



## 151<sup>st</sup> Meeting of the Scientific and Statistical Committee

March 12-14, 2024

Council Office, Honolulu HI

FINAL REPORT

### 4. Pacific Islands Fisheries Science Center Director Report

T. Todd Jones provided the Pacific Islands Fisheries Science Center (PIFSC) Director's report. He highlighted PIFSC's plan to develop a 10-year Strategic Plan and Implementation Plan; Western Pacific Fisheries Information Network (WPacFIN) data and application improvements; the main Hawaiian Islands (MHI) Deep7 bottomfish Western Pacific Stock Assessment Review (WPSAR) convened in December 2023; Fisheries Research and Monitoring Division (FRMD) support activities for the North Pacific Fisheries Commission; status of the Guam fishery independent survey planning; publication of the Guam Bottomfish Management Unit Species (BMUS) Data Workshop Report; International Scientific Committee for Tuna and Tuna-like Species (ISC) updates including the external peer review of the WCNPO striped marlin assessment and the upcoming new benchmark assessment for North Pacific shortfin mako shark; Bottomfish Fishery Independent Survey in Hawaii (BFISH) 2023 update; completion of the 2023 Hawaiian Islands Cetacean and Ecosystem Assessment Survey (HICEAS); and the uku ecosystem-based fishery management (EBFM) data summit.

An SSC member inquired when the CNMI fishery independent survey would be conducted. Jones indicated that the focus will remain on Guam before moving the effort up to the CNMI due to the Guam BMUS' overfished but not overfishing status. Jones also noted that there is funding for three years and they hope to make it an operational survey. The SSC noted that the HICEAS survey only had one on-effort visual detection but had more acoustic detections, and received clarification from Amanda Bradford, PIFSC, that it is more common to detect false killer whales acoustically than visually.

An SSC member inquired about the level of national coordination with electronic monitoring (EM) development. Jones indicated that there is a national-level working group overseeing the progress of EM but development has been regionally focused and reflecting regional differences in factors such as proximity to ports, funding sources and existing regulations. PIFSC has conducted pilot research and development using external funding, and is looking to secure funding for broader implementation. Unlike some regions that have dedicated EM or human observer funding through congressional appropriations, this region has no congressional funding for EM and will be looking to reallocate funds from existing budget lines.

The SSC also discussed the development of a PIFSC 10-year strategic plan, and noted that the process has just been initiated and that this will be PIFSC's first multi-year strategic plan. The strategic plan will be driven by the mandates including Magnuson-Stevens Act (MSA), Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA), with prioritization of species and activities determined based on available funding and consideration of moving towards climate informed science and EBFM.

**The SSC recommends that the Council work with PIFSC to ensure that their strategic and implementation plans align with the Council's plans and priorities.**

## **5. Island Fisheries**

### **A. Main Hawaiian Islands (MHI) Deep 7 Bottomfish Fishery Benchmark Stock Assessment**

#### **1. WPSAR Report**

Steve Martell, SSC member, provided a report of the WPSAR for the MHI Deep 7 Bottomfish Benchmark Stock Assessment. The WPSAR review was chaired by Martell and had independent expert panelists Yan Jiao and Cathy Dichmont as reviewers. Highlights from the WPSAR review include the participation of industry and traditional fishers in data workshops prior to the meeting and a scientific survey that included camera systems for fishery-independent estimation. The assessment also integrated traditional knowledge in model parameter priors. Martell provided an overview of how the assessment met the Terms of Reference (ToR) for the review. ToRs 1-5 were satisfied as data sources, catch-per-unit-effort (CPUE), model application, and uncertainty were well documented and justified.

Under ToR 8, the stock assessment is deemed adequate for projecting future status of the BMUS complex and can be applied to appropriately make management decisions. However, uncertainty needs to be characterized better. The reviewers suggest that managers consider additional buffers in setting catch limits, noting retrospective bias due to differences in trends in BFISH and CPUE.

Martell noted that the review panel went through a series of model runs with alternative prior distributions. The review panel converged on run 7 where the variance on the prior distributions was increased to allow the data to inform the initial population size and allow for more variability in the prior for  $r$ . This was the base case provided in the final assessment. Martell noted that the WPSAR panel found that the assessment is scientifically sound, contingent on implementing the short term recommendations as outlined in the WPSAR report. The WPSAR review panel concluded that implementing these changes would satisfy all of ToR in the review. The WPSAR review panel also noted the total allowable catch (TAC) setting process should take into consideration the retrospective bias in this assessment when determining the risk of overfishing.

**The SSC accepts the results of the WPSAR review and supports the panel's conclusions and recommendations.**

#### **2. Stock Assessment**

John Syslo, PIFSC, presented results of the MHI Deep 7 bottomfish stock assessment. The assessment uses data from the Hawaii Fishery Reporting System (FRS) from the fishing years 1949 to 2023 and the BFISH survey. This assessment on the Deep 7 BMUS complex included improvements on catch data (re-evaluation of unreported catch estimates), improved CPUE standardization with data filtering, use of a spatiotemporal approach for the BFISH survey, and inclusion of improvements in modeling platform based in WPSAR reviewer inputs in the previous presentation. The modeling platform is Just Another Bayesian Biomass Assessment (JABBA).

During the 2023 WPSAR, the panel felt that some of the assumed prior distributions were too constrained and requested the stock assessment team examine the effect of increasing the uncertainty in the priors for those parameters in the base model (Request no. 7 in the WPSAR Chair report). These changes were incorporated into the final base assessment.

