WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

143rd Meeting of the Scientific and Statistical Committee
March 14-162022
Web Conference

FINAL REPORT

4. Pacific Islands Fisheries Science Center Director Report

Michael Seki provided the Pacific Islands Fisheries Science Center (PIFSC) Director's report, highlighting that the IRC facility remains in Phase 1, which is primarily work-from-home for all staff. Seki noted that reintegration is on the horizon, however, and envisions a hybrid work environment by the June SSC meeting. Both NOAA Ships Rainier and Oscar Elton Sette are in Honolulu mobilizing for research expeditions. The Rainier will be departing soon for the Marianas RICHARD mission, principally a coral ecosystem and mapping survey. Oscar Elton Sette will be conducting a joint mission in Hawaii with the PIFSC Life History Program and the West Hawaii Integrated Ecosystem Assessment. Seki gave an overview of territorial bottomfish stock assessment improvements and noted that these will be discussed more fully in subsequent presentations. Seki then presented on the NMFS Next Generation Data Acquisition Plan (NG-DAP) which is a follow up to the 1998 plan and will serve as data acquisition guidance for the next 10-15 years.

An SSC member asked if the NG-DAP engagement meetings will be held in the territories and with fishing communities. Seki responded that a contractor is responsible for these virtual listening sessions and they are anticipated to reach as many people as possible. An SSC member asked about who has been leading this effort. Seki responded that Cisco Werner has been closely involved in planning and rolling out the NG-DAP. An SSC member pointed out that virtual meetings are potentially able to engage with more people and a wider cross section. Seki added that this is a national effort and will balance local needs and issues. The Executive Director noted that the SSC and Council have much historical material that will be useful for identifying these local needs and issues, and also asked about cost of contract and dedicated future funding. Seki responded he did not know the cost of the contract, and noted that future funding will be on a year-to-year basis with the requests for congressional funding.

The SSC thanked Seki for his informative presentation.

5. Program Planning and Research

A. Review of the Acceptable Biological Catch for the Main Hawaiian Island Deepwater Shrimp and Precious Corals (Action Item)

Council staff presented the re-setting of the Acceptable Biological Catches for the main Hawaiian island deep-water shrimp complex (*Heterocarpus laevigatus*, *H. ensifer*, and *Heterocarpus* spp.) and the precious corals at various beds for the fishing year 2022-2025. There are no new stock assessments available to revise the MSY estimates. Council staff presented two options: 1) no action - do not set the ABC; 2) roll over the current ABC to the fishing year 2022-2025. Council staff also presented a simple impact analysis showing no adverse impacts due to the inactive to low participation in the fisheries.

An SSC member questioned whether there was any novelty in the specification of the Tier 4 control rule parameter (0.91 * MSY). Council staff clarified that the Tier 4 control rule is designated for fisheries that only have MSY estimates in absence of a formal stock assessment, and are inactive or have low participation.

The SSC recommends Option 2 to roll over the current ABCs to the fishing year 2022-2025. This would establish the following ABCs for the main Hawaiian island deep-water shrimp and precious corals:

MUS/MUS Complex	ABC (lb.)
MHI Deepwater Shrimp	250,773
MHI Precious Corals	
Auau channel - black coral	5,512
Makapuu bed - pink coral	2,205
Makapuu bed - bamboo coral	551
180-fathom bank - pink coral	489
180-fathom bank - bamboo coral	123
Brooks bank - pink coral	979
Brooks bank - bamboo coral	245
Kaena point bed - pink coral	148
Kaena point bed - bamboo coral	37
Keahole bed - pink coral	148
Keahole bed - bamboo coral	37
Precious coral in MHI exploratory area	2,205

B. Revision of the Territorial Bottomfish Management Unit Species Complex

1. Multivariate Analysis of the Territorial Bottomfish Management Unit Species

Todd Jones, PIFSC Fishery Research and Monitoring Division presented the rationale for the analysis and how refining the BMUS list contributes to the improvements in future stock assessments. Jones reviewed the different requirements for a federal MUS from MSA and the National Standard 1 guidelines. Rob Ahrens, PIFSC FRMD, presented the hierarchical clustering of creel interviews for boat-based operations in American Samoa and Guam. The dendrograms are intended to delineate species aggregations that are potentially experiencing similar fishing

pressure when used in conjunction with life history information, to facilitate the determination of species complexes for FMPs and FEPs. The cluster analysis results showed a clear differentiation between shallow-water species and deep-water species. The clustering was consistent despite the length of the time series.

