



Bristol Bay Red King Crab Resampling Discussion

NOAA-AFSC Shellfish Assessment Program

May 2022 CPT Meeting

Proposed changes

Establish a 25% threshold for triggering Bristol Bay resampling
Standardize the number of stations resampled (20 stations)

(Proposed new protocol attached to agenda item)

Review of current protocol

- Resample if **10% or more** of BBRKC mature females have not completed the molt-mate cycle as determined by egg codes (i.e. empty egg cases, no eggs, hatching, and eyed eggs)

Barren



Eyed eggs



- Resample stations are selected based on mature female BBRKC densities (20-30 stations representing 80% of the Leg 1 distribution)

January 2022 CPT feedback

At the January meeting, the CPT recommended:

- (1) Clarifying the goals of resampling
- (1) Assessing how the clutch condition composition changed across all survey years compared to resampling years
- (1) Assessing impacts of past years if the threshold prompting resampling had been higher than 10%
- (1) Considering standardization of the selected stations for resampling

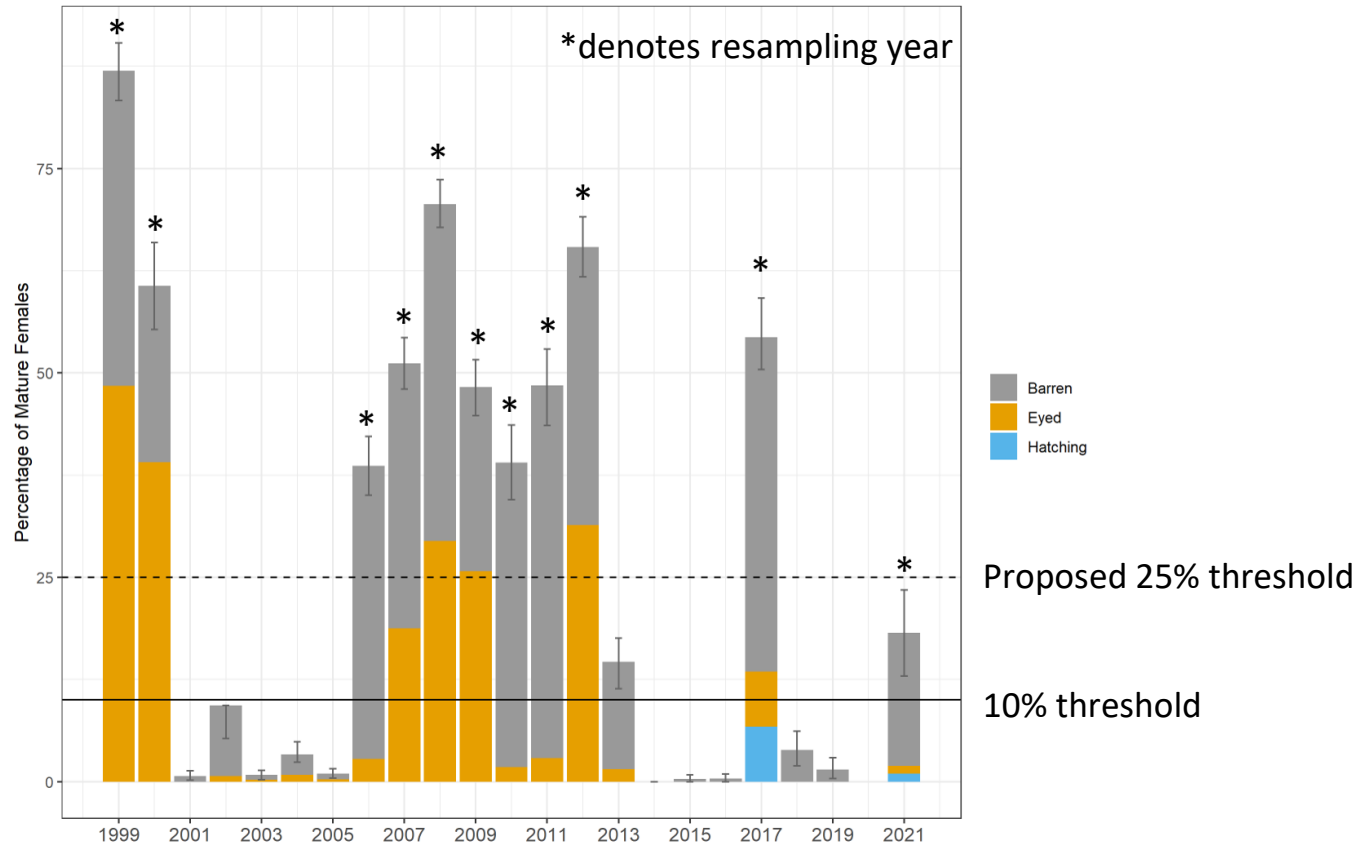
(1) CPT Recommendation 1: Clarify the goals of resampling

