to list under SARA for social and economic reasons. The conservation status of the population was not questioned. 3PS Cod was re-assessed as “endangered” in 2010, and is waiting for a listing decision under SARA. If such a decision was made, there would be a prohibition on all harm / catch. It is unlikely to be listed due to socio-economic reasons. The

scientific basis for the conservation status has not been questioned and DFO has not requested clarifications or changes to the 2010 COSEWIC assessment. As a result of this status, we are unclear how this fishery passed the pre-assessment process, and also note that there has been a change in the CAB between the pre-assessment and full assessment.

2.2 Marine Stewardship Council Certification Interpretation of Canadian Species at Risk Process

MSC no longer considered COSEWIC assessed species as ETP as of 2010 because they were not listed under national legislation, despite the fact that COSEWIC is designated under the *Species at Risk Act (SARA)*. There has been some discussion that this was a CB standard interpretation issue, rather than an MSC standard issue. This was a significant part of our objection to the swordfish fishery, as a number of COSEWIC assessed endangered species were impacted and continue to be impacted by that fishery.

MSC standard re: ETP Species: “*Endangered, threatened or protected species are those that are recognized by national legislation and/or binding international agreements (e.g. CITES) to which the jurisdictions controlling the fishery under assessment are party.*” (section 7.1.1.c))

COSEWIC is a legally established body to determine status and advise on listing decisions in Canada. Specific language in the Act is included below:

The Species At Risk Act

14. The Committee on the Status of Endangered Wildlife in Canada is hereby established.

15. (1) The functions of COSEWIC are to

(a) assess the status of each wildlife species considered by COSEWIC to be at risk and, as part of the assessment, identify existing and potential threats to the species and

(i) classify the species as extinct, extirpated, endangered, threatened or of special concern,

(ii) indicate that COSEWIC does not have sufficient information to classify the species, or

(iii) indicate that the species is not currently at risk

...

25. (3) On receiving a copy of an assessment of the status of a wildlife species from COSEWIC under subsection (1), the Minister must, within 90 days, include in the public registry a report on how the Minister intends to respond to the assessment and, to the extent possible, provide time lines for action.

2.3 Relevance to 3PS Cod Recommendation for Certification

We recognize that the assessment by COSEWIC and SARA listing process is seen by the client as a national policy issue, however our primary concern is for the health of the fish population, human impact as a result of the fishery and ensuring that all endangered species, if not listed, are managed consistent with a SARA recovery plan under *Fisheries Act* measures, as per Annex B of the Default Listing Policy and Do Not List Directive. As stated on the COSEWIC website: Populations in this designatable unit (DU) have declined 76-89% in the past 3 generations. The main cause of the decline in abundance was overfishing and there is

no indication of recovery. DFO has not contested this designation or the 2010 COSEWIC assessment.

We contend that MSC certification should not undermine application of national policy objectives. While this may be seen as irrelevant to the specific issues we have with the scoring and conditions set for this certification, it is an extremely important context because this certification sets a dangerous precedent of eco-certifying a fishery for an endangered species, and as such all aspects of the fishery should be at the highest standard.