The cluster analysis suggests the following deep-water species be included in the federal FEP for American Samoa and Guam:

American Samoa	**Guam**
Aphareus rutilans	*Aphareus rutilans*
Etelis boweni	*Etelis boweni*
Etelis carbunculus	*Etelis carbunculus*
Etelis coruscans	*Etelis coruscans*
Pristipomoides argyrogrammicus	*Pristipomoides argyrogrammicus*
Pristipomoides auricilla	*Pristipomoides auricilla*
Pristipomoides filamentosus	*Pristipomoides filamentosus*
Pristipomoides flavipinnis	*Pristipomoides flavipinnis*
Pristipomoides seiboldii	*Pristipomoides seiboldii*
Pristipomoides zonatus	*Pristipomoides zonatus*
Pristipomoides multidens	-
Paracaesio stonei	-
Paracaesio kusakarii	-

The species that are primarily shallow water or span shallow and deep habitats that occur primarily in territorial waters were proposed to be designated as Federal Ecosystem Component species and managed by territorial FMP included *Aprion virescens, Caranx lugubris, Variola louti, Lethrinus rubrioperculatus, and Lutjanus kasmira*.

Multiple SSC members commended the work presented by PIFSC to revisit the territorial BMUS lists. SSC members (including territory representatives) agreed that the methods employed were appropriate. Results indicating distinct deep and shallow-water species groupings were sensible and aligned with fishing community perspectives. PIFSC acknowledged the positive feedback and recognized the diverse partnerships required for the success of this project, including the valuable input provided by the fishing community.

An SSC member inquired about the status of a similar analysis for CNMI. PIFSC indicated that the analysis has been completed for CNMI boat-based and shore-based creel survey data, and will be included in the forthcoming PIFSC Technical Memorandum. Some additional species have been recommended for consideration in a CNMI territory fishery management plan, and PIFSC offered to provide a presentation to DFW staff.

The SSC thanked Jones and Ahrens for the analysis and informative presentation

2. Options for Revising the Territorial BMUS Complex

Council staff presented the options for revising the territorial BMUS complex based on the cluster analysis and the life history synthesis (Ahrens et al. 2022). The original Bottomfish

Fishery Management Plan (FMP) for the Western Pacific Region listed 20 fish species that dominated the landings, including shallow and deep-water species. The BMUS were grouped into a single bottomfish complex for stock assessment and management. The territorial bottomfish fisheries have evolved with the rise and fall of large vessel fleets and various sporadic fishery development projects. The current bottomfish fisheries consist of small boats undertaking single-day trips with few participants targeting coral reef fish and deep-water snappers using the same hook and line gear. The Council under MSA 600.305(c)(7) should periodically review the FMPs and the best scientific information available and determine if the stocks are appropriately identified.

The two options presented were: 1) no action and retaining the current composition of the BMUS complex for American Samoa and Guam; and 2) revise the BMUS complex based on the cluster analysis and life history synthesis presented in 5.B. In revising the list, the shallow-water species will be designated as Federal Ecosystem Component species and picked up in the territorial FMPs, while the Federal FEPs will only contain deep-water snappers. Several MSA requirements need to be examined for the new species list including 1) status determination criteria; 2) ACL and accountability measures; 3) essential fish habitats; 4) bycatch; 5) fishery monitoring; and 6) human communities.

SSC members questioned the implications of this decision for species recommended to move to territorial fishery management plans. Council staff confirmed that these species would be considered ECS in terms of future federal actions and not subject to MSA requirements. The Council would continue to work with local fishery agencies to include them in future territorial fishery management plans.

An SSC member inquired when a revised BMUS list could be utilized for assessment considerations. Council staff indicated that the 2023 American Samoa bottomfish stock assessment would be based on the current BMUS list. A new stock assessment on the revised BMUS list would enter the WPSAR review cycle once final action has been taken.

