



# NOAA FISHERIES

## Alaska Fisheries Science Center

### Protected Species Program Review Alaska Fisheries Science Center Summary and Response – March 2015

#### Introduction

On March 16-20, 2015, the Alaska Fisheries Science Center (AFSC) hosted a panel of experts to conduct a programmatic review of its protected species scientific research conducted pursuant to the Marine Mammal Protection Act (MMPA), Endangered Species Act (ESA), and Magnuson-Stevens Act and comparable international agreements.

This review was the third in a series of annual reviews of AFSC science, directed at different topics each year over a five-year cycle and designed to maximize the transparency and effectiveness of major science programs located at NOAA Fisheries' six science centers as well as those located in or coordinated through NOAA Fisheries' Office of Science and Technology.

For the 2015 review, an independent panel evaluated the marine mammal science information needs, priorities, and research activities that are relevant to the AFSC and the NOAA Fisheries Alaska Regional Office (AKR). This was not a review of any particular protected species stock assessment but rather a review of the overall research programs addressing species that are protected under the ESA, MMPA or both. For AFSC, the review focused on the following species and species groups: Steller sea lions, northern fur seals, ice-associated seals, harbor seals, large whales, Cook Inlet beluga, and other cetaceans. Within each species-focused section, the following themes were covered as required by the Terms of Reference agreed upon by the NOAA Fisheries Science Board: 1) research priorities, 2) objectives, 3) partners, 4) methods, 5) data quality, 6) strengths, 7) weaknesses, 8) mandates, 9) recommendations, 10) communication, and 11) access to data.

The independent panelists were selected as experts in the relevant topic areas; they were not associated with the AFSC. The panel was provided with presentations from AFSC staff covering the state of AFSC's protected species stock assessment and applied science programs. Panelists were also provided with background material for more in-depth information and had time to discuss the AFSC's marine mammal research program – and its utility – with AFSC management and staff and AKR management during the review. Comments and responses to questions from the public participants who attended the review were also considered by the panelists.

More information regarding the review of AFSC's marine mammal research programs may be found at: [http://www.afsc.noaa.gov/program\\_reviews/2015/default.htm](http://www.afsc.noaa.gov/program_reviews/2015/default.htm)

The results from this year's review, along with those being conducted at each of the other five fishery science centers, will be used to prepare a national summary to highlight best practices and to inform decisions on opportunities for improving science programs across NOAA Fisheries. The full suite of these reports will be found at: <http://www.st.nmfs.noaa.gov/science-program-review/>

The AFSC leadership would like to thank the review panelists who devoted a significant amount of time to participate in this review. Their observations and recommendations provide valuable

feedback on how AFSC's protected species research program is performing relative to its stated goals and objectives. The AFSC also greatly appreciates the time and thought that participating stakeholders put into this review; their questions and comments sparked many conversations and stakeholder perspectives were invaluable particularly when addressing the issues of priority setting and communications.

The panelists for this review were:

- Jim Harvey (Chair) – Moss Landing Marine Laboratory
- Laura Cowen – University of Victoria
- Mike Simpkins – Northeast Fisheries Science Center, NOAA Fisheries
- John Stein – Northwest Fisheries Science Center, NOAA Fisheries
- Mike Tillman - Scripps Institution of Oceanography

### **AFSC Responses to Review Panel Recommendations**

The reviewers provided overwhelmingly positive comments on the AFSC's protected species research program. The panel's summary and individual reports provide reinforcement and validation of the AFSC's commitment to maintaining protected species research as a core scientific priority. The results of this review will encourage and motivate staff and AFSC leadership to continue to pursue excellence in all aspects of protected species research.

Because the AFSC protected species research program provided overviews of key aspects of its research in lieu of information on specific projects, the review panel sometimes made recommendations inadvertently to conduct research that is already being done. In these situations, the AFSC has provided brief information documenting how the recommendation is already being addressed, and what further steps, if any, could be implemented.

#### **Theme 1: Overall Information Needs**

**Recommendation 1.1:** The Research Permit process needs to improve so that permits can be approved more rapidly with greater involvement in decision making by grantees.

**Response:** The current process for issuing permits under the MMPA and ESA has problems that are interfering with conducting high priority research on marine mammals and the AFSC agrees that this process needs to be improved. A NOAA Fisheries review panel was created by the Assistant Administrator (AA) for Fisheries to review the process for scientific permits for marine mammal research. That panel's final report was completed in March 2011 but no formal action has yet been taken to implement the reports' recommendations. Recently (July 2015), staff from the AFSC and NOAA Fisheries' Office of Protected Resources have finalized a plan to implement the recommendations from the 2011 report. Final approval from the AA is pending.

**Recommendation 1.2:** There needs to be a more transparent mechanism for making decisions on funding priorities. Although there seems to be good communication between the Science Center and the Regional Office, the panel was uncertain of the mechanisms in place to determine and fund priorities.

**Response:** The AFSC mechanism for making decisions about funding priorities is straightforward, albeit perhaps not well documented in agency reports. Initial allocation of funds derived from

Congressional appropriations is done according to either Congressional direction codified in appropriation language or decisions by NOAA Headquarters. The Office of Management and Budget (OMB) or NOAA Headquarters typically identifies funding available for protected resources research in a specific budget account. For example, the funds specified for Cook Inlet beluga whales are allocated fully to supporting research on that stock. Once allocated to a stock or a group of stocks, priority is typically given to: 1) assessing abundance, trends or stock structure, or 2) assessing the likely causes for any declines in abundance (at the population or sub-population level) or a lack of recovery. Progress towards meeting the second priority may be made through studies directed at understanding vital rates and what causes changes in vital rates. Typically, marine mammal populations identified as endangered or threatened under the ESA or as depleted under the MMPA are given a higher priority than populations that are not listed under the ESA or as depleted. Funding for permanent labor and other fixed costs take priority over discretionary costs that would support fieldwork. Where funding discretion exists, very limited in this fiscal environment, final allocations are made after consulting with the Alaska Regional Office. However, it must be noted that it is unlikely there will be significant new funding made available for marine mammal studies, given the current budgetary environment. The prioritization process within the AFSC will be used to determine the best use of existing funds; the Panel's recommendations will be considered as part of this prioritization, but inevitably not all recommendations will be accomplished.

