

# **Draft SSC Report December 2023**



**C3/C4 General Assessment comments;  
C3/C4 ESRs; C3/C4 Joint GPT; and C3  
BSAI harvest specifications**

# General Stock Assessment Comments

## Risk Tables

- In 2021, the SSC recommended that risk table categories be revised from four to three categories (normal, increased, extreme)
  - The SSC appreciated the change for assessments this year
  - This year's assessments used three categories by dropping level 2 (substantially increased concern) and left the description of other categories unchanged
  - The SSC **requests** that the category descriptions be revised to cover the range outlined by the original table

# General Stock Assessment Comments

## Risk Tables

- Additional recommendations
  - The SSC **reiterates** that only fishery performance indicators that provide information on the biology of the stock (e.g., population dynamics, changes to stock spatial distribution) should be used
  - The SSC **requests** that a brief justification of risk table scores be provided, even when that score indicates no elevated risk.
  - The SSC **recommends** risk tables consider future risks when these can be anticipated (e.g., El Nino conditions in the GOA in 2024)

# General Stock Assessment Comments

## Detailed Assessment Comments

- The SSC is encouraged by the use of One-Step-Ahead (OSA) residuals and welcomes a presentation on their use/interpretation
- The SSC **recommends** the Plan Teams consider a common method across assessments for harvest projections to estimate catch for the end of the calendar year, while allowing exceptions due to fishery-specific considerations.
- The SSC **requests** when Bayesian model output is reported, the appropriate convergence diagnostics also be presented.

# General Stock Assessment Comments

## Economic, Social, and Community Information in ESRs and ESPs (1 of 3)

- The SSC ***recognizes and encourages*** continued efforts to improve social, economic, and community indicators monitored at different decision-informing resolutions
  - These including species-level metrics of social, economic, and community information within ESPs, and
  - ecosystem-level metrics if social, economic, and community information within ESRs
  - These will complement FMP-level information in Econ SAFE and aggregated crab and groundfish community level information in ACEPO

# General Stock Assessment Comments

## Economic, Social, and Community Information in ESRs and ESPs (2 of 3)

- The SSC ***strongly recommends*** that additional coordination among AFSC, NMFS-AKRO, Council staff, Plan Team and SSC be readily undertaken to ensure that the best scientific information available is being applied in support of National Standards 1, 2, 4, 6 and 8.
- This coordination should address
  - the multiple Council decision-informing sources of social, economic and community information and include different scales of resolution (community-level, ecosystem-level, aggregated-species, single-species).
  - the timing of Council decision-informing information

# General Stock Assessment Comments

## Economic, Social, and Community Information in ESRs and ESPs (continued)

- The SSC reiterates that convening a working group or a workshop to develop species-level and ecosystem-level social, economic, and community indicators appropriate for ESRs and ESPs to complement ACEPO and the Economic SAFE indicators may be necessary to make progress

# C3/C4 Ecosystem Status Reports (ESRs)

## General Comments

- The SSC received a series of presentations on the regional ESRs and **thanks** the ESR authors for their continued progress
- The SSC **acknowledges** the continued value of the graphics in each report and separate “In Briefs” that visually translate how information is incorporated into Council processes and to inform broader audiences
- The SSC finds no major ecosystem concerns in 2023, but items that are noteworthy include low productivity in the Bering Sea, continued warm conditions in the western Aleutian Islands, mixed recovery from recent heatwaves in the GOA, and potential effects of El Niño in 2024.



## C3 Eastern Bering Sea ESR

- Multiple indicators of primary (Chl a / phytoplankton) and secondary (zooplankton) productivity indicate poor prey conditions for some fish species
  - Poor body condition of age-0, juvenile and adult pollock (elevated ecosystem concern in EBS pollock risk table & ABC reduction)
  - Declining & below-average body condition of yellowfin sole in the northern Bering Sea (elevated ecosystem concern in yellowfin risk table, no ABC reduction)

## C3 Aleutian Islands ESR

- Multi-year pattern of unusually warm conditions since ~2013/14 associated with lower productivity
  - Pacific cod body condition declined
  - Pacific cod are particularly sensitive to increased temperatures (energetic demands and diet) as was evident in the Gulf of Alaska during the 2014–2016 heatwave
  - Elevated (level 2) ecosystem concern for AI Pacific cod (and ABC reduction)