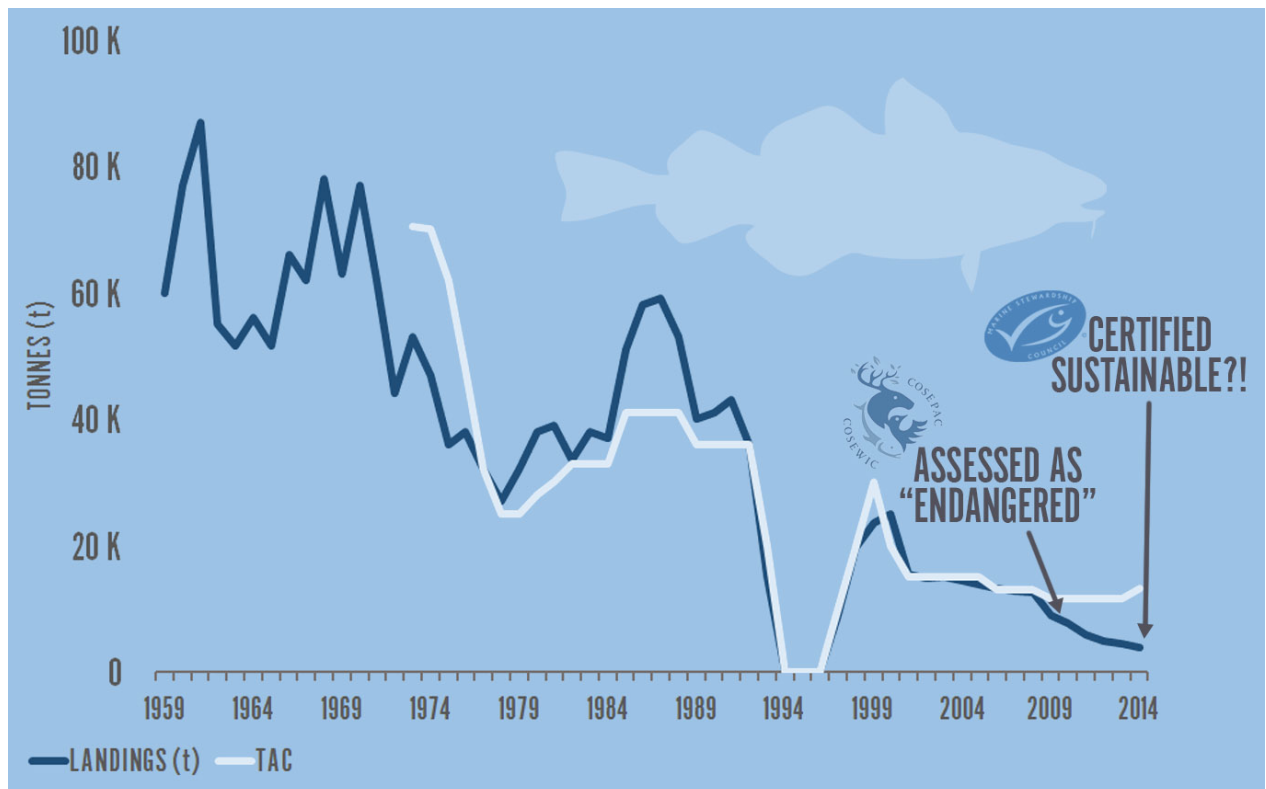


Figure 1. Landings of 3PS cod 1959-2014, with identification of key aspects of fisheries management and assessment as well as certification processes. (Figure redrawn from DFO 2015 Stock Assessment.)

3.0 Admissibility of Objection

We have complied with the MSC standards, and the IA has deemed our objection to have met the following determinants:

- CD2.3.4 The notice of objection must set out clearly and precisely the basis upon which CD2.7.2 is said to apply. It must:
 - CD2.3.4.1 Identify the alleged errors in the final report and determination;

- CD2.3.4.2 Explain in sufficient detail why it is claimed that the alleged errors made a material difference to the outcome of the determination or the fairness of the assessment.

4.0 Primary Aspects of the Objection

4.1 Objection Pursuant to CD 2.7.2.2.

4.1.1. P 1.1.2 was scored at SG 80, Limit and target reference points are appropriate for the stock (SG 80)

Our contention: The limit and target reference points defined in the report are **not** appropriate for the stock (CD 2.7.2.2 (a)) and the score of 80 is too high.

Critically important to our objection to the scoring here is the fact that both the LRP and the TRP are unrelated to B_{MSY} as noted in the Conservation Plan and Rebuilding Strategy (CPRS). Regarding scoring of 1.1.2 we question the choice of limit and target reference points.

- **Limit Reference Point:**
 - The Limit Reference Point (LRP) is defined as the minimum biomass from which there has been a sustained recovery.
 - This minimum occurred in 1994 and the SSB then increased for 1 generation (10 years). The SSB then declined rapidly by over 50% to below the SSB in 1994. Thus, the **recovery was not sustained** and the basis for the LRP is not supported by observation. The CAB did not respond adequately to this specific comment (CD 2.7.2.2 (b)).
- **Target Reference Point / Upper Stock Reference Point (TRP / USR)¹**
 - The TRP is defined as twice the LRP.
 - This is contrary to MSC Certification Requirements v 1.3 CB2.3.4. “In cases where the LRP is set at 20% B_0 , a default value for the TRP may be assumed to be 2xLRP (CB2.3.3.1). **In other cases, for instance where the LRP is set at the lowest historical biomass, it cannot be assumed that TRP (B_{MSY}) = 2xLRP.** Teams shall justify any TRP derived from an established LRP in terms of its consistency with B_{MSY} .”
 - Assessment teams did not justify the TRP derived from an LRP in terms of its consistency with B_{MSY} . Indeed, as part of the scoring of PI 1.1.2 it is stated that “**Establishment of a B_{MSY} reference point is subject to further development.**” There is no condition associated with this weakness in the report.