Recommendation 1.3: Consider developing a bit more formal process to crosswalk management needs and science activities at the Center.

Response: The AFSC and AKR currently hold formal annual meetings to discuss protected species information needs and management goals, but we are always looking for ways to strengthen that process. At our next joint meeting, AFSC and AKR will discuss this recommendation to identify specific steps to improve coordination and focus.

Recommendation 1.4: Explore alternative approaches to providing advice to managers related to stocks that are particularly difficult to assess or unlikely to receive sufficient funding support to assess (i.e., alternatives to full-blown population and mortality assessments with associated PBR evaluation).

Response: The AFSC agrees that alternative approaches for managing marine mammal populations in Alaska are needed. The current regime (i.e., referred to as the Potential Biological Removal (PBR) regime) was developed primarily to manage serious injury and mortality of marine mammal stocks incidental to commercial fishing activities. While this system works well in situations where both abundance and serious injury and mortality associated with commercial fishing can be routinely and reliably obtained, the system performs poorly in other situations. For example, the current system does not work well for stocks for which routine collection of abundance information is not possible or practical due to logistical challenges or cost. Further, the PBR system was never intended for application to management of marine mammal stocks targeted by Alaska Native hunters for subsistence purposes. Information on the status of most stocks in the High Arctic is unavailable due to funding constraints. The Alaska Scientific Review Group (ASRG) has also identified this as an issue needing attention and the AFSC expects that the topic will be on the agenda for the joint Scientific Review Group meeting scheduled for spring 2016. The AFSC is committed to working with the ASRG, Alaska Native co-management representatives, and the NOAA

Fisheries Alaska Regional Office to develop practical approaches for improving stock assessments where information on abundance, trends in abundance, and annual removal levels are currently not available.

Recommendation 1.5: Develop explicit strategy for assessing all stocks, considering costs, likely available funds, and scientific and management priorities. This could include alternative options for providing advice to managers, and a discussion of alternatives to PBR for management issues.

Response: In 2015-2016, the AFSC will develop a proposed strategy for assessing all marine mammal stocks and will include that strategy and a system for prioritizing those assessments, in the 5-year plan for the AFSC.

Recommendation 1.6: Pursue support for bycatch and harvest monitoring in particularly risky fisheries or regions.

Response: Estimates of bycatch that occur incidental to federally-regulated fisheries result from mandatory observer programs which are conducted annually and generally provide good information on bycatch for those fisheries. Estimation of bycatch in fisheries managed by the State of Alaska and monitoring of subsistence harvest levels is currently the responsibility of the Alaska Regional Office, but is unfunded. Although resources are limited, the AFSC will work with the Alaska Regional Office in 2015 to develop a joint list of priorities for understanding State fishery bycatch levels and harvest levels so both parts of the agency can argue effectively for additional resources.

Recommendation 1.7: More coordination among programs to allow piggy-backing among National Marine Mammal Laboratory (NMML) programs or other funded projects in the area.

Response: The optimal timing and geographic locations for many projects are typically quite specific to a stock and the key research objectives. In addition, bunk space on research vessels is often insufficient to host a full complement of researchers addressing multiple species and objectives. Thus, opportunities for “piggy-backing” or coordinating projects without compromising the objectives of at least one project are rare. Nevertheless, NMML programs routinely coordinate projects when the needs of multiple projects can be met. For instance, killer whale research was successfully executed on a Steller sea lion research cruise in the western Aleutian Islands in 2014. We also support cooperation between agencies: for instance, our Arctic aerial surveys for cetaceans, which are funded by the Bureau of Ocean Energy Management (BOEM), routinely collect and provide information on walrus haul-outs to the United States Fish and Wildlife Service (USFWS). The AFSC will continue to conduct joint research cruises with internal and external partners when the timing, geographic focus, and objectives are aligned.

Recommendation 1.8: Because the current AFSC 5-year Scientific Research plan lapses at the end of 2015, the Region and Center should review and revise the plan as needed for application to the 2016-2020 period, as well as reconsider the list of high priority information needs.

Response: The AFSC is in the process of revising its 5-year Scientific Research Plan and expects that an update will be finalized by early FY16. The AFSC will reconsider past recommendations and consider the review panel's recommendations when setting new goals for 2016-2020.

Recommendation 1.9: The Center should review the list of outdated estimates of abundance used for PBR assessments, determine their priority order, and work with the Region to develop the means for updating them.

Response: The AFSC will address this at the next annual meeting between the AFSC and the AKR to coordinate marine mammal information needs and research priorities.

## **Theme 2: Otariid Pinniped Science**

Recommendation 2.1: Greater collaboration with Native Alaskan hunters to provide additional samples to assess vital rates, contaminants, and disease.

Response: The AFSC has had an extensive program to collect biological samples from subsistence-harvested northern fur seals on St. Paul Island. Storage and processing are significant challenges in remote areas, and St. Paul is one of the few locations where we have the necessary facilities. The northern fur seal harvest also occurs on known dates and in a known and accessible location. We encourage and receive photographs of marked Steller sea lions from native hunters but the collection of samples from harvested sea lions has been very difficult due to the remoteness of the harvesting areas and the unpredictable timing of the harvests. We will continue to work with AKR and Alaska Native Organizations to explore ways to develop and utilize Steller sea lion biosampling programs.

Recommendation 2.2: Continue population monitoring and vital rates (marking and resighting) work for Steller sea lions and northern fur seals.

Response: The AFSC intends to continue our long-term monitoring of population abundance and vital rates of these species. This work is critical to improving our understanding of the population dynamics and the factors influencing changes in abundance for these species.

Recommendation 2.3: Continue to invest a reasonable portion of resources in investigating causes of population dynamics of Steller sea lions, with goal of striking good balance between monitoring current status and improving understanding, which in turn should identify ongoing or developing management issues.

