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Dr. Zachary Schakner
Protected Species Science Branch
Office of Science and Technology
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3226

ATTN: Stock Assessments, NOAA–NMFS–2022–0130

Dear Dr. Schakner:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the National Marine Fisheries Service (NMFS) draft 2022 stock assessment reports (SARs) for marine mammals occurring in U.S. waters (88 Fed. Reg. 4162). These reports provide valuable information needed to understand and address important marine mammal conservation issues. The Commission appreciates NMFS's efforts to update and improve these reports, as well as the opportunity to review them, provide comments, and recommend further improvements. The Commission is providing general comments on meeting the Marine Mammal Protection Act (MMPA) requirements pertaining to preparing SARs as well as comments specific to different regions and stocks.

## GENERAL COMMENTS

### Requirements of MMPA section 117

The Commission's letters commenting on the draft 2019, 2020, and 2021 SARs raised concern about NMFS's performance in meeting the requirement under Section 117 of the MMPA that each SAR include a minimum population estimate ($N_{min}$) for the stock. The Commission continues to be concerned about NMFS's failure to comply with this requirement. Including the draft 2022 SARs, an $N_{min}$ estimate is lacking for 80 of the 250 identified stocks, or 32 percent of reports. $N_{min}$ is a key factor for calculating a stock's potential biological removal (PBR) level. Under applicable agency guidelines for preparing SARs, estimates of $N_{min}$ are to be adjusted to account for increasing uncertainty with time since the most recent survey[1]. The need to make such adjustments depends upon several factors, including the number of years that have elapsed since the most recent survey, the frequency of the survey cycle, and whether the stock is subject to a recovery factor ($F_r$) less than 1 for reasons other than survey frequency. In cases where recent data are not available and there is no reliable basis for estimating $N_{min}$, NMFS has adopted the practice of denoting $N_{min}$ as "unknown" rather than providing some, perhaps low estimate of the stock's abundance. Omitting any estimate of the minimum size of a population does not comport with the statutory requirements and is useless for management purposes.

[1] NMFS 2023 Guidelines for Preparing Stock Assessment Reports Pursuant to the Marine Mammal Protection Act

When Congress was considering amending the MMPA in 1994 to add the stock assessment requirements and make associated changes to the provisions governing the taking of marine mammals incidental to commercial fishing operations, members recognized that the requirement to include a minimum population estimate in each SAR could, in some cases, result in what some parties consider to be an unrealistically low estimate (perhaps close to zero) due to the lack of reliable information. They also noted that, if that estimate (and the resulting calculation of PBR) has management or economic implications, this would provide an incentive for the agencies and the affected fisheries to fund or advocate for the resources needed to conduct the surveys necessary to obtain better information. The drafters of the 1994 MMPA amendments no doubt would be surprised that, nearly 30 years later, the SARs for almost one-third of the stocks do not include *any* minimum population estimate. Clearly, ignoring the requirement to include minimum population estimates, even if those estimates may be negatively biased, thereby avoiding any management implications that flow from those estimates, has not provided the envisioned incentive to collect better (or in some cases even minimal) information.

The Commission reiterates previous recommendations that NMFS make it a priority to secure the resources necessary to meet its responsibilities to conduct the surveys necessary to produce complete SARs (and to keep them up to date) and to work across regions in these efforts. The Commission further notes that other agencies (e.g., BOEM) may have shared interests in securing and using the information that NMFS collects to produce the SARS. The Commission encourages NMFS to continue to work with these agencies, as appropriate, to plan, fund, and carry out the surveys necessary to collect the information on marine mammals necessary for them to accomplish their respective missions. Also, the Commission again recommends that, when conducting surveys as part of partnership programs (e.g. GoMMAPPS), NMFS continue to provide sufficient personnel, logistical capability, and vessel and aircraft time to maximize the value of those surveys by allowing for photo-identification, biopsy sampling, satellite tagging, acoustic monitoring and other efforts. NMFS also needs to take steps to ensure that sufficient personnel and resources are available to allow for timely analyses of the samples and data collected during the surveys, to augment and increase the value of the core line-transect survey data. Employing these additional tools provides information necessary to delineate stock structure, confirm at-sea identification of cryptic species, and strengthen our understanding of marine mammal distribution, habitat use, health, and behavior.

