

# Eastern Bering Sea Pollock Model Development

## Coordinating overview for the September 2026 Plan Team review

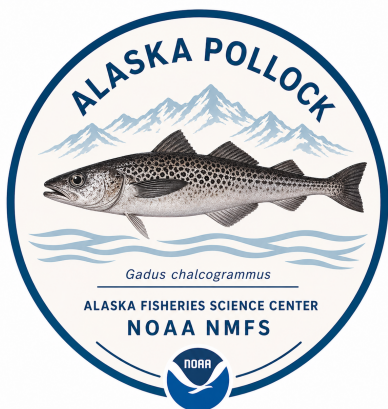
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Three working papers document complementary evaluations of candidate modeling frameworks for eastern Bering Sea pollock. This overview defines the role of each report, summarizes the common evidence and important differences, identifies the proposed development path, and lists questions for Plan Team review. The accepted ADMB assessment remains the basis for current management advice.

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COORDINATING OVERVIEW

# 1 Purpose of this overview

The September 2026 Plan Team review package contains three model-development working papers. They address related but distinct questions and should be read together rather than treated as three competing operational assessments. This overview provides the entry point for the package and identifies the feedback requested from the Plan Team.

## ! Important

The accepted ADMB assessment remains the basis for current management advice. The RTMB, SPoRC, and Rceattle results evaluate implementation fidelity, diagnostics, and future development options; none constitutes a proposed replacement assessment for September 2026.

## 2 Review package

| Report                                     | Primary question                                                                                                                          | Role in the review                                                                                                           |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">RTMB: main report</a>          | Can the custom ADMB assessment be represented faithfully in RTMB, and what do the resulting diagnostics and candidate refinements show?   | Primary technical report and common implementation baseline                                                                  |
| <a href="#">SPoRC: companion report</a>    | Can a general single-region stock-assessment framework reproduce the corrected ADMB candidate and support alternative process structures? | Independent framework comparison and continuing methods-development track                                                    |
| <a href="#">Rceattle: companion report</a> | Can a more general and extensible framework reproduce the principal assessment dynamics and support future operational development?       | Leading candidate for future operational assessment development, subject to the remaining diagnostic and review requirements |

The [main RTMB report](#) contains the fullest documentation of the common data treatment, fixed-parameter bridge, model fits, selectivity analyses, projections, retrospectives, and uncertainty diagnostics. The SPoRC and Rceattle reports should be used to compare how the same assessment problem behaves in more general frameworks.

### 2.1 Supporting analysis

| Identifier | Analysis                                               | Role in the review                                                                                                                                                                                  |
|------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S-1        | <a href="#">Fishery selectivity alternatives (PDF)</a> | Detailed RTMB comparison of the bridge-reference, hierarchical double-logistic, and year-by-age AR1 fishery selectivity specifications; supports the selectivity discussion in the main RTMB report |

The supporting analysis is part of the RTMB evidence package rather than a fourth modeling framework. Its stable links allow the three primary reports to refer to the same equations, diagnostics, and summary data.

### 3 Common evidence

The three reports establish several common points:

- The corrected comparison treats observed and predicted bottom-trawl survey age compositions over ages 1–15 and uses nominal multinomial sample sizes.
- Fixed-parameter comparisons reproduce the principal ADMB population dynamics closely, supporting the tested model mappings.
- Independently estimated models reveal differences that arise from parameterization, selectivity structure, and estimation rather than from the population-dynamics translation alone.
- Time-varying fishery and survey selectivity remains an important source of model sensitivity and weak identification.
- Positive retrospective patterns warrant continued evaluation before an alternative framework is considered for operational use.
- Sparse-metric Bayesian analyses remain exploratory until convergence and effective-sample-size criteria are satisfied.

