WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

Report to the Council from the 93rd Meeting of the Scientific and Statistical Committee

Council Office Conference Room
1164 Bishop Street, Suite 1400
Honolulu, HI 96813

October 3-5, 2006

Ecosystems and Habitat

5.A. NWHI Monument (ACTION ITEM)

Jarad Makaiau gave a presentation on the NWHI Marine National Monument which was established by Presidential Proclamation no. 8031. The proclamation set apart and reserved the Northwestern Hawaiian Islands for the purpose of protecting the historic objects, landmarks, prehistoric structures and other objects of historic or scientific interest that are situated upon lands owned and controlled by the federal Government of the United States. In establishing the NWHI monument, Proclamation No. 8031 assigns primary management responsibility of marine areas to the Secretary of Commerce, through the National Oceanic and Atmospheric Administration (NOAA) in consultation with the Secretary of the Interior.

With respect to fishing, the proclamation directs the Secretaries to:

1. Ensure any lobster permit is issued a zero harvest quota;
2. Ensure commercial fishing is conducted only with a valid bottomfish permit in effect on June 15, 2006;
3. Ensure that the total annual landing of bottomfish species by commercial bottomfish permit holders does not exceed 350,000 lbs.;
4. Ensure that the total annual landing of pelagic species by commercial bottomfish permit holders does not exceed 180,000 lbs.;
5. Ensure commercial fishing does not take place within any Ecological Reserve or Special Preservation Area;
6. Prohibit vessels from anchoring in the Monument;
7. Require VMS on all vessels operating in the Monument;
8. Allow sustenance fishing for bottomfish and pelagic species by anyone with a Monument permit.
9. Allow commercial fishing to continue only until June 15, 2011.

He said the regulations implementing the Monument rules were published in the Federal Register on August 29, 2006. Makaiau then described two major concerns expressed by NWHI fishermen.

Issue 1: Fishing for Five years Paradox

While Presidential Proclamation No. 8031 allows commercial fishing for bottomfish and pelagic species to continue for five years, some NWHI fishermen have expressed grave concern that the prohibition on fishing within Ecological Reserves and Special Preservation Areas, combined with the no-anchoring provision, will make it virtually impossible to catch bottomfish fish within the Monument and make bottomfishing economically unfeasible to continue.

No Anchoring

Makaiau said that anchoring on deep slopes is a common practice of bottomfishing in order to maintain vessel position over bottomfishing grounds during times of high currents. He said that while this practice is not always necessary, the anchoring prohibition takes away this option from fishermen.

Dan Polhemus said that it was his understanding that the Monument regulations prohibit anchoring on living or dead coral, but provides for bottomfishermen to anchor.

Makaiau responded stating that NOAA Fisheries informed Council staff that a NOAA approved Frequently Asked Questions document was published on the Monument website stating that anchoring by bottomfishermen could be done only to protect life and property. It does not provide for anchoring in normal fishing operations.

Ecological Reserves and Special Preservation Areas

Makaiau said that bottomfishers, particularly those in the Hoomalu Zone were also concerned with the Monument area closures because a substantial amount of the available bottomfish habitat and historical fishing areas are contained within Ecological Reserves (ER) and Special Preservation Areas (SPA) which are off limits to commercial fishing.

He also said fishermen expressed concern about the accuracy of the latitude/longitude coordinates in the Monument regulation in relation to the ER and SPA depth contours. He said that the banks where bottomfish are found are usually steep where the linear distance between the 25 fathom contour and the 50 fathom or 100 fathom depth contour is sometimes a matter of a few hundred feet. In some places, fishermen said it may be necessary for them to enter 25 fathoms and drift towards deeper waters in order to reach the target opakapaka, ehu and onaga depths. The concern is that fishermen will fish very close to the line of SPAs, and if enforcement actions are taken against them, it will be nearly impossible to fish for bottomfish on the banks where SPAs are located.

