

# Pacific Scientific Review Group

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## A Regional Advisory Group for the National Marine Fisheries Service and Fish and Wildlife Service

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Consultant

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Dear Assistant Administrator Coit and Regional Directors Morrison and Souza:

This letter conveys recommendations from the Pacific Scientific Review Group (PSRG) to the National Marine Fisheries Service (NMFS) and Fish and Wildlife Service (FWS) based on its in-person meeting in San Diego in March 2024 and subsequent discussions. First and foremost, the PSRG gratefully acknowledges NMFS and FWS scientists and managers who prepared stock assessment reports and made presentations at our meeting. In addition, the PSRG wants to recognize our NMFS liaison, Laura McCue, whose efforts greatly facilitated the PSRG meeting being run and reported on in an efficient and organized manner.

Further, we want to recognize the contribution of the NMFS Office of Science and Technology for their support of a vessel survey to contribute to the evaluation of False Killer Whales (FKW), and other cetaceans, in the vicinity of the Hawaiian Islands. We recognize that, due to weather and logistical issues that are out of the control of the Chief Scientist for the cruise, the success of the cruise in terms of data collection is hard to predict. Nonetheless, the PSRG supports the efforts and looks forward to receiving the survey results at our next meeting.

Three other procedural issues, before we present our recommendations, are that the PSRG would like 1) to see a timeline for the implementation of the recommendations from the FKW Take Reduction Team as soon as possible so it can be discussed at our next meeting, as well as a timeline regarding a decision related to spinner dolphin time-area closure regulations, 2) to see a timeline for the decision process related to the Makah request to take gray whales for subsistence purposes, and 3) to avoid the situation at this year's meeting, where we did not have the benefit of a response from either NMFS or FWS to our 2023 recommendations at our March 2024 meeting (note - as of this writing, the PSRG has yet to receive comments from FWS regarding 2023 recommendations directed to their office). Regarding the latter point, it would be helpful to have a date certain from NMFS and FWS, where it would be highly likely that responses could be received from the Agencies prior to our meeting in 2025.

Our recommendations from our most recent 2024 meeting are as follows:

**1. (General) The PSRG recommends that NMFS continue to rely on Bayesian state-space models (or equivalent methods) to estimate stock trends, while using SDM (Species Distribution Models) results for evaluating distribution, habitat use, environmental relationships, and overall abundance.** The PSRG appreciates the in-depth analyses conducted by NMFS to evaluate SDM reliability, including the effect of changing covariates, and including (or not including) an effect of year for capturing trends in cetacean abundance that are not fully explained by variation in dynamic environmental covariates. We continue to have concerns about the use of SDM for evaluating abundance trends, especially given the findings reported by NMFS that the incorporation of a year covariate can, in some cases, have a dramatic effect on the model results. This finding suggests potential issues with model specification or, more likely, insufficient sample sizes or length of time series to disentangle temporal trends from effects of environmental variables. In addition, the PSRG has concerns regarding how NMFS will interpret the results of SDM where latitude and longitude are included as covariates, as these effects can be particularly sensitive to a single year's survey design or small sample sizes. Therefore, the PSRG believes that continuing to rely on other analytical approaches to assess abundance trends, such as Bayesian state-space models, remains the best approach at the current time for most cetacean stocks. We appreciate both the potential and the challenges associated with transitioning to SDMs as a primary method of stock assessments, especially for cetacean species with limited numbers of survey observations, and the PSRG looks forward to updates and further discussions on the matter. In particular, the PSRG would like to discuss possible simulation trials to further explore the robustness of SDM for evaluating trends in abundance.

**2. (General) The PSRG recommends that NMFS provide summary information on species or putative stocks that are not formerly recognized in regional stock assessment report documents.** Some cetacean species are found periodically or regularly in U.S. waters for which no stock assessment reports exist (e.g., false killer whales along the U.S. west coast, a large number of species in Guam and other U.S. territories in the western Pacific). In addition, there are putative island-associated stocks of a number of species of odontocetes that have been proposed ([Oleson et al. 2013 PSRG-2013-16](#)) but not formally recognized as stocks (e.g., short-finned pilot whales, rough-toothed dolphins, pygmy killer whales, Blainville's beaked whales, goose-beaked whales, dwarf sperm whales in Hawai'i). While NMFS may not wish to formally prepare stock assessment reports for these species/putative stocks, it would be of value to

recognize that stock assessment reports may be prepared for at least some of these species in the future, given current levels of information available. A summary of these species/putative stocks could be presented in a similar way to the summary of details on revised stocks presented annually in Appendix 2 of stock assessment reports.