The stock assessment found that the Deep 7 stock was not overfished and not experiencing overfishing. Stock status has gradually increased over time from 2010 to present and estimated harvest rates have decreased. Catch levels have consistently been well below annual catch limit (ACL) levels of 492,000 lbs.

To complement the multi-species surplus-production model, two single-species models (surplus-production and age-structured) were presented for opakapaka, the dominant fish species in the Deep 7 complex. Both opakapaka models supported the general conclusions of the benchmark assessment.

SSC members discussed various aspects of the assessment, including the influence of the BFISH surveys, how differences in biological parameters across species were incorporated into the prior distribution for  $r$ , the stability of the species composition in the catch history, and the environmental covariates that were considered in the model. The SSC acknowledged how PIFSC were open to receiving input from fishers in the undertaking of the assessment.

SSC members also suggested that future assessments could consider age-structured production models and as well as posterior predictive check tests to evaluate the performance of the data standardization model. SSC members continued to express concerns about the utility of the Hawaii Marine Recreational Fishing Survey (HMRFS) data to inform effort levels and suggested alternative approaches to deriving reported and unreported catch levels across sectors.

**The SSC accepts the 2023 benchmark assessment as best scientific information available (BSIA). The SSC recommends that the Council proceed with convening the P\* and SEEM working groups to quantify the uncertainties to develop options to set the Acceptable Biological Catch and specify the Annual Catch Limits for the MHI Deep 7 bottomfish species.**

### **B. MHI Small Boat Fisheries Project Update**

Roy Morioka, Council contractor, provided an update of a Council project looking to engage the fishing community to participate in the management of small-boat fisheries in Hawaii. He noted the need to build relationships with the community through continuous engagement in order to get them to participate in fisheries management. Establishing communication channels and dialogue opportunities between the community and scientists/managers can help to better address the fishing community's needs and concerns. These meetings will also allow the fishing community to know who are the go-to NOAA or Council representatives that they can bring their concerns to.

SSC members commented on the importance of communicating how input from the fishing community was considered in management decisions. Morioka responded that active feedback and follow-up with fishing community is part of the project framework. The SSC thanked Morioka for his efforts to bring the diverse perspectives of the Hawaii fishing community into the management process and expressed strong support for the project.

### **C. Guam Bottomfish Stock Assessment Update**

#### **1. WPSAR Report**

Milani Chaloupka, SSC member, provided a report of the WPSAR for the 2024 Stock Assessment Update of the BMUS of Guam. The update assessment was intended to use the same

modeling platform as the previous benchmark assessment in 2019 by Langseth et al (2019). The WPSAR review panel found that the 2024 Guam BMUS update stock assessment was complete with no consequential deviations from 2019 benchmark assessment (Langseth et al 2019). ToRs 1-6 for the WPSAR reviewers were satisfactory because of this confirmation, uncertainty was well-documented, and results including estimated reference points can be used for management. Recommendations for future work were provided under ToR 8. These future recommendations include the following high priorities: latent structure and common trends in the catch and CPUE time series using Dynamic Factor Analytic approaches, elucidate data gaps in territorial data based on boat-based sampling protocols, and explore use of species categories based on depth and life history. Future modeling can include a single likelihood for data standardizations, use environmental covariates, and use posterior predictive check-tests to evaluate model performance. Public comments, panelists, and PIFSC analysts acknowledged the importance of accounting for shark depredation in CPUE estimation.

The SSC thanked Chaloupka for his informative presentation as well as the WPSAR panel for their review.

**The SSC accepts the results of the WPSAR review and supports the panel’s conclusions and recommendations. The SSC recommends that the next benchmark assessment disaggregate the stock complex into shallow and deepwater species.**

## **2. Stock Assessment**

Erin Bohaboy, PIFSC, presented the Guam BMUS update stock assessment. This assessment was an update from the 2019 stock assessment update. The Guam BMUS was treated as one multi-species complex comprising 13 bottomfish species such as onaga, opakapaka and ehu. The assessment used the same modeling platform and specifications as the Langseth et al (2019) assessment. Catch and CPUE from 2018-2023 were updated and added. Species composition changed over time with *E. coruscans* increasing. The assessment used CPUE from a boat-based creel survey by the Guam Department of Aquatic and Wildlife Resources. CPUE showed some increase since 2018. Results from the assessment found that the stock is likely not overfished and likely not-experiencing overfishing relative to Council Fishery Ecosystem Plan (FEP) reference points. Biomass is not yet at levels associated with maximum sustainable yield, which would be required to take the stock complex out of the rebuilding plan. WPSAR recommendations from the previous presentation were addressed by each ToR.

The SSC thanked Bohaboy for the informative presentation.

**The SSC accepts the 2024 update assessment as BSIA. The SSC recommends that the Council proceed with determining the need to revise the Annual Catch Limits for the Guam BMUS under the existing rebuilding plan.**

## **D. Guam Bottomfish Data WPSAR Terms of Reference**

Felipe Carvalho, PIFSC, presented the Terms of Reference for the proposed data WPSAR for Guam BMUS in July 2024. The next assessment should follow the same guidelines as the 2023 stock assessment for the American Samoa BMUS. The next stock assessment will explore length-based assessment techniques in lieu of a biomass dynamic modeling approach. The next review should allow application of recommendations provided by the WPSAR update assessment panelists as well.

**The SSC endorses the Terms of Reference for the 2024 Guam Bottomfish Data WPSAR and nominates Milani Chaloupka as chair of the WPSAR panel.**

**E. Public Comment**

Roy Morioka, Hawaii commercial fisherman, recommended removing Hapu‘u‘pu (*Hyporthodus quernus*) from the Deep 7 complex because it is a grouper. Morioka also expressed his concerns about the quality of the HMRFS data and instead recommended using the bottomfish vessel registry to define the Hawaii bottomfisher universe. Morioka noted that fishermen do not agree with moving to a single species assessment, considering the differences in commercial and non-commercial fishing motivations. Morioka also noted the importance of wind and currents as important environmental covariates for bottomfishing and highlighted this as an example of the need for scientists and fishermen to work together.