¹ Note that the terms Target Reference Point (TRP) and Upper Stock Reference (USR) are used interchangeably in the report.

- The TRP is inconsistent with CB2.3.4 and thus inappropriate.

The scoring of P 1.1.2 cannot meet SG 80 because:

- SI a was scored at SG 80, Reference points are appropriate for the stock and can be estimated. The defined reference points are in appropriate for the stock as detailed above.
- SI b was scored at SG 80, The limit reference point (LRP) is set above the level at which there is an appreciable risk of impairing reproductive capacity. An evaluation (CB2.2.1) of the landings history shows that the reproductive capacity of this stock is impaired. Over the 30 years from 1960-1990, the annual landings averaged 50,000t. Since 2005 the average landing was 10,000 t, the landings have declined steadily to 5,000 t, and the annual TAC has not been caught. Based on EAC's objection to the report, the CAB alleges that 3Ps Cod is currently in a low productivity regime based on warmer temperatures and the appearance of warm water species.
- The CAB does not cite any scientific literature demonstrating environmental factors specifically affecting 3Ps cod productivity and this was not discussed in the original report. In response to our Summary Document, the CAB included several references that were not included in the PDRC but also are not specific to 3PS cod. The concept of environmental change should not be used as an excuse to not have biologically meaningful reference points or consider the full trajectory of stock decline or potential for recovery. Guideline CB2.3.1 has not been met, the LRP as defined is too low, and SG 80 is not justified.
- SI c was scored at SG 80, The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent of outcome. Ironically, the report justifies the TRP based on CB 2.3.4, but as pointed out above, CB 2.3.4 does the opposite. Rather, the landings history of this stock indicates that annual landings averaged 50,000 t over a 30-year period. This is a reasonable proxy for MSY. If one assumes a harvest rate of 20%, this suggests that B_{MSY} is in the region of 250,000 t. The TRP proposed for 3Ps Cod is well below that. Scoring of SI c is therefore too high.

Comparison with recent recertification of Scotia Fundy Haddock

- Comparison with recent recommendation for recertification and final determination report for Scotia Fundy Haddock to illustrate discrepancies in scoring standards.

P.1.1.2 issue a Limit and Target Reference Points Are Appropriate for the Stock

- Scoring of 80 was given to the Canada Scotia Fundy haddock populations as a result of the following being in place:
 - "A Sissenwine- Shepard production model was run using the population estimates from the model. The analysis used the entire summer RV

survey time series. The model estimated Maximum Sustainable Yield (MSY) at 14,700 t, SSB at MSY (SSB_{msy}) at 52,000 t, and F_{msy} at 0.43. Biological reference points of 40% (20,800 t) and 80% (41,600 t) of SSB_{msy} were suggested as the limit reference point (LRP) and upper stock reference (USR). A target removal reference of 0.25 (F 0.1) is suggested. The foregoing is consistent with DFO Precautionary Approach guidelines and justifies a score of 80 for issue a.

- The reference points here, of LRP at 40% SSB and 80% SSB for the USR, including a target removal rate are far more precautionary than LRP at B_{RECOVERY}. If these reference points are scored at 80, it is difficult to understand how the reference points in the 3PS cod assessment can be scored at 80 given the difference in the modeling sophistication, reliance on only on the SURBA data for 3Ps cod vs a production model estimate for Haddock.
- This comparison further underscores the inappropriate scoring for 3Ps cod, given both stocks are managed by the Canadian Department of Fisheries and Oceans (DFO).

Impact of inappropriate reference points on scoring of P1 1.1.1.

PI 1.1.1 was scored at SG 70. However, based on our objection to the scoring of PI 1.1.2, we contend that this is too high.

