# Atlantic Scientific Review Group

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**Geneviève Nesslage, Chair**
University of Maryland Center for Environmental Science

**James A. Powell, Vice Chair**
Clearwater Marine Aquarium Research Institute

**Robert D. Kenney**
University of Rhode Island, Graduate School of Oceanography

**John Lawson**
Department of Fisheries and Oceans Canada

**Richard Merrick**
NOAA, Retired

**Michael J. Moore**
Woods Hole Oceanographic Institution

**Kathryn A. Ono**
University of New England

**Andrew J. Read**
Duke University

**Ana Širović**
Texas A&M University Galveston

**Erin L. Summers**
Maine Department of Marine Resources

**Randall S. Wells**
Chicago Zoological Society
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*Established under the Marine Mammal Protection Act to advise the National Marine Fisheries Service and U.S. Fish and Wildlife Service on the status of marine mammal stocks off the Atlantic and Gulf Coasts.*

April 3, 2020

Mr. Chris Oliver
Assistant Administrator for NOAA Fisheries
National Marine Fisheries Service
1315 East-West Highway, Room 14564
Silver Spring, MD 20910

Dear Mr. Oliver,

The Atlantic Scientific Review Group (ASRG) held its annual meeting on February 24-26 at Mote Marine Laboratory in Sarasota, FL. We appreciate the work done by Chicago Zoological Society's Sarasota Dolphin Research Program, Science Center, Headquarters, and Regional Office staff to prepare for this meeting. We were pleased to welcome back returning members Erin Summers and Jack Lawson, and we welcomed newly appointed members Richard Merrick, Kathryn Ono and Ana Širović. Nine of ten current members were able to attend the meeting while the tenth member participated via webinar. The ASRG has re-elected Geneviève Nesslage as Chairperson and we are pleased to announce the election of James Powell as Vice Chairperson.

The ASRG has several recommendations for the National Marine Fisheries Service (NMFS), presented below in approximate priority order.

1. The ASRG continues to be concerned about the status of North Atlantic Right Whale (NARW) and humpback whale cryptic mortality modelling. It is critical that this overall approach to estimating undocumented mortalities and incorporating them in whale management be expeditiously published in the peer-reviewed literature, and that these mortalities be incorporated into the sum of mortalities and serious injuries to more accurately reflect current stock status beyond the examination of documented carcasses and seriously injured animals. Once the methodology has been peer reviewed by the NEFSC as a "Fundamental Research Communication" and published in some form, we recommend NMFS count all cryptic mortality for right whales as anthropogenic. For humpback whales, the percentage of mortalities that are anthropogenic as cited in the Stock Assessment Report should be used to apportion anthropogenic vs natural mortality. Additionally, we recommend that NMFS conduct analyses to determine the appropriate apportionment of cryptic mortality by country and cause (vessel strikes vs entanglements) using the best diagnostic and demographic data available despite inevitable uncertainties. In the absence of robust

analyses, we recommend that ratios from known sources in existing data collected over the last five years be used to apportion country and cause, with the caveat that, while this information is the best available, it is highly uncertain.

We also remain concerned that seriously injured whales that are disentangled are counted towards the List of Fisheries, but not against PBR, unless the whale continues to show signs of health decline post-disentanglement or is already severely compromised. Our concern is that, while the disentanglement may have avoided a mortality for that individual, its omission skews the level of threat actually experienced by the species as a whole.

2.  The ASRG recommends that, as enabled by Marine Mammal Protection Act (MMPA) Section 112e, future stock assessment reports for NARW and humpback whales should examine the effects of sub-lethal trauma on fecundity rates and consequent impairment of population growth and recovery in the context of habitat quality, distribution and habitat use shifts, and food availability, given that non-lethal entanglement can result in reduced body condition that negatively affects fecundity[1,2]. Without attention to the consequences of non-lethal entanglement on the health of living animals, no amount of mortality reduction will allow significant recovery.

3.  The ASRG does not recommend subtracting additional known mortalities recorded after the terminal year of the capture-mark-recapture (CMR) model in Nbest calculations for either NARW or Humpback SARs, given that sighting information from later years are already used to inform terminal year abundance estimates.

4.  The ASRG commends the NEFSC for introduction of a CMR model as a more appropriate method for estimating the abundance of Gulf of Maine humpback whales. However, we cannot accept the application of the model (or the resulting abundance estimates) until a peer-reviewed manuscript describing its application to humpback whales, as well as the survey and sampling design used to collect the input data, is available for ASRG review. Completion of the NEFSC's internal "Fundamental Research Communications" (RPTS) review would suffice, although publication in a peer-reviewed journal would be useful to the larger marine mammal assessment community.

