WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

Archipelagic Fishery Ecosystem Plan Team Meeting
April 20-22, 2020
1:00 – 5:00 p.m.

Draft Report

1. Welcome and introductions

Stefanie Dukes, meeting chair, welcomed participants, led introductions, and reviewed meeting protocols. One Archipelagic Fishery Ecosystem Plan Team (Plan Team) member was present in person, Reginald Kokubun. Members present via teleconference were Bryan Ishida, Domingo Ochavillo, Brent Tibbatts, Annette Tagawa, Paul Murakawa, Joseph O'Malley, Michael Quach, Kirsten Leong, Minling Pan, T. Todd Jones, Reka Domokos-Boyer, Frank Parrish, Michael Parke, Marc Nadon, Felipe Carvalho, Melanie Hutchinson, Thomas Oliver, Brett Schumacher, and Samuel Khang. Jude Lizama, Frank Villagomez, and Jay Gutierrez were not present for the meeting. Samuel Khang was not present on the first day but attended the rest of the meeting. Other attendees via teleconference were Thomas Flores, Tito Aguon, and Beth Lumsden.

2. Approval of draft agenda

The draft agenda for the 2020 Archipelagic Plan Team meeting was approved.

3. Report on previous Plan Team recommendations and Council actions

Western Pacific Regional Fishery Management Council (Council) staff briefly presented on updates to progress on Plan Team recommendations from the 2019 Archipelagic Plan Team and 2020 Intersession Plan Team meetings. The Plan Team recommendation to review the bottomfish management unit species (BMUS) lists is in progress. The National Oceanic and Atmospheric Administration (NOAA) General Counsel (GC) stated there are no prohibitions to revise the list but also that the revisions must follow National Standard 1 (NS1) guidelines. Other recommendations and their statuses were made available to Plan Team members.

The Plan Team asked for clarification on the comment from NOAA GC and if complexes cannot be revised while in an overfished/overfishing state. NOAA GC said that nothing prevents the revision of a complex, but NS1 states criteria that the added or removed stocks must exist in federal waters and is not overfished/experiencing overfishing. There are no regulations preventing the revisions and NS1 is clear on its criteria otherwise. Ultimately, species can be revised within a complex even if it is overfished/experiencing overfishing.

4. Plan Team 101: Who Are We, What We Do and Your Role in the Process

Council staff gave a presentation on the basic roles, responsibilities, and actions of the Council's Plan Teams. The Plan Team is one of the advisory bodies for the Council authorized under Section 302(g) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and was established by the Council's Fishery Management Plans (FMPs; now Fishery Ecosystem Plans [FEPs]). The Plan Team oversees development and implementation of the FEPs as well as reviews information relevant to the performance of fisheries and status of fish stocks managed under the FEPs. The Plan Team monitors the performance of the FEP through the production of the annual stock assessment and fishery evaluation (SAFE) report, a combination of the

previously separate annual report and SAFE report, that presents fishery performance and other ecosystem considerations. The Plan Team makes recommendations for conservation and management measures through amendments to the FEPs to achieve management objectives.

The Plan Team meets once a year at minimum but more frequently as needed. It is comprised of members of federal and local marine resource management agencies as well as non-governmental organizations. The Plan Team's findings and recommendations are reported at the regular meetings of the Council. Plan Team members can serve indefinite terms.

It was clarified that, while the composition of the Plan Team has many staff from the Pacific Islands Fishery Science Center (PIFSC), for example, it is based on individual expertise. The members are not necessarily representing the view of PIFSC or their agency. Governmental agencies such as PIFSC are typically informed of Plan Team recommendations because the Council transmits recommendations brought to it by the Plan Team to the National Marine Fisheries Service (NMFS).

5. 2019 Annual Stock Assessment and Fishery Evaluation (SAFE) Report
A. Fishery Performance
1. Archipelagic fisheries modules
a. American Samoa

Domingo Ochavillo, American Samoa Department of Marine and Wildlife Resources (DMWR), presented on updates to American Samoa archipelagic fisheries in 2019 using data from the Western Pacific Fisheries Information Network (WPacFIN). The number of creel survey interviews declined since the start of the time series through recent years, and there was a general increase in vendors engaged over time. Invoice collection declined starting in the mid-1990s but increased since 2014; this increase was attributed to staff becoming more involved with vendors.

BMUS landings from boat-based creel survey expansion data and commercial invoices were variable over the course of the time series but showed a slight decline in recent years. There was a large difference in landings from creel data and commercial receipt books, suggesting that most of the catch was from non-commercial sources. Declines in landings from 2004 to 2005 were likely due to tropical cyclones. Similarly, declines after 2009 were attributed to a loss of alia boats from a tsunami. High catches in 2014 were attributed to government subsidies to the bottomfish fishery.

The top-ten harvested ecosystem component species (ECS) from boat-based creel survey data in American Samoa showed that humpback snapper had the most catch followed by parrotfish species. Many of the top-ten harvested ECS from commercial purchase data were aggregated into higher-level groups such as "reef fishes". The only time series available for the six prioritized ECS was *Parulirus penicillatus* (green spiny lobster), which had relatively consistent catch except for peaks around 2010 in the boat-based data and 2006 in the commercial data.

Bottomfishing and BMUS catch-per-unit-effort (CPUE) were variable over time but has showed a general decline since the late 1980s. The variability in CPUE was more pronounced in pounds per gear hour than pounds per trip. There were peaks in CPUE in 2009 followed by a decline attributed to the hurricane that impacted the archipelago that year. Bottomfishing and BMUS effort data showed that the number of fishing trips taken has increased over time and especially when the government subsidy was introduced in 2014. Gear hours also increased over the same time period and notably around 2008. There was a peak in fishing effort in 2017 followed by a decline because the government subsidy was discontinued. The number boats participating in

bottomfishing increased up through 2007 and then declined after 2009, while spearfishing participation has increased over the same time period. There was no bottomfishing bycatch in American Samoa as almost everything is retained.

It was clarified that the total landings presented are an expansion meant to represent population-wide statistics, not just what was directly observed in the creel surveys. It is believed that the difference between commercial receipt books and the creel survey data is what is retained by the fishermen. The data for CPUE, however, were not derived from expanded values because expanded gear hours would be disproportionate, and it is instead only based on raw data.

The Plan Team discussed if the increase in spearfishing boats in recent years was somehow linked to the decrease of bottomfishing boats over the same period, but the reason for the increase was not entirely clear. There is likely more spearfishing occurring than shown in the data because many people spearfish directly from shore. The reason for the BMUS CPUE decline from 2014 to 2017 was also unclear, but it was possible that the government subsidy program resulted in increased trips that did not result in a large increase in catch.

b. Guam

Brent Tibbatts, Guam Department of Aquatic Wildlife Resources (DAWR), presented on updates to Guam archipelagic fisheries in 2019. Relative to 2018, landings in shore-based rod and reel fishery decreased in 2019 while the throw net fishery had increases. There was no gleaning observed in 2019, which was uncommon. There was a run of *Siganus spinus* in October 2019.

93 surveys were completed in 2019 accounting for 786 interviews, which was higher than historical averages. Commercial data showed that six vendors were reporting in 2019, accounting for 1,176 receipts. However, there were less than three reporting BMUS, which resulted in issues presenting the values due to data confidentiality. The number of vendors reporting was higher than historical trends, but the number if receipts in 2019 was lower than 10- and 20-year averages. The reduction in receipts was likely because some of the long-time vendors have shut down over the last decade, might be selling on their own, or only catching for their family.

The total boat-based BMUS catch in 2019 was higher than historical averages while the commercial average was not reported due to data confidentiality. Catch from all bottomfishing was over the 10-year average but below the 20-year average. The top-ten harvested ECS from boat-based creel surveys had "reef fish" atop the list. These high-ranking general categories were likely due to difficulties in recording species-level breakdowns of the catch because of the way data are collected, where surveyors look inside coolers of returning boats. Atulai was second on the top ten list for boat-based creel survey data. The top-ten harvested ECS from commercial data also had "reef fish" in its number one spot, followed by atulai, parrotfish, and invertebrates. General groupings are reported in the commercial data because data recorders simply use the level of taxonomy that the vendors provide. Many of the vendors sell "assorted reef fish" not broken down by species, and that is how species are documented on the commercial receipts. Tibbatts indicated that a more complete presentation would be available by the end of the day.

The Plan Team asked if the notable reduction in spearfishing was indicative of a shift to bottomfishing, which had 2019 totals higher than historic averages. Many dedicated SCUBA spearfishing teams have stopped participating in the fishery due to retirement or changing to other professions. In 2020, there was a law passed banning SCUBA spearfishing in Guam, so data over the next year will likely reflect this change. Creel surveys do not necessarily capture

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illegal activity because they are voluntary, and fishers have been encouraged not to give surveyors information in the past.

c. CNMI

The 2019 archipelagic fishery performance section for the Commonwealth of the Northern Mariana Islands (CNMI) was presented by Thomas Remington, Council contractor, in the absence of Plan Team member Jude Lizama from the CNMI Department of Fish and Wildlife (DFW). This section was presented immediately after the presentation of the Hawaii archipelagic fishery performance section. In CNMI, BMUS catch decreased notably in 2019 from both the 10- and 20-year average. BMUS catch from commercial data in 2019, however, increased relative to the short- and long-term trends.

