



**131st Meeting of the Scientific and Statistical Committee
March 12 to 14, 2019
Council Office Conference Room
Honolulu, HI**

FINAL REPORT

5. Report from the Pacific Islands Fisheries Science Center Director

Michael Seki, Director of the Pacific Islands Fisheries Science Center (PIFSC), provided updates on Science Center accomplishments, issues and activities to the Western Pacific Regional Fishery Management Council's Scientific and Statistical Committee (SSC). Two big issues the Center is facing are research vessel repair and personnel loss due to retirement, personal, and professional movement. PIFSC and the Council are organizing the Western Pacific Insular Fisheries Monitoring Workshop scheduled for July 22-26, 2019 to evaluate existing data collection programs and determine the most effective means to collect fishery information to support fisheries science and management.

Some noteworthy updates include a positive population growth for NWHI monk seals (+2%) but shark predation continues to be a problem at French Frigate shoals and the impact of the disappearance of Trig and East Island will need to be assessed. PIFSC has completed the WPacFIN Data Portal that is now online and operational for downloads of non-confidential fisheries data. PIFSC also conducted a Marianas small boat survey for humpback whales and sea turtle research at Rose Atoll.

The SSC thanked Seki for an informative presentation.

6. Program Planning and Research

A. SSC Responsibilities in the Modern Fish Act

Council staff presented to the SSC on details of the Modern Fish Act and their associated responsibilities. The presented information was intended to be used in preparation for the SSC working group discussion related to the Modern Fish Act on Day 2 of the SSC meeting. The SSC members emphasized the importance of fishermen input but also noted limited availability of recreational noncommercial-level data (e.g. for Hawaii bottomfish and Kona crab). The SSC noted that there will be resistance from fishermen to share fisheries data because of bureaucracy and unwillingness to share information on catches. The SSC formed a working group to provide guidance on the process of incorporating data from nongovernment and other outside sources into fisheries management decisions.

B. MSRA Five Year Research Priority 2020-2024

Council staff presented highlights of the Council's new five-year research priorities for the years 2020 to 2024 under MSRA. These priorities were developed through a series of meetings and workshops between Council staff and PIFSC program leads, and have been iteratively updated over the last several months. Council priorities align well with the new PIFSC Five Year Science Plan and the Annual Guidance Memorandum. Council staff noted that there exists a time lag in between the Council and PIFSC annual schedules in the implementation of priorities. The SSC was tasked with endorsing research priorities and operationalizing the tracking process. Cisco Werner commended the research priorities process in the Western Pacific noting it is a good step forward to enhance collaboration between the Council and Science Center. **The SSC endorsed the MSRA Five Year Research Priorities for transmittal to the Secretary of Commerce and NMFS.**

C. NOAA Climate Science Workshop and Regional Action Plan Report

Phoebe Woodworth-Jefcoats, PIFSC staff, presented the highlights of the recent 2nd Collaborative Climate Science Workshop, which identified priorities for advancing regional climate science, as well as the Pacific Island Climate Regional Action Plan. The accomplishments of the action plan included the incorporation of environmental variables (e.g. PDO, phytoplankton size) into the recent swordfish stock assessment, species and habitat vulnerability assessments, and long-term monitoring of species and habitats.

The presentation by PIFSC was followed by a presentation from Council staff on how priorities and objectives derived from the Climate Science Workshop and Pacific Islands Regional Action Plan are considered in the development of the Council's next Five-Year Program Plan. From the Collaborative Climate Science Workshop, the top priority and all three secondary priorities were considered to be generally included in the Council's Five-Year Program Plan. Considering the 18 sub-objectives listed in the Pacific Islands Regional Action Plan, 15 were considered to be generally covered by the Council's proposed program areas. Objectives found in the Pacific Islands Regional Action Plan but not included in the Council's Five-Year Program Plan were typically omitted due to being outside the Council's operational purview (e.g. obligatory publication of scientific research).