### 4 Important differences among frameworks

| Dimension                             | RTMB                                                                                                  | SPoRC                                                                                                   | Rceattle                                                                                                                                                  |
|---------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relationship to the custom assessment | Direct translation of the ADMB model                                                                  | Re-expression in a general single-region assessment framework                                           | Re-expression in a broader, extensible assessment framework                                                                                               |
| Principal value                       | Transparent implementation baseline; rapid diagnostics and model experimentation                      | Independent comparison and access to generic population-process structures                              | Strongest path toward a maintainable future operational model and broader structural extensions                                                           |
| Current strengths                     | Detailed bridge tests, diagnostics, retrospectives, projections, and flexible selectivity development | Close corrected bridge, stable deterministic fit, and independent confirmation of core dynamics         | Numerical fixed-parameter bridge, independently estimated comparison, general data/model architecture, and capacity for recruitment extensions            |
| Main unresolved issues                | Retrospective bias and evaluation of candidate selectivity structures                                 | Self-test failures, retrospective bias, and posterior mixing in the correlated survey-selectivity model | Weak Hessian direction in annual selectivity, retrospective bias, observation-model sensitivity, and incomplete posterior mixing                          |
| Proposed role after this review       | Retain as the implementation reference and regression test for subsequent development                 | Continue as an independent methods and comparison track                                                 | Prioritize as the leading operational-development candidate, conditional on successful diagnostics, simulation testing, annual-update testing, and review |

## 5 Proposed development path

The proposed path retains the distinct value of all three frameworks while concentrating operational-development effort on Rceattle.

1. **Retain ADMB for management advice.** Continue the accepted operational assessment while candidate frameworks are evaluated.
2. **Retain RTMB as the technical reference.** Use the corrected RTMB bridge to test likelihood calculations, state variables, projections, and proposed structural changes.
3. **Continue SPoRC as an independent comparison.** Use SPoRC to test whether conclusions depend on a particular software architecture and to evaluate general process-model developments.
4. **Prioritize Rceattle for operational development.** Resolve selectivity identification and retrospective behavior, complete observation-model and simulation evaluations, demonstrate a reproducible annual update, and return with a defined candidate configuration.
5. **Make any transition through formal review.** Present a future operational candidate only after the deterministic model, uncertainty analysis, projections, and update procedures pass agreed review criteria.

## 6 Questions for the Plan Team

The review would benefit from direction on the following questions:

1. Does the Plan Team agree that RTMB should serve as the implementation baseline while Rceattle receives priority for future operational development?
2. Which selectivity and observation-model sensitivities are essential before evaluating an operational Rceattle candidate?
3. What magnitude and pattern of retrospective bias would require model revision, additional uncertainty treatment, or rejection of a candidate?
4. Which simulation tests should be required to evaluate bias, estimability, and robustness under alternative recruitment and selectivity histories?
5. What evidence is needed to demonstrate that the annual data-update and projection procedures are ready for operational use?
6. At what review stage should posterior uncertainty be incorporated, given the current mixing limitations in candidate selectivity models?

## 7 Suggested meeting sequence

For an efficient discussion, the reports can be presented in this order:

1. Use this overview to establish the decision context and requested feedback.
2. Present the RTMB report as the common technical baseline.
3. Briefly summarize supporting analysis S-1, emphasizing the 30% CV double-logistic sensitivity and the AR1 residual comparisons.
4. Present the SPoRC comparison, emphasizing independent confirmation and the remaining development issues.
5. Present the Rceattle comparison, emphasizing its potential operational role and the diagnostic work required before advancement.
6. Conclude with Plan Team direction on priorities, required analyses, and the criteria for the next review.

## 8 Documents

- [RTMB main report](#)
- [RTMB main report PDF](#)
- [Supporting analysis S-1: Fishery selectivity alternatives](#)

- [Supporting analysis S-1 PDF](#)
- [Fishery selectivity summary data](#)
- [SPoRC companion report](#)
- [SPoRC companion report PDF](#)
- [Rceattle companion report](#)
- [Rceattle companion report PDF](#)