Layne Nakagawa, Hawaii commercial fisherman, submitted written comments expressing concern about the accuracy and overall utility of HMRFS data for bottomfish stock assessments. He also recommended research focused on estimating the levels of non-commercial and under-reported commercial catch.

## **6. Pelagic and International Fisheries**

### **A. 2023 Longline Fishery Performance and Economic Snapshot Reports**

#### **1. Hawaii Longline Fishery Report**

Russell Ito, PIFSC, presented the 2023 annual report for the Hawaii longline fishery (deep-set and shallow-set components). The report covered fishery statistics including participation, effort, and catch. Hing Ling Chan, PIFSC, provided the Hawaii seafood market snapshot reports that include recent trends for the value and quantity of imported and local yellowfin tuna. In addition, research into the dynamic relationship between prices and sales of local and imported fish in Hawaii will be re-examined.

There was a fleet-wide increase of 3 vessels from the prior year. Fishing effort increased slightly for trips and sets, mainly for deep-set, with a record number hooks being set primarily on the high seas. For shallow-set, effort was more concentrated between 30-35N than in recent years.

Trends of catch suggest decrease of bigeye tuna and increase in yellowfin tuna (also in CPUE) particularly in 4th quarter of 2023. Also noted were increases in albacore catch (also in CPUE). Bigeye tuna catch was primarily southwest of the Hawaiian Islands. Swordfish catch was primarily in a region directly north of the Hawaiian Islands. It was noted that fuel and supply costs continue to increase while fish prices were very low. Recent catches of bluefin tuna were noted.

Economic analyses indicated soft inflation in Hawaii with 2023 catch (all species) ex-vessel price lower compared to recent years. There has also been a relatively high level of yellowfin tuna imports compared to historical levels, although early months in 2023 are lower than those in 2022. Hawaii longline revenue in 2023 was notably lower than pre-pandemic average levels (2015-2019), and lower than revenue in 2021 and 2022. Fuel price has been increasing annually and was higher than most baseline levels.

SSC members discussed trends in fuel price and if this is driving the deep-set fishing effort southwest of Hawaii. Ito responded that the southwest fishing grounds are a commonly fished area.

An SSC member asked if bigeye tuna were caught in the shallow-set fishery and if this was also experiencing a decline. Ito responded that bigeye catch was a negligible amount of the shallow-set total (~3%).

An SSC member asked about the ex-vessel price source. Chan stated that the integrated dealer data set created by WPacFIN was utilized, not direct data from dealers. Minling Pan, PIFSC, noted that for the longline fishery the two sources of price information are identical, which is not the case for small boat fishery data.

An SSC member asked if the fishery summaries could be presented in weight as well as numbers to allow comparison with some of the economic trends. Chan stated that they have not yet calculated economic performance. Ito clarified that weight could not be brought into report at this point in time given timeline of data availability and the SSC report-out. PIFSC staff indicated that weight data is available in the annual SAFE reports.

SSC discussed differences in prices for foreign versus domestic tuna and also the impacts of imported tuna on the local poke market. The SSC noted the value of ongoing research, in particular continued reporting on the volume of imported tuna in Hawaii and the potential impact of these imports on local longline and small boat economic performance.

**The SSC recommends that longline fishery summaries for catch and CPUE be reflected in numbers and weight when economic data is presented at the September SSC meeting.**

The SSC thanked Ito and Chan for their informative presentations.

## **2. American Samoa Longline Fishery Report**

Jennifer Stahl, PIFSC, presented the 2023 annual report for the American Samoa longline fishery covering fishery statistics including participation, effort, and catch. Hing Ling Chan, PIFSC, also provided market snapshots and economic trends for the American Samoa local longline fishery and its impact on the local market. Six vessels are utilizing electronic reporting tablets out of ten vessels that have them ready for use. Data on fishing outside the EEZ continues to be confidential (<3 vessels). Participation and effort were lower in 2023 (vessels, trips, sets, and hooks) with the last 4 years fairly similar. Catch and CPUE have been increasing since 2020.

Economic analysis indicates that the inflation rate (9.7% CPI in 2022) increased substantially since the pandemic and that there is a decreasing trend in ex-vessel price for South Pacific albacore since 2019. Profit fluctuates over time, with generally slightly profitable years but negative revenue in 2013-2014 and 2020. There was a significant increase (>50%) in 2022 fuel price. Local catch is very important for food security and source of income. A small-boat fishing survey indicated that 97% kept some of their catch for family consumption, but pelagic species are mostly given away.

An SSC member asked which NMFS Science Center and Council reports on the South Pacific albacore troll fishery (boats originating from the Pacific Northwest) and whether a summary of that fishery could be obtained, since they are targeting the same fish in the same area as longliners. Stahl responded that the Southwest Fisheries Science Center (SWFSC) handles this.

The SSC noted that the increase of yellowfin tuna catch and CPUE is similar to that seen in the Hawaii longline fishery and asked whether species other than albacore are important to profitability in the American Samoa longline fishery. Pan responded that the price for yellowfin tuna is less than albacore at the cannery. An SSC member noted that non-target species from foreign fleets compete with locally caught fish.

An SSC member asked about the costs of bait and other trip costs. Pan noted that they track trips costs, such as fuel and other costs, and can estimate net revenue per trip.

