DRIFT GILLNET PERFORMANCE METRICS METHODOLOGY

Beginning in 2017, the Council has received an annual report on estimated bycatch in the large mesh drift gillnet (DGN) fishery against performance metrics originally adopted by the Council in 2015. Both the original metrics and the annual reports on bycatch in the DGN fishery are based on estimating bycatch using the ratio of observed fishing effort to total annual fishing effort as estimated from logbooks by the National Marine Fisheries Service (NMFS) West Coast Region Observer Program. In June, the Highly Migratory Species Management Team pointed out the inherent inaccuracies in the ratio estimation method (Agenda G.3.a, HMSMT Report 1, June 2018). Especially with rare-event bycatch, simple ratio estimation can result in an upward-biased estimation of rare-event bycatch in years when at least one bycatch event is observed, and a downward-biased estimate when no bycatch is observed.

Mr. James Carretta, at the NMFS Southwest Fisheries Science Center, has utilized a random forest regression tree method to more accurately estimate rare event bycatch and applied it to estimate protected species bycatch in the DGN fishery. This method has been subject to peer reviewed publication as a NOAA Technical Memorandum (Carretta, J.V., J.E. Moore, and K.A. Forney. 2017. Regression tree and ratio estimates of marine mammal, sea turtle, and seabird bycatch in the California drift gillnet fishery: 1990-2015. NOAA Technical Memorandum, NOAA-TM-NMFS-SWFSC-568. 83 p. doi:10.7289/V5/TM-SWFSC-568). Mr. Carretta presented this method to the Council in March 2017 (Agenda Item J.1.b, Supplemental SWFSC PPT, March 2017). In past reports, the HMSMT has suggested that this method is superior to ratio estimation, and the Council should consider using it to recalculate performance metrics and annually estimate bycatch in the DGN fishery to report against them. Currently Mr. Carretta only estimates protected species (marine mammals, sea turtles, and seabirds) bycatch using this technique. The HMSMT has discussed the feasibility of extending this or other methods[1] to the finfish performance metrics.

Although NMFS Protected Resources Division has already determined that the regression tree method is superior to ratio methods for estimating rare event bycatch in the DGN fishery, in June the Council requested its Scientific and Statistical Committee to review the method and report on its suitability for use in calculating performance metrics. The HMSMT is also prepared to report on how this method could be used for performance metrics reporting beginning in 2019.

Council Action:

Adopt Recommendations on Methods for Estimating Bycatch Relative to Performance Metrics in the Drift Gillnet Fishery.

Reference Materials:

None.

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[1] e.g., Martin, S.L., Stohs, S.M., and Moore, J.E. 2015. Bayesian inference and assessment for rare-event bycatch in marine fisheries: a drift gillnet fishery case study. Ecological Applications, 25(2), pp. 416–429.

PFMC
08/08/18