## C4 Gulf of Alaska ESR

- In 2023, GOA shelf ocean temperatures remain near the long-term average with indicators for productivity mixed pelagic feeding conditions for adult groundfish.
- No elevated ecosystem concerns for any stocks (all level 1).
- Expected transition to El Nino and warmer conditions in early 2024
- Groundfish that may be vulnerable in 2024 due to warm surface waters and reduced zooplankton quality potentially include:
  - larvae and age-0 juveniles of Pacific cod, walleye pollock, and northern rock sole.
- The SSC **appreciates** the addition of the vulnerability synthesis to the GOA ESR (which species may be at the highest risk and most vulnerable to warmer conditions predicated for 2024 and which appear more resilient)

# C3 BSAI /C4 GOA Groundfish Harvest Specifications

## Stock Prioritization

- The SSC received a presentation from AFSC detailed the five proposed assessment types
  - Operational full, operational update, harvest projections, catch reports and research assessments.
  - Definition for each, suggested trigger points for moving between assessment types and an expected level of review
- The SSC **supports** these definitions with some suggested considerations
- The SSC **reiterates** that any assessment with major model changes be reviewed at both the Sept/Oct and Nov/Dec meetings and had some other minor suggestions for improvements

# C3 BSAI Groundfish Harvest Specifications

## Overview

- Alaska wide - 1 full/update assessment (sablefish), 1 ecosystem report (sculpins)
- BSAI - 3 full assessments; 5 update assessments; 10 harvest projections; 5 catch reports; 1 ecosystem reports (forage)
- No stocks were subject to overfishing and, for Tier 1 - 3 stocks, none are overfished or approaching an overfished state
- SSC-recommended harvest specifications differed from the Joint GPT and BSAI GPT recommendations (**bold** in table) only for AI Pacific cod ABCs.

# C3 BSAI/ C4 GOA Groundfish Harvest Specifications

## Sablefish

- Scheduled for update, SSC received a full assessment with changes to input data and minor structural changes
- Spawning biomass well above reference points, increasing rapidly, due to above-average recruitment since 2014
- The SSC **recommends** Model 23.5, in agreement with author and JGPT
  - model updates are consistent with previous requests and current best practices, minor effects on stock status and trends or reference points
  - Stock is in Tier 3a (52% of unfished biomass)
- The SSC **agrees** with the recommended OFL and ABC (no reduction from maxABC)

# C3 BSAI/ C4 GOA Groundfish Harvest Specifications

## Sablefish

- The SSC **agrees** with the area apportionments (5-yr moving average of biomass in each area)
- The SSC **recommends**
  - Clarifications and potential changes to projecting catches through the end of the current year
  - Improvements to the combined longline & pot gear Catch-Per-Unit-Effort index
  - Additional technical improvements
- The SSC **highlights** the elevated fishery performance concerns associated with rapid changes in the fishery and the need for additional socio-economic information specific to this stock

# C3 BSAI /C4 GOA Groundfish Harvest Specifications

## Sculpins (Ecosystem Component)

- Non-target species, biomass decreasing in BSAI (-30%) and GOA (-40%). Large declines in bigmouth and great sculpins.
- No OFLs or ABCs are set for ecosystem components.
- The SSC **recommends** authors continue using the REMA model to produce biomass estimates
- The SSC **recommends** authors work with ESR authors to expand “Ecosystem Considerations” section as sculpins are a notable benthic forager.



# C3 BSAI Groundfish Harvest Specifications

## EBS pollock

- Full assessment, estimated biomass trends are positive with further confirmation that the 2018 year class is very large
- The 2023 biomass is estimated to be at 137% of  $B_{MSY}$
- The SSC ***recommends*** Model 23.0 in agreement with the authors and GPT
  - This model includes important improvements over the previous models along with updated data
  - The stock is estimated to be in Tier 1a

# C3 BSAI Groundfish Harvest Specifications

## EBS pollock

- The SSC **agrees** with authors and GPT on the recommended harvest specifications:
  - The OFL and maximum ABC are based on the Tier 1 calculation
  - The ABC is reduced from the maximum by 18%, based on the Tier 3 calculation (as in previous years) due to elevated ecosystem risk and uncertainty about future selectivity, which is very important to projections for this stock
- The SSC did not consider fishery- and management-related information (arguments for catch stability and continuation of historical fishery performance) for determining the ABC, but acknowledged it could be considered for TAC setting.