**3. (General) The PSRG requests further information on plans for the integration of environmental DNA (eDNA) collections with stock and species identification protocols.** This developing methodology, along with traditional methods (e.g., biopsy samples), should be coordinated with other Centers and agencies (e.g., BOEM, ONR). The PSRG noted with interest plans to include the collection of eDNA in upcoming vessel surveys directed by the Southwest Fisheries Science Center (SWFSC).

**4. (General) The PSRG requests that NMFS and FWS provide a summary of any policy changes since the last GAMMS report, and in particular articulate the role of PBR simulation results in making any such changes.** The PSRG welcomed the presentation on Potential Biological Removal (PBR) simulations by Moore. We understand that a broader presentation on the implications of PBR simulations will be presented at the Joint SRG meeting in 2025. The PSRG is interested in how the simulation results will be used to address the adequacy of both past and future survey intervals for a given stock, as well as whether changes in the definition of  $N_{min}$  are anticipated. For example, with a survey interval as long as 12 years and an  $N_{min}$ ,  $R_{max}$ , and  $FR$  as defined, would 95% of the simulations still equilibrate above the MNPL with the high and low CV levels used in Wade (1998).

**5. (FWS) The PSRG recommends that the U.S. Fish and Wildlife Service explore alternative methodologies to compensate for reduced aerial survey effort for sea otters.** Some sea otter habitats along the U.S. West Coast are lacking more recent surveys, largely due to cost involved with aerial surveys or unavailability of planes. These habitats tend to be further offshore, hence land-based drone observations are not an option. The PSRG suggests exploring the use of drone technology that incorporates a launch protocol off a small survey vessel. One option might be to liaise with NMFS survey staff on the west coast using similar technology. Small Unoccupied Aerial Systems (sUAS) are frequently hand launched and retrieved from small boats offshore to collect data (e.g., on whale morphology and kelp canopy coverage). sUAS can be programmed to fly on pre-designed flight paths to survey a designated area. These image data can be mosaiced together during analysis to form detailed, high-resolution imagery of the area. Such an approach can also be applied to census of sea otters, where individuals are counted in the resulting mosaic imagery. Alternatively, switching to a method of high-resolution aerial photography from a standard aerial platform, as has been conducted in parts of Alaska, may provide a transitional step from the current aerial counting techniques to eventual sUAS techniques. In both cases, stratified sampling survey designs (as opposed to the current exhaustive survey coverage) should allow for surveys to be completed on an annual or biennial basis.

**6. (PIFSC) Given the recent influx of new acoustic data on Pacific Ocean Bryde's whales ([Heible et al. 2024](#); [Tary et al. 2024](#); [Vioria-Comora et al. 2021](#)), including the growing evidence for unique spatially segregated acoustic attributes, the PSRG recommends comparisons across broader geographic regions to test hypotheses of stock structure. In**

addition to potentially impacting the management of Bryde's whales in US waters, knowledge about stock structure in the North Pacific has direct relevance for determining the sustainability of the Japanese whaling efforts targeting North Pacific Bryde's whales. In addition, the PSRG thanks the team from PIFSC (represented by Erin Oleson) for an interesting presentation on a novel call-type (dubbed the "biotwang") attributed to Bryde's whales in the western North Pacific. Initial analyses to compare stock structure using acoustic call types across this region would be ideal in the short term. Further work could follow, including genetic or morphometric comparisons where specimens/data are available. This work will likely identify limitations to existing sampling and guide additional field efforts needed to complete an accurate assessment of Bryde's whale stock structure in the North Pacific.

**7. (PIFSC) The PSRG recommends that the abundance estimates for spinner dolphins around the islands of Hawai'i be updated to incorporate perception and availability bias, particularly within the aerial surveys. In addition, the PSRG asks for an overview of previous estimates, especially the potential for detecting trends in abundance and distribution given the differences in methodology.** The PSRG thanks Claire Lacey (MMRP at University of Hawai'i) for the update on the estimated abundance of spinner dolphins, but notes that certain assumptions made in the course of the analysis (e.g., no perception or availability bias in the aerial surveys) are unrealistic given factors such as no visibility at g(0) and the knowledge that the ability to see dolphins under the water changes with distance from the plane, even in clear waters. It may be possible to leverage the overlap in the boat and aerial surveys to obtain estimates of the missing correction factors.

