UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

Megan Peterson Williams
Chair, Alaska Scientific Review Group
10293 Somerset Dr., Truckee, CA 96161

Dear Dr. Peterson Williams:

Thank you for the letter to Chris Oliver, Assistant Administrator for Fisheries, transmitting recommendations from the February 2020 meeting of the Alaska Scientific Review Group (SRG).

The SRG has made many valuable recommendations to help guide NOAA Fisheries' marine mammal science and management, which are addressed in the enclosure. We appreciate the continued service and contributions by members of the Alaska SRG in providing advice and support to NOAA Fisheries in accordance with the Marine Mammal Protection Act. We look forward to our continued partnership to improve the science supporting the conservation of marine mammals.

Sincerely,

Francisco Werner, Ph.D.
Director of Scientific Programs and Chief Science Advisor

Samuel D. Rauch III
Deputy Assistant Administrator for Regulatory Programs

Enclosure

cc: Chris Oliver, Assistant Administrator for Fisheries
Evan Howell, Director, Office of Science and Technology
Donna Wieting, Director, Office of Protected Resources

AK SRG Recommendations from 2020 Meeting

1. Ice Seal Abundance

In 2016, the NMFS and partners conducted an instrument-based aerial survey of ice seals in the Chukchi Sea region. A coordinated effort was conducted in Russian portions of the Chukchi Sea. The AKSRG recognizes that quantitative estimates of abundance are important for Alaskan ice seals, given that ringed and bearded seals are considered threatened under the U.S. Endangered Species Act (ESA) and subsistence harvest levels for some species may be approaching the Potential Biological Removal (PBR). **We recommend that NMFS update the AKSRG on the status of analyses to estimate abundance for Alaskan ice seals.**

Response: NMFS will offer a presentation and discussion of these issues at the 2021 Alaska SRG meeting.

2. Ice Seal Subsistence

In 2019, the AKSRG recommended that NMFS consult the work of Nelson et al. (2019) and incorporate more realistic estimates of harvest for ice seals. We are pleased that NMFS followed this recommendation and incorporated the harvest data from Nelson et al. (2019) in their SARs for ice seals. **We recommend that NMFS investigate how to work with the Ice Seal Committee to continue collecting harvest data and to update estimates of ice seal harvest on a regular basis, targeting formal updates at least every 3-4 years.**

Response: NMFS and the Ice Seal Committee (ISC) recognize the importance of continuing to collect harvest data. During the annual review of proposals for co-management funding under section 119 of the Marine Mammal Protection Act, we have provided feedback to the ISC to expand harvest monitoring to other villages in addition to updating estimates from villages that have been surveyed in recent years. The Alaska Department of Fish & Game (ADF&G) has also used NMFS funding under section 6 of the Endangered Species Act to continue this important work for threatened ringed and bearded seals. We will continue working with the ISC to encourage expanded harvest monitoring on a rotational basis across all of the regions where ice seals are used for subsistence. Although stable funding is not available to guarantee that updates occur at least every 3-4 years, we agree that periodic updates are appropriate and will continue to work with the ISC and ADF&G to pursue harvest monitoring as funding is available.

3. Cook Inlet Beluga Whales

NMFS staff presented a broad summary of research on Cook Inlet Beluga whales including new findings from aerial surveys and updated abundance and trend information (Shelden *et al*. 2019; Wade *et al*. 2019). These new methods, in concert with data from the latest survey (2018), substantially changed the estimates of population abundance and trend over the past 10 years (2008-2018) compared to previous reports. Earlier assessments by NMFS demonstrated a gradual decline from 1999 to 2016 (Hobbs *et al.* 2015; Shelden *et al*. 2017), while the newer studies suggest a dramatic population recovery period from 2004-2010, followed by a period of steep decline (Wade *et al*. 2019). Subsequent to the 2020 meeting, results from a University of Washington study that included NMFS personnel were published (Jacobson *et al.* 2020). This study, which incorporated the aerial survey data, arrived at yet another very different estimate of the recent abundance and trend of Cook Inlet belugas. **The SRG requests clarification on the diverging population abundance and trend estimates in light of the most recent publications mentioned, specifically as it relates to a newly identified recovery period 2004-2010, which suggests a maximum population growth rate that may not be biologically feasible.**

Moreover, using the new abundance estimation methods, Wade *et al*. (2019) report high variation in daily and annual estimates of abundance, often involving differences of hundreds of whales between years, and even between days within years. **The SRG requests additional clarification regarding the revised aerial-based sampling methods and the potential explanation for high variation/uncertainty in daily estimates.**

Response: See attachment for our response to this recommendation.

