SC/68A/HIM/01

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INTERNATIONAL WHALING COMMISSION

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ABSTRACT

The Ocean Modeling Forum at the University of Washington, Seattle, USA, has convened a working group in response to the Marine Mammal Protection Act Import Provisions, issued in 2016 by the US National Oceanographic and Atmospheric Administration (NOAA). The rule requires nations that wish to continue exporting fish or fish products to the United States to adhere to bycatch standards comparable to those of the United States. The working group, which is developing scientific tools, resources and guidelines to help nations comply with the rule, is an international team of scientists led by André Punt and Tessa Francis of the University of Washington and the UW Ocean Modeling Forum, and Rob Williams of Oceans Initiative. In addition, representatives from the NOAA Offices of 'International Affairs and Seafood Inspection' and 'Protected Resources' are participating as invited experts. The working group is funded by the Lenfest Ocean Program, and has four planned projects. The first two address steps in setting and applying bycatch standards: estimating abundance and assessing bycatch rates. The third will develop an online tool to synthesize data and evaluate potential management strategies. The fourth will further evaluate the applicability of the Potential Biological Removal method, the primary US bycatch standard.

BACKGROUND

In the US, marine mammals are protected by the Marine Mammal Protection Act (MMPA), which defines reference points for managing bycatch. The MMPA contains regulations about monitoring and determining a marine mammal stock's (population's) incidental take (bycatch) limit (the Potential Biological Removal, PBR), and what actions NOAA undertakes if the limit is reached. PBR is defined as the maximum number of mammals that humans may remove from a stock while allowing it to reach or maintain its optimum sustainable population. The values for the parameters of the PBR formula were selected using MSE, a similar process to how the IWC's Revised Management Procedure and Aboriginal Subsistence Whaling Management Procedures were developed by the Scientific Committee. Therefore, US fisheries are subject to specific guidelines for monitoring and regulating bycatch in commercial fisheries under the MMPA. However, most of the seafood consumed in the US is imported (NOAA estimates 80%). While US fisheries follow a complex framework for reducing marine mammal bycatch, much of what Americans eat comes from other countries and is less likely to have received the same management oversight.

The MMPA requires that imported fish and fish products be evaluated with respect to US standards, and regulations to implement that requirement were issued in 2016 (Williams *et al*., 2016). The regulations require nations that export fish and fish products to the US to adhere to bycatch standards "comparable" to the US standards (i.e., the framework noted above).

The US identifies foreign fisheries that are at risk of having high marine mammal bycatch mortality,

and categorizes them as “Export Fisheries.” Such fisheries have more than a remote likelihood of marine mammal bycatch. Fisheries can also be categorized as an Export Fishery if NOAA has insufficient information on marine mammal bycatch rates, or if the fishery gear type is gillnet, trawl, longline, or purse seine. The fishery categorization has been published by NOAA as the List of Foreign Fisheries (LOFF). Nations have a five-year grace period, from January 2017 until January 2022, to develop a regulatory program to address their marine mammal bycatch for export fisheries. Those nations will have to submit a progress report to the US. The US will then make a comparability finding, to see whether that nation’s marine mammal bycatch program is comparable to that of the US. The Secretary of Commerce is supposed to insist on “reasonable proof” from the foreign government about the impact of that particular fishery on marine mammal populations. If a nation fails the comparability finding, the product from that fishery would be prohibited from entering the US, and the country could reapply at any time.

There are two broad pathways implied for nations developing a regulatory program, and they are not mutually exclusive. One pathway is to take actions to mitigate bycatch mortality, either through regulation or other programmatic changes. Conditions for a comparability finding include: (1) Assess marine mammal stocks and bycatch associated with the fishery; (2) Develop a bycatch reporting and monitoring methodology; and (3) Calculate a bycatch limit equivalent to US’s PBR. A second pathway in applying for a comparability finding could involve technical approaches to assessing the impact of bycatch on populations, including estimations of marine mammal abundance, bycatch mortality, and population-level impacts of bycatch mortality. It also could involve evaluating which strategies are most likely to be effective at reducing population-level impacts.

The Ocean Modeling Forum has convened a team of international experts (see Appendix) to develop tools that could be used by nations to support these technical assessments. One of the challenges that comes with the new rule is that equivalent reference points need to be established, even when data availability and assessment methods differ. In order to compare other countries to the US standards, there has to be a system that can handle diverse data types, gear types, and marine mammal life histories, and that will establish comparability methods. Thus, the Ocean Modeling Forum is placing a special emphasis on providing support to data-limited cases.

The following sections provide summaries of the primary products being developed by the working group.

PROJECT 1: ESTIMATING ABUNDANCE

This project, being led by Phil Hammond (University of St. Andrews), will produce a comprehensive guide to methods and best practices for estimating marine mammal abundance, including extrapolation, line-transect sampling, mark-recapture analysis, static and towed acoustic surveys, opportunistic data, and model-based estimation. The guide will discuss strengths and weaknesses of each method, including logistics and cost, and detail the minimum information needed to support abundance estimates. It will also lay out a decision tree for selecting the best method for a given combination of species, data availability, and other circumstances.

PROJECT 2: ASSESSING BYCATCH RATES

This project, being led by Jeffery Moore (NOAA) and Dennis Heinemann (Marine Mammal Commission) will create a guide to common methods for estimating rates and levels of marine mammal bycatch in fisheries, along with best practices for method selection. The guide will review methods for collecting the necessary observational data, including on-board observer programs, logbook records, and

structured interviews with fishers. It will also address certain challenging situations, such as bycatch that commonly goes unobserved (e.g., entanglement in lines attached to pot gear), and encounters in which marine mammals are injured but not necessarily killed. In addition, the guide will summarize techniques to analyze bycatch data, evaluate the strengths and weaknesses of each technique, and provide a decision tree to help users reduce statistical bias and cost while ensuring accuracy and completeness.