The SSC recommends Option 2 to revise the BMUS list based on the cluster analysis and life history synthesis. In selecting Option 2, the SSC supports the refinement of the BMUS in the Federal FEPs, and moving the shallow-water species to Federal Ecosystem Components and recommends these species be included in the territorial FMPs. The change in the composition of the BMUS complex triggers revisions to the various MSA requirements for the MUS.

C. Outcomes of the American Samoa Bottomfish Fisherman Data Workshop

Felipe Carvalho, PIFSC-Stock Assessment Program, and Council staff Diana Kitiona presented the American Samoa Bottomfish Fisherman Data Workshop highlights. The data workshop is the first held in the territories as the first of a series of steps towards developing the 2023 benchmark stock assessment. The Tutuila fisherman workshop was held on February 2-3, 2022, at Sadies' By The Sea conference room, with PIFSC and Council staff participating via WebEx. Fifty-five percent of the invited fishermen attended with a mix from commercial and non-commercial sectors. Two fishermen that fished in the '60s and '70s also provided their historical insights.

The Manua Data Workshop was held in Tau on February 7-8, 2022, participated in by 25 fishermen with five village chiefs and one village mayor.

The workshop went through the various elements of the stock assessment through presentations and Q/A after the short presentations. A break-out session, facilitated by DMWR and Council Island staff, was conducted to answer specific questions raised by the assessment scientists regarding the trends in the fishery data, the species in the BMUS complex, and their recollection of the events and historical observations about the fishery. The groups reported their discussion on day 2 and were given the opportunity to ask the scientists questions regarding the data and the assessment process.

The workshop highlighted several issues related to the data for some species. Species identification was an issue for the palu-malau (*Etelis carbunculus*) and the giant palu-malau (*Etelis boweni*) and the two species of papa or velo (yellow-margin and the white-margin lyretail groupers). The absence of data before and after certain years was due to data collection issues since fishermen reported that they continue to catch palu-ena-ena (*Pristipomoides filamentosus*) and palu-sina (*P. flavipinnis*) and palu-ula (*P. zonatus*).

SSC members felt the American Samoa bottomfish data workshops were successful, that fishing community input and data filtering insights should help in future assessments, and thanked the Council and PIFSC for supporting the workshops in American Samoa.

An SSC member highlighted the stated discrepancies between data streams and community perspectives for a few species and questioned methods to address this moving forward. PIFSC staff indicated that input provided at the workshops related to common name usage and changes in species identification protocols allowed analysts to dig into the data and correct most, if not all significant discrepancies. PIFSC also highlighted strategies to resolve catch trends or use selective time periods to address species identification concerns.

The SSC thanked Kitiona and Carvalho for the informative presentation.

D. Public Comment

There were no public comments.

6. Protected Species

A. False Killer Whale Hook Study Implications

Council staff provided an overview of the considerations for future direction of the False Killer Whale Take Reduction Plan, including implications of a weak hook study conducted in 2021. The weak hook study evaluated target and non-target species catch rate and value of two hook sizes: a 4.5 mm shank diameter circle hook meeting the current regulatory requirement under the False Killer Whale Take Reduction Plan (FKWTRP), and a 4.2 mm shank diameter circle hook. The results indicate that target catch rates were not significantly different between the two hook sizes, but bigeye tuna body length, weight, and value were significantly higher on 4.5mm hooks. The number of straightened hooks recorded during the study was not significantly different between the two hook sizes. The SSC previously recommended in its September 2021 Issues Paper that weak hook mitigation strategies should only be mandated after thorough testing of hook and line strength, target catch retention and training of captain and crews under different hooking scenarios. Staff also highlighted considerations for updating the Council's previous position statement for the FKWTRP from April 2018, including NMFS' serious injury guidelines, updated abundance estimates, and the Southern Exclusion Zone.

SSC member questions focused on study design (i.e., sample size for each hook type) and the statistical significance of differences in catch and hook straightening. SSC members also noted that the switch to monofilament leader in the fishery will allow the branch line to be severed more easily below the weighted swivel and closer to the hook, which in turn may reduce mortality and serious injury.

