

achieve the monitoring rates for the strata. The relationship between the different selection rates is provided in Figure B-3.

Results and Discussion

In the present analysis, the fixed-gear EM pool consisted of 168 vessels approved by NMFS. No vessels requested to be removed. Since no new funds to support fixed gear EM were received, no additional vessels were approved by NMFS to participate in fixed gear EM for 2021. Vessels that volunteered for continued participation in federally funded fixed-gear EM Research were considered to be placed in the zero selection pool (Appendix C). A list of 70 vessels expected to participate in Trawl EM was received 20 November 2020. Expected vessel participation for the other fishery monitoring strata is provided in Table B-2.

The expected coverage rates expected to be afforded in 2021 are approximately 15-16% across all observer monitored strata, despite the at-sea budget being set higher than 2000 days, which was the expectation in the draft 2021 ADP. The similarity in monitoring rates between the draft and final 2021 ADP, despite the higher number of monitoring days budgeted in the final ADP, is due to the addition of a Pacific cod fishery in the GOA for 2021 (Barbeaux et al. 2020) and an increase in predicted fishing effort.

Adjustments to the monitoring rate were required as the result of COVID-19 safety protocols. Port based trip-selection disproportionately affects the POT stratum, since trips within the POT stratum tend to utilize ports outside of the sample frame much more than trips within the HAL or TRW strata. Additional waiver rates (after accounting for the sample frame) are also expected to be higher for fixed gear strata (HAL and POT) relative to the TRW stratum because they have a greater tendency to offload at ports that differ from their embark ports (Figure B-3).

Increased fishing effort and cost inefficiency are factors that combine to draw a challenging picture for optimized deployment for observers in the North Pacific in the future. It appears that the 2419 day program will not support much coverage above baseline (15%) levels. However, it is important to recognize that over the entire fleet, coverage in terms of trips is expected to be 44.3%⁸, which is comparable to the actual values (43.3%) observed in 2019 (Ganz et al. 2020).

The expected difference between the available budget and the expended cost is depicted as a risk-profile in Figure B-2. The median and most likely sea-day expenditure for 2020 is expected to be \$681 over budget with a 95% confidence interval of being between \$350,754 under budget and \$343,736 over budget (~ 8 %).

Literature Cited

- Barbeaux, S., B. Ferriss, W. Palsson, K. Shotwell, I. Spies, M. Wang, S. and S. Zador. 2020. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. November Plan Team Draft. Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Gulf of Alaska. Gulf of Alaska Plan Team version. November 2020.
- Cahalan, J. and C. Faunce. 2020. Development and implementation of a fully randomized sampling design for a fishery monitoring program. U.S. Fishery Bulletin 118:87-99.

⁸ Summed number of observed trips divided by summed number of total trips in Table B-3.

