

Minutes from the Alaska Scientific Review Group Meeting NMFS Alaska Fisheries Science Center, Seattle, WA 4-5 April 2023

This report summarizes the 2023 meeting of the Alaska Scientific Review Group (AKSRG), held in Seattle, WA (with virtual access) from 4 to 5 April 2023. This document is intended to summarize the main points of discussion and does not attempt to record everything that was said during the meeting.

Attendees

The following individuals attended all or part of the meeting, in person and/or virtually.

AKSRG members: John Citta, Beth Concepcion, Thomas Doniol-Valcroze, Donna Hauser, Greg O’Corry-Crowe (AKSRG Co-Chair), Lori Quakenbush, Lorrie Rea, Eric Regehr, Kate Stafford, Megan Williams (AKSRG Co-Chair), Nicole Wojciechowski

NMFS:

- *Alaska Fisheries Science Center (AFSC)*: Alexey Altukhov, Robyn Angliss, John Bengtson, Catherine Berchok, Burlyn Birkemeier, Peter Boveng, Brian Brost, Amelia Brower, Vladimir Burkanov, Manuel Castellote, Jessica Crance, Shawn Dahle, Brian Fadley, Megan Ferguson, Nancy Friday, Tom Gelatt, Kim Goetz, Lacey Jeroue, Michelle Lander, Josh London, Katie Luxa, Molly McCormley, Rolf Ream, Kim Shelden, Jeremy Sterling, Katie Sweeney, Paul Wade, Janice Waite, Skyla Walcott, Nancy Young, Tonya Zeppelin, Alex Zerbini
- *Alaska Regional Office (AKRO)*: Anne Marie Eich, Suzie Teerlink
- *Northwest Fisheries Science Center (NWFSC)*: Kim Parsons
- *Office of Science and Technology (OST)*: Zac Schakner
- *Office of Protected Resources (OPR)*: Megan Di-Lernia, Meghan Gahm, Kristy Long, Eric Patterson (on detail to OST)

U.S. Fish and Wildlife Service (USFWS): Patrick Lemons, Paul Schuette, Charlie Hamilton

Marine Mammal Commission (MMC): Vicki Cornish, Erin LaBrecque, Lauri Leach, Lori Schwacke, Jackie Shaffe

Alaska Eskimo Whaling Commission (AEWC): Jenny Evans

General Topics

Welcome and introductions

AKSRG Co-Chairs Megan Williams and Greg O’Corry-Crowe and AFSC Marine Mammal Lab (MML) Director John Bengtson welcomed everyone. AKSRG members, including new member Lori Quakenbush, and other meeting attendees introduced themselves. Nancy Young reviewed meeting protocols, logistics, and the [VLab website](#).

Minutes from previous AKSRG Meeting

Young briefly summarized the development, review, and finalization of minutes from the April 2022 AKSRG meeting and May 2022 AKSRG inter-sessional call on humpback whales. The minutes are posted on the [NMFS SRG webpage](#) as well as on the VLab site.

2022 AKSRG Meeting Recommendations

Williams reviewed the AKSRG's recommendations from their 2022 meeting and NMFS' responses, which are posted [online](#). The AKSRG discussed a subset of these, as summarized below.

Recommendations are referred to by number as listed in NMFS' response letter.

- (1) Electronic monitoring (EM): AKSRG members briefly discussed that EM is the use of equipment like video cameras to capture fishery data as a supplement to or replacement of human observers, and that its use may lead to less data collection on marine mammal interactions. Kristy Long provided a brief update on the Alaska Marine Mammal Observer Program: NMFS has hired a program coordinator and is considering the potential to use EM in combination with observers to maximize data collection. She agreed to keep the AKSRG updated on that progress.
- (3) Pinger research in Southeast Alaska (SEAK): Williams asked for an update on the pinger research. Robyn Angliss summarized progress to date, including collection of baseline information off Juneau and Auke Bay using theodolites and acoustic moorings and determination that these are good locations for the study, and purchase and testing of pingers. Long noted that the purchased pingers are a new design with two frequencies geared to emit frequencies that can be heard by large whales and porpoise, but that the porpoise frequency is higher than the standard harbor porpoise pinger to put it above pinniped hearing range. Long noted the pinger is commercially available and she can share the specifications. O'Corry-Crowe asked about the manuscript by Kim Parsons (NMFS Northwest Fisheries Science Center) on SEAK harbor porpoise genetics; Angliss replied it is still in development and confirmed that there is currently no financial support for additional genetics work.
- (4) Expanding the SEAK salmon drift gillnet bycatch estimate of harbor porpoise: Angliss summarized NMFS' response about not having specific information needed to support an extrapolation of the estimate to unobserved portions of the fishery. Williams asked if that information would be collected in the future, and Angliss replied that NMFS is focused on actively pursuing a new observer program, not on extrapolating the older estimates using assumptions that could be easily challenged. Williams asked about next steps under the Marine Mammal Protection Act (MMPA); Long responded that while the MMPA triggers have been met to establish a Take Reduction Team (TRT), additional data are needed to facilitate effective TRT discussions. She stated that NMFS is trying to be methodical about collecting data to support next steps, but it will take several years before sufficient observer data are available.
- (5) Killer whale genetic analyses: Thomas Doniol-Valcroze stated that social structure in killer whales is not necessarily only studied using genetics, and there might be other approaches available that are feasible and potentially less costly (e.g., association indices, dialects).
- (9) Confirming philopatry in humpback whales using genetic relatedness: O'Corry-Crowe stated that he fundamentally disagrees with NMFS' response. He and Paul Wade discussed this further during Wade's SPLASH 2 presentation (see below.)

- (14) Survey protocols and synergies: Angliss said that MML appreciates the AKSRG’s recommendation to piggy-back additional studies on planned surveys and agrees that it would be valuable to collect as much data as possible on every cruise, but it might not be possible financially given the extra cost of the additional studies. Lorrie Rea asked whether AKSRG recommendations about where to place money actually help advocate for additional funding. Bengtson replied that while their recommendations do not guide NMFS regionally or locally, it could be helpful at the national level, and MML definitely would not get extra funds if they do not keep asking for it. Eric Patterson expanded to say that across the board NMFS does not have enough money and he does not see a reason why the SRGs could not band together to talk to Congress to advocate in ways that the agency cannot. Erin LaBrecque said that MMC is happy to engage. Bengtson also noted the potential for Congress to require NMFS to do something but not be given any funding, which would necessitate canceling another project to pay for any new required projects. Nicole Wojciechowski noted that the SRGs should not go to Congress to advocate for particular things if they are not already NOAA priorities. Bengtson agreed, but O’Corry-Crowe warned that SRGs would need to be careful to maintain their independence and advocate based on their own recommendations to the agency. Zac Schakner suggested that the AKSRG could recommend that NMFS convene a joint SRG meeting to coordinate such advocacy.

NMFS Headquarters updates

SRG membership review

Schakner presented a brief update on SRG membership. He summarized information on SRG member term limits and procedures as outlined in [SRG Terms of Reference](#) and listed the current status of each AKSRG member’s appointment. Finally, he provided links to a [background ethics document](#) and a [summary of ethics rules for Special Government Employees](#), which SRG members are considered to be. O’Corry-Crowe acknowledged the contributions of long-time AKSRG member Mike Miller, who recently stepped down from the AKSRG, and emphasized that he will be missed.

Guidelines for Assessing Marine Mammal Stocks revision

Patterson provided context for the most recent revisions to the [Guidelines for Assessing Marine Mammal Stocks](#) (GAMMS) and summarized the process NMFS underwent to develop revisions and consider public input. He then summarized the substantive revisions, including:

- incorporating the “[MMPA Stock Policy](#);”
- updating the guidance related to calculating N_{MIN} by doing away with the 8-year “rule” (after which time N_{MIN} would have been considered unknown) and adding guidance for adjusting N_{MIN} to account for potential abundance changes that may have occurred since the last survey;
- updating guidance related to designating stocks as strategic;
- improving guidance on unobserved/cryptic mortality and serious injury (M/SI);
- updating guidance on climate change, habitat issues, prey, etc., in a revised “Other Factors...” section;
- clarifying peer-review expectations; and
- improving guidance on data sources/criteria used for documenting human-caused M/SI.

Patterson then discussed the plan for GAMMS IV implementation, including incorporating some changes into the 2023 SARs and future SARs as they are revised. He noted that the next GAMMS review will be February 2028 and will likely follow a similar process.

Doniol-Valcroze asked about the guidance related to abundance estimates older than 8 years and Patterson provided a few examples, such as using a time-series to project out both the abundance and uncertainty. Patterson clarified that the GAMMS do not provide a quantitative rule, but rather acknowledge increasing uncertainty in the estimate over time. Doniol-Valcroze noted that some of the Alaska SARs have an outdated N_{MIN} and asked about the plan for applying the revised GAMMS retroactively to existing SARs. Patterson replied that generating a new abundance estimate can be a big lift, and that NMFS plans to proceed with an iterative process in which NMFS determines the priorities for revising if the SAR is up for review. O’Corry-Crowe asked whether there are cases of finding no change in abundance when a new estimate was produced after 8 years. Patterson said he is not aware of anyone who has looked at that in detail, but it is a good question.

Williams asked for more information about designating stocks as strategic. Patterson summarized the overall guidance and briefly described how a strategic status determination could be conducted under one prong of the MPAA's strategic definition (section 3(19)(A), in which human-caused M/SI exceeds PBR). He noted that the approach considers all scenarios of whether there is complete or incomplete information for the stock’s range-wide abundance and human-caused M/SI.

Citta asked whether Alaska Native co-management partner review of pre-publication draft SARs was included in the GAMMS revisions and Patterson confirmed. Citta noted that the process for soliciting Alaska Native Organization (ANO) input needs improvement, such as incorporating it into co-management meetings, because email is insufficient for coordinating with people in remote Alaskan villages. Patterson said the GAMMS say that such coordination should be done but do not prescribe how it should happen. He expressed that it would likely be an iterative process that can be improved going forward.

