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FISHERIES

Update on BSAI Blackspotted/Rougheye rockfish stock Assessment

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Objectives

- Discuss initial responses to Plan Team and SSC comments, and exploratory model runs
 - 1) Potential inclusion of IPHC longline data into assessment
 - 2) Examination of size composition data from longline surveys – are big fish in the population but not showing up in the fishery?
 - 3) Rate of blackspotted/rougheye to POP in survey tows
- Recommendations of potential modeling options to consider for the final 2024 assessment

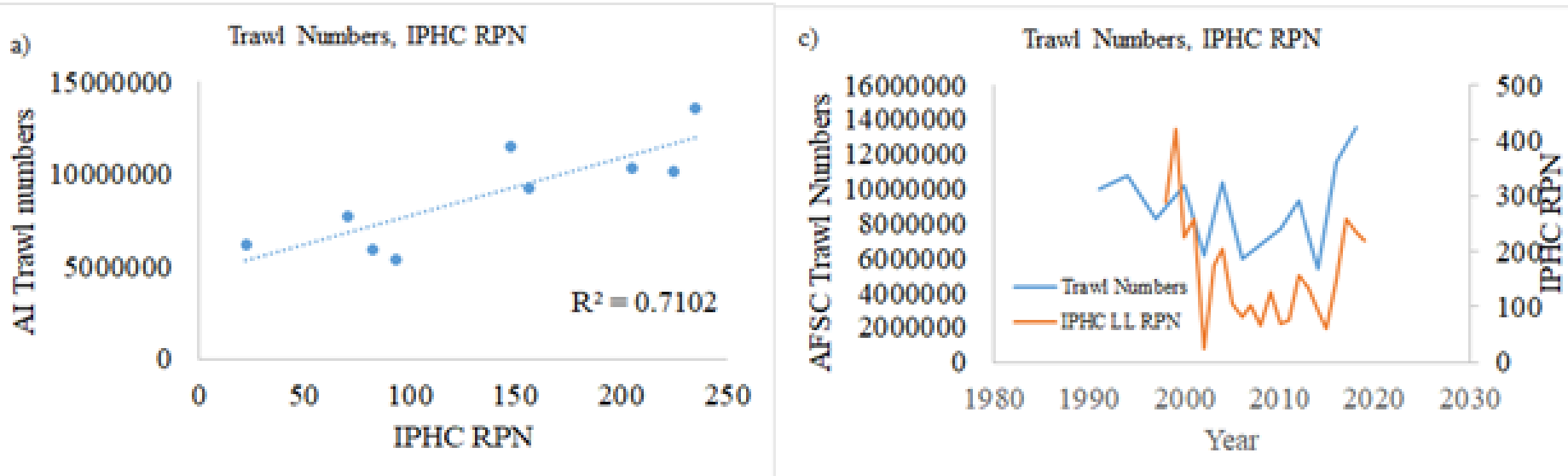


Plan Team/SSC comments

- (SSC, October 2022) *The SSC acknowledged the changes in the IPhC longline survey sampling design in 2020 but noted that the survey was highly correlated with the bottom trawl survey prior to 2020. Given the retrospective bias in the current model and its difficulty in assessing the scale of the stock, the SSC recommends the author explore use of the pre-2020 data in the assessment with emphasis on sampling in untrawlable habitats.*



Correlation between IPHC RPN estimates and AFSC trawl survey abundance estimates



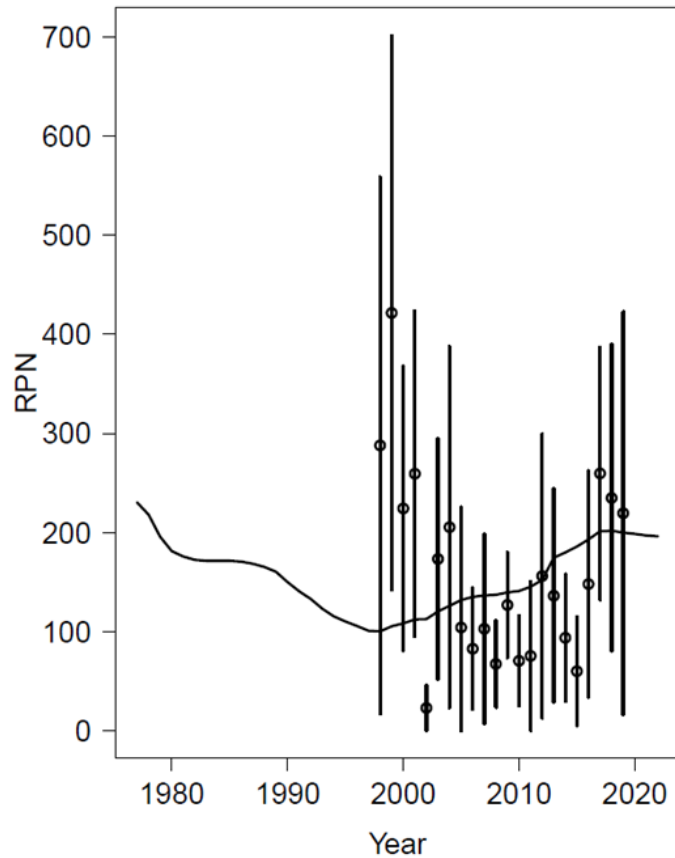
Correlation is based on years in common (i.e., between 2000 and 2018). It does not include part of the decline in the IPHC RPN estimates in the late 1990s (when the trawl survey estimates were relatively stable).

Models considered in this report

Model	Description
Model 20	Accepted model from the 2022 assessment.
Model 24.1	Model 20, but with include the IPHC longline survey RPN estimates (from 1996- 2018). No IPHC composition data because lengths and otoliths are only routinely sampled for halibut.