**8. (PIFSC) The PSRG recommends that the NMFS continue to refine and develop the capture-recapture (CR) analysis of insular false killer whale abundance and trends accounting for observation bias, and to consider expanding this approach to a full-fledged integrated population model.** The PSRG supports NMFS efforts to develop this novel method, which we believe holds great promise for illuminating the demographic drivers of FKW trends while accounting for the spatially biased nature of monitoring and of habitat use by different social clusters. The PSRG suggests that future iterations of the current spatial CR analysis should be expanded to allow for time-varying demographic parameters and observation processes, potentially by leveraging additional data types. More broadly, given the diversity of data types now available for Main Hawaiian Islands (MHI) insular false killer whales, as well as the pressing need for improving understanding of the drivers of current trends and vulnerabilities, formal development of an integrated population model (IPM) may be both possible and advisable. An IPM structure would fully leverage the strengths of the various available data types (e.g., distribution and abundance surveys, tracking data on movements and group composition, photo-based CR data, body condition data, genetic data on population structure, etc.) and could allow for greater insights into demographic structure and processes, while highlighting key limiting factors and allowing for population projections under alternative management scenarios.

**9. (PIRO) The PSRG reiterates its concerns for the lack of effectiveness of the 50-yard rule within important spinner dolphin resting bays and recommends the implementation of no-go areas in these habitats.** This recommendation has been extant for a number of years. At a

minimum, the PSRG requests a discussion with appropriate PIRO staff before the Joint SRG meeting in the spring of 2025 (i.e., a virtual meeting).

**10. (PIRO) The PSRG reiterates its recommendation from 2023 that NMFS manages mortality and serious injury for the pelagic stock of false killer whales (FKW) over its entire range.** The PSRG commends NMFS in their expedient achievements since the 2023 recommendations, particularly in redefining the FKW management area. The 2023 recommendation defined the following guiding principles:

- 1) There should be the reasonable potential to collect pelagic FKW abundance data for the entire management area for the purpose of calculating a PBR.
- 2) Because there is currently little information on social or population structure within the pelagic FKW stock, the PSRG believes that a precautionary approach would be to minimize the potential for localized depletion (e.g., depletion within the EEZ), until more is known about possible social/genetic structure.

Both of these principles should be prioritized for future research efforts including:

- 1) Expand the geographic scope of sighting surveys to estimate abundance in the entire expanded management area, with particular focus on areas with high U.S. fishing effort.
- 2) Continue efforts with the appropriate international fishery associations to provide for reliable estimates of foreign fleet bycatch in the area outside the EEZ used for PBR calculations.
- 3) Continue to evaluate the robustness and uncertainty associated with estimates of abundance in the species distribution models (SDMs). This could be done using simulations, as well as by incorporating data from sighting surveys designed to provide a calibration for the SDM output, especially for areas outside the EEZ.
- 4) Using appropriate methodology (e.g., telemetry tagging, genetic samples, photo ID mark recapture, etc.) to improve understanding of potential social or genetic structure within the pelagic FKW stock and to determine whether the population is open/well-mixed or has internal structure (similar to insular FKW) that could allow localized depletion if bycatch mortality were spatially concentrated.

Considering the above principals, we believe maintaining separate PBR values for the U.S. Hawaiian Islands EEZ and for the larger area outside the EEZ is important, and that a single Stock Assessment Review (SAR) for pelagic false killer whales include the following:

- 1) Pelagic FKW abundance, bycatch, and PBR for the portion within the U.S. Hawaiian Islands EEZ
- 2) Pelagic FKW abundance, bycatch, and PBR for the portion outside\* the U.S. Hawaiian Islands EEZ, encompassing the area for which there are existing data on pelagic FKW occurrence, including past records of bycatch by the U.S. fishing fleet.

\*We recognize that item #2 above includes areas of foreign fishing operations, for which FKW bycatch data are not currently available but will need to be properly accounted for going forward.