Makaiau said that seven of the nine SPAs are in the Hoomalu Zone. He summarized a graph that was included in NOAA's September 20, 2006 Advice and Recommendations Document (Pg. C-23) which showed non-confidential bottomfish catch by bank between the years 1996-2002. According to that graph, 12.4% of the total bottomfish catch was taken from French Frigate Shoals which is immediately closed to bottomfish fishing.

He added that if fishermen cannot fish the line near the SPAs at Gardner, Maro, Laysan and Lisianski, a total of 48.4% of the total bottomfish catch would be lost. In the Mau Zone, 18.3% of the bottomfish catch could be loss. Combined, the fishery could lose up to 67% of their catches.

Makaiau said that the first vessels equipped with VMS left for the NWHI the week of September 16. Currently, it is not known how close the fishermen are fishing in relation to the SPAs or if they are being told to stay away from the SPAs by those monitoring their signals. However, the some Hoomalu Zone fishermen said that they would like the Council to consider allowing them access to the Mau Zone due to the number of ERs and SPAs in the Hoomalu Zone.

Makaiau briefly described three options that the SSC might consider.

Option 1: No Action. Under this option, the Hoomalu and Mau zones remain in place and fishermen with permits for the Mau Zone can only fish the Mau Zone and fishermen with permits for the Hoomalu Zone can only fish the Hoomalu Zone. Additionally, the Monument cap of 350,000 lbs. will be shared by both zones.

Option 2: Suspend the permit zoning restriction and allow Mau Zone fishermen to fish in the Hoomalu Zone and vice versa.

Option 3: Combine the Mau and Hoomalu Zone into one zone.

The SSC discussed the pros and cons of the options. They noted that it would be unlikely that Mau Zone fishermen would be able to fish west of French Frigate Shoals because their vessels are relatively small, while Hoomalu Zone fishers would be able to fish in the Mau Zone.

SSC members also discussed the possibility of all eight permit holders fishing exclusively on Nihoa and Necker and whether it could result in local depletion of those two banks over the next five years. Further, they discussed the possible ramifications to MHI bottomfish stocks.

The SSC notes that the Martell et al, analysis indicates that a potential short-term effort increase in the Mau Zone is not a cause for concern in regard to bottomfish stocks, and therefore believes that combining the two NWHI bottomfish permit zones would have little impact on stocks within the 5-year fishing period allowed by the Monument. Hence the SSC does not object to Option 3, which is to combine the Mau and Ho‘omalu Bottomfish Permit Zones.

Issue 2: Fishing outside the Monument

Makaiau said that some of the NWHI commercial pelagic handline and trollers who are were immediately prohibited from fishing in the Monument expressed interest in fishing outside of the Monument for pelagics species. However, these fishermen indicated that they often incidentally harvest uku, a bottomfish management unit species while trolling for ono on Salmon Bank which is outside the Monument.

The problem here is the Bottomfish FMP regulations prohibit anyone from retaining uku without a NWHI limited entry permit. Therefore, pelagic trollers are forced to discard uku making it a regulatory discard.

Joe Detling, a NWHI commercial pelagic handline and troller said that up to 50% of the fish he catches while trolling for pelagic is uku, kahala or kamanu. He said it is not right for him to have to discard this because of a regulatory reason not a biological reason.

The SSC believes that the incidental catch of uku outside the Monument probably has little impact on uku stocks in the NWHI and, moreover, notes that uku is not one of the State of Hawaii designated "deep-7" bottomfish species that are the species of most concern. Therefore, the SSC recommends that the Council explore options to enable the retention of uku, kamanu and kahala caught incidentally in the commercial pelagic troll and handline fishery.

5.B. Hawaii Archipelago Ecosystem Research Program

Frank Parrish provided a brief update on the development of a Hawaii Archipelago Ecosystem Research Program. He noted that the purpose of HAERP is to develop a coordinated approach to ecosystem research in the Hawaiian Archipelago. The primary focus during this development stage was to determine how best to integrate and interface research initiatives from various agencies, and he re-iterated that this is still in a planning stage.