The primary goal of resampling is to improve the accuracy of size composition data for post-molt females

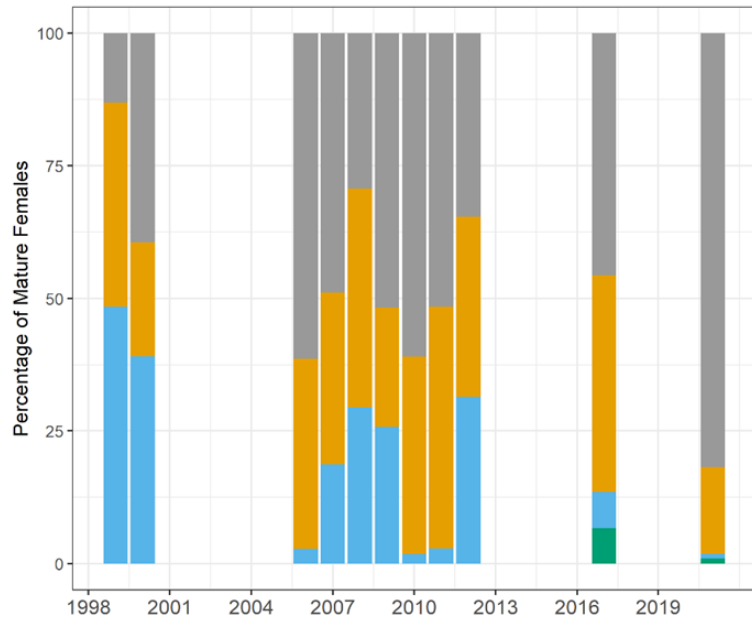
Secondary goal: Improve abundance estimates of mature females by including post-molt females potentially unavailable to Leg 1 survey gear

Tertiary goal: Improve accuracy of mature female reproductive status by including post-molt females

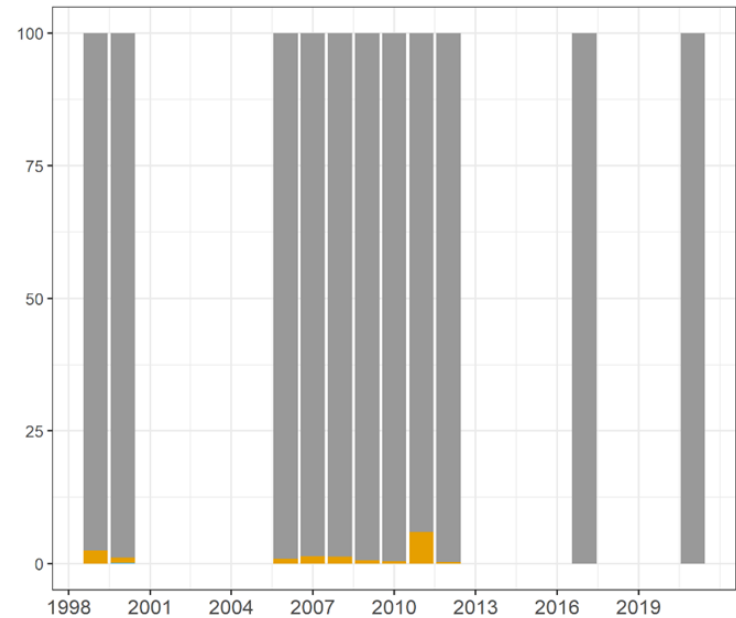
CPT Recommendation #2: How has the clutch condition composition changed across all survey years compared to resampling years?