4. Eastern Bering Sea Beluga Whale Status

The Alaska Native Subsistence harvest of Eastern Bering Sea (EBS) belugas is currently exceeding the Potential Biological Removal (PBR) for this stock. Removals are likely underestimated because harvest information does not currently include struck and lost belugas. The Alaska Beluga Whale Committee (ABWC) collects harvest data for EBS belugas. The ABWC, including ABWC delegates from communities that hunt EBS belugas, are aware that harvest currently exceeds PBR, and the ABWC is exploring if there is regional support for a beluga management plan. **We recommend that NMFS closely monitor this situation and prioritize estimating the abundance of EBS belugas on a regular basis. We also recommend that NMFS investigate how to work with ABWC to support collection and consistent reporting of harvest information and data necessary to estimate the proportion of struck and lost belugas. We are concerned that total harvest of belugas may greatly exceed PBR once the number of struck and lost belugas are properly accounted for.**

Response: NMFS shares the SRG's concern about the Eastern Bering Sea beluga whale stock. The abundance of this stock was last assessed in 2017. Given the concern about the subsistence harvest, we plan to survey the stock in 2023 and conveyed these plans to the Alaska Beluga Whale Committee (ABWC) in writing in early 2020.

The ABWC annually collects harvest information from hunter representatives in each village that uses beluga whales for subsistence, and these reports include animals that were struck and lost. As with all subsistence harvest monitoring, it is possible that some underreporting occurs, but ABWC has been diligent in reminding hunter representatives of the importance of tallying landed whales as well as struck and lost whales, consistent with our January 2000 co-management agreement under section 119 of the Marine Mammal Protection Act. We *acknowledge that the struck and lost data have not been consistently reported in the beluga whale SARs. We will include updated beluga whale subsistence harvest data (including the number of struck and lost animals) in the final 2020 beluga whale SARs.*

5. Electronic Monitoring

Electronic Monitoring (EM) is expanding in most federal commercial fishery fleets in Alaska as well as nationally. In particular, partial coverage fleets operating out of the Eastern Bering Sea and Gulf of Alaska are seeing a significant proportion of coverage transitioning to EM (as opposed on-board observers). As EM programs continue to expand, and more vessels opt to use EM instead of observers, it will be increasingly difficult to track marine mammal interactions as cameras are not currently designed to monitor marine mammal interactions. This will in turn decrease the amount of data on marine mammal interactions with commercial fisheries and increase uncertainty in Mortality and Serious Injury (M&SI) estimates in several marine mammal stock assessments. **We recommend that NMFS and the Marine Mammal Lab at the Alaska Fisheries Science Center work with the observer program to develop protocols within the EM framework to ensure that marine mammal interaction data collection continues to be a component of the observer program. If marine mammal interaction data cannot be collected via EM, the AKSRG would like to be updated on how M&SI estimates are being adjusted as more vessels transition to EM.**

Response: The North Pacific Observer Program will work with the North Pacific Fishery Management Council and its associated monitoring committees to foster multi-capability electronic monitoring systems in order to maintain the quantity and quality of information currently collected on marine mammal interactions to the extent possible. Electronic monitoring tools hold the possibility of collecting information on marine mammal interactions and current systems do an excellent job of capturing interactions that are very close to vessels and those in which the mammal is brought aboard the vessel. The Observer Program is working on electronic monitoring systems that could improve morphometric data collection, which could increase the information collected on marine mammals. However, electronic monitoring systems cannot collect biological samples such as tissues for genetic information.

