WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

Report of the
Seventh Meeting of the Protected Species Advisory Committee
May 1 – 2, 2019
Council Office

1. Welcome and Introductions

Sam Kahng, Acting Chair, welcomed members of the Protect Species Advisory Committee (PSAC) and other meeting participants. Members in attendance were George Balazs, Melanie Hutchinson, Sam Kahng, Erin Oleson, Clay Tam and Milani Chaloupka; and Jim Lynch participated by phone. David Hyrenbach was excused. Other meeting participants included Russel Ito, T. Todd Jones, Sunny Bak-Hospital, and Alex Filardo.

2. Approval of Agenda

The agenda was approved without any changes.

3. Status of the Fifth and Sixth Protected Species Advisory Committee Meeting Recommendations

Asuka Ishizaki, Council Staff, provided a brief update on recommendations made by PSAC at the two PSAC meetings in 2018.

4. Endangered Species Act and Marine Mammal Protection Act Updates

Ishizaki provided an update on Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) actions on behalf of the PIRO Protected Resources Division. The updates included: ESA petition to list cauliflower coral and giant clams; ESA final listing of the chambered nautilus as threatened; ESA status review for leatherback turtles; ESA recovery plans for the main Hawaiian Islands (MHI) insular false killer whales, North Pacific loggerhead turtles, oceanic whitetip sharks, giant manta rays, humpback whales and scalloped hammerhead sharks; and ESA critical habitat for humpback whales and Indo-Pacific corals.

Ishizaki also provided an update on the False Killer Whale Take Reduction Team (TRT). The TRT met April 10-13, 2018 along with several follow-up teleconferences but to date has not reached a consensus regarding recommendations to modify the Take Reduction Plan. In accordance with the Take Reduction Plan, two false killer whale mortality and serious injuries within the EEZ triggered the closure of the Southern Exclusion Zone (SEZ) in July 2018 for the rest of the calendar year. The fishery was reopened on January 1, 2019, however, closed again in February 2019 and will remain closed until a reevaluation is completed by NMFS. The Council discussed reopening criteria during their March meeting.

One PSAC member inquired about the status of the green sea turtle critical habitat. Ishizaki indicated that US Fish and Wildlife Service identified the green sea turtle critical habitat designation as a low priority and NMFS was not actively working on it.

5. Pelagic Longline Fisheries Issues

A. Review of the Draft 2018 Fishery Ecosystem Plans (FEP) Annual Stock Assessment and Fishery Evaluation (SAFE) Report

i. Summary of relevant fishery data: 2018 Hawaii and American Samoa Logbook Reports

Russel Ito, PIFSC, presented the 2018 Hawaii and American Samoa Longline Logbook Reports, which included participation, effort, spatial distribution, and catch trends. The report consisted of preliminary data containing 90-95 percent of the effort from 2018.

The Hawaii longline fishery's effort in 2018 was similar to that of 2017 in terms of the number of vessels, although the number of deep sets increased while the number of shallow sets decreased compared to 2017. Most of the effort was focused in the high seas and there was minimal change in effort within the EEZ. Ito noted high yellowfin tuna catch in recent years but a decline in albacore tuna catch and the lowest swordfish catch since the fishery reopened in 2004. Additionally, 40 captains and 33 vessels began training and using electronic reporting tablets to report their catch data. Issues with electronic reporting included language barriers, Bluetooth connection, and issues with vessel monitoring system (VMS) units.

The American Samoa longline fishery showed a downward trend in both effort and catch. However, catch per unit effort (CPUE) has been stable in recent years with a slight increase in albacore CPUE in 2018 despite having lower catch than in 2017.

One PSAC member asked about the vessels longlining off the coast of California. Ito explained that these longline vessels were fishing outside of the EEZ under a Hawaii permit and most vessels typically returned to Hawaii after fishing. Council staff informed the PSAC that the Pacific Fishery Management Council is considering the development of a shallow-set longline fishery off the West Coast as a replacement to the drift gillnet fishery.