5.  The ASRG commends the SEFSC for its important efforts to update Gulf of Mexico SARs and to assess the effects of the *Deepwater Horizon* oil spill (DWH), including estimating mortalities through new and updated modeling. While it seems clear that the DWH had a very large adverse effect on many cetacean stocks in the Northern Gulf of Mexico, quantifying these losses such that they may be incorporated directly into the PBR evaluation system is challenging. The models used to estimate losses need to be reviewed and published through the SEFSC's internal "Fundamental Research Communications" system, at least as a

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[1] van der Hoop J, Corkeron P, Moore M (2017) Entanglement is a costly life-history stage in large whales. Ecology and Evolution 7:92-106

[2] Corkeron P, Hamilton P, Bannister J, Best P, Charlton C, Groch KR, Findlay K, Rowntree V, Vermeulen E, Pace RM III (2018) The recovery of North Atlantic right whales, *Eubalaena glacialis*, has been constrained by human-caused mortality. Royal Society open science 5:180892

NMFS technical document. It is our understanding that the models have yet to be validated with empirical data, that such validation will be difficult to accomplish, and, in the absence of such validations, mortality estimates could be biased high or low. The starting point abundance estimates in the models are many years older than the accepted period for valid abundance estimates, and these are used to estimate current mortalities. Without validation, it is difficult to evaluate whether DWH mortality estimates are appropriate for comparison with recent survey-based Nbest estimates of abundance and determination of stock status (strategic vs. non-strategic). Given these mismatches with accepted GAMM procedures, the ASRG recommends moving the model-based mortality discussion to the Habitat section of the SARs for each species, where model-derived information on percent decline in abundance, annual mortalities (annual average and trends), and lost cetacean years should be presented, along with an explanation of why the data are not incorporated into the stock assessment calculations.

6. The ASRG encourages and welcomes the development of new methods for estimation of stock structure, abundance, and mortality. However, application of such novel methods may require significant independent review prior to their use in the SARs. The ASRG reminds NOAA and FWS of the earliest GAMMS guidance[3] to limit use of gray literature in the SARs. As per OMB/NOAA guidance on the peer review of "highly influential scientific assessments"[4], all scientific information used in support of the SARs should meet the peer review requirements NOAA Fisheries has established for "Fundamental Research Communications". In general, we believe that, under this guidance, a tiered approach to peer review of data and analysis supporting the SARs is appropriate, along the following lines:

- Level 1 - For analyses using methods unchanged from previously peer reviewed and published analyses for the affected stock, there is no need for additional peer review beyond that provided by the Science Center review of Fundamental Research Communications.
- Level 2 - For analyses using methods similar to but significantly modified from previously peer-reviewed and published analyses for the affected stock, Science Center review of the analyses should be completed, and a manuscript be made available for the SRG to review to support use of the information in the SAR.
- Level 3 - For analyses using novel methods for the assessment of a single stock (but already in use for other similar stocks), we suggest that NMFS scientists consult with the SRG about the need for further peer review beyond the requisite Science Center review of Fundamental Research Communications. Regardless of the outcome of this discussion, a manuscript should be available for the SRG to read in support of use of the information in the SAR (for example, see #4 above).
- Level 4 - For analyses using completely novel methods or methods newly applied to the assessment of multiple stocks, we suggest that an independent review of the analyses be conducted in addition to Science Center review, and that a manuscript be available for the

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[3] Page 34, Wade and Angliss. 1997. Guidelines for Assessing Marine Mammal Stocks: Report of the GAMMS Workshop April 3-5,1996, Seattle, Washington. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-OPR-12. 93 pp.
[4] See https://www.cio.noaa.gov/services_programs/pdfs/OMB_Peer_Review_Bulletin_m05-03.pdf

SRG to support use of the information in the SAR. Said manuscript should also be considered for publication in a peer reviewed journal.

We welcome the opportunity to participate in peer reviews of these new approaches, and would be happy to chair reviews (e.g., CIE reviews) following similar approaches used by Fishery Management Councils' Scientific and Statistical Committees in independent peer reviews of NMFS fishery assessments. We are also willing to meet with Center scientists intersessionally by webinar or conference call to discuss and review assessment methods.

We further note that model-based estimates, because of their inherent uncertainties as predictive tools, will require significant validation in out years or be limited to a relative short prediction period (<5 years).