Since the 92nd SSC meeting in May 2006, a vision statement and six key research themes have been proposed. They include: (1) Connectivity; (2) Invasive Species; (3) Patterns of Resource Utilization; (4) Indicators of Change; (5) Ecosystem Modeling and Forecasting; and (6) Ecosystem Sustainability, Resilience and Recovery.

Parrish said the next immediate step was to establish 5-7 member blue ribbon panel of senior scientist with expertise in large scale ecosystem programs to review the research themes to see if we are on the right track, identify gaps etc.

Dr. Callaghan noted that perhaps a component of the HAERP could be to help define such terms as ecosystem resilience, ecosystem services and ecosystem recover.

Some SSC members also noted the need for social sciences to be included in the HAERP.

Parrish said he would welcome suggestions from the SSC on possible ecological economist to be invited onto the "blue-ribbon" panel.

Suggested individuals included Dr David Fluharty of the University of Washington, Dr. Robert Costanza, the Gund Professor of Ecological Economics and Director of the Gund Institute for Ecological Economics at the University of Vermont and Jeff Johnson from East Carolina.

5.C. Hawaii Coral Reef Fisheries Statistics

Dan Polhemus provided a comprehensive summary of commercial coral reef fisheries statistics fiscal years 1980-2005. He briefly summarize the data collection mechanisms and sources of data. He noted that commercial coral reef landings over the 25 year period was relatively stable, averaging between 1 million and 2 million pounds. He noted that akule made up the majority of this catch. He also provided time series landings for Acanthuridae, Mullidae, Holocentridae, Octopidiae, and Scaridae over the 25 year time period. He also provided a breakdown of annual commercial landings and by method, noting that there has been:

- an increase in pounds per trip for nets (excluding akule and opelu);
- stable trend in pounds per trip for inshore handline (excluding akule and opelu)
- an increase in pounds per trip beginning in 2001 for spearfishing and diving.

With respect to the harvest of coral reef fish taxa, surgeonfish catches have increased, goatfish catches have decreased, soldierfish and parrotfish catches have remained stable. He then showed a graph illustrating commercial marine landings between 1900 and 2005. He noted that in 1950, there was a major change in commercial marine landings of reef fish with catches decreasing markedly from the years prior.

SSC members discussed possible causes for this decline including increased fishing pressure, loss of essential nursery grounds to dredging and development, changes in diet from seafood to imported products and the shift towards pelagic fishing.

5.D. Hawaii Coral Reef Fisheries Assessment

Alan Friedlander gave a presentation on a project being conducted to assess shallow water Hawaiian reef fish stocks through the use of a spatially heterogeneous management regime.

He said that the Hawaiian Islands provide an ideal laboratory for studying human perturbations to marine environments as the main Hawaiian Islands experience heavy fishing pressure, both commercial and recreational, and coastal development in contrast to the NWHI where these pressures are absent.

He noted that they assessed the status of many shallow water reef fish stocks by taking advantage of this contrast and of the numerous designated no-take marine reserves, partially protected areas, and open access areas within the main Hawaiian Islands. Diurnal visual fish counts were conducted throughout the archipelago ant these data were converted into biomass densities (kg per m^2) using widely available length-weight conversion equations. The assumption used was that the Northwestern Hawaiian Islands had distinct and pristine stocks of fish that could considered as virgin biomass. The biomass estimates of the MHI were compared to those of the NWHI.

Friedlander noted that considerations were made for rare species particularly those which had distinct latitudinal ranges and are not evenly found throughout the island chain.

He said the analyses suggested that numerous shallow water Hawaiian reef fish stocks are depleted—some quite badly—despite existing area closures, gear restrictions, size limits, and catch limits. He added that the utility of this work illustrates the value of large no-take reserves as reference areas, but also highlights the weakness of small no-take reserves and partially protected areas to serve in that capacity.

Some SSC members questioned why some species which were not known to be fished were found to be in trouble according to the study.