Response: As a matter of high priority, the AFSC intends to continue to invest resources in investigating the causes of decline in the western population of Steller sea lions, as well as monitoring trends in the six sub-regions for Steller sea lions described in the Recovery Plan.

Recommendation 2.4: For Steller sea lions, the Center should urgently continue and strengthen its research efforts in the Western and Central Aleutians, paving the way for comparative studies of the very different recovery response in these two areas. Such comparative studies might give new insights into the factors controlling Steller sea lion population dynamics.

Response: The AFSC agrees that these efforts should be strengthened. However, the remoteness of the area, the logistical challenges and the financial costs involved in conducting field research in these areas present considerable challenges to expanding current efforts. Without additional resources, considerable trade-offs will be required between strengthening these efforts and scaling back other research directed at either Steller sea lions or other pinnipeds in Alaska.

Recommendation 2.5: Given flexibility in use of pinniped funding, the AFSC should consider relative priorities (in terms of science and management) for research spending among the pinniped research programs. For example, given lack of information on ice seals and climate and development threats facing those species, some resources might be shifted to ice seal research from the traditionally better-funded otariid programs.

Response: The AFSC considers all of the priorities inherent in managing multiple species of concern. Currently, all of the NOAA Fisheries' Alaska pinniped funding is provided from the same budget line. The Center works with the Alaska Regional Office to respond to management information needs, including those of the North Pacific Fishery Management Council, those related to ESA status reviews, and those related to ESA consultations on oil and gas activities. Recent and pending decisions regarding ESA listings have elevated the priority of work on ice seals, but the AFSC and AKR will continue to have to assess tradeoffs between otariids and phocids as we work together to set research priorities. For example, to implement Recommendation 2.4 (alone) would likely require shifting funds away from ice seals and harbor seals; implementing Recommendation 2.5 would likely require shifting resources away from important Steller sea lion research.

Recommendation 2.6: Leverage resources by conducting joint Steller sea lion, northern fur seal, harbor seal, and killer whale (and perhaps other species as well) research efforts in Western Aleutian Islands.

Response: Where possible, the AFSC will seek opportunities to conduct research investigating the potential causes of multi-species population declines and the ecosystem dynamics in the western Aleutians.

Recommendation 2.7: Check the correction factor on the eastern population of Steller sea lions using a Jolly-Seber model to get a second estimator of abundance. Once at least 3 years of mark-resight data have been collected, a Jolly-Seber model can be used to obtain an abundance estimate of the pups as well as survival information. Once this study has been ongoing to include different age classes and sex, this will be extremely useful to evaluate the abundance estimator as well as provide the survival rate estimation that is lacking.

Response: The AFSC welcomes this recommendation and will explore the use of the marked animal data to explicitly estimate both abundance and vital rates. The AFSC, along with its research partners, intends to continue the collection of sightings of marked animals throughout Alaska.

**Recommendation 2.8:** For northern fur seals, the Center should continue and enhance its research efforts at Bogoslof Island, making possible comparative studies of the disparate recovery response of this population and giving insights into the population dynamics of northern fur seals.

**Response:** The AFSC agrees with the importance of continuing (and, where possible, expanding) research efforts at Bogoslof Island. Since 2005, we have attempted to access the island once every 3-5 years to conduct population abundance estimates and deploy satellite tags on northern fur seals. The remote location, lack of facilities or fresh water, and difficulty in access present a constant challenge to conduct work on Bogoslof Island. We will return to the island in 2015.

**Recommendation 2.9:** Regarding Steller sea lion and northern fur seal, the Center should continue its examination of hexacopters and other unmanned aerial systems (UAS) given their relative low cost and applicability to difficult weather/terrain situations.

**Response:** The AFSC agrees. Hexacopters and other unmanned aerial systems have proven their utility in meeting certain marine mammal research goals. The AFSC intends to continue further investigations of these and other new technologies as resources allow.

**Recommendation 2.10:** Given that populations of Steller sea lions and harbor seals west of 177° W longitude are not recovering, we suggest conducting a study to determine the differences in environmental conditions between the region west and east of 177° W in the Aleutians.

**Response:** The AFSC agrees that environmental conditions may influence the population abundance of these two species. Designing a study to examine differences between the two areas will require collaboration with physical oceanographers and climate scientists. A post-doctoral researcher in physical oceanography has been engaged for a 1-2 year position to study this issue. In addition, a multi-divisional effort at AFSC will be proposed for support in FY16 along the lines suggested by the reviewers.

### **Theme 3: Phocid Pinniped Science**

**Recommendation 3.1:** Recommend the hiring of a data manager for this program to help manage the large and increasing datasets.

**Response:** Data management is becoming increasingly important both because efficient data management allows researchers to focus more on data analysis and interpretation and also because policies and deadlines regarding public access to data will require near-immediate quality-control and processing after each field season. The AFSC agrees that hiring a data manager for phocid data is critical. Approval has been given to recruit a data manager, with a plan to have the position filled before the end of fiscal year 2015.

**Recommendation 3.2:** Continued funding and improvements of aerial assessments to produce abundance estimates at the appropriate intervals, especially for ice seals. Continue efforts to automate detection capabilities via forward-looking infrared data.

Response: The AFSC agrees that it is important to continue to support aerial assessments of ice seal abundance and distribution. More complete automation of the seal detection and identification process is needed to reduce labor costs and make results available in a timely manner. Our work on improvements to detection software is ongoing, but the largest increment in further progress on automation efficiency is likely to depend on acquisition of cooled infrared (IR) imagers, which are substantially more expensive than the uncooled imagers currently in use. We will seek supplemental funds for the cooled imagers as a matter of high priority.

Recommendation 3.3: Continue to fund the satellite tagging efforts, especially of ice seals, to improve data on assessments, movements, and habitat use.