6. Survey Prioritization

Data necessary for determining stock status, such as abundance estimates, for most of the large whale species assessed in the Alaska SARs are decades old. It is critical to focus survey efforts in the eastern Bering Sea (EBS) and the Gulf of Alaska, which are areas where extensive surveys have not occurred recently. Surveys are particularly important in the EBS, where extreme climate-change-driven transformations in the distribution of zooplankton, fish and, potentially, marine mammals are occurring. **We therefore recommend that NMFS prioritize the upcoming PACMAPPs and ARMAPPs marine mammal shipboard surveys in order to assist NMFS in fulfilling its mandate of calculating Potential Biological Removal for marine mammal stocks in Alaska**.

The Arctic region is also undergoing significant changes; however there has been considerable ice-based and aerial survey effort in the United States Arctic over the past 40 years. **We also recommend that NMFS work towards synthesizing existing acoustic-, vessel-based, and aerial-survey data from the US Arctic.**

Response: NMFS is in the process of planning for vessel-based and aerial surveys to assess the abundance of many stocks of cetaceans that have not been assessed in many years. We will provide an update on our plans at the 2021 Alaska SRG meeting.

We are working towards synthesizing different types of data, including acoustics, vessel-based data, aerial-survey data, opportunistic data, and environmental data. Synthesizing various data streams is complex and often requires advances in analytical procedures, which can be time consuming. We will provide an update on specific projects that are underway at the 2021 Alaska SRG meeting. To help focus future efforts to synthesize various datasets, we also ask that the SRG identify specific high priority research questions that might best be addressed through such a synthesis.

7. Habitat Concerns Section Standardization

There is some inconsistency among SARs as to whether climate change and other potential stressors in the habitat are described. **We recommend that the section titled Habitat Concerns be consistently used in all SARs to reflect environmental factors that are likely to pose a threat to marine mammals in Alaska. This should include a statement on how climate change and ocean acidification are expected to impact each species overall, followed by other specific potential threats such as marine heatwave events, commercial shipping activities, unusual mortality events (UMEs), harmful algal blooms, and environmental contaminants (e.g., mercury, persistent organic pollutants etc.) when information is available for that species.** This information is important to have in one section together so that the potential for multiple stressors in the habitat can be assessed.

Response: NMFS is in the process of revising the Guidelines for Assessing Marine Mammal Stocks (GAMMS) and, through this effort, NMFS is considering updating the GAMMS with respect to the inclusion and incorporation of information in the Habitat Concerns sections of the SARs. We will present the draft revisions to the GAMMS at a future Alaska SRG meeting. In the meantime, the SARs revised in 2020 will include a discussion of environmental factors likely to pose a threat to the stock and we will strive to standardize the text in future SAR revisions.

8. N_{MIN} and R_{MAX} Standardization

The Alaska SRG commends NMFS staff and stock assessment authors for their response to the 2019 recommendations to improve the language and consistency surrounding deviations from default N_{MIN} and R_{MAX} used in SARs and PBR determinations. Surveys typically cannot cover the full distribution of marine mammal stocks, thus N_{MIN} is often estimated for a portion of a stock's known range. **We recommend that stock assessment authors specify *to the extent possible* the portion of the stock's range for which the stock N_{MIN} is estimated.** This will enable the SRG to better assess uncertainty around N_{MIN} estimates as well as implications regarding fishery interactions.

Response: We agree that this is useful information to include in the SARs and will ensure that this information is consistently provided in the final 2020 SARs and in future SAR revisions.

