WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

135th Meeting of the Scientific and Statistical Committee
March 3-5, 2020
Council Office Conference Room
Honolulu, HI

FINAL REPORT

Members present: Jim Lynch, Steve Martell, Dave Itano, Graham Pilling, Justin Hospital, Milani Chaloupka, Michael Seki, Craig Severance, Mike Tenorio, Debra Cabrera, Frank Camacho, Erik Franklin, Ryan Okano, Don Kobayashi, Domingo Ochavillo, Ray Hilborn and Shelton Harley

Member excused: Kurt Schaefer

4. Report from the Pacific Islands Fisheries Science Center Director

Michael Seki, PIFSC Director, reported on the recent highlights and activities conducted by PIFSC in the past five months. There were several changes in staffing which presents challenges in keeping the momentum on some projects, and he encourages patience as his office works to fill vacant positions. The life history cruise in American Samoa of the NOAA R/V Oscar Elton Sette was cancelled and the life history activities shifted to a shore-based operation that would be working with the local fishermen to collect the life history samples. The cancelation provided more flexibility for the PIFSC bigeye tuna initiative on the area selection for their cruise.

The NOAA R/V Rainier is scheduled for a mapping cruise in the Marianas. The Director also reported on the effect of toxoplasmosis on the population of monk seals and the need to further understand this disease. Regarding the green sea turtle, Hurricane Walaka altered the nesting grounds at East and Tern Islands. The majority of East Island was no longer available for nesting and while the removal of the vegetation on Tern and added sand blown to the runway potentially increased the nesting habitat, nest success is still unknown. National Geographic magazine featured one of PIFSC scientific work on the mixing of microplastics with the fish larval concentration in surface slicks and its impact on the ecosystem and fisheries.

PIFSC will be conducting a Bigeye oceanographic spawning survey on the R/V Oscar Elton Sette. Additional discussions were held on increasing bottomfish research efforts to determine if bottomfish species are not as productive in American Samoa as estimated in the previous benchmark stock assessment compared to other territories. Questions were also raised on sea turtle nesting habitat and the need to distinguish nesting between Tern and East islands.

The SSC thanked Mike Seki for his presentation.

5. Program Planning and Research

A. Standardized Bycatch Reporting Methodology

Brett Schumacher, PIRO, and Council staff presented on the requirements for Standardized Bycatch Reporting Methodology (SBRM) under a final rule published by NMFS in January 2017. This rule provides guidance to regional fishery management councils and the Secretary of Commerce regarding the development, documentation, and review of SBRM for any fishery under fishery management plans (FMPs) developed pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The Council, in coordination with NMFS, is required to conduct a review of its FMPs for consistency with the new guidance, and all FMPs must be consistent with the new guidance by February 21, 2022. The rule also requires that the Council consult with its SSC and/or the regional NMFS Science Center on reporting methodology design considerations such as data elements, sampling designs, sample sizes, and reporting frequency. PIRO and Council staff have initiated a review of the existing SBRM provisions in the Council's five Fishery Ecosystem Plans (FEPs), and plan to provide a full review report for SSC input at a future meeting.

Questions were raised on the definition of bycatch as they may vary by territory. It was clarified that the definition provided by MSA was used. Additional discussions were on the capacity and ability of the territories data collection programs to document bycatch.

The SSC recommends that council staff continue working with the NMFS PIFSC and PIRO in further addressing the SBRM requirements.

The SSC Brett Schumacher for his informative presentation.

B. Public Comment

There was no public comment.

6. Island Fisheries

A. Options Paper to Amend Bottomfish Management Unit Species in American Samoa and Marianas FEP (Initial Action)

Felipe Carvalho, PIFSC Stock Assessment Program, presented on the potential alternative grouping of the Bottomfish Management Unit Species based on available biological and fishery data and the feasibility of conducting stock assessments. Based on the Stock Assessment Program analysis, the BMUS complex could be regrouped as a deep bottomfish complex that would be using a surplus production model and the rest of the BMUS could be analyzed as a single species complex that would use a data-limited assessment approach. The BMUS complex could also be split as single species and could be assessed as single species. Carvalho presented the pros and cons of each of these approaches. Carvalho also made it clear that the stock assessment group was committed to holding data discussion workshops which would fully include input from local fishermen, stakeholders, and SSC members. The effort is intended to develop data driven decision making that incorporates fishermen's knowledge.

Council staff presented the options on the process the SSC may take considering the information presented by the Stock Assessment Program. The SSC considered the following options:

1) No action – Retain the BMUS lists as single complexes and do not generate a new assessment

2) Retain the current language in the FEPs that allow the Council to apply the control rules from single species to complex level and initiate the development of a new benchmark assessment

3) Amend the FEPs to refine the BMUS lists to fixed sets of grouping with a predetermined status determination criteria and initiate the development of a new benchmark assessment.