A PSAC member asked if the effort in terms of number of hooks per set was increasing, and whether effort was more concentrated in 2018. Ito emphasized the importance of looking at interaction rates, and noted that each year has hotspots causing fish, and thus fishing vessels, to aggregate. Another PSAC member emphasized the importance of weather in the captain's determination to leave port. In 2018 hurricanes prevented vessels, especially smaller vessels, from fishing east of Hawaii.

Ito also noted that anecdotal information indicated that the fishery experienced higher than usual depredation events in 2018. One PSAC member asked if depredation data was recorded and it was noted that observers provide presence-absence data of depredation events. Council staff asked if depredation data could be used to inform false killer whale or shark abundances. One PSAC member recently started considering using depredation data to inform habitat modeling for false killer whale density. Analyses of observer data have shown that effort was the best predictor of depredation with some seasonal patterns of higher depredation in the fourth and first quarter based on the long-term average.

ii. 2018 Protected Species Section

PSAC reviewed the Hawaii and American Samoa longline sections of the draft 2018 SAFE Report Protected Species Modules. Alex Filardo, Council Contractor, provided a summary of the 2018 draft report.

The PSAC discussed the options of displaying the sea turtle interaction data for the Hawaii shallow-set longline fishery in the SAFE report since the annual number of interactions on the Observer Program annual reports are tallied by vessel arrival date while the sea turtle hard caps are monitored based on interaction date. The PSAC initially discussed describing the shallow-set sea turtle data based on interaction dates while leaving the other data tables unchanged. However, after further consideration, the PSAC determined it would be more beneficial to add both tables for the shallow-set turtle data and clearly distinguish between the two. This allows the reader to sum the sea turtle interactions across all Western Pacific longline fisheries without issues concerning cutoff date or changes in effort.

Additionally, several interaction trends were highlighted for additional discussion including: loggerhead turtles, Guadalupe fur seals, black-footed and Laysan albatross and oceanic whitetip sharks in the shallow-set fishery; olive ridleys, green sea turtle, false killer whales and black footed albatross in the deep-set longline fishery; and green turtles, olive ridleys, and hawksbill turtles in the American Samoa longline fishery.

PSAC discussion on the review of this section included the following:

- A higher level of interactions of loggerhead sea turtles was observed in the shallow-set longline fishery beginning in 2017 until the early closure of the fishery in May of 2018. The Council took action on adding individual trip limits to the management measures for the fishery to address the higher level of observed interactions observed since 2017. It was noted that the interactions may be in part due to a higher recruitment in Japan over the last decade. One PSAC member suggested using models based on Hawaii green turtle or Florida loggerhead population-interaction dynamics as a proxy for Western Pacific loggerheads. However, a meeting participant informed the committee that it would be difficult to use another species or stock as a proxy since there would be a number of covariates that may affect the proxy and it would be difficult to obtain the same quality of consistent data as that of the Western Pacific loggerhead turtles. If the increasing interactions is due to high recruitment, it would be expected to have higher loggerhead CPUE in the future. PSAC members discussed the potential for adjusting the hard cap to be dynamic with the population. A PSAC member inquired about the use of TurtleWatch and efforts to improve the model with regards to fishery dependent data. Efforts to improve TurtleWatch based on an ecosystem-based fishery model are ongoing (see agenda item 5.C).
- Oceanic whitetip shark interactions have been observed throughout the shallow-set longline time seires, although only one observed interaction was recorded in 2018. This could be due to the closure the of the fishery since spatial overlap between fishing grounds and oceanic whitetip habitat typically does not occur until the second quarter. When a PSAC member asked about the high number of interactions in 2005, Council Staff informed the committee that ongoing CPUE standardization work may provide additional insight into the higher number.