**The SSC recommends that PIFSC include U.S. South Pacific albacore troll fishery summaries from the SWFSC alongside annual American Samoa longline fishery summaries.**

**The SSC recommends that time series plot of hooks per set be provided in future longline reports along with an explanatory narrative.**

The SSC thanked Stahl and Chan for their informative presentations.

**B. Public Comment**

There was no public comment.



## **7. Program Planning and Research (Part 1)**

### **A. PIFSC Ongoing Research Updates**

Council staff provided an overview of this new section on PIFSC and other NOAA ongoing research updates, which was added to the SSC agenda as part of the ongoing coordination between the Council and PIFSC. The intent of this section is to provide the opportunity for SSC to become more familiar with ongoing PIFSC research of fishery management relevance, PIFSC scientists to get input/feedback from SSC before work is completed, and help facilitate the ongoing coordination for scientific needs for fishery management. For future meetings, Council and PIFSC staff will coordinate to schedule out presentations for this agenda section in advance.

#### **1. Hawaii Shallow-set Longline Fishery Species Distribution Model**

Justin Suca, PIFSC, presented an analysis on the factors affecting catch rates in the Hawaii shallow-set longline fishery. The analysis used ensemble boosted regression trees to estimate the occurrence and catch rate of species caught in >1% of sets in the Hawaii shallow-set longline fishery from 2005-2022. Results indicated clear patterns in catch rate driven by gear and captain effects. Catchability for species with diel vertical migratory behavior was impacted by the lunar cycle. For the majority of taxa, catch rate was partitioned by the North Pacific Transition Zone, with unique secondary target and bycatch patterns on each side of the front. Proximity to seamounts and islands and teleconnections such as El Niño-Southern Oscillation (ENSO) played important roles in the catch rate of select taxa. These models provide baselines for how oceanography drives catch rates, and informs future projections of shifts in occurrence and catch rate of these taxa in a changing climate.

The SSC asked for clarification on the model in terms of space, model type, and variance exploration. Suca stated that space was not explicitly incorporated into the model. Suca noted that a Bernoulli model was used, investigating presence/absence, and stated that variance explanation was not fully explored due to the limited depth of interactions.

The SSC supported the project, emphasizing the importance of tools like these for understanding CPUE of pelagic resources, aggregation and catchability of species, and noting the value of combining the model with an effort displacement model to learn how closures can result in increased bycatch in other areas. An SSC member also suggested that concentration of forage is an important factor for catch rates of pelagic species.

SSC thanked Suca for his informative presentation.

#### **2. Status of Leatherback, Loggerhead, and Green Sea Turtle Research and Assessments**

Summer Martin, PIFSC, presented on the status of leatherback, loggerhead, and green sea turtle research and assessments, highlighting ongoing activities by the Marine Turtle Biology and Assessment Program (MTBAP) under their themes of population assessment, addressing threats, and technology. Ongoing research and associated activities to inform leatherback population assessment include an international working group to strengthen partnerships, securing data pipelines from nesting beaches in Indonesia and Solomon Islands, and satellite telemetry and genetics to understand connectivity and habitat use. Research and related activities to inform loggerhead population assessment include collaboration with Japan on nesting dynamics to update nesting data after 2016, post-hooking telemetry in the Hawaii SLL fishery to fill data gaps for EBFM modeling (PSERF), and re-engaging Japanese coastal pound-net fishers for

bycatch research. Fifty loggerhead sea turtles have been tagged by trained observers since 2021, and associated analysis is pending. Green turtle population assessment research includes Rose Atoll nesting surveys in American Samoa, Pearl Harbor in-water satellite tagging and NWHI nesting for Hawaii, and in-water tagging, nesting dynamics, telemetry, genetics and breeding sex ratio research in Guam and CNMI. Efforts are also ongoing to develop robust-design mark recapture model, integrated population model, and refine the existing PVAs and take models. Monitoring to reduce egg harvesting, egg predation, and direct take of foraging leatherback turtles are also ongoing in Indonesia, with 91% reduction in direct take of foraging turtles from 2017 to 2023. For climate change research, MTBAP has provided scientific expertise for the Lalo Resilience Plan, and there are also manuscripts in progress for adaptation to habitat loss and demographic parameter shifts. Ongoing technological development include leatherback telemetry anchor attachment and net illumination for bycatch reduction in net fisheries. Initial deployment testing for the leatherback direct tag attachment method will occur during summer 2024 in collaboration with SEFSC.

SSC thanked Martin for the informative presentation, and noted value in receiving regular updates on important turtle research relevant to the SSC (e.g., information on WP leatherback turtles and NP loggerhead turtles).

### **3. NOAA OER Beyond the Blue Pacific Campaign**

Kasey Cantwell and Trish Albano, NOAA Office of Ocean Exploration and Research (OER) presented on the plans and priorities for exploring the Pacific Islands region with the NOAA Ship Okeanos Explorer as part of the Beyond the Blue: Illuminating the Pacific campaign. The initiative is aimed at increasing the understanding of the Pacific Islands region waters through coastal and ocean mapping, exploration, and characterization.

SSC emphasized the importance of involving indigenous communities in the campaign. Also noted was that targeting the younger generation would be most effective in generating interest and involvement. The presenters re-affirmed the inclusion of indigenous communities to ensure respectful and appropriate engagement with the community.

SSC asked about the number of ship days planned for the year and were informed that the number of days at sea per year is 180 to 200.

SSC inquired about the geographic focus of the OER Cooperative Institutes, noting their concentration on the East Coast and Gulf Coast despite spending significant time elsewhere. NOAA OER acknowledged this and noted their collaborative efforts with communities, organizations, and academic institutes in Hawaii and American Samoa.

