C4 BSAI Groundfish Harvest Specifications

EBS Pacific Cod

- The SSC continues to encourage the authors to work with the PT to define a process for how ensemble member weights will be reviewed and updated, given concern that the 5-year CIE review cycle may limit potential progress in development of model(s)
- Given recent evidence for Pacific cod movement in and out of the EBS+NBS regions and stock structure considerations, the SSC encourages collaboration with other Pacific cod assessment authors to explore the feasibility and utility of a more spatially comprehensive assessment model for Alaska that considers connectivity with the GOA

C4 BSAI Groundfish Harvest Specifications

AI Pacific Cod

- Full assessment (last full in 2021)
- Tier 5 random effects model (used since 2013), and two Tier 3 age-structured models presented (aggregated and separated fleets)
- Current estimate of SSB is above $B_{35\%}$, but below $B_{40\%}$
- Tier 5
- The SSC ***recommends*** the Tier 5 random effects model (13.4), consistent with author and PT recommendations
  - Strong positive retrospective pattern in both age structured models (22.0, 22.1), indicating overly-optimistic projections for increasing abundance
  - Consistent positive bias in fits to trawl survey index early in the timeseries

C4 BSAI Groundfish Harvest Specifications

AI Pacific Cod

- The SSC ***supports*** the author and PT recommendation for no reduction from maxABC
- The SSC is encouraged by the authors' progress in development of age-structured models for this stock, and suggests
  - If fleet disaggregated models are pursued in the future, consideration of dome-shaped selectivity for the HAL fleet
  - If fleet aggregated models are pursued in the future, exploration of time-varying fishery selectivity as an option for addressing the retrospective pattern and changes in gear use over time
  - Given the uncertainty in the AI BTS, consideration of age structured models that fit to the AFSC longline survey or IPHC survey data

C4 BSAI Groundfish Harvest Specifications

AI Pacific Cod

- The SSC ***supports*** the PT recommendation to consider a hybrid approach where natural mortality estimated by a Tier 3 model is used for Tier 5 harvest specification
- The SSC ***encourages*** the authors and PT to consider this stock for reduced assessment frequency

C4 BSAI Groundfish Harvest Specifications

Yellowfin sole

- Full assessment, total biomass increasing, but female spawning biomass continues a general decline since early 1990's
- However, female spawning biomass is 1.86 times Bmsy
- Tier 3a
- The SSC ***recommends*** Model 22.1 in agreement with author and PT with its associated OFL and ABC
  - no reduction from maxABC
  - Selected model includes VAST estimates and includes both EBS and NBS.

C4 BSAI Groundfish Harvest Specifications

Yellowfin sole

- The SSC ***recommends*** a more detailed examination of the role of including the NBS with and without VAST estimates.
- The SSC ***supports*** the GPT recommendation to continue examination of temperature (especially with the addition of NBS survey data) for model improvement and to improve understanding of climate change impacts
- The SSC ***recommends*** the examination of the large 2017 recruitment through a retrospective analysis.

C4 BSAI Groundfish Harvest Specifications

Greenland turbot

- Full assessment, total biomass spawning biomass and total biomass slight decline, recent recruitment low
- SSB above $B_{40\%}$;Tier 3a
- The SSC ***recommends*** Model 16.4 in agreement with authors and PT
  - Performs similarly to previous model
  - Uses ASFC longline data to estimate selectivity and all available data to model growth
- ***Agree*** with BSAI GPT on 2023 / 2024 OFL (4,645 mt / 3,947 mt)
- ***Disagree*** with BSAI GPT 2023 /2024 ABC (3,960 mt / 3,364 mt)
- SSC ***supports*** area apportionment for AI and EBS

C4 BSAI Groundfish Harvest Specifications

Greenland turbot

- The author and BSAI GPT recommended a 6% reduction from maxABC
  - below average recruitment
  - 6% reduction based on uncertainty in estimated length of maturity from sensitivity analysis
- The SSC ***recommends*** no reduction from maxABC
  - below average recruitment captured in assessment model
  - authors have been hesitant to use that sensitivity analysis to inform stock assessment model

C4 BSAI Groundfish Harvest Specifications

Greenland turbot

- The SSC ***supports*** authors' plans
  - update maturity curves as a priority through new data collection or comprehensive meta-analysis
  - Revisit trawl survey catchability and impact of selectivity curves
- The SSC ***supports*** PT's recommendations
  - revise interpolation method combining BS and AI longline survey RPNs
  - explore of killer whale depredation impact on longline survey abundance estimates
  - present newly available sex-structured length composition data from longline survey