The SSC encouraged the Collaborative Climate Steering Committee to consider modifying the schedule of future Collaborative Climate Science Workshops to better align with Council meetings to enhance participation from territory representatives.

The SSC thanked Woodworth-Jefcoats for her presentation.

D. Public Comment

There was no public comment.

7. Island Fisheries

A. Main Hawaiian Islands Kona Crab Benchmark Stock Assessment WPSAR Report

SSC member Steve Martell presented the highlights and findings of the benchmark assessment review for the main Hawaiian island (MHI) Kona crab fishery conducted on September 10-14, 2018 in Honolulu, HI. The review panel included two reviewers contracted through the Center for Independent Experts (CIE): Dr. Malcolm Haddon (Australia), Dr. Nick Caputi (Australia), and chaired by a member of the Western Pacific Regional Fishery Management Council (WPRFMC) SSC. The WPSAR generated three individual panel reviewer reports and one consensus report by the WPSAR Chair. The panel's decisions were presented using the 11 individual terms of reference.

Overall, the WPSAR panel deemed this benchmark assessment to be an improvement to the last (2015) assessment used in the 2017 ACL specification and was found to be acceptable for use in management advice. The panel did advise on some small changes in the model configuration which were explored during the WPSAR review.

The SSC noted that the assessment probably defined a lower bound of the stock due to the small geographic extent of the commercial fishery relative to the larger distribution of the stock in Hawaii as well as a lack of information on non-commercial fishing activities. The SSC suggested that female crab discards should be recorded on fisherman trip reports. The SSC also pointed out that, since this fishery handles males and females differently, it would be logical to apply a stock assessment model which can account for sex-specific dynamics rather than the aggregated-sex model used in this benchmark assessment.

The SSC thanked Steve Martell for his presentation.

B. Benchmark Stock Assessment for the Main Hawaiian Islands Kona Crab with Projections for 2020-2026

Felipe Carvalho, PIFSC staff, presented the final benchmark stock assessment for the Kona crab fishery conducted in 2018 using data from 1958 through 2016. The 2018 benchmark assessment improved upon filtering of data records by re-defining fishing effort as a single reported fishing day and exploring fisher effects (individual fisher effects and cumulative fishing experience) in catch per-unit effort (CPUE) standardization. Additionally, this 2018 assessment addressed uncertainty previously unaccounted for, including unreported catch, incidental mortality of female crab catch following the prohibition of female crab harvest in 2006, and a Bayesian prior on the initial ratio of biomass to carrying capacity. The assessment used a Bayesian state-space surplus production model in a new user-friendly framework, Just Another Bayesian Biomass Assessment (JABBA). The model fit standardized CPUE data in a generalized Pella-Tomlinson surplus production model.

Results from this assessment conclude that in 2016, the Hawaii Kona crab fishery was not overfished (defined as $B/B_{MSY} < 0.7$) with a 1.7% probability of the status being overfished in 2016. In 2016, the stock was not experiencing overfishing (defined as $H/H_{MSY} > 1$), with 0.0% probability of overfishing occurring. In fact, the stock was never overfished historically, and there were only 2 years in the early 1970s where overfishing occurred in the fishery. Projections

for 2020-2026 quantified overfishing risks for various future catch levels, and concluded that a 50% risk of overfishing in 2026 corresponds to an annual reported catch of 33,989 lbs.

There was extensive SSC discussion on this assessment. Notably, the SSC highlighted that the even sex ratio (1:1 male to female) observed in the catch suggested a minimal impact of the fishery on the stock, given the sex-selective fishing that occurs due to the prohibition on female take. However, the study that estimated an even sex ratio did not occur on Penguin Bank, where the fishery primarily operates, which suggests the need for a study to determine the sex ratio of Kona crab on Penguin Banks.

The SSC recommends PIFSC explore other models that account for sex-specific dynamics rather than the sex-aggregated production model in the next benchmark assessment.

The SSC recommends that this benchmark assessment of the Main Hawaiian Islands Kona crab be accepted as best scientific information available (BSIA) and be used for management purposes.