For the top ten landed ECS in CNMI in 2019, available data streams showed that the group for surgeonfish had the most catch in the creel surveys, while "assorted reef fish" had the most catch from commercial data. The second most caught species was parrotfish in both the creel survey data and commercial purchase data. Several other species had notable catch estimates in the creel survey data, including *Seriola dumerili* and *Epibulus insidiator*. Most of the remainder of the top ten ECS from commercial purchase data were family groups (e.g., Acanthuridae). For prioritized ECS in CNMI, 2019 creel survey catch estimates for five of the seven species were zero. *Naso lituratus* and *Lethrinus harak* were the only two species with catch recorded in the boat-based creel surveys. There were species codes for six of the seven prioritized ECS species in CNMI commercial purchase data, with *Scarus ghobban* not having been recorded. For the six available species, commercial receipts showed zero catch for four species. Only *N. lituratus* and *Siganus argenteus* had commercial data in 2019, both of which were lower than historical averages.

CPUE for BMUS harvested by the bottomfishing handline gear decreased for both presented metrics in 2019: pounds per trip and pounds per gear hour. The total estimated number of bottomfishing trips that harvested BMUS decreased from 10- and 20-year averages. The estimated number of bottomfishing gear hours also decreased from historical trends. Bottomfish fishery participants decreased in 2019 as well. There was no recorded bycatch in 2019.

d. Hawaii

Bryan Ishida, Hawaii Division of Aquatic Resources (HDAR), presented on updates to Hawaii archipelagic fisheries in 2019. The Hawaii Deep 7 bottomfish complex had decreases in 2019 (fishing year) in licenses, trips, and catch. 2019 catch was the lowest it has been since 1973 and the number of fishing trips for Deep 7 bottomfish was the lowest it has been since 1976. Deep 7 bottomfish catch has historically been dominated by deep-sea handline gear type, and deep-sea handline comprised 98.5% of catch in 2019. Opakapaka and onaga have consistently been the most caught species of the Deep 7 bottomfish, however it was noted that there were difficulties in finding opakapaka in 2019. Fishers also noted a higher rate of shark depredation.

The non-Deep 7 bottomfish complex is now comprised solely of uku. Catch and number of trips fishing for uku in 2019 had decreases from their 10-year averages despite having slight increases from 2018. Targeting of uku has increased in recent years due to Deep 7 bottomfish fishers shifting their focus. Like the Deep 7 bottomfish, uku catch has been dominated by deep-sea handline. In the past 20 years, other gear types like inshore handline and casting and jigging have emerged more as uku have been increasingly targeted. All gear types fishing for uku have been showing a gradual increase in CPUE over the years.

The top-ten harvested ECS in Hawaii were dominated by akule, and three of the ten species being prioritized ECS. Almost all 2019 values for prioritized ECS were below short- and long-term averages with exceptions for opihi, uhu, and taape. Uhu had small increase in catch relative to its 20-year average, and opihi had huge increases in the number of individuals caught. The large increase in number of opihi harvested was likely due to fishers providing a rough estimate of the numbers caught, but pounds is a more reliable metric. All of these species had increases in participation and catch around 2008 to 2010. There are many factors impacting ECS fisheries, but it appears that economic effects have had a strong influence on the data. Commercial marine license (CML) holders are typically part-time fishers using fishing to supplement income, and peaks occurred between 2008 and 2010 when the economy was in a recession.

Crustacean management unit species (CMUS) in Hawaii are comprised of deepwater shrimp and kona crab. Large peaks over the course of the time series are from large catches of deepwater shrimp, whereas kona crab catches tended to be more consistent in size. In recent years, the deepwater shrimp fishery has had less than three participants, so data cannot be presented due to data confidentiality. There has been little contribution in terms of catch from the deepwater shrimp fishery over the past several years. The kona crab fishery is an important one in Hawaii but has been heavily regulated by size and sex (e.g., the take of females was restricted in 2006). There was an increase in kona crab catch in 2019 from 2018, but the total was still much less than historical averages. The recent stock assessment of Hawaii kona crab found the stock to be healthy, so HDAR has been taking action to allow take of female kona crab soon. Precious coral fisheries were restricted by data confidentiality, having less than three active fishers.

Analyses involving roving shoreline surveys were put on hold due to a recent position vacancy at HDAR. Non-commercial fisheries in Hawaii in 2019 had six waves of surveys performed, totaling 1,230 shore-based intercepts and 1,630 boat based intercepts.

The Plan Team inquired if there are anecdotal reasons for such a large increase in number of opihi harvested, and if it might also be possible that people are catching smaller and smaller individuals. Because opihi is such a small animal, it is not expected for the dealer to have a full count of individuals. One of the recommendations at HDAR for this species is to remove the numbers harvested because it is an unreasonable metric that does not provide quality data.

Additionally, the Plan Team discussed that cross-taxa peaks associated with the 2008 economic recession might also be relevant for 2020 given the COVID-19 pandemic. The pandemic has created an unstable economic situation, so fishing peaks may recur. However, since the pandemic has been ongoing, the number of CMLs distributed has dropped. This may be due the fee increase from $50 to $100 two years ago. While it makes sense that people might want to supplement their income with fishing during an economic downturn, there has been no increase in CMLs in the past two months. CMLs may increase in the coming months, which is reasonable since the "shelter in place" phase of the pandemic was still ongoing at the time of this meeting.

2. Discussions

Plan Team discussions were typically held immediately after each agenda item. However, there was a brief list of discussion items presented to the Plan Team regarding changes to the annual SAFE reports made in the last year associated with the ecosystem component amendment that reclassified many management unit species (MUS) as ECS.

The first two items brought to the Plan Team for discussion were about the representation of ECS species in the top-ten lists and the prioritized species time series. The lists of the top-ten

harvested ECS had several multi-species groups, though the original intention of the section was to monitor individual ECS. The prioritized ECS time series had many zero values for catch across many species and years presented. Since it seems unlikely that there was truly no catch for the species, it is possible that the species are being grouped into families during data collection.

It may be difficult for commercial vendors to report data on the species level, though the expanded catch from creel surveys should have better species resolution. The price of fish sold are linked to groups of similar species rather than organizing them by individual species. If the territories move towards a self-reporting system, it would be a good opportunity to work with the vendors to get more detailed data from them. However, this would require someone to be with the vendors to help record the data and would require more resources. It was also noted that fish resources, from cultural point of view, may not necessarily be important on species level, whereas functional groups may provide more useful data from a social perspective.

The Plan Team noted that there must be a balance struck between levels of information needed to inform management action and ease of collection. Groups such as "total reef fish" are not necessarily useful, so there needs to be a strategy for enhanced data collection on the species level. The best way to capture data with higher species resolution is likely via the boat-based surveys, which are more useful than commercial data, but it would take more time and resources.

Stock assessments for reef fish already exist at the species level, but it is also possible that different groupings could be viable (functional groups, family level, etc.). While science always prefers the species level, grouping some species by families might be acceptable especially in the vendor logs. Grouping species by functional group could be even better than families in some cases, creating the possibility of matching underwater census data with creel survey data for ECS. Collecting data for some individual species might make them seem like they appeared in the middle of the time series as data collection has improved from taxonomic identifications.

The original intent of the ecosystem components amendment was to establish a group of species that can be monitored over time to see whether they are worth bringing back as MUS in the future, but there are not yet criteria for what should be brought back. Regarding the number of zeros in the data, there are some ECS that are better represented in shore-based creel survey that are no longer being tracking in the annual SAFE reports, and commercial landings are accounting for both shore- and boat-based catches as well. It may be difficult to include shore-based creel survey data going forward, though, as federal support for the surveys are being diminished. The best course of action may be to enhance current boat-based data.

Biosampling programs are also producing high quality data streams that are associated with vendors. These data are useful because are at species level when identifying commercial catch, however the PIFSC Life History Program (LHP) is shifting focus to only analyze MUS species.

The third item brought to the Plan Team for discussion was that commercial data for ECS was sometimes higher than survey data for the same species. One situation that results in higher commercial values is when certain species are captured better in commercial data than creel surveys (e.g., lobsters) because they are brought straight to market. Commercial data may be more representative for certain species, and creel surveys are insufficient in certain contexts.

The fourth discussion item brought to the Plan Team was about the gears reported in this year's annual SAFE reports. In focusing more on BMUS, there was only bottomfishing and spearfishing reported for the territories (as well as bottomfishing-trolling mix in America Samoa). The intention was to emulate how the PIFSC Stock Assessment Program (SAP)

structures data for their assessments, which included other methods that harvest BMUS. The Plan Team emphasized that it is necessary to understand total removals and noted that there are several BMUS species that can be caught by trolling as well. The Plan Team was in favor of retaining all gear types reported and to add trolling data back to the reports in future years.