C4 BSAI Groundfish Harvest Specifications

Arrowtooth flounder

- A full assessment
- There were no changes to assessment methodology
- The SSC ***supports*** Model 18.9
- Tier 3a
- The SSC ***supports*** authors' and BSAI GPT's OFL and ABC and no reduction from the maxABC
- SSC ***supports*** the author's proposed future work on selectivity, growth, age-length conversion matrices, and estimates of predation mortality.
- SSC looks forward to seeing a more detailed follow-up on parameterization of selectivity

C4 BSAI Groundfish Harvest Specifications

Kamchatka flounder

- Full assessment
- Small projected decrease in total biomass and spawning biomass
- Tier 3a
- The SSC ***recommends*** Model 16.0b in agreement with author and PT
- The SSC ***supports*** author and PT OFL and ABC, no reduction from max
- The SSC ***encourages*** examination of relationship between catchability and temperate/ cold pool extent
- The SSC ***supports*** authors' plans to
  - evaluate formal data weighting given fits to EBS shelf survey
  - incorporate aging error into assessment
  - explore age- and length-composition data between BS and AI subareas

C4 BSAI Groundfish Harvest Specifications

Northern rock sole

- Full assessment in 2022
- Survey index increased 25%
- The SSC ***recommends*** authors' and Plan Team selected model (18.3)
- Stock is managed under Tier 1a
- The SSC ***supports*** author and Plan Team OFL
- The SSC ***supports*** author and Plan Team recommendation to reduce ABC by 23% due to assessment uncertainty not accounted for in the assessment
    - Model has consistent pattern of overestimating recruitment in recent years, leading to positive retrospective pattern

C4 BSAI Groundfish Harvest Specifications

Northern rock sole

- The 23% reduction from maxABC based on alternative model (22.1) that incorporated data weighting methods to better fit the more recent survey data
- The SSC ***recommends*** that the authors continue to examine data weight tools to address overestimates of survey biomass in recent years

C4 BSAI Groundfish Harvest Specifications

Flathead sole

- Partial assessment (last full assessment in 2020)
- Biomass is stable with small increases projected in 2024
- Spawning stock biomass is more than 2 times $B_{35\%}$
- This stock is managed under Tier 3a.
- The SSC ***concurs*** with the author and team recommended OFL and maxABC

C4 BSAI Groundfish Harvest Specifications

Alaska plaice

- Partial assessment (last full assessment in 2021)
- Biomass is stable with small increases projected in 2024
- Spawning stock biomass is 1.5 times $B_{35\%}$
- This stock is managed under Tier 3a
- The SSC ***concurs*** with the author and team recommended OFL and maxABC

C4 BSAI Groundfish Harvest Specifications

Pacific Ocean Perch

- Full assessment (last full in 2020)
- Survey biomass continues to increase (AI 2022 survey), as seen in other recent surveys (2012 – 2018; no survey in 2020)
- 2023 spawning biomass above B40%, Tier 3a
- The SSC ***recommends*** Model 16.3 (2022), in agreement with authors and the BSAI GPT
- The SSC ***concurs*** with the recommended OFL and the use of maxABC, in agreement with the authors and BSAI GPT
- The SSC ***supports*** BSAI GPT recommendation to explore time-varying survey selectivity for the AI BTS

C4 BSAI Groundfish Harvest Specifications

Northern Rockfish

- Partial assessment, slight increasing trend in biomass estimates
- Tier 3a stock
- 2022 spawning stock biomass is roughly 2 times $B_{35\%}$
- The SSC ***recommends*** the presented ABC and OFL in agreement with the authors and plan team, with no reduction from maxABC
- The SSC ***supports*** the author in updating the aging error matrix and re-evaluating the stock structure template in the next full assessment

C4 BSAI Groundfish Harvest Specifications

Blackspotted/Rougheye Rockfish

- Full assessment (last full in 2020); Tier 3 in AI, Tier 5 for EBS
- Survey biomass increased or stable in all subareas
- The SSC ***recommends*** Model 20 (2022) for AI portion of stock, in agreement with authors and BSAI GPT
  - Allowing for time-varying fishery selectivity (alternative Model 22) did not alleviate long-standing issues
  - Poor survey biomass fit in recent years; strong, positive retrospective pattern
- Large and highly uncertain estimated 2010 year class increased the estimate of B40% significantly from 2020, which was deemed implausible given the population dynamics of this complex

C4 BSAI Groundfish Harvest Specifications

Blackspotted/Rougheye Rockfish

- For purposes of calculating B40%, 2010 recruitment estimate was reduced to the next largest year class value (2002), stabilizing this reference point
- Results place this complex in Tier 3b
- The SSC ***recommends*** a reduction from maxABC (12.8%), in agreement with the authors and BSAI GPT
  - Risk table - assessment considerations (3), population dynamics (2) and fishery performance (2)
  - Persistent positive retrospective pattern; poor fit to survey; need for tight priors on M and survey Q; model unable to account for decline in larger fish in fishery and survey compositions