7. The ASRG recommends that the SEFSC and SERO convene a meeting with external research partners to examine revisions and updates to the stock structure of common bottlenose dolphins off the coast of North Carolina. Draft SARs indicate a 50% reduction in the abundance of coastal bottlenose dolphins along the eastern seaboard between 2011 and 2016, presumably as a result of the 2013-2015 UME. In addition, the two strategic estuarine stocks in North Carolina continue to experience bycatch in coastal gillnet fisheries. This bycatch is managed by the Bottlenose Dolphin Take Reduction Plan. At the same time, there has been a significant increase in our knowledge of these stocks due to research conducted inside (new molecular approaches to assigning stock identity) and outside (e.g., new photo-ID research projects in the Chesapeake Bay, New Jersey, New York, Delaware, and Assateague) the agency. Several outstanding questions still exist regarding stock definition, as highlighted in the SEFSC update and relevant SARs. It is still difficult, and often impossible, to assign fisheries takes to specific stocks. We understand that NMFS is exploring how existing approaches can be integrated in ways that will improve our understanding of the definition of these stocks. We suggest that a review of Atlantic coastal migratory and estuarine bottlenose dolphin stocks be conducted in 2021, with a specific focus on definition of the four stocks which occur in North Carolina and on developing the ability to assign stock identity to specific dolphins, both for abundance assessments and for by-caught animals.

8. The wording of the final paragraph of the "Stock Definition and Geographic Range" section in many of the Gulf of Mexico SARs has been modified from the original, apparently by Headquarters staff. The lead sentence now makes a declarative statement that may not be scientifically justifiable, with no supporting references. The second sentence then begins by saying that there is no information to justify what was just said. That juxtaposition seems contradictory. The ASRG recommends rewording the lead sentence to something less dogmatic, which makes it clear that the stock delineation is a hypothesis, perhaps as simple as a minor edit like "… are managed as a separate stock…"

Original: The Gulf of Mexico population is provisionally being considered a separate stock for management purposes, although there is currently no information to differentiate this stock from the Atlantic Ocean stock(s). Additional morphological, acoustic, genetic, and/or behavioral data are needed to provide further information on stock delineation.

<u>Revision</u>: Blainville's beaked whales in the Gulf of Mexico are a separate stock from those in the western North Atlantic. Although there is currently no information to differentiate the two stocks, such separation is consistent with the fact that the Gulf of Mexico and western North Atlantic belong to distinct marine ecoregions (Spalding et al. 2007; Moore and Merrick 2011). There are insufficient data to determine whether the northern Gulf of Mexico stock comprises multiple demographically independent populations. Additional morphological, acoustic, genetic, and/or behavioral data are needed to further delineate population structure in this region.

9. The ASRG recommends that separate abundance estimates be generated for beaked whales of the genera *Mesoplodon* and *Ziphius* in the Gulf of Mexico, rather than pooling estimates for both genera. This process should use genus-specific sightings, and observers should be encouraged to report sightings to the genus level. Future analyses should explore the possibility of using passive acoustic monitoring data and habitat preferences to pro-rate sightings of Gervais' and Blainville's beaked whales in the Gulf of Mexico. We also recommend considering existing acoustic density estimates as potential lower bounds.

10. The ASRG is concerned that there is inconsistent reporting by the Northeast and Southeast Fisheries Science Centers of *Kogia* spp. seen during at-sea surveys. We strongly suggest that the two Science Centers, in consultation with the SWFSC and PIFSC, come to common agreement on at-sea identification of *Kogia sima* and *K. breviceps*.

11. The ASRG strongly encourages the SEFSC to develop a mark-recapture abundance estimate for the Gulf of Mexico Bryde's whale. The current line-transect survey, which was used for the most recent estimate, is not optimized for surveys across this population's limited habitat. On the other hand, there has been extensive effort to collect photo-IDs. The latter data should provide more accurate estimates for this small population.

12. The ASRG commends the NEFSC on providing SARs that follow a consistent format, but encourages consistent use of the "habitat issues" section across all species. In particular, we recommend the inclusion of the description of habitat issues arising from anthropogenic noise as it pertains to different baleen whale species, especially those which have been shown to likely be susceptible to reduction in communication space through acoustic masking, such as right, fin, minke, and humpback whales[5]. When appropriate, we also encourage consideration of acoustic features, especially baleen whale songs or echolocation train patterns, when considering characteristics of stock differentiation[6].

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[5] As demonstrated in: Cholewiak, D., Clark, C.W., Ponirakis, D., Frankel, A., Hatch, L.T., Risch, D., Stanistreet, J.E., Thompson, M., Vu, E., and Van Parijs, S.M. 2018. Communicating amidst the noise: modeling the aggregate influence of ambient and vessel noise on baleen whale communication space in a national marine sanctuary. Endang. Species Res. 36:59-75.

