

SPRFMO Jack Mackerel MSE Task Team

MEETING REPORT

Meeting report: Candidate management procedures, robustness testing, and SC14 preparation

Meeting date: 24 July 2026

Status: Draft for member review and Scientific Committee circulation

Prepared for: SPRFMO Scientific Committee members

Executive summary

The task team reviewed work completed after the Wageningen MSE workshop, including operating-model conditioning, corrections to the power-ramp harvest control rule, candidate-management-procedure tuning, and robustness tests. The discussion identified two principal candidate management procedures for continued evaluation: MP29, which uses a hockeystick harvest control rule, and MP32, which uses a power-ramp rule. These remain candidates rather than a final recommendation.

Both procedures were tuned against the same long-term biological objective: an approximately 60% probability of being in the dynamic Kobe-green condition during 2041–2050 under the reference operating model. In the reference comparisons, MP29 generally provided higher short-term catch and lower interannual catch variability. MP32 responded more quickly when the combined index declined and performed comparatively well under some adverse recruitment scenarios. Members emphasized that the differences were often modest and should not be described as establishing an “optimal” procedure.

Tests using only fishery-dependent indices produced a more responsive indicator but slightly lower short-term catch and greater catch variability. The group agreed to retain all five indices for the present analysis. Members stressed that the northern Chile acoustic survey is the only fishery-independent index in the current set and provides information that cannot be replaced fully by fishery-dependent series.

The two-stock robustness tests identified important stock-specific risks. Without movement, the southern stock met the agreed performance benchmark, while the northern stock did not unless the simulated distribution of catch shifted by approximately 3.07 percentage points from north to south. With movement, equal weighting of northern and southern indices could cause the combined indicator to rise while southern spawning biomass declined. No tested catch distribution produced the desired long-term result for both stocks in that movement scenario. The group therefore recommended tracking northern and southern indices separately and incorporating divergence between them into the exceptional-circumstances process.

Further work before SC14 includes final 500-replicate tuning runs, a limited comparison of annual TAC-change constraints, completion of banking-and-borrowing tests, clearer diagnostic figures, a technical annex, and a concise synthesis for members. The formal submission target discussed was 8 August, although the technical annex may follow during 10–14 August. A follow-up meeting was proposed for 13 August.

1. Purpose and scope

The meeting was convened to:

1. review technical work completed after the Wageningen MSE workshop;
2. examine the narrowed candidate-management-procedure set;
3. review robustness tests and their interpretation;
4. clarify how annual advice would be calculated with future data;
5. identify exceptional-circumstance considerations; and
6. agree on the remaining analyses and reporting needed for SC14.

The task team's role is to provide results and a clear technical synthesis to the Scientific Committee. The Scientific Committee will consider those results when developing advice to the Commission. No final management procedure was selected at this meeting.

2. Technical progress since the workshop

The analysts reported the following changes:

- Additional performance measures were added, including vulnerable biomass and dynamic reference-point measures.
- Projected index errors now include iteration-specific variability, autocorrelation, and cross-correlation among indices.
- A straight-slope harvest rule was added as a structural comparison.
- Errors in the power-ramp rule were corrected. The correction did not materially change the broad workshop conclusions but was necessary for consistent implementation.
- An effort constraint was added to avoid unrealistic projected effort.
- The operating-model grid was retained around the one-stock reference model, with alternatives for steepness, assessment configuration, selectivity, recruitment, two-stock structure, and movement.

The analysts will add distributions of the index-error standard deviations and autocorrelation parameters to the technical report so members can see the uncertainty used in projection.

3. Candidate management procedures

The tuning process was deliberately nested. Analysts first compared targets within each harvest-control-rule family, then examined the effect of a minimum catch, an index limit, alternative index sets, replicate number, and robustness scenarios.

Working label	Meeting identifier	Rule	Catch target	Annual TAC-change constraint
HS+20	MP29	Hockeystick	2,000 kt	-15% / +20%
PR+20	MP32	Power ramp	1,500 kt	-15% / +20%

Both procedures use a 270-kt minimum catch, an index limit of 0.1, and the mean of all five standardized indices. The working labels are intended to make the comparison easier to follow. “HS” denotes hockeystick, “PR” denotes power ramp, and “+20” identifies the 20% maximum annual increase. MP numbers should be retained in technical tables for traceability.

3.1 Hockeystick candidate

Within the hockeystick family, a 2,000-kt target provided a useful balance among short-term catch, long-term catch, biological performance, and catch variability. Adding a 270-kt minimum catch and an index limit of 0.1 modestly reduced interannual catch variability. This configuration became MP29.

3.2 Power-ramp candidate

The power-ramp rule reduces catch more rapidly when the index falls below its trigger. A 1,500-kt target, 270-kt minimum catch, and index limit of 0.1 provided the preferred configuration within this family and became MP32.