9. PBR and mortality for transboundary stocks

A related issue to N_{MIN} representing only a portion of a stock's range is that of transboundary stocks. The GAMMS specify that in such cases, mortality must be compared to PBR in a consistent way. Ideally, both U.S. and non-U.S. sources of human-caused mortality and serious injury must be compared to the PBR for the entire stock range. If estimates of mortality or abundance from outside the U.S. EEZ cannot be determined, PBR calculations should be based on abundance within the EEZ and compared to mortality within the EEZ (which, for migratory stocks, may involve apportioning the total PBR based on the fraction of time the stock spends in U.S. waters). Numerous Alaska stocks are transboundary, yet this issue is not always addressed in a clear and consistent manner. **Overall, the SARs would benefit from explicitly acknowledging the transboundary nature of the stocks, and we recommend clarifying whether total mortality in a given SAR is compared to total abundance or whether PBR has been apportioned in some way.**

Response: We agree that this is useful information to include in the SARs and will work to include this information consistently in the final 2020 SARs and in future SAR revisions.

10. SEAK Harbor Porpoise

The AKSRG appreciates the significant advances made on Southeast Alaska (SEAK) harbor porpoise research in 2019 via eDNA work and the SEAK vessel-based survey. There is evidence the footprint of state gillnet fisheries is expanding, which will in turn increase the likelihood of fishery interactions with SEAK porpoise. Thus, we look forward to the development of the SEAK state-water observer program to better monitor SEAK harbor porpoise interactions. We also note there remains a high degree of uncertainty regarding inshore and offshore population structure for this stock, and this may have important implications for fishery interactions and future abundance estimates. SEAK harbor porpoise remains an important conservation issue as the M&SI estimate continues to exceed the PBR, and data on fishery interactions are limited. **We recommend that abundance estimates and stock structure data**

be updated and included in the 2021 SEAK harbor porpoise SAR, and we continue to support prioritizing observer funds to monitor state-water fisheries interactions with harbor porpoise.

Response: Work is underway on the analysis and publication of results for both abundance surveys and genetics of harbor porpoise in Southeast Alaska. While some research has been delayed in 2020 due to the pandemic, we expect that we will be updating the Southeast Alaska harbor porpoise SAR in 2021 and 2022 as data become available.

The Alaska Fisheries Science Center has begun to scope out the approach and cost of an observer program designed to understand the level of serious injury and mortality of harbor porpoise incidental to Southeast Alaska gillnet fisheries. Funding for this observer program is currently limited and future funding is uncertain as it must fit into the larger context of observer program priorities nationwide. With current limited funds, we are investing in infrastructure to support the broader Alaska Marine Mammal Observer Program (AMMOP).

We will provide an update on abundance, genetics, and stock structure of Southeast Alaska harbor porpoise, and an update on AMMOP, at the 2021 Alaska SRG meeting.

Response to Alaska SRG Recommendation #3

A. Clarification on diverging trends – differences from previous trend estimated in Shelden et al. (2017).

As summarized in Wade et al. (2019), the following changes were made to the estimated trends from previous calculations:

1) the abundance estimate from the 2018 aerial survey was included in the time series,
2) criteria for what constitutes an "acceptable" survey day were reviewed and changed,
3) a change was made to use the median instead of the mean of all acceptable days for an annual estimate, and
4) a substantial revision of the methods used for estimating group size was implemented for abundance estimates obtained since 2004 (Boyd et al. 2019).

In total, these changes created a different estimate of the trend of the population from the previous results (Hobbs et al. 2015; Shelden et al. 2015, 2017) for the 2004 to 2018 time period. Although most of the difference was due to the revised group size estimation method (Boyd et al. 2019), differences also resulted from the other changes. In particular, the change to the definition of an acceptable survey day led to three additional days being included in the annual abundance estimates, and excluded a day with a particularly high abundance estimate in 2004, which lowered the annual estimate in that year and contributed substantially to what is now viewed as an increase from 2004 to 2010. The 2018 abundance estimate also contributed to the estimation of a larger decline in the most recent 10-year period.

We compared trends between the two group size estimation methods (i.e., those presented in Hobbs et al. 2015 and Boyd et al. 2019) after applying the new criteria for acceptable days and using medians (see Fig. 5 in Wade et al. 2019). The smoothed trend in both cases share some major similarities – there is an increase followed by a decline. There are still some differences, notably that the year of peak abundance is now 2 years later (2010 versus 2008) using the Boyd et al. (2019) group sizes, and the recent decline is more severe, though this latter point is partially due to the low 2018 estimate (there is no estimate for 2018 using the previous group size estimation method presented in Hobbs et al. 2015). Therefore, the improved group size estimation method has also contributed to the differences in trends seen now, primarily by increasing the abundance estimates in 2010, 2012, and 2014, and including the estimate from 2018.