- In the Hawaii deep-set longline fishery, observed olive ridley interactions were highest on record in 2016 with continued higher levels of interaction in 2017 and 2018. Both the eastern and western Pacific populations of olive ridleys, as well as the East Pacific distinct population segment (DPS) of green sea turtles exceeded the three-year incidental take statement (ITS) and consultation was reinitiated in October 2018. A PSAC member asked if there were any notable population trends for any of these stocks and a meeting participant informed the committee that they are not of high concern due to high abundance estimates.
- False killer whales interactions in the deep-set fishery in 2018 was the highest since 2002 with 12 observed interactions, but nominal CPUE has been higher in previous years. Additionally, the 5-year average mortality and serious injury for the HI pelagic stock inside the EEZ was lower than PBR. A PSAC member pointed out that the PBR for false killer whales is from 2017 and a new stock assessment report is currently in progress.
- In the American Samoa longline fishery, four green sea turtle interactions were annually observed since 2016 with the highest nominal CPUE in 2018 since the observer program started. Additionally, olive ridley interactions were consistently higher over recent years compared to the earlier part of the time series. However, PSAC determined that it was difficult to interpret any the trends due to the rare nature of the interactions and small number of observed interactions over the years.
- In 2016, the first hawksbill interaction was observed followed by two additional takes in 2018. A meeting participant informed the committee that the hawksbill interactions could be a concern as there are only about 50 nesting hawksbill turtles in American Samoa.
- PSAC members discussed the variable interaction rates in the Hawaii deep-set and American Samoa longline fisheries, and noted that an examination of the spatial variability in fishery effort and interactions may be informative.

iii. Standardized Metric for Protected Species

Sunny Bak-Hospital, Council Contractor, presented a preliminary view of a potential standardized metric approach for the protected species in the SAFE Report. The goal of this metric would be to develop a simple and robust technique to quickly flag potential outlier values. Since the protected species data are non-parametric, represent rare interactions, and may be affected by various factors, Bak-Hospital recommended using the median as the central tendency and using the median absolute deviation (MedAD) to compute a threshold.

A council staff asked why use the MedAD rather than a quantile or percentile and Bak-Hospital responded that the MedAD would be very similar to the quantiles. A PSAC member questioned the use of a medial statistical test such as the MedAD method instead of a statistical model that is meant for count data. Bak-Hospital and council staff emphasized that the standardized metric was meant to create a simple threshold that can be completed every year without an extensive statistical background to flag values that deviate from the norm.

B. Council Fishery Actions on Pelagic Longline Fisheries

i. Framework for Managing Sea Turtle Interactions in the Hawaii Shallow-set Longline Fishery

Ishizaki provided an update and status of the Council's action for managing sea turtle interactions in the Hawaii shallow-set longline fishery and the associated Biological Opinion

(BiOp). At the 173rd Council Meeting, the Council recommended a management framework that includes the hard cap limits and individual trip interaction limits. The Council recommended fleet-wide hard cap limits of 37 loggerhead and 21 leatherback turtles and an individual trip limit of 5 loggerhead interactions per trip. The individual trip limit would require vessels to return to port but would allow the vessel to resume shallow-set fishing on the next trip, which would take at minimum seven to ten days given the distance shallow-set vessel travel to their fishing grounds.

The draft BiOp was released to the Council on March 28, 2019, which concluded that the fishery is not likely to jeopardize ESA listed species. The draft BiOp included ITSs of 21 leatherback sea turtles and 36 loggerhead turtles. The draft BiOp also included Reasonable and Prudent Measures (RPMs) that would require implementation of individual vessel limits of two leatherback and six loggerhead turtles to reduce the impact of a small number of vessels causing a large proportion of interactions. Additionally, the draft BiOp included requirements to develop and implement additional minimization measures within two years with the goal to reduce protected species interactions by 25 percent and to require a hard cap of 16 leatherbacks and 36 loggerhead turtles.

Ishizaki presented the key findings of the BiOp Review Advisory Panel and the Council's action at the 177th meeting on April 12, 2019. The Council recommended retaining the action from the 173rd meeting and requested that NMFS revise the RPMs for consistency with the Council's action. The final BiOp is pending.

Regarding the vessel interaction limits, a PSAC member asked if there was evidence of a single or a small number of vessels consistently interacting with a high number of protected species. Ishizaki responded that some vessels do interact with more turtles than others, although the number of turtle interactions is associated with a vessels effort and participation in the fishery over time. The PSAC member asked if the leatherback population continues to decline, whether a lower hard cap be expected in the future. Ishizaki said that the sea turtle ITS could decline further in the next BiOp. PSAC members discussed the use of satellite tagging with sea turtles and a meeting participant informed the PSAC that PIFSC recently obtained satellite tags and is planning to tag loggerheads in 2020 and leatherbacks in 2021.

ii. Seabird Bycatch Mitigation Measures in the Hawaii Longline Fishery

Ishizaki provided an update on the Council's activities related to seabird mitigation measures in the Hawaii longline fishery. The existing seabird mitigation measures were first implemented in 2001, and resulted in a significant reduction in seabird interactions. Interactions gradually increased in the decade following the seabird measure implementation, followed by a higher level of interactions since 2015.