Serious Injury Procedure revision

Patterson described the recent revisions to NMFS’ procedure for distinguishing serious from non-serious injury of marine mammals, which included:

- clarifying the injury determination process and reporting procedures,
- improving the overall readability,
- incorporating various edits to align with the revised GAMMS,
- refining and expanding existing small cetacean injury subcategories,
- developing new pinniped injury criteria, and
- developing new guidance on capture myopathy in marine mammals.

Humpback whale recovery planning

Patterson summarized the ongoing humpback whale recovery planning efforts. He provided background on the Endangered Species Act (ESA) listing of humpback whale distinct population segments (DPSs), the post-delisting management plan for DPSs that are no longer qualified for listing under the ESA, and current recovery planning efforts for the three listed DPSs in U.S. waters. The

agency is using a new 3-part recovery plan framework that includes a Recovery Status Review (a living document), the recovery plan (final document), and recovery implementation strategy (a living document) to make the process more nimble and able to keep certain parts updated without a formal updating process involving public comment and Federal Register notices. He summarized progress to date, the target timeline, and next steps, including recovery plan maintenance. Suzie Teerlink noted that the Recovery Status Review will be similar to the ESA 5-year review so it would be beneficial to review them together.

NMFS Marine Mammal Lab funding overview

Bengtson provided an overview of the MML fiscal year 2023 provisional budget. Bengtson noted that MML's priorities likely align with the AKSRG's, but MML is limited in what can be done based on available funding. He emphasized that the base allocation of funds has been relatively flat, despite increased costs. He presented a list of projects that are expected to be funded with MML's base allocation, projects that MML can only do if MML receives temporary federal money from within NMFS or reimbursable funds from other agencies like the Navy or BOEM, and projects that MML is unlikely to be able to do. He said that a lot of MML's research will focus on abundance and distribution because those data are needed for actions under ESA and the National Environmental Policy Act, but that MML is still not able to conduct all of the necessary abundance and monitoring studies.

Doniol-Valcroze asked about MML's criteria for prioritizing species (e.g., strategic stocks, stocks subject to subsistence harvest). Bengtson replied that some Congressional allocations are tied to specific projects or species, such as Cook Inlet belugas and Steller sea lions, and must be spent on those. Williams asked how the funds are initially appropriated to specific species. Bengtson and Patterson replied that various groups advocate for funds for different reasons; for example, a lot of the pressure to research Steller sea lions came from the fishing industry.

Teerlink noted that several of the projects are being considered for discretionary funding by the NMFS Alaska Regional Office (AKRO), and AKRO is working with MML to prioritize what AKRO can support.

NMFS Alaska Regional Office updates

Teerlink presented updates from AKRO. She noted that Jon Kurland is now the AKRO Regional Administrator and Anne-Marie Eich is the new head of the AKRO Protected Resources Division. She summarized some of their current work, including ESA section 7 formal consultations, responding to lawsuits, and progress working with NMFS Headquarters and AFSC on ESA and MMPA processes. These include humpback whale recovery planning and ESA 5-year review; the North Pacific right whale ESA 5-year review and 12-month finding in response to a petition to revise critical habitat; the Western North Pacific gray whale 5-year review and DPS analysis; and the conservation plan for northern fur seals. She noted AKRO hosted a deterrence workshop with Alaska fishermen to consider the effectiveness of deterrents. Lastly, she announced AKRO has a new tribal coordinator, Amilee Wilson.

Rea asked about the new tribal coordinator's role. Eich said Wilson will help organize tribal consultation meetings and ensure consistency for the Alaska Native partners. Teerlink added that AKRO will continue to have individual points of contact for each co-management agreement.

Donna Hauser asked for clarification on AKRO's and MML's roles in tribal consultations. Teerlink and Bengtson replied that AKRO has the formal lead in co-management and has staff points of contact for each agreement, and that MML has a similar arrangement with staff that go to the co-management meetings and conduct collaborative research with the ANOs. Eich noted that AFSC and AKR conduct Tribal Consultations separately but they communicate and coordinate to make sure the agency provides a consistent response and engagement. Wojciechowski highlighted the recent White House guidance on utilization of indigenous knowledge by federal agencies. Eich noted that there are efforts within NMFS to incorporate local, traditional, and subsistence information into projects.

SPLASH 2 update

Wade presented an update on the Structure of Populations, Levels of Abundance and Status of Humpback Whales 2 (SPLASH 2) project on behalf of principal investigators Jeff Moore (NMFS Southwest Fisheries Science Center) and John Calambokidis (Cascadia Research Collective) and the Steering Committee. He stated that the impetus for the project was the increased numbers of entanglements of two ESA-listed populations of humpback whales off the U.S. West Coast and the development of Happywhale.com, a large database of sightings from various sources (research and opportunistic) with automated photo-ID matching. The project is an international collaboration to update knowledge of North Pacific humpbacks, with goals to estimate total and regional abundance and population dynamics, better understand migration patterns, and better understand genetic structure. Wade noted that NOAA provided financial support via grants for fieldwork and Happywhale (getting photos into the database and matching including genetic integration). Additional activities include developing a mark-recapture estimate for the Central American population; conducting genetic analyses of migratory herds; resolving genetic structure of Central America and Mexico DPS whales and their geographic "boundaries;" and collaborative analysis with Happywhale, including developing new Pacific-wide abundance estimates. He noted that there is a lot coming out of this project despite very little funding.

O'Corry-Crowe and Wade discussed the differences between philopatry (return to birth location) and site fidelity (returning to areas consistently, but not necessarily birth location). O'Corry-Crowe stated that mitochondrial DNA differentiation and divergence of matrilineal lines over time indicate but do not prove philopatry, but that kinship analysis does and can be done with existing data. Wade thought it would be good to talk to Karen Martien (SWFSC) about such analyses for humpbacks.

Teerlink noted that humpback calves have a low probability of recapture but the Happywhale algorithm has been able to increase the probability. She also mentioned that AKRO supported a study linking genetically sampled humpbacks in SEAK to their known sighting histories and hopes the results will be available for the next AKSRG meeting.

Overview of AEWC & co-management program and activities

Alaska Eskimo Whaling Commission (AEWC) Chairman John Hopson, Jr. was unable to attend but sent his regards. Jenny Evans gave Hopson's planned presentation in his place. Evans explained that they are Alaska's First People, hunters, and stewards, and the Arctic has been the home of their ancestors for thousands of years. She noted the eleven AEWC whaling villages are located in some of the most remote areas of Alaska where subsistence hunting is essential to food security. She described

subsistence whaling as being of significant importance and a way of life for their people. She discussed the formation of the AEW in 1977 in response to the International Whaling Commission's (IWC) ban on subsistence hunting of bowhead whales, which she characterized as being based on inaccurate science regarding the health of the bowhead whale stock. Since 1977, through collaboration with the North Slope Borough, the AEW has developed an extensive bowhead whale scientific program built on a foundation of local knowledge. Evans summarized the roles of the IWC, the U.S. (through NOAA), and the AEW in the politics and regulation of subsistence whaling, noting that the AEW has carried out federal management and enforcement responsibilities, including ongoing compliance, under the authority delegated through the NOAA-AEW Cooperative Agreement. She discussed the AEW's role in implementing management, conducting bowhead research, and improving the quality and reliability of weapons used for harvesting. She emphasized that the AEW serves as an integral part of the U.S. efforts to carry out its international obligations as a member of the IWC, and the AEW's critical role in collecting data necessary to develop the bowhead whale SAR. She described the requirement for NOAA to provide co-management funding to ensure the AEW is able to carry out its responsibilities under the Agreement, but stated that the AEW must compete for limited species-specific grants, despite their communities relying on more than one species for food security. She also characterized the funding provided through the grant program as grossly insufficient relative to the AEW's obligation burden, accounting for only 20% of the AEW's operational budget. Evans concluded the presentation by thanking the AKSRG for inviting them to participate in the meeting.

Williams asked about the priority research areas important to community members and scientists. Evans clarified that the North Slope Borough Department of Wildlife Management does a lot of the bowhead whale research, but the AEW is regularly and increasingly approached by the research community with requests for consultations and funding.

Citta noted that there are upcoming deadlines imposed by the IWC, including renewal of the bowhead whale quota in 2024 and an implementation review at the IWC Scientific Committee meeting in 2025. He said the implementation review will determine if the stock is still within the parameters used to determine if the harvest is sustainable and will require updates on stock structure, genetics, abundance, distribution, health, and other topics. In addition, the next estimate of bowhead whale abundance must be reviewed and agreed upon by the IWC Scientific Committee by 2029. He explained that NOAA provides funding to the AEW to support meetings, but much of the meeting time is being used by scientists and oil and gas industry folks who seek AEW's input on their activities to make sure they do not conflict with whaling or disrupt the migration patterns and health of bowheads, with no financial compensation by those seeking consultation. Evans elaborated to say that the AEW has never been able to fund the minimal amount of co-management work through NOAA's fundings, and they have not included science in the requests to NOAA because funding for science would mean decreased funds for meetings and operational costs.

O'Corry-Crowe thanked Evans for her presentation and said it was good to be reminded of the tradition of subsistence hunting and its importance for food security. He noted that in addition to the increase in demands in time for consultation regarding research activities, there is also a similar increase in the amount of research that should be done, neither of which is being met by current funding and resources. Evans replied that the research is important, but the AEW does not feel that there is

sufficient management at the federal level to prevent duplicative projects from being done and they are trying to find ways to mitigate that. O'Corry-Crowe asked if she recommended that there be a streamlined project vetting process to prevent duplication and to be more efficient with AEWC's time. Evans affirmed, and said they need to find a way to keep the consultations efficient but meaningful. She noted that people come to AEWC meetings to do "one-stop shopping" in consultation but this is problematic because Commissioners represent 11 different villages and should not be responsible for going back and spreading the word for the scientists. She also said that, when asked, hunters give their time and expertise in traditional and local knowledge and they should be compensated. She stressed that the AEWC wants consultations to happen effectively and meaningfully, but they need to consider the time and financial burden to communities and hunters.

