Minutes for the
Pacific Scientific Review Group Meeting
12-14 March 2024

The 34th meeting of the Pacific Scientific Review Group (SRG) was held at the Southwest Fisheries Science Center in La Jolla, CA. All Pacific SRG members participated in the meeting except Lars Bejder: Robin Baird, Scott Baker, Simone Baumann-Pickering, John Brandon, Doug DeMaster, Chris Free, Matt Leslie, Leslie New, Tim Tinker, and Leigh Torres. Doug DeMaster served as Chair of the SRG, Laura McCue facilitated the meeting, and Jim Carretta, Tracy Mercer, Kym Yano, and Janelle Badger served as rapporteurs. The attending SRG members and other participants are listed in Appendix A, the agenda of the meeting is in Appendix B, and the documents are listed in Appendix C.

Opening remarks and welcome were given from Southwest Fisheries Science Center (SWFSC)'s Director, Kristen Koch. She summarized new PSRG membership and changes to NOAA Fisheries' staff. Koch then summarized Inflation Reduction Act (IRA) funding support initiatives and some of the highlights of her Center's research and products.

National Topics

Ethics Briefing

DOC attorney Ken Hagans reviewed the ethics requirements for Special Government Employees (SGEs), which are defined as those that conduct temporary government service not to exceed 130 days during any period of 365 days. SGE definition includes those who serve "without compensation." SGEs are required to complete ethics program requirements and training. SGEs should not participate if it could raise a conflict of interest.

Doug DeMaster thanked Ken. Robin Baird asked about SRG members submitting public comments on proposed rules or stock assessments published by NMFS, to which Hagans replied that it would not be a conflict as long as non-public knowledge that was obtained as an SRG member is not used; as a public citizen you have the right to make comments.

Pacific SRG Updates, Joint SRG Meeting, Stock Policy, and Humpback Whale Recovery Planning Updates

Zac Schakner from NMFS Office of Science and Technology (OST) reviewed the SRG code of conduct requirements and provided an update on Pacific SRG membership, including new members Robin Baird, Chris Free, and Leigh Torres, and the status of other members' terms limits.

Eric Patterson from NMFS Office of Protected Resources (OPR) provided an update on the status of the NMFS stock policy, which was established in 2019 and is up for review. He confirmed the policy will be complementary to the Guidelines for Establishing Marine Mammal Stock (GAMMS), and that working groups will be assigned to examine any needed changes, which will be shared with the 3 regional SRGs.

Patterson then updated the SRG on the plans for the joint SRG meeting, which is scheduled for February or March 2025 in Seattle, WA. He informed the SRG that the meeting will have a heavy focus on implementing GAMMS, but a tentative list of subjects includes SRG reviews of stock assessment reports (SARs), outdated N_{min} values, transboundary stocks, methods comparison for estimating bycatch and

abundance surveys, precision vs resource trade-offs for abundance estimation, defaults for recovery factor and R_{max}, electronic monitoring, stock designation / structure, and cryptic mortality. He requested that the PSRG identify 3 weeks within a time window that would work for them for dates, and he will coordinate with other regional SRGs.

DeMaster asked about funding priorities for Species In The Spotlight (SITS), and how it works in relation to SRG priorities. Patterson noted there is a process (such as for Rice's whale) to be designated as a SITS, but the connection in setting overall priorities in the Agency for conservation and building partnerships for the species' recovery varies.

Patterson reviewed Endangered Species Act (ESA) listing of humpback whale distinct population segments (DPSs). He provided a brief update on the recovery plan framework and background on the DPS listings. He then summarized the updates since last year's Pacific SRG meeting, which included updates on the recovery status review, recovery plan, recovery implementation strategy, and the 5-year reviews. Patterson highlighted the engagement efforts with partners in the states and territories and with Alaska Natives and Tribes.

Leigh Torres asked how the ESA process intertwines with incidental take permits for U.S. West Coast fisheries. Kristy Long of NMFS Office of Protected Resources (OPR) noted that incidental take permit is specific to Dungeness crab fisheries, and actions to include proposed incidental takes for humpbacks, blue whales, and other cetacean species in other fisheries will be much broader.

Matt Leslie asked about international outreach / coordination regarding the transboundary stocks. Long noted that there is engagement with the (International Whaling Commission (IWC) on transboundary stocks and breeding areas, and they hope to engage with international colleagues more during the peer review process of the recovery plan.

Coordination of the 3 Science Centers

Sharon Melin from the Alaska Fisheries Science Center (AFSC) provided an overview on the assessment responsibilities for the AFSC, SWFSC, and Northwest Fisheries Science Centers (NWFSC). She reviewed a brief history of the stock assessment responsibilities going back to the 1970s through today for pinnipeds and cetaceans. Melin gave an overview of the coordination and planning that the Centers had with other offices, agencies, and researchers on the different species. Finally, she outlined the benefits of a cross-Center approach to stock assessments.

DeMaster asked about funding priorities for the 3 Centers when resources are limited because there is an overlap in responsibilities. Melin explained that the 3 Centers work together to determine how to complete surveys and gave the harbor porpoise as an example. Koch added that the 3 Center Directors delegate the responsibility to the division-level leadership and that Directors will be involved in the coordination only if particular needs cannot be solved at the division level. She also noted that resources (like vessels) are shared and it depends on how vessel availability and funding vary. Inflation Reduction Act (IRA) funding is benefitting all West Coast centers regarding marine mammal survey work. Jeff Moore of SWFSC noted that external funding (e.g., Bureau of Ocean Energy Management (BOEM)) has been more important in recent years. Koch noted that we have educated BOEM about the needs for our large-scale surveys, while providing BOEM with data for smaller regions of interest / action.

DeMaster asked if there was support from OPR, to which Koch noted much of that is allocated to fisheries-related work.

Alaska Fisheries Science Center Updates

California Current Ecosystem Program (CCEP) Updates

Melin reviewed AFSC budget, staffing, and research priorities and 2023 field work accomplishments. These include range-wide aerial surveys for northern elephant seal (NES) abundance; population abundance and demographic studies of California sea lions and northern fur seals; estimates of Pacific Coast Feeding Group (PCFG) gray whale abundance and artificial intelligence (AI) workflow for gray whale individual photo-identification (ID); and progress on SAR reproducibility using R-markdown / Quarto. For the NES SAR, they used a new approach developed by Condit et al. 2022, using a single survey timed to peak adult female census window to enumerate adult females, apply a correction factor based on survey data and rookery, and multiply corrected adult females x fecundity rate to estimate total population size. While this approach is a more efficient use of resources, a weakness of this approach is that the fecundity rate of 0.975 is based on the Ano Nuevo colony in the 1970s and 1980s because no other fecundity data are available, however this may not be accurate across all colonies 30 years later. For the California stock northern fur seal stock assessment including San Miguel Island (SMI) and Farallon Islands, they used pup counts x correction factor of 4 to estimate a population size of approximately 19,000, which is a 39.8% increase from 2013. Using the default R_{max} of 12%, the potential biological removal (PBR) was 527. Melin then described the 2024 research plans, which include Pacific harbor seal OR/WA outer coast, Eastern DPS Steller sea lion (SSL) WA/OR/CA, and California sea lion abundance surveys. They are also monitoring for avian influenza and health and condition status, noting a few cases in WA harbor seals, but no other west coast pinnipeds, estimating age-specific survival rates for CA/OR/WA Eastern DPS of SSL through 2021 and will evaluate environmental covariates on the survival rates. They also plan to develop an integrated population model for CA sea lions for use in the stock assessment. Melin then explained how they are analyzing genetics of Guadalupe fur seals colonizing SMI, because they suspect there may be hybridization with CA sea lions. Melin provided a review of planned surveys for all pinnipeds through 2026, and that a 5-year survey schedule is proposed to faciliate monitoring of climate change impacts. She noted some current projects may impact species, like offshore wind development may alter foraging areas offshore, and potential coastal impacts from infrastructure development may impact haulout, breeding and movements. Finally, Melin noted international collaboration with colleagues in Mexico for Guadalupe fur seal research.

Baird asked about correction factors based on older research and how interannual variability (marine heat waves) may be impacting the results of assuming these correction factors are still useful. Melin responded that there is not a lot of tagging data to estimate survival and fecundity in recent years at any of the colonies, but colleagues at UC Santa Cruz plan to update survival and fecundity rates for the Año Nuevo population soon. We are not sure how that will relate to the larger colonies like San Miguel and San Nicolas. There are currently no plans due to lack of staff and funding to take on tagging in the Channel Islands. In addition, the Farallon Islands stopped monitoring their elephant seal population due to loss of their funding. She noted that while these are challenges and there are issues because of them, elephant seals have a robust population that indicates that fecundity rates are likely high. Melin noted that there is one tagging study in the Channel Islands but the researcher that holds the data has not published the data and is not interested in sharing the data at this time.

Tim Tinker asked if other data types that may be less costly to assess pinnipeds, such as beach surveys to estimate variability in fecundity. Tinker gave the example of San Simeon elephant seals as a potential data source. Melin noted that the colonies in the Channel Islands are significantly larger making this logistically difficult but there may be data on southern elephant seals that could be useful analogs, but

there is currently no support for these as proxies. She will ask colleagues working at the data from Año Nuevo if they have tried other methods in a smaller colony. She noted that elephant seals are not a high priority and there is less funding to research them because they have such a robust population.

John Brandon asked about Farallon Islands fur seals and if there are other studies ongoing. Melin affirmed that tagging/abundance, isotope and diet studies are being looked at. They also hope to do unmanned aerial systems (UAS) surveys to assess distribution and abundance, but they are a challenge due to overlap with nesting birds. Diet study results show that these animals are largely eating squid, but they are still working on the sample analysis.

Leslie New asked about outdated fecundity correction factors and whether or not fecundity patterns in other pinniped species could be examined to investigate variation and assumptions in the context of a sensitivity analysis. Simone Baumann-Pickering followed up noting that while NES population is doing reasonably well, what about the sensitivity of peak presence (used as current survey strategy) assumptions to estimate abundance, given climate change (i.e. are the times of peak abundance changing over time?). Melin responded that index sites are being monitored, and modeling of curves of rookeries over time shows movement of the peak presence. She noted that as long as they survey between Jan 23 - Jan 30, they should cover peak period, but over time it may shift. The timing of elephant seal arrivals is more impacted by what happens in the winter when they are pregnant and foraging in the North Pacific ocean, so large scale changes in the North Pacific Ocean likely will impact their phenology.