The fifth discussion item was regarding data being reported in the annual SAFE reports for "all species" as well as "BMUS only". Having the comparison between all species caught versus BMUS is helpful to see if BMUS are a notable portion of bottomfishing catch. If not, then the current BMUS list might not be useful for managing the fishery. The Plan Team noted that it is good to have multiple streams of data and was in favor of retaining both forms of data reporting.

The sixth discussion item the Plan Team was about the two effort metrics presented in the annual SAFE reports this year, number of trips and number of gear hours, both of which were used for CPUE as well. The Plan Team was in favor of retaining both metrics.

The seventh discussion item presented to the Plan Team had to do with the new participation metrics, number of unique vessels and estimated average fishers per trip. These parameters are being used to get a proxy of participants, since there is not licensing in the territories to estimate the number of people impacted by Council actions. These metrics could be used to help indicate economic changes in the fisheries as well. The Plan Team supported retaining both metrics since there are not a lot of social indicators for territory fisheries. It was noted that the calculation of average fishers per trips is based on raw data, and Guam and CNMI sometimes gather these data based on number of boat trailers observed instead of licenses, for example. It may be useful to change the boat-based survey methodology to focus solely on boat registration numbers. American Samoa has data on the number of commercial licenses, and it would be easy to differentiate the kind of fishing in which one of those fishers will likely participate.

3. Public Comment

There was no public comment.

B. Ecosystem Considerations
1. Protected species section

Council staff presented on updates to the protected species sections of the 2019 annual SAFE reports. Updates to the protected species section were done by the protected species work team. The protected species section has not yet been restructured to reflect the ecosystem components amendment because the work team wanted to get the Plan Team to give guidance on revisions.

The protected species section focuses on fishing operations in federal waters. There has been no observer coverage in the archipelagic fisheries except for in the Northwestern Hawaiian Islands (NWHI) from 2003 to 2005. There are few reported interactions with protected species in most archipelagic fisheries, and potentially destructive gears (e.g., bottom trawling) are prohibited. Because there is little observer data for archipelagic fisheries, focus was put on monitoring effort and gear characteristics as an indicator for change in protected species interaction potential.

Updates to the protected species section in 2019 included updates to ESA consultations with the recent listings of oceanic whitetip shark (OWT) and giant manta rays (GMR). Consultations are ongoing for the main Hawaiian Islands (MHI) and territory bottomfish fisheries, and a "no effect" memo was put on file for all other fisheries. A Biological Evaluation looked at CML, NWHI bottomfish observer, creel survey, and CNMI federal logbook data summaries for any OWT records. There were no records available from American Samoa.

For Hawaii, NWHI observer data from 2003 to 2006 had five records of OWT interactions, but species identification in the records was uncertain. The NWHI bottomfish fishery vessels were larger and used different gears, so they were distinct from the fishery composition at present. Cooperative research and PIFSC survey data showed no OWT interactions, though there were some interactions with whitetip reef sharks. Hawaii CML data from 2000 to 2017 showed 23 "whitetip" records, but there was a single code for both OWT and whitetip reef sharks. Only eight of the 23 were likely to be OWT based on area fished, catch composition, and size. Regarding a previous Council recommendation on improving Hawaii shark species identification to facilitate improved data collection on OWT interactions, HDAR assigned two different reporting codes for OWT and whitetip reef sharks. There were no GMR records available.

For the Marianas, Guam creel survey data from 1982 to 2017 recorded 39 whitetip reef shark interactions and three OWT interactions, while CNMI creel survey data from 2000 to 2017 had zero OWT interaction records. The CNMI federal commercial bottomfish logbook had 33 "whitetip" records, but only 12 of those records were likely to be OWT. In the available cooperative research and PIFSC survey data, there were no OWT interactions but one record of OWT depredation in Guam. There were no records of GMR interactions in the Marianas.

Information on the status of protected species interactions in bottomfish, coral reef ecosystem, crustacean, and precious coral fisheries were also included in the annual SAFE reports. Hawaii, Marianas, and American Samoa FEP fisheries are not expected to interact with turtles, marine mammals, or seabirds based on previous consultations except for the potential for vessel collision with green turtles in the MHI bottomfish fishery. The Plan Team was asked to discuss potential for increased risk to protected species based on effort and gear characteristic data.

There was a list presented of research, data, and assessment needs that has been continuously updated, which included improving species identification in fisheries data to understand potential protected species impacts, define and evaluate innovative approaches to derive estimates of protected species interactions in insular fisheries, update analysis of fishing gear-related strandings of Hawaii green sea turtles, resolve population structure for listed elasmobranchs, and estimate post-release survival for incidental protected species.

The Plan Team was asked to discuss the inclusion of available OWT and GMR data, restructuring the report for next year to reflect the ECS amendment, and other information or changes to fisheries that may affect potential for protected species interactions.

Upcoming DNA testing of shark bites in Guam could perhaps be informative in identifying OWT interactions going forward. Additionally, PIFSC will be developing projections for OWT interactions up to 2026 for the Western and Central Pacific Ocean (WCPO) that will be presented to the Western and Central Pacific Fishery Commission (WCPFC).

Regarding input on restructuring associated with the ecosystem component amendment, it was noted that the fisheries still exist even though some of the MSA provisions no longer apply. Because coral reef fisheries have been removed from fishery performance sections of the annual SAFE reports, effort information will no longer be available. It is not clear whether information on coral reef and other fisheries should be retained for removed despite not having much data in the first place. Removing these portions of the section would be problematic if there are a lot of interactions in the future that are not being monitored. However, if there are no ACLs for the fisheries and they have no other federal management, no more federal consultations would need to be done. However, there are still some federal permits active for some of these fisheries, meaning they could potentially continue as a federal nexus in the future.

The outcome of the processes determining critical habitat for coral species is tied to ESA consultations. During consultations, direct interactions with the species as well as impacts to habitat for those species are reviewed. If interactions are no longer being monitored, then impacts to critical habitat would not be considered either. Regarding the cauliflower coral, it is in the same situation as coral reef fishery species from a protected species standpoint; if there is no need for federal management, no more federal consultations would be performed.

With respect to the research, data, and assessment needs presented, there were questions about resolving population structure for listed elasmobranchs, as the word "resolve" was initially unclear. Since the OWT is listed as one population because of genetic studies, different population segments could not be established. There exists the potential for distinct populations of OWT in the Pacific, but there is no evidence available and no ongoing studies. The Plan Team agreed to change the wording to "conduct research to improve understanding of the population structure of listed elasmobranchs".

There was additional discussion regarding the use of outreach to improve species identification in fisheries data to enhance understanding of potential protected species impacts. It was clarified that outreach and revised species codes can be used improve species identification that is needed to improve understanding on levels of impacts. The item was re-worded to be clearer.

2. Climate, ecosystems, and biological section

a. Environmental & climate variables

Thomas Oliver, PIFSC, presented on updates to the climate and oceanic indicators sections of the 2019 annual SAFE reports. An indicator is a "specific, well-designed, and measurable variable that has been proven to reflect the status of some component of the ecosystem". The chapter aims to help understanding the nature of interactions and to develop capabilities to predict future changes using both basin-scale and island-scale measures. The Oceanic Niño Index (ONI) and Pacific Decadal Oscillation (PDO) are most prominent modes of natural variability, which lead to changes in sea surface temperature (SST) that can impact the number of tropical cyclones and severity of coral bleaching events. The ONI and PDO also greatly influence chlorophyll-a (chl-a) concentrations and rainfall patterns. Atmospheric carbon dioxide (CO_2) is the main driver for anthropogenic climate change, which impacts both oceanic pH and atmospheric warming. Atmospheric warming influences sea level rise, chl-a concentrations, and SST, which in turn has implications for tropical cyclones and coral bleaching events.

On a basin-wide scale, the 2019 average CO_2 was at 411 ppm, its time series maximum and part of an increasing trend progressing at a faster rate each year. There may be a downturn in atmospheric CO_2 in the 2020 data due to implications of the COVID-19 pandemic but will not likely be indicative of a major change in the overall trend. Oceanic pH in 2018 was 8.07, representing a 9.7% increase in acidity since 1989. Experimental studies on pteropods show impacts to the formation of their shells (i.e., calcification) at currently observed levels. ONI uses SST metrics in a particular region where upwelling typically occurs to measure the El Niño – Southern Oscillation (ENSO). In 2019, a weak El Niño slightly transitioned to neutral. PDO is a similar oscillation on a more long-term scale and has meaningful impacts on several Pacific fisheries and protected species interactions. In 2019, PDO was transitioning out of a positive phase to neutral. The Accumulated Cyclone Energy (ACE) in the Pacific was less in 2019 than in 2018 but not vastly different from historical averages.

Looking at spatially-specific indicators, SST in MHI from 1982 to 2018 significantly increased, and 2019 had a strong positive anomaly on top of the warming trend. This led to major bleaching events in MHI and NWHI monitored via degree heating weeks (DHW), with the DHW being well above the established coral bleaching threshold. Because much of the warming was in offshore waters, the impact is expected to be less than the 2015 bleaching event. Chl-a had no significant trend in MHI, with slight intensification around the MHI but negative anomalies on their windward shores. Precipitation had a weak positive anomaly that was not much different than historical averages. Sea level continued to rise at the same rate as last year.