There was an extensive SSC discussion centered on a number of scientific issues. It was noted that there was a need to consider the covariation in catch and recruitment trends between species in the same groups. A SSC member pointed out that the stock assessment had focused on the heavily exploited area around Tutuila and less around the more lightly exploited area around the offshore seamounts and the Manua islands. He urged the team to separate the deep complex from the shallow complex and noted that 2 species, lunar tail grouper and uku belonged in the shallow water complex and that black jack moved between the deep and shallow zones. A SSC member cautioned on the inherent risks of using CPUE on single stocks in small fisheries since one species could drive the results in either direction, and easily become a disaster. He suggested that organizing species groups around those that were caught together could be a useful approach. A SSC member noted that along with the regular benchmark assessment, there could be a "shadow assessment" using a different methodology such as an indicator species which could then be compared to the benchmark assessment. A SSC member suggested that for the next benchmark assessment, careful attention should be given to the definition of a bottomfishing trip as having bottomfishing gear onboard, because unless there was a consistent protocol that was consistently followed to observe leaders and hooks, the FAO hand crank reels and even electric reels were used both for bottomfishing and trolling and were essentially the

same gear.

Staff described the possibility of and plans for using electronic technology to gather catch and effort data for one year to incorporate into a new stock assessment.

The SSC recommends option 2, that the Council retains the current language in the FEPs that allows the application of the control rules from a single species to a complex level and initiates the development of a new benchmark assessment.

Moreover, the SSC recommends the Council request PIFSC to initiate the development of a new benchmark assessment on a species resolution that is deemed appropriate during the data preparation workshop and apply the appropriate status determination criteria for the assessment that would be subject to WPSAR at the earliest time practicable.

The SSC recommends PIFSC to explore other data sets aside from the creel surveys and commercial receipt books (e.g. electronic self-reporting) and other modeling approaches for next BMUS benchmark assessment

The SSC recognizes that a new benchmark assessment includes all the steps from data preparation, assessment, and projections.

SSC member Steve Martell will liaise with PIFSC and Council staff during the development of the next benchmark assessment for the territorial bottomfish. SSC member designee will work with PIFSC and Council staff on exploring the deep and shallow species grouping, trip and gear definition, and available data sources.

B. Specifying the Acceptable Biological Catches (ABC) in the Marianas Bottomfish Fisheries

1. P* Analysis

Council staff reported on the outcome of the P* Working Group meetings in CNMI and Guam on January 29, 2020, and January 31, 2020, respectively. The release of the 2019 Territorial Bottomfish Benchmark Stock Assessments, its subsequent review by the SSC and it's endorsement as best scientific information available for the BMUS in American Samoa, Guam and CNMI triggered the re-evaluation of the risk of overfishing for the ABC specification in fishing year 2020-2023 for the Mariana Archipelago. The P* Working Groups re-evaluated the various criteria under the four P* Dimensions: 1) Assessment Information; 2) Uncertainty Characterization; 3) Stock Status; 4) Productivity and Susceptibility. The scores for the first two dimensions are similar for both areas because it is based on the same stock assessment model. The productivity attributes for the fourth dimension are similar for both areas because the fishery is targeting the same species. The main difference in score lies in the stock status dimension.

The catches associated with the final P* value is the ABC. The final P* for CNMI is 39 percent risk of overfishing while the final P* for Guam is 31 percent.

2. SEEM Analysis

Council staff presented the outcome of the SEEM Working Group meetings. Along with the evaluation of the scientific uncertainty, the uncertainties associated with management and other factors outside the stock assessment were evaluated to determine the risk level to specify the annual catch limits (ACLs). The CNMI and Guam SEEM Working Groups met on January 29 and January 31, 2020, respectively, to re-evaluate the various criteria under the four SEEM Dimensions: 1) social; 2) economic; 3) ecological; and 4) monitoring and management uncertainties.

The catch associated with the final risk level after accounting for the SEEM uncertainties is the ACL. The CNMI SEEM working group suggested adding a 5 percent buffer accounting for the monitoring and management uncertainty and use 2023 as the terminal year. This was the basis for setting the annual catch target (ACT). The Guam SEEM working group acknowledged the importance of the bottomfish fishery to the social and economic dimensions of the Guam fishing communities. The working group also noted that additional reduction would lead to an overage of the conservative quota. Further, the working group noted that the majority of the uncertainties come from the lack of capability to monitor the catch in near-real-time and the ability to close the fishery in-season. The working group concluded that the ACL should be set equal to the ABC.

A SSC member suggested that staff include the tables in the SEEM* Framework in the report and presentation in order to put the SEEM* results in proper context.