3.3 Comparison

Both candidates were tuned to approximately the same long-term biological objective. Their main contrasts were:

- MP29 generally produced higher short-term catch and lower interannual catch variability.
- MP32 responded more quickly to a declining index and showed somewhat stronger recovery under the tested recruitment-crash and cyclic-recruitment scenarios.
- MP29 appeared less sensitive to the alternative selectivity scenario, but the observed differences were small and were affected partly by changes in the FMSY reference point.
- Neither result supports calling one procedure “optimal.” The procedures represent different trade-offs for Scientific Committee and Commission consideration.

4. Choice of indices

The standard candidate procedures use five standardized indices: northern Chile acoustic biomass, Chilean CPUE, Peruvian artisanal and industrial indices, and offshore CPUE. The annual indicator is based on a three-year rolling mean of their combined standardized values.

The CPUE-only comparison omitted the acoustic series. It responded more quickly to changes in simulated stock status but produced slightly lower short-term catch and higher short-term catch variability. The differences in overall performance were limited. The group agreed to retain all indices for the current candidate runs.

Members asked that the report avoid describing the acoustic survey only as a source of noise. The survey is the only fishery-independent abundance index in the current set. Fishery-dependent indices may respond to fuel prices, fleet behavior, market conditions, spatial access, and other factors unrelated to abundance. The final report should explain this complementary role and provide clearer figures comparing index responsiveness.

Only recent observations enter the annual management calculation. Earlier standardized values shown in historical plots do not affect the current three-year indicator.

5. Replicates and tuning

Comparisons using 100 and 500 simulation replicates produced similar trigger estimates and performance summaries. The agreed computational approach was:

- use 100 replicates for broad exploration and sensitivity testing; and
- use 500 replicates for final tuning and the reduced candidate set.

Final reported candidate results should therefore be based on the 500-replicate runs when available.

6. Robustness findings

6.1 Two-stock hypothesis without movement

When the one-stock candidates were applied to the two-stock operating model, the southern stock remained above the agreed performance benchmark but the northern stock declined. An exploratory change in simulated catch distribution of approximately 3.07 percentage points from north to south brought both stocks to the 60% long-term benchmark in the no-movement case.

This result does not constitute an allocation recommendation. It illustrates that a total TAC applied to two separately exploited biological components can create stock-specific risk if the resulting catch distribution is not represented explicitly. The agreed neutral term for the report is “catch distribution”; “catch share” and “allocation” should be avoided in describing this sensitivity test.

Peru confirmed that it intends to continue its independent monitoring, assessment, and management of the northern component. Under that arrangement, the primary question for the SPRFMO candidate procedure is whether the southern stock remains adequately protected when the procedure is applied under a one-stock assumption.

6.2 Two-stock hypothesis with movement

In the movement scenario, biomass shifted from the southern to the northern stock. Because the five indices were weighted equally, increases in the two Peruvian indices could raise the combined indicator even while southern spawning biomass declined. The procedure could therefore recommend increasing catches for a declining southern component.

No tested catch distribution achieved the 60% long-term benchmark for both stocks in this movement scenario. The meeting did not conclude that this scenario is occurring. Rather, it identified an observable warning signal: persistent divergence between northern and southern indices. Northern and southern

index groups should be tracked separately each year, and material divergence should be considered explicitly in the exceptional-circumstances protocol.

6.3 Alternative selectivity

The alternative selectivity placed more fishing pressure on younger fish. This changed FMSY and therefore changed F/FMSY-based risk measures even when catch and spawning-biomass trajectories were relatively similar. Comparisons should distinguish effects caused by the reference-point definition from effects caused by the management procedure itself.

MP29 appeared somewhat less sensitive than MP32 to this selectivity change, but members cautioned that the differences were small and should not be overstated.

6.4 Recruitment scenarios

The recruitment tests included a discrete recruitment crash and a seven-year cyclic reduction. MP32 responded more quickly and produced stronger long-term recovery in these tests, although catch variability could be higher. These results illustrate the intended structural contrast between the two candidate rule shapes.

Other annex runs, including alternative steepness and assessment configurations, were not judged to change the main conclusions materially.

7. Data timing and annual application

The simulations assume that most data are available with a one-year lag. Offshore CPUE is assumed to have a two-year lag. Consequently, calculation of catch advice during 2026 for application in 2027 would use:

- 2025 values for the northern Chile acoustic, Chilean CPUE, and Peruvian indices; and
- the 2024 value for offshore CPUE.

Within a three-year indicator window, the offshore series would therefore contribute only the available observations. The current implementation does not use same-year 2026 observations in the 2027 calculation. Any proposal to use a draft 2026 acoustic result would require an explicit change to the agreed data-availability rule.

At the time of the meeting, the complete 2025 inputs were not yet assembled, so a final 2027 MP-based catch calculation could not be produced.