- SI(a) was scored at SG 80. It is highly likely that the stock is above the point where recruitment would be impaired. This is based solely on the probability that the stock is above the LRP, as defined in the report. Nothing is presented to support the requirement that recruitment is not impaired. The EAC contends that recruitment is indeed currently impaired and the LRP is too low.
- SI (b) was scored at SG 70 because the stock is not fluctuating around the TRP.
- The requirement for the PI is “The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing”. As noted earlier, the stock produced average annual landings of 50,000t over a 30-year period from 1960-1990. Since 2005, the average annual landing was 10,000t, the landings have declined steadily to 5,000t, and the annual TAC has not been caught. Clearly the stock is not highly productive and recruitment is likely to be impaired.

4.1.2 PI 1.2.1 There is a robust and precautionary harvest strategy in place

- The CAB refers to the Conservation Plan and Recovery Strategy (CPRS) adopted in 2013 and approved by the Minister of Fisheries and Oceans in 2014 as the primary evidence that a “robust and precautionary harvest strategy is in place”. Simply stating that the harvest strategy is robust (initial part of first sentence in justification of SI (c)) is not sufficient. Nor is the uncited reference to “similar harvest strategies”. Furthermore, the concept of robustness is not developed in the justification.

- The CPRS has not been fully evaluated. DFO science response to the quantitative evaluation of the CPRS indicates that there are significant uncertainties as well as inability to quantitatively assess the CPRS (DFO 2012d <http://www.dfo-mpo.gc.ca/Library/347618.pdf>.)
- The evaluation states: “The management objectives are ‘To achieve and maintain the 3Ps Cod Spawning Stock Biomass (SSB) in the ‘healthy zone’ as defined by DFO’s Precautionary Approach framework, and at or near BMSY or its proxy, and to provide reasonable fishing opportunities during the rebuilding period’. **These objectives have not been stated in a way that can be measured.** Timelines to reach the ‘safe zone’ and B_{MSY} need to be identified and risk tolerances specified. Further in the proposed CPRS it states ‘The fishing mortality rate should not exceed F_{MAX} ’. It is assumed that this is meant to be F_{MSY} . **The time horizon and risk tolerance for evaluating $F > F_{MSY}$ are also not identified.** Finally, the meaning of ‘reasonable fishing opportunities’ would need to be presented within the objectives in a quantitative manner. **Until these aspects are specified it is neither possible to test if any CPRS would meet the management objectives nor to determine if objectives are actually being met should the plan be implemented.”**
- The report concludes: “**The CPRS, in its present form, is unable to be quantitatively evaluated.** However, modifications may be possible that would allow such an evaluation, where wording is prescriptive of decisions to be made under particular conditions. **The present (SURBA) assessment model cannot be used in a quantitative evaluation of a CPRS which makes decisions regarding TAC given that it is unable to evaluate the specific impacts of catch levels.** Other assessment models exist that can be used when there is uncertainty in landings, but these would need to be developed for the 3Ps stock of Atlantic Cod and peer reviewed in an assessment framework process. Notably, these developments are not possible in the near future (and not before the 2013/2014 fishing season) and require the investment of significant human resources and require additional expertise. Finally, regarding the management objectives of the CPRS – these are also unable to be quantitatively evaluated as currently stated.”
- The inability to quantitatively evaluate the CPRS is based on two reasons:
 - 1) The TAC decision rules are poorly defined and subjective and
 - 2) The SURBA method does not estimate exploitation rate, and therefore the impact the fishery is having on the stock.
- The CPRS, as of December 2015 has not been quantitatively evaluated in a manner that is publicly available.
- Most importantly, the harvest strategy has no explicit mechanism to control the harvest rate of the fishery (F). While the strategy will reduce the TAC as the SSB index declines, the recent TACs have not been taken and the TAC is not restricting exploitation.
- The inability to quantitatively assess the CPRS makes it difficult to understand the HRC included can be considered robust.
- A removal reference is integral to the DFO PA framework. Thus, it is difficult to understand how the harvest strategy can be considered precautionary.
- Without an estimate of exploitation rate, it is impossible to understand the proportion of Z that is attributable to fishing. Z has been increasing since 1997. There is no condition that requires that the TAC be at least reduced to an average of recent catch levels,

suggesting that there is no incentive to further reduce fishing mortality. If natural mortality is increasing, there is little that the industry can do within a Client Action Plan to affect this.

