



**NOAA
FISHERIES**

Projections and Diagnostics for St. Thomas and St. John Caribbean Spiny Lobster SEDAR 91 Sensitivity Runs

SEDAR 91 Addendum – Projections (Draft: FOR REVIEW ONLY)

July 2026

NOAA Fisheries, SEFSC, Sustainable Fisheries Division, Caribbean Fisheries Branch

Summary

- CFMC Request (April 2026): Explore and integrate a commercial logbook index of abundance for STTJ Spiny Lobster.
- Incorporating indices fundamentally improves assessment by accounting for natural recruitment fluctuations.
- Initial and sensitivity models indicate the STTJ stock is not overfished and overfishing is not occurring.
- Analyses to refine short-term management projections: two index data-weighting thresholds ($SE = 0.2$ vs. $SE = 0.1$) and two forward-looking recruitment scenarios (Stock Recruitment Relationship and Recent Average)



Data Weighting & Performance Diagnostics

Two Configurations Evaluated:

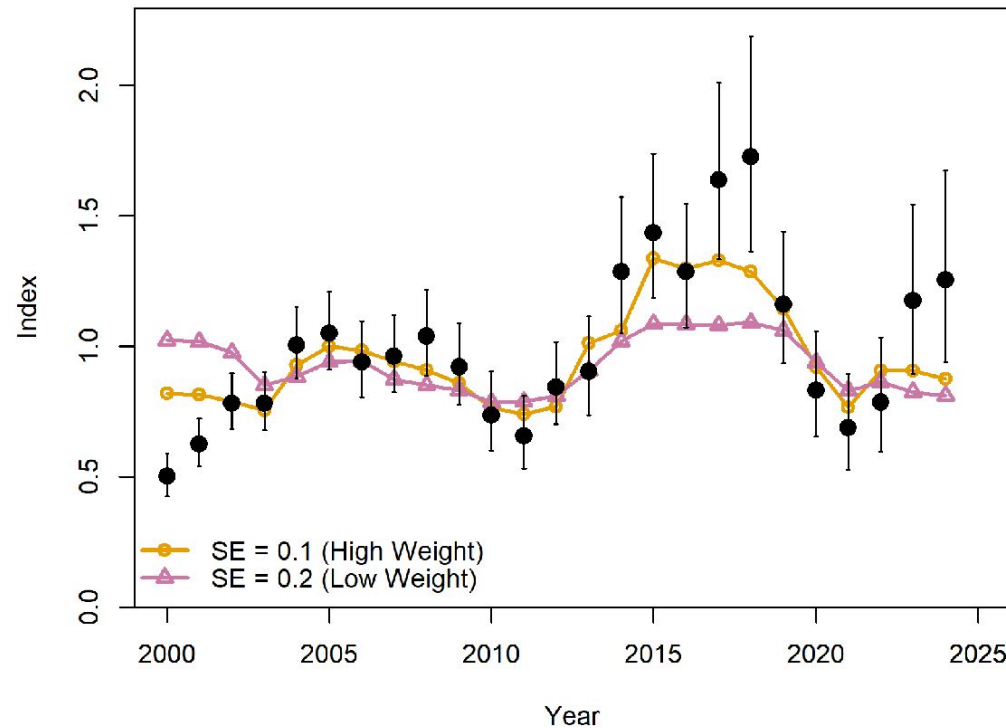
- Low Weight Index: Scaled Standard Error (SE) of 0.2
- High Weight Index: Scaled SE of 0.1

Diagnostics:

- Tested via a 5-year retrospective hindcast cross-validation.
- While both runs exhibit a systematic retrospective pattern, the Low Weight (SE = 0.2) scenario achieved a slightly lower forecasting error (supported by lower Mean Absolute Scaled Error scores).