2023 SAR review and revision process/timeline & ANO involvement

Young summarized the timeline and procedures followed for the 2023 SARs. She noted that the draft 2023 SARs were developed while the draft 2022 SARs were still out for public comment, so the draft 2023 SARs may need to be adjusted depending on how the draft 2022 SARs are finalized. She then showed a slide from last year's AKSRG meeting that described new steps in the SAR development and review process, including first conducting and documenting a review to determine which SARs to revise; sharing the draft list with NMFS Headquarters, AKRO, and the AKSRG; and then moving forward with developing revisions to those SARs. Also, as previously requested by the AKSRG, MML developed a document summarizing key information on the strategic stocks that were reviewed but not revised in 2023; Doniol-Valcroze requested that the document include the stocks' PBR values to provide context for the updated human-caused mortality and serious injury (M/SI) information. The AKSRG also discussed whether MML intended for them to officially review the document and when that review should occur. Doniol-Valcroze suggested that the AKSRG review the list in the fall. Patterson suggested a short inter-sessional meeting.

Young also described the new step for ANO review of draft SARs for species subject to subsistence harvest. Due to internal delays, the draft 2023 SARs were not shared with ANOs until early March 2023, too late to receive and incorporate feedback before SARs were distributed to the AKSRG. Young noted that MML is still figuring out the process and timeline for meaningfully engaging the ANOs in SAR reviews and strives to do better next year.

Young noted that when MML shared the draft Eastern Chukchi Sea beluga whale draft SAR with the Alaska Beluga Whale Committee (ABWC) for their review, MML let them know that they were not revising the Bristol Bay beluga whale SAR this year despite the availability of an Alaska Department of Fish and Game (ADF&G) report with a new abundance estimate from a 2022 aerial survey. She indicated that Megan Ferguson would summarize the ABWC's comments and MML's scientific concerns in the next presentation.

Bristol Bay beluga whale abundance estimate

Ferguson summarized MML's consideration of the Bristol Bay beluga whale abundance estimate from ADF&G's 2022 aerial survey. She said the ADF&G abundance report used the same correction factors as were used in previous Bristol Bay beluga abundance estimates. The report was finalized as an

ABWC report (Quakenbush et al. 2022¹) and then transmitted by the ABWC to MML to update the Bristol Bay SAR. MML later notified the ABWC that they would not be updating the Bristol Bay beluga SAR in the 2023 SAR cycle because the new abundance estimate did not reflect new correction factors that MML and the ABWC recently developed for the Eastern Bering Sea (EBS) beluga aerial survey.

Ferguson summarized the ABWC's response that postponing revision of the SAR would not lead to a better correction factor and that the correction factor used in the Bristol Bay abundance analysis was at least as good as that used for Beaufort Sea and Eastern Chukchi Sea belugas. Ferguson presented information on the status of new abundance estimates for Beaufort Sea and Eastern Chukchi Sea belugas, both of which will incorporate new correction factors.

Quakenbush, the lead author of the Bristol Bay abundance report, said that the intent of the report was to use similar methods (and correction factors) as previous surveys so that the estimates could be compared to see if there was a trend. The group discussed that the report provided an estimate of relative abundance, but that the SAR ultimately needs an estimate of absolute abundance. Quakenbush noted that the survey data are available to be analyzed with improved correction factors, as needed.

Ferguson and the AKSRG discussed NMFS's concerns regarding the availability bias component that needs to be accounted for in an estimate of absolute abundance derived from the aerial survey data collected in 2022 and previous annual surveys in the series. Ferguson also presented information about ways to address calf detection bias. MML, Quakenbush, and Citta discussed the similarities in distribution and other factors leading to detection bias during visual aerial surveys for belugas in Bristol Bay and Cook Inlet; they suggested that lessons learned in Cook Inlet might improve future survey methods or estimates of absolute abundance for Bristol Bay belugas. Citta discussed the ABWC's concerns about the 2022 survey, which were focused not on the correction factors, but on the low number of replicates flown.

Angliss pointed out that MML needed to complete draft SARs quickly to send the drafts out for review by AKR and co-managers, and a nuanced conversation could not be had among NMFS, ADF&G, and ABWC fast enough to incorporate an accepted abundance estimate for Bristol Bay belugas derived from the new 2022 aerial survey data. She suggested that the AKSRG delay the detailed conversation about correction factors to a future time because we may need to do a deep dive on correction factors for this beluga stock. She said this should involve a conversation with ABWC and ADF&G, and then with the AKSRG potentially next year when MML would have the information incorporated into a SAR.

O'Corry-Crowe thanked Ferguson for her presentation and suggested that an AKSRG sub-committee or sub-group could be formed to articulate the strengths/weaknesses of the approaches so they are armed as a full group to assess estimates. Citta agreed that Angliss' suggestion about a deep dive is good. Angliss applauded Ferguson's work on Eastern Bering Sea belugas, which has informed issues regarding other beluga stocks. Angliss and Ferguson noted that field methods and analytical tools are

¹ Quakenbush, L., J. Olnes, and A. Bryan. 2022. 2022 Bristol Bay aerial surveys of beluga whales. Alaska Beluga Whale Committee Report 22-1, 11 pp.

always improving, and there are probably better ways of estimating abundance now than in the past. Doniol-Valcroze agreed this topic needs more lengthy conversations to come up with a way forward.

PacMAPPS cetacean abundance estimates

Alex Zerbini presented preliminary estimates of cetacean density and abundance from the Pacific Marine Assessment Program for Protected Species (PacMAPPS) 2021 survey. The survey was conducted in the eastern Gulf of Alaska shelf and slope aboard the research vessel *Oscar Dyson* in August 2021. The cruise report is available [online](#). Zerbini outlined the research objectives, highlighting that the survey was conducted using a double platform to allow assessment of the trackline detection probability ($g(0)$) for cetaceans. The study area consisted of two strata (coastal and slope), each with three sub-strata. The trackline was designed with equal spacing zig-zags (for uniform coverage probability) and both transect and transit lines were sampled. The survey was conducted in passing mode (i.e., the ship did not divert from the trackline to close in on sightings), with some exceptions. Zerbini presented preliminary estimates (with $g(0)=1$) for four species (humpback whale, fin whale, killer whale, and Dall's porpoise) but noted efforts are ongoing to compute abundance using mark-recapture distance sampling methods (independent platform, $g(0)<1$). Future work includes potentially pooling data across previous surveys to provide sufficient sample sizes for species not seen regularly during PacMAPPS 2021, and integrating sightings that were not identified to species into the estimate.

Kate Stafford asked why the survey was conducted using passing mode instead of closing mode. Zerbini responded that closing mode would have made it more difficult to cover the trackline in their limited survey time because of the need to divert the vessel. Doniol-Valcroze agreed that passing versus closing mode is a trade-off. Stafford followed up by asking about the proportion of unidentified versus identified large whales; Zerbini replied that there were 20 sightings of unidentified large whales and about 200 sightings of identified large whales.

Doniol-Valcroze congratulated Zerbini and his collaborators for conducting a well-planned, state-of-the-art survey. He asked whether the observers were fully independent, or whether the setup of the double platform might have allowed observers on the upper deck to see the people on the lower platform. Zerbini and Jessica Crance said that every attempt was made to make both decks acoustically and visually independent from one another.

Doniol-Valcroze asked how duplicate sightings between the platforms would be identified. Zerbini replied that some sightings were matched during the survey by a third party observer, and after the survey concluded, the sightings were reviewed to identify other potential matches by matching time, species, and group size. He noted that one way to estimate $g(0)$ is to split sightings into definite, probable, and possible matches to assess uncertainty in matching.

Williams thanked Zerbini for his work so far and said she looks forward to continued refinement of the estimates.

Draft SAR review: Eastern Steller sea lion

Rea summarized the draft SAR. She noted the subsistence harvest numbers are more than 10 years old and wondered if that could be improved. She also noted information on productivity rates and takes

on the Canadian side of this DPS are unavailable. Hauser agreed with Rea on older subsistence data. Rea said she heard from Mike Miller that there might be some under-reporting of harvest and there might be other ways of getting additional information.

Quakenbush noted on page 3, the sentence beginning with “The total number of western stock non-pups...” needs to be clarified.

The AKSRG discussed the mixing zone between the Eastern and Western stocks in Southeast Alaska. O’Corry-Crowe noted it is potentially a precedent-setting scenario for management and that it is rare to get geographically, evolutionarily, demographically different stocks forming a contact zone that may have its own dynamics. He said that until there is clarity on whether those animals are a new discrete group, or whether they are part of one of the existing stocks, we are trying to get an accounting of Eastern and Western stocks in the mixing area, which is a messy challenge. Citta noted that, while it is messy, the mixing is relatively small compared to the overall size of the Eastern stock.

Citta questioned how to consider the 517 western stock non-pups that presumably have pups and have settled in the area. O’Corry-Crowe replied that genetics have shown a proportion of the pups are mixed and that they are not remaining discrete. Citta asked if there is value in thinking about how to move forward with this scenario. O’Corry-Crowe replied that this is something we can start seeing as populations recover, these secondary contacts and local conditions and dynamics taking over. Williams noted this is also something we can expect with shifting distributions, and that we did not necessarily anticipate. She asked if there are other instances where this has occurred elsewhere and if there are any management precedents.

The group discussed that this secondary contact is a unique challenge. With recolonization of an area by multiple populations, if the area is geographically distinct and separate from other areas, then it would be easy to determine this is a new population from these other source populations. But with Steller sea lions, the mixing area is on the border of the two stocks as a continuum. It was noted that this might become apparent with sea otters, and harbor seals, both of which also contain separate stocks that are mingling.

Citta commented that there are a lot of sea lions within the overlap area (~10,000), and one option would be to consider this as its own management unit.

Doniol-Valcroze mentioned that counts from Canada, including new counts from 2017, might be available.² Katie Sweeney responded she will look into it.

Citta asked if O’Corry-Crowe has any recommendations for how to proceed. O’Corry-Crowe replied that the thinking within NMFS so far is: How ephemeral or permanent is this phenomenon? If these have been evolutionarily distinct meta-populations, do they occasionally have these periods of secondary contact? The mixing is localized in this contact zone now, but we will have to wait to see what happens, whether it stops and the two original populations remain, or the mixing spreads and the two stocks join

² Following the meeting, Doniol-Valcroze shared that counts in British Columbia (pups and non-pups) for 2017 are available in a 2021 DFO document: <https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/41003925.pdf>.

or a new stock is formed. Rea noted that it is not just a matter of genetics but also demographics and population trends too. She asked if there have been internal discussions yet about revisiting where the lines are drawn and how the DPSs are defined. Tom Gelatt responded that the samples this is based on were last collected in 2006, and there has been no support for new sample collection. For the dynamics of that area, the newest rookeries didn't even exist until the 1990s, so the genetic makeup of those areas is really unknown.