**11. (PIRO/OPR) The PSRG recommends that NMFS Office of Protected Resources and Pacific Islands Regional Office provide an improved solution on how to regulate commercial fisheries once the takes of the pelagic stock of false killer whales reach the PBR.** The current southern exclusion zone does not address reducing bycatch adequately because much of the take of the pelagic stock of false killer whales occurs outside the U.S. Hawaiian Islands Exclusive Economic Zone (EEZ) and hence fishing effort will move to the broader region prior to or when the exclusion is in place. If NMFS were to maintain separate PBR values for the U.S. Hawaiian Islands EEZ and for the larger area outside the EEZ, as recommended by the PSRG last year, then the southern exclusion zone could remain as a management tool for the EEZ while a different solution would be needed for take occurring in the larger area outside the EEZ.

**12. (PIRO) PSRG recommends that NMFS report at, or prior to, the next PSRG meeting on possible management actions that could be taken to stabilize or reverse the downward trend for the ESA-listed main Hawaiian Islands insular stock of false killer whales.** The PSRG notes the downward trend of this stock, and that there is evidence of high levels of fisheries interactions for this stock, evident from fisheries-related injury reports.

**13. (PIRO) The PSRG recommends that NMFS investigate the degree and extent of tour operations undertaking swim-with activities with species other than spinner dolphins in Hawai'i that may have resulted as an unintended consequence of regulating spinner dolphin swim-with operations.**

**14. (PIRO) The PSRG recommends that NMFS revisit categorization of the Hawai'i charter vessel and Hawai'i trolling, rod and reel fisheries in relation to spotted dolphin fishery interactions.** At the November 2011 PSRG meeting, it was reported that these fisheries were elevated to Category II based on a suite of qualitative information, including fishing techniques; however, in the final list of fisheries published in 2012 these fisheries remained category III fisheries, i.e., having a “remote likelihood or no known incidental mortality and serious injury of marine mammals”. At the 2015 PSRG meeting, information was presented on a study examining spotted dolphin fishery interactions relevant to these fisheries, and this information was presented at the 2019 meeting at PSRG-2019-16, and published in Fisheries Research in 2020. In 2019, the PSRG recommended that “NMFS develop and implement a research strategy that will provide the basic information needed to complete an informative stock assessment for insular spotted dolphins in Hawai'i. The existing information is sufficient to conclude that individuals from this stock interact with fisheries around the main Hawaiian Islands. NMFS should be assessing the nature and frequency of these interactions to determine and minimize their impact on the dolphins.”

**15. (CalCurrent) The PSRG recommends that NMFS review and if necessary, update the correction factors currently used in the estimation of northern elephant seal and harbor seal abundance, and that stochasticity be incorporated into the northern elephant seal population models.** The correction factors currently being used to account for the proportion hauled out or proportion of adult females reproducing are over a decade old and were constructed from partial population information. Given changes in technology, climate, and population numbers, these correction factors are likely no longer accurate, and should be

reviewed and updated with newer data if possible. Also, the PSRG believes that the inclusion of stochasticity in the models for northern elephant seals will allow NMFS to gain a better understanding of the sensitivity of the population to environmental shifts.

**16. (CalCurrent) The PSRG recommends inclusion of the survey observation process into the state-space model for Washington harbor seals.** The PSRG appreciates NMFS responsiveness to earlier recommendations, which resulted in a substantial improvement from the previous deterministic model, by moving to a Bayesian state space model for assessing population dynamics and estimating metrics for management. However, the PSRG also notes that one of the key advantages of a state-space modeling approach, particularly within a Bayesian framework, is the ability to directly link the observation and state processes. Currently, the observation process is simplified prior to model fitting, and thus the two processes are decoupled, which means that there is not proper propagation of full uncertainty through the model. This could be addressed by incorporating the raw survey results, with explicit specification of the observation process (including multiple surveys, correction factors, and their associated uncertainty, etc.).

**17. (CalCurrent) The PSRG recommends a heightened monitoring schedule during the near-term aftermath of the ENP gray whale UME.** Prior to the UME, the southbound survey schedule for ENP gray whale abundance was implemented over five-year blocks, including two consecutive annual surveys, followed by three years with no survey. The PSRG notes that the estimates of abundance from the southbound survey are not able to statistically incorporate, as of yet, unquantified sources of interannual variation in the survey data. This can lead to apparent differences between consecutive annual abundance estimates that may not accurately reflect a true change in underlying abundance between years or may even mask a true change. **Similarly, the PSRG recommends that the northbound calf production survey be continued on an annual basis.** The PSRG notes that an increase in calf production from historic lows during the last UME has not yet been observed ([Eguchi et al. 2023](#)). Continued annual calf production monitoring provides an independent leading indicator for recruitment and hence any post-UME recovery in ENP gray whale abundance.