In American Samoa in 2019, SST was warmer than usual, leading to high coral bleaching exposure. Mass mortality of corals is expected due to values above eight DHW. Chl-a concentrations had a weak negative anomaly, while rainfall showed no major signal for the year. The sea level continues to rise, but the 2009 earthquake in the region impacted the baseline against which sea level rise is measured.

In the Mariana Archipelago, SST in 2019 was warm with positive anomalies that were larger in the northern islands. This warming translated to coral bleaching exposure that was not as severe as other regions, but the Marianas have experienced repeated bleaching events in recent years. Chl-a concentrations were generally in line with climatological values. For rainfall, 2019 was one of the wetter years in the last decade. The sea level continued to rise rapidly.

In the Pacific Remote Island Areas (PRIAs), SST was high due to ENSO-associated warming. There was minor bleaching exposure due to the weak El Niño that was being transitioned out of in 2019. Chl-a concentrations were slightly down, but not nearly as dramatically as observed in 2015. Rainfall in the PRIAs grid in 2019 was consistent with historical averages, and sea level measured at Wake Island showed a moderate rise.

Fisheries scientists and managers are starting to determine linkages between climate indicators and observed biological conditions, however, there has not been a lot of work done to date. PIFSC examines several indicators to associate them with biological change (e.g. link between PDO and albatross interactions), and while they are being used more in a research context, there are not many strong examples of indicators being incorporated into stock assessments. It is the goal of the PIFSC SAP to incorporate ecosystem indicators within the assessment framework to identify potential drivers that influence population dynamics, better understand recruitment, and reduce uncertainty in reference point estimates. The challenge of incorporation is that there is a long chain of causality between climatic indicators and biologic conditions that require more targeted fishery and biosampling data collection. Ideally, climatic indicators will be able to be used as a tool to make decisions on how stocks should be managed within the ACL framework.

There was some work on this front using Ecopath and Ecosim models nearly a decade ago, and MHI Atlantis modeling represents the successor to that work. The original models projected impacts on the MHI longline fishery, perhaps suggesting a decline in productivity in the region where the fishery operates. Other research suggested a shift to in the location of productivity with the longline fishery likely following this shift, but there is still being work one on this front. Anecdotal information from MHI fishers suggested that opakapaka catch has decreased due to relatively warmer SST. While SST does not always describe what is going on at bottomfishing depths, PIFSC is beginning to look at how to get reliable data from deeper habitats.

b. Life history and length-derived variables

Joseph O'Malley, PIFSC, presented on updates to the life history and length-derived variables sections of the 2019 annual SAFE reports. The PIFSC LHP collects information on fish length and age that allows for the estimation of growth and mortality. When analyzing maturity using gonads, information on size at maturity and spawning season can be gleaned. Previous SAFE reports had a many species, but current reports shifted focus to MUS and the priority ECS.

For the priority ECS in American Samoa, there were no life history information available but some length-derived parameters. Guam priority ECS all had information on length-derived parameters, while there were a few with applicable life history data; this was the same for CNMI priority ECS. There was no life history information for American Samoa priority ECS, but length-weight information was available. Length parameters were not reported for Hawaii, and available life history information for priority ECS was limited to lobster and parrotfish species.

American Samoa had length parameters for many of the BMUS but little life history information. There was information on length parameters for almost all Guam and CNMI BMUS but also little life history data. There was life history information for just over half of the Hawaii BMUS.

Several key points from LHP studies in last year were presented, including studies on maturity and reproductive tendencies of CNMI goatfish, age-based demographics of deepwater snappers in American Samoa, MHI uku age and growth rates, and sexually dimorphic size of *Etelis* spp. Ongoing research includes studies on age, growth, and spatial variability for *Etelis carbunculus* and *Pristipomoides filamentosus* in the Hawaiian Archipelago, reproductivity for *E. coruscans* in the MHI, and age, growth, reproduction, and spatial variability for *P. zonatus* in the Marianas.

The LHP also generated a Biosampling Prioritization Plan for the territories, continuing to prioritize MUS and update their sampling design to gather robust life history information. Several methods of collection were explored including haphazard, random, targeting random, length stratified with size bins, and catch proportion size bins. Catch proportional size bins were deemed to be ideal but require catch length information to properly utilize.

The Plan Team discussed the implications of splitting *E. carbunculus* into two separate species and what that might mean for the FEPs. It is known that *E. carbunculus* is comprised of two different species that are caught at the same depths, but species-specific information has been grouped together up to this point. The "new" species for *E. carbunculus* that exists in the Mariana Archipelago and American Samoa is much larger than other bottomfish, so it may be possible to use otolith morphology to statistically discern the different species. It would still be difficult to retrospectively split the catch for the species, however. The best course of action is likely to identify the two different species being caught in the territories going forward. The Council could consult its Advisory Panels (APs) in each region to determine which of the species is more prevalent in recent catch and before beginning the FEP amendment process.

Some information is available help territory staff distinguish the species from one another. Creel surveyors have not yet been given this information, and the Plan Team advised that the material be shared with those performing the creel surveys. The main morphologic distinguishing factors are the size, the sharpness of the spine on the operculum, and a mark on the caudal fins. There is no species-specific length-weight information for the two different sects of *E. carbunculus*, but it is possible that researchers in the South Pacific and Indian Oceans have additional information.

There was also discussion regarding uku having similar life history parameters in samples collected oceans apart, especially when there such notable regional differences in other bottomfish species. Differences in growth rates are based on ecology such as temperature and

food availability, so uku is not necessarily different or special. There is variability in uku across the Indian ocean (i.e., comparing samples from the east and west).

Noting the gaps in life history data for some of the presented BMUS and ECS species, the Plan Team also discussed the utility of using life history information from different areas if it is better than having no information at all. Theoretically, all life history tables could be filled if data from other regions was used, but that is not necessarily the point of the tables. If there is a location that is ecologically similar where life history data exists, there are some cases where having the information is better than nothing and some cases where it is worse due to its inaccuracy. The PIFSC SAP ideally wants use location-specific data, but sometimes parameters will be borrowed from other areas for an assessment to be possible at all. The best course of action would be to have the PIFSC LHP continue to progressively fill in the blanks going forward.

c. Biomass estimates for Coral Reef Ecosystem Components

Marc Nadon, PIFSC, presented on updates to the coral reef ecosystem parameters sections of the 2019 annual SAFE reports that was worked on by Ivor Williams, which had been modified from previous years to focus on monitoring biomass estimates for coral reef ECS due to the recent ecosystem component amendment. PIFSC Ecosystem Science Division (ESD) administers diver surveys from which the data were summarized.

American Samoa coral cover across all islands had a general pattern of decline cover over the past decade, but this may be related to the El Niño event in 2015 and 2016. Reef fish biomass in American Samoa showed that Tutuila had a slight increase in herbivores and decrease in piscivores, while Rose Atoll and Swains Island had an increase in biomass across groups. Ofu, Olosenga, and Tau had relatively consistent fish biomass over the last decade.

Coral cover in Guam has also been decreasing over the past decade, and there was a decrease in herbivore, surgeonfish, and snapper biomass. Piscivore fish biomass seemed to increase, but this may have been due to the surveys observing large groups. Coral cover in CNMI showed decreases over the past decade as well, possibly also because of the El Niño event in 2015 and 2016. Reef fish biomass was distinctly different from remote islands to inhabited islands, where biomass around inhabited islands was mostly consistent over time and remote islands had an increase in biomass for piscivores.

Hawaii coral cover declined in both the MHI and NWHI over the last decade, but the decreases were more pronounced in the MHI. However, reef fish biomass generally increased for the evaluated groups in the MHI, while the NWHI had no discernable trends.

The PRIAs had decreasing coral cover over the last decade, especially at Jarvis Island from in the period from 2016 to 2018. There was a decline in corallivore biomass at Jarvis Island that is likely associated the notable decrease in coral cover. Howland and Baker Islands had consistent fish biomass for most groups except piscivores. Johnston Island only had two data points, so trends could not be discerned. Wake Island had increasing trends for herbivores and piscivores, while biomass for surgeonfish and snappers was consistent. Jarvis Island, Palmyra Atoll, and Kingman reef showed declines in biomass for piscivores, snappers, and surgeons.

The decline in coral cover can likely be attributed to coral bleaching events, especially from 2013 to 2016, as well as coastal development. On an island scale, general decline is observable. Using a finer scale resolution would illustrate that there is a diversity in impacts among areas.

The Plan Team discussed plans to present on other types of benthic cover, such as crustose coralline algae (CCA). The reason that only coral cover was presented is because it is a more

straightforward indicator for benthic communities and the surveys were more likely to accurately identify it. Other viable indicators to examine how changing benthos are impacting reef populations associated with herbivory and corallivory may include ratios of "hard" to "soft" substrate and CCA cover. Data on CCA and macroalgae are available in the habitat sections of the SAFE reports but are at an island-wide spatial scale; a finer scale would be preferred.