Leigh Torres asked about the PCFG gray whale data used for abundance estimation, which is spatially and temporally patchy, which can impact the mark-recapture estimates of abundance. Melin noted that compared to historic surveys, the data are getting much better regarding spatial and temporal coverage in recent years. Implementing a saw-tooth survey pattern to capture the increased offshore distribution of the PCFG gray whales has helped, and added that the use of UAS has helped to increase geographic range of surveys. Melin noted an increase in PCFG gray whale presence in Alaska.

Washington harbor seal abundance estimates and the new modeling approach

Casey Clark, from the WA Department of Fish and Wildlife (DFW), provided an update on the trends and status of harbor seals in WA based on aerial surveys. He explained that there is a reanalysis of harbor seal abundance estimation available for Hood Canal, Washington Coast, Southern Puget Sound, and the Northern Inland Waters stocks. Staci Amburgey, also from WA DFW, reviewed the state space models for population growth model. A literature review of other pinniped species helped inform the new priors used in the models. Estimated and derived parameters include 20th percentile (N_{min}), carrying capacity (K), maximum net productivity level (MNPL), and optimum sustainable population (OSP). New model parameters fall within the old logistic growth model parameters presented at the 2023 Pacific SRG meeting. Overall results did not change appreciably though the method is more-nuanced. Clark then reviewed the harbor seal results by stock, some of which appear to be within OSP range (N. Inland Waters, Southern Puget Sound, Hood Canal). New results appear to show continued growth in the Southern Puget Sound stock, which is a different result from the logistic growth model; WA Coast stock is much larger than others, but no estimate of carrying capacity (K) is provided; and three inland water stocks are considered to be within OSP.

Tinker suggested that the observer model (using negative binomial) could be improved via having the surveys with higher precision contribute more to the overall model. New then asked

why they did not take advantage of state space modeling approaches to model the observation process. She noted that as a result, the observation process is oversimplified using the negative binomial. Amburgey responded that they tried to leverage what the Huber and London models had for correction factors and that the aerial surveys varied over time, so this was their way to try to correct counts. She agreed to move the model forward into a singular unified process, but noted that the conclusions will likely stay the same.

Chris Free asked about the model fit and if it may be sensitive to short-term changes. Amburgey stated that they balanced the model to try to account for variation over time. Free noted that a stock-specific z-parameter may help to assess the carrying capacity issue.

Baird reiterated that there are perils with reliance upon old correction factors, with a point that stocks that are at/near carrying capacity may be more likely to have individuals (or a larger percentage of animals) that disperse and result in undetected changes to older attendance correction factors. Clark responded that they plan to use flipper mounted spot tags to give better understanding of haul out factors and that they will also double-instrument some seals with back mounted tags, which should give a good representation of different haul out patterns.

New reiterated the importance of examining additional models that do not 'force' populations toward K.

Southwest Fisheries Science Center Updates

Science Overview

Dave Weller gave an overview of the SWFSC Marine Mammal and Turtle Division. He reported there are about 30 federal employees in the Division (mammals and turtles combined) and he reviewed accomplishments in the past year, annual priorities in the present year and notable recent publications. Weller also highlighted challenges the Division faces as related to persistent flat-budget funding levels in tandem with increasing costs which has required reliance on external partnerships (e.g., BOEM) to accomplish mandated science (e.g., stock assessments). Further, staffing is declining, with an approximate backfill ratio of 1 replacement to 3 departures. Other challenges noted include: tuning mission scope to fit climate driven shifting baselines, a growing need for monitoring first of its kind offshore wind energy development activities off the West Coast and instability of scheduling and securing NOAA ships and planes for assessment surveys. Emerging data collection directions in the Division include use of beyond visual line of sight (BVLOS) drone operations and glider-based passive acoustic monitoring.

DeMaster noted that the Division also provides critical advisory roles to the IWC, with a particularly important role with gray whales and the Makah Marine Mammal Protection Act (MMPA) waiver request.

Preview to the 2024 CA Current marine mammal assessment survey

Moore from SWFSC provided a preview of the California current cetacean ecosystem and assessment survey (CalCurCEAS) 2024 U.S. west coast EEZ cruise, which is supported by BOEM and NOAA (MMTD + IRA funds). The survey will include line and strip-transect using

passive acoustic deployments, large-whale photo ID and biopsy, UAS studies, and passive acoustics glider research and development. He noted there will be 120 survey days between July 24 – Dec 5. The products will include updated estimates of abundance and trends and updated species distribution models to support wind energy assessments. The cost of the cruise is about $1.2 million (contracts, grants, equipment, analyses), plus $3.7 million for a chartered vessel. The proposed survey grid has evolved and will have an offshore and inshore strata. The inshore stratum is important to utilize high-density DASBR clusters in wind energy development areas and maximize photo-ID of such important stocks as humpback whales.

Scott Baker asked about small-boat deployment from the large vessel, to which Moore responded that they will conduct photo ID from both the ship and from small boats.

SPLASH 2 and Update on mark-recapture analyses of West Coast pops of humpbacks and blue whales

John Calambokidis from Cascadia Research Collective, Moore, and Alex Curtis from SWFSC presented on the SPLASH-2 project and updates on mark-recapture analyses of humpback and blue whales. SPLASH-2 began some years ago to examine Pacific basin-wide ecology of humpbacks. The goals are to study North Pacific humpbacks and better assess how the various DPSs / stocks are impacted by anthropogenic sources of mortality and serious injury (MSI). Grants have been awarded for regional sampling on wintering areas and for data preparation and uploading to Happywhale (an automated photo ID matching service). Calambokidis presented updated information on abundance research for humpback and blue whales. The IWC has a comprehensive assessment for North Pacific humpbacks developing new integrated population models. The examination of time-of-arrival into breeding areas will help to differentiate DPSs. Results show that early arrivals (Oct – Dec) to Nayarit breeding areas is comprised almost exclusively of whales from CA feedings areas, with very few from other feeding areas. A new publication shows that beginning in mid-2010s, there has been a decline in humpbacks going to Hawai‘i breeding areas. A new element in the data is an increase in sightings of whales feeding in Alaska that are also showing up in California. About 1-2% of whales off CA-OR have also been seen in AK in recent years. Calambokidis noted agreement in species density models (SDM) and long-term estimate trends for humpbacks, but an opposite pattern for blue whales. A change in the distribution of blue whales may explain some of this disagreement and collaborative work by Cascadia with the University of St Andrews (PhD student Georgie Whittome) and Oregon State University using satellite tagging may help to address this issue. In addition, surveys are being conducted by Cascadia to assess the entanglement risk of humpbacks with pot-trap fisheries along the U.S. West Coast and to inform decisions on the California commercial Dungeness crab fishery timing. New biologically important feeding areas (BIAs) for humpbacks and blue whales were recently published and are available, based on a combination of the SDM work from Becker et al. (2020), home-range studies from tags deployed by OSU, and Cascadia sighting information (Calambokidis et al. 2024).

Curtis presented updates on mark-recapture analyses of DPS mixtures of humpbacks along the U.S West Coast. The proportions of humpback whale DPSs at different latitudes are needed to assess impacts of human-caused MSI. One strategy includes using capture probabilities off feeding and wintering areas to assess proportion of whales at a given latitude attributable to a

given DPS. Curtis noted the next steps for DPS assignment are to stratify by season, explore use of sightings vs individuals, and to use Monte Carlo simulations to characterize uncertainty. Other work includes updates to Central America DPS/herd abundance, which is currently in progress.

Update on genetic assignment of humpback whales to migratory herds using nuclear SNP loci

Karen Martien from SWFSC reviewed the migratory herd concept. She explained that the goals are to characterize herds using a large panel of nuclear loci, assess genetic differentiation and demographic independence of herds, provide genetic assignment of feeding-area samples to herd, and compare herds that share a wintering area to determine if substantial breeding occurs on migration. Preliminary results use 562 samples in the current dataset with 326 SNP loci, and show significant Fst values (high degree of differentiation) comparing stocks to wintering areas. Martien noted that the next steps will include continued QA/QC and analyzing the data to estimate the magnitude of differentiation, conducting an assignment test for the two west coast herds, and incorporate mtDNA data.

S. Baker asked for clarification of whether the samples represent individuals that are confirmed to be photographed on specific feeding and breeding areas, to which Martien confirmed they are.

Calambokidis asked if Martien is able to supplement low sample size for some herds. Martien responded that she is not able to do so at this time, but would like to do that in future, which would include getting more samples from areas of low sample size for analysis. She noted however that lab work has been challenging and there hasn't been available funding and staff support.

Update on epigenetic age estimation of MHI false killer whales

Martien presented on epigenetic age estimation of Main Hawaiian Islands (MHI) false killer whales. The goal is to develop an age-estimation model for false killer whales using methylation data from animals with uncertain age estimates. This is done by training sample of known-aged animals by using two approaches: LASSO regression using package *glmnet*, or to develop a Bayesian model that takes into account uncertainty in age and methylation estimates and reflects uncertainty in the age estimates. LASSO regression only uses the point estimate (age.best) for each sample, and the predictive power is assessed using leave-one-out cross validation. Although the median age error is about 5 years off target, a distribution of predicted minus age.best shows some extreme values up to +/- 20 yrs off 'known; ages. Martien summarized the results that showed that the regression-based clock is performing well, with accuracy for high-confidence samples similar to that for species with traditional "known age" samples, and the Bayesian clock performs well for all samples with moderate confidence (= 3 or 4), but there's a major offset for samples with high confidence. She noted the next steps include tweaking some priors, particularly the intercept; changing how methylation is modeled; and reevaluating convergence.

S. Baker wanted to know how many loci sites are involved, to which Martien explained that the same data are going into both models (n=8).

Free asked about how the range in age.min and age.max impacts the confidence in the estimated ages. Martien responded that the residuals seem to imply that older individuals could be driving the results.

Jay Barlow (audience member) asked if the 14 animals that were being sampled twice were being used in any special way in the analysis. Martien said that they are not being used in any different way. Barlow noted that the known-age differences in these samples could inform the slope of the model.