In September 2018, the Council convened a workshop to review seabird mitigation bycatch measures for the Hawaii pelagic longline fisheries. The high priority mitigation measures identified by workshop participants included captain and crew training, side setting, bird curtain, tori lines, towed buoy, and branchline weighting design. Tori lines were tested in the late 1990s and not adopted due to risk of entanglement and safety concerns. However, some Hawaii fishermen voluntarily use a tori line type deterrent. Although currently required, the workshop

participants decided to deprioritize the use of blue-dyed bait as it is not as effective as side setting in the Hawaii longline fishery. Workshop participants discussed potential modifications to the current measures which include removal of blue-dyed bait and addition of tori lines, bird curtains and offal discards to the list of potential mitigation measures. Ishizaki also provided a summary of a discussion paper presented to the Council at the 176th Meeting in March 2019 evaluating the potential impacts of removing blue-dyed bait without replacement measures and identifying strategies for improving seabird mitigation measure effectiveness in the Hawaii longline fishery. The Council is moving forward with development of tori line minimum standards, and will be conducting a demonstration and field trial project over the next year.

A PSAC member inquired about the availability of data associated with tori lines in the Hawaii longline fisheries. Ishizaki responded that there is a binary presence-absence data field for tori lines in the observer report, but the data are likely not suitable for assessing effectiveness due to the lack of minimum standards. PSAC members asked why fishers did not like blue-dyed bait and Ishizaki informed the PSAC that it was messy and an extra step for the fishers where they have to partially thaw the bait which reduces hook retention.

iii. Other Pelagic Actions

Mark Fitchett, Council staff, provided updates of recent pelagic fisheries management actions. These updates included electronic reporting, Council action taken on the American Samoa Large Vessel Prohibited Area (LVPA), and 2018 US Participating Territory big eye tuna catch and allocation limits. As of February 2019, 22 electronic reporting tablets are in use with a goal of 160 tablets. Potential issues of electronic reporting include vessel owners interested in obtaining daily logbook transmissions, failure of transmission, annual subscription fees, and at-sea enforcement.

C. Outcomes of the Olive Ridley Turtle Project and Next Steps for the Ecosystem-based Fishery Management Turtle Project

T. Todd Jones, PIFSC, provided an overview and outputs on an ecosystem-based fisheries management study using ensemble random forest model for olive ridley sea turtles. The model uses a suite of environmental, effort, and species data to predict the chance of an interaction. According to this model, the highest ranked variables predicting an olive ridley interaction includes temperature at the mixed layer, sea surface temperature, and current divergence. The next steps include evaluating sea turtle interactions and efficacy of management strategies in the Hawaii and American Samoa longline fisheries. Additionally, the ensemble random forest model can be used to validate TurtleWatch. Furthermore, the model can be used to predict interactions with other species including target species.

The PSAC members noted that the model produces variables with the largest correlation with an olive ridley interaction, but does not explain the mechanisms. PSAC further discussed sea turtle foraging habitats. Jones noted that loggerheads and leatherbacks are typically fowl hooked, whereas necropsy evidence indicate that olive ridleys feed on bait and one olive ridley passed a hook suggesting that the animal had depredation events in years prior.

A PSAC member asked if the model would be able to use depredation data to predict false killer whale or shark interactions. Jones responded that the model does not have sufficient statistical

power for species with low sample sizes. The model will be used to look at ecological drivers for three case studies (olive ridley sea turtles, black footed albatross and oceanic whitetip sharks) which will be used to look at different levels of rarity in interactions. Another PSAC member noted that the model will not be able to capture behavioral factors associated with false killer whale interactions.

D. Discussion on Emerging Issues, Data Gaps and Research Needs

There was no further discussion regarding the 2018 draft SAFE report for pelagic longline fisheries.