3. Habitat section
a. Current habitat module

Michael Parke, PIFSC, presented on updates to the essential fish habitat sections of the 2019 annual SAFE report, but focused more on habitat and ecosystem considerations that are going on at PIFSC. The SAFE report contains references to several recent EFH reviews, including precious corals in 2017, crustaceans in 2019, coral reef ecosystem species in 2009, and BMUS in 2010 (and updated in 2016). The main changes to the section itself this year were new data collection and analysis methods for benthic communities on a finer resolution to better match scale of research production with local management needs. A few examples of finer-scale projects for localized impacts to habitat were presented, including integration of reef vulnerability and resilience and modeling coral reef diversity and resilience. Research and data needs included the want to improve levels of EFH knowledge, with most MUS still being at level 1 (only distribution data available). Recent work with bottomfish has been done to help approach level 2 data for the MHI, and there are hardly any level 3 or 4 data for any species.

Next, the PIFSC approach to habitat and ecosystem based-fisheries science was presented. PIFSC has no specific habitat program, but their Coral Reef ecosystem Program (CREP) focuses on nearshore shallow reef habitats. The PIFSC ESD has strengthened collaborations with the Pacific Islands Regional Office (PIRO) and the WCPFC to coordinate habitat science priorities and management needs. Additionally, PIFSC has begun shifting its habitat focus to ecosystem-based fisheries management (EBFM). Habitat-related EBFM science at PIFSC ESD includes projects such as the characterization and analysis of protected species interactions in the Hawaii-based fisheries, the MHI Atlantis project, incorporating environmental and climate drivers into coral reef community down-scaling analyses, and using spatial data for land-based sources of pollution to assess cumulative impact.

The Plan Team discussed what the next steps could possibly be in order to move forward with work on the presented habitat objectives and needs. It was suggested that the Council could begin attending quarterly meetings held between PIFSC and PIRO to foster more open and frequent communication and allow for the inclusion of Council habitat initiatives. The quarterly meetings are functionally just a communication group on how to move forward in various areas such that ESD is in-step with habitat and protected species groups. They have been focusing on thinking about how to implement further EBFM going forward. PIFSC is sending a representative to the national habitat meeting to present on how the Western Pacific region plans to continue work on habitat objectives and meet some of the goals for EBFM. Council staff indicated that they would be interested in participating in these meetings.

b. Updated habitat module for future report

Darla White, Council contractor from Lynker, presented on potential updates that can be made to the EFH sections of the annual SAFE reports in future report cycles. There was a Coral Reef Conservation Program (CRCP) grant funded to expand the habitat module to focus on non-fishing adverse effects on EFH, and the final report on possible updates was recently provided to the Council. The objectives of the project were to recommend a suite of habitat condition

indicators, a revised template for the habitat section, and a timeline for updating the habitat section. Background information was presented at the 2019 Archipelagic Plan Team meeting.

There are many different types of adverse impacts to EFH, including direct impacts (e.g., physical disturbance), indirect impacts (e.g., loss of prey), and site-specific/habitat-wide impacts. The only data stream currently used is benthic habitat from PIFSC Reef Assessment and Monitoring Program (RAMP) surveys. One data stream is likely insufficient to determine whether coral reef habitat condition is affecting fisheries productivity or signal if non-fishing activities may be adversely affecting the habitat. In the Kona Integrated Ecosystem Assessment (IEA), for example, there was a lengthy process that went into choosing a range of indicators for ecosystem impacts, which are primarily driven by the type of information available. In Hawaii, the Hawaii Monitoring and Research Collaborative (HIMARC) database has the most data available from a wide range of indicators, including ecological-, fish-, and benthic-based indicators. Common indicators include fish biomass, fish size, benthic percent cover, benthic diversity, water quality, coastal development, and climatic indicators presented previously.

The new habitat modules in the annual SAFE reports could include ongoing data streams, finer grain scale and improved data acquisition. Ways to display data include looking at long term trends and recovery from disturbance, but ultimately the Plan Team should decide the best ways to do this. Data availability from various programs for each region is variable in both time and space. For example, HIMARC can give raw data ever three years, while the Hawaii Department of Health reports water quality parameters every two years.

Lastly, a geospatial platform was presented for consideration by the Plan Team to incorporate habitat information going forward. Since most data sources give raw data that are not summarized or visualized, a geodatabase and geospatial platform could be continuously updated as new data become available for each region. Analyses could be programmed in R for ease of computation in a geospatial such as ArcGIS Pro. While this would take a lot of work to set up initially, it would be efficient moving into the future.

The Plan Team was asked to discuss bioregion delineations, habitat classifications, data management, and analyses and trends to include in report. The Plan Team was also prompted to take action on the new habitat module if possible, advising whether the updates would be useful to add to the annual SAFE report. PIFSC ESD is working in a similar direction regarding habitat but implementing this into the annual SAFE report may be difficult to do with an integrated perspective in each region. ESD and PIRO have put in a letter of intent for a data integrator position to replicate HIMARC in each jurisdiction annually to provide a foundational database, which would make it easier to transition into a database and allow the integration of NOAA and local agency data. PIFSC ESD is working on downscaling efforts for NOAA and HIMARC data.

Because there are so many data streams that have so many different types of data, the Plan Team likely needs to look at what makes sense in each jurisdiction and not across them. There are tables in the submitted document that simplify indicators for each region that have been vetted by each jurisdiction. The bigger issue could be with differing scales in the data streams, as data sets may not be comparable in a spatial or temporal manner. If this is the case, it is possible to separate the data into different maps, and there are existing models that overlay data in this way.

It was suggested to add a work item for the Plan Team to review the habitat section of the annual SAFE report, establish a smaller working group to collaborate with the Lynker contractors to tease out indicators for each jurisdiction, and begin revising the module.

4. Socioeconomics section

Minling Pan, PIFSC, presented on updates to the socioeconomics sections of the 2019 annual SAFE reports. The main points of the presentation were trends in pounds sold, revenue, BMUS price, BMUS fishing costs, and pounds caught and sold for ECS between 2018 and 2019. Across all four regions, fuel price has been trending downward except for 2017 and 2018. American Samoa fuel cost was the lowest of the four areas, likely due to the government subsidy program.

American Samoa pounds sold and revenue increased in 2019 compared to 2018. Pounds sold was just 13% of pounds caught. Fish price generally increased over the last decade before peaking in 2017. Trip cost continued to rise in 2019 at $151 per trip due to increases in fuel and lost gear costs. For American Samoa ECS top-ten, pounds caught from boat-based creel surveys in 2019 were generally higher than 2018, leading to a higher estimated revenue. Top-ten ECS from the commercial receipts in 2019 had nearly twice the amount of pounds sold than 2018. Priority ECS data in the commercial receipts were limited to the green spiny lobster in 2019.

Guam pounds sold and revenue data were restricted in 2019 due to data confidentiality, however, in 2018, pounds sold were a small portion (11%) of pounds caught. Trip cost in 2019 was lower than 2018 due to reduced cost of lost gears. For ECS pounds caught from boat-based creel surveys, the priority species had relatively consistent catch. Pounds sold and revenue of ECS from commercial receipts were much higher in 2018 than 2019. CNMI pounds sold and revenue data increased in 2019 compared to 2018, and pounds sold was 75% of pounds caught. BMUS price had been increasing since 2016.. Fishing trip cost was much higher in 2019 than previous years due to fuel. Commercial landings for the top-ten ECS had pounds sold and revenue that were lower in 2019 than 2018.

Hawaii deep 7 bottomfish revenue was 75% of all MUS, while uku was 23% and crustacean was 2%. There were fewer fishers in 2019 in a declining trend since 2016. The proportion of CML fishers who caught species that were reported in dealer's data was 84%. Deep 7 bottomfish pounds sold and revenue peaked in 2015 before declining. Uku pounds sold and revenue slightly increased in 2019 from 2018, which had a notable decline after an increase from 2014 to 2017. There were similar trends between pounds landed and sold, as pounds sold was 92% of pounds caught for uku. Revenue for per vessel for all bottomfish has been around $6,000 annually since 2014. The gini coefficient (i.e., economic performance indicator for differences among fisher's revenues) was 0.8 (where 1.0 is "very different"); this may indicate the presence of some highliners in Hawaii. Deep 7 bottomfish price increased slightly in 2019, while uku price had a slight decline despite being relatively stable over the past decade. The top-ten ECS were consistent between 2018 and 2019 with almost $2 million in revenue each year. The priority ECS had uhu accounting over 40% of revenue each year. 88% priority ECS caught were sold.

Plan Team members were surprised to see kahala on the Hawaii top-ten ECS list despite the low number of pounds sold and large number of fishermen. It is likely that kahala is caught as an incidental catch that fishers can sell. The market is cautious when buying kahala due to the ciguatera toxin, but it is likely that the species is sold more in smaller markets (e.g., Chinatown in Honolulu) rather than the auction.

5. Marine Planning section

Remington also presented on updates to the marine planning sections of the 2019 annual SAFE reports. This agenda item was moved to the beginning of Day 3. There were no major updates made to the marine planning sections of the American Samoa or PRIA annual SAFE reports.