Friedlander said that this is where they fall out using the methodologies but, what is more important is how managers can use this to target those species that are of priority. For example, the fish that is low in biomass but not fished is would be less of a management priority than one that is important to the recreational or commercial fishery and should be first for management considerations.

Dan Polhemus noted that species which perform important ecological services such as the herbivores would be a high priority than say a secondary piscivore if it were on the list.

5.E. American Samoa Coral Reef Fish Survey

Bob Schroeder, reported on the American Samoa coral reef assessment and monitoring cruise completed in March 2006. He noted this was the third assessment cruise to American Samoa. Schroeder said that the assessment visited all seven islands of American Samoa and surveyed 60 monitoring sites and did about 950 scuba dives, each about an hour long.

Schroeder elaborated on the goals of the monitoring program and said NMFS will be producing four reports for the entire western Pacific region, which include 55 islands and atolls. He said the first report will be on American Samoa from the three years that were surveyed, 2002, 2004 and 2006. Each island will include habitat mapping, oceanography and water quality, a reef fish section, sections on the benthic environment, corals, algae and invertebrates, bioacoustics and then ecosystem integration where we try to tie all those different disciplinary activities together for each of the islands and then for the entire archipelago. The reports are expected to be completed four to six months after each cruise.

Schroeder said a question that they are often asked is if Tutuila overfished? He noted that the REA, is fishery independent monitoring tool and can only provide some of the information to answer to question. REAs don't provide information on fishing effort or other things to really fully answer the question. He said the REAs can provide a relative comparison of species abundance between locations and summarized comparison of species between the different islands.

He said for surgeonfish, Rose and Swains, the most remote and least inhabited islands tend to have a higher density. Tutuila seems to be lowest. He added that there was a similar trend for the snapper. For jacks, Rose and Swains are also high. Tutuila and the Manua group are lower in comparison.

He said parrotfish showed somewhat of a different trend. Swains is very low. Tutuila is about average for parrotfish here, looking at biomass. For grouper, Tutuila is the lowest grouper density. Rose and Swains are a bit higher.

5.F. Guam Offshore Project

Paul Bartram provided an update on the initiative of the Guam boating community and the University of Guam for the offshore banks. He said the purpose of the project is to involve and empower Guam's offshore fishermen in all facets of bottomfish management and foster place-based management of this fishery.

One of the primary objectives of this project is to gather greater spatial and temporal resolution of bottomfish information.

Fisheries Data: Fishermen participating in the project would record their catch by species, by specific location (GPS where possible) and depth. They would also provide information on the hours of bottomfishing and record the date, weather, currents, moon phase (to index or "calibrate" CPUE and relate to life history data.

Biological Data: As the fish enter the Guam Fishermen's Coop, the Coop would record the length and weight of each fish and ID each individual fish for later cross referencing. They would also weigh the gonads of each fish in order to obtain information on spawning size and identify spawning seasons by bank.

The information would be collected and administered by the Guam Fishermen's Coop and analyses would be done by working with the University of Guam, marine biologist.

Bartram identified several logistical issues with collection of the biological information as this must be done without interrupting the Guam Fishermen's Coop business operations.

He noted this would be a long term project as it would require time to collect and analyze the data to identify spawning seasons and sizes by bank. He noted that using this information, Guam fishermen could learn more about their stocks and develop true community based methods to conserve the stocks. One of the ideas is to develop an informational brochure for fishermen with voluntary guidelines on when and where it would be appropriate to catch bottomfish.

Bartram said that in Guam, community "peer pressure" is an effective incentive for fishermen to follow any guidelines that is developed by this project.

5.G Public Comments

Joe Detling asked that the SSC also consider allowing NWHI commercial pelagic trollers to retain uku and kahala (both bottomfish management unit species) as they are frequently caught while trolling for pelagic. He added that these species are more pelagic than they are bottomfish and should be categorized accordingly. He also asked the SSC to look into the developing seamount fishery which harvests, monchong, walu and deep-water moi.

