



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

Megan J. Williams, PhD
Chair, Alaska Scientific Review Group

Dear Dr. Williams:

Thank you for the letter to Janet Coit, Assistant Administrator for Fisheries, transmitting recommendations from the March 2022 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 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: Janet Coit, Assistant Administrator for Fisheries
Evan Howell, Director, Office of Science and Technology
Kim Damon-Randall, Director, Office of Protected Resources



Responses to Recommendations from the 2022 Alaska Scientific Review Group (AKSRG) Meeting

Bycatch and Marine Mammal Interactions

1. Electronic Monitoring (EM) continues to expand in 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 have seen a significant proportion of coverage transitioning to EM (as opposed to onboard observers). As EM programs become more commonplace, it may be increasingly difficult to track marine mammal interactions as cameras are not currently designed to monitor marine mammal interactions. This, in turn, decreases the amount of data on marine mammal interactions with commercial fisheries and may increase uncertainty in Mortality and Serious Injury (M&SI) estimates in several marine mammal stock assessments. **The AKSRG recommends that NMFS and the Marine Mammal Lab (MML) at the Alaska Fisheries Science Center (AFSC) continue to 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 and/or associated logbooks. Additionally, the AKSRG would like to be updated on: 1) how M&SI estimates are being adjusted as more vessels transition to EM, and 2) how new EM-based marine mammal sightings/interaction data are being processed and eventually incorporated into the SARs.**

Response: NMFS expects that the quality of data on marine mammal bycatch in Alaska fisheries may decline as EM is implemented for some commercial fisheries in Alaska. The AFSC will develop approaches to evaluate the impacts of EM on our ability to estimate bycatch and provide a presentation on the points raised by the AKSRG in either 2023 or 2024.

2. The AKSRG received an informative presentation from Brian Brost regarding approaches for estimating marine mammal bycatch in commercial fisheries nationally and in the Alaska region specifically. The Alaska region currently estimates bycatch based on the bycatch per unit effort for observed hauls, which is then extrapolated to the unobserved portion of the fleet and stratified by vessel length, region and time period. The current approach is problematic due to the inherent volatility of bycatch estimates associated with low coverage and/or documentation of rare events. Additionally, false zeros (or undetected bycatch events), are likely to occur and bias bycatch estimates low. **The AKSRG therefore supports the work proposed to evaluate the efficacy of new bycatch estimation methods as well as methods employed in other regions, such as Generalized Linear Models or Generalized Additive Models, to estimate marine mammal bycatch with the longer-term goal of applying new bycatch estimation methods in the Alaska region. The AKSRG notes that models that consider Zero-Inflated distributions and hierarchical structures to better characterize uncertainty should be explored as part of this work.** The AKSRG looks forward to reviewing analyses exploring ways to improve bycatch estimation at future meetings.

Response: NMFS appreciates the AKSRG’s support for exploring alternative approaches to estimate marine mammal bycatch in Alaska fisheries. We will share our progress toward this objective, including a description of new methodology and a comparison of bycatch estimates at the 2023 annual AKSRG meeting.

Southeast Alaska (SEAK) Harbor Porpoise

3. The AKSRG applauds the extensive work that NMFS has done to clarify SEAK harbor porpoise stock structure and abundance and looks forward to reviewing the upcoming Parsons et al. manuscript for additional genetic information. This research helps identify gaps in our understanding of and ability to effectively manage SEAK harbor porpoise stocks. The AKSRG therefore recommends the following research priorities: **1) increased observer coverage of the SEAK gillnet fisheries to collect better information on bycatch. The SEAK Harbor Porpoise SAR bycatch information is old and based on limited observer coverage. 2) Increased funding for work aimed at reducing bycatch, noting that research to address the response of SEAK harbor porpoise to pingers was not funded for FY22. If pingers reduce or eliminate bycatch, this could directly address conservation concerns with SEAK harbor porpoise bycatch and stock structure. 3) Further clarification of stock structure, especially near Yakutat and for offshore regions, and to the extent possible to understand movement between offshore and inshore stocks.**

Response: NMFS appreciates the AKSRG’s recommendations for further research. NMFS has support to hire a new team member to start developing recommendations for the design and implementation of an observer program, including the number of observer sea days needed to provide the needed information on bycatch rates. NMFS also notes an apparent misunderstanding as, contrary to the AKSRG’s comment, the project designed to understand whether pingers work to deter harbor porpoise in Southeast Alaska was funded in FY22 and additional funding is planned for FY23. However, support for additional genetics or population assessment of harbor porpoise is not available.