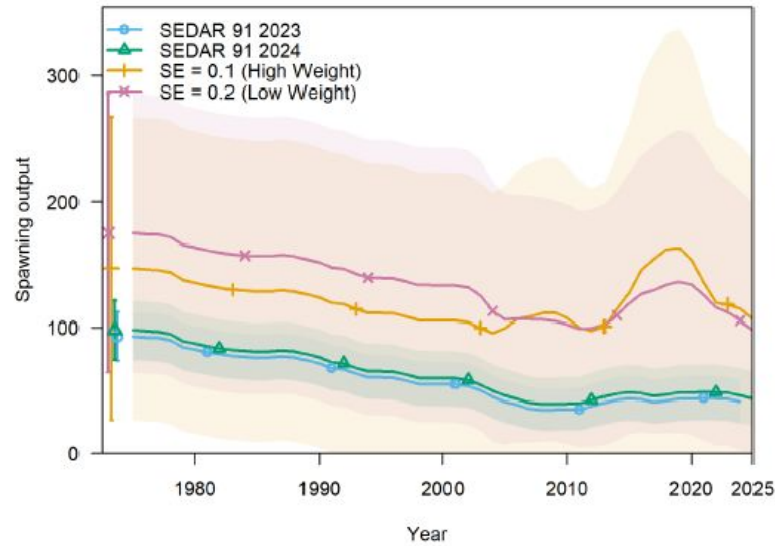


Trap Fleet-Specific Index Fits

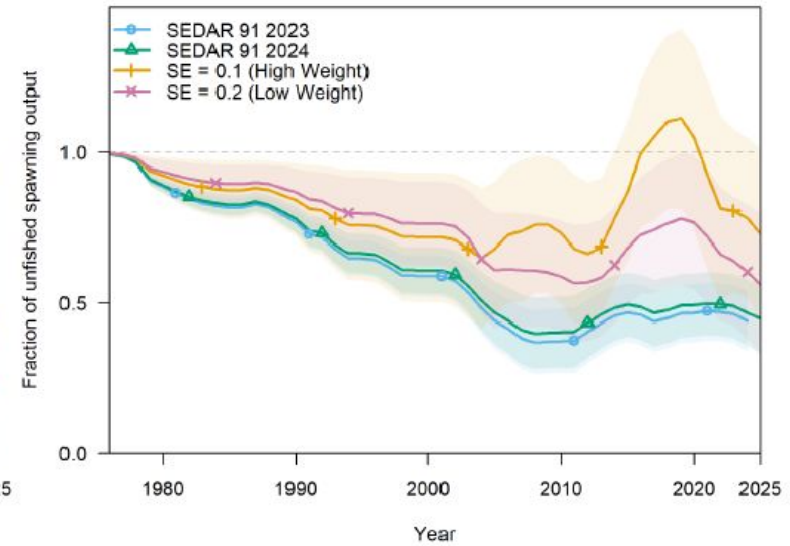


- Tightening the error threshold to $SE = 0.1$ forces the model to track recent annual fluctuations more closely.

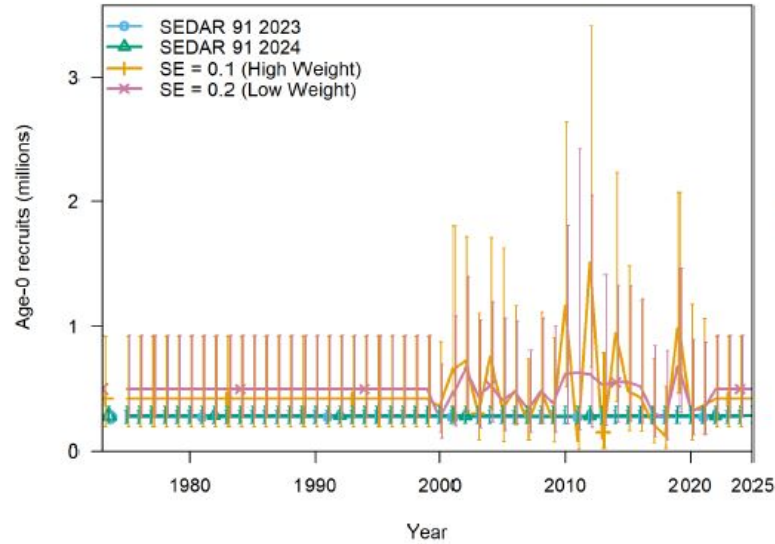
Population Trajectories:



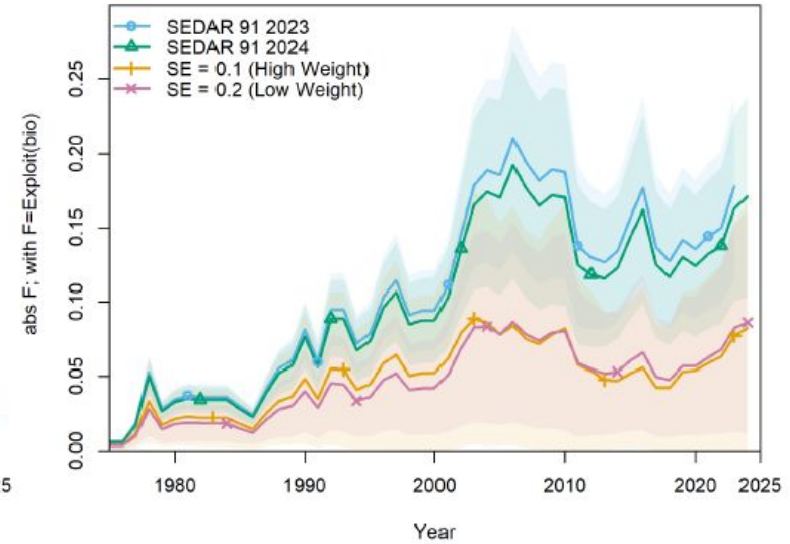
(a) Spawning Biomass



(b) Relative Spawning Biomass

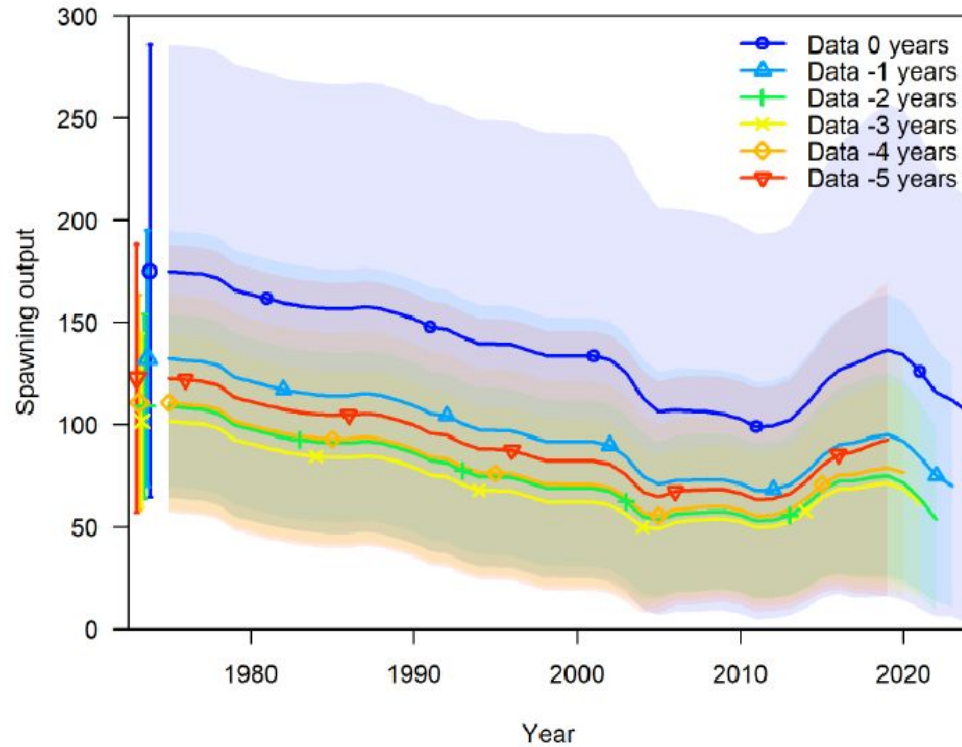


(c) Recruitment

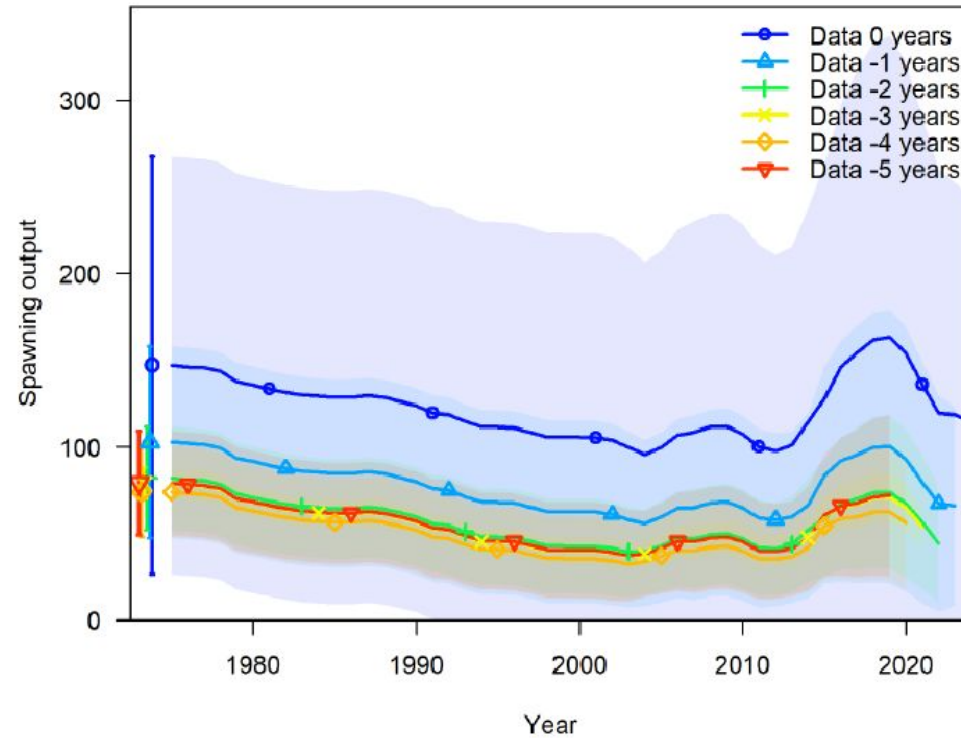


(d) Fishing Mortality

Retrospective trajectories for Spawning Stock Biomass

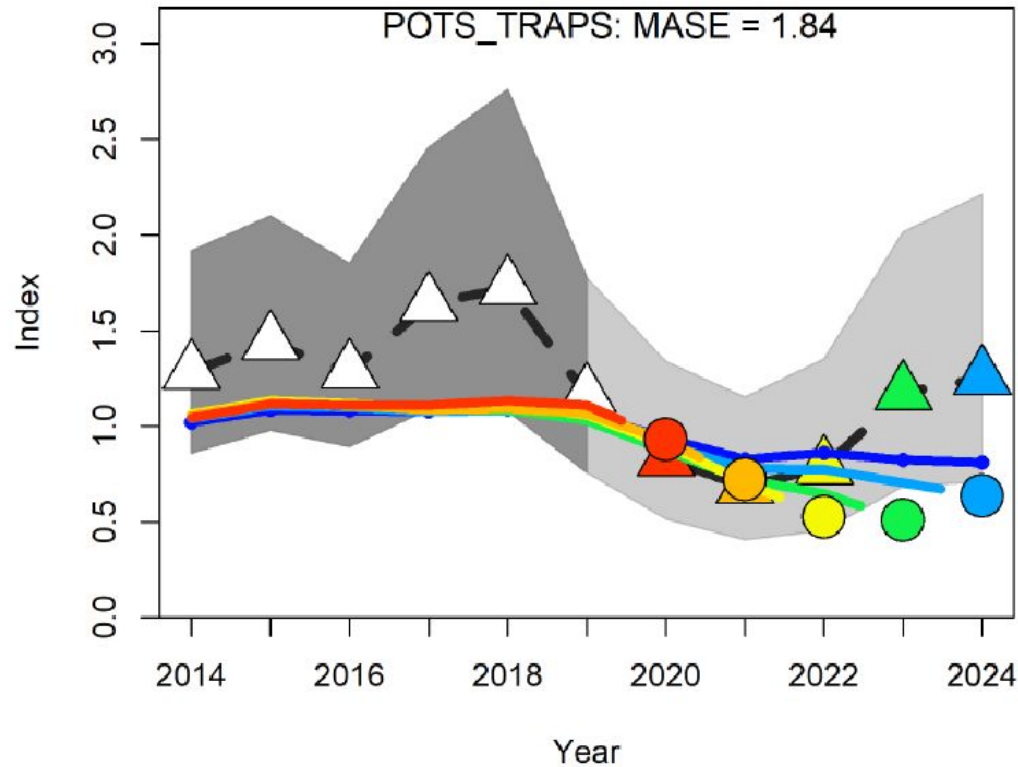


