Summary of CIE review for BSAI POP

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Overview

- Virtual Meeting, May 11-13, 2022
- Focused on BSAI POP
- Chair: Pete Hulson
- Support: Jim Ianelli
- Reviewers:
  - Noel Cadigan (Memorial University, Newfoundland)
  - Geoff Tingley (Gingerfish Ltd, New Zealand)
  - Matthew Cieri (Maine Department of Natural Resources)

Research Topics

- Lack of fit to AI survey in recent years
- Evaluation of natural mortality, including loosening prior distribution and time blocks of M
- Data weighting (we considered McAllister-Ianelli, Francis, and Dirichlet Multinomial)

These topics were considered with many different sensitivity runs

Terms of reference

- Evaluation of the data used in the assessments, specifically trawl survey estimates of abundance, and recommendations for processing data before use as assessment inputs
- Evaluation of analytical methods used in assessments, particularly in regard to selectivity, modeling of natural mortality, and data weighting assumptions
- Evaluation of the ability of the stock assessment model for BSAI Pacific ocean perch to provide parameter estimates to assess the current status of the stock
- Evaluation of the strengths and weaknesses in the stock assessment model for BSAI Pacific ocean perch
- Recommendations for improvements to the assessment models

Overall Conclusions

- The assessment is the best available science and is appropriate for management use
- The retrospective pattern is recognized and “vexing”, but despite this the assessment is robust, of “high quality”, and meets scientific standards for management
- Use of pre-recorded video presentations was great, and should be continued even with in-person reviews
- The support provided by local NMFS staff was “excellent”

Detailed recommendations from Noel Cadigan

- High Priority
  - Evaluate how first year numbers at age are computed. If equilibrium, consider Z being different from M. Also consider stochastic initial numbers at age
  - Demonstrate the lack of fit in the early that the dome-shape fishery selectivity fixes
  - Investigate M with a time-varying walk
  - Provide table of inputs of SPR calculations
  - Fit the model to survey abundance rather than biomass
  - Use a Gaussian AR(1) distribution for the annual F deviations

More detailed recommendations from Noel Cadigan

Medium priority

- Conduct a standard study between the new accelerometers and old bottom contact sensors (2010 should have both gear)
- Spatio-temporal model of variation in size at age
- Updated maturity field study
- Estimate σ_r
- Increase length plus group to 45 cm (from 39 cm)
- Consider length-based stock biomass and selectivity
- Estimate survey availability (i.e., the proportion in the EBS and AI areas) within the model

Even more recommendations from Noel Cadigan

Low priority

- Provide time series of AI survey length compositions
- Consider estimating the age-length conversion matrix internally

Recommendations from Geoff Tingley

- In general, continue to explore different approaches for addressing the mismatch between the composition data and the survey indices
- Re-evaluate the age plus group (now at 40 years)
- Consider plausible alternative catch histories
- Continue to explore spatio-temporal approaches for survey and fishery data
- Continue to ensure that sufficient, representative fishery composition data are collected from each of the two areas
- The utility of re-starting the EBS survey should be considered

Recommendations from Matthew Cieri

- Conduct a study evaluating the samples of POP from fishery observers where POP is not a dominant component of the catch (especially in the EBS)
- Fleet structure should be examined
- Re-evaluate the age plus group (now at 40 years)
- Updated maturity field study
- Fit the model to survey abundance rather than biomass
- Re-start the EBS survey, or consider developing a standardized fishery CPUE index

Points of Consensus from all Reviewers

- All reviewers noted that the last of fit to recent AI survey, and the associated retrospective pattern, was an issue, but there were no obvious remedies
- Alternative data-weighting procedures did not provide strong evidence to depart from the current use of the McAllister-Ianelli procedure

Recommendations from multiple reviewers

- Initiate new maturity field studies (Cadigan,Cieri)
- Fit the model to survey abundance, not biomass (Cadigan, Cieri)
- Re-evaluation of the age 40+ plus group (Tingley, Cieri)
- Either re-start the EBS slope survey, or explore the utility of doing so (Tingley, Cieri)

Point of disagreement between reviewers

- Investigate time-varying *M* with a random walk (Cadigan)
- *. . . there appears to be no evidence that there should be an expected change in natural mortality across years, and as such a constant M is likely a more robust assumption* (Cieri)

Things to explore for the 2022 Assessment

- Fit model to survey abundance instead of biomass
- (Re)- explore stochastic initial age compositions
- For equilibrium initial age composition, explore mortality rates other than *M*