A member of the audience noted that younger animals may introduce more errors, given that the mean age is much smaller. Another comment from the public suggested log-transforming the ages and potential use of random forests to predict the ages.

SWFSC genetics updates

Martien provided general genetics updates, beginning with long-beaked common dolphins. A paper was submitted that describes long-beaked common dolphin as a separate species (*Delphinus bairdii*), based on morphology. There is also a new killer whale paper by Morin et al. that delineates Bigg's and resident ecotype killer whales as separate species. She also updated the SRG on gray whale skin microbiome and epigenetics processes, and that the cetacean genomes project is ongoing (they are trying to get complete genomes for as many species as possible). Martien then provided an update on Central Mexico Humpback herd affiliation that evaluated what the ranges of the Central America and Mexico wintering aggregations are, which extend northward to include the states of Oaxaca and Guerrero, with some animals extending even farther north.

S. Baker asked how replicate individuals seen in multiple strata were handled (Central America and mainland Mexico in particular). Martien responded that due to a lack of nuclear data, duplicates could not be excluded. But photo-ID data were used to remove replicates otherwise.

A simulation approach for setting case-specific estimates of Fr for PBR estimation

Moore presented a simulation-based approach for setting values of a recovery factor (Fr) for calculating PBR. He reviewed why we use the 20th percentile of the distribution of abundance for calculating PBR, which is because this value for N_{min} is roughly the level where we have a 95% chance of maintaining populations at MNPL, given assumptions like survey frequency, no bias or uncertainty in R_{max}, precise removal estimates, and others. He explained that the 0.5 value for FR was the default based on the results of bias trials for metrics such as biases in estimation of N, R_{max}, bycatch, and only surveying every 8 years. However, they need to know what to do if they do not meet these metrics. He noted his objectives included determining whether we can refine historical PBR approach by incorporating case-specific considerations for bias, uncertainty, survey schedule, cryptic bycatch concerns; if we can create tools that allow us to assess the robustness of such an approach, essentially recreating the simulations of Wade, but exanding the number of scenarios; exploring 324 combinations of R_{max}, CV of abundance, bycatch CV, two forms of generalized logistic growth curve (one for which MNPL = 0.7K), and

survey frequency of 4, 8, 12 years, and a success criteria (95% probability) of maintaining a population at OSP. The findings when Fr = 1 should include N_{min} <20% of N when survey frequency > 8 years and when CV of bycatch is high. He found that acceptable values for N_{min} were less sensitive to variable levels of R_{max}. Moore gave two constrasting examples of gray whales and sperm whales case-specific simulations. He had many questions to explore on how to address biases in the distribution of abundance estimates: Does it make sense to build bias into the recovery factor or should it just be part of the estimation for the relevant parameters? He noted that code is developed but could be converted into an R-package or Shiny App, and that a workshop would be beneficial to develop this. How should the tool look? Should N_{min} or Fr be adjusted? Where should we incorporate suspected biases into the PBR process, for example, if we are concerned bycatch is 2x as high as estimated, maybe the bycatch estimate itself should be adjusted?

Tinker asked why stop at deterministic models, e.g., why not add more information, such as age-structure for smaller populations? Moore agreed that they could include age structure in the model.

New noted that a few simulated populations went extinct and asked if extinction risk would be a consideration or parameter. Moore was not able to answer that at this time.

John Brandon noted some work has suggested that recovery factors be represented as a function of an abundance trend, to which Moore stated that this is something to consider. Barb Taylor suggested going from a general PBR ruleset to a customized tweaking of management case-specific approaches to address evolving threats.

DeMaster noted that more time will be needed to discuss this in the future, and suggested adding it to the topics for the 2025 joint SRG meeting.

Considerations for assessing cetacean abundance and trends using habitat-based species density models

Karin Forney and Elizabeth Becker from SWFSC presented the considerations of using SDMs for assessing abundance and trends. They reviewed that Bayesian hierarchical methods have improved our ability to detect trends; however, incorporating dynamic habitat info can be challenging, lack of convergence, etc. SDMs offer several advantages over design-based methods, including reductions in sampling variability, providing spatially-resolved density information, and the ability to use heterogenous survey data. Becker provided examples where a year term was included in SDMs to see if they could capture trend info. They included species for which trends were known to occur or for species where the species distribution has changed. Humpbacks were the 1st example and included a comparison of mark-recapture and the humpback whale GAM year covariate. Fin whales were another example showing the same agreement between trends and the GAM year covariate. Striped dolphins, which show high interannual variability in abundance in the California Current Ecosystem (CCE) have a range of 9,000 to 90,000 estimated abundance, with the high estimate occurring during the 2014 marine heat wave. They analyzed what happens when year is offered as a covariate in the striped dolphin model. They assumed that year is likely acting as a proxy for a dynamic variable such as

SST, and they varied the degrees of freedom for comparison. Another example was Pacific white-sided dolphin for which they forced a non-significant year term into the model, which resulted in the most stable estimates. One oddity is that the marine heat wave year resulted in the highest estimate of Pacific white-sided dolphins, although they are known to be a cold-water species. It was noted that matching degrees of freedom may not reflect true ecological patterns. They found that the year term can represent a true population trend, sampling variation, or shifts in animal distribution. One question they want to address is if year is non-significant, what are the implications for management.

Tinker thanked the presenters for addressing the SRG concerns on this subject. He noted that SDMs are being used in SARs for different purposes, evaluating trends vs. changes in distribution vs. changes in abundance. There needs to be caution about how the SDMs are being interpreted. Tinker emphasized the need to figure out what the correct 'null model' SDM is for a given situation. Forney noted that the SDM lessons are that if there is an obvious trend occurring, the models are able to detect the trend accurately, and if the model does not include a year term, then any potential trend is small relative to the uncertainty in the estimates (i.e. the signal-to-noise ratio is small).

New noted that broad and consistent survey coverage is the most-important tool, and that adjusting PBR may not be sufficient to capture larger animal movements or trends that SDMs are not capturing. New noted that even SDMs with precise CVs may have a lot of uncertainty. Becker responded that improvements in estimating model uncertainty include some rather large CVs in excess of 10. She added that northern right whale dolphins were compressed into a very small area in 2014, which was captured by both the conventional line-transect and SDM studies. Forney stated that a paper by Boyd et al. on Dall's porpoise also noted a compression in suitable habitat. She continued that the SDM products are not being used to infer trends by outside users, but are used for assessing spatial risk for things like wind farms.

Torres asked about the latitude / longitude terms in the models and wondered about lat + lon + year models being constrained by the combination of lat + lon in models. Becker noted they started including lat + lon because the users need average density estimates for a given small operating region (Becker provided a Navy example).

Simone Baumann-Pickering asked what kind of constraints can be put on the models to maintain their usefulness, especially in the context of extrapolating densities to areas that have not been surveyed. Forney agreed and noted that they are trying to avoid making 'out of bounds' predictions. Tinker followed up, noting that year + lat + lon are fundamentally different from other covariates, they are essentially random effects that are proxies for things we have not measured. The presenters agreed.

DeMaster asked if there were any questions. Patterson noted this is the kind of discussion that is desirable for the joint SRG meeting.

Day 2

Updates on gray whale research

Deb Fauquier, from NMFS OPR, reviewed the gray whale unusual mortality event (UME). She noted that from 2019-2023, 690 gray whales, (347 US, 316 MEX, 27 CAN) died. Closure of the UME will occur 3/14/2024. Findings revealed that malnutrition was the main cause of death and no infectious diseases were identified. Abundance and calf production were noted to decline during the UME. Changes in distribution and feeding behaviors occurred as well as changes in gray whale prey associated with ecosystem changes in Arctic feeding areas. Population modeling linked both UMEs to changes in Arctic benthic prey biomass. Fauquier ended with a list of research gaps: what is a normal level of atrophy in blubber layers? What are impacts of infectious diseases? What are impacts of biotoxin exposure? What ecosystem changes have generated site specific changes in prey abundance, presence, and quality in gray whale feeding areas?

S. Baker asked if there was any sex bias detected in carcasses. Fauquier did not know offhand, but will provide answer.

Aimee Lang from SWFSC updated results from the gray whale shore-based surveys, where calf counts have occurred since 1994 at Piedras Blancas. In addition, there have been southbound surveys at Granite Canyon since 1967, the longest abundance time series for any baleen whale. The 2022/2023 estimate is approximately 14,500 individuals. New estimates from 2023/2024 will be published shortly and the draft SAR will be updated with new values for PSRG re-review. Lang noted that another Granite Canyon southbound abundance survey will again occur in 2024/2025.

Brandon asked what the strategy will be for the southbound survey frequency, given that the UME has expired. Lang responded that they made the decision to do the survey next year, and plan to discuss future plans for survey frequency this summer.

Trevor Joyce from SWFSC presented UAS results for gray whale distribution, density, and group size on southbound surveys. He used a fixed-wing vertical take off and landing UAS, one of the first-use cases for cetaceans. Images were used to train algorithms for assessing detection and identification efficacy using UAS. They found that, on average, gray whale groups were at or near the surface approximately 78% of the time within a spatial sighting window. He is currently working on a perception and availability bias model. He found that observers underestimate group size by an average of -0.27 animals per group. The lack of ability to hover with the fixed-wing UAS represents a minimum estimate of perception bias for groups. Joyce noted that this work is important for estimating parameters that are needed to estimate gray whale abundance. He provided information about the UAS, including that it has a range of up to 2 nmi (out of visual sight), and the FlightWave Edge 130 has 70 – 90 min of flight time. However, technical issues necessitated using the quadrocopter, which was used to collect group size information for southbound gray whales. Joyce noted that the ability to do focal-follow allows for quantifying surfacing time. He ended with the long-term goal of obtaining density estimates from high-resolution satellite imagery.

Torres asked about integrating body condition indices into the UAS monitoring and detecting pregnancy based on morphology. Joyce noted that they are currently working on that, but this year's focus was on group size and there is interest in comparing pregnancy rates from UAS to calf production estimates.

Leslie asked about the challenges in using a DGI based system. Joyce noted that while they have limitations, they are probably the cheapest and best units on the market, but their use will come to end soon.

Tinker noted that the UAS work could greatly increase the precision of the abundance estimates, to which Joyce agreed.