The SSC recommends the Council direct staff to convene a working group to conduct the P* and SEEM analyses to support the ABC and ACL specifications, respectively.

On the topic of Kona crab regulations, the SSC questioned the science behind the State of Hawaii changes in regulations to prohibit catch of females. This measure, along with other regulations already in place for Kona crab, had greatly diminished participation in the fishery. The SSC further notes that at its 126th meeting, the SSC recommended an evaluation of alternative management options for Kona crab including changes in mesh size and retention of females.

The SSC recommends that female crab discards be recorded on fisherman trip reports to provide a more comprehensive record of commercial catch.

The SSC recommends that the sex ratio of Kona crabs on Penguin Bank be studied to evaluate the potential effects on the stock from sex-selective fishing.

The SSC again strongly recommends that alternative management options for Kona crab, including extension of the closed season, changes in mesh size and retention of females, be evaluated to stimulate fisher participation in this healthy fishery.

The SSC complimented the authors and thanked them for the report.

C. Public Comment

A member of the public commented that the fishermen are on-board with regards to extending the closed-season for Kona crabs through September because they observed that females are still berried in August.

8. Protected Species

A. Discussion Paper on Seabird Bycatch Mitigation Measures

Council staff presented a discussion paper regarding evaluating the effect of potential removal of blue-dyed bait without additional replacement measures on seabird interaction rates and other considerations for improving seabird mitigation measures in the Hawaii longline fishery. The paper was prepared in response to a Council directive from the 174th Meeting in October 2018 following a report of outcomes of the Workshop to Review Seabird Bycatch Mitigation Measures for the Hawaii Pelagic Longline Fisheries convened by the Council in September 2018.

Council staff presented the history of blue-dyed bait implementation in the Hawaii longline fishery, research on the effectiveness of the measure, and a review of available information evaluating whether removal of blue-dyed bait without additional replacement measures may be feasible without compromising effectiveness of the overall seabird measures.

Available information suggests that removal of blue-dyed bait from the Hawaii longline fishery's seabird mitigation measures may result in a further increase in albatross interactions, if the measure is not replaced with equally or more effective measures.

Council staff presented strategies for improving mitigation measure effectiveness for the Hawaii longline fishery, including 1) addressing captain effects through strategic outreach (some captains apparently more prone to seabird-gear interactions); 2) identify tori line designs suitable for the Hawaii longline fishery; 3) encourage additional trials for making minor modifications to existing required measures to enhance effectiveness such as branchline weighting configurations; and 4) progress international bycatch assessment for North Pacific albatross species and assess the relative risk of the Hawaii longline fishery to albatross populations.

The SSC thanks Council staff for the informative presentation.

The SSC recommends that Council evaluate within the next year whether blue-dyed bait has a negative impact on target species catch rates. Impacts on catchability may result in increased effort to compensate for the loss in target catch, which in turn could increase seabird interactions across the fleet.

B. False Killer Whales

1. Status of the False Killer Whale Take Reduction Team Recommendations

Kevin Brindock, PIRO, provided an update of the status of False Killer Whale Take Reduction Team (FKWTRT) recommendations. He provided a summary of false killer whale interactions since the Take Reduction Plan (TRP) implementation in 2013. The FKWTRT met in April 2018 to discuss various options for increasing the chances of the weak hook straightening and releasing the false killer whale without any gear attached, but the TRT did not reach consensus at that meeting and is continuing to work over teleconference. In January 2019, two false killer whale interactions were observed inside the EEZ that met the closure trigger for the Southern Exclusion Zone (SEZ) under the TRP. The SEZ was subsequently closed on February 22, 2019.

There have been 3 FKW observed mortalities out of 50 FKW interactions since 2013 in the Hawaiian longline fishery but around 66% of the interactions have been assessed as resulting in a serious injury. The observed interactions are based on approximately 20% observer coverage in the deep-set fishery.

