

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON
ELECTRONIC MONITORING-FINAL PACIFIC HALIBUT DISCARD MORTALITY
RATES, DISCARD SPECIES LISTS, AND THIRD-PARTY REVIEW

The Scientific and Statistical Committee (SSC) reviewed a report from the Groundfish Management Team (GMT) ([Agenda F.11.a, GMT Report 1, November 2017](#)), which evaluates methods for determining Pacific Halibut discard mortality rates (DMR) for electronically monitored (EM) groundfish bottom trawl trips. Patrick Mirick (Oregon Department of Fish and Wildlife and GMT) and Aileen Smith (Pacific States Marine Fisheries Commission [PSMFC]) presented a summary of the GMT report which was based on analysis done by PSMFC. Currently Pacific halibut caught on EM trips are assigned a DMR of 90 percent. Mr. Mirick indicated that the GMT was seeking the endorsement of the proposed method for assigning Pacific halibut EM DMRs based on time-on-deck.

The PSMFC analysis used observer data from groundfish bottom trawl tows with Pacific halibut catch in 2015-2016 to fit statistical models that estimate probabilities of halibut condition (excellent, poor, or dead) as a function of time-on-deck, haul duration, average depth, catch weight, fork length, and catch composition. The GMT found that a simple single-variable model with time-on-deck as the explanatory variable performed nearly as well as more complicated multi-variable models and proposed using this model to assign DMRs to Pacific halibut caught on EM groundfish trawl tows. Estimated probabilities for each condition (excellent, poor, dead) are multiplied by International Pacific Halibut Commission (IPHC) endorsed survival rates to calculate a weighted average DMR that would be assigned to each fish.

While the GMT analysis showed that more complex multivariable models with haul duration or fork length yield statistically better fits to the data, adding these variables leads to very small changes in estimated probabilities of different conditions and do not justify the use of the more complex model. However, additional analysis presented by the GMT to the SSC indicates that gear type may have a larger impact on estimated condition probabilities. The SSC recommends consideration of a model that includes gear type.

Independent of whether a single or multi-variable model is chosen, the SSC is concerned that the proposed approach for assigning a DMR (because of the non-linear model structure) may lead to a bias in the average DMR assigned, relative to the average that would be calculated by the methods used in the non-EM fishery. There was no analysis available to evaluate this bias using the full data set, but an analysis with a small sample from observed EM trips did indicate a negative bias in calculated DMRs. This issue can be resolved by altering the survival rates associated with each condition category in the equation used to calculate DMRs.

Assigning a DMR based on time-on-deck, and potentially gear, should create strong incentives for fishers to minimize time-on-deck which may in turn reduce actual discard mortality. However, it may be important to ensure that use of proper handling procedures is not undermined by a rush to get halibut off the deck. The SSC notes that the analysis did not fully assess how well the approach accurately represents long-term vessel-specific DMRs, which was a point of interest noted in GMT Report 1.

The SSC conditionally endorses the approach proposed by the GMT to assign DMR rates based on time-on-deck subject to the following three conditions:

1. The analysts estimate and evaluate an additional model that includes gear type so the Council can consider using this alternative model for assigning DMRs.
2. The analysts determine and correct for bias in the average DMR assigned by this approach relative to the average DMR calculated using conditions noted by observers.
3. The analysts adjust the survival rates in the equation used to calculate an overall DMR such that fish categorized by observers as "excellent" have an average overall calculated DMR of 20% and the DMR for fish that are out of water for a long time approaches 100% on average.

The SSC recommends that the GMT confer with the chairs of the SSC Groundfish and Economics Subcommittees after conducting this analysis before making a final recommendation on the specific model parameters that will be used to assign a Pacific Halibut DMR to EM groundfish trawl trips.

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