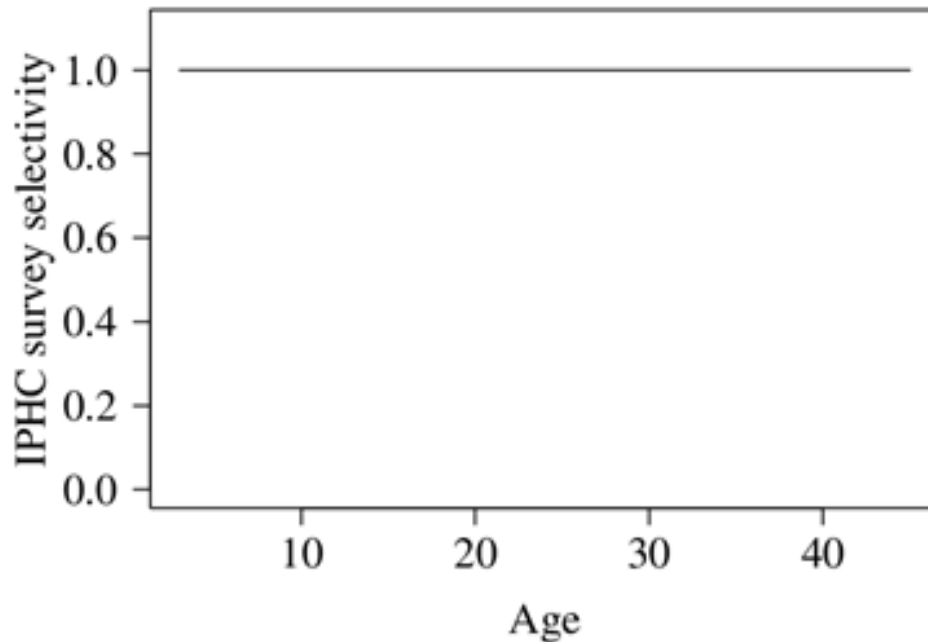


Fit to the IPHC longline RPN estimates



Early and late years are underestimated,
middle years are overestimated

Estimated IPHC RPN survey selectivity

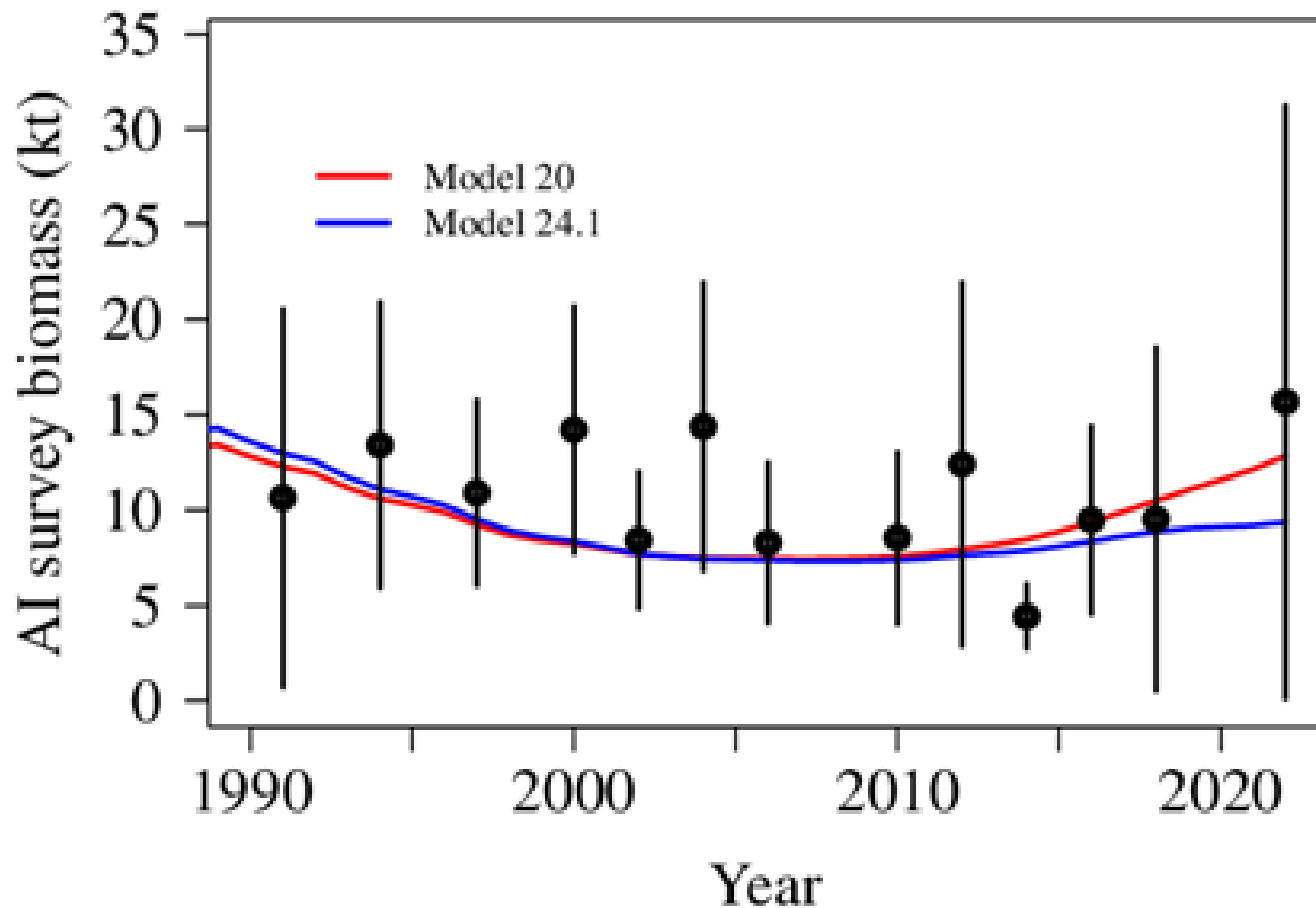


There is no information that informs IPHC survey selectivity

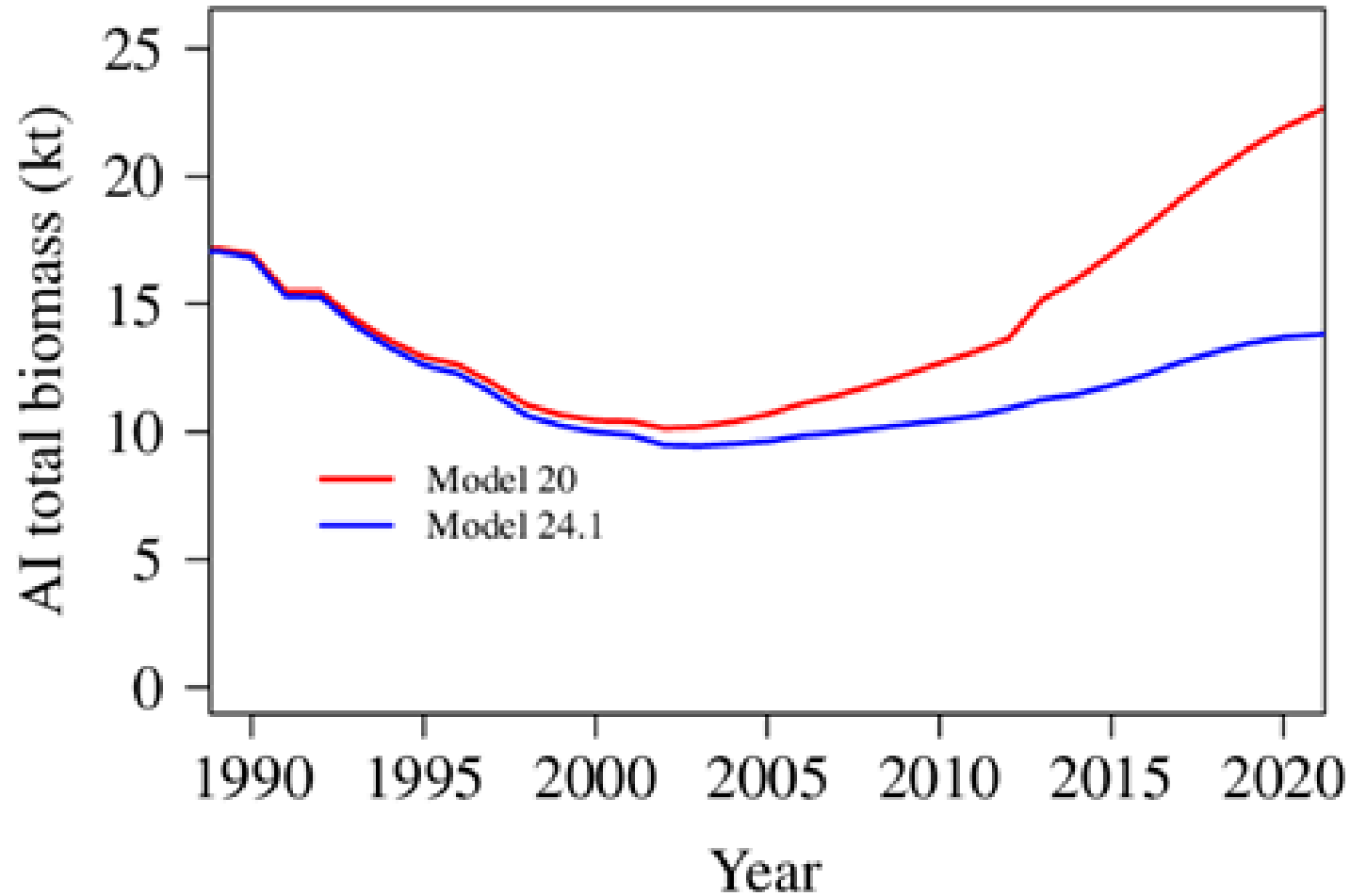