4. M&SI estimates for SEAK harbor porpoise stocks are a critical source of data as estimates of the fishery-related mortality for the SEAK harbor porpoise stocks are close to, exceed or are unknown relative to estimated Potential Biological Removal (PBR) levels, in large part due to interactions with regional gillnet fisheries. The current approach to estimating M&SI for SEAK harbor porpoise stocks estimates interactions and extrapolates estimates to only a subset of the known species range based on historical observer coverage. **The AKSRG notes this could result in an underestimation of overall M&SI estimates for these stocks and recommends that NMFS report back to the ASKRG on the feasibility of extending the M&SI estimate to the full range of the SEAK harbor porpoise stocks in question.** The AKSRG also notes that the M&SI estimates are *already* likely biased low due to limited observer coverage in state-water fleets; thus, additional bias introduced by limited spatial extrapolation further increases the likelihood that M&SI is underestimated for these stocks.

Response: NMFS agrees that total, stock-specific M&SI is likely underestimated for harbor porpoise in Southeast Alaska because only two fishing areas were observed. NMFS has not

extrapolated the existing bycatch rates beyond the areas observed because it would require assumptions and extrapolation of factors that would be challenging to estimate. The estimated bycatch - without extrapolation - likely exceeds the PBR level for one stock, and is close to the PBR level for another stock, highlights a current harbor porpoise conservation issue in Southeast Alaska.

Killer Whales

5. The AKSRG took note that NMFS is currently reviewing new genetic information on resident killer whales in Alaska that might indicate the current stock structure of killer whales in Alaska needs to be reassessed. **The AKSRG requests an update on new genetic work associated with killer whale stock structure as this work develops.**

Response: No new genetic work on killer whale stock genetics is currently planned. We agree that the results of the genetic analysis published in Parsons et al. (2013) suggest that resident killer whale stock structure in Alaska should be reconsidered. Under current NMFS policy (NMFS 2019), the beginning step for revising stock structure is to publish a review (e.g., as a NOAA Tech Memo) of all relevant information (genetics, movements, etc.) about whether demographically independent units might exist within a currently designated stock. If NMFS staff have sufficient time to complete such a review, it will be shared with the AKSRG for comments.

6. Upon reviewing the current SAR for the ENP Alaska Resident stock, the AKSRG acknowledged the efforts made to use the best available information and to synthesize abundance data from a large number of sources (line-transect surveys, photo-identification catalogs and mark-recaptures analyses) covering different time periods and spatial areas. While recognizing the challenges of monitoring a large and wide-ranging population of killer whales, the AKSRG noted that there were issues with using catalog tallies of unique individuals as minimum counts when those counts are taken over multiple years (e.g., 2001-2012 for Aleutian Islands and Bering Sea, 2005-2019 for Gulf of Alaska). Catalog totals could overestimate the number of living individuals if evidence of deaths is lacking, are often based on unpublished or non peer-reviewed sources, and do not have any measure of uncertainty associated with them. Although these concerns are partially alleviated when there is evidence that the population is growing, killer whale populations are known to be vulnerable to the loss of key individuals and disruptions in social structure. **Therefore, the AKSRG encourages the assessment of an updated abundance estimate for the full population using relevant modelling approaches.**

Response: NMFS appreciates the recommendation. At this time, NMFS does not have resources to conduct a comprehensive modeling effort. We will continue to compile information collected by other researchers in the stock assessment reports as it becomes available to us in reports and publications.

Bowhead Whales

7. The AKSRG will be reviewing the Bowhead whale SAR again in 2023 due to an additional population estimate from dedicated aerial surveys. **The AKSRG therefore requests a presentation on the aerial survey estimates that were noted in the SAR but not presented, as well as what NMFS' rationale will be for using the ice-based census versus the aerial survey data.** The AKSRG also highlights the commencement of year-round commercial shipping in the northern Bering Sea and through Bering Strait in winter which has the potential to impact bowhead whales in core use habitat both via noise, but more critically, through the increased likelihood of ship strikes.