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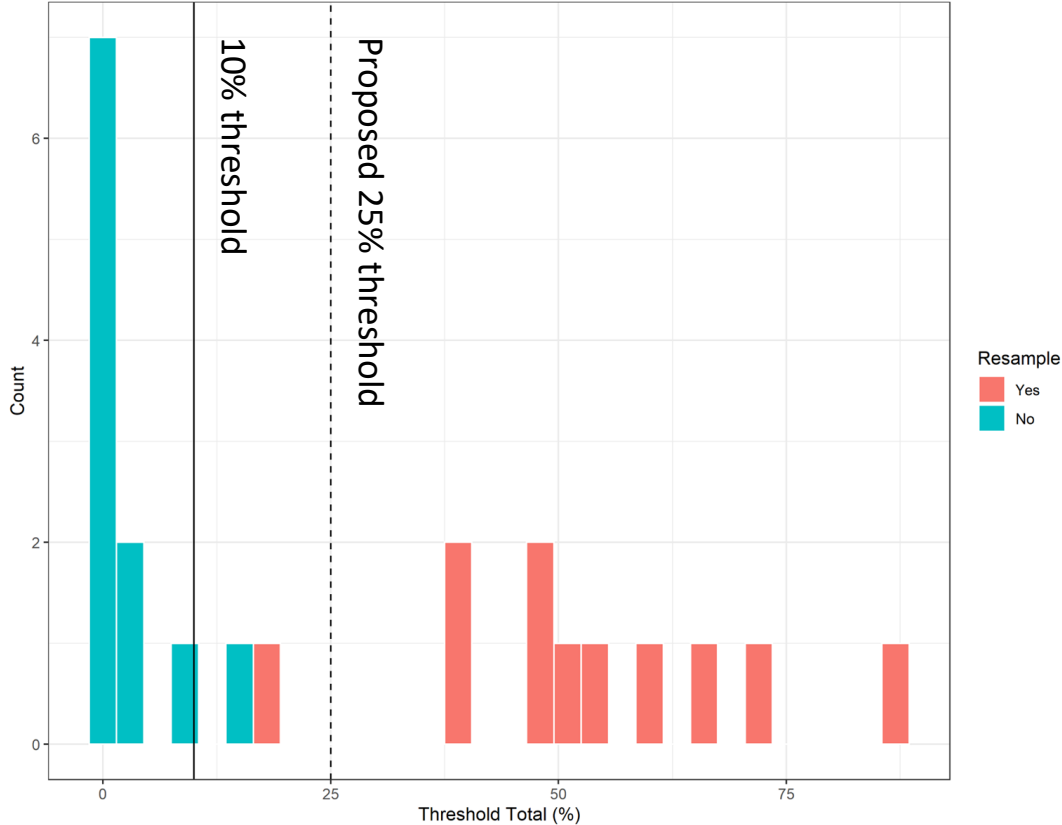