Rea noted that the population trends have changed a lot even within the western DPS. O'Corry-Crowe added that years ago distinctions of population response, gene flow and dispersal, and trend were determined at the demographic level within the U.S. portion of the Western stock. New information has come out recently about the relationship between the U.S. portion of the Western stock and Russia and Asia. They have noticed a distinct difference in genetics between rookeries within the U.S. Western stock that were in oceanic and continental regimes, which line up nicely with other attributes: trend, diet, and ecology. He said there may be indications of genetic differences between the U.S. portion of the western stock and Russian rookeries, yet they are all considered part of Western DPS. He suggested it may be time to revisit these bigger issues.

Patterson commented that the processes for reviewing DPS and stock structure and boundaries under the ESA and MMPA are different processes. Under the MMPA, the first step would be for AKR and AFSC to identify the need, and whether there is enough new information to reconsider boundaries or stock structure. It would then go through the process outlined in the MMPA stock policy, including scientific identification of demographically independent populations (DIPs) and consideration of whether to designate DIPs as separate stocks.

O'Corry-Crowe asked if we have detailed information on the movement of animals between continental rookeries and oceanic rookeries within the Western stock. Gelatt replied no and commented that the 517 western non-pups that have settled in the mixing zone is based on marked animals, not genetics, and relies on having a pool of marked animals. He said that if we only knew the genetics, we would not know the animals are moving. Further, he said that we do not have that information out west because we do not have enough marked animals. O'Corry-Crowe responded that the genetic differences we are finding between oceanic vs. continental within the Western stock are not at the scale of Eastern vs. Western, or for the Aleutian Islands and Russia.

Draft SAR review: Western Steller sea lion

O'Corry-Crowe summarized the changes in the draft SAR and said it still paints a grim picture out west. Beth Concepcion commented that this was one of the first SARs to include M/SI information from electronic monitoring and asked for clarification on where those takes are presented in the SAR's M/SI table and how the percent observer coverage was reported. Young agreed to look into this.

Concepcion and Sweeney discussed that Steller sea lions in the eastern Aleutian Islands area were increasing well and now may have stabilized, though there are large error bars on the last two estimates and this area was not surveyed in 2022. Concepcion noted that the fishery is having trouble finding Atka mackerel for the third year in the eastern Aleutians, and that the longline cod fleet has been going out to the Aleutian Islands more than they used to since ~2007/08 because the total

allowable catch (TAC) limits are higher there and typically not met compared to the Bering Sea, where TAC limits are low due to warm water bringing cod stocks down. She said it will be interesting to see how this plays out with more data, and if Steller sea lions continue to increase in certain areas where the fishing industry is not finding fish.

Sweeney commented that new survival data will be published soon and can be included in the next SAR update.

Draft SAR review: Bowhead whale

Bowhead whale abundance estimates

Ferguson presented the methods for developing a spatial density model to estimate abundance for Western Arctic bowhead whales based on the August 2019 aerial line-transect survey in the Beaufort Sea, as described in the paper submitted to the IWC Scientific Committee by Ferguson et al. (2022³). She explained that three abundance estimates were produced from 2019 data: two from the aerial survey (the spatial model and conventional methods) and one from the ice-based survey. The 2019 aerial estimate has not yet been published because Ferguson is working to address de-transformation bias, which, once addressed, is expected to increase the point estimate of abundance by roughly 2,000, although she characterized that as a very loose guess of the magnitude of the effect. Citta asked if the correction would change the coefficient of variation (CV) and Ferguson responded that de-transformation bias does not affect precision. Citta commented that the CV on the 2019 ice-based survey estimate was relatively high because they did not have acoustic monitoring in the same year, otherwise, the CV is expected to have been much lower.

Citta said he had previously reviewed Ferguson's bowhead analysis and had been concerned she could not tell the difference between deep-feeding and traveling whales during the aerial survey. However, he said that her response, demonstrating that dropping the behavioral structure from the analysis had very little effect on anything, convinced him that the estimate was robust. Doniol-Valcroze asked how activity states were assigned during aerial surveys. Ferguson said for deep feeding, they look for signs of echelon feeding, feces, and skim feeding at the surface; and they combine that with milling, which is defined as >1 animal with random orientation with respect to each other. Doniol-Valcroze asked if all of that can be determined from a single pass of the whale. Ferguson responded that the survey protocol involved circling almost all bowhead sightings unless there were safety issues or they were running out of daylight; circling the sightings provides a prolonged observation period and, in many cases, opportunities for taking photographs for further review.

O'Corry-Crowe asked how the new estimate affects the abundance trend. Ferguson showed a graph of the 1978-2019 aerial- and ice-based estimates and the trend line extended on its trajectory. She explained that both of the 2019 estimates fell below the trend line, but once she corrects for de-transformation bias, she expects the aerial-based estimate will likely fall on the trend line.

³ Ferguson, M. C., D. L. Miller, J. T. Clarke, et al.. 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 presented to the IWC Scientific Committee, May 2022.

After Ferguson's presentation concluded, Stafford summarized her review of the SAR. She noted that she came up with a different number for the inverse-variance weighted average of the ice- and aerial-based estimates when she ran it in MATLAB⁴. She emphasized that this is a healthy, well-managed population with recent, robust population estimates, and regardless of whether the 2019 ice- or aerial-based estimate is used, bowhead whales are in good shape with respect to the level of removals. Concepcion also reviewed the SAR and had no additional comments.

O'Corry-Crowe asked whether challenges identified with the ice-based survey (abnormal ice conditions and migration route that were not accounted for in the abundance estimate and likely resulted in an underestimate of abundance) could be overcome with the aerial survey. Citta responded yes, potentially, but both survey methods miss the proportion of the population that is not in the study area during the survey, resulting in unknowns.

Doniol-Valcroze asked if it would be better to use this new aerial estimate from the IWC paper instead of waiting for a newer estimate with correction for de-transformation bias. He and Ferguson agreed that once there is a revised estimate, it can be incorporated into the next SAR.

Patterson noted that when the SAR was being updated, NMFS had internal discussions about which estimate to use or to average them, but the agency is open to recommendations from the AKSRG. Ferguson reported that Geof Givens, author of the 2019 ice-based abundance estimate report⁵, said both the ice- and aerial-based estimates have biases and one is not better than the other, which argues for using the inverse-variance weighted average. Doniol-Valcroze noted that even if both methods had produced the exact same estimate with the same CV, inverse-variance weighted averaging decreases the CV, which increases PBR. He continued by noting that, for the particular case of bowhead abundance in 2019, because the estimates are similar and there are a lot of different types of information confirming this reflects the true population size, by inverse-variance weighted averaging them, the uncertainty is reduced, reinforcing our confidence that the estimate is in this range. Stafford asked if both estimates and their CVs, N_{MINS} and PBRs should be included. Patterson responded that it was discussed, but that one estimate is needed. Stafford noted that the IWC quota takes precedence over PBR.

Bengtson announced that MML is hoping to fly another aerial line-transect survey in the Beaufort Sea in 2025. He asked what MML should do if there is enough ice to do an ice-based survey and estimates from the two methods end up being quite different. Doniol-Valcroze answered that it is not because the 2019 estimates are similar that he is advocating to average them; indeed, if two methods produce quite different results, and if there is no good reason to say one is biased low or high because of something we can identify (in which case that estimate could be disregarded), then the best estimate is the inverse-variance weighted average of the two estimates, which increases the chance you are around the true value. Citta noted it would come down to the patterns you saw in your data; if there were

⁴ Following the meeting, Ferguson and Stafford reviewed the calculation and determined that the value in the draft SAR was correct.

⁵ Givens, G., J. C. George, R. Suydam, and B. Tudor. 2021a. Bering-Chukchi-Beaufort Seas bowhead whale (*Balaena mysticetus*) abundance estimate from the 2019 ice-based survey. *J. Cetac. Res. Manage.* 22(1):61-73. <https://doi.org/10.47536/jcrm.v22i1.230>

drastically different results, we could figure out why that might be and make an intelligent decision about what to do. The group discussed that the SAR includes text that the ice-based estimate is low, and that text needs to be added to explain that the aerial estimate is also thought to be biased low and the factors contributing to that bias.

Draft SAR review: Sato's beaked whale

Young explained that the AKSRG reviewed the new Sato's beaked whale SAR at their meeting in 2022 but it was not included in the draft 2022 SARs that were released for public review because NMFS leadership determined that the agency first needed to document its stock designation evaluation in accordance with NMFS' stock policy. She noted that the draft 2023 SAR is largely unchanged from the version the AKSRG reviewed last year. AKSRG members had only a brief discussion of the SAR. Concepcion requested a revision to text in the Status of Stock section to clarify that all *Berardius* species beaked whales are included in Appendix I under the Convention on International Trade in Endangered Species of Wild Fauna and Flora, and not just Sato's beaked whale.

Progress toward new bycatch estimation method

Brian Brost, a statistician at MML, described his progress in developing a new model to estimate marine mammal bycatch in Alaska fisheries. He characterized his model as a simple model-based version of the ratio estimator, as he did not want to make too many analytical changes at once. He specified that there is a separate model to produce a separate estimate for each of the 49 marine mammal/fishery combinations. Observed bycatch in a stratum in year "t" is a proportion of total bycatch as determined by observer coverage, and the total bycatch for a year is a sum of strata-level estimates. Brost added a random effect for the year, allowing inter-annual variation in bycatch and providing the ability to share information across years.

Brost showed an example of annual bycatch for ringed seals in the Bering Sea Aleutian Islands flatfish trawl fishery, with observed bycatch, model-based estimates, and ratio-based estimates. In that case, the fishery had high coverage so there was not much to estimate and observed and modeled estimates were very similar. Another example, eastern Steller sea lion bycatch in the Gulf of Alaska sablefish longline fishery, which has 10-20% observer coverage, illustrated more differences between the ratio- and model-based estimates. In years with no observed bycatch, the ratio estimates and variances are zero, while the model-based estimates are low but greater than zero. In the model, there is some acknowledgement that bycatch can occur in years with no observed bycatch, because it has occurred previously and observer coverage is fairly low so there is some probability of bycatch in the unobserved portion of the fleet. In the two years that observed bycatch occurred, the ratio-based estimates were relatively high; the model-based estimate is less volatile because sharing information across years moderates it.

