Appendix A: Risk table for Pribilof Islands Red King Crab

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The following is a synthesis and interpretation of the most recent ecosystem information available for Pribilof Islands Red King Crab from the Eastern Bering Sea Ecosystem Status Reports (ESR, Siddon, 2024; Siddon, 2025, in press). This information may be helpful for evaluating risk table score levels and is organized below by the proposed risk table categories.

Category Summary:

Assessment-related Considerations	Population Dynamics Considerations	Ecosystem Considerations	Fishery-informed Stock Considerations
Level 2: Increased concern	**Level 2**: Increased concern	**Level 1:** Normal	**Level 1**: Normal
Removal of the corner stations contributed to the decrease in the number of observed crab from 77 in 2022 to 9 in 2025 and resulted in increased CVs.	No recruitment has been observed since 2018; only very large crab were observed in the 2025 survey	Warm conditions with a reduced cold pool extent in 2024; forecast to be warm with delayed sea ice arrival in 2025. Corrosive bottom waters remain a concern for growth and survival. Overall, ecosystem concerns are minor with uncertain impacts on the stock.	No fishery occurs for PIRKC.

Assessment-related considerations:

- A decrease in the sampling intensity around the Pribilof Islands contributed to increases in CVs for the input data of the assessment. Declining abundances also contributed to the increase in CVs.

Population dynamics considerations:

- Essentially no recruitment has been observed since 2018.
- Only very large crab were observed in the 2025 survey.

Ecosystem Considerations:

Ecosystem indicators are organized into several categories to capture the scope of considerations available in the ESR reports:

- Distribution: December 2023 had significant along-shelf winds that could have driven offshore Ekman transport. March to May 2024 had weaker, but more sustained winds that also favored offshore transport (ESR: Hennon, 2024). Strong summer winds in 2024 resulted in a deep mixed layer (ESR: Hennon, 2024).

- Environmental Processes: During winter 2024-2025, the NPI was negative (ESR: Siddon, 2025) for the first time in 9 years, an indication of a stronger Aleutian Low Pressure System (ESR: Siddon, 2025). This means the Bering Sea was warm, stormy, and had less sea ice.
- Summer bottom trawl SSTs in the EBS were slightly cool, while mean bottom water temperature increased by 0.5°C from 2024 to 2025. The extent of the cold pool was below average and a 29% decrease from 2024 (ESR: Siddon, 2025).
- Sea ice is expected to arrive in the northern Bering Sea later in winter 2025/2026 than 2024/2025 due to comparatively low sea ice extent currently in the Chukchi Sea (ESR: Siddon, 2025 *forecast will be updated for final ESR*).
- The NMME ensemble forecasts as of today show moderate warm SST anomalies over much of the SEBS (<0.5°C) into fall 2025, except Bristol Bay shows anomalies up to +2 °C. The NBS is projected to have SSTs close to the historical mean (ESR: Siddon, 2025 *forecast will be updated for final ESR*).
- Bottom waters remained near threshold levels in 2024 that could negatively impact growth and survival, with the most corrosive bottom waters found in slope waters and over the northwest shelf (ESR: Pilcher, 2024).
- Prey: Diatom abundance anomalies, based on the Continuous Plankton Recorder, remained positive from 2023 to 2024 (ESR: Siddon, 2025), indicating above-average feeding conditions for pelagic crab stages in 2023 and 2024.
- Competitors:Over the southern shelf, motile epifauna (e.g., sea stars, brittle stars) biomass increased from 2023 to 2024 and remains above the long term mean (ESR: Siddon, 2024). Benthic forager (i.e., small-mouthed flatfish) biomass increased from 2023 to 2024, but remains below the time series mean, suggesting competition for prey resources remains low in 2024 (ESR: Siddon, 2024).
- Predators: Bristol Bay sockeye salmon run sizes were closer to the long-term average in 2023-2024 (ESR: Siddon, 2024), after multiple years of large run sizes, indicating a decline in predation pressure.

References

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