8. Annual TAC-change limits and banking and borrowing

The base candidates used a maximum annual TAC decrease of 15% and increase of 20%. Members discussed a limited and justified set of additional constraints rather than a large grid of combinations:

- the reverse asymmetry: -20% / $+15\%$;
- a symmetric $\pm 15\%$ constraint, reflecting manager-questionnaire responses; and

- -30% / +20%, reflecting the Commission task discussed in relation to paragraph 63 of the Commission report.

The final subset should be supported by the manager-questionnaire record and the Commission request. These alternatives should be retuned rather than compared using an unchanged trigger.

Ten-percent banking-and-borrowing simulations were still running at the time of the meeting. The technical report should state whether this provision materially changes performance.

9. Exceptional circumstances and current fishery information

The meeting identified two matters for exceptional-circumstance review:

1. divergence between northern and southern abundance indices, particularly under a possible two-stock-with-movement interpretation; and
2. whether current 2026 survey and fishery information lies outside the range represented by the operating models or is inconsistent with MP expectations.

Participants provided preliminary oral updates:

- Chile reported more than 80,000 t caught during July in the south-central fishery, principally near Valdivia and Chiloé, with fish generally above 40 cm and no observed juvenile concentration in those areas. Fishing was expected potentially to continue into September.
- Peru reported approximately 5,000 t caught by the industrial fleet in the SPRFMO area and approximately 27,000 t within Peruvian waters, with the artisanal fleet active.
- Participants noted that southward movement during El Niño conditions has historical precedent.

These were preliminary meeting reports rather than validated data submissions. They do not, by themselves, establish exceptional circumstances. Updated catch, survey, and index data should be reviewed together against the operating-model distributions and the formal exceptional-circumstances criteria.

10. Matters for Scientific Committee consideration

The Scientific Committee will need to consider:

1. whether MP29 and MP32 provide an adequate central comparison of rule shape;
2. which annual TAC-change constraints should be retained for Commission consideration;
3. whether retaining all five indices is appropriate, including the role of the fishery-independent acoustic survey;
4. how separate northern and southern index trends should enter annual monitoring and exceptional-circumstance review;
5. how the two-stock robustness findings should be interpreted given Peru's separate monitoring and management of the northern component;

6. whether banking and borrowing materially changes candidate performance;
7. whether final candidate results should be based on 500 replicates; and
8. whether additional contractor work after SC14 is required and, if so, how it would be authorized and funded.

11. Reporting schedule

The formal document-submission target discussed was 8 August. The analysts indicated that a complete technical annex and draft executive summary would more realistically be available around 10–14 August. The meeting agreed that technical quality and member review were important and that the main synthesis could be circulated while the annex was finalized.

A follow-up meeting was proposed for Thursday, 13 August. Susana was asked to circulate the meeting notice.

12. Action register

Action	Lead	Timing/status
Circulate the updated presentation and provide access through Teams or GitHub	Jim Ianelli; Iago Mosqueira and Benoît Bergès	Following the meeting
Provide corrections to the candidate documentation and registry	Iago Mosqueira and Benoît Bergès; all members	Member review
Add distributions of index-error SD and autocorrelation parameters	Iago Mosqueira and Benoît Bergès	Technical annex
Add clearer plots of index responsiveness and HCR slopes	Iago Mosqueira and Benoît Bergès	Technical annex
Explain the value of the acoustic survey as a fishery-independent index	Iago Mosqueira and Benoît Bergès	Technical annex and synthesis
Complete final tuning using 500 replicates	Iago Mosqueira and Benoît Bergès	Before final candidate results
Use neutral “catch distribution” wording in two-stock analyses	All authors	Immediate
Continue northern-stock monitoring and provide current Peruvian fishery information	Criscely Lujan and Peru	SC14 materials
Track northern and southern indices separately	Analysts and task team	Annual implementation/ECP
Prepare the technical annex and a draft executive summary	Iago Mosqueira and Benoît Bergès	Target approximately 10 August
Prepare and circulate the task-team meeting report	Jim Ianelli	This document
Retrieve manager-questionnaire responses supporting TAC-limit choices	Jim Ianelli	Before final scenario selection
Complete and circulate TAC-limit comparisons	Analysts; Jim Ianelli	Before SC14 review

Action	Lead	Timing/status
Complete and circulate 10% banking-and-borrowing results	Iago Mosqueira and Benoît Bergès	Pending
Provide updated 2025 catch data	SPRFMO Secretariat	Pending
Assess current evidence against exceptional-circumstances criteria	Jim Ianelli and task team	Before SC14
Update the candidate website, Slick material, and plain-language OM/MP map	Jim Ianelli	Ongoing
Circulate notice for the 13 August follow-up meeting	Susana	As soon as practicable

13. Source and review note

This report was prepared from the meeting transcript and automated meeting summary. It is a concise record of discussion and agreed follow-up, not a verbatim transcript. Preliminary oral catch reports and technical values should be checked against formal submissions and the contractor technical annex before the document is finalized.