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6. Protected Species

A. Update on protected species issues

Irene Kinan provided the 93rd SSC with updates on year three of the Council's turtle programs and on the outcome of the Third Turtle Advisory Committee Meeting. **The SSC notes with pleasure the ongoing success of the turtle conservation projects and encourages continuation of these projects.**

Regarding the TAC's recommendation that Council staff develop an exit strategy for the PNG project that is designed to protect and bolster leatherback hatchling production, **the SSC suggested that the Council collaborate with Bishop Museum field station and its efforts in PNG.** Another suggestion was made to involve the Peace Corps, which often undertakes such country-wide or region-wide projects.

The SSC also suggested that the TAC become more involved in PIFSC-led efforts (elements that the Council collaborates in) to persuade fishermen to use gear (such as circle hooks and/or fish bait) that reduce impacts to turtles. The SSC recognizes the lack of information regarding dispersal patterns and habitats of 8-40cm sea turtles and recommends investigation of this topic and the involvement of fishermen to assist in this research question.

B. Monk Seal Fatty Acid Study report

Mike Seki reported that the final report on this study has not yet been received.

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Precious Corals Fisheries

7. Insular Fisheries

A. Precious Corals Management

1. Black Coral Workshop

Frank Parrish presented a report on the Black Coral Science and Management Workshop to the SSC. He said that it was a two day workshop held in April on the Hawaiian black coral fishery. The workshop was held to bring the mix of scientists, fishers, managers, industry and enforcement together to review the state of knowledge on Hawaiian black coral and identify objectives for the future.

Parrish reviewed the report by section and gave the SSC an insight to the rationale behind the matrices of objectives for science and management. The SSC agreed that the report was well-done.

2. Precious Corals Plan Team Report

Parrish presented the Precious Corals Plan Team report to the SSC. The Precious Corals Plan Team met in August to discuss issues pertaining to gold coral as well as to discuss the Black Coral Workshop Report. Parrish reviewed the recommendations of the plan team.

3. Public Comment

There was no Public Comment

4. SSC Discussion and Recommendations

The SSC discussed each plan team recommendation individually and formulated the following recommendations to the Council:

1. The SSC supports a downward revision of MSY by 25% for the Auau

Channel black coral fishery from 5000 to 3750 kg. per year, but was not presented sufficient information to support the establishment of a quota at this time. Nevertheless, as a precautionary measure, the fishery should be regulated so that harvests do not exceed this revised MSY.

2. **The SSC recommends that the Council, NMFS PIFSC, and Hawaii DAR work together to monitor and track MHI black coral harvest and prevent black coral landings from exceeding the revised MSY values for the Auau Channel fishery. The SSC requests that the plan team investigate the most effective ways of accomplishing this, and report back to SSC and Council at a subsequent date.**

3. **The SSC supports imposing a moratorium on the harvest of gold coral, both live and dead, in the Western Pacific region, accompanied by a research program to determine linear/axial growth, recruitment/mortality, and deterioration rates. The SSC recognizes that there may be potential for the harvesting of dead gold coral and encourages development of methods for distinguishing harvested dead from harvested live coral, and assessing the ecosystem functions of dead coral.**

4. **The SSC supports the plan team recommendation that the Council work with the State of Hawaii to create a black coral biological reference area where harvest would be banned except for collections related to permitted research activities.**

5. **The SSC supports the plan team recommendation that the Council study the creation of a limited access program for the MHI black coral fishery.**

The SSC commends the Precious Coral Plan Team for having performed an excellent job in conducting the 2006 Black Coral Science and Management Workshop, and the brevity and clarity of the workshop report.

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Bottomfish Fisheries

7.C.1 Bottomfish Stock Assessment

Gerard DiNardo reported that PIFSC contracted Dr. Steve Martell from the University of British Columbia to conduct a stock assessment for Hawaii bottomfish. To initiate the assessment, a workshop was held on May 1-12, 2006 to evaluate the information collection programs, quality of available data, information gaps and potential methods of conducting a stock assessment on Hawaii bottomfish resources. The stock assessment report resulting from the May workshop has been completed and reviewed. The PIFSC asked the SSC to review and comment on the draft report.