(a) Scenario $SE = 0.2$ Retrospective Peels

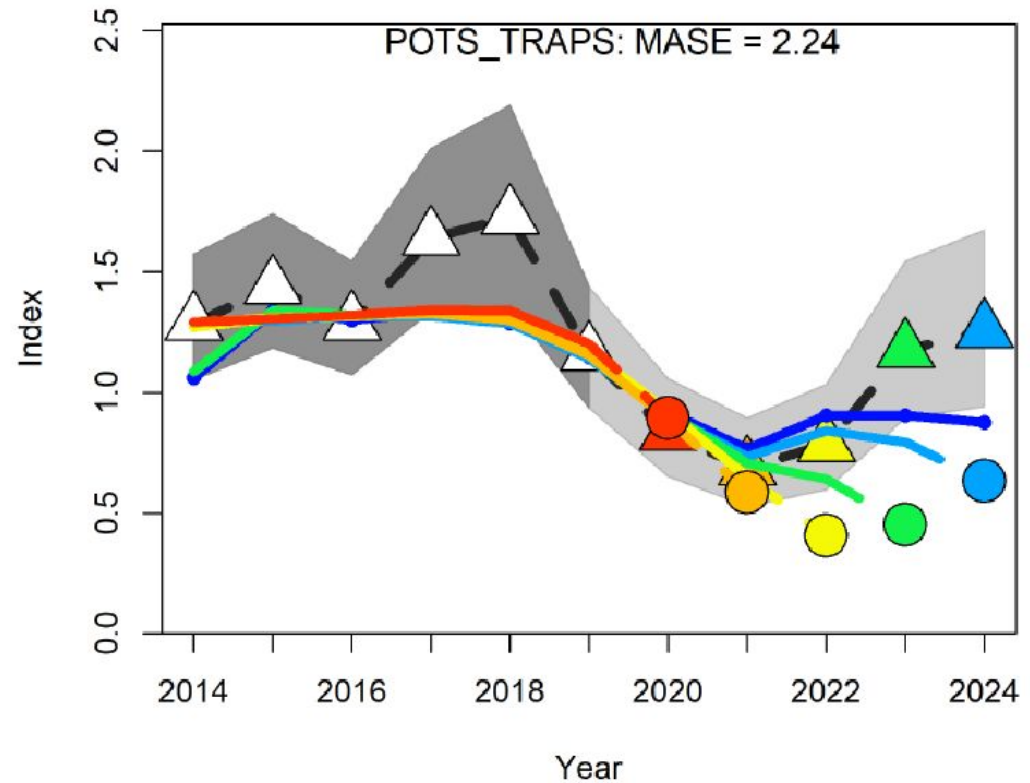


(b) Scenario $SE = 0.1$ Retrospective Peels

Hindcast cross-validation trajectories for both data-weighting scenarios



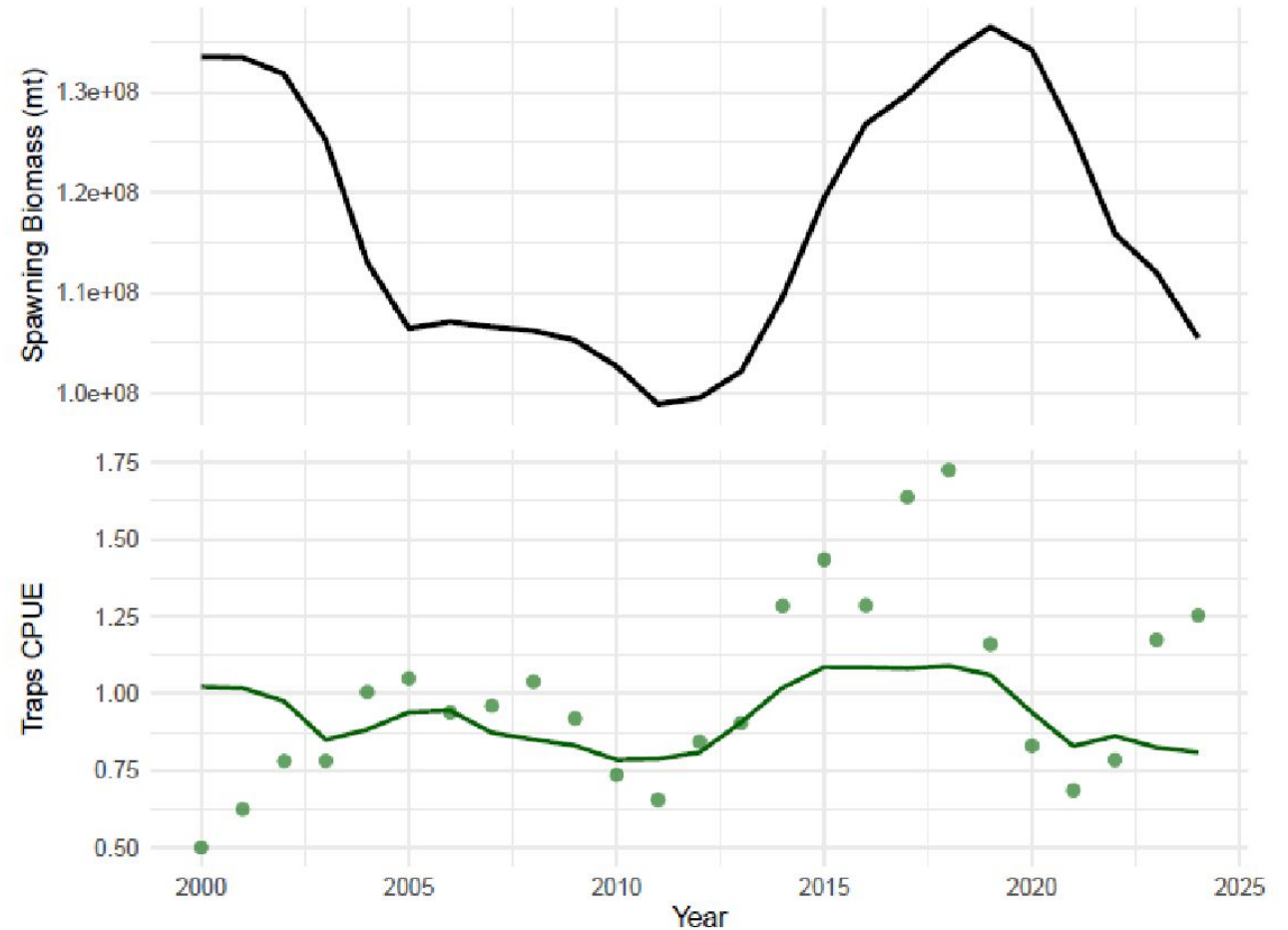
(a) Traps Hindcast (Scenario SE = 0.2)



(b) Traps Hindcast (Scenario SE = 0.1)

Recruitment

- Unlike in PR , STTJ did not show sustained period of recruitment over the past decade.
- This peak in recent years is not captured by the predicted index.
- Isolated terminal years (2022–2024) from stable data-driven years (2020–2021)



Projection Settings

Interim Years (2025–2026):

- Catches are fixed using the 3-year geometric mean of recent landings (2022–2024) to reflect recent fishery realities.

Alternative Recruitment Projection:

- Utilizes South Atlantic SAFMC SSC Workgroup guidelines.
- Projects future recruitment based on the mean of six high-recruitment years (2015–2021).

Rationale:

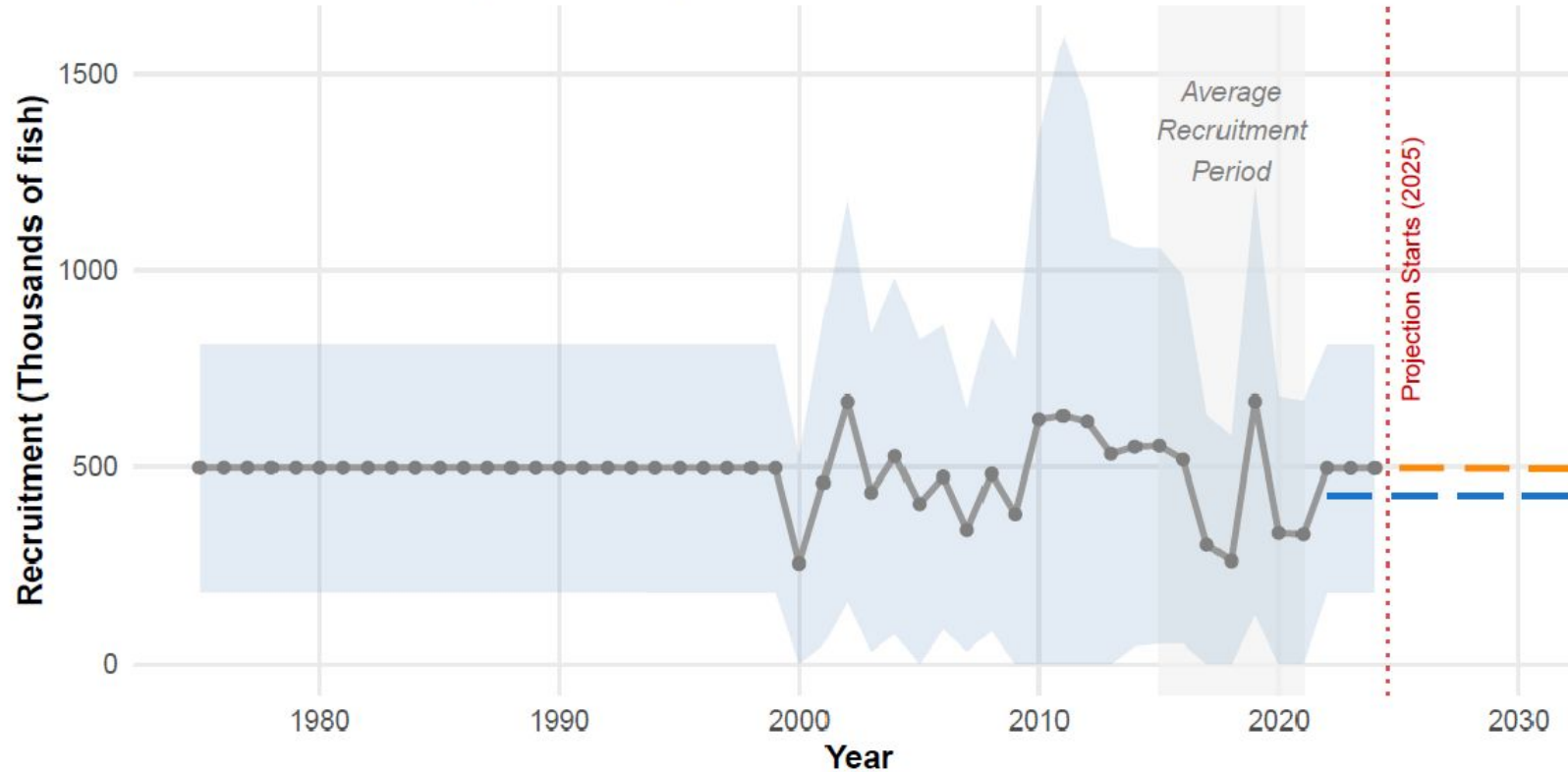
- Overall stock recruitment relationship may not represent recent productivity; the recent average alternative evaluates the sensitivity of OFL advice to sustained recent recruitment trends.



Projection Settings

STTJ Spiny Lobster: Recruitment Trajectory & Forecast

Historical trajectory, Stock Recruitment Relationship (SRR), and recent recruitment period average (2015–2021)