**Timing of the SARs release**

The draft 2022 SARs were not made available for public comment until 24 January 2023 (88 Fed. Reg. 4162). At around the same time, initial drafts of the 2023 SARs were being compiled and circulated to Scientific Review Group (SRG) members and the Commission in preparation for the 2023 SRG meetings, which began in February. Having two sets of SARs under review at the same time has created some confusion, particularly where the newer initial drafts include information that calls into question whether the SARs out for public review contain the "best scientific information available," as required under MMPA section 117(a). Are commenters on the draft 2022 SARs to ignore more recent information included in the 2023 initial drafts?

This situation could be avoided if NMFS were to adhere to a more rigorous schedule for timely publication of draft SARs for public review. Given that the MMPA mandates a 90-day comment period on the drafts, the Commission recommends that NMFS set a deadline to make them available no later than the end of September each year. Timely availability of draft SARs for

public comment will allow for more thoughtful review by the Commission, researchers, and other interested parties. It will also make the relevant scientific information available sooner for fisheries management purposes, which under the MMPA scheme, is a key purpose of preparing the SARs.

**SPECIFIC COMMENTS**

**Atlantic**

*Changes from "strategic" to "non-strategic" status* – NMFS proposes to change the status of four western North Atlantic common bottlenose dolphin stocks from "strategic" to "non-strategic" in the draft 2022 SARs: the Northern South Carolina Estuarine System (NSCES), the Central Georgia Estuarine System (CGES), the Southern Georgia Estuarine System (SGES), and the Biscayne Bay stocks. However, those SARs do not explicitly explain the basis for the proposed changes in status. The Commission recommends that NMFS provide adequate justification for any proposed changes in status, particularly for stocks for which there is incomplete information.

The draft SAR for the NSCES stock includes an updated abundance estimate, but abundance estimates for the remaining three stocks are reported as "unknown" either because previous estimates are now more than eight years old (CGES and SGES), or because no current information on abundance is available (Biscayne Bay). Estimates of human-caused mortality and serious injury (M/SI) are updated for all four stocks, but reflect only minimum counts. There is no federal observer program for the relevant fisheries and therefore the "minimum counts" are based on data only from reported strandings, at-sea observations of dead or injured dolphins, and self-reporting by fishermen. As such, it is likely that the actual human-caused M/SI is higher, and possibly a great deal higher, than those estimates. Inasmuch as the new, low estimates of human-caused M/SI are discussed in the Status of Stock sections, it seems that the changes to non-strategic status are based exclusively, or at least largely on these updated M/SI estimates. However, as noted above, this is unclear.

Given the uncertainty surrounding the M/SI estimates and the possibility that the actual number of deaths and serious injuries attributable to fisheries and other human causes could be substantially higher, the Commission is concerned about the proposed changes to non-strategic status for these stocks. All are small stocks and it would require relatively few additional human-caused mortalities to exceed PBR. For the NSCES stock, the only one of the four stocks for which a PBR level is set, the PBR is only 3.6. The minimum annual human-caused M/SI estimate for the NSCES stock is 0.5, and M/SI could be exceeding PBR if only a small number of undetected or unreported deaths or serious injuries occurred each year. For the NSCES stock only seven strandings from any cause were detected over the most recent five years for which data are available (2016-2020). Evidence of human interaction could only be evaluated for five, and of those, two (40%) were a result of entanglement in blue crab fishing gear.

Wells et al. (2015) estimated the proportion of carcasses recovered to be 0.33 for common bottlenose dolphins near Sarasota, Florida, but Sarasota is a highly developed area with sandy beaches and heavy human use of coastal and bay waters. Less populated areas and those with intricate networks of marsh habitat, conditions that occur within the range of the NSCES stock, likely have substantially lower carcass detection. For example, lower detection rates have been estimated for bay, sound, and estuary (BSE) stocks in other portions of the southeastern U.S. coast. Modeling to quantify the injury to BSE stocks following the *Deepwater Horizon* (DWH) oil spill

estimated the probability of a common bottlenose dolphin carcass beaching and being detected to be 0.02, 0.07, and 0.09 for Chandeleur Sound, Mississippi Sound, and Mobile Bay, respectively (DWH MMIQT 2015). For Barataria Bay, an area with heavy human activity and extensive response efforts following the DWH spill, the detection probability was estimated to be 0.16. Extrapolating these results to the NSCES, it is not unreasonable to conclude that the number of strandings detected underestimates the actual M/SI by a factor of at least 3 or perhaps more than 10.