# C3 BSAI Groundfish Harvest Specifications

## EBS pollock

- The SSC **recommends** that the next stock assessment include a new approach that may include:
  - A constant buffer based on factors outside the assessment, such as ecosystem function,
  - Or, a better representation of uncertainty in the Tier 1/control rule calculation
- The SSC expects the risk table approach will continue to be used, infrequently, to address specific risks that may arise.
- The SSC **recommends** a suite of assessment changes and clarifications for next year.

# C3 BSAI Groundfish Harvest Specifications

## EBS Pacific Cod

- Operational full assessment
- Projected 2024 spawning biomass is below B40%, but above B35%
- Authors recommended and GPT supported moving away from previous four-model ensemble due poor performance of ensemble member models
  - Convergence to different solutions during jitting analysis
  - Problems with Dirichlet-multinomial parameters at bounds
  - Potential confounding among time-varying growth and selectivity
  - Autocorrelated patterns in model residuals

# C3 BSAI Groundfish Harvest Specifications

## EBS Pacific Cod

- Author began with a simplified version of ensemble member model 22.2 (23.1.0.a), with sequential addition of model components:
  - Annually-varying growth and survey selectivity
  - 1990 fishery selectivity time block
  - Fixed value for natural mortality (M), which also provides stability to estimates of survey catchability (q)
- The SSC **recommends** Model 23.1.0.d, (Tier 3b) in agreement with the authors and GPT, based on superior overall performance
- The SSC **agrees** with the recommended OFLs and ABCs, with no reduction from maxABC

# C3 BSAI Groundfish Harvest Specifications

## EBS Pacific cod

- The SSC ***recommends***
  - Consideration of the necessity of time-varying survey selectivity
  - Integrating fishery age composition data
  - Continued exploration of fitting conditional age-at-length data within the assessment to inform age structure and variation in growth
  - Likelihood profile on M across a broader range of potential values (including those used in the most recent assessment)
  - Exploration of potential environmental linkages with bottom trawl survey catchability
- The SSC requests a conceptual discussion of how the three Alaskan cod stock assessments might be restructured in light of recent tagging and genetic information suggesting connectivity.

# C3 BSAI Groundfish Harvest Specifications

## AI Pacific Cod

- Full assessment
- No new AI trawl survey in 2023
- Tier 5 random effects model (used since 2013), and three Tier 3 age-structured models presented
- Tier 3 models and projections showed a wide range of potential management advice and stock status
- The SSC appreciated the model explorations, but there was not adequate time to review them for this cycle
- The SSC **recommends** the Tier 5 random effects model (13.4), consistent with PT recommendation

# C3 BSAI Groundfish Harvest Specifications

## AI Pacific Cod

- The SSC **supports** the author and PT recommendation for a reduction from maxABC
  - The Plan Team recommended the use of the OFL from the author recommended model
  - The SSC considered that an endorsement of that model, so instead **recommends** a 10% reduction from maximum based on concerning environmental conditions in the AI (some of the same conditions experienced by the GOA cod stock prior to a substantial decline) in an off-year for the survey
- The SSC thanks the authors for making progress on Tier 3 models and **suggests** for 2024 to focus on establishing a parsimonious base age-structured model and provide detailed rationale for increased complexity



# C3 BSAI Groundfish Harvest Specifications

## Yellowfin sole

- “Update” assessment, second lowest survey estimate on record, 25% decline in total biomass, but only 1% decline in female spawning biomass
- However, female spawning biomass is still 1.6 times  $B_{msy}$
- Models 22.1 and 23.0 presented. Model 23.0 simplified to a single-sex fishery selectivity and both models included VAST estimates.
- The SSC ***recommends*** Model 23.0 in agreement with author and PT
  - Model 23.0 was simpler and had improved fits to data.
  - Tier 1a

# C3 BSAI Groundfish Harvest Specifications

## Yellowfin sole

- The SSC **agrees** with the recommended harvest specifications
  - No reduction from maxABC
  - Risk table Level 2 for pop. dyn and ecosystem cons., but not sufficient to warrant a reduction
- The SSC **recommends** further exploration regarding natural mortality
- The SSC **recommends** the authors investigate mismatch in body condition indices
- The SSC **recommends** further investigation of the sharp decline in the 2017 year class.