The SSC recommends that NMFS implement effective captain and crew training to reduce the risk of FKW mortality or serious injury from gear interactions in the Hawaii longline fishery while also promoting crew safety.

The SSC thanks PIRO staff for the informative presentation.

2. Southern Exclusion Zone (SEZ)

Council staff provided a briefing on the SEZ reopening criteria. One of the reopening criteria specifies that the SEZ may be reopened if the average estimated level of false killer whale mortality and serious injury (M&SI) in the deep-set longline fishery within the remaining open areas of the EEZ around Hawaii for up to the 5 most recent years is below PBR for the Hawaii Pelagic stock of false killer whales at that time. It was noted that the SEZ closure, coupled with the MHI Longline Prohibited Area, and expanded Papahānaumokuākea Marine National Monument, results in a mere 18% of the Hawaii EEZ accessible to the Hawaii Longline Fishery. A rough estimate generated by Council staff indicates that the average M&SI in the most recent 5-year period is less than 7 in the Hawaii DSLL fishery, which is below the current PBR of 9.3.

NMFS conducted an EEZ-wide survey in 2017 which will be used to update false killer whale abundance estimates and PBR, and this information is expected by late 2019.

SSC members continue to raise a number of concerns about PBR and its application under the MMPA as the sole metric to assess acceptable limits to marine mammal incidental take in US fisheries. The SSC believes that comprehensive population viability analysis (PVA) provides a more appropriate approach and provides best scientific information available to determining acceptable take in US longline fisheries and should replace the use of PBR or supplement PBR where applicable. The SSC noted that while PBR and the basic formula for calculating PBR is mandated under the MMPA, guidance on incorporating available data in PBR calculations is a NMFS policy under its Guidelines for Preparing Stock Assessment Reports. The SSC also discussed the application of NMFS' Serious Injury Determination criteria and raised concerns regarding the assignment of 100% mortality estimate to interactions that result in serious injury determinations.

The SSC thanked Council staff for the informative presentation.

The SSC recommends that the Council request NMFS to develop approaches for incorporating comprehensive PVA to supplement the use of PBR and to reduce uncertainty in PBR estimates under its policy guidelines for preparing MMPA Stock Assessment Reports. The SSC further recommends that the Council request from NMFS data sufficient for the SSC to develop the PVA in parallel to the NMFS process.

The SSC further recommends that the Council request NMFS to consider developing probability-based serious injury determination criteria for false killer whales.

C. Updates on Endangered Species Act and Marine Mammal Protection Act Actions

Kevin Brindock, PIRO, presented updates on ESA and MMPA actions of relevance to fishery management actions, including the leatherback turtle status review; critical habitat designation status for humpback whales; recovery plan development for insular false killer whales, humpback whales and oceanic whitetip sharks; and North Pacific loggerhead turtles; and responses to ESA listing petitions on cauliflower coral and giant clams. Currently, there are no petitions awaiting 90-day findings.

The SSC thanks PIRO staff for the informative presentation.

9. Concurrent Work Session

A. Developing a Roadmap to Effective Spatial Management

Ray Hilborn provided a presentation entitled “What do theory and empirical data tell us about blue water MPAs” which explored the efficacy of open ocean marine protected areas and their theoretical aspects. MPAs theoretically increase resource abundance inside the closed area and are effective if proportional to the range of the resource. However, results of MPAs depend on fishing pressure, whether they are managed by harvest or effort controls, dispersal of the species, and stock status prior to the MPA implementation. Hilborn summarized that in practical terms, ‘blue water MPAs’ have not been verified as an effective tool to increase fish abundance or biodiversity for highly mobile species- and this can be likely due to effort redistribution, migratory nature of pelagic fish, and bycatch rates of non-target species.

Council staff assembled a working group to address spatial management, gave instructions for the working group, and provided discussion directives. Council staff presented an example of pelagic MPAs in the Indian Ocean which were found to have little or no benefit on yellowfin tuna abundance unless fishing effort was eliminated (and not redistributed). Council staff also mentioned the importance that stock structure and climate change have on the distribution of pelagic fisheries, which may render static spatial closures to be ineffectual or negative over a significant time period. Council staff provided an overview of the emerging UN Convention on the Conservation of Biodiversity Beyond National Jurisdiction (BBNJ) activities, which may imminently propose high-seas closures.