6. Pelagic Non-longline Fisheries Issues

A. Review of the Draft 2018 FEP Annual SAFE Report for Pelagic Non-Longline Fisheries

i. Summary of relevant fishery data

Ito presented the MHI troll and handline effort in terms of the number of fishers and days fished. For the pelagic non-longline fisheries, fishers are defined by commercial licenses. The MHI troll has the largest fishery effort, however, the effort has a declining trend since 2012. Similarly, both the MHI and offshore handline fisheries have been declining, although the days fished in the offshore handline was higher in 2018 compared to 2017.

One PSAC member informed the committee that many fishers left the fishery due to overall economy and fuel prices. In response to a PSAC member's question, Ito clarified that the short lines were not parsed out from the handline data. Ito also explained that both troll and handline fishers use the same boats but different gear and operate within 50 miles from shore.

ii. Protected species section

PSAC reviewed the pelagic non-longline section of the draft 2018 SAFE report protected species module. Filardo provided an overview of the draft report.

In general, impacts to protected species in these fisheries are considered minimal based on ESA consultations and MMPA List of Fisheries (LOF) classifications. Additionally, there are no reported interactions with protected species in the existing fishery data. There is an ITS of four green turtle mortalities per year from collisions for the Western Pacific troll and handline fisheries, but there has been no reported or observed collisions attributed to these fisheries.

The PSAC discussed the reporting requirements for oceanic whitetip shark interactions within the pelagic non-longline fisheries. The state's commercial marine license (CML) reporting form does not include a line to report protected species interactions in part due to the lack of state fishery exemptions for protected species incidental interactions. PSAC members noted that cooperation with the State of Hawaii will be important in improving reporting of shark interactions. A PSAC member expressed concern that efforts such as the bill to prohibit intentional capture of sharks will likely discourage any reporting going forward.

A PSAC member informed the committee that the state's new Species Recovery Grant under ESA Section 6 includes a new form for the state to report protected species sightings as well as the development of an online platform that assisted fishers in shark identification. Another PSAC

member noted that a fishermen's shark identification may not be reliable as these fishers are not trained in shark identification and the data should be verified with quantified data. PASC members suggested that Council advisory bodies could help inform the development of the program and bring in broader fisher relationships.

PSAC also discussed how much new information on shark interactions should be incorporated into the SAFE report, and agreed that oceanic whitetip shark research data should be incorporated into the report after published information is available.

B. Discussion on Emerging Issues, Data Gaps and Research Needs

The PSAC discussed the lack of accurate information regarding shark interactions as a data gap in the pelagic non-longline section of the draft 2018 SAFE Report Protected Species module. No changes to the emerging issues and data gaps section of the report were identified.

7. Public Comment

There were no public comments at the conclusion of day 1.

8. Insular Fisheries Issues

A. Review of the Draft 2018 FEP Annual SAFE Report for Insular Fisheries

i. Summary of relevant fishery data

Marlowe Sabater, Council Staff, presented the preliminary 2018 insular fishery data, which included creel survey performance, shore-based effort trends, boat-based effort trends, and bycatch trends for Guam, Commonwealth of the Northern Mariana Islands (CNMI), and American Samoa. Hawaii data for insular fisheries were not available at the time of the meeting.

Guam creel surveys were lower in the last three years which can affect the effort estimates in these fisheries. Within the Guam shore-based fishery, cast net effort in terms of hours fished was greater in 2018 than in 2017, whereas hook and line and spear effort in 2018 were both less than that of recent years. Sabater also noted that bottomfishing and SCUBA spear increased in effort within the Guam boat-based fishery and there was a decline in spear and troll effort in recent years. Bycatch in the Guam insular fisheries was less than one percent in 2018.

Shore-based effort (i.e. hook and line, spear, and cast net) increased in the CNMI insular fisheries from 2017 to 2018, which is subject to further investigation. Within the boat-based fishery, the troll effort declined in 2018. The bycatch within the CNMI insular fisheries was less than one percent in 2018.