The SSC finds that the 2021 weak hook study does not provide sufficient scientific evidence to support adoption of a weaker circle hook. This finding is further supported by false killer whale interaction outcomes that show low success rates of weak hooks.

The SSC reiterates the recommendations from the 2021 Issues Paper to further assess the utility of severing the branch line below the weighted swivel and close to the hook. The switch to monofilament leader by the fishery may allow for development and assessment of simpler dehooking devices that manage flyback.

The SSC does not recommend weaker hooks to be considered for implementation. The SSC recommends that crew training be deferred on weak hooks and tie off strategies that increase stress on the animals. This would allow industry to cooperatively develop new and more effective strategies to reduce trailing gear.

The SSC also recommends the Take Reduction Team 1) further develop strategies for significantly reducing trailing gear and 2) evaluate the effectiveness of the SEZ in meeting the conservation goals of the FKWTRP.

B. Meta-synthesis of Marine Turtle Post-release Mortality

Milani Chaloupka, SSC member, presented on a recent meta-synthesis of marine turtle post-release mortality, funded through the Cooperative Research Program. The analysis represents the first comprehensive meta-synthesis of post-release mortality for 5 marine turtle species bycaught in various fishing gears, with a specific focus on post-release mortality for loggerhead marine

turtles bycaught in pelagic longline fisheries since most compiled study-specific summaries were for this species and gear type. The meta-synthesis revealed a knowledge gap concerning reliable information on fishery discard rates for other marine turtle species beside the loggerhead and for other gear-types beside pelagic longline gear. A Bayesian meta-regression modeling approach was used to draw robust and generalizable inference from the compiled study-specific summaries of loggerhead post-release mortality.

The most informative predictors of loggerhead marine turtle post-release mortality in the meta-synthesis were ocean basin (Mediterranean vs. elsewhere) and the anatomical hooking position (shallow-hooked vs deep-hooked). It was estimated that deep-hooked loggerheads irrespective of geographic region were 2.6 times more likely to die when bycaught in pelagic longline fisheries than shallow-hooked loggerheads. The estimated post-release mortality rate for shallow-hooked loggerheads was 0.079 and 0.213 for deep-hooked loggerheads. It was further estimated that deep-hooked loggerheads bycaught in Pacific Ocean pelagic longline fisheries were 5.6 times more likely to die than shallow-hooked loggerheads. The estimated Pacific Ocean only PRM for shallow-hooked loggerheads was 0.041 and 0.228 for deep-hooked loggerheads.

The SSC thanks Chaloupka for an evidence-informed presentation that outlines a productive way forward in developing science-supported bycatch mitigation strategies.

The SSC recommends that the shallow- and deep-hooked post release mortality estimates presented above be adopted in future loggerhead Biological Opinions.

C. ESA Consultations for the Hawaii Deep-set Longline Fishery, American Samoa Longline Fishery, and Bottomfish Fisheries

Chelsey Young, PIRO Protected Resources Division, presented on the current status of ESA consultations for the pelagic longline fisheries, US purse seine and bottomfish fisheries in the MHI and territories. The consultations were initiated in 2018 and 2019. The Hawaii deep-set longline fishery and consultations for the main Hawaiian island, American Samoa, Guam and Commonwealth of Northern Mariana Islands bottomfish fisheries are expected to be completed by April 2022, and the American Samoa longline fishery consultation is expected to be completed by May 2022.

The Council Executive Director requested an explanation for PIRO's delays in completing the consultations. Young stated that these concerns would be forwarded.

D. ESA and Marine Mammal Protection Act Updates

Chelsey Young, PIRO Protected Species Division, provided the SSC with ESA and MMPA updates for the region.

<u>Insular FKW 5-year Review</u>
Young noted that the final Insular FKW 5-year review will be published in spring 2022. The review will consider information on impacts of the fishery on insular FKW. Young explained that the review should not delay any ongoing ESA consultations.

Shortfin Mako Shark Petition
In response to a petition to list shortfin mako shark, an Extinction Risk Assessment (ERA) team has been formed. As a first step, the ERA is currently gathering information to examine the global status of the species. Council staff noted that recent assessments concluded that the North Pacific spawning stock biomass is above levels associated with BMSY and that fishing mortality rates may be declining in certain regions.