Brandon asked about the ability to get a better sense of identifying individual animals and herd dynamics, which Joyce confirmed they have started, including aerial photo ID via AI algorithms.

Calambokidis asked if there are differences between Durban's body condition work from UAS and the current work, i.e., is the current work mirroring the same goals. Joyce noted that prior studies focused on short flights targeting mother-calf pairs, but this work will not continue on northbound surveys. Weller added that animals should be in peak condition during the southbound surveys, since their body condition reflects summer feeding conditions. In contrast, the northbound surveys give more info about how thin animals can get before potential death. The focus is on addressing climate change and understanding what is happening in the Arctic.

Peter Mahoney, from the AFSC, discussed PCFG abundance estimation, which was updated through 2022, and will be published sometime this spring. He noted there has been discussion about shifting a PCFG boundary westward in the eastern Strait of Juan de Fuca. The time series is from 1998 – 2022. He noted that the population size has been stable, despite the recent UME. There are coast-wide surveys June – August, which are coordinated with the Department of Fisheries and Oceans Canada (DFO) partners. In addition, there are collaborative surveys within the Makah waters.

Brandon commented about the dynamics since the 2016 survey. On one hand, the population may have declined, but at the same time, there may be confounding issues with a redistribution of whales, due to changing oceanographic conditions. Mahoney noted that there has been a recent redistribution of whales but that has not resulted in a significant drop in abundance estimates. They have been collecting body condition data since 2020 and would like to incorporate that data to look at what some of the drivers might be to determine if the stable trend is real.

Torres noted that the peak of body condition in their region was in 2016, and asked how the model does or does not handle variability in survey effort. Mahoney noted that the model is not corrected for survey effort, since effort is not recorded regularly. Mahoney noted that they intend to do a better job with updated models and address issues with quantifying effort better in the future.

Lang then reviewed some of the findings from the gray whale stock identification workshop that was held in 2012. The information available at that time from genetic studies was consistent with levels of internal and external recruitment being comparable, and photo ID studies have documented new non-calf whales recruited each year. These new non-calf whales could be immigrants or could be animals that were undetected when they were calves. She provided an update on an ongoing study to further evaluate recruitment into the PCFG by using kinship analysis to determine if these new non-calf whales could be the offspring of sampled PCFG females. She showed that the kinship analysis works well when used to validate field-identified mother-calf pairs. Lang noted one challenge in assigning mother-offspring relationships among non-calf whales is determining which individual is the mother and which the offspring, so other approaches such as epigenetic aging are being examined.

Lang updated the Sakhalin and Kamchatka gray whale survey effort noting that 97 whales were identified off Kamchatka, 43 of which had a sighting history in Sakhalin. Off Sakhalin, only 7 whales were identified.

Joyce discussed AI for photo-ID matching and noted the development of a web-based AI matching algorithm. One algorithm is based on matching dorsal edge profiles, but that method has been eclipsed via data science competitions (MiewID). This method has greater computational efficiency and performance (91% accuracy on first result, 97% accuracy cumulative).

S. Baker asked what the total size of the catalog is, to which Mahoney responded that there are approximately 17,000 images in FlukeBook, but much work is needed to clean up the data (e.g., some images have not been assigned a whale ID).

Torres asked how the AI methods are accounting for skin conditions, and how those may be more prominent than the whale's natural markings. Mahoney requested they discuss this issue more offline.

Large Whale SeriousInjury Package Shiny App Demo

Jim Carretta from SWFSC provided a demo of the Large Whale SeriousInjury Package Shiny app. He noted that the algorithm assesses injury severity from narratives and assigns a probability of death/serious injury and recovery, based on the fraction of random forest trees that result in each assignment. He noted that the more information you add to the model the better, and that if you change/update information then the results will change.

Tinker asked who would be using this and are there concerns that users may "game the system" to get a desired outcome. Carretta responded that they are not seeing such issues with the current serious injury policy, where the language features used for assessment (i.e. 'constricting' vs 'loose' gear) are transparent and unequivocal. The opportunity for manipulating injury narratives to favor one outcome or another (serious vs non-serious injury) is already a possibility now (the algorithm is not currently used as policy) and there has been no evidence of manipulation. Tinker followed up asking if the tool addresses potential biases in the detectability of non-serious vs

serious injuries, especially with favorable outcomes that may be easier to detect (due to longer potential observation periods) than undetected serious injuries (i.e., 'cryptic mortality'). Carretta noted that a serious injury is equivalent to death in the dataset, which includes a lot of dead and necropsied animals. He noted that it was unlikely that the language used for detected deaths and serious injuries would differ enough from injury characteristics of undetected serious injuries and deaths to generate such as bias.

West Coast Management updates

West Coast Region Management update

Dan Lawson of the West Coast Regional Office (WCRO) reviewed WCR management issues. He provided updates on large whale entanglements and the known sources of entanglements in 2023, which were 11 Dungeness crab pot (9 commercial, one recreational, one tribal), one spot prawn pot, one groundfish trawl, and one halibut longline sablefish trap. He announced that the WCRO will be establishing a Take Reduction Team (TRT) for the sablefish pot fishery at a minimum (referred to Kristy Long for the update on other fisheries). His updates also included the modeling efforts to inform whale entanglement risk mitigation, ongoing line marking research, and phasing out the drift gillnet fishery, which was signed into law, and includes a 5-year phase out with the adoption of alternative fishing practices that minimize incidental catch of living marine resources. He noted that the hard caps for this fishery are not currently moving forward. For the Pacific Offshore Cetacean TRT, the CA drift gillnet fishery has reduced all M/SI to achieve short-term and long-term goals for all stocks. He continued with vessel strikes, and noted that gray whales had the highest number (10) in 2023. A recent consultation on oil and gas development concluded a small number of vessel strikes would occur. In addition, wind energy and aquaculture consultations are occurring throughout the region. Lawson then provided an update of MMPA Section 120 activities, including that the estimates of fish 'saved' by these activities in the Columbia River Basin are 16,000 to 45,000 fewer fish because they are not being consumed by sea lions. The next topic Lawson discussed was the Makah waiver. He noted that the final 2023 EIS was published and the decision lies with the NMFS Assistant Administrator to issue a record of decision. Finally, Lawson ended with an update on Southern Resident Killer Whales (SRKW). He noted that there are currently 75 whales as of 2023. The agency is focused on vessel noise, habitat, and pollutant threats. There are new WA state approach distance regulations of 1,000 yards that will go into effect in 2025 and the results of vessel trials of speed and sound reductions seem promising. Lawson then provided updates on the SRKW recovery program with a PFMC Amendment 21 update, and a note about the litigation of SEAK salmon fisheries and the Chinook hatchery program for SRKW prey. In addition, SRKW oil spill response has a deterrence task force established by the Northwest Area Contingency Plan. NMFS will host a health assessment workshop to discuss SRKW, Cook Inlet beluga, and North Pacific right whales.

DeMaster asked about the Makah waiver and what the process was and if it was initiated. Lawson responded that there has been no decision or initiation. Grace Ferrara, also of the WCRO, noted that the permitting process (if granted) would be implemented by the West Coast Region. DeMaster then asked if the 1999 Makah take was under a permitted process or waiver. Ferrara indicated that it was neither under a permitted process nor a waiver.

Baird asked about fishery interactions involving small cetaceans, and noted that they are not detected at as high a frequency as baleen whales. Lawson noted there are several hook and line fisheries, but most have low- to zero observer coverage.

Torres asked what counts as a vessel strike, does it have to be a dead animal, and how is the reporting process. Long noted that all injuries caused by a vessel are counted and assessed in stock assessments. Further, any reports of vessel strikes should be sent to the NMFS stranding network POC in the West Coast region.

Baumann-Pickering asked about the Coast Guard cetacean desk and if that was expanding to all of the west coast. Patterson responded that the Coast Guard was mandated to set that up, but there is no intention to expand the program.

Brandon noted that the Makah hunt plan does not include a single stock of gray whales and asked if we get to the 'Yes' decision point on the proposed hunt, whether or not there would be a separate permitting process for the WNP stock. Ferrara responded that there will be no waiver for the WNP stock and no directed take allowance for WNP gray whales. She also noted that the probability of taking a WNP gray whale is estimated to be very low.

Upcoming 2025 West Coast TRT

Long discussed the upcoming West Coast TRT. In 2022, the Center for Biological Diversity (CBD) challenged an MMPA 101(A)(5)(E) permit for the sablefish pot fishery to incidentally take marine mammals and to take ESA-listed humpback whales. The judge ruled in favor of CBD that a take reduction plan must be developed or in development TRT to issue the permit. NMFS and CBD settled the lawsuit and NMFS agreed to convene a TRT by November 30, 2025. NMFS has preliminarily determined that in addition to the Federal sablefish pot fishery, the CA spot prawn and CA + OR + WA state Dungeness crab fisheries, and U.S. West Coast sablefish pot fisheries will be included in the TRT and address Central American and Mainland Mexico humpbacks as well as Eastern North Pacific blue whales. Information available at https://www.fisheries.noaa.gov/west-coast/marine-mammal-protection/west-coast-take-reduction-team; and the scoping notice for TRT at: https://www.fisheries.noaa.gov/action/scoping-marine-mammal-take-reduction-team-address-incidental-mortality-and-serious-injury

S. Baker asked about individual state involvement in ESA-listed species. Long noted that CBD also sued the state of CA, who is developing an application plan for the ESA section 10(a)(1)(B) incidental take permit.

USFWS Update - Southern sea otter update including toxoplasmosis

Lilian Carswell, from the USFWS, provided a southern sea otter update. She first described updates about toxoplasmosis (*T. gondii*) in southern sea otters, noting that there is a new COUG genotype strain that was first detected in 2020-2022 in southern sea otters, which was the first

known occurrence in a marine mammal. Sarcocystis (*S. neurona*) is also a cause of death. Approximately 75% of southern sea otter samples were infected with *S. neurona*, *T. gondii*, or both concurrently. Those with *T. gondii* had 2.3-fold higher odds of fatal cardiomyopathy. There are high risk clusters near Morro Bay, Cambria, and Oso Flaco with the COUG strain detected near Morro Bay. Southern sea otters with fatal shark bites were found to have greater than 3 times more likely to have preexisting Toxoplamosis encephalitus. Carswell then moved on to the Species Status Assessment. She noted that the population reached the 2003 criterion for delisting consideration and noted that in the near-term, this population size was likely to be sustained. However, long-term, evolving threats indicate that the sustainability of the population is uncertain. The stock remains listed as Threatened under the ESA. Finally, Carswell noted that there is a feasibility assessment for a reintroduction of sea otters along the U.S. West Coast, which had been requested by Congress.