Response: NMFS will provide the requested presentation at the 2023 AKSRG meeting. In the interim, estimates from the 2019 aerial survey are available in a paper submitted to the International Whaling Commission's (IWC) Scientific Committee (Ferguson et al. 2022).

Humpback Whales

8. The AKSRG applauds NMFS for releasing five updated draft humpback whale SARs in 2022. The revised Western North Pacific (WNP) humpback whale SAR M&SI estimation exceeds the PBR for this stock, and this overage is largely driven by Japanese and Korea bycatch. International take data for this transboundary Endangered stock is critical for a meaningful comparison against PBR; however, there is no uncertainty associated with the international M&SI estimates, and per conversations during the SAR review, the data from Japan in recent years in particular may represent false zeros. **The AKSRG therefore recommends NMFS discuss international take data uncertainty in more detail in future WNP humpback whale SARs, and/or if the uncertainty around these international data increases, the AKSRG recommends considering alternative methods for estimating M&SI for this transboundary stock in subsequent years.**

Response: NMFS will address this uncertainty in future WNP humpback whale SARs, given the expectation that Japan will no longer be submitting bycatch data to the International Whaling Commission (IWC) beyond 2020 (the final year of data included in the 2022 SAR). The IWC Scientific Committee is currently undertaking a comprehensive assessment of North Pacific humpback whales; this assessment, when completed, may provide information on bycatch and other takes of this stock that could be referenced in the SAR.

9. **The AKSRG also encourages NMFS and MML to conduct genetic relatedness analyses on humpback whales within and between demographically independent populations (DIPs) to confirm philopatry when feasible.**

Response: Philopatry to feeding and winter areas is a well-established phenomenon in humpback whales, including the North Pacific, based on extensive photo-identification data. Researchers at the NMFS Southwest Fisheries Science Center (led by K. Martien) have been conducting combined studies of genetics and movements (through photo-ID) of North Pacific humpback whales in order to resolve humpback whale herds (i.e., groups of whales that share a winter and summer migratory destination). The results of their research will enable assessment of the degree of demographic independence between herds, as well as genetic

assignment of animals sampled on a feeding ground to a herd/distinct population segment. The Alaska Region recently supported a study that linked genetic data and photo-ID for humpback whales in Southeast Alaska (report currently in preparation: Straley, Cheeseman, and Baker). This will provide genetic assignment and probability of occurrence in Southeast Alaska. However, while genetic relatedness is of biological interest, it is unlikely to be informative with respect to philopatry. Because animals that use different feeding grounds but the same wintering ground (e.g., the herds that feed off of Southeast Alaska and Kodiak and both winter in Hawai‘i) likely interbreed on the wintering ground, they are likely to have high genetic relatedness despite being demographically independent. As results of ongoing genetic studies become available, we will share them with the AKSRG.

Potential Biological Removal and Sustainable Removals

10. The AKSRG recognizes that the PBR method to calculate mortality limits for marine mammals reflects management objectives and risk tolerances that seek to minimize unwanted mortality (e.g., resulting from bycatch) and ensure that stocks remain within their Optimum Sustainable Population (OSP) range. PBR is not necessarily an appropriate mortality limit for other types of removals, and in some cases PBR is considerably lower than the level of removals that would be considered sustainable for subsistence harvest (e.g., polar bears in the Chukchi Sea; Regehr et al. 2021). **The AKSRG recommends that, when available and applicable, NMFS and USFWS include “other relevant information” in the SARs about the sustainable level of removals.**

Response: NMFS appreciates the AKSRG’s recommendation and the opportunity to further clarify NMFS’ obligations under the MMPA.

MMPA Section 3(19) defines a strategic stock as marine mammal stock:

“(A) for which the level of direct human-caused mortality exceeds the potential biological removal level;

(B) which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the Endangered Species Act of 1973 [16 U.S.C. 1531 et seq.] within the foreseeable future; or

(C) which is listed as a threatened species or endangered species under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), or is designated as depleted under this chapter.”