In the current model, the reason recent recruitment (and total biomass) is large is because selectivity at young ages is low.

If we have a survey in which selectivity at young ages is large, this lowers the estimates of recruitment (and total biomass) for recent years

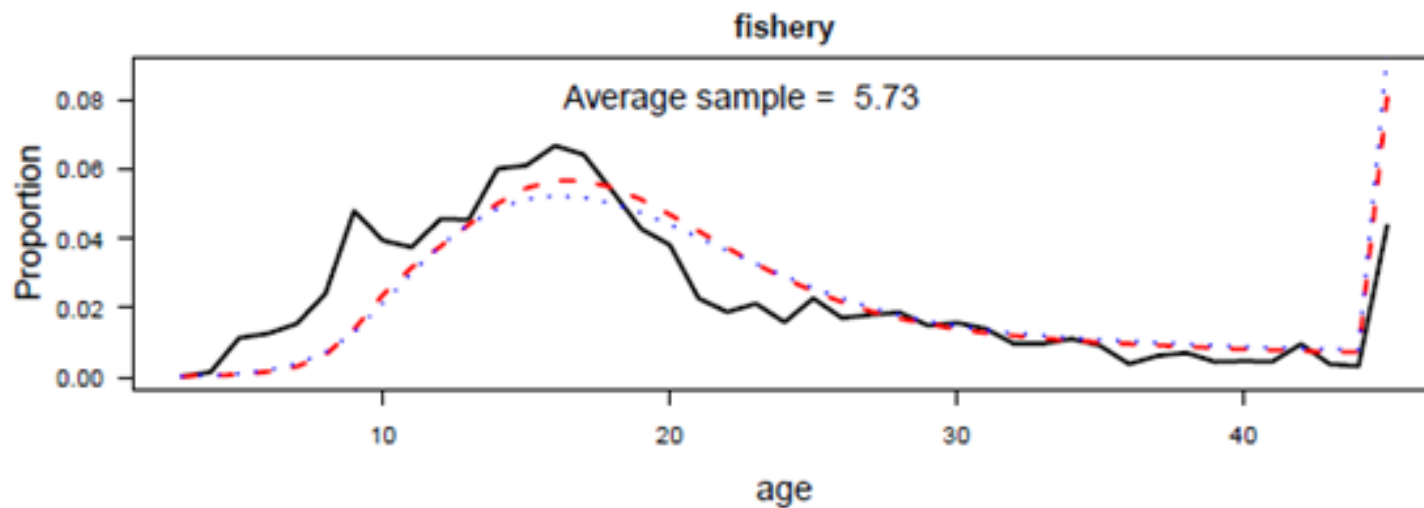
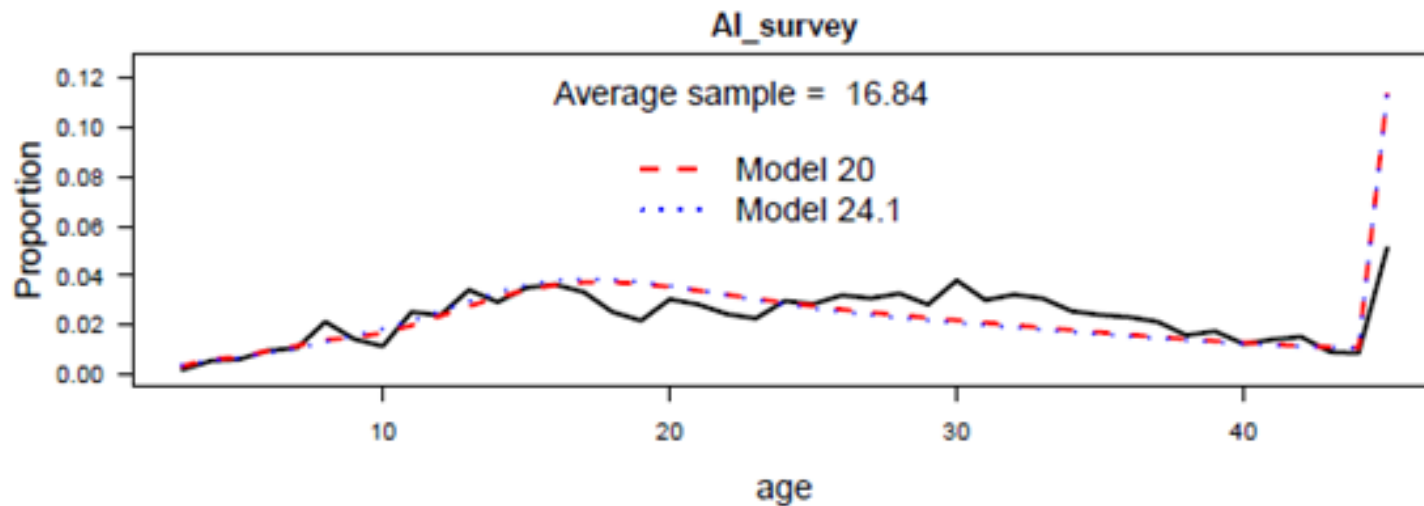
Fit to the AI survey biomass index