# C3 BSAI Groundfish Harvest Specifications

## Northern Rockfish

- Tier 3 update assessment, no concerning population trends
- Projected female spawning biomass for 2023 (118,251) is well above B40% (68,707)
- The last accepted full assessment model (2021) was brought forward, with minor changes and updates to the data
- The SSC ***recommends*** the updated model

# C3 BSAI Groundfish Harvest Specifications

## Northern Rockfish

- The SSC **agrees** with the recommended harvest specifications
  - The risk table score was level 2, due to assessment and population dynamics concerns
  - No reduction from max ABC is recommended since catches are consistently well below ABC and no concerning population trends are evident
- The SSC **recommends** continuing to closely monitor the stock for signs of local depletion and concentrated fishing effort. No evidence that this is an issue at this time, but recent research suggest a highly structure population/

# C3 BSAI Groundfish Harvest Specifications

## Octopus Complex

- Update assessment. Alternative Tier 6 method uses a predation-based estimate of total natural mortality using Pacific cod stomach samples. New data = 13,614 samples from 2012-13 and 2016-23. Total samples = 52,843.
- Catches are very low relative to the OFL (2022 was 5%)
- The SSC **agrees** the author and Plan Team recommended 2024 and 2025 OFLs and ABCs.
- The SSC **requests** that the author provide a link to the original predation-based total natural mortality estimation method from the 2012 assessment and that the author continue to track the survey estimates.

# C3 BSAI Groundfish Harvest Specifications

## Skates

- Update assessment. Alaska skate biomass declining since 2021, but above long-term average. Other skates: 2023 EBS biomass highest in time series, AI biomass continues downward trend, EBS slope – no survey since 2016 – no change.
- Alaska skate female spawning biomass is above B40%
- Model 14.2d Alaska skate (updated SS version), Model 23.0 other skates (transition to *rema*),
- The SSC **recommends** models presented in agreement with authors and GPT
  - Tier 3a Alaska skate, Tier 5 other skates

# C3 BSAI Groundfish Harvest Specifications

## Skates

- The SSC **agrees** with the recommended harvest specifications
- The SSC **agrees** with planned improvements for future assessments including exploring updated M for each of the Tier 5 “other skate” species
- The SSC **concur**s with BSAI GPT recommendation to explore using a catchability that is tuned to temperature
- The SSC **suggests** updating stock structure template as suggested previously

# C3 BSAI Groundfish Harvest Specifications

## Harvest Projections

- Harvest projections (formerly called Partial Assessments) including fishery trends, survey trends and updated catch for:
  - AI Pollock
  - Flatfish (Greenland turbot, ATF, Kamchatka flounder, N rocksole, FHS, AK plaice)
  - Pacific Ocean Perch (POP)
  - Black-spotted / Rougheyeye rockfish (BS/RE)
  - Atka mackerel
- The SSC **supports** the authors' and BSAI GPT's recommended OFLs and ABCs for these stocks



# C3 BSAI Groundfish Harvest Specifications

## Catch Reports

- Catch reports are a new assessment category this year and are intended to ensure sudden changes in the fishery for a given stock are not missed by the SSC in years when no formal stock assessment is conducted
- The SSC reviewed the catch reports and appreciates the updates

# C3 BSAI Groundfish Harvest Specifications

## Forage Species

- Ecosystem Component, non-target species, prevalence and density from EBS trawl survey and BASIS surveys
- No OFLs or ABCs are set for ecosystem components.
  - Abundance of EBS forage was generally low, including all-time lows for capelin, eulachon, and the integrated forage index.
  - Herring prevalence in 2023 declined, but prevalence and density increases have been observed since 2018. This is positive for herring predators, but there has been elevated herring PSC since 2020.
  - Squid catches are double historic maximums since 2019

# C3 BSAI Groundfish Harvest Specifications

## Forage Species

- The SSC ***supports*** the addition of data from the BASIS juvenile fish surface trawls and looks forward to integration with prior datasets used in this report.
- The SSC ***supports*** the new directions the author is exploring and the future inclusion of composite indices of forage and models that link abundance changes to environmental conditions.