7.C.2 Fishery Independent Research Workshop

Gerard DiNardo reported on the Fisheries Independent Research Workshop that was held on September 20-21, 2006 at the East West Center. This workshop reviewed ongoing and future bottomfish research initiatives. Workshop presentations were heard on ecology and biology of Hawaii bottomfish, larval/transport modeling, the Hawaii Bottomfish Fishery, current management, bioacoustics, autonomous unmanned vehicles (AUVs), cameras, biopsy plugs, BOTCAMS, juvenile assessments, GIS assessment of habitat quality and size and current stock assessment approach and population status. A summary of workshop findings were presented in the form of short, mid and long term recommendations.

DiNardo outlined a fishery independent research project using local fishing boats to collect baseline data from areas throughout the MHI. The project intends to collect baseline information from existing closed areas and new areas before the federal and state management programs are implemented.

7.C. 3. Status of bottomfish stocks

Walter Ikehara reviewed the process for developing the status of the stocks report that is sent to Congress annually. The status determination for Hawaii bottomfish will be taken from the PIFSC final report released on September 28th. DiNardo reported that the Guam, American Samoa and CNMI bottomfish stock assessments will be completed by the end of 2006.

7.C.4. Plan Team Recommendations

Bob Moffitt reported that the Hawaii members of the Bottomfish Plan Team did meet on September 27, 2006 at the Council office to review the draft bottomfish stock assessment. A summary of the draft recommendations were provided to the SSC.

7.C.5 SSC Recommendations

Regarding bottomfish stock assessment, the SSC:

1) Recommends that bottomfish data be standardized and placed in a modern relational database such as MS Access.

2) Suggests that measures of uncertainty be incorporated into biomass projection and parameter estimates in the Martell et al report.

3) Recommends that the Council support the generation of an index of historical recreational fishing catch and effort in the MHI, for use in future stock assessments.

4) Recommends that a robust index of abundance be estimated from the commercial catch and effort data as a substitute for the current CPUE calculation method.

5) Recommends that the MHI bottomfish complex be disaggregated and analyzed as individual taxa with individual MSST. The SSC notes that some of the species included in the Martell et al analysis, such as Kahala, Uku and Taape are not true deep slope species and therefore assessment of these species should be a lower priority.

6) Recommends analysis of the bottomfish sub-stock structure by zones rather than as a single archipelagic stock.

7) Notes that some pertinent data are not being utilized for stock assessment. For example existing tagging data should be reviewed for use in this regard.

8) Recommends that fishery sampling occur in the NWHI National Marine Monument since this would provide the most reliable indicator of stock status. If such sampling is not conducted, the SSC recommends that model projections be used as a proxy for stock status in the NWHI.

Regarding the NMFS Fishery Independent Research Workshop, the SSC:

9) Supports the short, mid-, and long-term research approaches presented by PIFSC and looks forward to being updated on progress in this area.

Regarding the Bottomfish Plan Team Recommendations, the SSC:

10) Does not object to the draft Plan Team recommendations as presented.

Regarding the NWHI Bottomfish Fishery, the SSC:

11) Does not object to the proposed combining of the Hoomalu and Mau Zones given the 5 year timeframe for phasing out of the NWHI bottomfish fishery. The SSC notes that the Martell et al, analysis indicates that a potential short-term effort increase in the Mau Zone is not a cause for concern in regard to bottomfish stocks.

12) Commends the Council for doing an excellent job of managing bottomfish fisheries in the NWHI over the last 20 years. The health of these stocks is a testament to Council and MSA effectiveness.