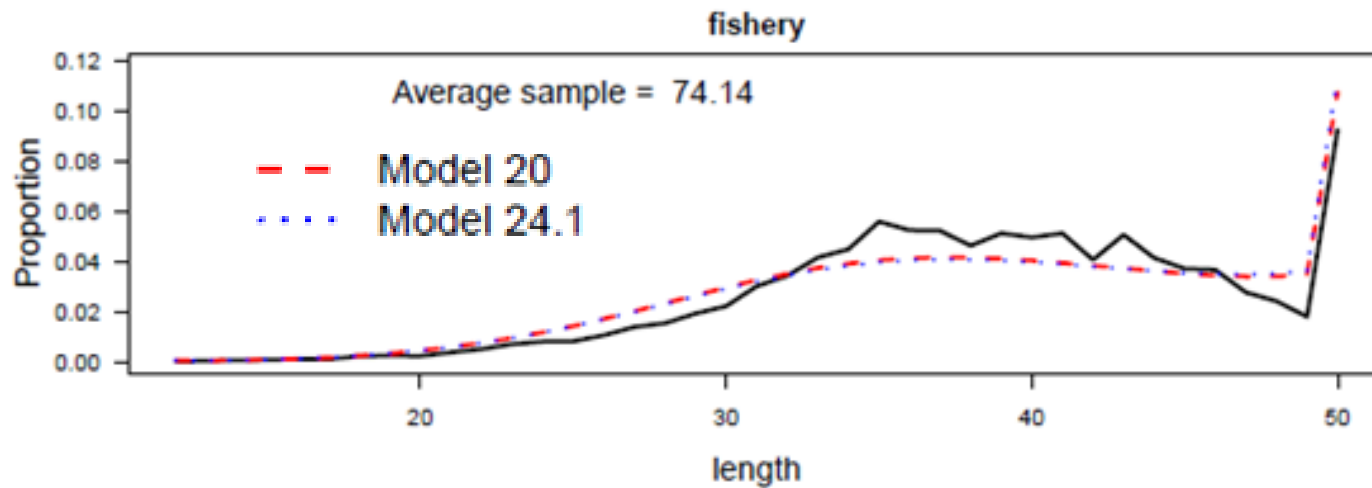
Estimated total biomass



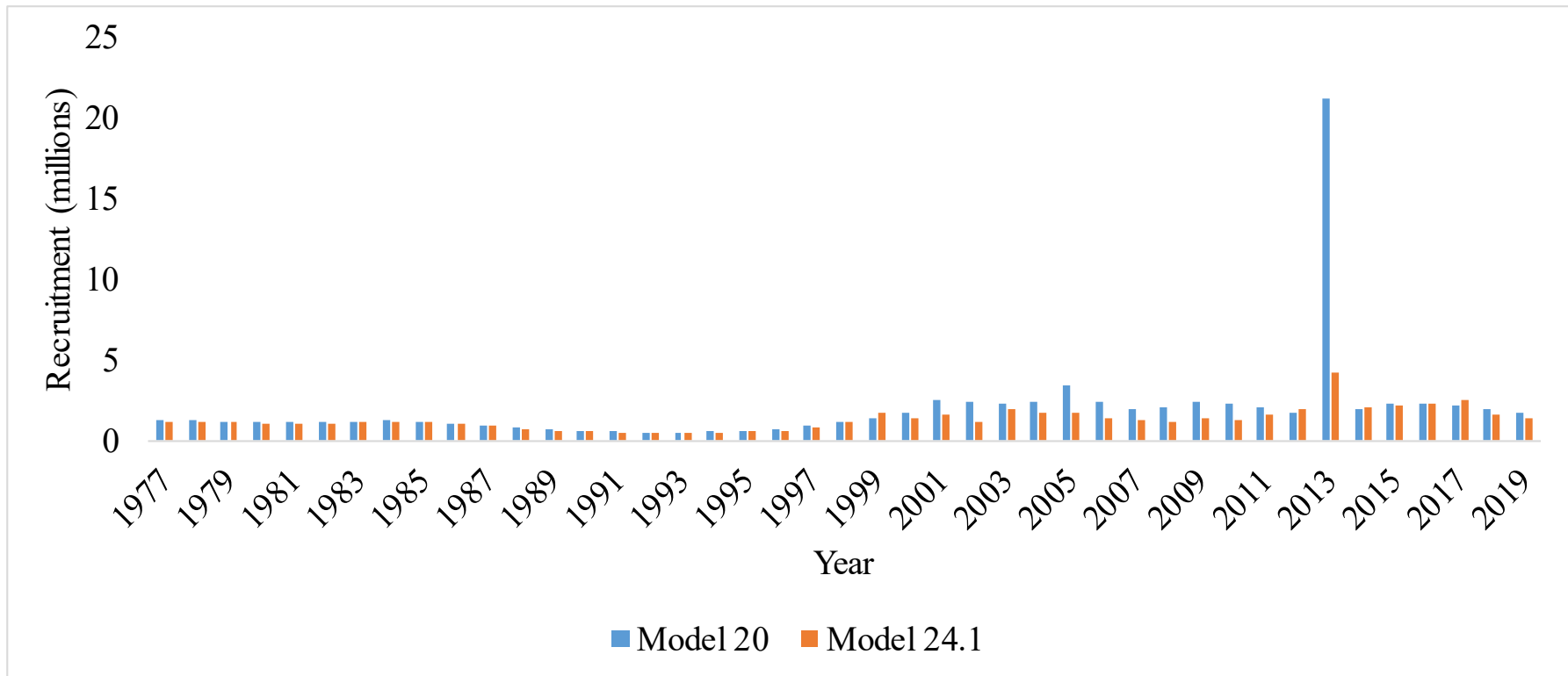
Aggregate age comps



Aggregate length comps



Estimated age 3 recruitment



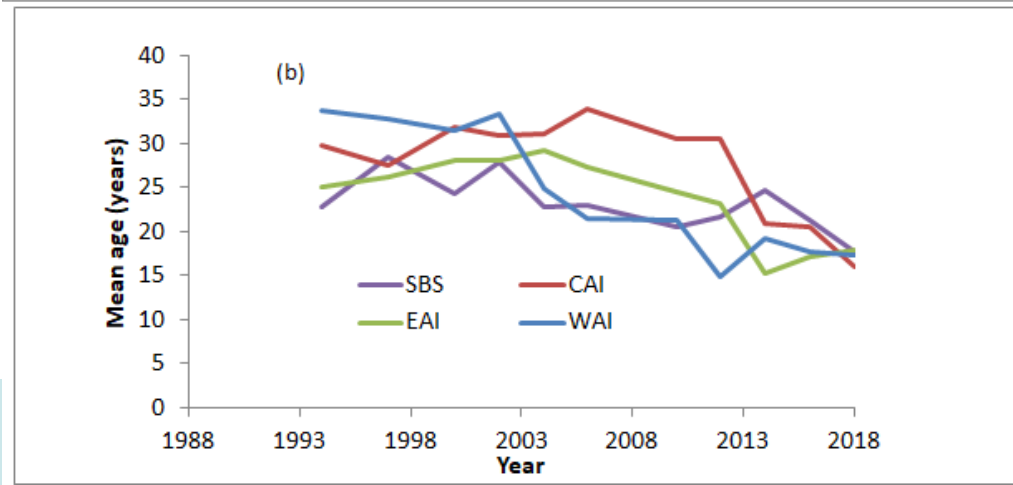
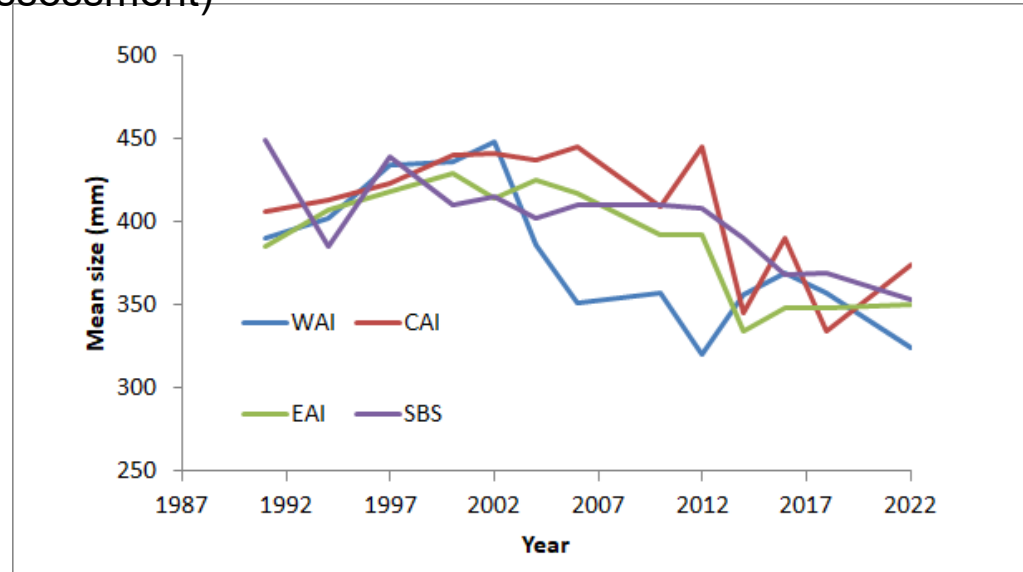
Plan Team/SSC comments

- (BSAI Plan Team, November 2022). *The Team discussed the lack of larger fish in fishery composition data and recommended examining the NMFS and IPHC longline survey data to determine if larger fish may be in the population and not showing up in the fishery.*