In the American Samoa insular fisheries, the 2018 boat-based fishing effort declined compared to 2017 effort and there was zero reported bycatch.

ii. Protected Species Section

PSAC reviewed the insular fishery portion of the draft 2018 SAFE report Protected Species module. Filardo presented an overview of the insular fisheries draft update. Fishing effort and gear characteristics are used as proxies for monitoring changes in the insular fisheries as these fisheries do not have observer coverage. While NMFS is still reviewing information on oceanic whitetips and giant manta rays, impacts to the other protected species in insular fisheries are

considered minimal based on ESA consultations and MMPA LOF classifications. There is an ITS of two green turtle mortalities per year from vessel collisions for the MHI bottomfish fisheries, but there has been no reported or observed collisions attributed to these fisheries.

iii. Discussion and Synthesis

There was no further discussion regarding the 2018 draft SAFE report for insular fisheries.

B. Council Fishery Actions on Insular Fisheries

Sabater provided an overview of Council actions on insular fisheries over the past year. In February 2019, the final rule reclassified certain management unit species (MUS) as ecosystem component species (ECS). The intent of the final rule is to prioritize conservation and management efforts to improve fishery management in the region. Changes to the SAFE report resulting from the ECS amendment will be reflected in next year's report. In addition, there was a region-wide moratorium on the harvest of gold corals in the U.S. Pacific Islands.

In American Samoa, NMFS announced the approval of a marine conservation plan to prioritize conservation and management projects. In the Hawaii insular fisheries, NMFS established an annual harvest guideline of zero lobsters for the commercial fishery and the final 2017 Hawaii Kona Crab annual catch limits.

C. French Frigate Shoals Green Turtle Research Plans

Jones provided a presentation on research plans for the French Frigate Shoals (FFS) green turtles. Most (~96%) of the Hawaii green turtles (Central North Pacific DPS) nesting occurs at FFS, but nesting has been recorded throughout the NWHI. In recent years, the monk seal field team has been trained to conduct sea turtle field surveys since the monk seal team conducts work throughout NWHI, whereas the turtle team is focused on FFS. For FFS, complete monitoring of both Tern and East Island started three years ago. Shell identification marking show turtles moving between islets during a nesting season. Jones presented nesting trends for East Island with a low of about 50 nests in 1976 and a high of 889 nests in 2014. The following year nesting dropped to 88 nests, which is likely driven by environmental conditions in combination with natural oscillations.

Effort is ongoing to re-estimate total nesting at East Island for some of the older data. Field research currently consists of excavations of nests post-hatching, deploying nest temperature loggers, and GPS tagging. Jones also presented data on nest lay date and nest temperatures. Eggs laid earlier in the season have longer incubation periods but lower hatch success rate while nests laid later produce eggs that undergo shorter incubation periods and higher hatch success rates.

Several low-lying islands in FFS disappeared previously, including Whale-Skate Island in the 1990s. Trig Island disappeared in 2018. Additionally, Hurricane Walaka shifted the sand under water at East Island resulting in an estimated loss of approximately 19 percent of nests, although 2018 was a low nesting season. Three islands remain available for nesting for the 2019 season: Gin Island, Little Gin Island, and Tern Island. Past tagging data indicate that the turtles were moving between islets in the FFS within a nesting season both for nesting and basking.

PIFSC will send three members of the sea turtle field team to FFS this year to monitor nesting and will be coordinating with the monk seal camp. Recent MHI monitoring and ultrasounds indicate that there are gravid females ready for nesting and a female was tagged and tracked back to Tern Island. There is ongoing monitoring of females on the MHI. Future research will focus on genetic sampling, male migratory ecology and paternity and pivotal nesting temperatures.

One PSAC member noted that this year's cohort will include first time nesters that are not experienced at nesting on East Island. A PSAC member asked about the density dependence and carrying capacity in FFS and Jones responded that there are multiple lines of inquires that are informative, although there are a number of potential confounding factors. Another PSAC member referenced work showing poor body conditions that suggests a carrying capacity on FFS. Additionally, there is about a 25-year lag between hatching and nesting making it challenging to assess.

The PSAC discussed the movement and accretion of sand on the various islets. One PSAC member advised looking at sand accretion before and after Kona storms to predict sand return rates. Another PSAC member asked if PIFSC has commissioned satellite photography of FFS on a weekly basis and Jones responded that he would look further into it.