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8. Pelagics Fisheries

A. Swordfish closure (ACTION ITEM)

Unlike 2005, the swordfish fishery reached its 'hard' limit of loggerhead turtle interactions (17) in 2006 compared to 12 interactions in 2005. There were only 2 leatherback interactions in 2006 compared to 8 interactions in 2005. Current regulations allow for a seven day period to shut down the swordfish fishery following reaching of the hard loggerhead (& leatherback) turtle limit. However, there is a danger that continued fishing might catch additional turtles in this seven day grace period. This would require NMFS to initiate consultation under Section 7 of the Endangered Species Act.

The swordfish fishery was closed by emergency rule in 2006 within three days of the catch of the 17th loggerhead turtle. However, an emergency rule may only last for one year. There were 30 vessels fishing at time of closure which meant that they all had swordfish to unload on returning to Honolulu. Several vessels held back catch to avoid flooding the market in Honolulu and lowering prices. However, this had an effect on quality of fish during later unloading. Given the circumstances surrounding the closure it appears that there needs to be a better mechanism to alert vessels when the hard limit is being approached, so as to give fishermen advanced warning of impending closure and to prevent adverse impacts on markets and other factors.

The SSC reviewed options for modifying the swordfish longline regulations similar to those presented previously at its 92nd meeting. **At this time the SSC had recommended the modification of the existing regulations to close the fishery immediately upon reaching either turtle cap. At its 93rd meeting, the SSC saw no reason to change that recommendation.**

B. Shark management (ACTION ITEM)

The SSC reviewed information on the catches of sharks by the Hawaii longline fishery, and its previous recommendations with respect to limits on shark landings by this fishery, which stemmed from concerns about shark finning and the use of demersal longline gear to catch

sharks. These included the following options:

1. No action: continue current management under PFMP

2. Implement a non blue shark trip limit

3. Implement a non-blue shark annual quota

4. Introduce gear modifications to minimize shark catches

5. Implement handling and release guidelines

Since the development of the original amendment to the PFMP (Am 9), the retention and finning of large numbers of sharks in the HLL fishery has ceased due to the federal shark finning ban in 2000. Moreover, the implementation of the CREFMP had dealt with the issues surrounding the use of demersal longline fishing for sharks. **Therefore, the SSC supports option 1, no action: continue current management under PFMP. With respect to option 4 concerning gear regulations, the SSC supports gear research but not imposition of regulations at this time.**

Regarding shark viewing options, SSC recommends option 2, that is to conduct research on shark movement, behavior, and population numbers in and around the North Shore of O'ahu. The SSC suggests that any evaluation of shark viewing activity should study social and economic benefits to business operators and clients, costs and benefits to the economy as a whole, and considerations to public health and safety.

The SSC recalls that it has previously requested an improved study of this activity and notes that it has yet to see an improved study design. The SSC furthermore suggests that any regulatory action of this activity be considered in the context of a community based ocean use plan similar for example to developments used in French Polynesia.

C. American Samoa FADs (ACTION ITEM)

The SSC has heard that despite the implementation of 50 nm area closures to pelagic fishing vessels of > 50ft, trollers fishing around Tutuila (the main island of American Samoa) wanted additional protection from competition with small-scale *alia* longliners. Troll fishermen have expressed concerns that troll fishing CPUEs around Tutuila have declined since the advent of the longline fishery. At its June 2005, meeting the Council requested staff to look at the potential for implementing 5 nm longline exclusion zones around FADs deployed around Tutuila. Subsequently, at its 133rd meeting in American Samoa, the Council directed staff to draft a range of preliminary alternatives and analyses regarding longline area closures around American Samoa's FADs.

Regarding a request to the Council for action from recreational trollers for a longline exclusion zone around FADs around Tutuila, American Samoa, the SSC notes that this is

an allocation issue and not a conservation concern. Therefore the SSC has no recommendations on this issue.