Oceanic Whitetip Shark (OWT) Recovery Plan
A draft Recovery Plan for OWT is in the initial stages of internal review at HQ Office of Protected Resources. The Recovery Plan is a guidance document that lists the conditions that should be met before delisting OWT. An SSC member asked whether there was any discussion about mitigation measures for OWT in purse seine fisheries. Young indicated that mitigation measures to reduce OWT bycatch were discussed in the recovery planning workshops, including purse seine mitigation measures.

ESA Coral Recovery Planning
NMFS is exploring an ecosystem recovery plan that addresses the threat of climate change to coral ecosystems. The plan also highlights the need for traditional and innovative solutions for ESA-listed coral recovery.

Coral Critical Habitat
NMFS is continuing to refine the distribution and mapping of ESA listed corals. NMFS is also conducting an economic impact analysis of the listing.

Hawaiian Spinner Dolphin Proposed Rule
NMFS published a proposed rule to create time-area closures at five sites in the Main Hawaiian Islands. NMFS hosted a public forum in December 2021 and collected comments on the proposed rule. A final decision on the proposed rule is expected by fall 2022.

FKW Interactions in the Hawaii Longline Fishery
In 2021, observers recorded 15 FKW interactions in the Hawaii longline fishery, of which there was 1 mortality and 5 serious injuries. On March 8, 2022, NMFS notified the public that these levels of mortality and serious injury met the threshold to trigger the closure of the SEZ. However, because the injury determination was not made available until 2022, the SEZ remained open through December 2021.

An SSC member asked why the injury determination was late in coming. Young indicated that the timing of the triggering event was relatively close to the end of the calendar year, which may have prevented a more timely determination and action. NMFS observers have recorded 3 FKW interactions in the DSLL fishery in 2022.

The SSC thanks Young for an informative presentation.

E. Public Comment

There were no public comments.

7. Pelagic and International Fisheries

A. 2021 American Samoa Longline Fishery Report

Keith Bigelow, PIFSC, provided the 2021 annual report for the American Samoa longline fishery. The report covered fishery statistics including participation, effort, and catch. CPUE for albacore in the fishery has declined continuously since 2007, with current CPUE below levels associated with fleet profitability.

An SSC member noted that there the data indicated a high release rate for pomfret and asked whether this related to a lack of market demand for the species. An SSC member responded that while direct information was not available, this was indeed a likely cause.

An SSC member inquired whether the recent increase in albacore CPUE in American Samoa data was also found across the region. An SSC member noted that the regional data provision deadline for 2021 was the end of April, so a regional picture of the 2021 fishery would be available after that time.

An SSC member asked whether American Samoa vessels had engaged in troll activity in the South Pacific fishery in 2021-2022 season (December to March/April), as some vessels had in recent years. Bigelow noted that vessels had engaged in the fishery in 2020-2021, but there was no information available at this time for the current season.

An SSC member noted an increase in the CPUE of sharks in 2021, and asked whether fishers had noted an increase in shark interactions. Bigelow noted that the logsheet information on sharks that underpinned the CPUE was potentially biased, and that data from the observer program would be the best source of information on trends, but had not been analyzed at this time.

SSC thanked Bigelow for his presentation.

B. 2021 Hawaii Longline Fishery Report

Russell Ito, PIFSC, provided the 2021 annual report for the Hawaii longline fishery (deep-set and shallow-set components). The report covered fishery statistics including participation, effort, and catch.

An SSC member noted the decline in opah catches, and asked whether the cause was known. Ito responded that this would best be answered through fisher interviews, but noted that there may be a spatial effect given the pattern of increased fishing in the south of the Main Hawaiian Islands area in 2021.

Noting the change in the spatial distribution of fishing in 2021 and declines in CPUE in that year, an SSC member inquired whether the change in fishing location was a result of fleets minimizing costs, or whether this higher effort had contributed to the lower CPUE. Ito noted that the cause was not clear, but that the human dimensions project could collect information on this. An SSC member noted that the lack of fishing in the Northeast of the region, where there was a perception of higher bigeye productivity in previous years that may have changed.