SSC thanked Cantwell and Albano for the informative presentation.

### **B. Public Comment**

There were no public comments.

## **8. Protected Species**

### **A. Overview of the 2024 Hawaii Pelagic False Killer Whale Survey**

Amanda Bradford, PIFSC, provided an overview of the 2024 Hawaii pelagic false killer whale (FKW) survey, developed in response to issues raised in developing the new management area. PIFSC will conduct a 30-day ship-based survey (April 23 – May 22, 2024) focused on encountering and collecting biological data from as many pelagic FKWs as possible. The intent is for this effort to inform future development of the Hawaii pelagic FKW management area. Bradford noted this effort will not be a design-based survey and will concentrate outside the EEZ to the SE of Hawaii Island to investigate areas where information on FKW stock structure is lacking. This area was chosen because of the relatively higher estimated densities of FKWs and the potential for overlap with other pelagic stocks that needs to be evaluated. Standard visual and acoustic line transect data will be collected and possibly eDNA sampling. Small boat operations will be necessary for biopsy sampling and tagging and therefore weather dependent. Bradford also noted that eDNA cannot be used for stock-structure.

The SSC discussed the pros and cons of conducting the survey inside versus outside the currently defined stock area boundary. It was noted that the cruise objective was to investigate areas outside the current management area and to not spend survey time in areas where pelagic FKW are known to exist. The SSC noted that conducting the survey outside the EEZ has the potential to impact the current management area boundary and the associated Potential Biological Review (PBR) values, as does the potential foreign bycatch impacts within the stock area boundary. There is an ongoing effort to estimate potential foreign bycatch impacts, the results of which may change how those impacts are incorporated into the estimation of PBR.

An SSC member inquired about different potential methods used for stock identification (ID) using genetics or acoustics. Bradford indicated that both mitochondrial and nuclear DNA methods are more developed and suitable for Stock ID versus the less developed, but potentially promising, acoustic signature methods.

### **B. SSC False Killer Whale Working Group Update**

Shelton Harley, SSC member, presented a report of the SSC Working Group formed at the 149<sup>th</sup> meeting in September 2023. The Working Group was tasked with working with staff to respond to PIFSC's response to the June 2023 SSC recommendations regarding the pelagic FKW management area approach, as well as to provide comments on the draft 2023 Stock Assessment Report (SAR) when it becomes available. The Working Group, comprising of Harley, Milani Chaloupka, Ray Hilborn, and David Itano, provided further review of the pelagic management area approach and its application in the draft 2023 SAR (published on January 29, 2024, and open for public comment through April 29, 2024), and prepared a report for the full SSC's consideration at this meeting.

The abundance within the pelagic FKW management area was estimated using the species distribution model (SDM) in the 2023 Hawaii FKW SAR. Harley noted that predicted abundance of pelagic species can change rapidly in response to changing environmental conditions. The Working Group recommended that the design-based approach be used to estimate FKW abundance inside the EEZ until such time that a more rigorous and independent evaluation of the SDM approach can be completed.

For areas outside of the EEZ, the Working Group recommends that NMFS not use the

management area boundary and associated abundance estimate using the SDM in the SAR or for any management purposes because the available data are not fit for purpose. The working group recommended that data be acquired through additional surveys outside of the EEZ to gather tagging and genetics data to delineate a biologically-based area that defines the pelagic stock.

The SSC notes that PIFSC has plans underway to survey the area south of the proposed management area boundary to obtain additional data useful to delineate a biologically-based area that defines the pelagic FKW stock. Harley noted that the Working Group's review occurred prior to receiving information about the upcoming survey outside of the EEZ.

The SSC noted a separate PIFSC working group, including SSC members, that is considering foreign fleet impacts on the pelagic FKW stocks.

**The SSC adopts the Working Group report and recommendations (Appendix A).** The SSC sees value in PIFSC meeting with the SSC Working Group to follow-up on the report.

**The SSC recommends that the Council include the Working Group report and recommendations in its comment letter in response to the draft SAR.**

### **C. Public Comment**

There was no public comment.

## **9. Program Planning and Research (Part II)**

### **A. Council 5-year Program Plan Updates for 2025-2029**

Council staff presented an overview of the Program Plan for the next four-year administrative award period of 2025-2028. The plan is built around the Council's mission, seven guiding principles and its governance structure as required by the Magnuson-Stevens Act (MSA). The primary driver is the MSA, 10 national standards and other statutes, executive orders, and policies including NEPA, ESA, APA, CZMA, and MMPA. No significant changes are being proposed to the Council's governance structure (who, how, when and where the Council and its advisory bodies meet) at this time. The plan also includes active agreements, policies and plans by which the Council conducts business. The new program will be arranged by FEP, which is aligned with the jurisdictional areas, which is a restructure from the 2020-2024 plan structure based on five program areas (pelagics, island fisheries, protected species, human dimensions, and education and outreach). All of these program elements and activities will remain but be presented by FEP/island area. Five major themes have been identified by staff to which the new program activities will be addressed within each FEP/island area:

- Climate Changes Resiliency
- Strengthening US Pacific Fishery Competitiveness Domestically and Internationally
- Emerging Technologies in US Pacific Fisheries
- Equity and Environmental Justice/Underserved Communities
- Capacity Building and Fishery Development

Work included a new Council program policy initiative to focus on emerging technologies such as electronic monitoring and reporting.

The SSC thanked Council staff for the informative presentation.