3. Options for Acceptable Biological Catch in the Marianas Bottomfish Fisheries

Council staff presented the options for final action to set the acceptable biological catches (ABCs) for the Territories of Guam and Commonwealth of the Northern Mariana Islands (CNMI) bottomfish fisheries for fishing year 2020-2023. The specification was based on the 2019 Benchmark Stock Assessment of the Mariana Archipelago Bottomfish Fisheries, which is the best scientific information available. This recent assessment utilized a new methodology and found the Guam fishery to be overfished but not experiencing overfishing, and the CNMI fishery to be neither overfished nor experiencing overfishing.

The ABCs are provided to the Council by its Scientific and Statistical Committee, which sets the ABCs based on the overfishing limit (OFL) reflected in the stock assessment minus any scientific uncertainties. Based on this information, the SSC were presented with the following options:

1) No action (status quo): Do not specify ABCs

2) Specify new ABCs based on the results of the P* analysis

3) Specify new ABCs lower than the results of the P* analysis

The SSC deemed that the P* analysis conducted in Guam and CNMI adequately captured the scientific uncertainties in the new benchmark assessment (Langseth et al. 2019).

The SSC sets the new ABCs for the Guam and CNMI bottomfish fisheries based on the results of the P* analysis. The ABC for CNMI BMUS is at P*=0.39 corresponding to a catch level of 84,000 lb. The ABC for Guam BMUS is at P*=0.31 corresponding to a catch level of 27,000 lb. This P* and ABC would apply to fishing year 2020-2023.

C. Interim Measure for American Samoa Bottomfish Fishery

Brett Schumacher, PIRO Sustainable Fisheries Division staff presented the analysis and potential options for the interim measure. At the 180th Council meeting in October 2019, the Council requested NMFS to implement an interim measure to minimize the impact of the severe reduction in the potential ACL for the American Samoa bottomfish fishery. The interim measure allows the fishery, in the short-term, to harvest the stock above OFL as long as the overfishing is reduced (not ended immediately) and the biomass is allowed to increase.

Full closure of the federal waters will only affect 15 percent of the defined EFH (assuming that effort will not shift between territorial and federal waters). There is a need to establish a mechanism that would close both areas once the interim measure catch level is projected to be reached. There is also a need to establish a near-real-time monitoring program that would track the catch relative to the interim catch level.

The SSC recommends the Council, in collaboration with PIFSC, focus its efforts on implementing the electronic self-reporting with corresponding training of the bottomfish fishermen and comprehensive outreach efforts on the importance of accurate and timely reporting.

The SSC thanked Brett Schumacher for an informative presentation.

D. Requirements for the Rebuilding Plan

Brett Schumacher, PIRO Sustainable Fisheries Division staff presented on the federal requirements for developing rebuilding plans. The release of the 2019 benchmark stock assessment for the territory bottomfish fishery triggered the development of a rebuilding plan for the American Samoa and Guam bottomfish that were considered overfished. This is the first rebuilding plan that will be developed for the region.

The SSC thanked Brett Schumacher for an informative presentation.

E. Update on Hawaii Precious Coral EFH and Associated Bed Designation Issues

Council staff provided updates on the status of the Hawaii precious coral EFH and the issues in designating established or conditional beds. At the 180th meeting, the Council received the presentation from staff on options to redefine the precious coral EFH. This action was placed on hold by NOAA General Counsel because the new information allows for the Council to designate new beds rather than just updating the EFH definition. Designating new beds would require an amendment to the FEP and would have to comply with the Magnuson-Steven Act requirements for a fishery management plan including calculation of MSY for each bed. This

information is currently not available.

The SSC recommends that the Council use existing regulations to manage the revised precious coral EFH through the use of the exploratory permit.

F. Public Comment

There was no public comment.

7. Protected Species

A. False Killer Whale Abundance Estimates

Amanda Bradford, PIFSC Protected Species Division, presented on abundance estimates for the pelagic stock of false killer whales. The estimates utilize data collected during the July-December 2017 Hawaiian Islands Cetacean Ecosystem Assessment Survey (HICEAS), as well as data from previous HICEAS line-transect surveys conducted in 2002 and 2010. Design- and model-based line-transect methods were used to estimate the abundance of the pelagic stock of false killer whales during 2002, 2010 and 2017, with the design-based approach estimating density uniformly within the Exclusive Economic Zone (EEZ) around Hawaii. The model-based approach estimates density as a function of habitat covariates within the broader central Pacific and, from that, the Hawaii EEZ. The species distribution model (SDM) underwent an external review and was also reviewed by the Pacific Scientific Review Group (PSRG).

The design-based estimates of pelagic false killer whale abundance in the EEZ in 2002, 2010, and 2017 are 613, 2,489, and 5,106 respectively. The model-based estimates inside the EEZ in 2002, 2010, and 2017 are 2,127, 2,182 and 2,102 respectively.[1] Model-based estimates presented by NOAA for the broader central Pacific in 2002, 2010, and 2017 are 24,991, 24,014, 32,317, respectively.