4.1.3 PI 1.2.2 There are well defined and effective harvest control rules in place

- As stated by the CAB “the overarching harvest control rule is the annual TAC set according to the protocol defined under the harvest strategy (see 1.2.1). Please refer to our objection to the scoring in 1.2.1, as the CPRS details harvest control rules (HCR).
- We refer specifically here to the text in the evaluation of the CPRS (DFO 2012d), where it is stated that “if the CPRS is meant to served as a guide to managers to provide a range of annual TAC options, **rather than a prescriptive harvest control rule when the stock is in a particular condition**, then it cannot be evaluated since the subjectivity of such a process cannot be quantitatively simulated. Under the assumption that the plan is meant to specify the actual TAC value that managers would apply each year, then modifications could be made to allow it to be quantitatively evaluated.”
- **The rules as they are currently written define a decision space from which the TAC could be chosen rather than prescribing a specific TAC that one would choose under particular conditions.**” From this statement, it is difficult to conclude that there are effective harvest control rules in place.
- In order to achieve a score of 80 for SI (a) the harvest strategy must ensure that the exploitation rate is reduced as the LRP is approached. As noted previously, the harvest strategy does not contain explicit consideration for the harvest rate (removal reference) and hence we fail to see how the harvest control rule can be effective. While the strategy will reduce the TAC as the SSB index declines, it is not clear that this would reduce the exploitation rate. The recent TACs have not been taken and the total mortality rate is increasing suggesting that the exploitation rate is in fact increasing.
- SI (b) was scored at SG80, The selection of the harvest control rules takes into account the main uncertainties. The scoring justification describes how apparently contradictory data (commercial catch and catch at age) were eliminated from the assessment in order to reduce uncertainty. Any apparent reduction in uncertainty would be artificial since the data uncertainties are masked. The evidence provided does not support the assigned score, or any other score for that matter.
- SI (c) asks for evidence that the available tools are used effectively to achieve exploitation levels required under the harvest control rules. As noted previously, the harvest strategy does not include explicit targets for the exploitation rate and the assessment does not provide estimates of the exploitation rate. The evidence presented does not support the assigned score.

5.0 Aspects of the Objection Relating to Meeting Conditions

5.1 Objection Pursuant to ACD.2.7.1.

5.1.1 Condition 1 relating to Performance Indicator 1.1.1

Condition 1: The condition states that by the end of the third year of certification it has to be demonstrated that the **stock is at or fluctuating around its target reference point**. Notwithstanding that the target reference point is unrealistically low, as is addressed under CD 2.7.2.2, The current SSB is well below the target (USR) and the total mortality rate is high (0.57) and increasing despite a decline in total catch. **It is highly unlikely that the target will be reached in 3 years, given that the average in the time series is well below the URP.**

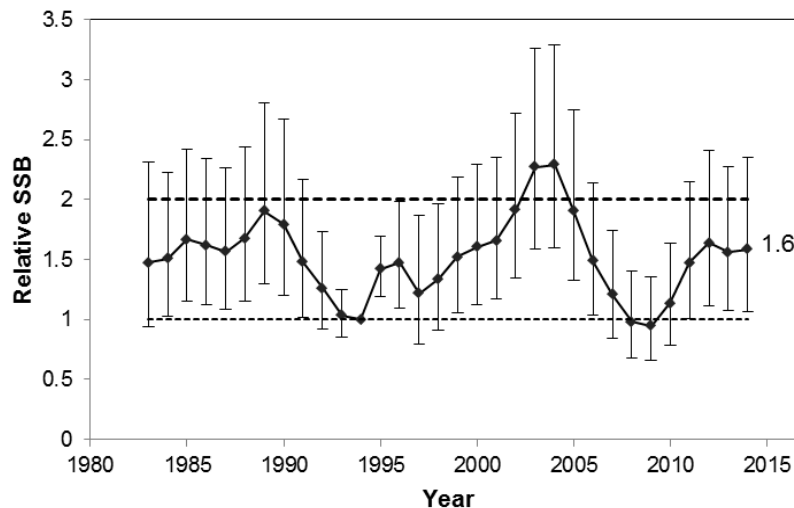


Figure 2. The 3PS cod stock has only been above the USR twice in 35 years, according to the SURBA analysis. (DFO 2015).