PROJECT 3: HELPING MANAGERS EXPLORE OPTIONS

This project, being led by Margaret Siple (University of Washington) is developing a user-friendly, interactive web application (https://msiple.shinyapps.io/mammaltool/) to explore the impacts of various bycatch management strategies on marine mammal abundance. Users will enter information on abundance and bycatch rates, and the application will return forecasts of abundance trajectories under alternative strategies (e.g., Fig. 1) and a set of performance measures, including the probability that the population will rebuild to the Maximum Net Productivity Level (MNPL) after 50 and 100 years. A final option will allow users to compute the maximum bycatch rate consistent with recovery to a target level of abundance within a specified amount of time.

The application will work with various levels of data availability. For example, users will have a choice of a range of life history parameters, which can be as specific as "humpback whale," or as general as "phocid seal." To account for uncertainty, users will be able to enter a CV for the estimates of abundance and bycatch rate, and explore a range of future bycatch scenarios.

PROJECT 4: EXTENDED EVALUATION OF THE PBR PROCESS

This project, being led by André Punt (University of Washington) involves conducting further evaluations of the PBR standard. The parameters of the PBR formula were selected accounting for several sources of uncertainty, but that uncertainty has not been evaluated for some situations that may be relevant in exporting nations, such as when environmental conditions fluctuate, carrying capacity changes, populations have spatial structure, or there are multiple fisheries impacts a stock, only some of which are characterized as Export Fisheries. The project is also developing case-specific simulation frameworks for bycatch of harbor porpoise, harbor seal and grey seal off Iceland and South American seal lion and South American fur seal off Chile. These frameworks involves fitting operating models to the actual data for the cases, and conducting projections that cover a range of alternative management options where there are multiple fisheries and impacted stocks.

References

Williams, R., Burgess, M.G., Ashe, E., Gaines, S.D. and Reeves, R.R., 2016. US seafood import restriction presents opportunity and risk. *Science* 354:1372-1374.

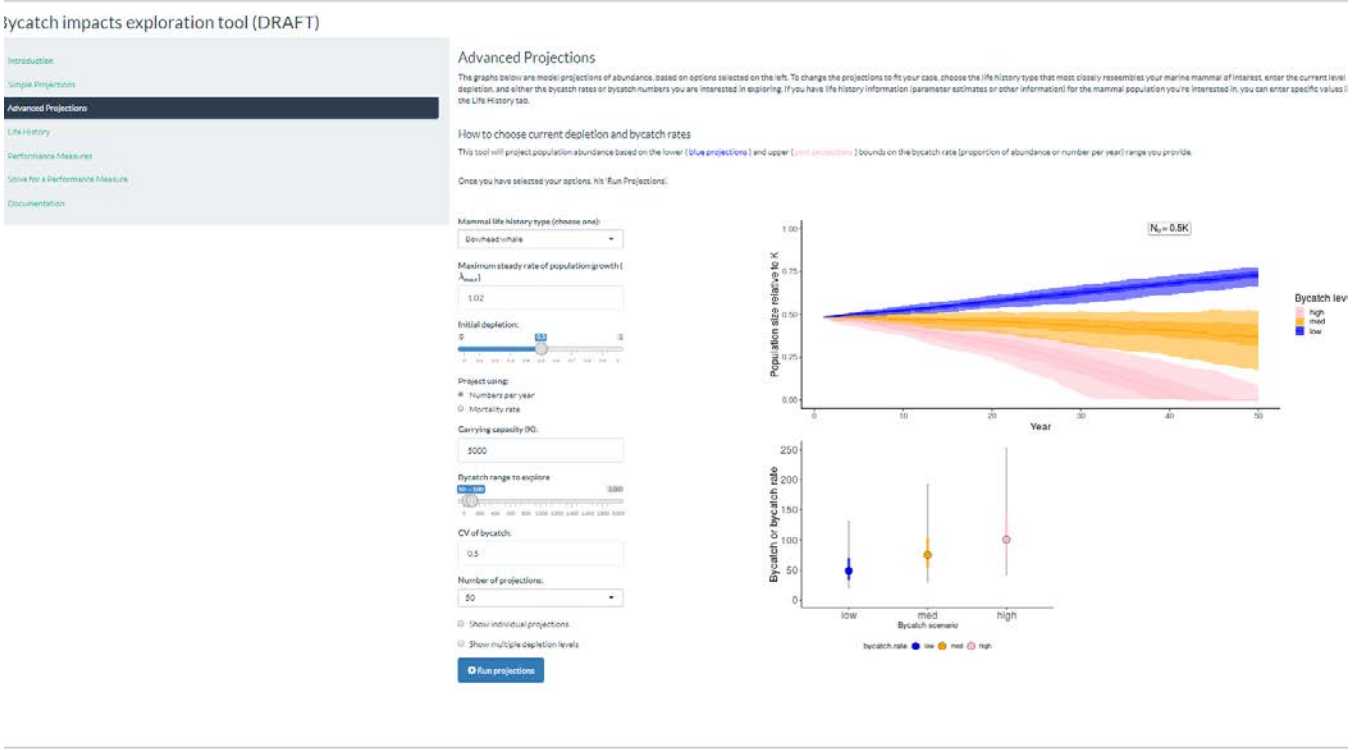

Fig. 1. Screenshot of the interactive web application, showing forecasts of abundance trajectories under alternative strategies.

Appendix

Working group members

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Invited experts

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