Doniol-Valcroze asked where variance comes from in the ratio-based estimate. Brost said it is a complicated formula and did not know it off hand. Doniol-Valcroze added that in the ratio-based estimate, information from one year does not inform other years. Brost agreed and said that was why he decided to add the random effect variable to the model.

Williams asked whether the time period used varied by fishery. Brost replied that he generally used all available data going back to 2012, but differences in fisheries over time would need to be considered.

Brost showed a comparison of model- vs. ratio-based estimates across all species, fisheries, and year. He highlighted the handful of cases where the ratio-based estimates were higher than the model-based estimates, and the larger number of cases where the ratio-based estimate was zero but the model-based estimate was greater than zero. Brost said it was the same story when looking at 5-year averages: the model-based average estimates were less extreme than the average ratio-based estimate but most confidence intervals overlap, except when there were zero observed mortalities. Brost also showed another way of looking at the 5-year averages, with a figure showing the probability of bycatch exceeding a certain number of individuals. For example, the probability of bycatch exceeding 0 Steller sea lions in each of the five year periods is 100%, but there is a lower probability of bycatch exceeding the higher number. He suggested this might be a way of assessing the risk of commercial fisheries to marine mammals.

Brost wrapped up his presentation by indicating the highest priority items in his to-do list, including a thorough checking of model adequacy with more sophisticated diagnostics; investigating the few models that did not converge (3 to 4 models, all involving the Gulf of Alaska halibut longline fishery, which has very low observer coverage); and incorporating additional bycatch events, such as those on unobserved hauls or bycatch that is not detected until offload. Brost said that these bycatch events are not currently factored into the analysis because there are no associated haul weights (which are needed for calculating observer coverage). Young clarified how some of those additional bycatch events are currently included in the SARs.

Citta asked if Brost considered simulation trials to explore when ratio estimators might perform better than a hierarchical model, such as years with unusually high observed bycatch (in which the model-based estimator would “dampen” the effect). Brost replied that he had not considered simulations to explore scenarios like that and thought Citta’s concern was valid. He noted, however, that there is quite a bit of flexibility in the random effect variable, so the variance term on the random effect should, in theory, inflate to accommodate those situations.

Doniol-Valcroze said that the approach is great and demonstrates good progress. He suggested a beta binomial to allow for variance to be higher if bycatch is generally rare but, when it happens, a large number of animals are taken, such as if the events are correlated. Brost said he was thinking about an over-dispersed Poisson process as a starting point, but either one could be an option. He also noted that it would be easy to code for zero-inflation over-dispersion.

Doniol-Valcroze asked whether it would be good to report a range of M/SI, instead of the point estimate, in the SARs to compare to PBR. Brost said that CVs are reported, though that is not an easily interpretable metric. He stated that he thought variance and confidence intervals are just as important as point estimates, even though it might be more difficult to deal with a range of plausible values. Doniol-Valcroze thought it would be helpful to include them, even if they are only used qualitatively.

Williams said that she appreciates the approach and that it represents an advancement for the SARs. She asked if he would be able to consider the behavioral aspect of interactions, such as a different likelihood of interaction for sperm whales and killer whales that are depredating from the gear. Brost said he had not thought about this and asked whether she thought it was not reflected in the observed bycatch, or if she was asking to model interactions more broadly, not just mortalities. Williams replied that it should be captured in the mortality rate, but it is something to think about if he ever does a deep dive on interactions and how that is related to the likelihood of mortality.

Quakenbush noted that it is unlikely that a killer whale mortality on longline gear would be observed but she has seen stranded killer whales with hooks in their stomachs. She asked how those stranding data make it back into the SARs. Teerlink said AKRO reviews stranding reports and makes determination of the fishery involved where possible. She also noted that AKRO and the West Coast Regional Office will soon finalize a gear guide that compiles all they know about what fishery gear looks like, to better inform the determinations of fisheries associated with strandings.

Concepcion commented that there is bias associated with the number of interactions (not just mortalities) reported by observers, based on the level of observer coverage. For example, her fleet carries two observers on every vessel and observers are specifically requested to record marine mammal data as a high priority. She said you would expect there to be more reports of interactions with her fleet than in a fishery with no or lower observer coverage where marine mammal interaction reporting is not as high a priority.

USFWS updates

Patrick Lemons provided updates on USFWS-managed species, beginning with the Northern sea otter. He summarized the boundaries of the three Alaska stocks and the management units within the Southwest stock and then provided an update on completed, ongoing, and upcoming research activities for each stock. Williams asked for additional information about the research to understand otter interactions with mariculture activities. Lemons replied that the interactions mainly involve otters destroying gear and taking products, and fishermen shooting them in retaliation. He said he thought it was likely that fishermen were unaware of their options for deterring otters, so there is a need for two-way education to understand where and how many interactions are occurring and what can be done.

Lemons presented sea otter harvest records by stock from 2013-2022 from data collected through the Marking, Tagging, and Reporting Program (MTRP). He described the harvest of the Southwest and Southcentral stocks as generally stable, while the harvest of the Southeast stock had an unusually large increase in the early years of the time period, though it has since decreased and largely stabilized. He noted that the increase in the Southeast coincided with the introduction of the "bounty bill" in the State Senate that incentivized harvest, though the bounty never went into place, as well as efforts in Sitka to promote traditional practices associated with sea otter harvest. Rea asked how much the level of reporting has to do with the differences in trends. Lemons replied that USFWS does not have a good idea of the level of under-reporting in sea otters (or polar bears), and said they tried to be explicit about this uncertainty in the SAR. Lemons noted that various factors can affect the level of under-reporting, including the number of enforcement actions and the frequency of community visits by MTRP employees, so he is hesitant to say whether under-reporting is consistent across regions.

Lemons then moved to Pacific walrus, beginning with a map of stock definition and range. He said they are a very large, mixed population that move throughout the range. The only differentiation that occurs is in the summer when most adult males stay in the Bering on land-based haulouts, though recent surveys indicate there may be some transition occurring, as more adult males were spotted in the Chukchi Sea in the summer. With sea ice changes, there is speculation that previously distinct breeding aggregations are becoming more continuous. Lemons summarized abundance estimates from aerial surveys conducted with Russian colleagues (1975-2006) and a genetic mark-recapture study (Beatty et al. 2022⁶). Lemons advised that trend should not be inferred from the estimates given differences in survey techniques and biases in the aerial survey estimates. However, he said that researchers found a large (~55%), multi-decadal decline has likely occurred since the 1980s and may still be occurring, though at a lower rate of decline (Taylor and Udevitz 2015⁷, Taylor et al. 2018⁸). He said that the early part of the decline was likely due to overharvesting, but it is unknown whether recent declines in sea ice could be having an impact on the population.

Lemons showed a graph of harvest data, which is the bulk of the human-caused removals, but noted that the graph does not include deaths on coastal haulouts, which are arguably humans caused (e.g., disturbances causing stampedes). He reported that USFWS no longer has communications with Russian colleagues due to the current geopolitical situation, so the agency is likely to be limited in getting Russian harvest data going forward. Lemons then described the walrus harvest monitoring program conducted on St. Lawrence Island, where the most harvest has occurred in recent years. He noted that there are incentives to tag harvested animals through the mark tagging reporting program (e.g., animals must be tagged to be sold for ivory) so there is high compliance, and it is unclear whether it is appropriate to apply the rates from St. Lawrence Island to other areas across the state.

Lemons summarized the future outlook for walrus conservation and management, including dependence on coastal haulouts, where large aggregations lead to a high risk of stampedes and increased calf mortality. Lemons said USFWS tried to account for this in the SAR but noted that carcass counts from the beach represent only a portion of actual mortalities. He said that USFWS is working with local communities, mainly Pt. Lay, to protect haulouts and minimize disturbances, and is working to build and support co-management partnerships with the Eskimo Walrus Commission to ensure harvests remain sustainable.

Hauser asked about the funding to support harvest monitoring work. Lemons replied that his office spends a substantial amount of their discretionary funds on that, with the support of their Regional Director. Additionally, based on advocacy by Mike Miller, Katya Gray, and others, Congress funded a line item to continue efforts to set up self-determination harvest management.

⁶ Beatty, W. S., P. R. Lemons, J. P. Everett, et al. 2021. Estimating Pacific walrus abundance and survival with multievent mark-recapture models. *Mar. Ecol. Prog. Ser.* 697:167-182. <https://doi.org/10.3354/meps14131>

⁷ Taylor, R. L. and M. S. Udevitz. 2015. Demography of the Pacific walrus (*Odobenus rosmarus divergens*): 1974–2006. *Mar. Mamm. Sci.* 31(1):231-254. <https://doi.org/10.1111/mms.12156>

⁸ Taylor, R. L., M. S. Udevitz, C. V. Jay, et al. 2018. Demography of the Pacific walrus (*Odobenus rosmarus divergens*) in a changing Arctic. *Mar. Mamm. Sci.* 34(1):54-86. <https://doi.org/10.1111/mms.12434>

Citta asked for clarification on whether there is a higher proportion of cows with calves that are hauling out in Russia. Lemons said the haulouts are not new, but recently walrus have been hauling out for longer durations of time and in larger aggregations in both the U.S. and Russia. Lemons said that, for example, the Cape Serdtse-Kamen' haulout stretched for 14 km, and it is suspected that nearly the entire population shows up there in the fall. Quakenbush noted that Tony Fischbach (United States Geological Survey, USGS) has reviewed satellite imagery showing more walrus at Cape Serdtse-Kamen' than the entire population estimate. O'Corry-Crowe asked if there was an abundance estimate from that haulout. Lemons said there is ongoing work to count walrus on coastal haulouts from satellite imagery, but it is unclear how to account for animals that are in the water. He noted that USGS had published⁹ such an analysis for Pt. Lay using satellite tags to get occupancy rates. O'Corry-Crowe asked for clarification on the timing of when different sex and age classes occupied different areas. Lemons said that walrus are not generally in the Beaufort Sea, mostly in the Chukchi Sea. In early fall (August/September) haulouts are largely adult females and dependent young, but at some point in fall, males move from the Bering Sea to the Chukchi Sea (or Bering Strait). It is speculated that they stage off Cape Lisburne and the entire population moves to the southeast Chukchi and haulouts in Russia, where they stay until the ice forces them out in December/January. Lemons noted that it is too risky to fly over the very large haulouts in Russia, but Fischbach's work using satellite images shows a lot of potential because it does not disturb the animals.