Response: The AFSC agrees that satellite tagging of ice seals is critical, particularly given the recent listing of some stocks under the ESA, as well as the environmental and anthropogenic changes occurring in the Arctic. Phocid seal stocks cannot reliably be assessed without good information on haul-out time budgets and seasonal movements. Although we have recently made substantial progress in filling information gaps in these areas, the data are still sparse and we have little knowledge of interannual variability in crucial parameters. Therefore, a regular program of monitoring is required, at least until the variability is sufficiently documented. In some cases, such as Aleutian and Iliamna Lake harbor seals, basic data are lacking even though there are elevated conservation concerns. Gaining an improved understanding of ice seal and harbor seal stocks in the next few years will be important. The AFSC will continue to make regular requests for vessel support, the primary resource required for satellite tagging of seals in the Aleutian Islands and the pack ice of the Bering Sea.

Recommendation 3.4: Finish ice seal abundance estimates and update SARs.

Response: Range-wide abundance estimates are unavailable for any of the four ice-associated seal species. New provisional abundance estimates for ribbon seals and the bearded seal stock that occurs in U.S. waters were included in the draft stock assessment reports (SAR) for 2015. We expect that information on abundance for the spotted seal stock and a substantial portion of the ringed seal stock that occur in U.S. waters will be made available in the SARs in fall 2015 for use in the 2016 draft SARs. Complete abundance estimates derived from aerial surveys of ice-associated seals in the Bering and Okhotsk seas will be available in 2016.

Recommendation 3.5: Conduct Chukchi/Beaufort surveys for ice seals, particularly important for ringed and bearded seals.

Response: The AFSC agrees that conducting surveys for ringed and bearded seals in the Chukchi and Beaufort Seas is a very high priority. Surveys of ice-associated seals in the Chukchi Sea (both U.S. and Russian waters) are planned for 2016 in collaboration with Russian colleagues.

A portion of the required funds has been made available in FY15 and a similar portion is anticipated for FY16. We hope that the remainder of needed resources can be obtained



through a combination of base-funded NOAA aircraft time and external (i.e., reimbursable) funds, so that these surveys can be completed without cancellation of other high-priority seal monitoring and research.

Recommendation 3.6: Link ice seal survey and tracking data to habitat variables to investigate habitat preferences, potential areas of special importance, and possible impacts of loss of sea ice.

Response: The importance of major habitat covariates for ice seals is a key output result from our model-based statistical procedure for quantifying abundance and distribution. The species distribution maps that we have developed from preliminary analysis of a portion of our Bering Sea survey data are very encouraging for their strong similarity to previous natural history descriptions of the breeding distributions of bearded, ringed, spotted, and ribbon seals. Seal movement data from tracking studies provide a crucial extension of inference about habitat requirements in other seasons, when aerial surveys are impractical. The behavior data obtained from the tracking studies also provide insights about processes that are key to habitat selection and requirements. We have recently initiated a collaboration with a large group of experts in the ecology of bearded seal prey communities and ecosystem dynamics in the Chukchi Sea, to integrate our bearded seal movement and diving data with spatial information about a broad suite of prey species and environmental features. We have joined a second collaboration to identify 'hot spots' for marine mammals in the Chukchi and northern Bering seas.

Recommendation 3.7: Investigate Population Consequences of Disturbance (PCOD) work on harbor seals and other species and consider similar approaches to estimating impacts of disturbance on seals (e.g., cruise ships in glacial fjords).

Response: The AFSC agrees that this may be a productive way to approach this topic, which is challenging to address through direct observation or measurement of disturbance effects on vital rates. Lacking the ability to obtain data on vital rates, a decision framework based on expert judgment may provide justification for management actions if our population monitoring results indicate a need. We intend to assess the feasibility of applying a PCOD or similar process as funds and staff time permit.

Recommendation 3.8: Consider implementing a rotating panel survey design. Panel surveys reduce variance estimates compared with traditional designs. Also important is that low priority colonies be surveyed to capture any shifts in habitat use.

Response: In some situations, rotating panels can be used with design-based inference, and in that scenario they increase precision and are much more convenient than completely randomized or stratified designs. However, we believe a rotating panel would be less effective than our current model-based approach to harbor seal assessment. The model-based approach provides flexibility to adapt to fluctuating resources as well as a framework for optimizing the allocation of effort among sites and between the count and the haul-out components of the model. A rotating panel would impose a structure that is not as flexible, and not necessarily optimal. We believe our current approach covers the same principles as a rotating panel: spread samples out in space and time, sample important sites more often

than less important ones, and sample efficiently. In our current approach, we are optimizing this with empirical information and adapting it, rather than following a prescribed algorithm.

Recommendation 3.9: Collaborate with cruise ships (perhaps user fees for example) to begin research on the effects of cruise ships on harbor seals. Ideally a before-after control-impact (BACI) design would be implemented here.

Response: Our research into the impacts of cruise ships on harbor seals in Alaskan glacial fjords began as a collaboration in which the cruise ship industry provided major funding, and has incorporated some elements of before-after control-impact designs. Specifically, we conducted aerial surveys for abundance and distribution of seals before and after cruise ship visits in Disenchantment Bay (treatment site), with paired observations conducted in nearby Icy Bay, which was not visited by cruise ships. Although the design incorporates the salient BACI features, in reality the two sites have differences that leave doubts about whether Icy Bay is an appropriate control. The number of glacial fjords visited by cruise ships is small, and the selection of potential control sites is even smaller, making a true BACI design difficult to implement reliably. Moreover, no variable has yet been identified that is practical to measure and that reflects a crucial demographic response of interest, such as vital rates of survival, reproduction, or emigration. Although considerable thought and effort has been devoted to study designs by the AFSC, the Alaska Department of Fish and Game, and the National Park Service, no practical means have yet been identified for measuring a demographically relevant response to chronic, low-level harassment events. Until an appropriate measure becomes available, AFSC's approach to this problem will likely remain primarily one of monitoring abundance and trends to ensure that any significant population impacts would be apparent. If new techniques or technologies become available for more direct quantification of demographic effects, the cruise ship industry will be solicited for collaborative support to apply them.

Recommendation 3.10: The Center should work with NOAA's Office of Marine and Aviation Operation (OMAO) to obtain a King Air aircraft that would increase the safety and other capabilities of the aerial surveys.