S. Baker asked if the detection process for Toxoplamosis was a PCR assay or a seriological assay. Carswell noted that both were used.

Baumann-Pickering asked if there was a direct path to death as a result of Toxoplamosis infection or reduced fitness with infection. Carswell indicated based on the literature, it seems to be a direct pathway to death and Michelle Barbieri provided a link in the chat that provides more information (https://www.frontiersin.org/articles/10.3389/fmars.2023.1116899/full). Baumann-Pickering then asked if UAS survey work can be done for sea otters, given challenges in doing aerial surveys. Carswell noted that this is not a practical approach for surveying southern sea otter, given the large area occupied in water too far offshore to be effectively surveyed with UAS.

New asked about plans for revising the survey approach. Carswell noted that future strategies may involve moving away from trying to count every otter, and perhaps surveying index sites, but the USCG is the lead in developing appropriate survey protocols.

Leslie asked how much genetic information is available for animals, especially for those proposed for reintroduction. Carswell responded that animals have extremely limited genetic diversity and for that reason, re-connecting northern and southern sea otters would be valuable from a genetic diversity viewpoint. They will be conducting genomic analyses in the future.

Southern Resident Killer Whale SAR

Brad Hanson, from the NWFSC, provided a summary of the SRKW SAR. He noted that the population size is up to 75 whales (increase of 2 from last year). There were no mortalities in the population in most-recent 12-month survey period, which is a first since 2009. He stated that the soundscape for coastal waters is being analysed with data from the deployment of passive acoustic recorders, which will help assess compliance with required vessel speed limits. Hanson noted that health assessments include 3 new published papers on contaminant levels. Gut microbiome analyses and photogrammetric analyses are ongoing, and in 2023, 14 whales were noted to be in poor condition. On prey availability, Hanson highlighted a new paper (Nelson et al.) that showed that SRKW mortality rates are strongly associated with declines in chinook salmon abundance. Another result is that northern resident killer whale (NRKW) abundance may

be impacting SRKW carrying capacity, possibly through resource competition. Hanson informed the SRG that there is a backlog of fecal and prey samples to be analyzed, but that funding limitations precluding this research from being completed. On the small population analysis front, DFO is continuing their analyses on NRKW samples. Hanson noted that there was change of stock status.

DeMaster referred to the inbreeding and chinook availability issues, and asked about the relative risks of each, noting that some believe that inbreeding is a bigger issue than prey availability. Hanson responded that a cumulative risk analysis is desired, with respect to this question. DeMaster noted that prioritizing funding for such an analysis using 'Species in the Spotlight' status could be an option. Hanson agreed that they have benefited from additional funding, and they're also working on a postdoc position, but this work would require a longer time commitment.

Leslie asked if funding for photogrammetry sampling was going to continue, to which Hanson replied that cooperation with other entities, such as the San Diego Zoo, has been supportive of such sampling and this work is planned to continue next year.

S. Baker asked if fecal analyses allowed for assessing the stock origin of Chinook prey. Hanson noted that in some cases they could get stock ID from prey items (approximately 10%), but there are challenges that make it difficult to research this.

DeMaster asked if there is any PVA type analysis to predict where SRKW might be in 10 years, given births and age structures known in the population.

U.S. West Coast Draft 2023 SARs

Carretta reviewed each of the SARs and took comments for each species.

Overview table:

Baird asked how many species don't have a SAR. Carretta responded, using the genus *Mesoplodon* as an example, where NMFS currently lumps several species that occur along the U.S. West Coast into a single assessment, due to the inability to identify most sightings to species during visual line-transect surveys. Thus, the abundance estimates given the '*Mesoplodon*' SAR for the U.S. West Coast include several species lumped into a single category. Oleson similarly noted the same issue applies to Pacific Islands waters.

DeMaster inquired about the PBR and N_{mins} and how to use the data effectively; he reiterated a past concern about using N_{mins} that are greater than 8 years old. Carretta noted that most data come from 2018 since that was a big survey year, and prior to that most came from 2014. Patterson noted that this summary table will be available for future meetings to assist with developing recommendations. Carretta noted that they can declare PBR as "undetermined." DeMaster then asked what '0' in the table means. Carretta explained that 0 means we surveyed and didn't find any, but agreed that flexibility about the terminology should be incorporated in the future.

DeMaster asked specifically about the harbor porpoise Morro Bay PBR of 60 from an abundance estimate in 2012. Forney stated that SAR hasn't been updated since 2012, and Carretta added that it should have been revised to clarify that the data haven't been updated since then. It was agreed that additional effort is needed to increase the transparency as to how old the data are and where there are data gaps.

DeMaster noted that this table is very helpful and expressed appreciation for it. He noted that it doesn't reflect some of what is in the GAMMS. Carretta agreed that that information hasn't been incorporated yet since the new GAMMS was established prior to this draft of the SARs.

Torres asked if the harbor porpoise stock was recently designated, and Forney replied that the SAR is available, but not designated by stock.

There was a question about the American Samoa humpback whale stock. Carretta replied that the PBR should be 'undetermined' and not '0.' Oleson clarified that the SAR was written by SWFSC in 2009 and hasn't been updated since, but it needs to be revised based on the Stock Policy. Patterson added that NMFS will review this table and discuss how to move forward with stocks that have very old data. DeMaster recommended adding a sentence to the SAR that states the PBR is undetermined, or that it is based on data from 2009.

Baird noted that SRKW had a total anthropogenic mortality and serious injury total of 0, whereas other stocks referred to this as 'unknown.' He stated that it seemed inappropriate to have 0 for Hawai'i odontocetes because there is no observer coverage in the fisheries, and therefore a lot of bycatch is not being documented. Zero implies certainty exists. Carretta responded that the GAMMS could help to reflect that and noted that there is room to accommodate language of 'unknown' in cases where no anthropogenic mortality is documented. Long added that there needs to be consideration for how that data could be taken out of context.

There was another question about whether there are plans to update American Samoa humpback whales SAR, to which Oleson responded no.

DeMaster asked why there were no published sources or Technical Memos for some pinniped abundance estimates. Melin responded that for west coast pinniped SARs, there will be a Technical Memo with finalization of the SAR, and that what is presented here is very new.

Northern elephant seal (California breeding)

Tinker asked if "other mortality" includes anthropogenic factors, to which Carretta responded yes.

Baumann-Pickering pointed out that "other factors" are required per the new GAMMS, but it's not reported for northern elephant seals, so she asked if it really was required. Patterson clarified that it is a requirement for strategic stocks, and may be included for non-strategic stocks but is not required. He noted that it is included where the information was available.

Guadalupe fur seal (Mexico)

Carretta asked Melin for clarification for this stock. Melin responded that there is now a tight collaboration with Mexico for Guadalupe fur seal work and these data may be able to be incorporated into next year's SAR.

Torres noted that "pups" needs to be added to the figure axis.

J. Baker noted that there is new data about Guadalupe fur seals that has not been published yet, that is based on a workshop from last year. He noted that they received support to do another study, so the SARs could probably be updated soon. Carretta expressed concern about including data that isn't publicly available yet. Melin clarified the data are from 2019 and they would work together to update the SAR.

Northern fur seal (California)
No comments.

Monk seal (Hawai'i)
No comments.

Killer whale (southern resident)
No comments.

Gray whale (Eastern North Pacific and *Western North Pacific)*

Melin noted that there are not abundance updates for PCFG gray whales in the current draft SAR, because they are waiting on 2023 data. Lang added that there were discussions about providing estimates as a paper to the IWC, which can be citable in the SARs and is forthcoming. Carretta asked if there were any updates to the abundance or human-caused mortalities for Western Pacific gray whales, to which Lang responded no.

Brandon noted that some of the language for gray whales is a little inaccurate and offered to work with Carretta on updating it. He also noted that it is getting close to the 8-year deadline for outdated abundance estimates for Western gray whales. Patterson noted that the 8-year time frame was a rule in the past but now they are looking at it case-by-case. Some members of the SRG raised concerns regarding such an approach.

Pacific Islands Topics

Science Overview and Climate, Ecosystems, and Fisheries Initiative (CEFI) developments

Charles Littnan, Director for PIFSC, reviewed personnel changes at PIFSC, including his new role as Center Director, and Erin Oleson as the new Protected Species Division (PSD) Director. He noted the fiscal challenges for PIFSC include salary increases (cost of living adjustment) and NOAA white ship use related to staffing shortages and availability of these ships. Littnan also noted that most of the current research and achievements, including Hawaiian monk seal assessment, false killer whale assessment, and passive acoustic monitoring plans will be

discussed in the next session's presentations. Finally, Littnan provided an overview of the Climate, Ecosystems, and Fisheries Initiative (CEFI).

DeMaster asked how the rest of the 2024 budget and the 2025 looks. Littnan responded that the 2024 budget was fine, but there are interesting developments for the 2025 budget. DeMaster then asked about the status of the white ships (i.e., NOAA vessels). Littnan mentioned the optimization plan and the availability of Class C ships estimated to be available for NMFS staff in 2036. Koch added that two Class B vessels are coming out of the IRA funds before construction of the Class C vessels will start. Long also provided information and statuses about funding sources.

Leslie stated that he is encouraged by CEFI and mentioned some of his connections that may be useful.

Hawaiian monk seal research updates & SAR

Jason Baker form PIFSC provided monitoring and status updates for Hawaiian monk seals. He noted that the next SAR revision that includes data through 2023 will not have updates to rangewide abundance or trends. He also explained that the plans for field camps in 2024 include a charter vessel, 2-3 months at Lalo (French Frigate Shoals), 1.5-2 months at Kamole (Laysan), Kapou (Lisianski), and Manawai (Pearl and Hermes Reef). He announced that they are drafting an update to the Red List assessment for the Hawaiian monk seal, and it is being moved to 'vulnerable.' J. Baker then provided updates about Lalo, and noted that much of the habitat is gone due to sea-level rise. Pupping has shifted onto remaining islands at the south end of the shoal's range. He noted that there are concerns about highly pathogenic avian influenza (HPAI) in Hawaiian monk seals due to the prevalence and impact from other species and areas. For example, it was noted that a rate of 97% pup mortality of elephant seals in Argentina was recently reported related to an outbreak of HPAI. Finally, J. Baker stated that he does not expect that Hawaiian monk seals will have a strong resistance to this disease.