> Relevant insights can also be gleaned by comparing detected M/SI with what might be expected from a population of this size. NMFS SAR guidelines state:
>
> Where annual estimates of abundance and mortality are available from population models, it is straightforward to calculate the amount of total (human-caused and natural) undetected mortality by comparing annual mortality estimates [from modeling] to observed mortalities (Pace et al. 2017, 2021).

Analyses of photo-identification data for other U.S. BSE dolphin stocks have estimated apparent annual mortality rates of 0.039 and 0.049 (Wells and Scott 1990, Speakman et al. 2010). Applying the lower of these rates to the best estimate of NSCES abundance presented in the SAR ($N_{est}$ of 453), one would expect approximately 18 deaths in the population per year; yet the mean annual number of reported strandings was 1.4. This suggests a detection rate of approximately 0.08, similar to the rates estimated for the Gulf of Mexico BSE stocks following the DWH oil spill. Once again, if we apply this detection rate to the total number of strandings provided in the draft SAR for the NSCES dolphin stock, it appears that the information reported in the SAR may be significantly negatively biased, perhaps by more than 10-fold. If so, human-caused mortality could be well above PBR.

Similar arguments can be made concerning the detection rates for the CGES and SGES stocks, calling into question whether M/SI exceeds PBR. Given the uncertainty in the abundance of these populations and the extent of M/SI, the Commission thinks it premature to conclude that they are non-strategic. Although the carcass detection rate in Biscayne Bay may be similar to that reported for Sarasota, that still could mean that the actual M/SI is three times higher than the reported number.

In light of the uncertainties concerning stock sizes and the likelihood that the reported M/SI numbers are substantially underestimated, the Commission recommends that NMFS:

- reevaluate the strategic status of these four stocks, considering all available scientific information regarding plausible human-caused M/SI beyond the minimum count of detected strandings and at-sea observations;
- provide a detailed explanation of its rationale if it decides to change the status of these stocks from strategic to non-strategic in the final SARs;
- substantially increase efforts to investigate alternative strategies for collecting information on human-caused M/SI for BSE common bottlenose dolphin stocks, for which entanglements are difficult to detect or quantify, and for which observer programs are lacking.

The Commission would welcome the opportunity to consult with NMFS further on this last point, and would consider co-convening a workshop, as resources allow, on potential approaches for collecting better information on M/SI rates for these stocks.

## Pacific

*Humpback Whale Mainland Mexico – California/Oregon/Washington and Central America / Southern Mexico – California/Oregon/Washington Stocks*

Current and maximum net productivity rates — The draft SARs for these two stocks set the maximum productivity rate ($R_{max}$) at 8.2 percent based on the following information:

> Calambokidis and Barlow (2020) estimated that humpback whale abundance increased approximately 8.2% annually in the California Current since the late 1980s, based on mark-recapture estimates largely restricted to whales summering in California and Oregon waters. However, these estimates include whales from two stocks; the Central America / Southern Mexico - CA/OR/WA stock and the Mainland Mexico - CA/OR/WA stock. … However, the theoretical maximum net productivity rate can be taken to be at least as high as the maximum observed for the combined stocks, or 8.2% annually (Calambokidis and Barlow 2020), though it could be higher if one of the stocks is growing faster than another.

It would be surprising, although not impossible, if the current rates of increase of these two demographically independent populations were so similar that they could be considered the same. It is, however, far more likely that the increase rate of one is significantly greater and the other significantly lower than 8.2 percent. The SAR for the Mainland Mexico - CA/OR/WA SAR stock provides no estimate of the current net productivity rate for this stock. However, the Central America / Southern Mexico - CA/OR/WA SAR states:

> …Curtis et al. (2022) derived a population growth rate for Central America / Southern Mexico whales based on differences between the 2004-2006 estimate and the current estimate by excluding whales in southern Mexico waters in the spatial recapture model. This yields an annual growth rate of 1.8% (SD = 2.3%) for the Central America / Southern Mexico - CA/OR/WA stock of humpback whales; however, the estimate has high uncertainty (Curtis et al. 2022).