Response: The safety of our staff is of critical concern. While we feel confident that we take appropriate, conservative measures to ensure the safety of our staff when flying aerial surveys a long distance from shore over sea ice, this activity has inherent risks and we are keenly interested in taking steps to ensure and improve staff safety. Aircraft with long endurance range and relatively high speeds enable us to cover survey areas more quickly during (rare) periods of ideal weather and to reach a greater number of back-up airstrips if weather deteriorates during a survey. High rates of climb are also helpful for responding to rapid, unforeseen declines in conditions. We have identified the King Air aircraft operated by NOAA's Office of Marine and Aircraft Operations as meeting these criteria. AFSC is actively working with NOAA Fisheries leadership and with OMAO to confirm the suitability of the NOAA King Air for our surveys and to acquire access to it for surveys of ice-associated seals in the high Arctic during FY16.

**Recommendation 3.11:** The Center should consider using the Ice Seal Committee to address the issue of coordinating satellite tagging efforts.

**Response:** The AFSC has the lead role for providing scientific support to activities conducted under the co-management agreement between NOAA Fisheries and the Ice Seal Committee (ISC). This agreement has been the basis for many productive collaborations between the two parties over the past decade. AFSC staff plan to convene and facilitate a brief workshop in 2016 for coordinating satellite tagging studies of ice-associated seals in Alaska, involving NOAA Fisheries, the ISC, Alaska Department of Fish and Game, and the North Slope Borough Department of Wildlife Management.

**Recommendation 3.12:** The Center should pursue with the USFWS undertaking a possible polar bear aerial survey in the Chukchi Sea, applying NMML's camera system and data analysis, and leveraging that to get ice seal data as well.

**Response:** AFSC and USFWS scientists are discussing survey designs that would be suitable for estimating the abundance of ringed seals, bearded seals, and polar bears. Initial power analyses indicate that adequate precision for polar bear estimates could be achieved by increasing survey effort by approximately 50% over the minimum effort required for seals alone. These discussions will continue with a goal of determining whether joint resources of the two agencies can be obtained in support of a combined, expanded survey that would avoid duplication of effort.

#### **Theme 4: Large Cetacean Science**

**Recommendation 4.1:** Recommended funding for a wide-scale vessel survey of the Bering Sea and Gulf of Alaska that would provide estimates for North Pacific right whales but also many marine mammals in this region. This would allow photo-ID, tagging, and other dedicated operations when right whales were observed.

**Response:** The AFSC agrees that a wide-scale vessel survey is important to understanding Alaska cetacean abundance, distribution and stock structure. The AFSC will request ship time, as well as funding for personnel and other associated costs, to implement surveys in two sequential years starting in FY16 or FY17. Specifically regarding North Pacific right whales, the AFSC agrees with the recommendation to secure funding to support a synoptic survey. The AFSC will continue to work with the Alaska Regional Office, NOAA Fisheries Headquarters, and other potential sources of support to seek funds to implement such a survey. Fortunately, ship time aboard the new NOAA Ship *Reuben Lasker* became available in 2015, and the AFSC and Southwest Fisheries Science Center will jointly be conducting a 20-day survey for right whales in the Gulf of Alaska in August. This survey will search for right whales in shelf and offshore waters near Kodiak, and will photo-identify, biopsy sample and (if possible) satellite-tag any right whales that are observed.

**Recommendation 4.2:** Need support to allow recovery and redeployment of passive acoustic monitoring instruments for cetaceans in the Bering Sea, Chukchi, and Beaufort Seas to preserve this excellent and irreplaceable source of information. The Center should identify and pursue partners

(e.g., U.S. Coast Guard, NOAA's National Ocean Service) who might be willing to provide ship support for servicing the acoustic array this year, and possibly in the longer term.

Response: Monitoring of cetacean calls using passive acoustic instruments has become a very cost-effective way of understanding animal distribution, and new research may allow us to use the acoustic recordings to estimate local abundance for some cetaceans and to differentiate certain stocks of cetaceans. The AFSC agrees that providing the relatively small amount of funding needed to recover and redeploy acoustic recorders is important and we will continue trying to find these funds either internally or externally to the AFSC. The AFSC agrees that seeking partners with routine access to ship support may facilitate long-term use of acoustic recorders and we will investigate this possibility with potential partners in FY15.

Recommendation 4.3: Recommend support by NOAA to finish the genetic samples of humpback whales collected during the Structure of Populations, Levels of Abundance, and Status of Humpbacks (SPLASH) project.

Response: The AFSC agrees that this should be a priority for NOAA Fisheries because population structure in the feeding grounds remains unclear. A better understanding of this issue is important to the future management of humpback whales in the North Pacific, particularly given the agency's proposal to revise the status of some sub-populations under the ESA. Unfortunately, funding for this analysis is not currently available, and will have to wait until funding is provided.

Recommendation 4.4: Continue broad-scale, multi-year research programs – especially the Aerial Surveys of Arctic Marine Mammals (ASAMM) given its long time series and importance for monitoring Arctic change.

Response: The AFSC agrees that implementing broad-scale and multi-year research is important to understanding changes in cetacean distribution that may occur due to anthropogenic causes, environmental change or both. We will continue to seek internal funding and external partnerships that will enable these studies to continue, and we will initiate new studies as new resources are secured.

Recommendation 4.5: Reinvest in North Pacific right whale research by redirecting limited internal funds and, more likely, by attracting external support. This is a critically endangered species that warrants research attention.

Response: The AFSC has discussed the urgent need for research on North Pacific right whales both within NOAA Fisheries as well as with potential external partners. At present, there is some external interest in supporting our research on this critically endangered species. We expect that this external support will be valuable in providing modest amounts of funds that can be used very productively to analyze data already in hand. However, substantial additional funds will be needed to collect new information, such as biopsy sampling, mark-recapture estimates, or tagging of North Pacific right whales because the cost of a vessel charter is considerably more expensive. The AFSC urgently needs dedicated

vessel time to collect information about the distribution and abundance of this population so managers have an informed basis for determining what types of measures are needed to protect right whales.