DeMaster asked if Baker had any speculation as to why they seals are not all concentrating on Tern Island. J. Baker said it is unclear but noted that monk seals tend to prefer ephemeral islands.

Baird asked about the trends in growth rates for monk seals in the main Hawaiian islands (MHI). J. Baker noted 4% growth in the MHI, which represent approximately 25% of the overall population size.

DeMaster asked about entanglement data. J. Baker noted that he has been reviewing the 40+ years of entanglement data, and by next year he should be able to provide a background document at the PSRG meeting.

Tinker asked if predation has dropped at Lalo. J. Baker responded that it seems to be less of an issue now; the survival rate has increased, but it is not necessarily high enough to support a population recovery. The real problem is young animals getting washed off of beaches while they are too young to swim.

Toxoplasmosis sub-lethal effects in marine mammals

Michelle Barbieri from PIFSC provided an overview of the genotypes and sublethal effects of Toxoplasmosis in Hawai‘i marine mammals. She explained that Toxoplasmosis infections range from acutely lethal to latent and that *Sarcocystis neurona* is also an issue. There are currently two species that have been observed with toxoplasmosis: spinner dolphins and bottlenose dolphins, with18 additional cetacean species testing negative for these infections by PCR. Specific to Hawaiian monk seals, since 2004, Toxoplasmosis has been identified as the primary cause of death in 15 seals. The preliminary genotyping results included occasional Sarcocystis presence, essentially coinfections with Toxoplasmosis. The results show 33% seropositive rate in stranded spinner dolphins. There has also been seropositivity observed in one Fraser's dolphin, one bottlenose dolphin, one rough-toothed dolphin, and one dwarf sperm whale.

S. Baker asked about prevalence of Toxoplasmosis strains in feral cats. Barbieri noted that is data-limited.

Tinker noted some seropositive rates of 70% in sea otters, with a morbidity rate of around 9%. In contrast, with monk seals, there are acute morbidity levels. Barbieri agreed, and that has been her impression since the mid-2010s, noting that carcasses are full of Toxoplasmosis, and that is their primary cause of death and causes them to die quickly. Tinker then asked if opossums were present in Hawai‘i, given the presence of Sarcocystis, and followed up asking about shedding from other pinnipeds. Barbieri noted that opossums were absent in Hawai‘i and there are no other pinniped species in Hawai‘i; it is a mystery how Sarcocystis is getting to the Hawai‘i region.

Day 3

Update on FKW photo ID and tagging, and *the ongoing issue of fishery interactions among endangered Hawaiian false killer whales: repeated mouthline and dorsal fin injuries, stock- and sex-specific trends, and early-life interactions*

Robin Baird, from Cascadia Research Collective, provided an overview of false killer whale (FKW) research activities in 2023 and issues related to fisheries interactions. Baird noted that photo contributions are provided by a number of organizations in Hawai‘i. He provided a map of the quantified survey effort around MHI, with most effort concentrated on leeward sides of the islands. There were 36 encounters and 279 IDs in 2023. He noted that there were few encounters off Kaua‘i and Ni‘ihau, with most IDs coming from animals off O‘ahu and Hawai‘i Island. Most encounters (76 individuals) are from the MHI stock, and only a single individual was new to the catalog in 2023, probably a calf. There were 24 IDs from the pelagic stock. Baird then reviewed the biopsy totals over all years, which included 19 animals from the pelagic stock, 5 of which were new individuals in 2023, and 151 animals from the MHI stock. For satellite tagging efforts, there was a single limpet satellite tag applied to a MHI FKW. He noted that in the social network analysis, there are a number of whales unassigned to any known stock. Dive behavior analyses showed a strong diel pattern for the MHI stock. He noted that one satellite-tagged animal from the Hawai‘i pelagic stock traveled just outside of the boundary of the FKW management area.

Baird then transitioned to the topic of an ongoing issue of fishery interactions among endangered Hawai‘i false killer whales. He provided a list of FKW prey items that overlap with commercial fisheries and maps that showed how the Hawai‘i stocks overlap with nearshore fisheries, high-seas fisheries, and the commercial longline fisheries. He then showed the 4 MHI social clusters, which have differing overlap with fisheries. Baird noted that there is a lack of observer coverage around the MHI, so the data on interactions comes mainly from research-directed photo-ID of dorsal fin disfigurements or mouthline injuries. His results suggested that MHI FKWs have much higher rates of dorsal fin injuries compared with the NWHI and Pelagic stocks. Additionally, females are more likely to have dorsal fin disfigurements than males, but similar rates of mouthline injuries. He surmised that it’s possible that males are more likely to break through gear when entangled, given their larger size. He noted that there also appear to be some age-related differences in fishery interaction rates. Finally, Baird noted that the data suggest that the documented proportion of FKW with mouthline injuries is negatively-biased.

Torres asked if the photo-ID methods have changed over time, given that there is an increase in emphasizing photographs of the mouth. Baird agreed and also noted that adoption of digital imagery in the time series equates to greater ability to photograph heads, in contrast to earlier years when photo-ID based on dorsal fins was emphasized and use of slide film limited the sample sizes. Torres then asked if there are patterns related to environmental variation. Baird replied that this was difficult to identify.

Baumann-Pickering asked that when there is an injury, if it is visible across the entire mouthline. Baird noted it is usually on one side or the other. She then asked about recreational fisheries in Hawai‘i. Baird noted that recreational fisheries are likely responsible for four times the catch, but it is difficult to quantify because they do not have to report take and there is no license needed to fish for pelagic fish.

Tinker asked if there is potential for effects of mouthline injuries on feeding ability and survival. Baird noted there is an analysis underway on body condition to compare animals with and without fisheries interactions. He noted that there also remains the problem of undetected fisheries interactions.

J. Baker suggested using 'age class x sex' for analyses.

Congressional FKW appropriations

Erin Oleson, from PIFSC, presented on the Congressional Appropriations for FKW projects. She noted that Congress appropriated ~$1M to study interactions between the U.S. fishing fleet and FKW in the Western Pacific, originally in FY21 and continuing annually since. The funds are allocated through joint prioritization between PIFSC and the Pacific Islands Regional Office (PIRO) with input from the TRT. To date, all funds have gone towards research. She noted the ongoing projects include telemetry deployments via Cascadia Research Collective and acoustic monitoring of the longline fleet to identify and mitigate acoustic cues related to depredation. There are discussions occurring about how to increase tension on branchlines to facilitate more effective straightening of hooks to release FKWs, and she explained that a 'fighting line device' is available to increase the tension to potentially allow for more effective straightening of hooks. In FY23 another project began that includes observation of the shortline fishery. All projects pursued since 2021 were reviewed.

DeMaster asked if there was an annual report to Congress. Oleson noted that PIFSC annually reports on all Congressionally-funded protected species projects (monk seals, turtles, and FKW) to the Hawaii delegation.

Baumann-Pickering asked how predation rates can be attributed to FKW only. Oleson replied that observers can differentiate depredation signs on the fish that are caused by odontocetes (that are inferred to be largely FKWs) versus squid or sharks. She agreed that attributing FKW depredation based on empty hooks is more challenging.

Hawai'i pelagic FKW management area

Oleson presented on the new assessment approach for Hawai'i pelagic false killer whales that was implemented in the 2023 SAR (still under public review) following discussions with the PSRG last year. She reviewed the management area Technical Memo, and noted that the data are available on Github. She reminded the SRG that the new approach is needed given the mismatch between an EEZ-based historical assessment approach versus the distribution of the longline effort that has largely shifted outside of EEZ waters, with an increasing proportion of bycatch now outside of the EEZ. Oleson reviewed what the Pacific SRG had recommended last year in regards to this new management area. She explained that the Hawai'i pelagic FKW management area incorporates biopsy, telemetry, sightings, and bycatch data. The 2023 assessment of pelagic FKWs within the management area showed that PBR is exceeded whether or not it's based on the full management area or just the EEZ. The management area PBR uses a recovery factor of 0.4 to accommodate uncertainty in foreign fleet effort and bycatch outside of the EEZ. She noted

that this management area and PBR were incorporated into the draft 2023 SAR, which is out for public comment. She then noted that there are efforts to get a better handle of foreign-fleet effort within the management area, which may be as high as 12% of all effort. These countries included China, Japan, Korea, Taiwan, and Vanuatu. Oleson concluded by noting that the Program will be conducting a survey for FKWs in April to collect biological data outside of the management area, hoping to address the other primary source of uncertainty in the current management area boundary.

DeMaster asked if there was fishing far to the east, given a Guadalupe fur seal was taken in the longline fishery. Oleson noted there are vessels that land catch on the U.S. West Coast, and that one of the previous iterations of a possible management area using fishery distribution utilized a 95% kernel density estimate, excluding some effort to the east, south, and west, outside of that space. DeMaster then asked if there is a strong seasonal component to the fisheries, to which Oleson affirmed.

Torres asked if there were regulations about what time of day lines are set and if there were restrictions at night. Oleson responded that the fishery usually sets during the day and hauls at night. Torres wondered about how the diel patterns in foraging might interact with these activities from the fishery.

Baumann-Pickering noted that PBR was exceeded for at least 2 years given the new calculations, and asked what the current management is with the expanded region in terms of fishery closures. Oleson replied that PIRO has not yet settled on a management framework and that this will be discussed further after the 2023 SAR is finalized.

Bob Brownell, from SWFSC, asked about changes in fishing effort in China and Japan, but Oleson could not address that without looking at the regional fishery management organization data.