The PSRG welcomed updates on the closure of the 2019-2023 Eastern North Pacific (ENP) gray whale Unusual Mortality Event (UME). The PSRG notes the importance of the responsive shift to annual southbound migration surveys NMFS undertook for monitoring abundance during the UME, as well as the value to management from multiple long-term monitoring programs for this stock.

**18. (CalCurrent) The PSRG requests further updates on unmanned aerial survey (UAS) planning and study efforts for gray whales.** The PSRG welcomed the presentation on recent efforts using UAS platforms for collecting visual observations of gray whales and associated detection metrics. The request for further presentations on this topic includes a desire by the PSRG to better understand financial cost estimates for larger scale UAS efforts, and how those compare to more established survey methods for gray whales. For example, the PSRG is interested in better understanding how the cost of the shore-based southbound migration survey for abundance would compare with an estimate of cost for collecting a corresponding level of data sufficient to estimate abundance from UAS platforms. This assessment can help address

whether UAS surveys are a cost-effective alternative to traditional survey methods, in light of impending funding reductions for NMFS monitoring.

**19. (CalCurrent) The PSRG recommends that NMFS explore the sighting patterns of whales externally recruited (first observed as non-calves) to the Pacific Coast Feeding Group (PCFG) of gray whales.** The PSRG recognizes the productive efforts NMFS is taking to quantify internal recruitment to the PCFG, yet the role of external recruitment must be equally evaluated to gain the needed understanding on the PCFG's demographic independence from the Eastern North Pacific (ENP) population. The PSRG suggests that the sighting history of the "non-calf recruits" to the PCFG be analyzed to assess the degree to which these whales use the PCFG range. For example, has the whale only been seen twice over 10 years (indicating low probability of actual recruitment) or has the whale been observed 10 times over 2 years (indicating high probability of recruitment)? Additionally, the Minimum Tenure (MT) of these "non-calf recruits" in years of observation should be explored as another metric that can provide insight on the level of space use within the PCFG range. MT is calculated as the number of days between the earliest and latest date the whale was photographed, with a minimum of one day for any whale observed. The IWC criteria to be a PCFG whale (observed twice in the range between 1 June and 30 Nov) is a rather low bar that could errantly identify ENP whales on the margins of migrations as PCFG whales, particularly in years of high survey effort. Hence, this suggested exploration of the sighting histories of "non-calf recruits" can identify whether the current criteria, in light of variable annual survey effort, may be leading to inaccurate group assignments, and lead to greater confidence about actual external recruitment rates to the PCFG.

**20. (CalCurrent) The PSRG recommends that NMFS revise Pacific Coast Feeding Group (PCFG) gray whale models of population abundance and trend estimation to incorporate the variable spatial and temporal effort in photo-ID data collection.** Annual PCFG abundance has been calculated using capture-recapture models based on photo-ID data since 1996, yet these models do not account for the vast variation in effort to collect this photo-ID data of PCFG whales across the PCFG range and between years. The authors acknowledge this effort is unaccounted for and assume that any effect of its exclusion will be limited to additional uncertainty in parameter estimation. Regardless, the abundance estimates may be influenced by where and when photo-ID data was collected each year. Indeed, the International Whaling Commission Scientific Committee has regularly expressed concerns about the nature of the opportunistic data and the heterogeneity in sampling effort. The PSRG recommends that a Bayesian framework is applied to the PCFG photo-ID data to account for variation in spatial and temporal data collection effort to estimate abundance and trend. While information on effort is not available for all years in the time series, and varies in how it was recorded, Bayesian methods can account for missing data and variable process models.

**21. (CalCurrent) The PSRG requests further updates from NMFS on monitoring and photo-ID catalog efforts for Western North Pacific gray whales.** The PSRG requests information to review how NMFS may approach calculating  $N_{MIN}$  for the WNP gray whale SAR, assuming a new abundance estimate is not forthcoming, and hence the most recent estimate from 2016 becomes older than eight years. Additionally, any available updates from observations made during photo-ID surveys on the feeding grounds are requested (e.g., evidence for shifts in feeding distribution), as well as updates on photo-ID catalog efforts (e.g., data sharing and



curation, given otherwise disparate monitoring programs). Noting this photo-ID dataset not only forms the basis for abundance and trend estimation, but also provides the potential to identify individual whales from this stock that may be observed subject to interactions with fisheries or other human activities across multiple range-states, including U.S. waters.