The estimates are highly uncertain due to low number of sightings across all surveys. The authors also made adjustments to the sampling protocols to include more realistic group size estimates. The SDM was presented as providing a more stable temporal basis for assessing false killer whale abundance. Bradford indicated that the model based estimates will be used as the basis for developing the stock assessment report that will be reviewed by the PSRG at its 24 – 26 March, 2020 meeting in Honolulu, Hawaii.

An SSC member remarked on the consistency of the SDM results ranging between 2,102 – 2,182 that resulted from surveys having highly variable sighting data. A SSC member suggested that model based estimates, that did not include year effects, would likely generate similar results if the habitat characteristics across years were similar.

An SSC member noted that static habitat plots generated by the SDM model do not provide an indication of uncertainty and may give a false impression that they indicate true geographic abundance. An SSC member suggested that any presentation of results include a measure of the level of uncertainty in estimates. The potential of the model was noted and members suggested that additional development and data inputs should be tested. An SSC member suggested exploring the use of interaction rates in the Hawaii longline fishery as an additional measure of relative density for the habitat model. However, the SSC expressed concern with applying this model to abundance estimates of the false killer whale pelagic stock in the broader central Pacific. The SSC discussed whether it was appropriate to use the average of the design-based estimators for or the model-based estimates for the three time periods or to only use the most recent estimate; the SSC was unable to reach a consensus.

[1] The average estimates over the three survey years are 2,736 (CV=0.53, 95% CI=1,030-7,269) individuals for the design-based approach and 2,134 (CV=0.37, 95% CI=1,052-4,330) individuals for the model-based approach.

The SSC recommends that both design- and model-based results be used to develop false killer whale abundance estimates for the stock assessment report.

The SSC further recommends that a simulation-based evaluation of the two estimators be undertaken to better determine the relative value of each approach for management decision making purposes.

The SSC thanked Amanda Bradford for the informative presentation.

B. Assessing Population Level Impacts of Marine Turtle Interactions in the Hawaii Deep-set Longline Fishery

Summer Martin and T. Todd Jones, PIFSC, and Zachary Siders, University of Florida, provided a presentation on assessing population level impacts of loggerhead and leatherback turtle interactions in the Hawaii deep-set longline fishery. The assessment is based on the model developed for the Hawaii shallow-set longline fishery, which the SSC at its 134th Meeting endorsed as best scientific information available for evaluating population-level effects of the fishery on North Pacific loggerhead and leatherback turtles. The modeling framework involves (A) data imputations for monthly nest counts (leatherback turtle data only); (B) trend analysis of nest count data to estimate population growth rates and current abundance; (C) population viability analysis including future projections of population size and assessment of the impacts of anticipated take levels on the projections.

Model results for the deep-set fishery are similar to that of the shallow-set fishery, and indicate that take has no discernable impact on the loggerhead turtle population projection, and no discernable difference between the trends for the no-take and take scenarios for the leatherback turtle population projection.

The SSC questioned the relative degree of take and mortality of loggerhead and leatherback turtles by non-U.S. fisheries. The presenters could not be certain due to data limitations but offered expert opinion that mortality and impact of foreign fisheries would be much higher due to higher overall effort and lower application of best practices for bycatch mitigation. It was noted that the impact of climate change was not incorporated into the model as it was not clear how to apply climate impacts in a holistic manner.

The SSC recommend the Council direct staff to work with NMFS obtain publicly available reports and other data on sea turtle interaction rates in foreign fisheries operating in the areas overlapping with the loggerhead and leatherback turtle distributions, and to provide a presentation to the SSC at its next meeting.

The SSC thanked Summer Martin and her colleagues for the informative presentation. The SSC requests a presentation at the 136th SSC on the application of this model to the impact of the American Samoa longline fishery on the viability of the marine turtle populations exposed to that fishery.

C. Hawaii-based Shallow-set Longline Fishery Biological Opinion Reasonable and Prudent Measures Working Group

Joshua Lee, PIRO, provided an update on the work plan for implementing the Reasonable and Prudent Measures (RPMs) under the Hawaii shallow-set longline biological opinion (BiOp) issued in June 2019. The BiOp included a number of RPMs that require additional evaluation and potential development of additional mitigation measures beyond those considered at the 179th Council Meeting (Pelagic Amendment 10). PIRO Sustainable Fisheries Division developed a work plan for addressing the remaining RPMs in the BiOp, and convened a working group consisting of PIRO, PIFSC and Council staff.

The SSC notes its prior review and consideration of the RPMs and reiterated its position that certain RPMs were not warranted.

The SSC recommends that PIRO include a social scientist in the RPM Working Group.

The SSC thanked Joshua Lee for his informative presentation.