Although there is high uncertainty (CV = 1.28) associated with this estimated growth rate for the Central America / Southern Mexico - CA/OR/WA stock, it is very likely less than 8.2 percent, as the upper limit of the 95-percent confidence limit on the point estimate of 1.8 percent is 6.4 percent. Thus, using an $R_{max}$ of 8.2 percent for the Central America/Southern Mexico - CA/OR/WA stock seems unwarranted and would result in a PBR that is much too high. The Commission recommends that NMFS use an $R_{max}$ of 8.2 percent for the Mainland Mexico - CA/OR/WA stock, even though $R_{max}$ may be greater than 8.2 percent, and the default $R_{max}$ value for cetaceans of 4 percent for the Central America / Southern Mexico - CA/OR/WA stock.

Potential biological removal — The calculated PBR levels for these two stocks are divided by two to produce a "U.S. PBR" to be used in assessing the status of each stock. This approach is justified in the draft SARs by the statement that each "… stock spends approximately half its time outside the U.S. Exclusive Economic Zone (EEZ)." However, the draft SARs contain no data, analyses, or references to support this conclusion. From what is known about the migration of the two stocks between their summering grounds off the U.S. West Coast and their calving grounds in Mexico and Central America, it is clear that most members of each stock spend a portion of the year

outside of U.S. waters. However, it is also reported that some humpback whales are present in U.S. waters during all seasons (e.g., Campbell et al. 2015). In most SARs, NMFS estimates or specifies the components it uses to calculate PBR ($N_{min}$, $R_{max,}$ and $F_r$) as precisely as possible based on the available data. For these two stocks, however, the agency is applying an additional component (proportion of time spent in U.S. waters), which it quantifies crudely as "approximately half," and without any supporting data or rationale. The Commission recommends that NMFS use information on the timing of arrival to and departures from the U.S. EEZ by these two humpback whale stocks, as well as information on seasonal occupancy rates within the U.S. EEZ, to provide a more precise and justifiable estimate of the 'proportion of time spent in U.S. waters', to calculate the U.S. PBRs for these two stocks.

Human-caused mortality and serious injury — The draft SARs for these stocks identify two primary sources of human-caused M/SI on the West Coast, ship strikes and entanglement in fishing gear (fixed gear buoy lines). Recognizing that many carcasses sink or strand but are not found, the SARs acknowledge that the reported and confirmed M/SI events likely represent only a fraction of the number that occur. However, the SARs do not estimate or apply an appropriate correction factor to account for the undetected 'cryptic mortality,' due to fisheries interactions.[2] This seems inconsistent with the guidelines for preparing SARs, which state that:

> For many marine mammal stocks, it is not possible to estimate the undetected fraction of human-caused M/SI. However, in some cases, it may be appropriate to rely on estimates from other stocks to inform those that lack stock-specific information. In these cases, SAR authors may evaluate application of correction factors derived from data-rich species (e.g., coastal common bottlenose dolphins), which represent "best case" scenarios for carcass recovery due to their relatively high stranding probabilities ….

The Commission therefore recommends that NMFS revise these SARs to consider, adopt, and apply appropriate correction factors for fisheries M/SI.

Estimates of the proportion of carcasses detected[3] for 27 populations of odontocetes range from 0.0 to 0.33. Ten studies have estimated the proportion of carcasses detected for three populations of baleen whales: 0.05 and 0.085 for the Pacific gray whale (*Eschrichtius robustus*; Heyning & Dahlheim 1990 and Punt & Wade 2009, respectively); 0.103 for humpback whales (*Megaptera novaeangliae*) in the Gulf of Maine (Robbins et al. 2009); and 0.28, 0.17 and 0.36 for North Atlantic right whales (*Eubalaena glacialis*; Knowlton & Kraus 2001, Kraus et al. 2005, and Pace et al. 2021, respectively). These estimates suggest that, at most, about one-third of carcasses are detected and that the appropriate correction factors for adjusting M/SI estimates for baleen whales range from about 3 to 20.