Hawai‘i pelagic FKW ship survey

Amanda Bradford, from PIFSC, provided an update on survey plans for the upcoming FKW cruise, which will emphasize the area SE of the Hawaiian Islands, outside of the U.S.EEZ and the Hawai‘i pelagic FKW management area. It will be a standard line-transect and acoustic line-transect survey. Acoustic operations will begin before sunrise to detect and track FKW groups and this will facilitate small-boat launches for biopsy collection and satellite tagging. There will also be eDNA sampling of FKW groups and ecosystem operations to better characterize the FKW habitat. Bradford noted that they will be looking for overlap between FKWs in the Central North Pacific (CNP) and Eastern Tropical Pacific (ETP). There are higher densities of FKW closer to the tropics and a general lack of biopsies in this region. There is a lack of spatial overlap with the longline fishery in the proposed survey area.

Tinker noted that the survey has the potential to significantly alter the SDMs of Becker and Forney, and since the emphasis is on acoustic detections, it may come at the expense of visual detections. He asked if Bradford anticipates any challenges due to the different survey designs. Bradford replied that there have been discussions about this and agreed that implications for the

SDMs are important. She also noted that they are currently working on incorporating acoustic detections in the density estimates, and determining how to make this comparable to previous efforts. Tinker then asked if they were trying to reduce uncertainty given this is a data deficient area, to which Bradford agreed would be beneficial.

Baumann-Pickering referred back to the SDM, noting a disconnect between tropical and equatorial FKWs, which are responding to local productivity, versus increases in SST. She asked if that may confound existing SDMs for the species. Forney responded that the SDMs include many variables in addition to SST that relate to productivity.

Brandon asked why they are not investing some survey effort in the management area. Bradford replied that reducing uncertainty in the current knowledge of Hawai‘i Pelagic FKW distribution and stock structure necessitates going outside of the current management area. Oleson added that the original design was to survey in an area that overlapped with the management area based on a gap in the genetic sample distribution. She noted that they want to maximize latitudinal gradient in sampling design due to ship time.

S. Baker asked about biospy data from small boats versus eDNA from the ship, and noted that ID of haplotypes from eDNA is a feasible option. Bradford responded that they will be supplementing the opportunistic CTD casts from the ship with targeted water collection for eDNA (from either the ship or small boat) on FKW groups.

Baird suggested acquiring new mirrorless cameras to improve data collection. Baird noted that perhaps focusing satellite tagging in areas with favorable weather inside the management area may yield equally important information as sampling outside the management area, given that animals range widely. Bradford replied that the survey will include transits through the management area, and they can be flexible and pivot to a small extent, but they did need to come up with an overall survey design for the sake of planning.

Brownell asked about using *Stenella* as a sampling proxy for FKW. Bradford noted that there are ongoing discussions about how to prioritize data collection for species other than FKW.

MHI insular FKW abundance update

Janelle Badger from PIFSC presented on long-term abundance and trends in MHI FKW. She provided background on the population and the challenges to analyzing the data for abundance. She noted her goal was to improve abundance estimates by incorporating animal availability into the estimation framework by using a pseudospatial capture-recapture model. She then provided an overview of the survey effort and how they define animal space use, which is availability = animal presence x survey effort. Badger then explained the model formulation; the assumptions for the model; and the results, which revealed a decline in the MHI FKW abundance. She ended her presentation with the next steps, which include a manuscript and additional changes to the model.

DeMaster asked if a point estimate for MHI false killer whales had to be given, what would it be. Badger noted that it is in the most recent SAR.

New thanked Badger for including the recommended simulation-based approach based on last year's recommendation. She asked about the state/label switching issue. Badger replied that the solution was to run on each social cluster separately, which gave good results, but she will look into it further.

Tinker noted that the analysis is elegant. He recommended pursuing the auto-regressive survival approach. He also suggested that she use a quadratic term because the trends suggest something is changing, so a quadratic term could capture the increase and the decrease. Badger noted that it may be a real or an artifact of sampling, but she is open to it. Tinker then asked about estimating the proportion distinctive as a separate process, rather than having it as another model parameter, so that it is reflected in the model posteriors. Badger agreed that she would look into this.

Brandon was curious about a discovery curve and how low encounter rates early in a mark-recapture time series can give odd results. He asked how these results would pertain to studies elsewhere off other islands with similar issues, and if you start a study, do you need to be cautious in the first few years about any signals in the data. Badger noted she is considering encounter rates, and will explore this more.

A member of the audience asked that given beaked whales are deep divers, do you have to consider a time lag between a front that the DASBR would be pulled into and the response of beaked whale to that front, and if that is a bias that is being explored. Badger noted that this was an interesting idea but she is not sure how it could be studied.

General assessment update

Bradford reviewed the PIFSC CRP assessment updates. She provided an overview of the Hawaiian Islands Cetacean Ecosystem and Assessment Survey (HICEAS), which included 145 days at sea, 310 sightings of 23 species, deployment of 15 DASBRs, over 20,000 km surveyed, with 574 acoustic detections. Other activities include sightings of over 55 bird species, 60 eDNA samples from 20 sites, 169 CTD casts, and 88 net tows. Bradford explained there were 35 days lost due to a variety of issues, which impacted their ability to collect data. She also provided a map that summarized the sighting locations and species. Bradford reviewed their analysis plans, which included producing design-based abundance estimates (using the new R package 'LtabundR'), for all species, and model-based estimates, starting with FKWs. She noted that the low DASBR effort will complicate abundance analyses. She stated that the ecosystem and eDNA analyses were ongoing. She then introduced a newly-initiated Protected Species Toolbox Imitative project, with goals to reformulate the current central Pacific and Hawaii SDM framework using updated spatial functionality and modeled oceanographic products. Bradford provided an overview of activities relating to automating photo-ID dolphins in the Pacific Islands (i.e., Artificial Fintelligence) specifically using Flukebook to assess functionality for processing and matching, and Phil Patton's PhD work on evaluating tradeoffs in automation and bias in population assessments.

Tinker asked about tradeoff evaluation results being transferable to other algorithms / tools. Phil Patton from UH Manoa noted that this could be done and that the tool currently resides on Github.

Mariana cetacean assessments

Bradford reviewed the cetacean assessment works for the Mariana archipelago. She provided a summary of the results that indicated that Marianas bottlenose dolphin hybridize with Fraser's dolphins, it is a small, island-associated population with limited exchange with offshore populations, the mtDNA and nuclear DNA diversity is lower than island-associated populations around the MHI, and abundance within study area is low. She provided an update on the results relative to PSRG recommendations from last year and noted the 2024 publication on this topic. While there are not currently SARs for Marianas stocks, they are headed in that direction. She then provided a brief overview of the abundance estimation efforts following the Marianas Archipelago Cetacean Survey (MACS) from 2021. Bradford first reviewed the SDM based estimates for this region for three species and then presented preliminary design-based line transect estimates for seven others.

Mariana beaked whale DE results, including sensitivity analyses

Badger provided an acoustic-based density estimation of Blainville's and Cuvier's beaked whales in the Marianas based on data from drifting acoustic spar buoy recorders (DASBRs). She noted that some of the parameters, such as mean group size, echolocation depth, and dive times, were defined via a random-effects meta-analysis of data from other regions due to a lack of local Marianas data on these species, and this uncertainty was propagated through the Bayesian analysis. Badger explained that the study area was defined by the Commonwealth of the Mariana Islands (CNMI) EEZ, exlcuding regions less than 500m depth and outside a 50 km buffer from DASBR drifts. There were two strata, northern and southern, based on differences in detection densities. Her model provided the following estimates: approximately 15,000 Blainville's beaked whales and 6,000 Cuvier's beaked whales. She presented results to examine non-random bias due to DASBRs potentially being entrained into areas of high or low beaked whale density by looking at variability of encounter rates vs time. While there was no evidence of such bias using this method, results were inconsistent.

New asked about the 50km buffer and how it related to the detection radius. Badger noted this value is flexible, but seemed reasonable to the experts. Barlow noted that the transects were approximately 100 km apart, so the 50km buffer seemed reasonable. He noted that a forthcoming paper by Fiedler found no covariates that were associated with beaked whale densities, thus, potential biases between beaked whale density and specific oceanographic covariates may not be a concern.

Tinker asked if there were any other covariates, like bathymetry, that could be incorporated into the metanalysis. Badger replied that she didn't look at bathymetry, but didn't think it would be necessary. She noted that she did look at tag type, but didn't see an effect.

A member of the audience asked that given beaked whales are deep divers, do you have to consider a time lag between a front that the DASBR would be pulled into and the response of beaked whale to that front, and if that is a bias that is being explored. Badger noted that this was an interesting idea but she is not sure how it could be studied.

Cetacean acoustics update

Oleson provided an overview of the acoustic research being conducted on cetaceans at PIFSC. These activities include acoustic monitoring of the longline fishery, advances towards abundance estimation using passive acoustic datasets, examining species/stock distribution using PAM datasets (e.g. Bryde's whale in the western and central Pacific), and advances in glider and quantitative acoustic assessment approaches under the IRA initiatives.

S. Baker asked if the Bryde's whale "biotwang" vocalization was sex-specific or related to a breeding cycle. Oleson responded that most detections included single animals and mother-calf pairs, suggesting they may not be sex-specific. She noted that "biotwang" vocalizations are rarely detected at Hawaiian Islands monitoring sites.

Torres asked if there were behavior signals to detect the "biotwang" vocalization. Oleson responded that there probably was a behavioral component, but there are insufficient observations to deduce the behavioral context at this time.

Leslie asked about the "biotwang" vocalization and Bryde's whale stock structure. Oleson noted that the forthcoming paper indicates it is probably stock-specific to the Western Pacific.

Barlow asked that of the 5 or 6 types of Bryde's calls in the eastern Pacific, what are being detected around the Hawaiian Islands. Ann Allen, from PIFSC, responded that her analyses haven't yet considered the other Bryde's whale call types described in Oleson et al (2003), but that the work of other researchers using the hydrophones at PMRF have detected at least one of those call types in Hawaii.