At the 131st SSC, the spatial working group (SWG) was asked to provide discussion in order to populate a matrix of benefits and costs/drawbacks for specific spatial management actions when implemented as a response to specific objectives. Discussed management actions include: time-area closures, adaptive/real-time closures/restrictions, area-specific fishery/gear restrictions, permanent no-take closures, and alternative non-spatial management actions (gear restrictions, input/output controls). Specific objectives discussed by the SWG include: increase abundance of targeted pelagic fishes (i.e. bigeye tuna and American Samoa albacore), reduce Hawaii shallow-set longline leatherback/loggerhead sea turtle bycatch, and reduce false killer whale interactions in Hawaii deep-set longline fishery. Performance metrics were identified to be biodiversity benefits/loss, social costs/benefits, and economic gains/losses. The working group was tasked to provide recommendations for the SSC based on discussions that emerged and in response to current fishery issues. A working paper with specific recommendations on effective spatial management and alternative management measures will be developed further as a discussion white paper by the SWG.

The SSC recommends that the Council endorse the following recommendations for effective spatial management:

1) Prior to developing spatial management areas, objectives and performance metrics must be explicitly specified to evaluate the effectiveness of spatial management. Performance metrics must concurrently address conservation objectives (e.g. increase in abundance or decrease in bycatch), economic objectives (e.g. net economic benefit, price per pound, quality of product), social objectives (e.g. crew safety, equitable access, food security, cultural value, transfer of

local/cultural knowledge).

2) Monitoring of performance metrics is needed with regularity to gauge efficacy of existing closures and suitability for future spatial fishing closures or modifying existing closures. Monitoring needs to account for changes in performance metrics before and after management action, such as counterfactual analyses.

3) Modifying fishing gear or methods are likely to be more effective to minimize protected species bycatch rather than permanent closed areas.

4) Maintain flexibility in regulations so that industry can find voluntary means to reduce bycatch interactions and have input in the development of mitigation measures.

5) Research should evaluate whether existing closures meet stated objectives and performance metrics.

6) Prior to implementing any closure or other spatial management action of any kind, compliance monitoring and enforcement should be planned and tenable.

In addition to these recommendations, the SWG will provide further specific details for consideration by the Council prior to its June 2019 meeting.

B. Developing a Process to Comply with the Modern Fish Act

Title II, Section 201 of the Modern Fish Act, passed by Congress in December 2018, requires the Secretary of Commerce to work with the SSCs and Commissions (not later than 1 year after enactment) on a report facilitating greater incorporation of data, analysis, stock assessments and surveys from state agencies and nongovernmental sources into fisheries management decisions. The SSC work group noted that the existing Council process already facilitates greater incorporation of these sources of information into fisheries management decisions.

The SSC work group highlighted the following key points:

- The requirements described by the Modern Fish Act are currently addressed through Council processes via the WPSAR, Plan Team, and SSC meetings;
- If a non-government author wants his/her science or data to be considered for a fishery conservation and management measure, the author should provide the information to the Council. A standardized solicitation for scientific information channeled through the Council website and meeting notices in the Federal Register may provide an avenue for those authors.
- Science from non-governmental sources related to stocks under Council management, should be added as supplemental materials during the review of a scheduled stock assessment for consideration when the panel evaluates what is potentially the best scientific information available;
- Data preparation workshops should be considered for inclusion into the WPSAR process prior to the development of scheduled stock assessments to determine the

- range of available data and evaluate the quality of these data sets to be used in the assessment;
- The Plan Team, in the development of the Annual SAFE report, should update the references of the most recent scientific information that can be used in the development of amendments for conservation and management measures.