Lemons then summarized research and management activities that are completed, ongoing, and upcoming, including SAR updates, population assessments, co-management activities, protection of coastal habitats, and an upcoming update to the Species Status Assessment.

Wojciechowski asked whether subsistence take estimates have improved over time given the USFWS' relationship with the Eskimo Walrus Commission (EWC) and 30 years of the MTRP. Lemons said that trying to link reporting levels with the changing relationship with hunters on St. Lawrence Island would be difficult, given other variables that affect reporting. He also said there is no general trend in the reporting rate in the MTRP, which can range from 30% to 80% year to year. He also noted that USFWS does not have a presence in the community year-round and reporting is likely to be higher in the month their staff are there.

Wojciechowski asked about rates of natural mortality in the pack ice versus on coastal haulouts. Lemons replied that it is difficult to separate disturbance-related mortalities from natural mortalities of calves, but there is likely much less mortality on the ice compared to coastal haulouts.

Eric Regehr commended the USFWS and USGS for their genetic capture-recapture study. He noted that the potential magnitude of negative bias in the new abundance estimate due to permanent and temporary emigration is very large, given large-scale seasonal directional movements that can occur. He suggested there might be value in trying to incorporate radio telemetry into the analysis to account for these movements. Regehr then asked whether polar bear predation and disturbance is likely going to be more significant going forward. Finally, he commended USFWS for their work with co-managers

⁹ Fischbach, A. S., R. L. Taylor, and C. V. Jay. 2022. Regional walrus abundance estimate in the United States Chukchi Sea in autumn. *J. Wildl. Manage.* 86(6):e22256. <https://doi.org/10.1002/jwmg.22256>

and their pursuit of less western management based approaches to sustainability and harvest. Lemons said that during the first two years of the 2013-2014 survey cruise, they did put out satellite radio telemetry tags but could not get enough information to use alongside genetics to answer that question. He thought Bill Beatty (lead author of the 2022 abundance publication) had looked at within- and across-year capture probability and found higher rates of recapture within the same year. Though there were small sample sizes, there did not appear to be a problem with permanent emigration out of the U.S., and animals were mixing at a higher rate than was previously thought. Finally, Lemons noted that bear-related disturbance is occurring due to both polar bears and brown bears.

Lemons then moved on to polar bears, beginning by summarizing polar bear range and the two stocks under U.S. jurisdiction (Southern Beaufort Sea, Chukchi-Bering Sea), recent and ongoing conservation and management activities (including a species status assessment, ESA 5-year review, and SAR revisions). He noted that USFWS will coordinate with the AKSRG to try to ensure the next AKSRG meeting overlaps with the public comment period for the revised polar bear SARs. Lemons presented polar bear harvest state-wide (not specific to stock), showing a general decline in harvest that is likely an actual reduction in harvest, not just a decline in reporting. He also summarized completed, ongoing, and upcoming research and monitoring activities and publications.

Williams asked AKSRG members to hold their questions for Lemons until the SAR reviews.

Draft SAR review: North Pacific right whale

Williams characterized the SAR as really well written, thorough, and digestible. She noted that there were not very many substantive changes other than incorporation of information from two new publications. She flagged that there are still large gaps in knowledge about North Pacific right whales, such as overwintering locations and migration routes, but she appreciates the information that is included in the SAR. She specifically called out the “Other Factors That May Be Causing a Decline or Impeding Recovery” section, noting that while we do not have much information on vessel strikes and entanglements of North Pacific right whales, data on North Atlantic right whales suggests that it is likely an issue. She questioned whether the R_{MAX} of 4% was unrealistically high. Patterson replied that NMFS generally uses the default values unless stock-specific information is available, but suggested the AKSRG could make a recommendation for the value in this SAR. Doniol-Valcroze stated that, in this specific situation, changing the R_{MAX} would not change the PBR value much because the estimated abundance is so low.

Stafford asked SAR author Jessica Crance whether the North Pacific right whale seen in Monterey Bay last month was matched to the photo-ID catalog. Crance replied that there should be an answer very shortly, but initial indications are that there is no match.¹⁰

Williams asked about evidence to support a distinction between the Gulf of Alaska and the Bering Sea. Crance said that the separation is still a hypothesis but it is based on the lack of photo matches between the two areas.

¹⁰ Following the meeting, Crance confirmed that the whale was not able to be matched to the catalog but was not confirmed as a new individual.

Doniol-Valcroze requested a revision to Figure 2 to label consistently the two recent sightings in British Columbia. He asked Crance whether there was enough data to generate a new population estimate. Crance said MML is looking into whether they can use photo data from recent years and both resights and new sightings to get a new updated estimate, but noted the low resight rate. Doniol-Valcroze acknowledged that the resight rate is low but the fact that 8 out of 18 recent sightings were of new individuals is potentially good news for the population.

Draft SAR review: Eastern Chukchi Sea beluga whale

Ferguson gave a brief update about the NMFS effort she is leading to investigate whether there is a demographically independent population (DIP) of beluga whales in Kotzebue Sound. She noted that if NMFS identifies a DIP, there is a subsequent internal process for determining whether it should be designated as a stock. She said that the effort began about a year ago and the internal working group has considered various sources of information including genetics, seasonality of beluga harvest, sightings, acoustics, and satellite telemetry. Ferguson also highlighted the group's meeting with O'Corry-Crowe to discuss his 2021 paper¹¹ and said the meeting resulted in a list of additional information that could be collected to better understand the ecology of belugas in the Kotzebue Sound area. She outlined next steps involving developing DIP evaluation documentation, meeting with the ABWC Executive Committee (May 2023), considering options for Tribal consultation, and updating the AKSRG to raise potential assessment issues.

Stafford asked about Yakutat belugas. O'Corry-Crowe said his work identified a genetically distinct resident group in Yakutat that probably would be considered demographically independent. He said NMFS asked how viable and long term that small (~20) group of whales is, which requires more information to answer. Citta asked what the next closest related genetic stock is, and O'Corry-Crowe responded it is Cook Inlet and that Yakutat belugas are currently considered to be part of the Cook Inlet stock.

Ferguson summarized the ABWC's comments on the Eastern Chukchi Sea (ECS) beluga whale SAR, since their comments had not been addressed in the version of the SAR that was shared with the AKSRG. Ferguson said MML thinks the comments are reasonable and plans to incorporate them into the SAR version that will go out for public review. Angliss said MML expects to respond to the ABWC's comments via an email from Bengtson with a copy of the revised SAR.

Doniol-Valcroze pointed out that it would be better to refer to a peer-reviewed primary publication rather than an unpublished IWC report (replace Givens et al. 2019 with Givens et al. 2020¹²), noting that the lower CV would change the PBR through N_{MIN} . Ferguson agreed and committed to updating the draft SAR to reflect this.

¹¹ O'Corry-Crowe, G., T. Ferrer, J. J. Citta, et al. Genetic history and stock identity of beluga whales in Kotzebue Sound. *Polar Res.* 40(S1). <https://doi.org/10.33265/polar.v40.7623>

¹² Givens, G. H., M. C. Ferguson, J. T. Clarke, et al. 2020. Abundance of the Eastern Chukchi Sea stock of beluga whales, 2012-17. *Arctic* 73(4):485-498. <https://doi.org/10.14430/arctic71592>

Citta said the ABWC has never combined the Kotzebue Sound beluga harvest with ECS harvest and has considered Kotzebue Sound belugas to be a separate population for many years. He asked if Kotzebue Sound belugas have always been included in the ECS SAR. Angliss responded that ABWC provides harvest data by village and then NMFS has to assign stock; in the past, belugas harvested in Kotzebue were assigned to the ECS stock because that seemed like the most likely case.

Hauser questioned Table 1 and associated text in the SAR regarding which months and villages are being attributed to the ECS stock. She asked which months make up spring and summer, and which of those are included in Table 1. Citta stated it is unclear which stocks are actually being harvested in Utqiaġvik. Genetic samples have been sent to O’Corry-Crowe for analysis. Samples analyzed so far indicate the ECS stock but the harvest may also include some Beaufort Sea belugas.

Referencing the Fisheries Information section of the SAR, Citta commented that the only commercial fishery is in Kotzebue Sound, which he thinks is for the fish species, Dolly Varden. He said there used to be a small commercial fishery in Kaktovik long ago.

Wojciechowski noted that the status of current science vs. the discussion of potentially designating Kotzebue Sound belugas as their own DIP and stock should be made clear in the SAR. Citta said the current science says there is no evidence ECS belugas are being harvested in Kotzebue Sound, but the identity of harvested whales is unknown, because most harvested whales are not sampled. O’Corry-Crowe added that the only clear, consistent piece of data is that the belugas harvested in the Kotzebue Sound area have never been from the ECS stock.

Doniol-Valcroze suggested adding a second map to the SAR that would be more detailed and zoomed in on the survey area because there is a substantial discussion of beluga movements in the SAR text. He also expressed concern that only the most recent (and largest) abundance estimate is used in the SAR despite a fairly rich time-series for this stock. He noted that if we had an increasing or decreasing population that is well documented with a good time series, it would make sense to use the latest estimate, but this SAR says there is no trend. He suggested that there might be ways to use model estimates or an average estimate that gives less weight to older estimates but gives a more realistic view than just reporting the newest estimate. He noted that the SAR has a paragraph about the assumptions behind the survey approach and asked whether violation of the assumptions could explain the big differences in abundance estimates. Ferguson said the study area is only a fraction of the range during that time of year. Doniol-Valcroze commented that in other SARs, we do not extrapolate to unsurveyed areas if we only have surveyed a portion of the range, but that could be included as justification for why only the newest estimate is used.