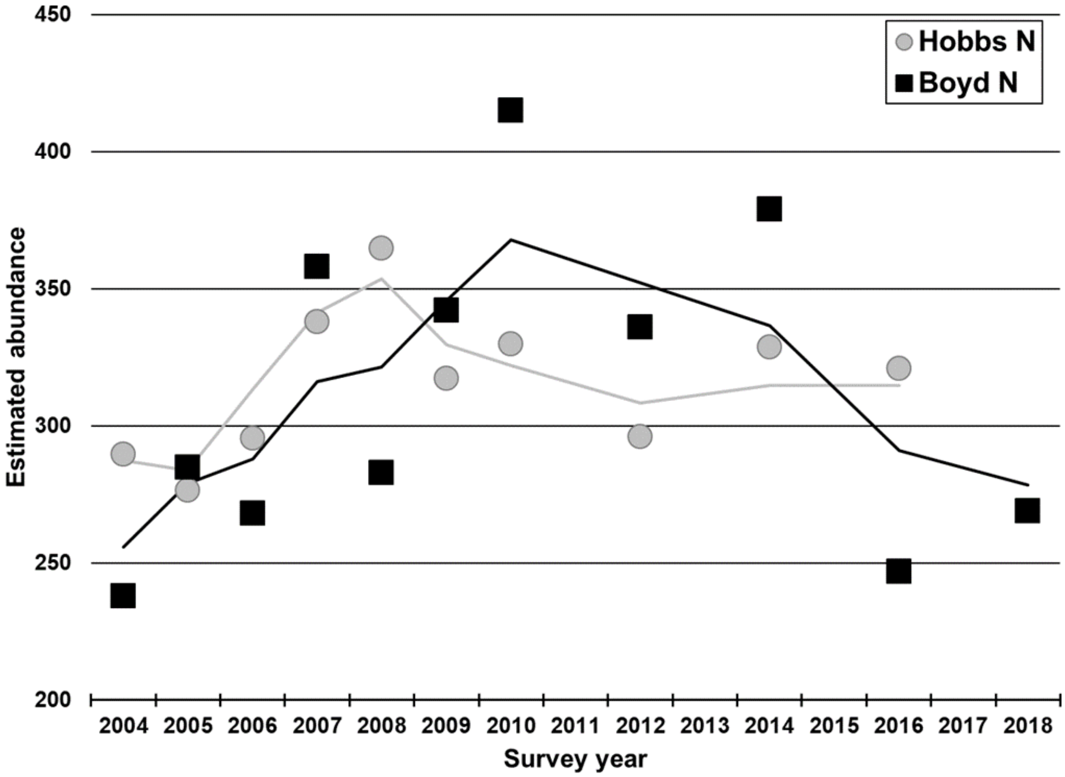

Figure 5 from Wade et al. (2019) comparing revised estimates after applying medians and acceptable day criteria to the Hobbs methodology.

B. Clarification on diverging trends – differences from trend estimated in Jacobson et al. (2020).

Key differences between Jacobson et al. (2020) and Wade et al. (2019) models include whether to use the median group size or highest group size estimate, how to partition the observed variability between process and observation error, and using a 10-year trend versus a moving average. If a moving average was applied to the 2004-2016 period, the moving average would produce a similar increasing and then decreasing trajectory as shown in Wade et al. (2019).

C. Newly identified recovery period of 2004-2010, which suggests a maximum population growth rate that may not be biologically feasible.

The trend during 2004-2010 is not biologically implausible, as the mean trend in the moving average is ~5%/year, with a probability interval that includes the default R_{MAX} of 4%/year.

D. The SRG requests additional clarification regarding the revised aerial-based sampling methods and the potential explanation for high variation/uncertainty in daily estimates.