For the Mariana Archipelago marine planning section, some slight updates were made regarding military training activities and exercises. The 2019 Mariana Islands Training and Testing (MITT) final supplemental Environmental Impact Statement (EIS) is expected in spring 2020. Several meetings have been held with DFW and military officials to discuss relevant natural resource, land use, and social concerns, which prompted the reconsideration of proposed alternatives for MITT. A revised draft EIS for CNMI joint military training was expected in early 2019, but there has been no new information provided since then. For Tinian Infrastructure Improvements, the United States Air Force made the draft SEIS available for review in May 2019 where it received substantive comments that will be taken into consideration for the final draft. Lastly, the restricted 12 nautical miles around Farallon de Medinilla was reduced after meetings with military officials, where it is now 3 nautical miles when exercises are not being conducted. Additionally, a table presenting the number of notices to mariners and number of associated affected days was added to the section. In 2019, there were a total of 90 notices across five areas, ranging from 22 affected days to 165 affected days.

For the Hawaii marine planning section, the aquaculture facility formerly known as Kampachi farms was rebranded as Ocean Era. In 2017, the Special Coral Reef Ecosystem Fishing Permit (SCREFP) associated with the facility was transferred to an organization called Forever Oceans. Forever Oceans was recently the process of renewing the SCREFP cooperatively with NMFS in order to harvest of two cohorts of fish that were stocked in early 2019. The permit was renewed in March 2020 under the same terms and conditions through June 30, 2021.

6. Discussions

Plan Team discussions were held immediately after each agenda item.

7. Public Comment

There was no public comment.

C. Administrative Reports
1. Number of federal permits

Brett Schumacher, PIRO, presented on updates to the sections of the 2019 annual SAFE reports describing the number of federal permits in archipelagic fisheries. There have been no crustacean permits issued in American Samoa since 2015, and no other types of permits have ever been issued. In CNMI, there have been no coral reef ecosystem or precious coral permits issued since data has been tracked. No lobster or shrimp permits were issued in 2019, though 11 bottomfish permits were issued. Guam had no permits issued in 2019 for lobster, shrimp, or bottomfish, and there have never been any coral reef ecosystem or precious coral permits issued. In 2019 for Hawaii, there were two lobster permits, six shrimp permits, three bottomfish permits, one precious coral permit, and zero coral reef ecosystem permits. Bottomfish permits have decreased over the last decade after regulations were set for non-commercial bottomfish, since commercial permits of the same cost did not have the same regulations. In 2019, the PRIAs had no lobster or shrimp permits and just four bottomfish permits.

Though there are logbooks associated with federal permits, often there are too few to report data due to data confidentiality. In 2019, there were several instances of three or more permits being issued, but these logbook data are no longer presented in the annual SAFE reports. The Plan Team considered the inclusion of these logbook data for future reports, but there is the possibility that the permits were issued with no catch having been recorded. However, the Plan Team agreed that it is worth seeing if there is information available.

2. Regulatory actions in 2019

Schumacher also presented on regulatory actions taken by NMFS that were described in the 2019 annual SAFE reports. The ECS amendment applied to American Samoa, Guam, CNMI, and Hawaii, essentially changing most species other than BMUS (and CMUS for Hawaii) to ECS. There was a final environmental assessment and finding of no significant impact for construction of an ice house and boat ramp in Pago Pago Harbor in American Samoa. In Hawaii, there were actions to set the ACL for NWHI lobsters to zero and the ACL for Deep 7 bottomfish at 492,000 lbs. for 2018-2021 with in-season and post-season accountability measures. There were no regulatory actions for the PRIAs in 2019.

3. Discussions

Plan Team discussions were held immediately after each agenda item.

4. Public Comment

There was no public comment.

6. Action agenda items
A. American Samoa Bottomfish Fishery

1. P* Working Group Report

Council staff presented on the P* working group report for the American Samoa bottomfish fishery. The Council will be voting on an ACL for American Samoa bottomfish at its June 2020 meeting. The P* process itself involves classifying the fish stock in one of five tiers, with the American Samoa bottomfish stock falling between Tiers 1 and 2.

In the P* analysis, reductions are made to the OFL if the assessment is information poor, has poor characterization of uncertainty, and/or if stock status is overfished/experiencing overfishing. The total reduction score is subtracted from level of 50% risk of overfishing to calculate ABC. The scores given for American Samoa bottomfish assessment information resulted in a 4.5 point reduction (scaled to 3.3). The uncertainty characterization reduction score was 2.5, and the stock status reduction score was 10.0 since the stock is overfished and experiencing overfishing. Productivity was scored by the PIFSC LHP for an average of 5.23, and susceptibility was scored by fishermen for an average of 3.72 for an average score of 4.5. A total reduction score of -20 was generated.

The reduction score for the category on "reliable catch history" was 0.5 on a scale of 0 to 1, as the P* working group thought that the catch history was at least partially captured in the stock assessment. The word "reliable" was not clear to some of the Plan Team due to its ambiguity.

The reduction score for standardized CPUE was also noted to be 0 because it was utilized by the assessment. Standardized CPUE is a modeling process where the goal is to remove the effect of factors that impact abundance but do not reflect true population abundance.

2. SEEM Working Group Report

Council staff presented that the Social, Economic, Ecological, and Management (SEEM) working group did not meet because of the challenges with associated with the COVID-19 pandemic. While P* is a reduction from the OFL to the ABC, SEEM analyses evaluate additional factors to reduce the ABC to the ACL.

3. Alternatives for ACLs

Council staff presented on alternatives for possible ACLs for the American Samoa bottomfish fishery. At the October 2019 SSC and Council meetings, the new benchmark stock assessment was presented by PIFSC. The reference points from the most recent stock assessment indicated the bottomfish stock in American Samoa was overfished and experiencing overfishing. The MSY was 28,800 lbs. but the OFL was 7,000 lbs. for the terminal year projection in 2024 since the Council operates on a four-year specification. Over past ten years, there was only one year where American Samoa bottomfish catch was less than this OFL.

Option 1 is no action (i.e., no specification of ACLs), which does not comply the MSA, American Samoa FEP, or NS1. With no ACL, the fishery would operate unrestricted.

Option 2 is to specify the ACL based on the SSC's ABC. This option complies with the MSA, NS1, NS2, and FEP. The ACL would equal the ABC which is reduced from OFL from P* analysis. The ACL would be 2,000 lbs. at a 30% risk of overfishing. All catch over the last 20 years has exceeded this ACL. The ACL will not prevent overfishing from happening so there would likely be adverse impacts on target stocks due to the lack of in-season monitoring. Even if federal waters (about 15% of bottomfish EFH in American Samoa) were closed to fishing, effort would mostly move to territory waters where it primarily occurs anyway. If ACL overages were subtracted from the ACL for the following year, it would be likely be 0 lbs. but fishing would continue. Exceeding the ACL would prolong rebuilding and have adverse impacts on both the stock and fishing community.

Option 3 is to specify the ACL lower than the ABC. This option fulfills the same requirements as option 2. The ACL can be set at 0 lbs. or lower than 2,000 lbs. (i.e., 1,000 lbs.), making option 3 more severe than option 2. Rebuilding would be further delayed and there would likely be adverse impacts on both the target stock and fishing community.

Regarding accountability measures in place, the only one currently of use is post-season ACL adjustment that takes the recent three-year average catch and subtracts the overage from the following year's ACL; this would likely reduce the ACL to 0 lbs. Creel surveys are designed for annual expansion and their data are made available after the fishing year ends with a relatively low sample size. Commercial receipts have only a one- or two-month lag in data transmission, but their totals comprise 10% of the creel survey estimates. Because this is a federal action, only federal waters close, which will likely move effort to territorial waters. No parallel rulemaking exists with American Samoa, so they cannot close territorial waters due to this action. Federal waters can be closed but it will likely shift effort to territorial waters.

There were comments by the Plan Team on whether the overfished nature of the bottomfish fishery may be due to the shallow- or deep-water complex of bottomfish, but there is no way to determine if this might be the case since the assessment was done on the full complex. PIFSC has outlined the next step in exploring how to split the stock into smaller biological units for a subsequent benchmark stock assessment. This action considers the entirety of the complex on which the most recent assessment was based

There were questions about why the proposed ACLs for the fishery are so low relative to its MSY. The proposed ACLs are low because the estimated biomass is low. MSY is catch that can be obtained at equilibrium if fishing at F_{MSY} for several years with the stock at B_{MSY}. Because American Samoa is in a low biomass situation, the applied F_{MSY} makes the associated harvest rate low. MSY is where the fishery will ideally be after rebuilding the stock.

The American Samoa representative emphasized that options 2 and 3 will be hard to implement because of the lack of federal jurisdiction in territorial waters, and effort would likely redistribute to territorial if federal waters are closed. However, if option 1 were to be chosen instead, then NMFS would set the ACL instead of the Council via Secretarial action because the MSA requires ACLs. It would not be possible the select option 1 with the caveat that an ACL would be set after the next benchmark stock assessment, as the next assessment is several years away. The Council needs to comply with MSA by having an ACL for each year. Because of the overfishing situation, the Council is required to take action to immediately end overfishing.