The SSC recommends the Council direct staff, in collaboration with the SSC Chair Jim Lynch, develop a process paper to be presented to the SSC at its next meeting in June 2019. The SSC notes that the Council already addresses the requirements of the Modern Fish Act and the paper will explain how the Council processes comply with the new requirements. The paper should also include suggestions on how to engage the public and solicit outside data. This paper will be circulated to the SSC for review prior to the 132nd meeting.

10. Pelagics and International Fisheries

A. Updates to the Pelagic Fisheries Research Program

Council staff updated the SSC on the Council's Pelagic Fisheries Research Program priorities and recent activities. These priorities include bigeye tuna stock structure and connectivity, analyses of stock indicators for incidentally caught pelagics, Marianas shark interactions, impacts of closures on pelagic fisheries, and the advancement of ecosystem-based fisheries management. Recent activities include collecting samples for genetic studies for stock structure of Hawaii bigeye tuna, CPUE analyses in a Council-supported project (wahoo, mahi-mahi, opah, monchong, and shortbill spearfish), and a Council-supported project on the effects of area closures on the Hawaii longline fishery. It was noted that the US Pacific Islands Region has the highest landed value and benefit from pelagic fisheries in the US but receives the least amount of federal funding to support pelagic research.

B. American Samoa Longline Fisheries Report

Keith Bigelow, PIFSC staff, presented the 2018 annual report for the American Samoa longline fishery. The report covered fishery statistics including participation, effort, and catch, with 2018 statistics for each of these categories the lowest on record. The only bright spot was an increase in albacore CPUE in 2018 as compared to 2017 levels. SSC discussion noted the consistent declining trends in this fishery despite having a guaranteed market with the one remaining cannery in the territory and reasonable fuel costs. Additional vessels left the fishery in 2018 following years of declining catch and profits. It was further noted that the fishery experiences cyclic patterns of improved catches, possibly due to oceanographic factors and that the fishery tends to peak in the austral winter. The SSC thanked Bigelow for his report.

C. Hawaii Longline Fishery Report

Russell Ito, PIFSC staff, provided the 2018 annual report for the Hawaii longline fishery (deep-set and shallow-set components). The report covered fishery statistics including participation, effort, and catch. Overall participation in term of vessels remains stable, but declines in total catch, in comparison to 2017 levels, were noted for both the deep and shallow-set components of the fishery. Reductions in shallow-set effort and catch were attributed to early closure of the fishery in May 2018 related to high interaction rates with loggerhead turtles. Nineteen vessels made landings in California in 2018. It was noted that the entire processing operation of a large Hawaii-based seafood dealer was relocating its operations, including longline vessels, to San Diego in 2019. PIFSC receives logbook data from the Hawaii-permitted, California-based vessels. NMFS does not receive detailed weight and dealer data for these California landings and incurs added expenses for observer coverage. The SSC thanked Ito for his report.

The SSC recommends that PIFSC work with California fish dealers and the Southwest Fisheries Science Center to obtain weight information for landed catch.

D. Hawaii Shallow-set Longline Fishery

1. Status of the Hawaii Shallow-set Longline ESA Consultation

Council staff reported on the status of the Hawaii shallow-set longline Endangered Species Act (ESA) consultation and noted that PIRO notified the Council that it would provide the draft Biological Opinion (BiOp) on March 25, 2019, which is after the conclusion of the 176th Council meeting.

2. Managing Loggerhead and Leatherback Sea Turtle Interactions in the Hawaii-based Shallow-set Longline Fishery (Final Action)

Council staff provided a status update of the Council action considering the management of loggerhead and leatherback turtle interactions in the shallow-set fishery. Due to the delay in preparation of the draft BiOp, Council staff reported that the Council is planning to reconvene on April 4 to review the draft BiOp and consider this action item. The Council will additionally convene a draft BiOp review group on April 2nd that will report out to the April Council meeting. The review group will focus on the draft BiOp findings and potential Reasonable and Prudent Measures or Reasonable and Prudent Alternatives, but not the population modeling approach, which has already been independently reviewed.