C4 BSAI Groundfish Harvest Specifications

Blackspotted/Rougheye Rockfish

- Per October 2022 Council motion, the SSC re-evaluated whether a spatial management concern exists and if the magnitude of that concern has changed at this full assessment
- The SSC ***continues to register*** strong concern with the disproportionate harvest in excess of the subarea ABCs and the WAI MSSCs in recent years
- The SSC reiterates that the available life history information for BS/RE rockfish suggest that this complex may be especially vulnerable to localized depletion
- Multiple items were noted with regard to whether the concern level has changed
  - Updated genetic study; increasing survey biomass
  - Subarea ABC (WAI/CAI) and MSSCs (WAI) consistently exceeded; magnitude of overages increasing

C4 BSAI Groundfish Harvest Specifications

Blackspotted/Rougheye Rockfish

- Selected recommendations for assessment:
  - Author continue to provide opinion on spatial management concerns
  - Highlight importance of AI survey for 2010 year class estimation
  - Separate survey trends by species, as data allows
  - Untrawlable habitat research in GOA may inform future apportionment (long-term)
  - Spatially-explicit model (long-term; large time required of author)

C4 BSAI Groundfish Harvest Specifications

Shortraker Rockfish

- Full assessment; biennial cycle
- Managed in Tier 5
- The SSC ***recommends*** the use of Model 22, in agreement with authors and the BSAI GPT
  - New model incorporates the AFSC slope longline survey RPWs from the EBS slope and the multivariate version of the RE model
- The SSC ***concurs*** with the author and BSAI GPT recommended OFL and ABCs, with no reduction from maxABC
- The SSC ***recommends*** a re-evaluation of natural mortality for the next full assessment

C4 BSAI Groundfish Harvest Specifications

Other Rockfish

- Full assessment (last full in 2020),
- Biomass exhibits slight decrease in recent years but above long-term mean
- Tier 5, with shortspine thornyhead (SST) and non-SST rockfish species assessed separately due to different assumed M and combined for complex-level harvest specifications
- The SSC ***recommends*** Model 22, in agreement with authors and BSAI GPT
  - Bridged to REMA modeling framework
  - Includes NMFS longline survey data from the EBS slope for SST

C4 Groundfish Harvest Specifications

Other Rockfish

- The SSC ***concurs*** with the recommended ABC and OFL, with no reductions from maxABC
- The SSC ***recommends*** the stock author continue to closely monitor trends in the non-SST component of the stock complex in the AI and revisit the assumed M for non-SST rockfish in the next full assessment.

C4 Atka mackerel Harvest Specifications

Atka mackerel

- Full assessment
- SSC supports author and BSAI recommended Model 16.0b
- Tier 3a
- The SSC ***supports*** the authors' and CPT's recommendations of OFL and ABC, with no reduction maxABC
- The SSC ***supports*** ABC area apportionments.
- The SSC encourages continued development of the assessment including follow up on previous SSC recommendations

C4 BSAI Groundfish Harvest Specifications

BSAI Sharks

- New assessment format - single, streamlined document for the shark complex with separate OFLs and ABCs for the BSAI and GOA.
- The SSC ***concurs*** with the BSAI GPT to use status quo approach
  - SSC ***supports*** the BSAI GPT OFL (517 mt, max catch 2003-2015)
  - SSC ***acknowledges*** conservation concerns for Pacific sleeper shark
  - SSC ***supports*** BSAI GPT recommended 13% reduction from maxABC for Pacific sleeper shark component (ABC = 450 mt) using new method (ORCS model)
- The SSC ***supports*** efforts to consider alternative approaches for the shark complex and other data-limited stocks

C4 BSAI Groundfish Harvest Specifications

BSAI Octopus

- Partial assessment; biennial assessment with last full in 2020
- Tier 6 stock, managed using consumption model based on Pacific cod consumption
- The SSC ***accepts*** the author and BSAI GPT's recommended OFL and ABCs
  - Same since 2016 assessment
  - No reduction from maxABC
- The SSC ***supports*** the BSAI GPT recommendation to review the consumption model

C4 BSAI Groundfish Harvest Specifications

Skate Complex

- Partial assessment, biomass remains stable
- Complex comprised of Alaska Skate - Tier 3a stock and the remaining skate species – Tier 5, summed to complex-level
- For Tier 3 (Alaska skate), spawning stock biomass is just under 2x $B_{35\%}$
- The SSC ***recommends*** the ABC and OFL in agreement with the authors and plan team, with no reduction from maxABC
- The SSC ***recommends*** transitioning the RE model to the REMA framework and consider whether updating the stock structure template is warranted for the next full assessment