While Section 119 allows NMFS to enter into cooperative agreements with Alaska Native organizations to conserve marine mammals and provide co-management of subsistence use by Alaska Natives, in determining the status of marine mammal stocks subject to subsistence use, NMFS must comply with Section 3(19)(A-C), including whether, based on the best scientific information available, human-caused mortality from *all* sources exceeds PBR.

NMFS' 2016 Procedural Directive providing Guidelines for Preparing Stock Assessment Reports (hereafter, the GAMMS) describes how NMFS works with Alaska Native organizations for which we have established co-management agreements as we calculate PBR and determine strategic status. In light of the recent issues related to the Eastern Bering Sea (EBS) beluga whale SAR mentioned below, as part of NMFS' efforts to update the GAMMS, we are considering revisions to the existing GAMMS text on this subject to further clarify how and when NMFS will engage with co-management partners in calculating PBR and determining strategic status. We thank the AKSRG member who submitted a public comment on the draft GAMMS revisions regarding NMFS' co-management with Alaska Native organizations, which has been very helpful as we consider revisions related to this topic. NMFS anticipates finalizing revisions to the GAMMS related to this issue before the next annual AKSRG meeting. Once the revisions are final, they will be shared with the SRGs.

NMFS acknowledges that the primary driver behind the development of the PBR management strategy was to allow marine mammal stocks to reach or maintain OSP by reducing bycatch of marine mammals in commercial fisheries. As such, the default values provided for the PBR parameters in the GAMMS are conservative in order to achieve the goals of the MMPA. However, the PBR framework is flexible by nature and NMFS' existing GAMMS provide discretion when determining the appropriate values to use for PBR parameters such as the recovery factor (F_r), which for "stocks that are not known to be decreasing taken primarily by aboriginal subsistence hunters, could have higher F_r values, up to and including 1.0, provided there have not been recent increases in the levels of takes."

NMFS reiterates that if a stock is determined to be strategic due to subsistence takes, there is no inherent or immediate requirement for management action. In such situations, NMFS will work with its co-management partners to determine what, if any, action should be taken to ensure sustainable levels of take while supporting subsistence needs. The use of the PBR framework in the management of subsistence harvest is well established and has been used for diverse species including monodontid stocks (Hobbs et al. 2019) and to manage bushmeat hunting in tropical forests (Parry et al. 2009, Weinbaum et al. 2013). While the SARs must include the PBR level, NMFS and our Alaska Native co-managers jointly decide whether and how the PBR level should be used to assist in the co-management of the subsistence harvest of a particular Alaska marine mammal species.

11. The consideration of "other relevant information" on sustainable removals is especially pertinent to the management of marine mammals in Alaska, because many stocks harvested by Alaska Natives have limited bycatch in commercial fisheries. A timely example of this is provided by management issues surrounding EBS beluga whales. During the 2022 AKSRG meeting, an update on the SAR for EBS beluga whales was received. As part of this update, the AKSRG was provided with a letter to NMFS drafted by the Alaska Beluga Whale Committee (ABWC):

In response to Section 119, NMFS and FWS have entered into cooperative agreements with Alaska Native Organizations to conserve marine mammals and provide co-management of subsistence use by Alaska Natives. FWS and NMFS believe that it is appropriate to develop management programs for stocks subject to subsistence harvests

through the co-management process provided that commercial fisheries takes are not significant and that the process includes a sound research and management program to identify and address uncertainties concerning the status of these stocks. Calculations of PBR and classification as to whether a stock is strategic will be determined from the analysis of scientific and other relevant information discussed during the co-management process.”

Hence, it seems that management decisions related to PBR, such as the classification of stocks and harvest regulation, should address “other relevant information” when there is limited take by commercial fisheries. In contrast to this, during the 2022 AKSRG meeting, NMFS Office of Protected Resources staff stated that decisions for the classification of stocks will be based on “science alone” and that management decisions will be solely based on whether or not harvest exceeds PBR. **The AKSRG requests further clarification on this issue and, as stated above, would like to see NMFS consider all available and relevant information, not just the values of PBR and subsistence harvest.**

Response: See above (#10).