D. Ecosystem-based Fisheries Management Project for Protected Species Impacts Assessment for Hawaii and American Samoa Longline Fisheries

Rob Ahrens, University of Florida, provided an overview of the year 2 effort of the Ecosystem-based Fisheries Management Project for Protected Species Impacts Assessment for Hawaii and American Samoa Longline Fisheries. The project is a collaboration between PIFSC, Council, PIRO and University of Florida. In the first year of the initiative, the team developed methodologies to associate the spatiotemporal patterns of olive ridley turtle interactions with the Hawaii deep-set fishery primarily targeting bigeye tuna with static and dynamic environmental characteristics. The project resulted in the development of an Ensemble Random Forest modeling approach to 1) predict the probability of fishery interactions with olive ridley turtles; 2) define critical areas of interaction using quantile contouring over a range of temporal time frames; 3) assess the number of sets and interactions within the contours; and 4) develop covariate response curves using Accumulated Local Effects.

In year 2, the Ensemble Random Forest modeling approach will be expanded to investigate risk contours for a suite of species of interest. The analysis will explore the potential benefit and impact of closures or voluntary avoidance of interaction hotspots on protected species bycatch of interest (e.g., TurtleWatch) as well as on catch rates of primary and secondary target species in the fishery. The goal is to model how the redistribution of displaced effort may affect primary and secondary target catch rates as well as protected species interactions.

SSC members offered strong support for the approach to incentivize the fishing community to address bycatch issues (including spatial tradeoffs among bycatch species), such as through providing fishermen access to near real time remote sensing products.

The SSC thanked Rob Ahrens for his informative presentation.

E. Public Comment

There was no public comment.

8. Pelagic Fisheries

A. American Samoa Longline Fishery Report

Keith Bigelow, PIFSC, provided the 2019 semi-annual report for the American Samoa longline fishery. The report presented fishery statistics including participation, effort, and catch.

The SSC thanked Keith Bigelow for his informative presentation.

B. Hawaii Longline Report Fishery Report

Russell Ito, PIFSC, provided the 2019 semi-annual report for the Hawaii longline fishery (deep-set and shallow-set components). The report covered fishery statistics including participation, effort, and catch.

The SSC noted the Hawaiian longline fishery continues to see growth in participation (150 vessels in 2019) in the deep-set fishery; however, there has been a 50% reduction in the shallow-set longline effort. This reduction was noted to be due to early turtle encounter rates that severely restricted the ability of the fleet to pursue swordfish, and the fishery has been shut down early in the past two seasons. For the past 2 seasons, swordfish catch in the deep-set fishery has exceed the shallow-set fishery.

SSC noted the decline in albacore catch over the period 2000-2019 and increase in yellowfin catch, and enquired whether this was an effect of changes in fishing location, pattern of fishing in the year, or for albacore a population issue to be concerned over. SSC also noted comparable declining patterns in catches of monchong and mahi mahi and that the inshore troll fleet has also noted a decline in mahi mahi CPUE in recent years. Ito noted that the causes needed further investigation, but was potentially a spatial effect, given the pattern in hooks between floats did not appear to have varied specifically. SSC also noted that mahi mahi was more commonly caught in shallow sets, which had declined over time.

The SSC also noted an increasing trend in the catches of striped marlin and that given smaller individuals are commonly caught within the Hawaiian fishery, this might indicate a recruitment effect.

Recently there have been interactions between US and foreign fishing vessels. The SSC noted the potential for effort competition given the indicated increased fishing effort within the region that may affect overall catch rates.

The SSC recommended that the catch of bigeye per hook be mapped at an appropriate geographic scale in future presentations and in annual fishery reports.

The SSC recommended that data presented in figures be denoted in the final two years with numerical values.

The SSC thanked Russell Ito for his presentation.

C. Pacific Islands Pelagic Fisheries Research Plan Updates

1. Bigeye Tuna Research Initiative

Johanna Wren, PIFSC, presented on updates to the Center's Bigeye Tuna Research Initiative with NMFS and other partners. These include priorities such as bigeye tuna research on connectivity and stock structure, oceanographic issues driving pelagic fisheries, and life history works.

SSC noted their appreciation for the focused work proposed for bigeye tuna, and encouraged collaboration with other activities in this area ongoing in other institutes in the Pacific. The SSC discussed whether some of the genetic techniques used in Southern Bluefin tuna could be used for tropical tuna, and noted there were ongoing discussions between SPC and CSIRO in this area.

The SSC thanked Johanna Wren for her presentation.

2. Use of C-14 Analyses on Age Distribution of Tropical Tunas

Allen Andrews presented on a new paper he authored that uses bomb-radiocarbon dating to discern age distributions of yellowfin and bigeye tuna in the Northwest Atlantic and for validation of ageing of these species.

