

## Joint NPFMC / IPHC Meeting

June 7, 2017, Juneau, AK

### Agenda Item 4: Progress reports On Council Research and Management Priorities

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#### 4b. Bycatch and wastage accounting and calculation

Total catch estimates in the groundfish fisheries off Alaska are generated by the NMFS Alaska Region's Catch Accounting System (CAS) and are used to manage separate groundfish quotas and Prohibited Species Catch (PSC) limits in the Bering Sea/Aleutian Islands and Gulf of Alaska. Total catch means both retained and discarded catch, and includes halibut PSC (also known as bycatch) in the groundfish fisheries as well as at-sea discards of halibut in the directed halibut fishery (also known as wastage). The CAS uses information from multiple data sources to estimate total catch. Observer information, dealer landing reports ("fish tickets"), and at-sea production reports are combined to provide an integrated source for fisheries monitoring and in-season decision making. Estimates of the at-sea discards of halibut in both the halibut IFQ fishery and other fisheries not targeting halibut are based on discard rates of halibut generated from observer data that are applied to groundfish landings. A detailed description of the current catch estimation methods was published by Cahalan et al. (2014).

In the past, halibut PSC estimates have been available at the spatial resolution of NMFS federal reporting area. These areas are used for groundfish management however they do not align with IPHC management areas that are important for the stock assessment and management of halibut. In 2015 staff from NMFS and IPHC collaborated and developed an improved estimation approach at a finer spatial resolution. Each year, NMFS provides halibut PSC data to the IPHC for its halibut stock assessment at the beginning of November and provides revised estimates in January, once the groundfish fishing year has finished.

NMFS and the Pacific States Marine Fisheries Commission are conducting studies to evaluate alternative methods that may improve upon the estimation methods used in the CAS. Recent and ongoing work includes evaluation of the use of ratio estimators (Cahalan et al. 2015a); investigation of the precision of estimates on full coverage vessels in the Bering Sea using design-based estimators (Cahalan et al. 2015b); and evaluation of how data are grouped (post-stratified) during the estimation process. Another important evaluation goal is to characterize the variation associated with the final estimates. In June 2016,<sup>1</sup> NMFS presented work on developing methods to use observer data to estimate variance associated with the catch and bycatch estimates. Preliminary results for 2015 showed that the majority of the percent standard errors are relatively small; almost all species (including halibut), area, and gear estimates had percent standard errors of less than 30 percent. NMFS is continuing work to incorporate programming into CAS so that the variance associated with the catch and bycatch estimates can be available for stock assessment.

NMFS uses observer data in CAS to estimate the amount of at-sea discard of halibut in the directed halibut fishery (i.e. wastage). However, there are several outstanding issues related to NMFS' wastage estimates: 1) average size of halibut discards, and 2) halibut wastage estimates from vessels less than 40ft length overall (LOA).

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<sup>1</sup> <https://www.npfmc.org/wp-content/PDFdocuments/conservationissues/Observer/OACVarianceMay16.pdf>

On all longline vessels, observers collect fish weights used to estimate the mean weight per fish from the unsorted (retained and discarded) catch. Because there is a minimum size limit for retention of halibut in the halibut IFQ fishery, smaller halibut (less than 32 inches) are required to be discarded while larger halibut are required to be retained. Hence, estimating the total weight of discarded halibut by applying the mean weight of halibut from observer data may overestimate the mean weight of discarded halibut in the halibut IFQ fishery. The impact of differences in average weights on the final wastage (discard) estimates is not yet known. However in 2016, the Observer Program modified selection of halibut for condition sampling (viability and injury assessments), which includes obtaining a length estimate, to be a step in randomized biological sampling. This change to the sampling protocol will likely facilitate the evaluation of average weights of retained and discarded halibut, and enable development of refined estimation methods for halibut discard in the directed halibut fishery.

Starting in 2013, NMFS has the authority to place observers on any vessel in the partial coverage category, which encompasses vessels of all sizes. However, recognizing the challenging logistics of putting observers on small vessels, NMFS and the Council have recommended that vessels less than 40 ft LOA be in the no selection pool and have not been subject to observer coverage. In 2015, 53% of trips in the halibut fleet and 17% of catch occurred on vessels <40 ft. LOA. For this portion of the fleet with no observer data, NMFS uses data from vessels over 40ft in the same fishery and area to generate estimates of at-sea discards. However, the lack of direct monitoring information from vessels under 40ft LOA has raised concerns stemming from the Marine Stewardship Council's (MSC) review of the Alaska Pacific halibut fishery and also been noted as a gap to evaluate wastage for the halibut stock assessment.

Overall, the restructured Observer Program dramatically reduced the proportion of trips in the halibut fleet that are not subject to coverage and improved discard estimates by providing data that better represents the fishery. However, NMFS does agree that the lack of observer data from vessels less than 40ft LOA is a gap. NMFS and the Council have been working on incorporating Electronic Monitoring (EM) into the Observer Program and view EM as a potential mechanism for gathering data on vessels less than 40 ft LOA that could have trouble accommodating an observer. In December 2016, at the recommendation of the EM Workgroup, the Council requested a discussion paper about incorporating vessels <40' LOA in the EM selection pool.

#### References

- Cahalan, J., Gasper J., and J. Mondragon. 2015a. Catch estimation in the Federal trawl fisheries off Alaska: A simulation approach to compare the statistical properties of three trip- specific catch estimators. *Can. J. Fish. Aquat. Sci.* Web published March 26 2015. DOI 10.1139/cjafs-2014-0347
- Cahalan, J., J. Gasper, and J. Mondragon. 2015b. Evaluation of Design-Based Estimators in the Federal Groundfish Fisheries off Alaska. In: G.H. Kruse, H.C. An, J. DiCosimo, C.A. Eischens, G.S. Gislason, D.N. McBride, C.S. Rose, and C.E. Siddon (eds.), *Fisheries Bycatch: Global Issues and Creative Solutions*. Alaska Sea Grant, University of Alaska Fairbanks. <http://doi.org/10.4027/fbgics.2015.09>
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