There have been no revisions to the aerial-based sampling methods; the only revisions that occurred were to analysis methods. As discussed in Wade et al. (2019), there is substantial imprecision in the estimation of group size of large groups of whales. The Cook Inlet beluga whale population generally occurs in a highly aggregated manner, with a relatively small number of medium to large or very large sized groups. Therefore, there can be substantial variation from one year to the next, or from one day to the next, from group size estimation error. Additionally, as also discussed in Wade et al. (2019), there is also likely some additional model error that occurs in trying to estimate the size of the very largest groups which contributes additional uncertainty between surveys, and potentially leads to high outliers. Finally, as discussed in Wade et al. (2019), there are also likely days where some medium or large groups are missed, leading to low outliers. We changed from using the mean across days to using the median in order to make the annual estimate less influenced by these potential high and low outliers. There is nothing new about the high variation/uncertainty in daily estimates; it can be seen in Figure 4 of Wade et al. (2019) where there was similar daily variation using the previous group size estimation method (i.e., Hobbs et al. 2015; Shelden et al. 2015, 2017).

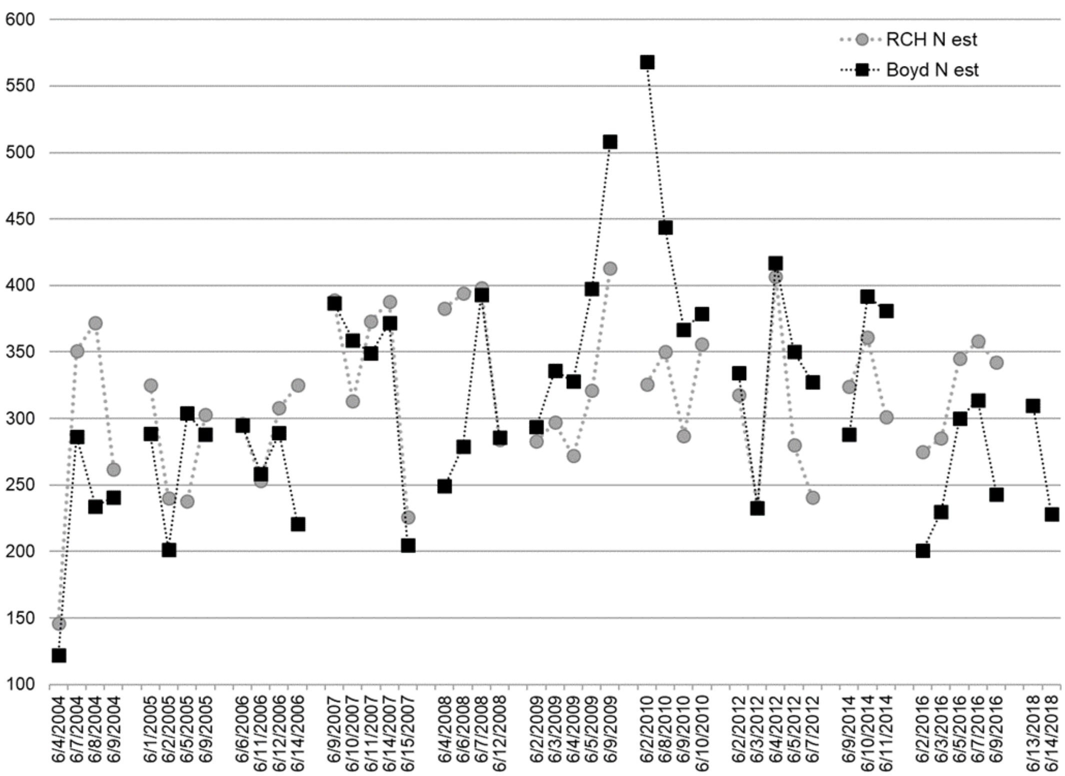

Figure 4 from Wade et al. (2019) showing daily estimates using the previous group size estimation method (RCH N est) compared to Boyd et al. (2019).

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