The relative SSB exceeded the target reference point in only 2 years (2003-2004) of the 32-year time series (1983-2014). These 2 peak years occurred following a 10-year increase in SSB initiated when the fishery was closed (1994-1996) and the total mortality rate for the stock was relatively low. These facts indicate this condition cannot be fulfilled.

Since then the total catch in the fishery has declined, the annual TACs have not been taken, and the total mortality rate has increased. There has been no effort to reduce the TAC to the actual catch levels.

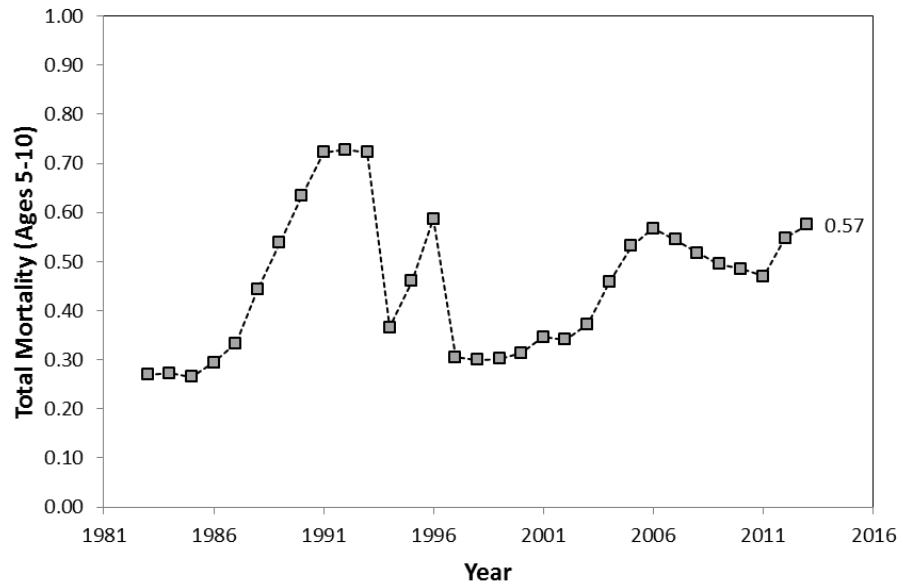


Figure 3. Total mortality, Z increased since the fishery was re-opened in 1996 following the fishery closure (from DFO 2015).

CAB Response: In response to our objection, the CAB has made one concession, extending the requirement to meet the condition from 3 years to 4. This indicates that there is an agreement that the condition will be difficult to meet.

5.1.2 Condition 2,3 relating to PI 2.1.3

In our objection, we raised concerns that Condition 2 & 3 may not be met as they pertain to sectors of the fishery that are not clients in the certification. Because these sectors are responsible for ~ 85% of the quota, and given our experience in other fisheries where sectors of the industry are not included in the client group, we know that there is often communication gaps between industry sectors. While the requirements of the conditions are likely welcomed by some industry players, and because the conditions require data collection and ultimate behavior change in collecting data and reporting on catch and bycatch, we question the certainty that these conditions will be met as well as the inclination of fishers to meet them particularly if they do not know that they are certified.

6.0 Aspects of the Objection Pursuant to PD 2.7.3

In our NoO we note that the CAB has not cited nor made use of the two reports completed by COSEWIC in 2003 where the 3Ps cod population as part of the Laurentian North designatable unit was considered threatened (COSEWIC 2003) and in 2010 where 3Ps cod population was considered endangered (COSEWIC 2010). Rather, the CAB cites COSEWIC reports for leatherback turtle, blue whale and pre COSEWIC assessment document for white hake. The CAB contends that the DFO stock assessments represent the most up to date scientific advice. This does not excuse the CAB from referring to and acknowledging the COSEWIC reports which assess 3PS cod as part of the Laurentian North designatable unit as “endangered.” We maintain that these reports should be referenced and included in the PDRC, and find it unacceptable that COSEWIC reports for bycatch and secondary species are included, yet similar reports for the target species and fishery under certification are omitted. Similarly, the CAB did not include a reference to the Default Listing Policy of 2014, yet includes references to most other DFO policies.

