

# Draft SSC Report June 2021



**Administrative and BSAI Crab Specifications**

# Administrative

- The **SSC recommends** the nominations of
  - Ms. Caroline Brown (ADF&G) to the Social Science Planning Team
  - Dr. Mike Litzow (AFSC) to the BSAI Crab Plan Team
  - Dr. Phil Joy (ADF&G) to the BSAI Groundfish Plan Team
  - Mr. Jared Weems (ADF&G) Bering Sea Fishery Ecosystem Plan Team
- For future SSC appointments, the **SSC recommends** the Council consider
  - a social scientist with a background in anthropology, sociology, human geography, or a related field
  - an economist
  - a quantitative scientist with strong background in stock assessments

# C1 BSAI Crab Harvest Specifications

## EBS Snow Crab

- 2021 EBS trawl survey indicates a very large drop in biomass since 2019 in the surveyed area
- Full assessment, the **SSC recommends** model 21.2 (includes mortality event in 2018-19), supporting the author and PT's recommendations
- SSC agrees with author and CPT that:
  - The stock is estimated to be in Tier 3b in 2021/2022, below the MSST
  - MMB was below MSST in 2020/21, therefore NMFS will make the determination of stock status as it relates to overfished status
  - Overfishing did not occur
  - OFL = 7.5 kt, ABC = 5.6 kt

# C1 BSAI Crab Harvest Specifications

## EBS Snow Crab

- The **SSC recommends** a 25% ABC buffer, supports the author and CPT recommendations
  - Reflects uncertainty in the estimation of M, retrospective patterns, extensive model changes made in 2021, and uncertainty in whether the 2018-2019 mortality event has ended
  - Same buffer as last year (reduced 5% that was assigned for uncertainty with loss of 2020 survey, increased 5% due to additional model uncertainties)

# C1 BSAI Crab Harvest Specifications

## EBS Snow Crab

- Difficult model situation in 2021:
  - Base model did not converge, so no “fallback option” this year
  - Large observed change in biomass since 2019, not use for advice with increased buffer
- The **SSC recommends** providing a Tier 4 calculation next year, but does not anticipate moving permanently to Tier 4
- The **SSC recommends** major revisions to next year’s assessment:
  - Moving to GMACS
  - Simplifying and reparameterizing to make the model more stable
  - Further exploration on the hypothesized mortality event and/or distributional changes
  - Characterization of maturity
  - Several other model improvements

# C1 BSAI Crab Harvest Specifications

## EBS Snow Crab

- The **SSC recommends** extending the NMFS trawl survey into deeper waters to provide additional information on crab distribution.
- The **SSC recommends** reporting depth distribution of fishery CPUE and shelf trawl survey catches
- The **SSC recommends** a genetic study to assess the potential for transboundary dynamics across the US-Russia border
- The **SSC recommends** a major revision to the timing of the snow crab assessment and review process in order to allow for stepwise changes, better checks on model convergence, and the inclusion of the Northern Bering Sea trawl survey data
  - This could require a delay in setting specifications or initiating the fishery.

# C1 BSAI Crab Harvest Specifications

## Bristol Bay Red King Crab

- Relative to surveys in 2018 and 2019, the 2021 NMFS trawl survey biomass estimates increased slightly for males and decreased for females.
- Mature male biomass at the time of mating continues to be low with little evidence of substantial changes in incoming recruitment.
- Full Assessment, the **SSC recommends** model 21.1 in agreement with author and CPT
- Tier 3b, the stock is not overfished and overfishing did not occur
- 20% ABC buffer, in agreement with CPT
  - Similar uncertainties as previously, revert to buffer prior to 2020
  - Decrease of 5% from last year
  - OFL = 2.23 kt, ABC = 1.78 kt

# C1 BSAI Crab Harvest Specifications

## Bristol Bay Red King Crab

- The **SSC recommends** that estimates of the probability of the stock approaching an overfished condition should be continued in future assessments in agreement with the CPT.
- The **SSC recommends** that the authors continue to explore the use of VAST model biomass estimates in the future.
- The **SSC supports** cooperative research between the BSFRF, NMFS and ADF&G on tagging to examine hypotheses regarding spatial shifts in distribution.
- The **SSC agrees** with the CPT recommendation to examine constant M scenarios with sex-specific M for 2022.
- The **SSC recommends** that authors continue to examine indicators used in the ESP to reduce redundancy and inform mechanisms.