### **B. Review of SSC Plan 2024-2026**

Lynch and Council staff presented the revised SSC Plan for 2024-2026. In anticipation of the Council projects under the Inflation Reduction Act funding, the SSC Plan has been revised to include a dedicated thematic area on the science to support climate-ready fisheries and climate-informed fishery management. Council staff highlighted new areas to be considered by the SSC in the 3 year period. In particular, they anticipated an increased SSC focus on climate-informed fisheries management advice.

SSC noted the addition of '*allocation of fisheries resources*' under *2. scientific advice for management actions*. Council staff clarified that this was intended to focus on allocations by sector or island area, including Uku ACLs and Marianas bottomfish where potential allocations between CNMI and Guam could be considered.

The SSC supported the addition of PIFSC ongoing research updates as a standing agenda item for future SSC meetings (item 6b).

**The SSC endorses the 2024-2026 SSC Plan.**

The SSC thanked Council staff for the informative presentation.

## **C. MSRA 5-year Research Priorities 2025-2029**

### **1. Status of Developing the MSRA 5-year Research Priorities 2025-2029**

Council staff reported on a workshop held with PIFSC to revise the Council's Five Year Research Priorities, and preliminary draft research priorities for 2025-2029. The draft priorities retain the four program areas from the previous priorities documents, which are Pelagic Fisheries, Island Fisheries, Protected Species, Human Communities.

The Pelagic Fisheries research program will focus over the next 5 years on addressing the Inflation Reduction Act priorities such as climate-informed fisheries management initiatives, including (1) improving understanding of pelagic fisheries performance, (2) evaluating policy interventions such as spatial closures, (3) improving knowledge of pelagic management unit species distribution and life history and responses to environmental factors, (4) advancing ecosystem-based fisheries management, and (5) depredation mitigation.

The Island Fisheries research program will focus on (1) data collection to inform state and territorial management, (2) improving life history and fishery-independent information, (3) climate resilient fisheries and EBFM, and (4) non-fishing impacts on essential habitats.

The Protected Species research program will focus on the Council management priorities such as (1) robust risk assessments for FKWs and marine turtle species exposed to pelagic longline fisheries, (2) ensuring climate-readiness, (3) evaluating the effectiveness of bycatch mitigation measures, and (4) addressing the needs of small boat fisheries and underserved communities including the mitigation of FKW and oceanic white-tip shark depredation.

The Human Communities research program will focus on (1) a socioeconomic characterization of regional fisheries, markets and fishing communities, (2) integrating socio-economic, ecological research efforts, (3) understanding cultural dimensions and values of island and indigenous fishing.

The SSC noted the potential to prioritize the research areas listed, to assist both staff and potential research providers, and to ensure the areas of proposed research were not over-specified. The SSC highlighted the need to coordinate with the PIFSC on future research areas.

The SSC thanked Council staff for the informative presentation.

### **2. SSC Work Session to Refine the MSRA Research Priority**

The SSC provided a review to refine the preliminary draft research priorities in a working session. The two working session summaries are attached as Appendix B.

**The SSC endorses the working session summaries. The SSC recommends the draft research priorities incorporating SSC input for further review by the Council advisory groups and looks forward to reviewing the final revised document at the June SSC meeting.**

The SSC noted there may be an opportunity to provide further comment on updated draft research priorities ahead of the review by the Council advisory groups.

## **D. Assessing Conservation and Biodiversity Protections Through Spatial Management**

### **1. Simulating Benefits, Costs and Trade-offs of Spatial Management**

Dan Ovando (IATTC) discussed his recent publication on simulating benefits, costs and trade-offs to spatial management in marine social-ecological systems. His paper presents a modeling framework called “marlin” that can be used to efficiently simulate the bio-economic dynamics of marine systems in support of both management and research. The paper presents two case studies on the conservation and food production impacts of marine protected areas (MPAs). In the coastal coral reef example, the paper explores how heterogeneity in species distributions and fleet preferences can affect distributional outcomes of MPAs. In the pelagic case study, the paper shows how their model can be used to assess the climate resilience of different MPA design strategies, as well as the climate sensitivity of different fishing fleets. This paper demonstrates how intermediate complexity simulation of coupled bio-economic dynamics can help communities predict and potentially manage trade-offs among conservation, fisheries yields and distributional outcomes of management policies affected by spatial bio-economic dynamics.

The SSC thanked Ovando for his informative presentation.

### **2. New Framework Reveals Gaps in US Ocean Biodiversity Protection**

Sarah Gignoux-Wolfsohn (University of Massachusetts-Lowell), Daniel Dunn (University of Queensland), and Emmett Duffy (Smithsonian Institute), presented a recent publication that proposes a scientific framework for assessing marine biodiversity at multiple spatial scales to assess gaps in biodiversity knowledge and protection. The framework prioritizes ecologically and societally important taxa, characteristics of effective networks, and existing data. Applying the framework to assess biodiversity inside and outside US marine protected areas, the analysis found that these areas contain a fraction of the biodiversity found in US waters. The paper shows that none of the nation’s 24 marine ecoregions meet all criteria for an effective protection network and that biodiversity coverage in protected areas varies among regions and taxa.

Duffy advised that this work has now been extended to examining the efficacy of marine biodiversity protection for different stakeholders through regional discussion groups. Duffy also advised that they are near completing a National Ocean Biodiversity Strategy that is anticipated for release by June 2024.

The SSC noted that any definition of “protection” is contentious and needed careful consideration, especially given that the paper indicated that the total closure of an area was the “best” protection. The SSC noted that a total closure might not be as effective as technical measures for specific conservation and fisheries management objectives.