[6] See for example: 1) Archer, F.I., Rankin, S., Stafford, K.M., Castellote, M., and Delarue, J. 2020. Quantifying spatial and temporal variation of North Pacific fin whale (*Balaenoptera physalus*) acoustic behavior. Mar. Mamm. Sci. 36(1):224-245; 2) Delarue, J., Dziak, R., Mellinger, D., Lawson, J., Moors-Murphy, H., Simard, Y., and Stafford, K. 2014. Western and central North Atlantic fin whale (*Balaenoptera physalus*) stock structure assessed using geographic song variations. J. Acoust. Soc. Amer. 135(4):2240.

13. The ASRG commends the F/ST for presenting examples of updated and improved species range maps for several Alaskan species. The ASRG recommends the inclusion of similar maps in the SARs for Atlantic and Gulf of Mexico species, particularly for those species for which there is evidence of range shifts (e.g., NARW). These maps would provide an opportunity to include indications of historic range patterns, and range updates resulting from additional data sources such as published acoustic studies[7]. Such maps could also indicate what proportion of the range was used to choose data sources for estimating abundance; for example, expanded range maps might suggest additional sources of bycatch mortality data relevant for assessing U.S. stocks.

14. The ASRG believes that the departure from the Group of the long-serving representative from the environmental nongovernmental community (e.g., in this case The Humane Society of the United States) represents the loss of an important perspective on marine conservation. In this regard, the ASRG requests that NOAA Fisheries solicit a new representative from the conservation NGO community; such an individual should have a strong science background in protected species conservation.

15. The ASRG commends the Science Centers for their attempts to streamline the presentation of numerical statistics in the SAR texts. However, removal of certain statistics (notably Nbest, Nmin, and PBR) from the written text significantly reduces the readability of the SARs. As such, the ASRG requests that these statistics be retained within the written text in the "Population Size," "Minimum Population Estimate," and "Potential Biological Removal" subsections of each SAR chapter. Discussion between NOAA Fisheries and the SRGs prior to implementation of similar systematic changes in future SARs could reduce the scale of post hoc editorial modifications by NOAA staff.

The ASRG would like to thank the authors of the SARs for their continued hard work. We continue to stand ready to assist NMFS with intersessional reviews as needed in addition to our annual meetings.

With best regards,

Geneviève Nesslage
Chair, Atlantic Scientific Review Group

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[7] See for example: 1) Baumann-Pickering, S., McDonald, M.A., Simonis, A.E., Solsona Berga, A., Merkens, K.P., Oleson, E.M., Roch, M.A., Wiggins, S.M., Rankin, S., Yack, T.M., and Hildebrand, J.A. 2013. Species-specific beaked whale echolocation signals. J. Acoust. Soc. Amer. 134(3):2293-2301; 2) Davis, G.E., Baumgartner, M.F., Bonnell, J.M., Bell, J., Berchok, C., Bort Thornton, J., Brault, S., Buchanan, G., Charif, R.A., Cholewiak, D., Clark, C.W., Corkeron, P.J., Delarue, J., Dudzinski, K., Hatch, L.T., Hildebrand, J., Hodge, L., Klinck, H., Kraus, S., Martin, B., Mellinger, D.K., Moors-Murphy, H., Nieukirk, S., Nowacek, D.P., Parks, S., Read, A.J., Rice, A.N., Risch, D., Širović, A., Soldevilla, M., Stafford, K., Stanistreet, J.E., Summers, E., Todd, S., Warde, A., and Van Parijs, S.M. 2017. Long-term passive acoustic recordings track the changing distribution of North Atlantic right whales (*Eubalaena glacialis*) from 2004 to 2014. Scientific Rep. 7(1):13460; 3) Harris, D.V., Miksis-Olds, J.L., Vernon, J.A., and Thomas, L. 2018. Fin whale density and distribution estimation using acoustic bearings derived from sparse arrays. J. Acoust. Soc. Amer. 143(5):2980-2993.

CC:

Mr. Michael Petony, Regional Administrator,
Greater Atlantic Region

Dr. Jon Hare, Director,
Northeast Fisheries Science Center

Dr. Roy E. Crabtree, Regional Administrator,
Southeast Region

Dr. Clay Porch, Director,
Southeast Fisheries Science Center

Ms. Donna Wieting, Director,
Office of Protected Resources

Dr. Shannon Bettridge, Chief,
Marine Mammal and Sea Turtle Division
Office of Protected Resources

Mr. David Detlor, Acting Director
NMFS Office of Science and Technology

Dr. Mridula Srinivasan, Chief,
Protected Species Science Branch
NOAA Fisheries Office of Science and Technology

Dr. Sean Hayes, ASRG Liaison & Chief,
Protected Species Branch
Northeast Fisheries Science Center

Dr. Peter Thomas, Executive Director,
Marine Mammal Commission