# C1 BSAI Crab Harvest Specifications

## Bristol Bay Red King Crab

- The **SSC noted** that re-tow protocols were triggered in 2021 even though ocean conditions were comparatively warm. The SSC requests that authors examine additional factors that could underlie this outcome such as prey quality and prey availability and metabolic rate.
- The **SSC requests** that indices of Pacific cod predation are aligned to ensure that they represent the consumption of cod within the area of spatial overlap with suitable sized crab.
- The **SSC noted** that the stock boundaries for BBRKC may need to be examined and **requests** a time series of abundance inside and outside the area

# C1 BSAI Crab Harvest Specifications

## EBS Tanner Crab

- Full assessment
- The **SSC recommends** Model 21.22a
  - Agrees with both the author and CPT recommendation
- Projected  $MMB > B_{MSY}$  qualifies as Tier 3a
  - Stock is not overfished, overfishing did not occur
- 20% ABC buffer (model uncertainty)
  - Recruitment pulses did not result in larger year classes observed at larger size, retrospective patterns
  - This is consistent with the CPT recommended buffer, and equal to the 2020/21 buffer (note last year there was no increased uncertainty due to missing 2020 survey)
  - OFL = 27.17 kt, ABC = 21.74 kt

# C1 BSAI Crab Harvest Specifications

## EBS Tanner Crab

- The **SSC appreciates** the author's efforts to address past SSC comments
- Assessment has struggled with finding an appropriate balance of model complexity, resulting in parameter bounding issues
  - The **SSC suggests** consideration of whether selectivity parameters might be shared among sexes or time blocks, to reduce model complexity
- The **SSC supports** continued
  - Research on model-based data weighting
  - Exploration of VAST survey abundance indices for this stock
  - Efforts to develop a version of this assessment in GMACS

# C1 BSAI Crab Harvest Specifications

## EBS Tanner Crab

- The **SSC reiterates** suggestion from Oct. 2020 to prioritize development of a projection model for crab that does not assume entire OFL is removed
  - Especially important for the Tanner crab stock given relatively low exploitation
- The **SSC notes** that trace plots for MCMC chains indicate significant autocorrelation and suboptimal mixing
  - The SSC suggests that given the existing level of thinning, this result is likely arising from model structural challenges

# C1 BSAI Crab Harvest Specifications

## Pribilof Island Red King Crab

- Rollover specification
- Changed to triennial assessment schedule – next full assessment in 2022
- Tier 4 stock – stock is not overfished and overfishing did not occur
- The **SSC recommends** retaining harvest specifications from the last full assessment (2019) for 2021/2022, in agreement with the CPT
  - Including retaining the 25% ABC buffer
  - OFL = 0.86 kt, ABC = 0.65 kt

# C1 BSAI Crab Harvest Specifications

## St. Matthew Blue King Crab

- Rollover specification
- Changed to biennial assessment schedule – next full assessment in 2022
- Tier 4 stock – stock is overfished and under a rebuilding plan (2020)
  - Overfishing did not occur
- The **SSC recommends** retaining harvest specifications from the last full assessment (2020) for 2021/2022, in agreement with the CPT
  - Including retaining the 25% ABC buffer
  - OFL = 0.05 kt, ABC = 0.04 kt

# C1 BSAI Crab Harvest Specifications

## Overfishing Updates

- The CPT provided updated catch data to determine if overfishing occurred for PIBKC, AIGKC, PIGKC, and WAIRKC
  - Catch for each was below the OFL –
  - overfishing did not occur in 2020/2021 for PIBKC, AIGKC, WAIRKC
  - overfishing did not occur in 2020 for PIGKC
  - PIBKC continues to be overfished and under a rebuilding plan