Hauser commented on the overlap between the Beaufort and Chukchi belugas in the survey area in July and August and suggested adding text to the SAR about data from Lowry et al. (2017) regarding percentages of time whales were outside the study area as justification that the Chukchi abundance could be underestimated. She also noted new information that could help justify that more recently tagged Beaufort Sea animals were not within the ECS beluga study area. Hauser asked if there are new genetic samples and analyses from whales harvested in Utqiaġvik, Wainwright, Nuiqsut, and Kaktovik. She noted that July/August whales from Utqiaġvik would be really interesting to look at for the

overlap of the two stocks. O’Corry-Crowe responded that analysis lags behind sample collection, but when they get some from summer, mainly in Utqiagvik/Kaktovik, they are a mix of stocks, which should temper our enthusiasm that all Beaufort animals have gone. He said they have not analyzed a lot of animals from Wainwright, which really needs to be done. Citta said harvest at Wainwright has been increasing and we need to figure out how to collect samples from there. Citta noted that satellite tagging occurs in just one place for each stock at more or less the same time of year, and relatively few tags last more than one year; therefore, if there is stock structure of ECS and Beaufort Sea stocks in the northeastern Chukchi and western Beaufort seas during July and August, we might not see it. O’Corry-Crowe noted how that shows the value of collecting samples in coastal communities throughout the season. Citta reported that the North Slope Borough secured funds to do a close-kin mark-recapture estimate for ECS belugas, and will be pursuing that in the next few years.

Hauser commented that the new name for the “Habitat Concerns” section, “Other Factors That May Be Causing a Decline or Impeding Recovery,” may not be appropriate for stocks not known to be in decline. Young explained that the new heading reflects guidance in the revised GAMMS and is common across all SARs, but MML could explore adding clarifying text to that section of the SAR, particularly for non-strategic stocks.

Overview of ADF&G Marine Mammal Program

Quakenbush began her presentation by outlining the structure of the ADF&G Marine Mammal Program, including the state-wide marine mammal program, the Gulf and Bering program, and the Arctic program. She summarized the Arctic program’s research projects, funding sources, and publications on ice seals, bowhead and beluga whales, walruses, and polar bears. Ice seal projects include biological and harvest monitoring, movements and habitat use via telemetry, and winter distribution of ringed seals using dog surveys. Bowhead research includes movements and behavior via telemetry. Beluga projects support ABWC priorities of telemetry, sampling for genetics and diet, and Bristol Bay aerial surveys. Walrus projects have included biomonitoring, sex-age composition, and movements using telemetry. Polar bear research includes developing eDNA methods to recover and genotype DNA from pawprints in snow for use in genetic mark-recapture studies. Quakenbush also highlighted efforts to include indigenous and local knowledge whenever possible to augment what is known about marine mammals in Alaska. She then described the Gulf and Bering program’s current research topics, including Steller sea lion population response to the Gulf of Alaska marine heatwave, the association of Steller sea lion adult female mortality with foraging and health in the face of the marine heatwave, estimating Steller sea lion ages using crossbow remote biopsies, reducing Steller sea lion catch depredation and entanglement, and characterizing the association of marine mammals with increasing kelp and shellfish mariculture in Alaska. Finally, she summarized the state-wide group’s studies on Cook Inlet beluga whales, walruses, polar bears, and sea otters. She concluded by noting that ADF&G sets their research priorities by trying to find gaps in what other agencies are doing or what ADF&G can do based on their skills and local knowledge, focusing mainly on subsistence-harvested species, and that finding funding for their program and research can be challenging.

Draft SAR review: Pacific walrus

Wojciechowski presented the SAR and its changes. She asked the AKSRG to discuss the continued use of 0.5 for the recovery factor (F_R), given that this is not an ESA-listed species and there has been

no increase in subsistence harvest. She also asked to discuss the reduction in R_{MAX} from 8% to 6% since the last SAR.

Citta commented that he does not have a problem with saying the stock is strategic but it looks strange when the N_{MIN} is nearly double the previous estimate. He also noted that it is unclear why R_{MAX} decreased and that if it hadn't changed, that alone would have made the stock non-strategic. He also said that the SAR reports that harvest appears to be sustainable and declining, but when harvest exceeds PBR, by definition you are saying that it is not sustainable.

Lemons said the R_{MAX} section probably needs to be revised to clarify the justification for the reduction to 6%, and urged the AKSRG to comment on that. Regarding mortality data, he said that the previous SAR did not account for haulout mortality, which is largely due to human disturbance, but it is accounted for in the draft SAR. Therefore, while harvest has not changed much, total human-caused removals exceed PBR. Lemons explained that the PBR is also affected by the change in the F_R to account for various uncertainties, such as whether the estimate of harvest reporting from St. Lawrence Island is representative of the whole state (because there is some thought that reporting is lower in other areas), or what proportion of total deaths are represented in the beach carcass counts.

Regehr commented the SAR was great, easy to follow, and incorporates good new information. He said that it seemed silly to call a stock strategic when known take is only 1.6% of total abundance, despite the biases in estimates, and emphasized that PBR is not necessarily a measure of sustainability. He suggested the SAR should be really clear about what went into the determinations for setting the factors in the PBR calculation. He also suggested that USFWS add even stronger caveats or qualifiers about not comparing abundance estimates. He repeated his concerns about the bias in the capture-recapture abundance estimate but acknowledged that is discussed in the 2022 paper. Regehr also commented on the apparent poor reporting and said he was surprised about the struck and lost correction factor. He noted that the many uncertainties in sources of mortality may be confounded going forward, and asked whether that should be reflected in R_{MAX} or F_R , or in some other way.

O'Corry-Crowe asked about the current status of listing walrus under the ESA. Lemons replied that in 2017 USFWS arrived at a "not warranted" finding, but they are being litigated and the finding could change in a settlement agreement.

O'Corry-Crowe asked whether the current abundance estimate is still an underestimate. Lemons replied that he thinks the discussion section of Beatty et al. (2022) says the abundance estimate is likely reflective of the broader population, which Lemons interprets as meaning it is not negatively biased. He noted that Beatty et al. (2022) anchor the statement on the idea that their analysis used a 1:1 sex ratio of adult males to adult females, which is debated in the literature, and may represent an overestimate of males and may compensate for any negative biases from emigration issues Regehr previously brought up.

Quakenbush asked whether the USFWS had discussed the change in strategic status with the EWC. Lemons said that the stock was also strategic in the previous SAR. In the previous SAR, there was strong evidence that the abundance estimate was negatively biased, but harvest exceeded PBR so the

stock was automatically considered strategic. Lemons said that USFWS is looking for feedback in accounting for uncertainty and bias by factoring it into the F_R . He also noted that PBR may not be the best measure of sustainability but they do not have a harvest risk assessment model for walrus like they do for polar bears.

Regehr discussed the ramifications of the political situation in Russia and how detrimental it can be to the conservation of walrus and other transboundary stocks. He noted that the Treasury Department has issued guidance that allows continued interactions between non-governmental organizations and suggested it could be important to further develop and implement non-governmental channels for collaboration. He asked if the AKSRG could call attention to this issue and provide some level of encouragement to continue opportunities for our countries to work together.

Citta said struck and lost rates are high and old, and asked whether USFWS has plans to update them. Lemons replied that hunters believe the current rate is an overestimate, but he said it would be difficult to update the numbers because you would need a way to collect the information without hunters knowing it is being collected so they continue to hunt in their usual way.

The AKSRG circled back to discuss the F_R value and the reasons for choosing 0.5. Lemons noted the lack of specific guidance on this topic beyond what is in Wade (1998¹³), and Patterson suggested that USFWS could look at Wade's test simulations and bias trials to see if they apply. He also suggested that they could run simulations themselves or do some "back calculations" similar to what is in NMFS' revised GAMMS to test out different recovery factors.

Doniol-Valcroze, O'Corry-Crowe, and Regehr discussed how various uncertainties are taken into account in other factors in the PBR equation, such as accounting for uncertainty in the abundance estimate by using N_{MIN} . Doniol-Valcroze also noted that the recovery factor in the previous SAR was 0.5 because it was a candidate species for ESA listing, but it is no longer a candidate species, which could be an argument for reconsidering the F_R . Lemons noted that if USFWS changes the F_R in response to public comments (including AKSRG and MMC comments) and that changes the stock's status, they may need to put the SAR out for public comment again.

Regehr said he has struggled with the ambiguity in guidance regarding the F_R and its huge range (from 0.1 to 1). He suggested that the F_R is the place where risk tolerance can be expressed, such as risk of overexploitation or risk of unnecessarily limiting subsistence harvest. He noted that there is some subjectivity and ability to broaden the types of risks being concerned and adjust accordingly.

Draft SAR review: Northern sea otter, Southwest stock

Hauser gave an overview of the SAR. She said that the SAR mentioned new genetic data from Flannery et al. (2021¹⁴) and asked how that might affect Alaska sea otter stock differentiation. More

¹³ Wade, P. R. 1998. Calculating limits to the allowable human-caused mortality of cetaceans and pinnipeds. *Mar. Mamm. Sci.* 14(1):1-37. <https://doi.org/10.1111/j.1748-7692.1998.tb00688.x>

¹⁴ Flannery, B. G., O. L. Russ, M. L. St. Martin, et al. 2022. Genetic variation in sea otters (*Enhydra lutris*) from the North Pacific with relevance to the threatened Southwest Alaska Distinct Population Segment. *Mar. Mamm. Sci.* 38(3):853-1301. <https://doi.org/10.1111/mms.12899>

specifically to the Southwest SAR, she noted differences in the frequency, timing, and methods of surveys within the management units (MUs), and raised the question of whether it is appropriate to determine total abundance and trend of the stock as a whole by combining information across MUs. She also commented that the SAR discusses a few R_{MAX} values from the literature but it is not clear which one ended up being used, so she suggested the text specify that. Additionally, she requested the AKSRG discuss which F_R value should be used.