An SSC member noted the decline in pelagic fisheries catch since 2010. Ito noted that high prices of bigeye would encourage bigeye fishing, and asked whether there were any trends in the regional stock assessment that might explain the pattern. An SSC member commented that the most recent assessment suggested relatively high abundance levels in the region around Hawaii, but that the regional pattern in stock assessment should be viewed with caution.

An SSC member asked whether the recent spike in fuel prices had influenced where and how often people were going out fishing. Ito noted that vessels are currently undertaking quick turnarounds, so there was little evidence of fuel-related impacts at this time.

An SSC member noted the relative lack of impact of the COVID pandemic on catches and effort. Ito responded that larger vessels did tie up initially, but were supported by bridging funding. As the economy rebounded and prices strengthened, this has led to a recovery of fishery activity.

An SSC member asked Ito whether the size of bigeye caught had been influenced by the location of fishing. Ito noted that recent COVID restrictions on auction visitors had limited observations, available data suggested that larger fish were still being caught, and that size data has been relatively constant over recent years at around 80lb. Further data were available in the pelagic SAFE report.

An SSC member noted the recent declines in the catches of non-target commercial species in the fishery, and inquired whether there were any clear drivers behind that decline. Ito responded that fishers had also noted this decline, but had no information on why it might be occurring. Their commercial value implied that they were unlikely to be discarded. An SSC member noted the current work underway examining these species, which includes an SSC member.

SSC recommends that further work be undertaken to better understand the potential causes behind the declining trends in the catches of these commercial species, and identify whether these declines could be explained by changes within the fishery or whether they may reflect declines in these stocks.

SSC thanked Ito for his informative presentation.

C. Area Based Management

1. Assessing the Population-level Conservation Effects of Marine Protected Areas

Dan Ovando, University of Washington, presented a recently published study. Marine protected areas (MPAs) cover 3–7% of the world's ocean, and international organizations call for 30% coverage by 2030. Although numerous studies show that MPAs produce conservation benefits inside their borders, many MPAs are also justified on the grounds that they confer conservation benefits to the connected populations that span beyond their borders. A network of MPAs covering roughly 20% of the Channel Islands National Marine Sanctuary was established in 2003, with a goal of providing regional conservation and fishery benefits. Ovando and his coauthors used a spatially explicit bioeconomic simulation model and a Bayesian difference-in-difference regression to examine the conditions under which MPAs can provide population-level conservation benefits inside and outside their borders and to assess evidence of those benefits in the Channel Islands. The authors estimated that biomass densities of targeted fin-fish had a

median value higher inside the Channel Island MPAs than outside. However, authors found no clear effect of these MPAs on mean total biomass densities at the population level. The simulation model showed that effect sizes of MPAs of <30% were likely to be difficult to detect (even when they were present); smaller effect sizes (which are likely to be common) were even harder to detect. Communicating expectations and uncertainties around MPAs is critical to ensuring that MPAs are effective. The authors provide a novel assessment of the population-level effects of a large MPA network across many different species of targeted fin-fish, and their results offer guidance for communities charged with monitoring and adapting MPAs.

An SSC member inquired which key information gaps need to be filled to improve the predictive power of the approach. Ovando noted stock structure, adult abundance and fleet dynamics were key uncertainties to be addressed.

An SSC member inquired whether information on the impacts of MPAs on fleet dynamics was available. Ovando noted that only coarse spatial information was available but not incorporated in the model.

An SSC member also noted that existing large open ocean MPAs were assumed present within the model. Ovando agreed that these were indeed included in the current model, but the implications of these could be evaluated specifically using this approach.

Ovando noted that many models were not set up for pelagic species, being based upon the knowledge of benthic species, and careful evaluation of model applicability for pelagic stocks was needed.

The SSC thanked Ovando for his informative presentation.