It was suggested that another option be developed specifying an ACL at 13,000 lbs. like the interim measure states. However, a 13,000 lbs. ACL is only available for the interim measure because the Council can specify an ACL that reduces overfishing but does not end it. An ACL cannot be specified that would allow overfishing after the first year, and the Council is making ACL recommendations on a four-year basis using the OFL of 7,000 lbs. after going through the P* and SEEM analyses. An option of 7,000 lbs. would not comply with the FEP. Such an option would be difficult to justify because it ignores uncertainty in the assessment and stock status.

The idea of parallel rulemaking between NMFS and the American Samoa government to jointly manage the bottomfish complex was briefly discussed. There would need to be an official statement from the American Samoa government to do this, but it has become less of a priority due to the COVID-19 pandemic. Because of the pandemic, there may be increased landings next year despite the data showing a decline in BMUS landings since 2015.

There were concerns that the 2,000 lbs. ACL would stifle data collection from boat-based creel surveys. The Council is amid the implementation of self-reporting for the fishermen, and a decision like this could hurt the relationships being formed with fishermen. Outreach for the self-reporting application would be even more important so that there are data to produce a good assessment when the time comes.

There was brief discussion about overfishing situations in Hawaii, where American Samoa could possibly emulate Hawaii. There were conservative Total Allowable Catches (TACs) developed and managers went to the communities to explain the importance of data. This was the start of the data collection system in Hawaii improving because fishers realized the implications of a conservative TAC. Hawaii, however, has rule congruency with the federal government such that if the federal agencies close their waters, the same would happen in State waters because it was understood that localized depletion would occur otherwise.

Most Plan Team members preferred option 2, following the lead of the SSC and ensuring compliance with the MSA. There was emphasis placed on data collection improvements by some members. Others stated that co-management is the only way to move forward to make federally-mandated actions relevant in the fishery to ensure long-term sustainability. The American Samoa representative preferred option 1 with caveats for commitment to better data collection as well as education and outreach.

B. Options for the Hawaii Small-Boat Fishery Management

Council staff presented on options for Hawaii small-boat fishery management. At the Council's 180th meeting, it recommended that staff perform scoping on management for small-boat fisheries (i.e., non-longline) in Hawaii. Scoping meetings were held on Big Island, Oahu, Maui, and Kauai that reviewed potential management scenarios demonstrating why it would be important for the Council to have a management framework in place. Six meetings were held

with 135 participations that generated five written comments. Comments suggested the need for better data, more research on pelagic species, improving the minimum size for yellowfin, better enforcement, and more communication with the fishing community.

The Oahu meetings had suggestions for more economic information and better market viability for local fishermen. Participants thought that purse seine fishers were problematic rather than non-commercial fishers, managers need to build trust with fishers, data collection needs to be improved, there is cause for concern about imports, fisheries education is lacking, and more research needs to be done on shark depredation. In Kona, participants talked about the benefit of tagging billfish, how change in fish size is important, how low participation does not necessarily mean stock is not healthy because many people are not reporting catch, and wanting to better understand the stock assessment process. In Hilo, participants discussed underreporting, non-resident licenses, area-based management, economic impacts of fisheries, and how their motivation for fishing is sharing their catch. The Maui meeting had discussion on roadside sales, underreporting, the impacts of climate change, and why mandatory reporting is good. Kauai meeting participants thought that international fisheries were a bigger problem than local, owning a boat is the main barrier to fishing, and data should be shared. There was also discussion on the impacts of climate change and offshore leasing.

These responses were brought back to the Council at their 181st meeting, and the Council recommended staff to prepare options for mandatory permitting and reporting for Hawaii small-boat fisheries. A working group is being developed and a draft options paper was made. Potential options are no action, implementing mandatory permitting/reporting, establishing a federal registry, or establishing a or pilot system. Hawaii will likely act as a pilot project for other areas in the Western Pacific. The Council will take initial action at its September 2020 meeting.

Plan Team members noticed in a lot of the meetings that participants had thoughts on fishers not reporting, and it was not clear how a mandatory system would help if people are already not participating. It was clarified that a mandatory reporting system would have the US Coast Guard and NOAA Office of Law Enforcement to enforce it. NMFS will still have to think about how to follow up with those fishers that do not report, as it has taken a huge effort from HDAR to do this so far. Hawaii representatives noted that in 2009, the civil resource violations system was implemented to get catch reports submitted on time. They now have 80% compliance for reports, with 95% of reports being submitted by the following month. The other consideration is quality assurance, as HDAR had to get their dealers to double-check their amounts sold online.

When the participants at the meetings talked about wanting more research, they were mostly referencing market-side research, including billfish tags and biological research. These types of programs show why fisheries management is important and how it can impact the fisheries. Council staff are drafting documents to help fishers understand what kind of research they want.

There were questions from the Plan Team on how to validate the data without trip declarations or vessel monitoring systems in place. It was suggested that boat registrations could be used to target specific fishers for outreach on the mandatory reporting regulation. Also, it would be beneficial to design the system such that there are benefits for fishers to engage in it. It was clarified that if a fisher sells one fish, then he is a commercial fisherman and should be operating under a CML. This will make part-time commercial fishers more likely to get a CML.

C. Discussions

Plan Team discussions were held immediately after each agenda item.

D. Public Comment

There was no public comment.

7. Standardized Bycatch Reporting Methodology

Schumacher and Council staff presented on updates to standardized bycatch reporting methodology (SBRM), which is still a work in progress. An overview was presented followed by issues encountered and items that needed Plan Team input. Section 303(a)(11) of the MSA requires that bycatch be adequately monitored and reported. National Standard 9 defined bycatch (i.e., regulatory and economic discards and other fishing mortality) but did not interpret SBRM requirements. Bycatch does not currently include marine mammals or seabirds. NMFS wants to clarify the basic requirements through formal rulemaking to have consistency in establishing and reviewing SBRM. In 2017, a rule was published requiring SBRM.

The NMFS rule requires that SBRMs are consistently designed, that FEPs must identify standardized methodologies for each fishery, explain how SBRM meets its purpose based on a fisher-specific analysis, and regular review of SBRMs. Standardized methodologies include observer program, electronic monitoring, and self-reporting. The purpose of SBRM is to collect, record, and report bycatch data that are used to assess the amount and type of bycatch to inform development of conservation and management measures. The rule requires Council conduct fishery-specific analyses when establishing or reviewing SBRMs that address characteristics of the bycatch, feasibility of the methodology, uncertainty of the data, and how the data are used. The FEPs must be consistent with rule by February 21, 2022. Councils must review their SBRMs in coordination with NMFS every five years to verify continued compliance.

The Council's history of addressing SBRM began following the 1996 Sustainable Fisheries Act when it created amendments in 1999 and 2002 that addressed each of its FMPs. Each amendment described bycatch characteristics, described data collection methodology available, and identified data sources as SBRM. These provisions transitioned to the FEPs in 2009.

The Plan Team was asked to discuss if MUS fisheries bycatch data are sufficiently captured in the annual SAFE reports in both amount and type of bycatch. ECS fisheries may not need SBRM, but their data collection requirements could still warrant consistency with SBRM. Most of the bycatch data reported in the annual SAFE reports currently has amount but not type of bycatch. The Hawaii annual SAFE report has no bycatch reporting. Federal logbook data are also not included in the annual SAFE reports but could be useful to include in the future.

The bycatch data would come from creel surveys in the territories. While the territories typically do not have bycatch for species like OWT and GMR, there are other species that are interacted with and/or discarded. It may be useful to promote education and outreach for creel surveyors and fishermen on the importance of identifying and recording bycatch species, since fishers may not report interactions with ESA-listed species for fear of getting in trouble. However, bycatch is not limited to ESA-listed species, and there are usually a few instances of other discards across available time series.

Because anything not retained is categorized as bycatch, this issue also has to do with how fishers are thinking about different fish species as food. There are not many regulatory discards, so discards due to size restrictions and ciguatera concerns also count.

In Guam creel surveys, any released catch is identified and reported on the family level. However, it was not initially clear whether recreational catch and release, charter catch and release, or depredated species are included as bycatch. It was clarified that all these things

constitute bycatch because the intention is to account for all mortality in a fishery. It was also suggested that bycatch definitions be better clarified for data collectors in the territories. In Hawaii, the State modified the commercial fishing report in October 2002 to report number of fish released. Fisherman are asked to report total catch in addition to those that which they intend to sell. The SAFE reports have reported the number of fish depredated, but it can be done.

SBRM allows the Council to identify if they have a bycatch problem, and if so, what sort of measures are needed to remedy it. If bycatch amounts are small, it is still useful to know what kind of species are being discarded. The MSA requires bycatch to be minimized to the extent practicable and reduce mortality when bycatch cannot be prevented. SBRM recognizes that general bycatch characteristics may or may not need intricate data collection systems; if bycatch is rare, for example, a detailed data collection system is not necessarily needed.

It was noted that it is not clear how ECS can be included in bycatch reporting, and associated questions will need to be resolved with the Sustainable Fisheries Division (SFD) and NOAA GC. Plan Team members were asked to contribute to a SBRM review in the coming year.