Background -- Declines in fish size, both survey and fishery

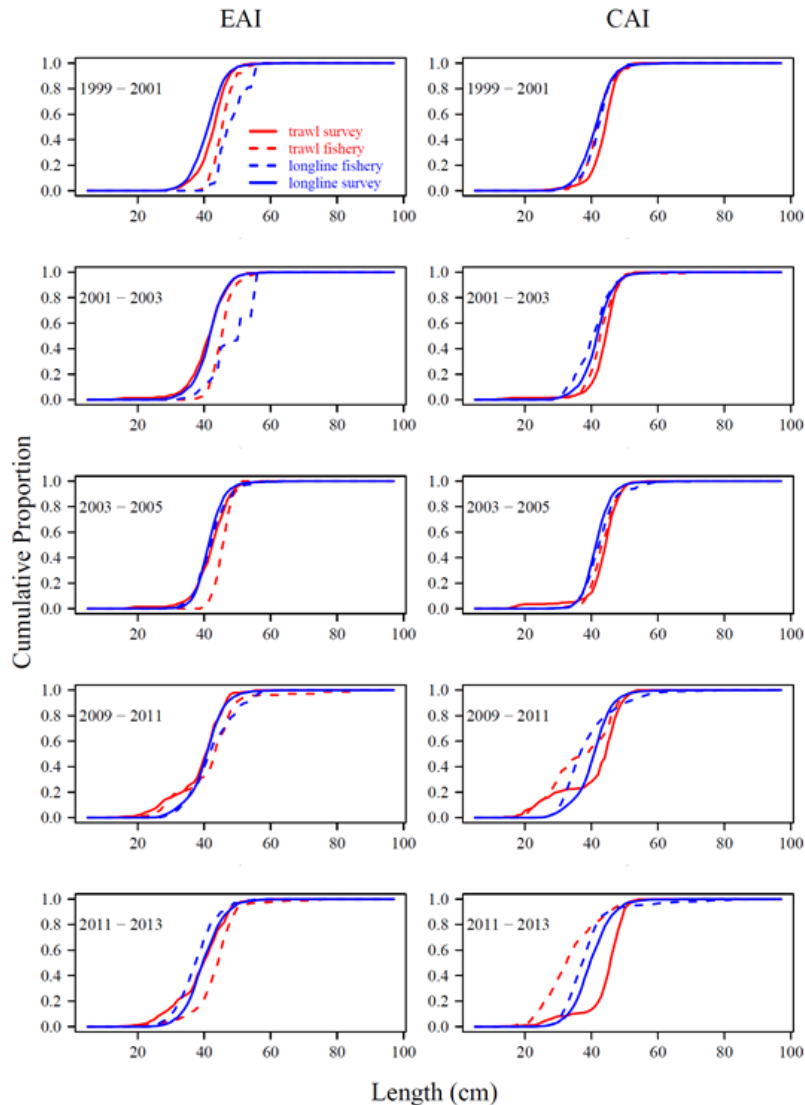
Survey mean size and age (from 2022 assessment)



Comparison of fishery and survey size compositions

- **Available datasets**
 - AI trawl survey, AFSC longline survey (AI portion), and fishery
 - AI trawl survey and fishery shown separately for CAI and EAI
 - Fishery data separated by trawl and longline gear
- **Comparisons by time periods**
 - Each time period combines 3 years of fishery catch that brackets a survey year

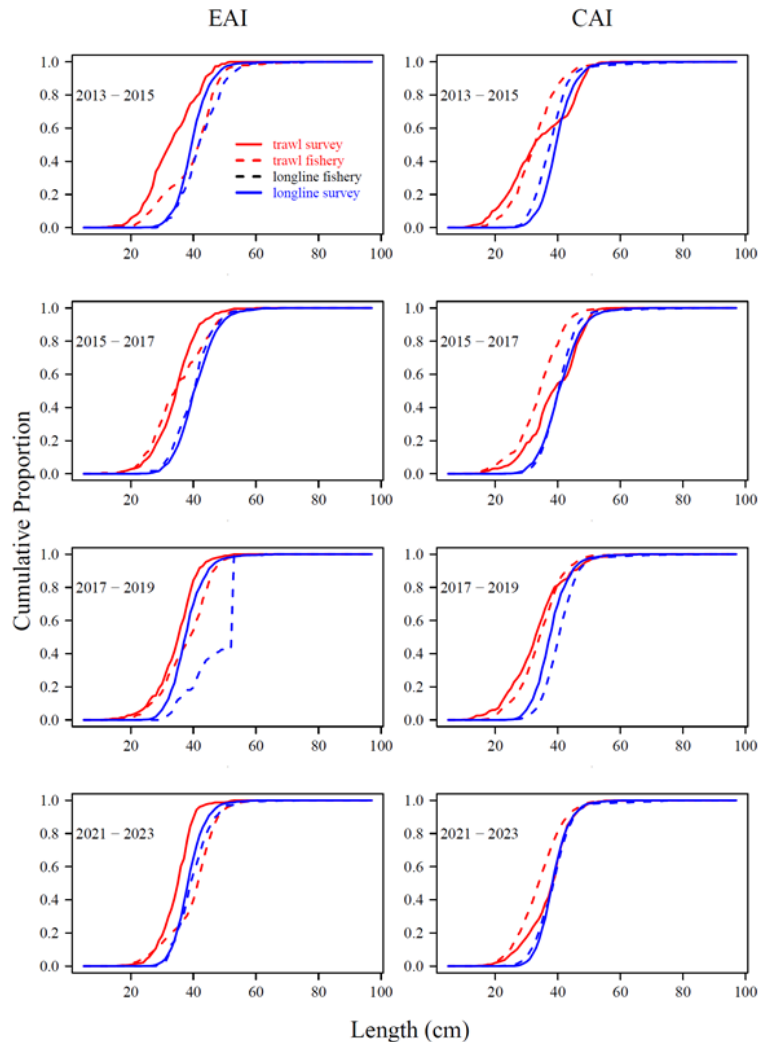
Comparison of size compositions



Comparison of fishery to the survey size compositions show a variety of patterns:

- 1) Larger sizes in the fishery (EAI, 1999-2001, 2001-2003)
- 2) Smaller sizes in the fishery (CAI, 2011-2013)
- 3) Bracketing the survey compositions (EAI, 2011-2013)
- 4) Similar sizes to the survey (CAI, 1999-2001, 2001-2003, 2003-2005 and EAI, 2015-2017)

Comparison of size compositions



In most time periods, the cumulative distributions are very similar at the upper end (i.e., > 90th percentile)

However, since about 2015 the longline survey has seen larger fish than the trawl survey.

In summary, a variety of patterns are observed, but no indication of larger sizes in the population than in the fishery.