2. The Trade-off Between Biodiversity and Sustainable Fish Harvest with Area-Based Management

Ray Hilborn, University of Washington, presented a newly published study linking trade-offs between biodiversity and sustainable harvest from area-based management action. While fisheries provide food and employment for hundreds of millions of people, they also can have a significant impact on biodiversity. Hilborn and his coauthors explore the potential of area-based fisheries management to simultaneously maintain biodiversity and high levels of sustainable food production. Static and dynamic closures were analyzed as either large closed areas or a mosaic of smaller closed areas. Assuming perfect knowledge of where the catch and bycatch occurs and a closure of 30% of fishing areas, the authors found that dynamic area closures could reduce bycatch by an average of 57% without sacrificing catch of target species, compared to 16% reductions in bycatch achievable by static closures. The authors suggest that, in most fisheries, such situations can be found and that effective area-based management can provide for high levels of biodiversity protection and food production.

An SSC member asked whether the study had looked at the impact of the model having imperfect knowledge of the overlap of target/bycatch species with the fishery. Hilborn noted that this would likely reduce the effectiveness of interventions further.

An SSC member asked whether declining efficiency was comparable to declining CPUE. Hilborn noted that this was technically correct. Fishing effort was moved in proportion to the level of effort in each spatial cell prior to the closure. The impact on CPUE was then modeled through the two assumptions on CPUE - constant or declining.

The SSC thanked Hilborn for his presentation.

3. SSC Working Group on Area-Based Management

Council staff provided an overview on progress of the SSC Working Group on Area-Based Management. The Working Group has developed an outline for a policy-informed paper to address Western Pacific Region objectives with respect to conservation, biodiversity, social/economic benefits, and reducing impacts on non-target species. This paper is intended to drive positions for the US with regard to the America the Beautiful executive order and negotiations for the UN Convention on Biodiversity Beyond National Jurisdiction (BBNJ). The paper is to be about 2,500 words and will be a communication piece to the peer-reviewed journal, *Marine Policy*.

Both an SSC member and the Executive Director noted there was considerable work involved in the development of the paper, and there was a need to clearly understand who the end client was. Council staff noted that key targets were the US Government working on relevant domestic issues, and the COFI35.

The SSC noted that Council staff, the SSC chair, and working group members should discuss the content and focus of the paper further to consider a more targeted audience, along with the associated practicalities. A meeting will be convened among working group members to discuss this further.

D. International Fisheries

1. SPRFMO Annual Meeting

Colin Brinkman, US State Department, discussed outcomes of the 10th Meeting of the South Pacific Regional Fishery Management Organization (SPRFMO), held from 24 to 28 January 2022. Brinkman noted that China came to the SPRFMO meeting with it’s first-ever proposal for any conservation and management measure which was for squid.

The SSC thanked Brinkman for his informative presentation.

2. New Strategy for Addressing WCPFC Issues

Council staff presented on development of a new strategy for addressing WCPFC issues through a more holistic approach. Council staff and representatives from US tuna industries have developed an information paper that emphasizes the importance of fisheries to the Pacific Islands community and of strategic importance to US national interests. The Biden Administration is currently soliciting comments on an Indo-Pacific Strategy.

Given the importance of US fisheries in the region, SSC members highlighted the need to promote coordination and cooperation with Pacific Island countries and territories with greater integration of US territories with the wider framework of Oceania; the voices of smaller US territories should not be ignored in these discussions. This could include higher profile roles for US territory members in negotiations.

The Executive Director noted that the East-West Center in Honolulu had developed a documented initiative called "The Pacific Islands Matter for America, America Matters for the Pacific Islands." This document is to inform the Congressional Pacific Islands Caucus, who are exploring a similar continuing strategy of the US in the Pacific. This initiative does not give a complete picture of Pacific Island issues and influences, because it does not address the roles that fisheries have in economic development in the Pacific and how the US can advance its own mutual interests with Pacific Islands through fisheries.

An SSC member asked how the US can influence competing nations in the US markets. The Executive Director mentioned that the US has tools such as provisions under the Marine Mammal Protection Act (MMPA) and other applicable laws that can curb imports from nations that do not have legal equivalencies.

The SSC recommends that US delegations to WCPFC subsidiary committees coordinate to address objectives of the Pacific Strategy and to ensure that representatives of the US Pacific Island Territories and Commonwealth take an active role in developing and implementing these objectives.