Recommendation 4.6: Consider a “user-pays” approach to funding cetacean and other research needs. Alternatively, seek industrial partnerships for supporting moorings, etc.

Response: There are many “users” of the Gulf of Alaska, Bering Sea, Chukchi and Beaufort Sea. The AFSC’s applied research needs have often overlapped with those of the Bureau of Ocean Energy Management and the U.S. Navy, and we have had productive partnerships with both. The oil and gas industry is another key user of Alaskan waters, and steps are being taken to allow the AFSC to support in-house research with funding from industry sources. The ASFC will continue to pursue internal and external federal agency support, industry partnerships, and non-governmental organization partnerships to support high priority research on cetaceans and other marine mammals in Alaska.

Recommendation 4.7: Continue to pursue automated approaches to processing acoustics data.

Response: The AFSC agrees that this is a priority and we will continue to advance automated approaches to processing acoustics data as resources allow.

Recommendation 4.8: Pursue resources for surveys, tagging, and acoustics work, all of which are needed to address core stock assessment mandates.

Response: The AFSC agrees that this is a priority and we will continue to pursue resources for surveys, tagging and acoustics work needed to address core stock assessment mandates.

Recommendation 4.9: Explore alternative approaches to providing advice to managers related to stocks that are particularly difficult to assess or unlikely to receive sufficient funding support to assess (i.e., alternatives to full-blown population and mortality assessments with associated PBR evaluation).

Response: The AFSC agrees that PBR is not the best metric for managing all aspects of marine mammal interactions with humans in Alaska. The PBR scheme was developed primarily to manage serious injury and mortality of marine mammal stocks incidental to commercial fishing activities. While this system works well in situations where both abundance and human-related serious injury and mortality can be routinely and reliably obtained, the system performs poorly in situations where estimates of serious injury and mortality incidental to commercial fisheries, as well as estimates of abundance, are not available. The Alaska Scientific Review Group has also identified this as an issue needing attention. The AFSC expects that the topic will be on the agenda for the joint Scientific Review Group meeting scheduled for spring 2016 (see also the response to recommendation 1.4).

Recommendation 4.10: Examine alternative methods of obtaining humpback calving ground observations through use of fisher or ecotourism guiding observations.

Response: This recommendation presumably relates to the “missing” humpback whale breeding ground, but there is currently no evidence as to where those grounds may be. One option that the AFSC will investigate would be to produce a list of possible locations and then investigate whether fishing or ecotourism operations are occurring in such places; if so, AFSC would endeavor to contact relevant groups to solicit observations.

Recommendation 4.11: The Center should consider approaching the U.S. Navy or other potential partners (BOEM, U.S. Coast Guard) about their interest in mining the Passive Acoustic Recorders data set for information about the presence of North Pacific right whales, bowheads, fin whales or humpback whales near or within chokepoints such as the Bering Strait and Unimak Pass.

Response: The AFSC agrees that mining data from these recorders would help understand the distribution of large whales in the Bering Strait and Unimak Pass. We will contact potential partners about this opportunity in FY15 or early FY16.

#### **Theme 5: Small Cetacean Science**

Recommendation 5.1: Recommend that the AFSC explore further permitting that would allow captures and sampling (e.g., satellite tagging, biopsy, health assessment) of Cook Inlet beluga whales. Once a permit is received, initiate biopsy and capture work to understand the cause(s) of the ongoing population decline.

Response: The AFSC agrees that it is important to obtain a permit that will allow sampling and tagging of Cook Inlet beluga whales. Because of the extreme tidal and other environmental conditions in Cook Inlet, capture operations there are difficult and potentially dangerous to the belugas. The AFSC intends to collaborate with AKR to develop and fund a plan for tagging Cook Inlet belugas.

Recommendation 5.2: Recommend that the AFSC further develop collaborations, data mining, or other sampling capabilities to assess prey availability and use (especially for salmon) by Cook Inlet beluga during the summer, and maybe during winter. If data on prey are lacking, initiate (or work to have the State initiate) improved fisheries data collection protocols.

Response: The AFSC recognizes the importance of understanding the seasonal density and availability of prey to Cook Inlet belugas. To this end, a few small scale efforts in conjunction with the AKR have determined the range of prey available by sampling in the vicinity of beluga groups and using fatty acid and stable isotope data from belugas captured for tagging and prey samples. While these provide a qualitative understanding, they lack the rigor and sample size for a quantitative analysis. Data for the commercial salmon fisheries that operate in lower Cook Inlet are fairly extensive, but the rivers in the upper inlet are not monitored in a consistent manner or annually for salmon escapement (methods include aerial surveys, weir counts, observer counts, etc.). Also, eulachon, a schooling smelt that has large runs in the upper inlet in May, are important forage species for belugas but are not a commercially fished species. There are no quantitative data on run strength and timing for a number of the anadromous fish runs in the upper inlet. Goetz et al. (2007, 2012) used river flow strength as a proxy for fish habitat in the models used to determine beluga preferred

habitat. Thus far data mining has shown limited potential. Recently AKR contracted with the Alaska Department of Fish and Game (ADFG) to design a series of studies to estimate seasonal densities and distribution of key prey items. AFSC has been collaborating with LGL Inc., an ecological research company, to seek funding for analysis of beluga sighting histories in relation to available anadromous fish data to determine if beluga movements can be predicted by existing fisheries data.

Recommendation 5.3: Recommend that when in the western Aleutians, the vessel time be expanded to allow greater effort by the killer whale group to tag and observe this species.

Response: The AFSC realizes that killer whale research in the western Aleutians is important because transient killer whales may be foraging on the endangered western stock of Steller sea lions, and resident-type killer whales may prey on fish species that are also prey of Steller sea lions, especially Atka mackerel. Killer whale field research has been added to a cruise designed to assess Steller sea lions, which has helped ameliorate a lack of funds for dedicated killer whale research cruises. If additional resources become available, the AFSC will consider extending the Steller sea lion cruise to help collect improved data on killer whales.