8. Report on Consultation on the Revision of the BMUS Species

Council staff presented on consultations regarding the revision of BMUS lists. The Plan Team met last January and came up with a recommendation to investigate revision possibilities to the BMUS lists, and whether the overfished/overfishing status restricts any changes. NOAA GC advised that there is no regulation that prevents changing MUS complex if its overfished and experiencing overfishing. NS1 criteria show procedures on how to add/remove species in the FMPs, and GC advised that it depends on the purpose and need. If changes are made to get out of overfished status, the action becomes arbitrary and capricious.

The Council took action on an options paper in March 2019 and worked with PIFSC to analyze available data to see what level of aggregation would make sense. The options paper investigated whether no action, reclassification (allowing flexibility), or a FEP amendment would be preferred. The Plan Team voted for option two to regroup the species instead of adding/removing species from complex via a FEP amendment.

There was clarification on the terms "regrouping" and "reclassification" versus adding and removing species from the BMUS complex. There is no action at this point to change BMUS, and the group will stay as is. The selection of option 2 gave the PIFSC SAP the freedom to assess current MUS to regroup them in the way they find to be best scientifically. "Regrouping" can be misleading, because the species of fish in the complex are not being changed, just shifted into different groups. One of the alternatives that will be considered on this front is splitting the complex into shallow- and deep-water species, but it is not clear as to if this will be the best way to regroup the species in a scientific manner. There will be no associated FEP amendment.

9. Implementing Electronic Self-Reporting for the Small Boat Fisheries
A. Small Boat Reporting Application

Council staff presented on updates to the small boat electronic reporting application. The Council is developing this application to support data collection in the territories and provide an alternative source of data other than creel surveys. The application works best with mandatory licensing and reporting in place.

Fishermen would self-report using the application, and the data goes to a server before being reviewed by a Council contractor for quality. Then, the data goes to the Council Amazon Web Services (AWS) bucket, to which local agencies, NMFS, and the Council have access. A

community dashboard allows the fishermen to see summarized total data. Additionally, each fisher that has an account will have access to personal catch logs and market performance relative to the rest of those submitting data.

The administrative portion of the application allows for new accounts to be added with personal fishing information/license number/vendor number/etc. Once the account is established, fishers can use their own application to file new reports or view existing or submitted reports. They can also see rejected reports that might have questionable entries.

New fishing reports allow for stipulation of time and place departed, registration number, whether it was a charter trip or not, and crew members if more than one person fishing (however, preferable if everyone reports catch on their own account). Then, the user can add fishing events with gear type, number of gears used, time fished, targeted species, place fished, fish species caught, number caught, estimated weight caught, photos, and additional notes. They can also log if a fish was thrown back or lost to predation before recording return time and place. Multiple fishing events can be recorded. The user can also log fishing vendor reports by submitting amount of fish sold and price per pound; the application will not allow for a record of more fish sold than caught. The vendor application is meant to be used to document fish being purchased from fishermen, and can record amount being bought, species, number, pounds, and price per pound. Fishers are still expected to report when they land no catch from a fishing trip, and the application has been configured to allow this.

The community dashboard acts as incentive to the community in the form of feedback. Fishers can see data summaries of cumulative catch through the year, including total trips, fishers, areas, and cumulative catch against active quotas. There is also a personal dashboard and a leaderboard for all reports. The dashboard shows average price per pound of bought fish as well as price sold relative to average market price. The vendors have their own dashboard displaying amount of fish purchased by each establishment relative to the total amount purchased for the island/region.

The Plan Team wondered if there would be issues with data summaries if less than three fishers were to report using the application. Less than three fishers would create issues with data confidentiality, so it will be important to foster participation and use of the application.

There were questions from Plan Team members regarding the identification of specific target species in the application. There are general categories available for the selection of target species, but a specific target species would be preferred to gather data on fishers' primary motivations for fishing trips. Because some fishers may not necessarily know in advance what species they are intending to catch, a broad category was included in this field of the application. Other Plan Team members felt that having a broad category for target species identification would be a mistake, as fishers may use it by default and it would defeat the purpose of including the field. It would likely be better for the data being used in stock assessments if preferred target species were indicated. The reality can be complicated; for example, the deep sea handline fishery in Hawaii has fishermen that know what they want to catch when they go on their fishing trip, but conditions play a factor in what is being targeted and can change in the midst of the trip.

Because this application is able to report preferred target species on a finer resolution as well as changing targets and areas within single dishing trips, those fields should be emphasized for specific answers to possibly help explain trends observed in catch composition and CPUE time series. Fishers may voluntarily select several preferred target species or broader categories if given the option to do so. Another possible solution is to change the field title to something like "most likely species targeting", as target species identification would be helpful for assessments.

The application is also meant to capture where fishing is occurring on a relatively broad scale and not identify the exact fishing grounds of the users. This will help generate a layout of fishing effort on a spatial scale. While some fishers may not know exactly where they plan to fish, they would be able to report the general fishing location afterwards when submitting their report. Because fishing trips may start in one area but end in a completely different area, it needs to be more clearly defined if the field for fishing area is referring to where the fishing efforts began or ended, etc. The developers are still working on tool tips with definitions for each of the fields. Grids for identifying fishing area do not currently extend to far away fishing areas, but new maps can be uploaded to remedy this.

It was also noted by the Plan Team that some commercial fishers take several trips per day, but only record catch or sales on a daily level (even if the fish was caught several days ago).

B. Coordination on Implementing the Reporting Apps in the Territories

Council staff presented on updates to implementing electronic reporting applications in American Samoa, CNMI, and Guam. The Council is almost done with the application, and it is nearly ready for deployment depending on the pandemic timeline. Ideally the application would be launched in American Samoa at the end of June and in the Marianas in August. Implementing the application will involve a lot of education and outreach. Outreach will occur through on-air media and paper flyers to emphasize importance of data reporting, and training will be held for the fishermen. The implementation plan was provided in the briefing materials for Plan Team members. Local names for the species are being added to the application for data entry.

It was emphasized that the Council needs to continue testing the application before its implementation. The Council has already had several fishermen that tested the application in the field, and the APs also found some issues that needed correction.

C. Discussions

Plan Team discussions were held immediately after each agenda item.

D. Public Comment

There was no public comment.

13. General Discussions

For the protected species sections of the annual SAFE reports, the list of research needs was revised based on Plan Team input.

For the marine planning sections of the annual SAFE reports, it was noted that PIFSC has been moving away from spatial planning as a main priority. It may be best to continue to have Council staff update the sections by reaching out to territory Plan Team members for relevant updates in future reports. The Council will have internal discussions on the merit of retaining the sections.

14. Fishery Ecosystem Plan Team Recommendations

1. Regarding the bottomfish life history, the Archipelagic Plan Team recommends the Council direct staff to work with the local fishery agencies to better identify the recently recognized species *Etelis* sp. (giant ruby snapper) in future data collection.
2. Regarding the annual SAFE Report socioeconomics module, the Archipelagic Plan Team recommends the Council direct staff to work with PIFSC Socioeconomic Program,

WPacFIN, and Hawaii DAR to investigate the landings of kahala in the top 10 species caught and track the disposition of these incidental catches.

3. Regarding the American Samoa ACL for fishing year 2021-2024, the majority of the Archipelagic Plan Team recommends the Council consider option 2 that specifies the ACL at 30 percent risk of overfishing equal to the Acceptable Biological Catch with an annual limit of 2,000 lbs. The Archipelagic Plan Team highlighted the importance of co-management between the local and federal government for the ACL action to be effective and to ensure sustainability of the bottomfish stock. The Archipelagic Plan Team also noted that the data collection may be affected by the ACL action and subsequently affect the ongoing efforts to improve the data collection.

4. The American Samoa representative expressed reservations in choosing an ACL level and selected option 1 with the caveat that an extensive education and outreach be conducted to inform the fisherman about the federal action and improve the fishery data collection. Therefore, the Archipelagic Plan Team recommends the Council work with the DMWR in conducting education and outreach on bottomfish management and projects to improve the fishery data collection in American Samoa.

5. Regarding Standardize Bycatch Reporting Methodology, the Archipelagic Plan Team recommends the Council direct staff to work with local fisheries management agencies to develop outreach materials on the importance of reporting and recording bycatch.

Work Item Recommendations:
- Provide direction on report structure for next year, particularly for the Protected Species module (protected species work team in coordination with fishery data section leads);
- Add the revised list of research needs incorporating Plan Team input into the protected species module version for the Council meeting;
- Improve bycatch reporting in the SAFE report in coordination with the ongoing SBRM review
    o Develop a bycatch data sections for the Hawaii fisheries;
    o Improve bycatch data sections for AS and Marianas reports, where data are available;
- Incorporate the list of changes to the Ecosystem Components section of annual SAFE reports;
- Explore other benthic cover categories in the future reports;
- Review the Habitat Report and identify the data streams that would be useful for the habitat module of the annual SAFE reports;
- Include summaries of the federal logbook data where available (note no data if permittees have not submitted any logbooks due to lack of fishing).

15. Other Business

There was no other business.