The SSC recommends that the following members of the SSC serve on the draft BiOp review group: Lynch, Martell, Harley, Chaloupka, Hospital, Hilborn, and Kobayashi.

E. US Participating Territory Longline Bigeye Specifications (Final Action)

Council staff presented on the 2019 US Participating Territory Longline Bigeye Specifications action item. It was noted that bigeye catch transfers have been ongoing between the Hawaii longline fishery and US Participating Territories since 2011 and that these catch limits must be specified annually. Under the Amendment 7 framework, which was implemented in 2014, the Council's status quo specification recommendations have been 2,000 mt total limits and 1,000 mt allocation limits for each US Participating Territory. Three alternatives were presented including: 1) No Action, 2) Status quo, and 3) Total catch limits of 2,000 mt per territory with allocation limits of up to 2,000 mt per territory. Potential impacts to bigeye stock status in relation to catch and allocation limits were presented. Under both action alternatives, including full utilization of distant-water longline catch allocations and territorial limits, overfishing and WCPFC limit reference points would not be breached. Discussion noted that the territorial agreements are acknowledged in the existing WCPFC conservation and management measures and further noted that the territories receive full financial benefit even if only a portion of their allocation limit is utilized. These funds provide significant benefit to the territories through the Sustainable Fisheries Fund.

The SSC finds that the methodology used to assess the relative impacts of the specification limits remains appropriate and utilizes a similar approach to the analyses conducted by the SPC to evaluate the effectiveness of the WCPFC tropical tuna measure.

Based on the evaluation conducted by Council and PIFSC, the SSC further notes that projected impacts from the options are believed to not lead to bigeye overfishing and are consistent with Commission management objectives.

F. Maturity, Age, and Growth of Central North Pacific Striped Marlin

Council staff presented published life history assumptions currently available for stock assessment of north Pacific striped marlin (NPSM), including stock structure, maturity information, age and growth, and other information. This information was presented at the ISC Billfish Working Group Meeting held January 14-21, 2019 in Honolulu. Council staff presented preliminary work on developing growth curves for NPSM using age estimates from 134 fin spines and tagging data in an integrated approach to show possible regional differences in growth. It was noted that the current stock assessment indicates a maturity schedule significantly delayed in comparison to similar histologically based maturation studies on the species from other Pacific areas.

The SSC recommends that PIFSC complete the histological maturity study for NPSM sampled from the Hawaii longline fishery and to provide the information to the ISC prior its July 2019 meeting.

G. International Fisheries Meetings

1. IATTC Tuna Growth Workshop

Council staff reported on the IATTC workshop to evaluate bigeye and yellowfin tuna ageing methodologies and growth models in the Pacific Ocean, which was held January 23-25, 2019 in La Jolla, CA. The workshop was organized by Kurt Schaefer and chaired by Mark Maunder (both of the IATTC). This workshop evaluated validation techniques of daily and annual age estimates for Pacific bigeye and yellowfin tuna. The workshop examined growth curves developed by CSIRO that caused a dramatic shift in the 2017 bigeye tuna stock assessment, altering stock status to not overfished with no overfishing occurring. It was noted that stock assessments for these species are highly sensitive to variations in growth parameters such as L_{inf} . The importance of developing stock assessment models that can accommodate spatial variability in growth and maturation was noted. Discrepancies in ageing techniques and future works by the IATTC and CSIRO (Fish Ageing Services) were discussed in detail.

2. IATTC Abundance Indices and Tagging Workshops

Council staff and David Itano presented outcomes of two IATTC-sponsored workshops. These include: 1) Workshop to improve the longline indices of abundance of bigeye and yellowfin tunas in the eastern Pacific Ocean held February 11-15, 2019 in La Jolla and 2) Workshop to review the proposed activities of the IATTC Regional Tuna Tagging Program in the eastern Pacific Ocean held January 28-30, 2019 in La Jolla, CA. The tagging program will target tropical tuna species to improve stock assessment, particularly for skipjack tuna. It was noted that pole and line vessels, which are best suited for tagging studies are becoming scarce which could impact future tagging efforts.