Recommendation 5.4: Recommend that the AFSC expend greater effort to obtain harbor porpoise samples throughout its range, especially to gather genetics samples that might determine stock structure. Work with external partners to investigate the use of novel genetic methods to understand harbor porpoise and other small cetaceans.

Response: The AFSC agrees that understanding stock structure of harbor porpoise is an important priority, as the currently recognized stock structure may not adequately reflect fine scale features. We have evidence from observer programs to document that the serious injury and mortality of harbor porpoise in some fisheries may be significant; before this can be evaluated in the context of the harbor porpoise population, we need to understand what population units are being impacted. The AFSC has received support in FY15 and is seeking support in FY16 to collect and analyze harbor porpoise tissue samples to improve our understanding of stock structure. Funds will also be used to analyze water samples for cetacean DNA in an attempt to understand what small cetacean stocks frequent the area. Understanding the stock structure, abundance, and incidental serious injury and mortality of harbor porpoise is a priority for the AFSC.

Recommendation 5.5: Keep as a priority the examination of the Dall's porpoise data to determine abundance. Mine data from the Southeast Alaska surveys program to inform other stock assessments, e.g. Dall's porpoise (which is apparently underway).

Response: The AFSC agrees that updating information on Dall's porpoise abundance is worthwhile, although it is not as high a priority as for some other species. The AFSC will mine existing survey data from Southeast Alaska and from other cruises in FY15 and FY16 and expects to submit a manuscript for publication in FY17. The AFSC will conduct surveys and develop a new abundance estimate for the Alaska stock of Dall's porpoise and the abundance within the US Exclusive Economic Zone if funding is available for this purpose.

However, because Dall's porpoise are expected to be abundant and there is no known human-related impact on the population, we expect that funding for Dall's porpoise surveys will be a medium or low priority relative to other pressing needs.

Recommendation 5.6: Gain access to and use the LGL Inc. photo-identification catalog for mark-recapture vital rates work.

Response: LGL Inc. maintains two photo catalogs of interest to the AFSC, a Cook Inlet beluga catalog and a bowhead whale catalog. The AFSC is working with LGL to bring the Cook Inlet beluga catalog up to date and has collaborated with LGL on funding proposals to cover costs of matching and development of sighting histories as well as collaboration on analyses. AFSC anticipates that sighting histories through 2014 will be available in FY 2016 for estimation of calving rates and intervals. The bowhead photo catalog has been analyzed in the past to estimate vital rates but these results are out of date. Funding is being sought to analyze recent photo data for vital rates.

Recommendation 5.7: Mine existing Cook Inlet fisheries data to inform prey availability for belugas. To the extent these data are not suitable, initiate (or work to have the State initiate) improved fisheries data collection protocols.

Response: See response to recommendation 5.2.

Recommendation 5.8: Investigate Population Consequences of Disturbance work and consider similar approaches to estimating impacts of disturbance (i.e., noise) on Cook Inlet belugas.

Response: The AFSC agrees that this approach may be helpful in understanding the potential effects of disturbance on Cook Inlet belugas and we have been working with the NOAA Fisheries' Office of Protected Resources and the AKR to evaluate some of the issues related to applying this technique in Cook Inlet. Key issues limiting the use of this technique in Cook Inlet are limited data on responses of beluga to acoustic stimuli and other disturbance, the individual cost of lost feeding opportunities, displacement from preferred habitat, and the impacts of these costs on survival and reproduction. While there are some results for other odontocetes to draw on, some work must be done on belugas to determine whether useful comparisons can be made. AFSC will continue to investigate this issue in FY16, and will seek input from other institutions with relevant expertise.

Recommendation 5.9: Mine data from the Southeast Alaska surveys program to inform other stock assessments, e.g., Dall's porpoise (which apparently is underway).

Response: The AFSC agrees that this would be useful and will continue to pursue this effort in FY15 and FY16. We expect to submit a manuscript on this topic for publication in 2016 (also see response to recommendation 5.5).

Recommendation 5.10: Pursue support for bycatch monitoring in particularly risky fisheries and/or regions.



Response: Federally regulated fisheries in Alaska carry observers on a portion of their fleet. Observer coverage – measured as percent of catch observed - ranges from ~10% to 100% depending on the fishery. Most funds for this program come from the Alaska groundfish fisheries and the program provides excellent information on marine mammal bycatch in those fisheries. However, there are also many State fisheries in Alaska that are known to have incidental bycatch of marine mammals. Some marine mammal bycatch data are over 20 years old but are still used for management purposes because those are the best data available. While funds have sometimes been brought together from various sources to implement observer programs in the past, such funds are no longer available. Thus, while we agree that it is important to try to get support for such observer programs, we expect it will be very challenging to implement any new programs to observe State-regulated fisheries.

Recommendation 5.11: Pursue potential partnership with the NOAA Office of Oceanic and Atmospheric Research (OAR) and external benefactors to develop methods for analyzing genetics from water samples collected near small cetaceans.

Response: See response to recommendation 5.4.

Recommendation 5.12: Leverage resources by conducting joint Steller sea lion, northern fur seal, harbor seal, and killer whale (and perhaps other species as well) along with oceanographic and fisheries research in Western Aleutian Islands.

Response: The AFSC will continue to conduct joint research with internal and external partners when the timing, geographic focus, and objectives of key projects are aligned. As noted in our response to recommendation 1.7, the optimal timing and geographic locations for many projects are typically quite specific to a stock and the key research objectives. Leveraging fieldwork resources are not always straightforward and care must be taken to ensure that doing so doesn't jeopardize research objectives.

## **Theme 6: Operational Issues**

Recommendation 6.1: Continue to develop succession plans to anticipate and respond to retirements.

Response: The AFSC agrees that this is a critical and strategic necessity. We will develop succession plans to the extent feasible, while keeping in mind the requirement to respect individual privacy regarding retirement plans and ensuring that hiring regulations are followed.

Recommendation 6.2: Work with NOAA Fisheries' Office of Protected Resources Permits and Conservation Division to identify challenges and solutions to common permitting issues (which could require changes or actions on the part of both NMML and the Permits and Conservation Division). Such an effort was initiated many years ago. Following up on the findings of that effort would be a good starting point.