Spinner dolphin abundance - Oahu, Hawai'i Island, and Maui Nui

Claire Lacey from the University of Hawai'i at Manoa provided an update on the spinner dolphin abundance estimates. She reviewed the methods, noting that Hawai'i island had survey coverage using both aircraft and boat surveys, with inshore and offshore strata. Boat surveys were done only on the leeward side of Hawai'i Island. In contrast, O'ahu had boats only, but used the same inshore and offshore strata. Lacey noted that data are lacking to correct for perception bias. However, there are data to inform availability bias. Group sizes ranged from one to 225 animals from boat surveys (up to 230 animals from aerial surveys). Sightings were made from both aircraft and boat survey around most of the coast of Hawaii Island, except for the SE sideAround O'ahu, the distribution of spinners was more uniform, although with no sightings in the NE corner. Opportunistic UAS (drone) footage of spinner dolphins off the Kona coast of Hawaii Island was analyzed to asses for availability bias. Findings revealed that spinner dolphins are available to be seen a vast majority of the time (0.99 – 1.00). Lacey explained that the aerial survey data were pooled with 2004 sightings to generate a detection function, and included left-

truncation to address a lack of visibility directly under the aircraft. For boat surveys, data from boat surveys of both islands were pooled to generate a detection function. The current abundance estimate is 899 animals for Hawai‘i Island and 614 for O‘ahu. For the Maui Nui region, some survey effort has been completed, with just a single spinner dolphin sighting detected off of Maui so far.

Tinker asked about availability bias correction, and if it was the same analysis for both types of survey platforms. Lacey noted that it was only applicable to the boat surveys. Given the clarity of the water, it is assumed that the animals can be seen at depth, verified via drone video, which also allows you to see the seabed. Tinker asked if there is any correction in the aerial survey for perception bias, to which Lacey stated that there has been no correction for perception bias for aerial platforms so far, so the aerial counts / estimates should be considered to be conservative.

Brandon noted the fact that “Island” was significant as a detection function covariate. Lacey explained that there are depth (and therefore habitat) differences between islands It is also possible that there were differences resulting from different observer teams and vessels used on the different islands. They are also different stocks, so there may be unknown behavioural differences and so on. It seems very likely that “island” is serving as a proxy for unknown differences.

New asked about differences between aerial and boat sightings (in absolute numbers), regarding temporal overlap. She noted that if aerial and boat surveys are occurring over the same period, and water clarity is high, you would expect sighting numbers to be similar between platform types. Lacey explained that there were differences in survey coverage between platform types; the areas where aerial platforms operated were disproportionately on the windward side of the island, where there are no resting areas for spinners, and thus, it is expected that spinner density would be low to none.

Forney noted that the lack of a belly window or bubble windows on the aerial platform warrants a deeper look into availability bias. Lacey agreed.

Pacific Islands Regional Office Updates

PIR Management updates

Elena Duke from PIRO provided management updates for the PIR. For FKW interactions and TRT updates, Duke stated there were six interactions in 2023 in the deep-set longline fishery. All are considered preliminary or final ‘serious’ injuries. She provided a plot that showed FKW M/SI by year from 2013 to 2023, parsed out by those that occurred inside and outside the EEZ. The MSI estimate was 47, exceeding the PBR of 33, which is reflected in the draft 2023 stock assessment. At the last TRT meeting, members discussied a range of measures including gear changes, dynamic closures, EM, deterrents, outreach and education. The TRT recommended 100% EM on the deep-set fishery, fully implementing the MMPA import rule, crew training, gear handling guidelines, and requiring that vessel operators must supervise and be in visual and/or verbal contact with the crew during any handling or release of marine mammals. Duke stated that the TRT also recommended that NMFS determine the full range and size of the Hawai‘i pelagic stock and estimate foreign fishery bycatch, including MSI within the full range

of the Hawai‘i pelagic stock. The suggested gear changes include weaker hooks and fighting line devices. Other issues discussed at the TRT meeting were effort caps; rolling closures; and reducing effort by hooks, sets, or total numbers of trips. Duke noted that the NMFS convened a working group to discuss handling guidance, which included veterinary advice on marine mammal handling. Finally, for FKW TRT, Duke reviewed the Southern Exclusion Zone Trigger changes. Duke also mentioned other management issues including the humpback whale approach regulations from vessels or aircraft, and an update that in addition to the spinner dolphin final rule that prohibits approach and swim-with dolphin programs, PIRO is continuing to work on the time-area closures.

Leslie asked about the timeline for the time-area closures for spinner dolphins. He noted that the Pacific SRG has been providing guidance on this for many years without any traction. Dawn Golden, PIRO's Assistant Regional Administrator, stated that they are reviewing a lot of new information and do not have a specific timeline.

DeMaster asked if there is a timeline for adopting the TRT recommendations. Golden noted that there are many ongoing initiatives, like crew training, and some are moving faster than others. She stated that the Take Reduction Plan (TRP) will be amended all at once, and some of the elements may be implemented before then. Duke added that they are also tracking implementing the fighting line device and gear testing projects. There was a follow up question regarding the timeline of the new TRP, and PIRO responded that there was no specific timeline.

Baird asked if the deep-set observer coverage was set in part in response to the lawsuit as part of an agreement, then why is there a reduction in coverage. Golden responded that it was not in response to the settlement, and the only requirement is that the fleet would have observers at the discretion of the regional administrator, which is funding-dependent.

Baumann-Pickering asked for clarification on what the electronic monitoring (EM) gear is doing on the longline. Duke explained that cameras were installed on the line. In addition, currently there are pilot projects to develop the EM program.

Baumann-Pickering asked if there would be reconsideration of the boundary of the southern exclusion zone, given the new larger proposed management area for FKW. PIRO responded that there is a transition to a new management area, and that NMFS will evaluate needed mitigation measures for the upcoming rulemaking given M/SI exceeds PBR.

Brandon asked if the international fleet would be bound by the same rules as the domestic fleet, and what implications would that have for PBR allocation between U.S. and non-U.S. fleets. Duke responded that this relates to the import rules, and NMFS develops a list of international fisheries, labeled as import or export fisheries. NMFS makes a determination of whether the fishery has measures in place comparable to U.S. standards. Long added that the measures we have in place for the Hawai‘i longline fishery are part of the evaluation of comparability findings. She also responded to Brandon's earlier comment by noting that NMFS does not apportion the PBR.

Concluding Remarks

That concluded the 2024 PSRG meeting. DeMaster thanked the SWFSC for hosting this year, thanked all of the presenters, thanked the participating members of the Pacific SRG, and then adjourned the public meeting.

Appendix A

Participant List

Pacific Scientific Review Group Members
Robin Baird
C. Scott Baker
Simone Baumann-Pickering
John Brandon
Doug DeMaster
Chris Free
Matt Leslie
Leslie New
Tim Tinker
Leigh Torres

NMFS Office of Science and Technology
Zac Schakner

NOAA Office of General Council
Kenneth Hagans

NOAA Oceanic and Atmospheric Research
Jim Berkson

NMFS Office of Protected Resources
Meghan Gahm, Deb Fauquier, Kristy Long, Eric Patterson, Jaclyn Taylor,

NMFS Pacific Islands Fisheries Science Center
Ann Allen, Janelle Badger, Jason Baker, Michelle Barbieri, Yvonne Barkley, Brenda Becker, Jessica Bohlander, Amanda Bradford, Claudia Cedillo, Selene Fregosi, Pina Gruden, Marie Hill, Thea Johanos-Kam, Devin Johnson, Charles Littnan, Laura McCue, Tracy Mercer, Karlina Merkens, Erik Norris, Erin Oleson, Jenny Trickey, Megan Wood, Kym Yano

NMFS Southwest Fisheries Science Center
Robert Brownell, Jim Carretta, Alex Curtis, Karin Forney, Alaina Harmon, Brittany Hancock-Hanser, Tom Jefferson, Trevor Joyce, Kristen Koch, Elise Kohli, Aimee Lang, Nick Kellar, Karen Martien, Sarah Mesnick, Jeff Moore, Phil Moran, Victoria Pease, Kathryn Sherman, Anne Simonis, Dave Weller

NMFS Northwest Fisheries Science Center
Brad Hanson

NMFS Alaska Fisheries Science Center
John Bengtson, Amelia Brower, Peter Mahoney, Sharon Melin, Tony Orr, Nancy Young

NMFS West Coast Region
Michelle Benedum, Christina Fahy, Grace Ferrara, Dan Lawson, Hanna Miller, Lauren Saez, Marisa Trego, Megan Wallen

NMFS Pacific Islands Regional Office
Nicole Davis, Elena Duke, Dawn Golden, Krista Graham, Francesca Koethe, Chelsey Young

Marine Mammal Commission
Vicki Cornish, Brianna Grimes, Michael Gosliner, Dennis Heinemann, Erin LaBrecque, Lauri Leach, Lori Schwacke

Western Pacific Fishery Management Council
Asuka Ishizaki

U.S. Fish and Wildlife Service
Lilian Carswell, Angela Gustavson, Anita Harrington, Anne Heron

Office of National Marine Sanctuaries
Eden Zang

Channel Islands National Marine Sanctuary
Lindsey Peavey

California Department of Fish and Wildlife
Ryan Bartling, Lindsay Caldwell, Morgan Ivens-Duran, Allegra La Ferr

Oregon Department of Fish and Wildlife
Kelly Corbett

Washington Department of Fish and Wildlife
Staci Amburgey, Casey Clark, Megan Hintz, Scott Pearson

Hawaii Department of Land and Natural Resources
Jeannine Rossa

Cascadia Research Collective
John Calambokidis, Kiirsten Flynn, Annette Harnish, Michaela Kratofil, Sabre Mahaffy

University of California San Diego
Lauren Baggett, Hadley Clark, Katrina Johnson, Clara Schoenbeck

University of Hawaii - Manoa
Claire Lacey, Brijonnay Madrigal, Megan McElligott, Philip Patton, Fabien Vivier

Mahak Tribe
Brian Gruber, Jonathan Scordino

Other
Diane Alps (Cabrillo Marine Aquarium); Jay Barlow (independent researcher); Thomas Doniol-Valcroze (Fisheries and Oceans Canada); Kathy Foley (UC Santa Cruz); Julie Gruber; Ben Grundy (Center for Biological Diversity); Catherine Kilduff (Center for Biological Diversity); Michaela Melanson (Moss Landing Marine Lab); Alexandria Mena (Sea World); Kathryn Ono (University of New England); Barb

Taylor (independent researcher); Patricia Tummons (Environment Hawaii); Ryan Steen (Stoel Rives); DJ Schubert (Animal Welfare Institute), Ryan Walsh (Surf to Snow Environmental Resource Management, Inc); Claire Wong (California State University); Suzanne Yin (Hawaii Marine Mammal Consortium)