The PSAC also discussed the potential use of eDNA studies but noted challenges using that technology beyond confirming the presence or absence in the open ocean environment.

The PSAC applauded the Marine Turtle Biology and Assessment Program's work and look forward to getting future updates.

D. Discussion on Emerging Issues, Data Gaps and Research Needs

Ishizaki reviewed the identification of emerging issues, data gaps and research needs within the protected species module of the 2018 SAFE Report. There were no changes identified for this year's report.

The PSAC discussed the need to improve the life history and growth information of oceanic whitetip sharks. Currently the studies involving oceanic whitetips are limited due to small sample sizes which produce inconsistent age and growth estimates. The PSAC suggested improving the observer program species identification and data collection. Additionally, the PSAC suggests requesting the Observer Program to sample the diseased oceanic whitetips for necropsies to further develop the life history and growth parameters.

9. Council's Research Priorities

A. Five-year Research Priorities

Ishizaki presented an overview of the new 2020-2024 five-year research priorities. Ishizaki informed the PSAC that the development of the five-year research priorities changed, and the Council worked with PIFSC to better align management priorities with PIFSC projects. The primary goal of the research priorities is to determine what type of scientific information is needed to properly inform the Council.

One PSAC member asked if the priorities have been sent out to PIFSC and Ishizaki informed the committee that PIFSC should have received the updated five-year priorities.

B. Cooperative Research Priorities

Ishizaki provided an overview of the cooperative research priorities. When a PSAC member suggested improving the life history parameters of oceanic whitetip sharks, Ishizaki clarified that the cooperative research priorities are intended to work in cooperation directly with the fishers.

As the PSAC reviewed the cooperative research priorities, the PSAC suggested reviewing the wording so it does not overlap with existing grants since federal grant programs cannot have an overlap in scope. For example, the wording of the cooperative research priority regarding the bycatch reduction and engineering overlaps with the Bycatch Reduction Engineering Program grant.

C. Discussion

There was no further discussion on the Council's research priorities.

10. Public Comment

There were no public comments at the conclusion of Day 2.

11. Committee Discussion and Recommendations

1. PSAC recommends that the Council work with NMFS to determine the extent to which the higher loggerhead turtle interactions in the Hawaii shallow-set longline fishery may be attributed to higher reproductive outputs at Japanese nesting beaches in the last decade. PSAC further recommends that the Council consider developing approaches to adjust hard caps and other applicable limits in the fishery to the population.

2. PSAC recommends that the Council continue to work with NMFS on the Ecosystem-based Fishery Management Turtle Project and to validate the assumptions in TurtleWatch through this project. PSAC further recommends that future versions of TurtleWatch include information on target catch as well as potential for interactions with other protected species of concern.

3. PSAC recommends that the Council work with NMFS to evaluate the temporal variability in oceanic whitetip shark interactions in the Hawaii deep-set and American Samoa longline fishery to better understand the drivers influencing the inter-annual variability. These may include, but not limited to: operational characteristics of fisheries, spatial distribution of effort, and management areas.

4. PSAC recommends that the Council work with the State of Hawaii to improve shark species identification by fishermen with a goal of facilitating improved data collection on oceanic whitetip shark interaction data. PSAC further recommends that the Council request the State of Hawaii to coordinate with the Council in the State's efforts to improve reporting of protected species in the Commercial Marine License reports.

5. PSAC commended PIFSC on their effort to enhance monitoring and research at FFS and throughout NWHI, and recommends that the Council continue to receive updates on the status of the NWHI research, including green turtle nesting habitat changes in FFS.

6. PSAC recommends the Council work with PIRO and PIFSC to improve coordination of observer program data collection, database access and other needs.

PSAC identified the following SAFE report work items to be addressed in this year's report:

- Add the interaction date summary table for sea turtle interactions in the shallow-set longline fishery (as a second table).

12. Other Business and Next Meeting

Ishizaki reported that this will be the last iteration of the PSAC meeting in its current form, and thanked each member for their contributions. Ishizaki provided an overview of the plans going forward. Beginning in 2020, the Archipelagic and Pelagic Plan Teams will be responsible for reviewing and addressing any issues with the Protected Species Module of the annual SAFE Report.