12. As part of the update on the SAR for EBS beluga whales, NMFS informed the AKSRG that they will seek input from co-management organizations prior to the adoption of SARs. **The AKSRG approves of this decision and requests that consultation with co-management organizations occur prior to the AKSRG review of the SARs, as this will ensure that the most up-to-date information is included in the SAR. For transparency, the AKSRG would also like to be informed as to how consultation altered the content of SARs under review. To improve communication and transparency in the process, the AKSRG also recommends that NMFS follow-up and consult with co-management organizations if the AKSRG recommends substantial revisions to a SAR during their annual review.**

Response: NMFS will strive to consult with all relevant Alaska Native organizations prior to the AKSRG’s review of the draft SARs. NMFS will also implement the AKSRG’s recommended documentation and communication steps to increase transparency regarding revisions to the draft SARs made during Alaska Native organization and AKSRG review.

PACMAPPS

13. The AKSRG appreciated receiving preliminary information about the recent PACMAPPS cruise in the Gulf of Alaska and is cognizant of the difficulties of planning and executing a cruise during a global pandemic and with limited ship time and multiple scientific priorities. **The AKSRG encourages MML to prioritize data analysis from this cruise as it may provide key new information for a number of SARs with limited abundance and distribution data.** The AKSRG is also interested in understanding how the double platforms were used during the cruise as this was not presented in 2022.

Response: The PacMAPPS cruise was designed to collect information to estimate density and abundance of multiple marine mammal species in the Gulf of Alaska. Sighting data were collected using two independent platforms in order to estimate the proportion of animals

missed on the trackline, a quantity known as “g(0)”. Estimates of g(0) will be obtained using mark-recapture distance sampling methods. Estimates of abundance will be calculated for as many marine mammal species as feasible; the calculated estimate of g(0) will be used to correct for animals missed on the trackline. We expect to be able to provide updated marine mammal abundance for certain species at the 2023 AKSRG meeting.

14. **The AKSRG also recommends that MML develop a set of well-reviewed protocols that will serve over the next decade of surveying so that results can be comparable among regions and years.** Having enough sea days to adequately cover the regions of interest and enough observers to allow time for off-effort identification of species, small boat operations when needed, and to account for weather systems in the region will maximize the use of limited resources. Developing protocols for handling common challenging situations (e.g., how to proceed when many whales are observed or when rare species such as right whales are sighted). NMFS should also consider pre-planning collaborations to maximize the value of data collection to establish priorities for sample and data collection and explore synergies for additional data collection (eDNA).

Response: NMFS agrees that pre-planning, standard protocols, and collaborations are, and will be, critical to successful data collection over the next decade with changing ecosystems and limited budgets. NMFS research teams have developed standard protocols for various types of surveys; these protocols are updated over time through our own research and research conducted by other NMFS and non-NMFS research teams conducting similar work. However, the design and implementation of field efforts must often be adjusted to fit within the funding available for a particular project. For instance, if estimating density and abundance is the primary goal of a project, resources will not always be available to collect data that are important for studies of stock structure, movements, and other factors. NMFS is currently working to develop a plan for resourcing rotating surveys between different areas and marine mammal populations to ensure that the priority marine mammal stocks in Alaska (particularly subsistence-harvested stocks) are assessed at least every 8 years. NMFS is also evaluating possible fieldwork collaborations to optimize days at sea, flight hours, and other fieldwork expenses and to ensure ecosystem data are collected concurrently, thus maximizing the value of data collection.

Research Priorities

15. NMFS requested that the AKSRG attempt to rank recommended research priorities for 2022-2023. The AKSRG suggests the following priorities, based on conservation need and the ability for management actions to alter population status and trajectory, in order of most important to least important:
- i. Southeast Alaska harbor porpoise (see recommendations above).
 - ii. Alaska Native Organization / Co-Management consultation and collaboration: The Alaska region is a unique position and can leverage partnerships with Alaska Native organizations, Tribal Governments and Co-Management Agencies to improve subsistence, life history, and distribution data quality for many marine mammal species in the Arctic and subarctic.

- iii. Improving methods to estimate marine mammal bycatch (see recommendations above).
- iv. The North Pacific right whale is in danger of extinction and data limited. Research on this endangered population should be a top NMFS priority. The AKSRG requests that NMFS continue to identify specific actions: such as processing of existing acoustic data, maintenance of monitoring stations, and/or the development of novel Platforms of Opportunity, that could provide important data on endangered North Pacific right whales in a cost-effective manner.
- v. The AKSRG would like to see issues relating to the reclassification of EBS beluga whale stock be resolved in a manner that includes meaningful and transparent consultation with the Alaska Beluga Whale Committee and agrees with NMFS that more frequent surveys of this stock are necessary.