7. Summary of Objection Points

- Because of the uncertainties in the stock assessment, omission of additional data as well as inability to quantitatively assess the CPRS, we contend that the scoring of P1.1.2, P1.2.1 and P1.2.2 are too high, particularly considering the stock status.
- USR/TRP at $2 \times LRP$ when LRP is set at $B_{RECOVER}$ does not meet MSC Certification Requirements v 1.3 CB2.3.4. There is no B_{MSY} estimation, as stated by the CPRS.
- The scoring of P.1.1.2 impacts 1.2.1 and 1.2.2, which assume that reference points are appropriate for the stock.
- There is no removal reference point established, which is contrary to Canadian government guidance on precautionary reference points and harvest control rules.
- There are no conditions to establish an appropriate B_{MSY} proxy or F .
- Total mortality has been increasing, with no effort to reduce the TAC to at least catch levels, particularly when there is no removal reference point (F).
- More precautionary reference points including a removal reference point have been established and scored at the same levels for Scotia Fundy Haddock.
- Omission of key documents produced by Canadian government science advisory

bodies, specifically COSEWIC, is unacceptable.

8.0 Rebuttal to Major Points by CAB

We have been disappointed in the CAB response to the points and critiques we have raised during the course of our stakeholder engagement and ensuing rebuttal. Specifically, we find the conflicting responses regarding high recruitment and low productivity to be particularly concerning as the CAB chooses to use conflicting information to justify its rejection of our concerns.

In regards to recruitment levels, the CAB in its response to our NoO regarding our objection pursuant to PD2.7.2.2 in which we state our concern that the Condition 1 will not be met states in para 25 & 26 where quotes from DFO 2015 are used to substantiate the evidence of strong recruitment *“Recruitment (fig 7 see below) has improved over the last decade with most cohorts at or above the time series (1983-2013) average. In particular the 2006 cohort appears to be quite strong. Preliminary indications are that the 2011 and 2012 cohorts are among the strongest in the series.”*

At the same time, the CAB has stated that 3PS cod is currently in a low productivity regime, and in its response to our summary document submitted on January 25th, the CAB provides several references to academic papers to make the case that 3Ps is in a low productivity regime because of environmental factors. We note that none of the papers included are specific to the 3PS cod stock and question their inclusion here and not in the PDRC.

In one case the CAB is arguing that there is high recruitment (which would indicate high productivity) and in the other the CAB is arguing that it is in a period of low productivity. It cannot be both. We note as well that there is a clear sign of a year effect in RV survey data, with single tows comprising a significant amount of the biomass estimates (1 tow in 2013 = > 50% of overall biomass located in one area). The impact of the 2011 year class has downgraded the overall strength of this year class. This is highly relevant to the appropriateness of the reference points (DFO 2015).

9.0 Proposed Options and Ways Forward for 3PS Cod and MSC Certification

We maintain our contention that this fishery should not be certified as it sets a poor precedent for the MSC and will further confuse consumers given that the population is also undergoing the listing process under the Canadian *Species At Risk Act* (SARA). There are several improvements in the rebuilding strategy, stock assessment and related decision rules that need to be addressed before certification is considered. These include, at a minimum:

- Developing a stock assessment model that produces estimates of exploitation rate.
- Establishment of a complete set of reference points either based on MSY or a suitable proxy, and include a TRP, a LRP, and a removal reference (F) as described in the DFO

Precautionary Approach policy. Incorporate these reference points into the CPRS and adjust the harvest control rules to take these into account.

- Completing a quantitative review of the revised CPRS and resolve issues raised in DFO 2012, including the confirmation that the CPRS and harvest control rules therein can be scientifically evaluated, particularly for the “cautious” and “critical” zones.
- Reducing current Total Allowable Catch (TAC) to a level consistent to recent annual catch until such time as the total mortality rate declines and the stock increases to above the USR. Reducing the TAC to the recent annual catch would exemplify precautionary management.

10. References

COSEWIC 2003. COSEWIC assessment and update status report on the Atlantic cod *Gadus morhua* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 76 pp.

http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_atlantic_cod_e.pdf

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