Council staff asked how natal origin be considered using this approach within the Pacific, given there may be more than one stock of particular tuna species in this region. Andrews responded that there was the potential to use coral samples from across the Pacific to examine the spatial pattern of isotopes, and sampling yearling fish to establish the baseline spatial pattern in tuna otoliths.

The SSC inquired how the von Bertalanffy growth estimates for bigeye tuna compared to those in the Pacific, and noted that information from Pacific tagging studies suggested a shorter lifespan to those indicated within the bomb-radiocarbon study. Andrews noted that while these growth estimates were being developed for the Gulf of Mexico, discussions were underway to consider applying this approach to the Pacific.

The SSC thanked Allen Andrews for his informative presentation.

3. Discussion on Effects of Closed Areas on Hawaii Longline Fisheries

Two papers were published in February 2020 on impacts of the national marine monument expansion in the Northwest Hawaiian Islands and spatial closures on Hawaii longline fisheries. The SSC discussed the contrasting outcomes in a small working group and Council staff reported on discussion points.

The SSC noted that the Lynham et al (2020) paper indicated protection of rare iconic species was the aim of the closed areas studied, but wondered whether the legislation around the closed areas included this information as this was important to identify the 'success' of the closure. Council staff indicated they would look into this further.

The SSC also noted the challenges in examining the fleet as a whole as in the Lynham et al (2020) paper, compared to looking at specific vessels for vessel attrition or impacts.

The SSC asked for clarification of the proposed blue water workshop linked into the BBNJ process. The Council staff clarified that developing a roadmap for the development of closed areas to inform the science and technical body reviewing proposals for closed areas would be a constructive step in the process.

The SSC requested that Council staff compile comments from SSC small working group and distribute to members for a response to the analyses presented in published works examining impacts of marine monument expansions.

The SSC requested that Council staff examine data on size composition of bigeye and yellowfin tunas from trips observed in areas closed to fishing in monument expansion versus size composition in areas where corresponding vessels fished elsewhere.

D. Counterfactual Analysis of Closed Areas at Palmyra Atoll, Kingman Reef, and Johnston Atoll

Eric Gilman and Milani Chaloupka presented results of a counterfactual analyses of the efficacy of closed areas in the Pacific Remote Island Areas (PRIAS). The analyses looked at the impacts of closed areas on biomass of target and non-target species, mean-length of these species as a response, and other impacts in the closed areas in 2009 compared to all over fishing areas for the fleet. The authors highlighted that consideration of wider ecological responses is needed to undertake evidence-based evaluation of a conservation intervention.

Once published, a copy will be provided to the SSC.

The SSC thanked Eric Gilman and Milani Chaloupka for their presentation.

E. Electronic Reporting and Monitoring

1. Electronic Technologies Implementation Plan

This item will be addressed at the June 2020 136th SSC Meeting.

2. Pacific Islands Region Longline Electronic Reporting Plan and Options for Implementation of Mandatory Reporting

Keith Bigelow reported on the progress of electronic monitoring of the Hawaii longline fishery, noting recent developments from trials in this area. Bigelow referenced optimal review speed of EM playback to be eight times the regular speed and referenced a tech memo currently available from NOAA.

The SSC asked whether seabirds could be identified to species level. Bigelow responded that the two key species were identifiable, but condition on release was sometimes missed as this

was often outside the field of view. The placement of a separate camera to monitor the tori line placement was noted. Approaches to improving information on shark through a requirement to handle them closer to the side were being considered.

The SSC inquired on the challenges to maintaining the electronic files gained through EM. Bigelow clarified that these are currently kept for 1 year then transferred to tape, and that there was the potential to keep these in perpetuity, noting that the schedule does not require this.

The SSC also asked on the use of machine learning to analyze the EM information. Bigelow noted that the movement of the fisher's hand was very important to identify hooks with fish on, and this was an area to focus on with machine learning.

The SSC thanked Keith Bigelow for his presentation.

Council staff reported on an options paper for SSC and Council review on reporting requirements, cost allocation, and data management of electronic reporting in the Hawaii longline fishery. The Council recommended at its 180th meeting that such options be spelled out for review for Council to take action in 2020. It was noted that a secure online data portal would allow industry members to track their data in near real time, and that the Science Center was working with NOAA S&T to develop this. Benefits for monitoring catches relative to quota limits were highlighted.

The SSC inquired on the potential costs per vessel. Bigelow highlighted that the cost structure of a Hawaiian EM program would be presented in the June meeting. The sampling cost, which includes hardware, video review and potentially an audit review, will be a key part of that cost.

SSC noted the scientific benefits of gaining more timely data from ER, but in the cost-recovery environment, there's a need to demonstrate the value of providing that data in near real time to the industry collecting these data. The issue of potential compliance considerations that might arise during the implementation learning phase was also noted, with the need to work with the industry during this phase.