3. WCPFC15

Council staff presented key outcomes of the 15th Regular Session of Western and Central Pacific Fisheries Commission (WCPFC15), which was held in Honolulu from December 10-14, 2018. Notable outcomes included roll-overs of the tropical tuna and Pacific Bluefin conservation and management measures and modifications to seabird and sea turtle measures. Other key outcomes were the adoption of an interim target reference point for South Pacific albacore; prioritizing striped marlin rebuilding, transshipment reform, and the adopting of a non-binding resolution on vessel crew labor standards.

4. 2018 Workshop on Identifying the Spatial Stock Structure of Tropical Pacific Tuna Stocks

Council staff presented on the Workshop on Identifying the Spatial Stock Structure of Tropical Pacific Tuna Stocks hosted by the SPC from October 9-12, 2018 in Noumea, New Caledonia. The workshop examined how tuna stocks should be defined for assessment purposes in the WCPO. The workshop identified genetic techniques to discern spatial distinctions of bigeye tuna, yellowfin tuna, skipjack tuna, and albacore. A research work plan emerged from discussions led by scientists throughout the Pacific region. A review of existing biological works and tagging studies on these species were also discussed.

5. North Pacific Fisheries Commission

Council staff reported on a meeting of the North Pacific Fisheries Commission (NPFC) Scientific Committee. He noted that the NPFC is in charge of the fishery resources of the Emperor Seamounts, such as armorhead and alfonsin and North Pacific pelagic species such as Pacific mackerel, saury, and squid. It was noted that these resources were potentially important to Hawaii fisheries and fisheries development but the US was not currently scheduled to participate in the meeting due to limited funding.

6. South Pacific Regional Fisheries Management Organization

Keith Bigelow, PIFSC staff, reported on the South Pacific Regional Fisheries Management Organization 6th Meeting of the Scientific Committee held in Puerto Varas, Chile from September 9-15, 2018. Issues addressed are the SPRFMO Scientific Committee work plan, current research and assessments, and SPRFMO ecosystem approach to fisheries management. The main species of interest include jack mackerel, orange roughy, and jumbo flying squid.

H. Public Comment

There were no public comments provided.

11. Other Business

A. 132nd SSC Meetings Dates

The next SSC meeting will be June 18-20, 2019. The location is to be determined.

B. Council's Five Year Program Plan

Council staff presented the Council's draft program plan for 2020-2024. The primary driver of this plan is the MSA, the Council Mission and guiding principles, and direction from Council advisory groups. There has been a realignment of Council programs, with ecosystem-based program priorities distributed among other programs. The Council's advisory groups have been realigned to operate more efficiently by reducing AP membership from 12 to six for each island area.

The Council is considering moving from three to four annual meetings to allow one to be held in each jurisdiction in the region. The SSC noted that an additional Council meeting would require an additional SSC meeting, but that the location of the meeting would be open to discussion.

The SSC supports the changes to the Council Programs. The SSC noted the importance of fishery development for underutilized species such as bottomfish in the Marianas and American Samoa with a focus on developing local capacity and infrastructure.

C. SSC Three-Year Plan (2020-2022)

Council staff presented the SSC Three-Year Plan for the upcoming cycle, which includes focus on determining BSIA, implementing ecosystem-based management, and reviewing assessments and recovery plans. The plan will be updated with additional science products to be reviewed by the SSC once the WPSAR Steering Committee finalizes the revised schedule on April 6, 2019.

D. National Scientific Coordinating Subcommittee Meeting 2020

Council staff presented a summary of the National Scientific Coordinating Subcommittee Meeting to be held in Kodiak, Alaska in July 2020. The North Pacific Fishery Management Council will be hosting this meeting. Council staff will update the SSC with any new information regarding the planning of the National Scientific Coordination Subcommittee Meeting 2020 at its June 2019 meeting.