Dunn indicated that the framework used an independent predetermined definition of protection of biodiversity. The use of OECMs (“Other Effective area-based Conservation Measures”) was also considered. Duffy also noted that the primary aim of the approach was to examine how the current network of protected areas worked to protect the biodiversity of US ocean habitats.

An SSC member noted that threats need to be identified in order to assess protection or effectiveness of spatial measures. Stated threats such as climate change or human interactions have been noted as key concerns for biodiversity protection, which the implementation of protected areas does not necessarily address.

An SSC member noted that the caveats and assumptions behind the paper were not explicitly stated and that the results presented might be interpreted as indicating total closures were the only means to effectively manage marine ecosystems and protect their biodiversity. It was noted that the paper's title might be misleading and could be seen as supporting FPA (Fully Protected Area) as a general strategy with potential significant unintended consequences, for example social and economic impacts in American Samoa from support for monument and or sanctuary expansion around the PRIA.

**The SSC recommends that the Council work with the Council Coordinating Committee (CCC) to ensure that any area-based conservation management measures proposed have stated abatable threats, a means to evaluate those threats, and evidence that such action would mitigate those threats.**

The SSC thanked Gignoux-Wolfsohn, Duffy and Dunn for their informative presentation.

#### **E. NASEM Committee on Assessing Equity in the Distribution of Fisheries Management Benefits**

Thomas Miller, Chair of the National Academies of Sciences, Engineering, and Medicine (NASEM) Committee, presented an overview of the report on assessing equity in the distribution of fishery management benefits. The independent review was requested by NMFS to address the goals of its Equity and Environmental Justice (EEJ) strategy. Within this review, the committee outlined key findings and recommendations to NMFS and the Council to address equity in fisheries management, focusing on distributional benefits of permits and quota assignment. It also identified six principal barriers to implementing an approach to EEJ in fisheries. This includes acknowledgment of the whole underserved communities; access to fishery benefits and allocation; engagement and access to services which includes language, geography, and cultural barriers; complex nature of the fishery and potential resistance to change; effects of ocean policy leading to under-engagement in fisheries; and social science capacity within NMFS.

An SSC member noted the Committee's struggle to operationalize various forms of "equity" and commended them for going beyond the stated task. He also commended them for the important recommendation on expanding the social science capacity of NOAA Fisheries, both regionally and nationally.

Noting the cultural issues raised by an SSC member, Miller highlighted that guidance documents should not be overly prescriptive on how equitable approaches should be developed so that a contextual approach could be taken.

**The SSC recommends the Council request that NMFS consider the recommendations from the NASEM report to help support Equity and Environmental Justice (EEJ) issues.**

The SSC thanked Miller for his informative presentation.

#### **F. Public Comment**

There was no public comment.





## SSC Working Group on Pelagic False Killer Whale Management Area Approach Response FINAL REPORT

Adopted by the SSC at its 151<sup>st</sup> SSC Meeting  
March 12-14, 2024

In response to the Scientific and Statistical Committee's (SSC) recommendation from the 149<sup>th</sup> meeting (September 2023) regarding the Pelagic False Killer Whale (FKW) Management Area Approach, the Council directed staff to work with the SSC Working Group to respond to PIFSC's response to the June 2023 recommendations, as well as to provide comments on the draft 2023 Stock Assessment Report (SAR) when it becomes available. The Council further directed staff to send a copy of the Council's responses to the Pacific Scientific Review Group (PSRG). The Working Group consisted of SSC members Shelton Harley, Milani Chaloupka, Ray Hilborn, and David Itano.

Based on further review of the Pelagic FKW Management Area approach and the draft 2023 SAR, the Working Group provides the following report for the full SSC's consideration at its 151<sup>st</sup> meeting.

### Working Group Report for SSC Consideration

**The Working Group finds that the design-based approach is the most appropriate for estimating abundance inside the EEZ around Hawaii.** The design-based approach utilizes data from the EEZ-wide cetacean survey intended for deriving abundance estimates, and provides the most robust estimate of the abundance for the corresponding area at the time of the 2017 survey. At the 135<sup>th</sup> meeting in March 2020 when the SSC reviewed the design-based and model-based (using species distribution model, or SDM) abundance estimates resulting from the 2017 Hawaiian Islands Cetacean Ecosystem Assessment Survey (HICEAS), the SSC noted a number of concerns regarding the use of SDM in both inside and outside of the EEZ. The SSC at the time had recommended a simulation-based evaluation of the two estimators to be undertaken to better determine the relative value of each approach for management decision making purposes.

Similarly, the Pacific Scientific Review Group (PSRG) in its recommendations resulting from the March 2023 meeting noted concerns regarding the "broad application of the SDM as the primary basis for assessing abundance and trends" and suggested investigating these concerns "through a rigorous simulation approach, similar to the simulation approach used to develop PBR calculation guidelines." The Working Group generally agrees with the PSRG's concerns and recommendations regarding the SDM,<sup>1</sup> and notes that they align with the SSC's

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<sup>1</sup> The Working Group notes that the PSRG's comments regarding the lack of validity in extrapolating to unsurveyed

recommendations from 2020. **The Working Group therefore recommends that the design-based approach be used to estimate abundance inside the EEZ until such time that a more rigorous and independent evaluation of the SDM approach can be completed.**

**For areas outside of the EEZ, the Working Group recommends that NMFS not use the management area boundary and associated abundance estimate using the SDM in the Stock Assessment Report or for any management purposes because the available data are not fit for purpose.** Specifically:

- The management area boundary relies heavily on a small number of tagging data (n=10), all of which have been tagged inside the EEZ, which is insufficient to delineate a biologically sound outer range of the pelagic stock;
- Available data used to delineate the management area boundary are limited in its spatial extent by anthropogenic boundaries, such as surveys conducted within the EEZ and interaction locations limited by fishing effort, which do not represent true biological and ecological ranges of the pelagic stock; and
- As described above, the underlying SDM needs further review and simulations before it is utilized for management purpose.