3. Biodiversity Beyond National Jurisdiction

Council staff provided an update of US positions and listening sessions for stakeholders regarding the negotiations for the UN Convention for Biodiversity Beyond National Jurisdiction (BBNJ). Area-based management issues are of principal concern for the Western Pacific Region. US statements will be made on the floor and not provided in advance of the meeting. US stakeholder concerns include adjacency of potential high seas closures to existing US domestic closures, BBNJ could undermine regional fishery management organization competency, and unintended consequences of curtailing US interests and transferred effects on marine life.

The SSC thanked the Council staff for their presentation.

8. Other Business

A. June SSC Meeting Dates

Council staff reminded the SSC members that the 144th SSC meeting is scheduled for June 14-16, 2022. The current intention is to hold the meeting in-person at the Council office.

B. Forage Fish Act

Council staff presented some key provisions HR 5779, the Forage Fish Conservation Act of 2021. The bill was introduced by Representative Dingell (D-MI) on October 28, 2021, and was referred to the House Committee on Natural Resources. Subcommittee hearings were held on November 16, 2021. The bill amends the MSA, requiring the Secretary to define "forage fish" and the SSCs to provide scientific advice to the Councils in managing forage fish. The bill requires the SSCs to provide scientific advice on 1) ABC; 2) measures to prevent overfishing; 3) MSY; 4) measures to achieve rebuilding targets; 5) maintaining a sufficient abundance, diversity, and localized distribution of forage fish populations to support their role in marine ecosystems; and 6) reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures, and sustainability of fishing practices.

Fishery managers must determine the definition of forage fish in the Pacific Islands. Forage fish, which are small pelagic schooling fish, are of more focus in other US regions where they have more mono-specific fishing areas for species like herring, shad, etc. In the Western Pacific region, anchovies, akule, opelu, goatfish, and others would fall under forage fish. Vertically-migrating tuna schools target these small coastal pelagics. Additionally, juvenile stages of small pelagics are important when considering forage fish because they likely share common prey.

An SSC member suggested that the Council utilize its territorial advisory panels to examine what fishers are finding in the bellies of the pelagic species they catch; for example, during the yellowfin tuna run around Guam, the bellies of the fish are often full of coral reef species (e.g., siganids). An SSC member suggested that forage fish, including squids, deserve more attention for their ecosystem roles. The larval duration of these fishes are not included in the definition. Forage fish in the Pacific Islands are distinct from other Council regions due to greater biodiversity. Another SSC member noted that nearshore flying fish and mid-water fauna such as mycophids might also be important forage species.

An SSC member noted concerns about setting ACLs for forage fish species by further reducing the limit based on the diet needs of other fish species because this aspect is already considered through natural mortality. It is not clear if the diet needs of other species must be specified in addition to natural mortality, and evaluating the diet needs of species that prey on forage fish would be a huge, ecosystem-wide, undertaking. Additionally, the Council may read the bill and begin expanding their research priorities to consider such large needs for fish that are not listed in the FEPs. Council staff noted that such comments could be sent to the CCC working group to be added to their paper on forage fish for the Western Pacific regional perspective, and this paper will be circulated to the SSC to allow for additional input to be provided to the CCC.

An SSC member noted that the Council has often not specified ACLs for species with short lifespans, which may include species of forage fish, since their populations rebound very quickly. However, under National Standard 1, the one-year lifespan exemption only applies to the Western Pacific squid MUS but not species like akule or opelu with a three-year lifespan. The Council maintains that most, if not all, potential forage fish species are classified as ECS under the FEPs.

The SSC recommends SSC members provide comments to the CCC National Legislative Working Group Paper to convey the regional perspective on issues surrounding the new forage fish legislation, including a potential burden on the specification of the Council's research priorities associated with setting ACLs for forage fish species.

C. Tier 1 WPSAR Review of the EFH Models

Council staff informed the SSC of the upcoming Tier 1 review of the Essential Fish Habitat models by SSC member Erik Franklin and PIFSC scientist Kisei Tanaka. These models cover the EFH level 1 definition through Franklin's static model and level 2 definition through Tanaka's dynamic model. The WPSAR review is scheduled for late June to early July 2022. Per WPSAR Policy, a Tier 1 review requires a WPSAR panel that will be chaired by a designated SSC member.

The SSC recommends Dr. Milani Chaloupka as chair of the WPSAR panel to review the EFH models.