The likelihood of detecting the carcass of a humpback whale, which is a coastal and shelf species, probably is not any greater than that for species with more coastal distributions, such as the gray whale or perhaps the North Atlantic right whale. Perhaps the most appropriate correction factor is the one estimate available for humpback whales, but NMFS may also want to consider the detection rates estimated for gray whales and North Atlantic right whales.

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[2] The SARs use a published model-based approach to estimate the total number of mortalities due to ship-strike.
[3] The carcass detection rate or observed mortality rate is the complement of the cryptic mortality rate; e.g., if the recovery rate is 0.25, then the cryptic mortality rate is 0.75.

The draft SARs for these two humpback whale stocks estimate that M/SI averaged 20.9 per year over the most recent five years for which data are available (2016-2020). Applying the lowest value for a correction factor (2.8), which is derived from the highest estimated detection rate for North Atlantic right whales, the extrapolated annual fisheries M/SI would be 58.5. At the other extreme, using the lowest estimated detection rate (0.05 for gray whales) and applying the corresponding correction factor would yield an estimate of annual M/SI over 400. If we were to use the low-end correction factor, apportion fisheries M/SI between the two stocks, and add the other sources of anthropogenic mortality and serious injury, the total annual M/SI for the Mainland Mexico - CA/OR/WA stock would be 50 and 34 for the Central America / Southern Mexico - CA/OR/WA stock. These values are roughly 1.5 and 13 times greater than the PBR levels for these stocks, and suggest that human-caused mortality and serious injury are having more consequential impacts on these stocks than indicated in the draft SARs. The Commission recommends that NMFS provide estimates of total fisheries mortality and serious injury for these stocks using appropriate correction factors to account for undetected whale carcasses.

## Alaska

*Eastern Bering Sea Beluga* – The use of 4.8 percent for $R_{max}$ is too high for the Eastern Bering Sea (EBS) stock of beluga whales. As stated in the draft 2022 SAR for this stock, an $R_{max}$ value specific to the EBS beluga whale is not available. The default $R_{max}$ value established by NMFS for cetaceans is 4.0 percent and the guidelines for preparing SARs state that deviations from the default $R_{max}$ value are to be made with caution, and with stock-specific information. The EBS beluga whale stock is co-managed by NMFS and the Alaska Beluga Whale Committee (ABWC). Through the co-management process, ABWC and NMFS reasoned that the Bristol Bay stock of beluga whale encounters environmental conditions and occupies habitat similar to those of the EBS beluga whale stock. An $R_{max}$ of 4.8 percent was calculated for the Bristol Bay beluga whale stock based on a 12-year study from 1993-2005 (Lowry et al. 2008). However, the most recently published Bristol Bay beluga whale SAR (2020) rejected the 4.8 percent value from Lowry et al. (2008) in favor of the 4.0 percent default because of the large CV associated with the Lowry et al. estimate[4]. NMFS is not updating the Bristol Bay beluga whale SAR in 2022. Thus, there is no new information on the selection of the appropriate $R_{max}$ value for that stock and, by extension, for the EBS stock. Because of the selection of the lower $R_{max}$ value for the Bristol Bay stock, the Commission recommends that NMFS use the default $R_{max}$ value of 4.0 percent for the EBS beluga whale stock until these uncertainties are resolved or until an $R_{max}$ value specific to the EBS stock is available.

[4] https://media.fisheries.noaa.gov/2022-11/BristolBeluga_2020%20SAR.pdf

The Commission appreciates the opportunity to provide comments and recommendations on the 2022 draft SARs. Please contact me if you have any questions regarding the Commission's rationale or recommendations.

Sincerely,

Peter O. Thomas, Ph.D.,
Executive Director

cc: James Powell, Chair, Atlantic Scientific Review Group
Richard Merrick, co-Chair, Atlantic Scientific Review Group
Megan Peterson Williams, Acting co-Chair, Alaska Scientific Review Group
Greg O'Corry-Crowe, Acting co-Chair, Alaska Scientific Review Group
John Calambokidis, Chair, Pacific Scientific Review Group

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