Original Stations



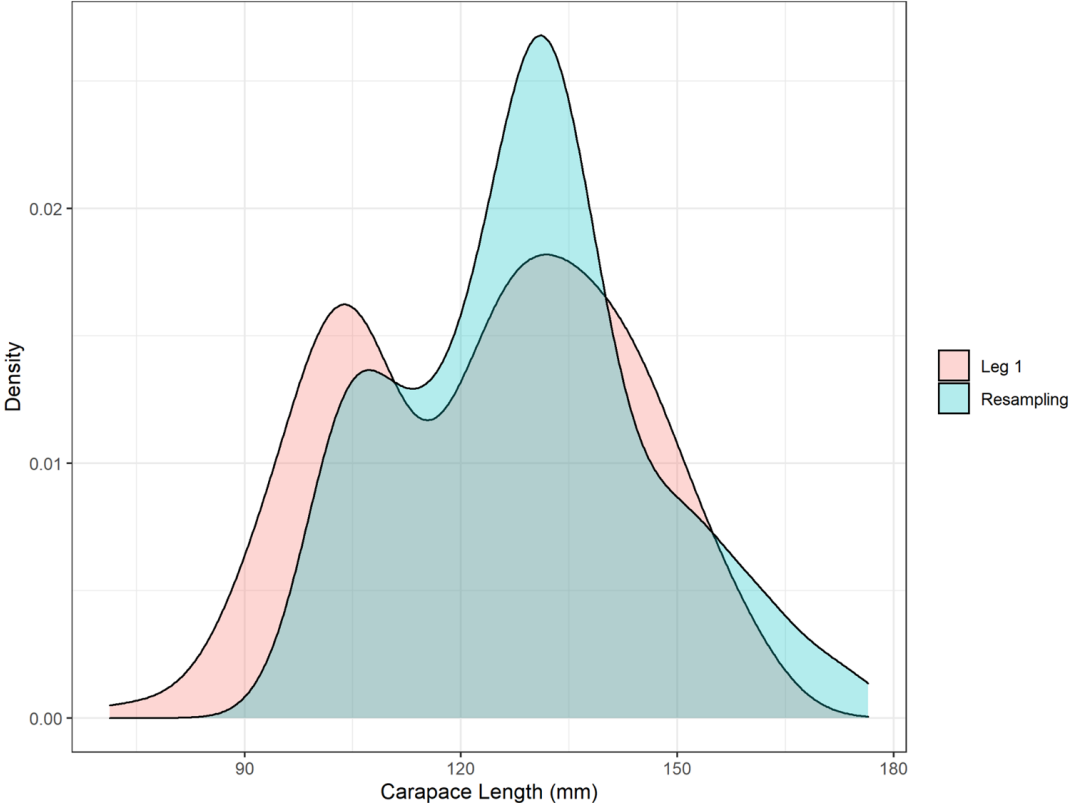
Resampled Stations

CPT Recommendation #2: How has the clutch condition composition changed across all survey years compared to resampling years?



CPT Recommendation #3: Impacts of past years if the threshold prompting resampling had been >10%

Under proposed 25% threshold, only 2021 would have retrospectively been impacted



(1) CPT Recommendation #4: Consider standardization of the selected stations for resampling

Proposed resampling protocol revisions:

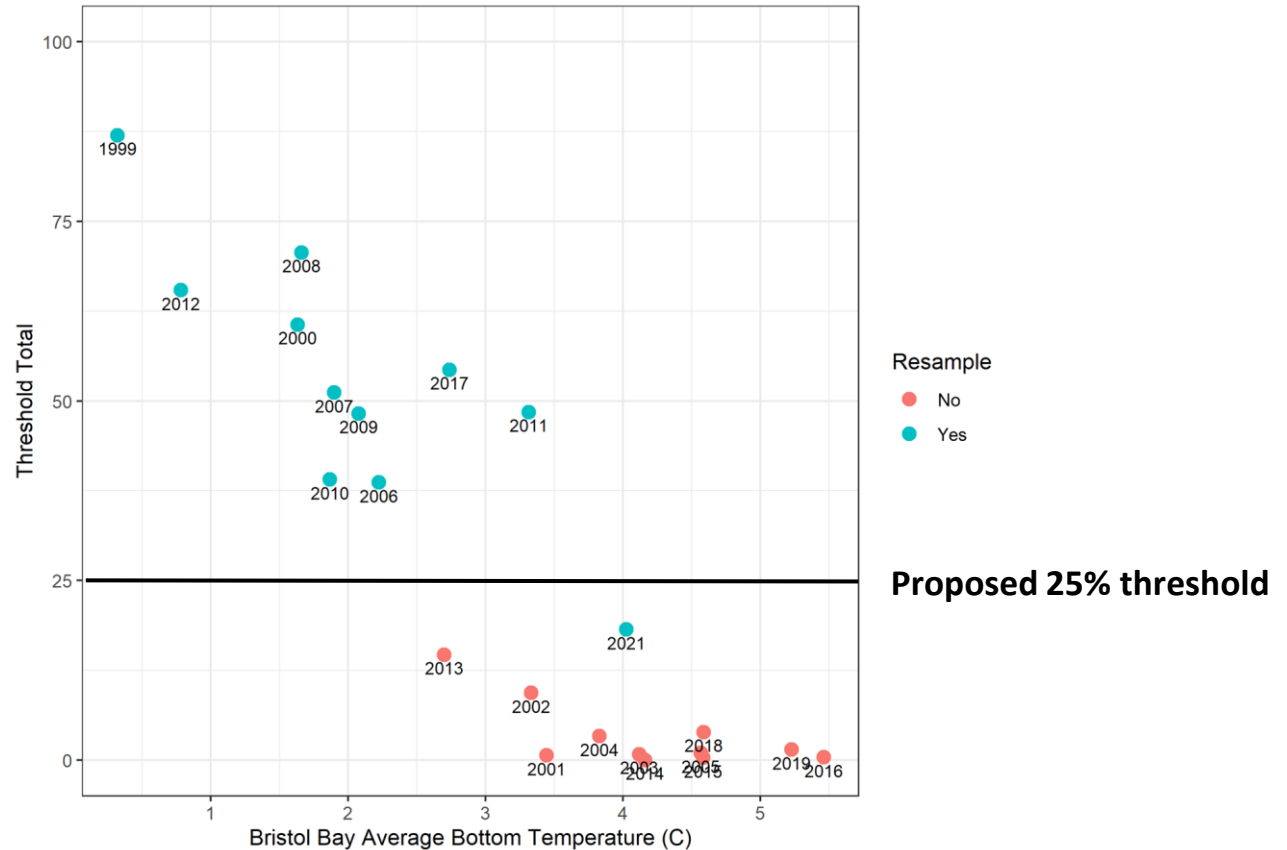
- Standardized number of stations sampled: 20
- Station selection criteria:
 - Stations encompassing 80% of non-molted/mated females sampled during original survey (with consideration of total mature female distribution)
 - Priority to sample contiguous stations