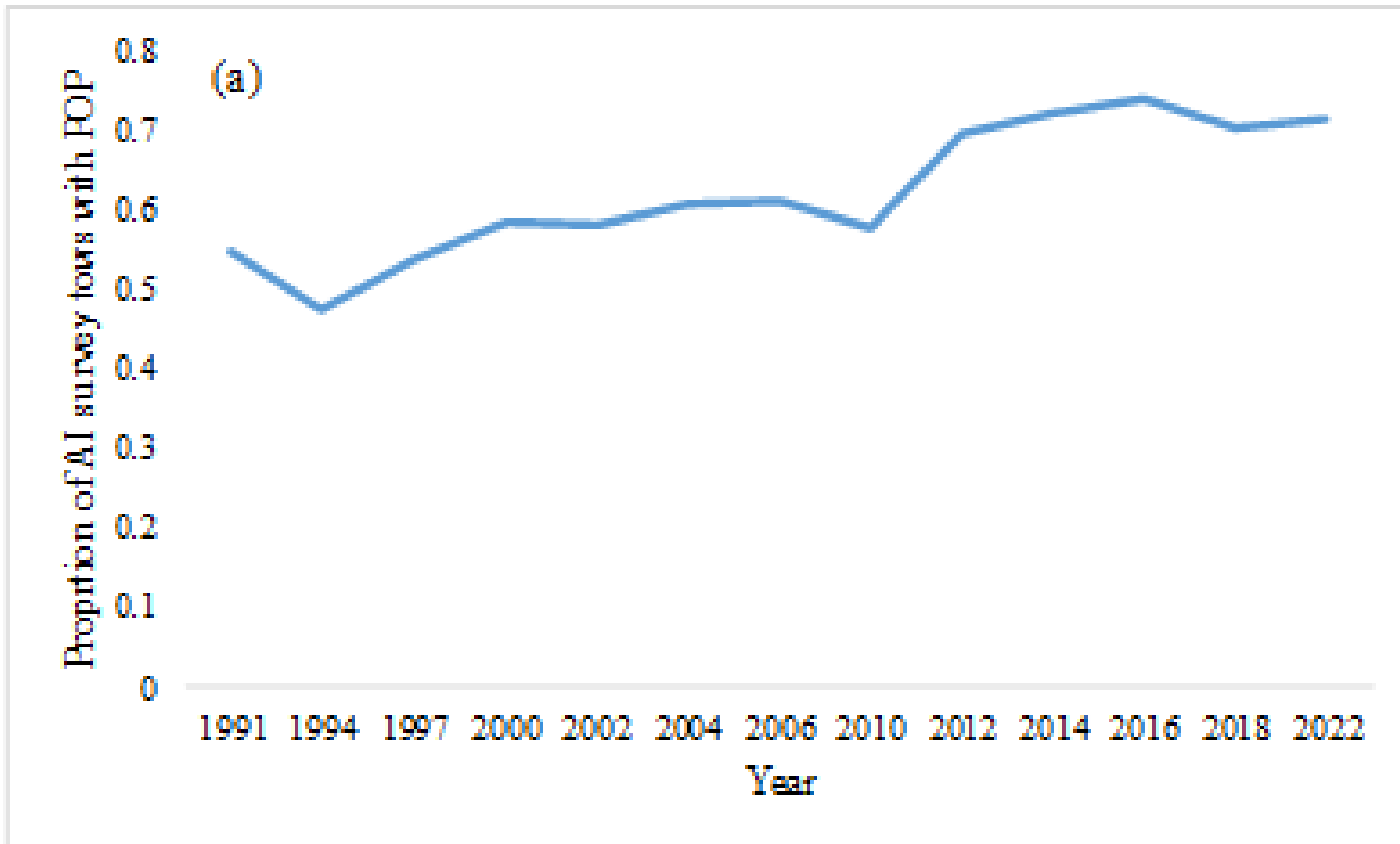
Plan Team/SSC comments

- (BSAI Plan Team, November 2022). *The Team also recommended looking at the rate of blackspotted/rougheye to Pacific ocean perch in the survey tows over the time series.*