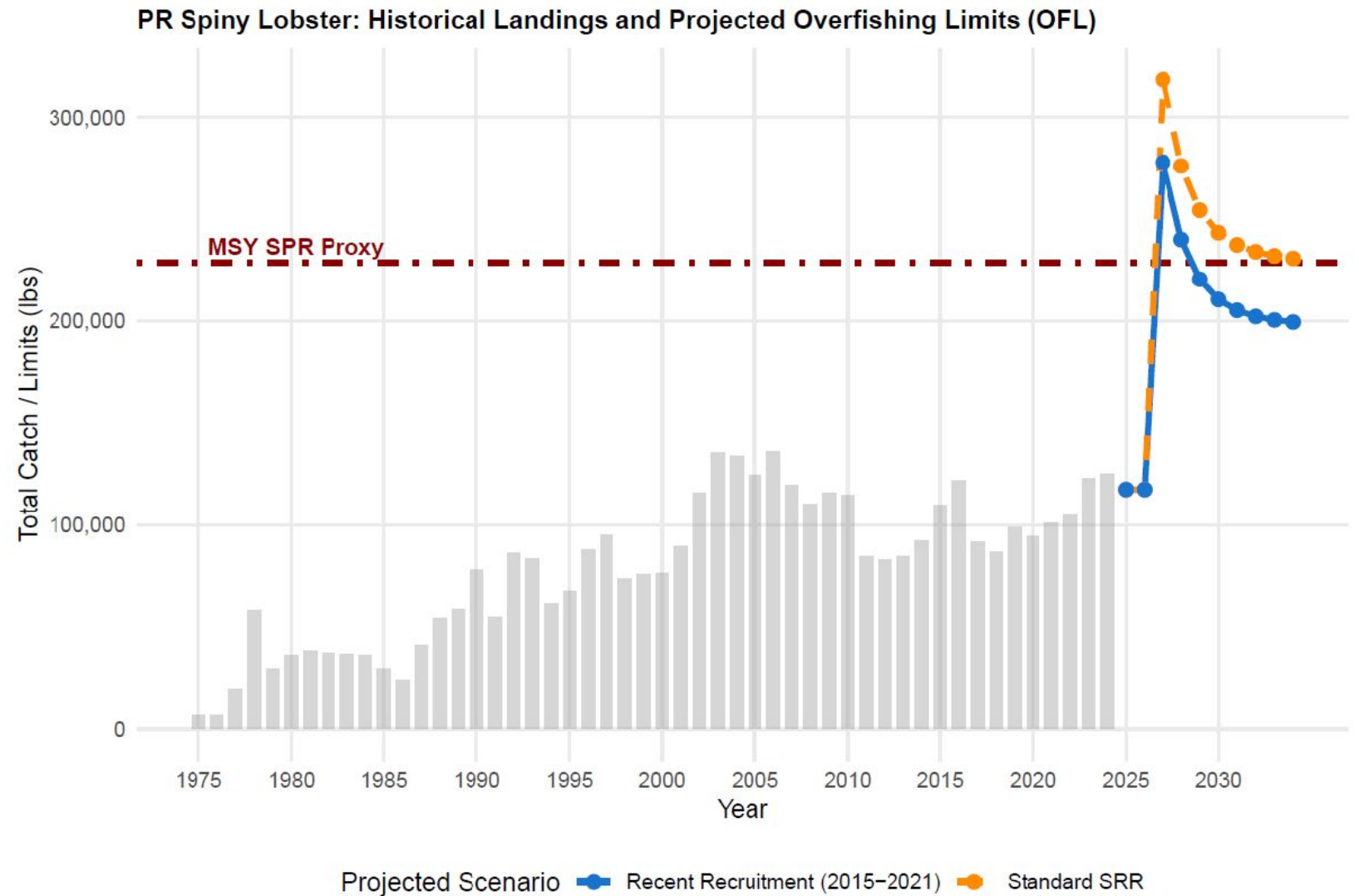
Projected Scenario:

— Recent Average (2015–2021) — Standard SRR



NOAA
FISHERIES

Projected Overfishing Limits (OFL)



- Preferred Scenario Results: Displays projected OFLs based on the preferred SE = 0.2 framework alongside the long-term MSY proxy.

Projected Overfishing Limits (OFL)

Metric	2025	2026	2027	2028	2029	2030
Standard SRR	117,386	117,386	318,347	276,125	254,409	243,357
Recent Recruitment (2015-2021)	117,386	117,386	277,930	240,055	220,546	210,558
MSY SPR Proxy	228,644	228,644	228,644	228,644	228,644	228,644

- Preferred Scenario Results: Displays projected OFLs based on the preferred SE = 0.2 framework alongside the long-term MSY proxy.



Summary

Best Available Framework

- The $SE = 0.2$ configuration incorporating logbook indices and accounting for sustained high recruitment provides the most accurate current measure of stock abundance.
- Offers a data-driven, quantitative tool to capture changes in CPUE and reports of local abundance.

These alternative projections should strictly be used for short-term management advice until fishery-independent surveys or explicit environmental recruitment mechanisms can be integrated.