February 2022 SSC feedback

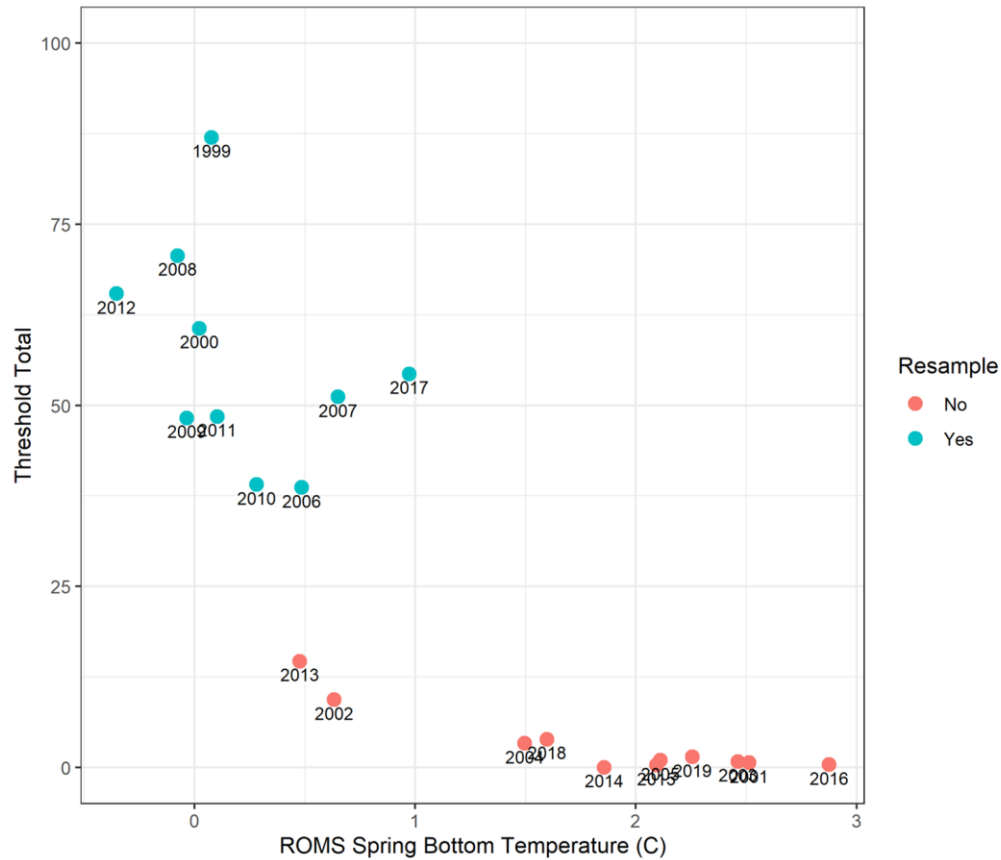
At the February meeting, the SSC suggested exploring:

- (1) Temperature effects on the timing of the molt-mate cycle. Has the temperature relationship broken down in recent years?
- (1) Temperatures prior to Leg 1 as a predictor of embryo state during Leg 1
- (1) Other potential drivers (e.g. prey quality or quantity) that could underlie the incomplete molt-mate cycle observed in 2021

SSC Recommendation #1: Examine the relationship between bottom temperatures and resampling thresholds. Has the relationship broken down?



SSC Recommendation #2: Examine temperatures prior to Leg 1 as a predictor of embryo state during Leg 1



Proposed BBRKC resampling protocol for CPT review

- Resample if **25% or more** of BBRKC mature females have not completed the molt-mate cycle as determined by egg codes (i.e. empty egg cases, no eggs, hatching, and eyed eggs)
- Resample **20 stations representing 80%** of mature females sampled during the original survey with an incomplete molt-mate cycle