**The Working Group additionally recommends that NMFS prioritize conducting surveys outside of the EEZ to gather additional tagging and genetics data to delineate a biologically-based area that defines the pelagic stock.**

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or poorly surveyed areas is an important point that is also discussed in a recent publication by Meyer and Pebesma (2022) regarding machine learning but has application to any SDM-type of modeling. The Working Group also agrees with the PSRG's comments that the inclusion of temporal effects in the model should be assessed as for any other habitat variable, but contends that such an assessment should be done using a Bayesian approach rather than AIC as suggested by the PSRG. *See* Meyer H, Pebesma E (2022) Machine learning-based global maps of ecological variables and the challenge of assessing them. *Nature Communications* 13: 2208. <https://doi.org/10.1038/s41467-022-29838-9>

## Appendix B

### MSRA 5-year Research Priorities Work Session Summaries

#### ***Group 1: Pelagic Fisheries and Protected Species Research Priorities (Harley; Kobayashi; Itano; Ochavillo; Pilling; Hilborn; Chaloupka; Lynch)***

##### **Overall comments**

- Group 1 discussed whether duplicated priorities should be repeated in respective sections, or included in the primary section and cross referenced for other sections. Some items such a depredation may warrant including in both pelagic/island fisheries, providing appropriate specificity for each, to ensure that relevant research outcomes can be tracked.
- The Group did not cover all PFs in the time available.

##### **Pelagic Section**

- For the primary categories (PF1-6), the group did not spot any major gaps in the categories but suggested the following changes:
  - Collapse PF1 & PF2 into a single priority, while retaining the focus on non-longline fisheries for relevant sub-categories
  - PF5 (advancing EBFM) could be collapsed into fewer priorities which might be captured under other PF, as EBFM is work that cuts across the range of Council activities
- Input on specific research priorities focused on:
  - Adding specificity for priority species
  - Updating carry-over priorities to reflect progress made in the past 5 year period (e.g., updating the priority re: examining effectiveness of closure to conducting synthesis of available studies)
  - Adding climate considerations where applicable
  - Requesting the Pelagic Plan Team to provide more specificity on priority species, based on ongoing work/existing information for PF4 priorities (improving knowledge on stock structure, distribution and life history of PMUS)

##### **Protected Species Section**

- For the primary categories, the group discussed potential overlaps between PF1 and PF2, in terms of whether the monitoring discussion fitted better into PF1
- Input on specific research priorities included
  - Consolidation of PS3.3 and PS3.4
  - Adding more specificity to PS3.3
  - Considering adding coral/green turtle critical habitat information needs
  - Discussion of aquaculture; the group noted that the management framework is in development, but that there was no specific research priority identified at this time

#### ***Group 2: Island Fisheries and Human Communities Research Priorities (Severance; Cabrera; Camacho; Biggs; Martell; Villagomez; Helyer; Jones)***

##### **Overall comments**

- Group 2 also addressed the need to potentially revise and collapse research priorities as appropriate. They also discussed the need to prioritize the priorities, noting that it needed to be clear that the listing order does not represent a priority order. A few priorities were

dropped, others were combined and rewritten in clarifying language. Those are reflected in the next iteration

### **Island Fisheries Section**

- There was discussion on what the Island Fisheries included and the group concentrated on the MUS species. and the ECS species. Members discussed the need to include shark depredation in the priorities and revised a priority to include the impacts of not just shark depredation but also research on data biases.
  - Added a new IF1.1.3
- The IF priorities were rearranged to focus on the process from collecting the data to use of the data to develop analyses of life history, and then using that information to develop data products like stock assessments.
  - IF4 was renamed “Improve EFH and HAPC Designations”
- Some of the priorities were collapsed in order to remove specific examples and broaden the priorities.
  - IF2.1.2-6 were collapsed into one new IF2.1.2 to broaden the priority and not list specific examples.
  - IF3.1.1 and 3.1.3 were combined into a new IF3.1.1 as both dealt with P\*
  - IF6.1.4-7 were combined and revised to make broader
- Some of the priorities were removed as the work was either already being done or they were no longer applicable.
  - IF4.1.2 was included in IF4.1.1
  - IF5 was included in IF4

### **Human Dimensions Section**

- It was noted that the Social Science Planning Committee (SSPC) plans to meet and discuss the Human Dimensions research priorities, and consider them in the context of their forthcoming review of their own SSPC general priorities. Three SSC members are a part of the SSPC.
- The HC priorities were rearranged to put the general cultural part first, as the group felt it was necessary to know what is going on culturally before you can focus on developing the research on socioeconomics and management impacts.
  - HC3 was moved before HC1 and the priorities renumbered
  - New HC1.1.3-5 was collapsed and reworded
- There was discussion on the need to enlarge the picture under the new HC2 (old HC1)
  - New HC2.1.5-7 was collapsed and reworded
  - New HC2.1.8 was incorporated into 2.1.1
  - HC2.1.9 was reworded
  - HC2.2.2 was moved to new HC1 and incorporated into that section
- There were changes to the new HC3 (old HC2)
  - HC3.1.1 and 3.1.2 were consolidated into one priority
  - HC3.1.4 was removed
  - HC3.2.2-4 were collapsed and reworded
  - HC3.2.3.1 was removed
  - HC3.3.1 was removed because it was already included in 3.2.1
  - HC3.3.3 was changed to identify the attributes