SSC recommended the move toward mandatory electronic reporting and remained supportive of its initiative. However, they recognized there were financial and regulatory processes to be considered which were outside the purview of the SSC.

3. Pacific Islands Regional Observer Program Overview and Costs

Stefanie Dukes and Dawn Golden, PIRO, presented on the standard operational procedures of the Pacific Islands Regional Observer Program and contributions to data collection on fisheries in the region. The special projects being undertaken by observers were also described. The observer program operates with thirteen full time employees (FTEs) and with an at-sea operating budget of $6M for its current coverage of just over 20% in the deepset longline fishery, 100% of the shallowset longline fishery, and 20% of the American Samoa longline fishery.

The SSC noted the wide range of special projects for observers, and enquired on the prioritization of the range of different data collection requests of observers. The presenters were aware that a considerable range of projects were being considered. They noted that the observers were generally happy to undertake the work, given realistic sampling protocols, but that the overall levels of work needed to be monitored. Challenges in insuring sufficient observer numbers and training were noted, although the low levels of observer turnover within this program were highlighted. The benefits of observer experience when moving into further NMFS roles were stressed.

The ranges of presented projects were discussed, including the collection of data on ripe and running bigeye tuna, on opah and flying fish. Further advice from the SSC, amongst others, would be sought on prioritization of these as needed.

The SSC thanked Stefanie Dukes and Dawn Golden for their presentation.

4. 2020 Electronic Monitoring Workshop

Eric Kingma, HLA, reported on outcomes of the 2020 Electronic Monitoring Workshop held February 11-13, 2020 in Seattle, WA.

SSC noted that for the Hawaii longline fishery, the estimated wet observer costs were approximately $6M per annum across the fishery, and compared that to the costs indicated for electronic monitoring at ~ $3M (covering administration and sampling costs) based on a 25% rate of EM footage evaluation. The SSC noted that the level of EM footage sampling would depend on the objective, with monitoring of rare events requiring higher review coverage. It was noted that for this objective, skippers could be mandated to radio report in real time critical interactions within the fishery, with the EM footage for those specific events then being evaluated, and additional footage could be audited, taking into account risk-based considerations.

The SSC noted that human observers would still be needed to undertake biological sampling, but port-side sampling or contract sampling by the crew, linked to the EM, could also be considered as cost-savings.

The SSC thanked Eric Kingma for his presentation.

F. US Territory Longline Bigeye Tuna Catch Allocation Limits (Final Action)

The WCPFC, of which the United States is a member, develops and agrees on conservation and management measures (CMMs) for highly migratory species caught by WCPFC members and Participating Territories in the WCPO. Under CMM 2018-01, the longline bigeye limits of six countries are maintained at 2016 levels, including the United States with a limit of 3,554 metric tons (mt). CMM 2018-01, like earlier conservation measures, does not establish an individual limit on the amount of bigeye tuna that may be harvested annually in the Convention Area by Small Island Developing States (SIDS) and Participating Territories, including American Samoa, Guam and the CNMI. Limits are not provided to the SIDS and Participating Territories in recognition of their fisheries development aspirations. CMM 2018-01 will expire at the end of 2020 with new allocation limits between fishery sectors and flag states

under the WCPFC.

In 2014, Amendment 7 to the Council's Pelagic FEP was approved and implemented. It established a management framework that provides for the following three provisions: 1) Catch or effort limits applicable to the US Participating Territories that include the authority of the US Participating Territories to use, assign, allocate and manage the pelagic management species catch and effort limits agreed to by the WCPFC through Specified Fishing Agreements with US vessels permitted under the Pelagic FEP for the purposes of responsible fisheries development. 2) Authorization for the Council to recommend and NMFS to specify catch or effort limits in the absence of such limits or additional or more restrictive limits than the WCPFC for conservation and management purposes. 3) Consistency review of Territory arrangements with the Pelagic FEP and other applicable laws by the Council and NMFS, as well as annual review and specification recommendations by the Council.

The Council will consider the following three limit options for 2020:

1) No management action: No specification of catch or allocation limits
2) Status quo: Specify for each US Participating Territory, a 2,000-mt catch limit and 1,000-mt allocation limit
3) Specify for each US Participating Territory, a 2,000-mt catch limit and up to a 2,000-mt allocation limit:
    a. 2,000 mt allocation for Guam and CNMI; 1,500 mt allocation for American Samoa
    b. 1,500 mt allocation per territory
    c. A provision to limit total allocations to not exceed 3,000 mt.

The SSC asked about the single listed "con" for option 2 regarding less fishery development funds available. Council staff clarified this to be related to the lesser transfer potential for this particular option (1000 mt) versus option 3 (2000 mt).