Response: see response to recommendation 1.1.

Recommendation 6.3: Consider the efficacy of more contract work with non-NOAA researchers, which would allow greater budgetary flexibility and access to a larger pool of expertise and resources.

Response: The AFSC currently relies heavily on both individual contractors and institutions funded through grants (such as the University of Washington) to produce a variety of products needed to meet our science goals, particularly for projects funded with external money. While contracting research or products does provide access to a larger pool of expertise, using contractors and grantees also has drawbacks such as higher overall costs to AFSC, potentially lower pay and benefits to non-federal workers, and lack of worker job security, all of which affects morale. The AFSC will consider contracting/granting research in the future on a case-by-case basis.

Recommendation 6.4: The AFSC should consider changing the name of the National Marine Mammal Laboratory considering its primary focus is on issues associated with Alaska.

Response: The AFSC's marine mammal research division has been known as the "National Marine Mammal Laboratory" for over 35 years. During that time period marine mammal research programs have continued or developed at the other five NOAA Fisheries Science Centers. Although AFSC scientists have conducted marine mammal research in many areas around the world, current work is focused primarily in Alaska and the California Current ecosystem in support of the NOAA Fisheries' Alaska Region and the West Coast Region (California, Oregon, Washington). It is recognized that the current name has created confusion among some stakeholders regarding which science center is responsible for a given marine mammal research program carried out by NOAA Fisheries. The AFSC will take this recommendation under consideration.

**Table: Summary of Action Items and Deadlines**

<b>Recommendation number and action item</b>	<b>Deadline</b>
1.1 AFSC will continue efforts to encourage NOAA Fisheries leadership to implement the permit process review panel's recommendations for strengthening the permit process.	Ongoing
1.3 Develop specific steps to improve coordination between the AFSC and AKR.	March 2016
1.4 Discuss approaches for managing Alaska marine mammal stocks that could be an alternative to comparing population and mortality assessments to the PBR level.	February 2016
1.5 Develop a strategy for assessing all stocks in the 5-year plan for the AFSC.	June 2016
1.6 The AFSC and AKR will develop a joint list of priorities for understanding State fishery bycatch levels and harvest levels.	March 2016
1.8 The AFSC will reconsider past high priority data needs and consider the review panel's recommendations when setting new goals for 2016-2020 that will be reflected in the updated 5-year Scientific Research Plan.	March 2016
1.9 The AFSC will review the list of outdated estimates of abundance used for PBR assessments, determine their priority order, and work with the Region to develop the means for updating them.	Ongoing
2.1 The AFSC will continue to work with AKR and Alaska Native Organizations to explore ways to develop and utilize Steller sea lion biosampling programs.	Ongoing
2.3 The AFSC intends to continue to invest resources in investigating the causes of decline in the western population of Steller sea lions, as well as monitoring trends in the six sub-regions for Steller sea lions described in the Recovery Plan	Ongoing
2.6 The AFSC will seek opportunities to conduct research investigating the potential causes of multi-species population declines and the ecosystem dynamics in the western Aleutians.	Ongoing; as possible
2.7 The AFSC will revisit the use of the correction factor for the eastern population of Steller sea lions and will explore the use of the marked animal data to explicitly estimate both abundance and vital rates.	February 2016
2.9 The AFSC will continue further investigations of UAS and other new technologies as resources allow.	Ongoing
2.10 The AFSC will pursue studies to examine differences between Steller sea lion and harbor seal dynamics east	Summer 2015; March 2016

and west of 177 °.	
3.1 The AFSC will strive to hire a data manager for phocid data.	December 2015
3.4 Update the stock assessment reports with new abundance data for ice-associated seals.	November 2015 (spotted seals); October 2016 (ribbon, bearded, and ringed seals)
3.5 Conduct surveys for ringed and bearded seals in the Chukchi Sea.	Spring 2016
3.6 Use ice seal survey and tracking data to investigate habitat preferences, potential areas of special importance, and possible impacts of loss of sea ice.	Ongoing
3.7 Assess the feasibility of using the Population Consequences of Disturbance framework to evaluate the possible impact of disturbance on seals.	Fall 2016
3.10 As funding permits, obtain a King Air aircraft that would increase the safety and capabilities of flights to assess ice-associated seals.	Spring 2016
3.11 Convene and facilitate a workshop for coordinating satellite tagging studies of ice-associated seals.	June 2016
4.1, 4.2 Work with the AKR, NMFS Headquarters and other sources of support to implement a wide-scale vessel survey for Alaska cetacean abundance, distribution and stock structure and to retrieve and redeploy acoustics recorders.	Ongoing
4.5 Use internal or external funds to conduct North Pacific right whale research.	Ongoing
4.9 Discuss with the Alaska SRG and Alaska Region alternatives to traditional population assessments that provide managers with key advice needed to manage Alaska cetacean stocks.	June 2016
4.11 Contact potential agency partners to assess interest in mining the Passive Acoustic Recorders data set for information about cetaceans near geographic chokepoints such as the Bering Strait and Unimak Pass.	November 2015
5.1 The AFSC will work with the AKR to develop a plan for tagging Cook Inlet beluga whales.	September 2015
5.4 Expand efforts to understand harbor porpoise stock structure.	August 2015 and ongoing
5.5 Publish an updated abundance estimate for Dall's porpoise in Alaska.	June 2017
5.6 Seek to gain sufficient access to LGL photo-identification databases for Cook Inlet beluga and bowhead whales to meet agency management needs.	June 2016
5.2 & 5.7 – Explore data mining or improved State data collection protocols with regard to Cook Inlet beluga prey.	June 2016
5.8 Investigate how the Population Consequences of Disturbance framework could help estimate impacts of disturbance on Cook Inlet beluga whales.	September 2016

5.9 Submit a manuscript based on data from the Southeast Alaska surveys program informing other stock assessments, e.g. Dall's porpoise. (Also see response to recommendation 5.5.)	December 2016
6.4 Determine if a name change from the National Marine Mammal Laboratory is warranted.	October 2015