**22. (CalCurrent) The PSRG thanks the presenter (Alex Curtis) for the update on estimation of abundance of humpback whales for the CentAm/SMex-CA/OR/WA demographically independent population (DIP) and request further updates and potential for inclusion of mtDNA haplotypes and other covariates, reflecting maternal fidelity on the feeding grounds.** The PSRG appreciated the update on progress with the International Whaling Commission (IWC) Comprehensive Assessment of the North Pacific humpback whale and requests a further update on the anticipated completion of the assessment during the 2024 meeting of the IWC Scientific Committee (SC/69B).

**23. (WCR) The PSRG recommends that NMFS include fin whales and gray whales in the upcoming West Coast Take Reduction Team (TRT).** Fin whales are listed as endangered under the Endangered Species Act (ESA) and depleted under the Marine Mammal Protection Act (MMPA), and there were two confirmed entanglements of fin whales in 2023 (and an additional confirmed entanglement in Oregon in 2024). While ENP gray whales are not ESA listed, they are the second most frequently recorded entangled whale species along the west coast, with nine confirmed entanglements in 2023. Considering that (1) ENP gray whales have just experienced a four-year UME, (2) ESA-listed Western gray whales occur in west coast waters and are therefore also at risk of entanglement, and (3) Pacific Coast Feeding Group (PCFG) gray whales are a small, culturally distinct sub-group with frequent overlap of foraging habitat with Dungeness crab fishing effort, the PSRG strongly encourages inclusion of these species in discussions of management and mitigation options at the TRT. Excluding these species from TRT discussions and plans may inadvertently increase entanglement risk for these vulnerable species.

**24. (WCR) The PSRG recommends that NMFS compile information on the number of vessels involved in, and spatial and temporal extent of, hook and line fisheries along the U.S. west coast, as a first step towards assessing the potential for cryptic bycatch of small odontocetes in these fisheries.** Bycatch of large whales in pot fisheries tends to be fairly obvious, as dead individuals persist on beaches for extended periods and live individuals with trailing gear are often seen by whale watchers or other mariners. Observers are generally not placed in small-vessel hook and line fisheries, and smaller animals that are killed are less likely to persist for long periods, allowing them to be detected. Many species of odontocetes may deplete from hook and line fisheries, thus potentially resulting in bycatch through hooking or entanglement in gear. In addition to information on the number of vessels involved in, and the spatial and temporal extent of hook and line fishing, information on target catch may help inform bycatch risk in these fisheries. This compilation of information could be presented to the PSRG at or in advance of the next PSRG meeting.

### **Joint meeting issues**

The PSRG has the following recommendation for the agenda of the 2025 Joint SRG meeting:

1. Advice from NMFS and FWS as to how individual PSRG members should respond when asked by NMFS or FWS staff, to comment on a draft SAR. That is, should a PSRG member respond directly or work through PSRG protocols?;
2. Are NMFS and FWS being consistent in the use of “in review” documents in draft SARs?;
3. What are NMFS plans for archiving cetacean images for photo-identification and encounter records? Will there be sufficient server support and back-up strategies for HappyWhale and other online platforms (e.g., Flukebook)?;
4. Would NMFS clarify how the use of drones by the general public are managed in marine mammal approach restrictions and regulations;
5. Would NMFS clarify in the summary SAR table the meaning of using either a “zero take” listing or “unknown takes” listing. This issue needs to be addressed, as apparently policy has changed over the last 15 years and some of the older stock assessments are not following the current policy;
6. Would NMFS clarify its policy regarding the application of eDNA surveys to marine mammal stock assessment (e.g., is there a document we can review?);
7. The PSRG would like to have an update on the IWC comprehensive assessment for North Pacific humpback whales;
8. The PSRG would like an update on NEPA/ESA/MMPA protocols related to wind energy; and
9. The PSRG would like a comprehensive review of issues and challenges related to the transition to SDMs as the primary method to assess stock status, at least for some species.

## References

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As noted above, the PSRG very much appreciates all the hard work and dedication of the NMFS and FWS staff that support research on and management of marine mammal stocks in the Pacific. The implementation of the marine mammal related mandates under the US Marine Mammal Protection Act and Endangered Species Act are dependent on these efforts.

Sincerely,

*Doug DeMaster*

Doug DeMaster, PSRG Chair

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