A member of public (HLA) stated support for option 3 and noted that this is critical towards Hawaii longline fishery viability.

G. Deep Sea Mining and Spatial Planning in the Pacific

Doug McCauley, Deep Sea Mining Watch and UC-Santa Barbara, presented on the expansion of deep sea mining activities, some of which are occurring 500 miles from Hilo, Hawaii.

The SSC inquired whether there were any studies on the uptake of released compounds in fish. McCauley indicated that studies examining this were ongoing, but such experiments were challenging.

The SSC asked whether there were existing identified issues with interactions with fisheries and the scale of operations as in tons per area per time, areal sizes of potential surface

plumes. McCauley noted that midwater plumes were a key potential interaction with fisheries. Plumes can be many kilometers in diameter, but the consequences were uncertain dependent upon their depth in the water column. The SSC noted that the impact on the benthic community would be severe and that those communities could be relatively biodiverse.

The SSC thanked Doug McCauley for his presentation.

H. International Fisheries

1. WCPFC

a. Conservation and Management Measures on Tropical Tunas

Council staff reported on Tropical Tuna CMMs and the allocation scheme that may follow the WCPFC annual meeting in December 2020. All tropical tuna CMMs expire in 2020 and a new allocation for the US longline fishery is possible. The US delegation introduced an allocation framework at the 16th WCPFC Regular Session in 2019.

A small working group of SSC members was proposed to develop an allocation scheme (between longline and purse seine gears, and flags within gears) and potential LRP risk/TRPs for bigeye. It was noted that the WCPFC Convention has principles on allocation that should be considered within this discussion. The IATTC had historically examined the issue of allocating between gears selecting younger and older components of the population, based upon a common currency (spawning potential impact; see Maunder 2002, Fish and Fisheries). The multispecies implications of species-specific controls were also noted.

SSC member Graham Pilling recused himself from discussions on this action item.

b. North Pacific Striped Marlin

Council staff presented on a rebuilding plan, introduced by the US Delegation to the WCPFC, for North Pacific striped marlin introduced at the Northern Committee in 2019 and pending biological information needed to make management decisions on catch levels from recruitment scenarios. These scenarios were the basis of stock projections included in the 2019 stock assessment.

The SSC noted that under the different assumptions on future recruitment within the projections, the reference points would also need adjustment to maintain consistency.

2. Biodiversity Beyond National Jurisdiction

Council staff provided a report on the UN Convention for the Conservation of Biodiversity Beyond National Jurisdiction (BBNJ). The fourth session will take place at UN Headquarters from 23 March to 3 April 2020 in New York City. On February 25, the US State Department hosted a teleconference with stakeholders which included fishing industry, fishery managers, and environmental NGOs. Limitations on language with respect to defining BBNJ objectives and scientific criteria for identifying area-based management tools (ABMT) were discussed.

I. Small Boat Scoping Meeting Report

Council staff reported on scoping meetings of pelagic small boat fisheries (troll, handline) in the main Hawaiian Islands in February, 2020. At present, these fisheries are managed under the auspices of the State of Hawaii. They are not under Section 7 consultations of the Endangered Species Act or NEPA. Fishermen were presented the status of fisheries and stocks and pros and cons of federal permits for these fisheries.

The SSC asked for more information on the issue of non-resident licenses raised during the discussions in Hilo. Council staff clarified that this was put forward as an approach to increasing revenue, but represented the view of one particular individual at the meeting. The SSC noted that many of the issues raised had also been raised at previous meetings.

Public comment

Eric Kingma, HLA, first commented on the Hawaii annual longline fishery report. Effort saturation is of concern for the Hawaii longline fishery, but Hawaii needs a swordfish fishery operating. Noting closure of the shallow-set fishery, this does transfer effort onto the bigeye. Kingma noted the transfer of 8,000 mt of bigeye in the EPO to China and Taiwan from Japan could increase competition.

Kingma explained that increased fishing competition with foreign fleets and their increased catches also have an effect on the bigeye allocations, so HLA supports option 3 of the territorial catch and allocations limits presented earlier.

Kingma acknowledged the Science Center on the turtle take model and work on bigeye tuna science. He noted the range of work on the recent Hawaii MPA expansions and was glad the SSC is considering it.

Regarding E-reporting, HLA supports movement to mandatory reporting, but concerned about the cost allocation issue- noting that the VMS system does come with a tablet and there is a currently underutilized data transmission allowance that could be considered. Access to the daily data by owners would be a good incentive to moving in the direction of Elogs.

Kingma commented that a request for exemption of BBNJ from the management of fish (tuna) stocks is paramount and noted that Iceland supports this movement.

The SSC asked about the use of VMS and its position in an age of Elogs. Kingma noted that VMS has compliance uses. Industry is supportive of mandatory Elogs, and Kingma stated benefits for bigeye quota monitoring.