Doniol-Valcroze commented that, given complexity of the data sources and difficulty in surveying those areas, the abundance estimates are as good as they can be. He noted that the SAR authors calculated an N_{MIN} for each MU and then added them together since they could not calculate a global CV, but the authors took the opposite approach in the Southcentral SAR, where they developed a global abundance estimate and CV and calculated N_{MIN} from that. He said that the approach for the Southwest stock is slightly more conservative but it only makes a small difference, and while he is not concerned about the different approaches, it is just an inconsistency across the two SARs. Paul Schuette said USFWS staff had internal discussions about developing a global CV for the Southwest stock but could not come up with a rational way to combine them. He commented that USFWS is trying to move toward an integrated population model to bring all the data into one model to account for different approaches used and get better estimates of overall trend. Schuette also said that it might be possible to optimize survey design so they are not trying to survey the entire range all at once.

O’Corry-Crowe said that the SAR was well written and the issue of MUs and different survey methodologies is transparent. He asked if USFWS is considering whether there might be more stocks within the Southwest stock, because some of the genetic differences are striking. Lemons said that they have not talked seriously about this explicitly because they do not have the bandwidth for it right now, but it is something they could consider at another time. Doniol-Valcroze noted that even within some MUs, there are likely sub-regions with different trajectories, and it is not clear at which scale the otters should be managed. He suggested that information could be added to the SAR to give a sense of how mortality is distributed across MUs, because mortality concentrated in one area could cause local depletion even if the overall PBR is not exceeded. Schuette characterized human-caused mortality and serious injury as mostly (~90%) occurring around Kodiak; Doniol-Valcroze said this was good news because that is the largest of the populations, and suggested adding even a qualitative statement to the SAR about having checked for the distribution of mortality and that it does not seem to be a concern.

O’Corry-Crowe asked whether the MUs were defined under the ESA. Lemons confirmed and described how they were originally identified, noting that the units generally line up with the genetic data that were collected and analyzed much later.

The AKSRG discussed the stock’s F_R . Hauser summarized the SAR’s rationale that it was originally set as 0.5 (the default for an ESA threatened species) and lowered to 0.4 to account for additional uncertainty and negative biases in human-caused mortality and difficulty in identifying trends. Patterson noted that there is a table in a paper by Taylor et al. (2003¹⁵) that may provide additional guidance on

¹⁵ Taylor, B. L., M. Scott, J. E. Heyning, and J. Barlow. 2003. Suggested guidelines for recovery factors for endangered marine mammals under the Marine Mammal Protection Act. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-SWFSC-354, 5 p. <https://repository.library.noaa.gov/view/noaa/3702>

setting the F_R . Lemons acknowledged that the justification in the SAR could be improved. Doniol-Valcroze suggested citing studies to better support it. He also said that the biases and uncertainties for sea otters are not accounted for anywhere else in the PBR equation, and asked whether reducing the F_R from 0.5 to 0.4 is enough to account for the biases. Schuette noted that there is likely always going to be some subjectivity involved in selecting the F_R . Regehr reiterated a comment from the earlier Pacific walrus SAR discussion that it would be more transparent and useful to put uncertainty “in the right box” by correcting for uncertainty in the relevant element itself, to the extent possible. For example, this could mean correcting the mortality estimate to address concerns about unreported mortality, rather than folding the uncertainty into the F_R , which is completely unrelated analytically. He said that this would also avoid obfuscating or hiding the information need. Lemons requested that the AKSRG provide recommendations on how to make such corrections, particularly for correcting harvest data. Regehr suggested the SAR be transparent and just say we do not know what unreported mortality is. Hauser noted that there were also important uncertainties in fisheries mortality data. Williams suggested the AKSRG or subcommittee should take some time to formulate some concrete recommendations. Doniol-Valcroze noted that he is not opposed to a 0.4 F_R but it might be considered arbitrary, and would also be comfortable using 0.5. Citta said it is not clear how much uncertainty you are actually accounting for by reducing the F_R by 0.1, but overall he praised the SAR for being clear in laying out the uncertainties.

Draft SAR review: Northern sea otter, Southcentral

Citta summarized the Southcentral sea otter SAR and mentioned that many of the issues discussed for the Southwest stock are also applicable to the other sea otter SARs, such as lowering the F_R to account for biases associated with human-caused mortality rates and harvest. He asked whether there was potential stock structure within the Southcentral stock that is not being accounted for. O’Corry-Crowe and Lemons replied that genetic analyses found that the Southwest/Southcentral stock boundary is not inconsistent with the genetics data, but the question of substructure within the Southcentral stock is not as clear. Lemons noted that there is a different dynamic in Southcentral compared to the Southwest, because the Southcentral coastline is not linear, like the big round area of Prince William Sound, and animals can move around more easily in all directions. He said the genetic structuring is not as strong within Southcentral as it is in the Southwest. Lemons mentioned that demographics could also be used to evaluate stock structure. Citta noted that, at least for the survey areas, the Southcentral stock is stable or growing; Lemons confirmed.

Doniol-Valcroze commented that the F_R for both the Southwest and Southcentral stocks were reduced to account for uncertainties, but the change in the F_R for the Southcentral stock (reduced by 25%) was greater than for the Southwest stock (reduced by 20%, from 0.5 to 0.4). This suggests that there is higher uncertainty or biases for the Southcentral stock than for the Southwest stock, which does not seem accurate. He suggested using a higher F_R for the Southcentral stock or a lower one for the Southwest stock. Patterson noted that while the decrease in the F_R is greater for the Southcentral stock, the Southcentral F_R value itself is still higher than the new F_R for the Southwest stock. Doniol-Valcroze asked whether the actual F_R value is more important than the difference from the default for that stock. Lemons replied that USFWS considered the relative change in F_R from the default starting point, not absolute change, and used a similar relative change (~20%) because the biases in mortality estimates are likely similar across stocks. Regehr reiterated a previous comment that, rather than

“back-dooring” the accounting for uncertainties and biases in the F_R , USFWS should instead produce a straightforward PBR and then describe the bias in the mortality estimate and what that could mean for the stock’s status.

Lemons, Patterson, and the AKSRG briefly discussed whether PBR is the most appropriate metric for determining the sustainability of subsistence harvest. They considered whether PBR was originally intended to be applied to subsistence harvest, the statutory requirement to use PBR to assess stock status relative to total human-caused mortality and serious injury, and the MMPA provision that section 117 (which deals with SARs) shall not affect or modify the exemptions for Alaska Native harvest. Patterson agreed to share NMFS’s response to a relevant recommendation from the AKSRG in 2022 with Lemons.

Doniol-Valcroze noted that a new R_{MAX} of 0.29 used in all three sea otter SARs comes from a recent paper by Eisaguirre et al. (2021¹⁶). He said the R_{MAX} was estimated specifically for the Southeast stock and that the authors made a case that the high value is plausible given certain conducive conditions in SEAK. He asked whether those conditions also apply to the other stocks, as support for using the same R_{MAX} . Schuette said the new R_{MAX} was used in all three SARs because it was the most current information. Doniol-Valcroze said that in general the intrinsic growth rate should be a species-wide value, but raised this question because in the past the AKSRG has needed strong justification for deviating from default or previous values, and because the paper being cited as the source of the number is very specific to the conditions in SEAK. Patterson said species- versus stock-specific R_{MAX} values may be addressed in a future GAMMS revision. AKSRG members did not develop a specific recommendation regarding the use of 0.29 as the R_{MAX} for the Southcentral and Southwest SARs, but Williams suggested that SAR authors use the best available information even if it is not specific to that stock, and they can reevaluate if more information becomes available for the stock in the future. Lemons said it is important to be objective and clear in the SAR about using the Southeast-specific number for the Southcentral and Southwest stocks.

Draft SAR review: Northern sea otter, Southeast

Citta noted that this SAR has the same issue as the other otter SARs in terms of accounting for uncertainty in the harvest rate via the F_R and suggested some thought be given to that. He commented that the R_{MAX} is stock-specific so there is no issue with that. He said that the population is increasing, even if harvest is substantially negatively biased, and does not think there is a conservation concern. Citta thanked USFWS for writing a clear SAR and said he liked the spatio-temporal model and the plans for sampling on a regular basis.

Lemons asked the AKSRG to comment if they think USFWS missed the mark on calculating the F_R . For the Southeast stock specifically, they did not take into account concerns about the sustainability of the harvest in setting the F_R , but rather took into account the biases associated with their estimates of human-caused mortality. He said for this SAR they started at $F_R=1$ and then adjusted based on the direction and magnitude of biases associated with the various estimates of human-caused mortality.

¹⁶ Eisaguirre, J. M., P. J. Williams, X. Lu, et al. 2021. Diffusion modeling reveals effects of multiple release sites and human activity on a recolonizing apex predator. *Mov. Ecol.* 9:34. <https://doi.org/10.1186/s40462-021-00270-w>

Citta said he does not think that was the wrong approach, and said he looks at the trend data as a mental check, as it would ring warning bells if you concluded that harvest was unsustainable and the trends are still declining. Lemons noted that trend is incorporated into the F_R as well, at least in the thought process, and requested the AKSRG comment if they thought that was not clear in the SAR.

Doniol-Valcroze agreed the logic for the F_R was sound. Lemons reminded the AKSRG that this was the first time USFWS was trying to use the F_R to account for biases, where they previously just used the benchmarks (e.g., threatened species get $F_R=0.5$). He said they would appreciate any comments on this, particularly given that the polar bear SARs are being revised next year.

Williams thanked Lemons and Schuette for their work and dedication.

Charlie Hamilton asked how the AKSRG plans to share comments on the draft SARs. He also noted that the AKSRG discussed some larger issues with the SARs that will need to be addressed over time and may not necessarily be addressed in the final SARs this year, and so he requested that the AKSRG differentiate their bigger picture comments from their specific comments. Williams responded that she expects the AKSRG would provide comments on individual SARs in track changes and a formal letter that will cover the bigger picture issues, and will aim to share those before USFWS' comment deadline. Hamilton agreed to provide Microsoft Word versions of the USFWS draft SARs for Young to distribute to the AKSRG.

Closing remarks

Given timing issues, the planned presentation by Amelia Brower and Young on fisheries effort and marine mammal range mapping was skipped. Closing remarks of the meeting were shared. AKSRG members then met in a closed session to discuss their recommendations, consider the election of a new Chair, and determine potential dates and location for the next meeting.