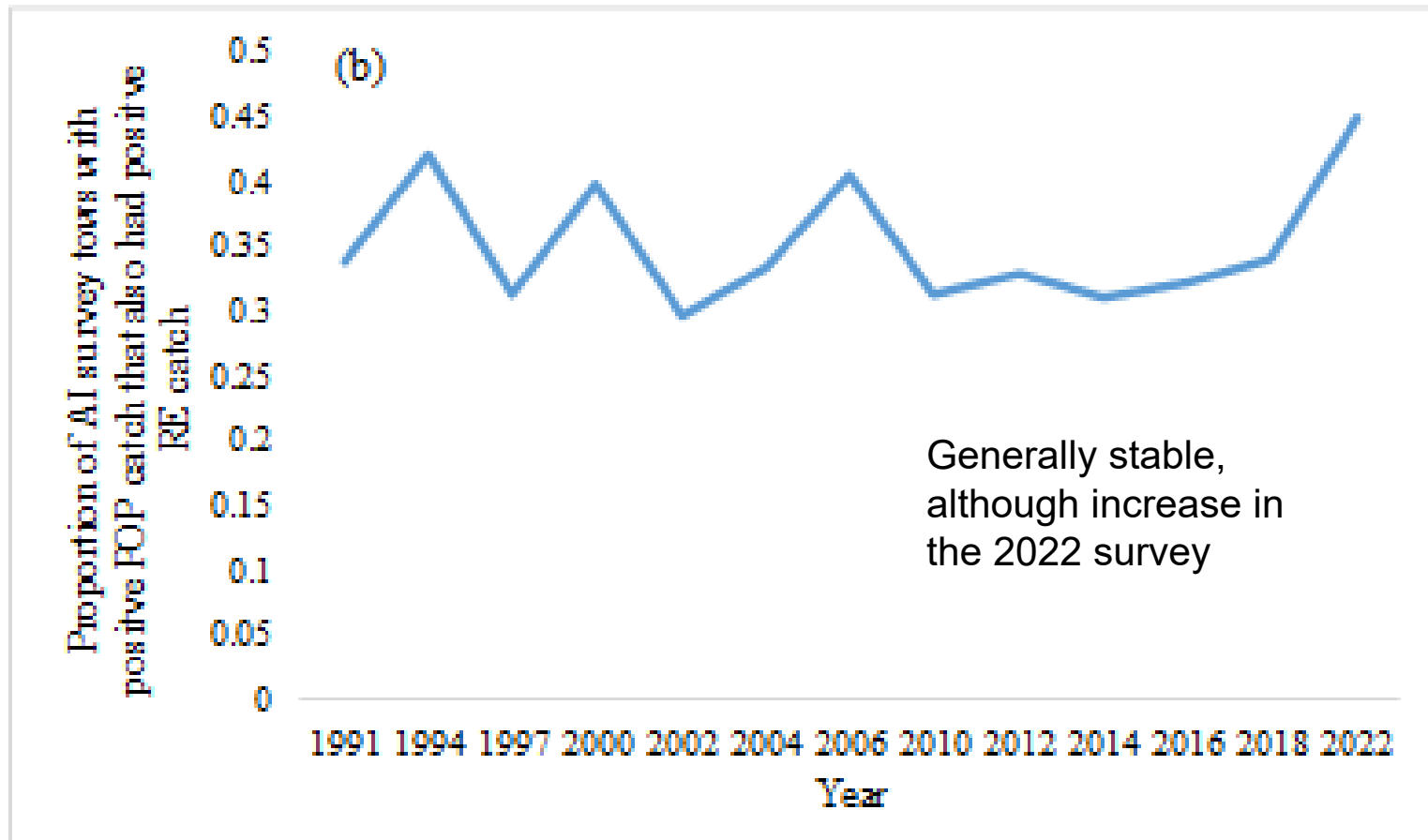
Ratios of catch rates in the AI survey

- Ratio defined as $\frac{\text{rougheye-blackspotted CPUE } (\frac{kg}{km^2})}{POP (\frac{kg}{km^2})}$
- Defined for only tows with POP catch

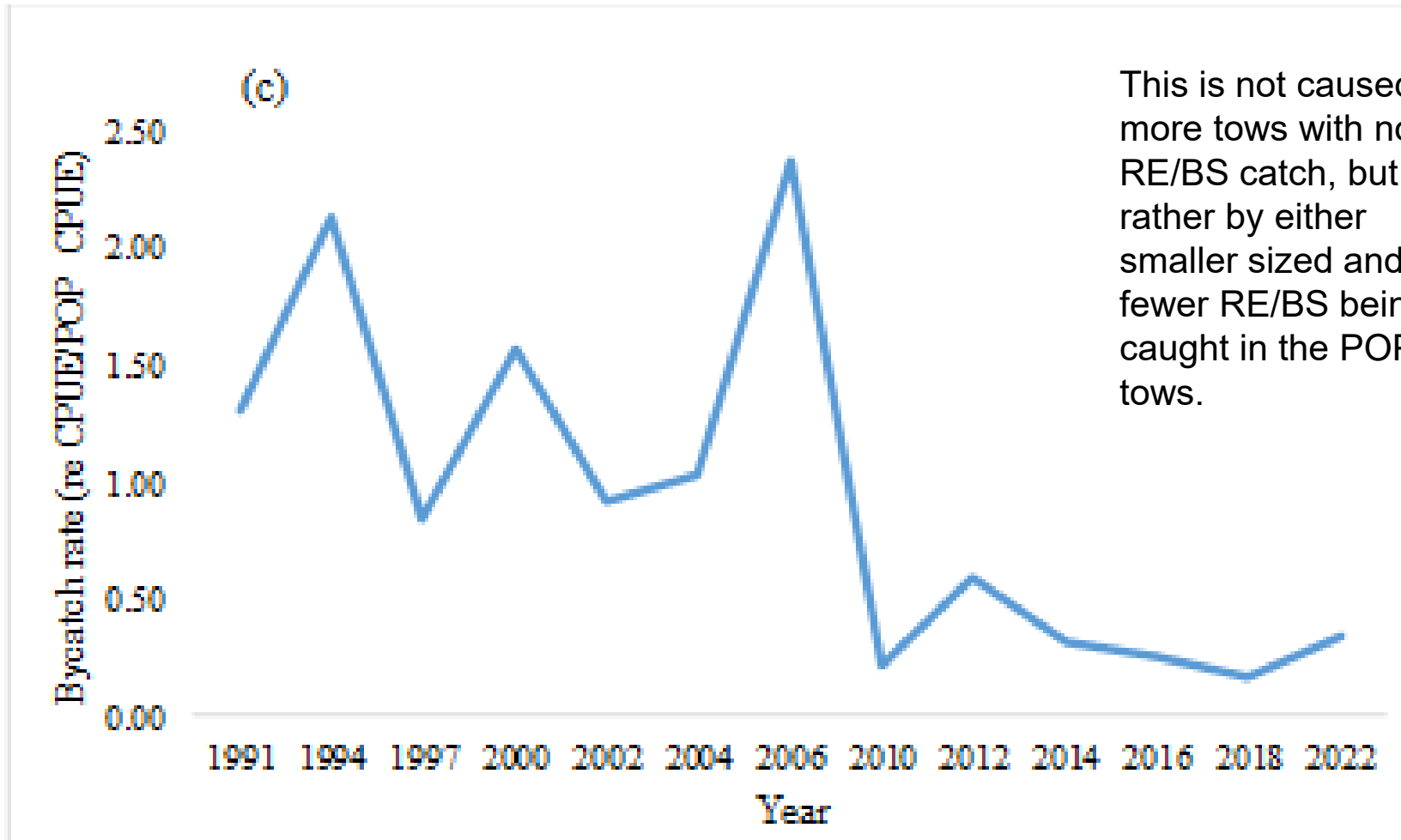
Proportion of AI survey tows with POP has increased



Proportion of AI surveys tows with POP that also caught blackspotted/rougheye



Decrease in ratio of survey catch rates



Summary and overall recommendations

- Inclusion of the IPHC survey is not recommended
- The size composition data from the fishery and survey do not indicate larger sizes in the population than in the survey.
- The length compositions and ratio of survey catch rates are consistent with declines survey mean size (previously presented to the Plan Team).