Response: NMFS appreciates the AKSRG's input on priorities and will take them into consideration as we prioritize our research. We agree that all five of these priorities are important. In considering this topic, it should be noted that setting priorities and allocating available funding are linked, they represent two discrete actions; all the funding types that we receive for our work are subject to rules governing the specific activities that can be supported with specific types of funding. The result is that we are usually limited to setting research priorities within focal areas linked to funding (e.g., cetaceans, pinnipeds, ESA-listed) rather than among all topics considered of high importance. Efforts are underway to improve methods to estimate marine mammal bycatch. We also agree that the status of the Eastern North Pacific right whale and Southeast Alaska harbor porpoise are of concern. We have a long and successful tradition of working closely with Alaska Native organizations and our co-management partners to support science, conservation, and sustainable co-management of subsistence harvests. With respect to the 2022 EBS beluga whale SAR, we have been working closely with the ABWC through the co-management process to improve and strengthen the 2022 SAR and to resolve issues concerning the reclassification of the EBS beluga stock. We have made excellent progress in that endeavor and a revised draft 2022 EBS beluga SAR is nearly ready for release for public comment. We extend our thanks to the AKSRG for its role and extra efforts in assisting in that process, which has resulted in considerable improvements to the SAR.

U.S. Fish and Wildlife Service (USFWS) Managed Species

NMFS shared the AKSRG's recommendations regarding USFWS-managed species with USFWS staff. The USFWS will respond to those recommendations in a separate letter.

References

- Ferguson, M. C., D. L. Miller, J. T. Clarke, A. A. Brower, A. L. Willoughby, and A. D. Rotrock. 2022. Spatial modeling, parameter uncertainty, and precision of density estimates from line-transect surveys: a case study with Western Arctic bowhead whales. Paper SC/68D/ASI/01 submitted to the IWC Scientific Committee. 53 p.
- Hobbs, R.C., R. R. Reeves, J. S. Prewitt, G. Desportes, K. Breton-Honeyman, T. Christensen, J. J. Citta, S. H. Ferguson, K. J. Frost, E. Garde, M. Gavriilo, M. Ghazal, D. M. Glazov, J.-F. Gosselin, M. Hammill, R. G. Hansen, L. Harwood, M. P. Heide-Jorgensen, G. Inglangasuk, K. M. Kovacs, V. V. Krasnova, D. M. Kuznetsova, D. S. Lee, V. Lesage, D. I. Litovka, E. D. Lorenzen, L. F. Lowry, C. Lydersen, C. J. D. Matthews, I. G. Meschersky, A. Mosnier, G. O'corry-Crowe, L. Postma, L. T. Quakenbush, O. V. Shpak, M. Skovrind, R. S. Suydam, and C. A. Watt. 2019. Global review of the conservation status of monodontid stocks. *Mar. Fish. Rev.* 81(3-4):1-53.
- NMFS. 2019. Reviewing and designating stocks and issuing Stock Assessment Reports under the Marine Mammal Protection Act. National Marine Fisheries Service Procedure 02-204-03.
- Parsons, K. M., J. W. Durban, A. M. Burdin, V. N. Burkanov, R. L. Pitman, J. Barlow, L. G. Barrett-Lennard, R. G. LeDuc, K. M. Robertson, C. O. Matkin, and P. R. Wade. 2013. Geographic patterns of genetic differentiation among killer whales in the northern North Pacific. *J. Hered.* 104(6):737-754.
- Parry, L., J. Barlow, and C. A. Peres. 2009. Hunting for sustainability in tropical secondary forests. *Conserv. Biol.* 23(5):1270-1280.
- Straley, J. M., T. Cheeseman, and S. Baker. In Preparation. Linking Humpback Whale Photo ID and DNA Profiles. Report on NOAA Award No. NA18NMF4370235.
- Weinbaum, K. Z., J. S. Brashares, C. D. Golden, and W. M. Getz. 2013. Searching for sustainability: are assessments of wildlife harvests behind the times? *Ecol. Lett.* 16(1):99-111.