D. Analysis of swordfish longline observer data

Eric Gilman presented a preliminary analysis of the observer data from 1994-1999 and 2004-2006 for the Hawaii longline fishery segment that targets swordfish. The 1994-1999 data cover the period when there were no additional management measures for the swordfish segment of the fishery requiring circle hooks and mackerel bait, which were implemented in 2004, along with other measures such as a 50% effort limitation in numbers of sets and hard caps on the number of loggerhead (17) and leatherback (16) interactions. Analyses of observer program data show that following the introduction of the regulations, capture rates of leatherback and loggerhead turtles declined significantly by 82.8% and 90.0%, respectively. The swordfish catch rate was significantly higher by 16.0%. However, the combined tuna species and combined mahimahi, opah, and wahoo catch rates were significantly lower by 50.0% and 34.1%, respectively. The shark catch rate was 36% lower.

There was considerable discussion arising from Gilman's presentation, relative to agenda item 8A on modifying the swordfish closure. According to Gilman, the swordfish fishermen appeared to be not interested in collaborating to either spreading effort over the first and second quarters to avoid reaching the turtle cap, or in communicating the locations of turtle interactions so as other vessels may avoid these areas. It was suggested that the results of this study be presented to the longline fishermen to show them the utility of communicating and collaboration to minimize sea turtle interactions.

E. Hawaii longline fishery research

1. Minimizing bycatch of loggerhead turtles based on a prediction of the transitional frontal structure

Evan Howell presented an analysis of oceanographic data which was conducted to characterize and ultimately predict the region where the highest loggerhead turtle bycatch by the Hawaii longline fishery occurs. Turtle interaction data from the Hawaii longline observer logbooks was used in conjunction with remotely-sensed oceanographic data to characterize the oceanic habitat in the transition zone where the highest historical interactions have been reported. This study also focused on the years 2005 and 2006 where there was 100% coverage of swordfish sets to attempt to delineate areas of high turtle interactions from regions of high swordfish CPUE from environmental variables. Further research will explore forecasting monthly or seasonal maps of the regions where higher probabilities of turtle interactions are expected. The final product would be a turtle interaction probability prediction map for each month in the first quarter of the year based on previous oceanographic conditions.

2. A model for predicting turtle bycatch and effort under a take cap

Stephen Stohs of the NMFS Southwest Region presented a Poisson probability model of protected species take risk to more accurately describe the economic and biological risks facing

fisheries managers in cases where protected species take is a concern. He explained that explicitly modeling the risk will potentially lead to more defensible predictions for the range of likely future experience than can be obtained by assuming a deterministic proportional relationship between fishing effort and bycatch. Stohs discussed the application of this model to fisheries where bycatch of protected marine turtles is an ongoing concern, including the California-Oregon drift gillnet fishery and the Hawaii longline fishery.

3. Impact of the swordfish fishery closures on the Hawaii fish market and industry

Minling Pan and Timothy Ming presented an analysis of the impact of the swordfish fishery closure on the Hawaii fish market and fishing industry. Historically, swordfish generates a substantial amount of revenue for the fisheries. In 2005, 2.30 million pounds of swordfish sold on the auction floor valuing $7.53 million. During the first four months of 2006, UFA accepted 1.43 million pounds of swordfish valued at $4.18 million. The closure of the swordfish fishery immediately created an economic backlash that adversely affects local fishers and dealers. Four aspects of economic losses were investigated as possible adverse impacts to the fisheries: (1) waiting time in the docks; (2) the amount of unsold fish, (3) declining fish price, and (4) loss of potential business to fish dealers.

Monthly prices for swordfish at the auction were lower in 2006 compared to monthly prices 2005. The average price for the first four months in 2005 was $3.40 per pound and the average price in 2006 was $2.88 per pound. Dealers of swordfish also suffered from the 2006 swordfish fishery closure as swordfish could no longer be a commodity to sell in the markets for the remainder of this calendar year. Major local exporters of swordfish have, consequently, decided to focus their efforts finding buyers for other species of fish or have temporarily switched to other businesses to cover their losses. Swordfish revenue, however, is now lost revenue for dealers this year and is considered irreplaceable by substitutes.

4. Implications of bio-economic model for estimating management trade-offs for the Hawaii longline fishery

Minling Pan and Shichao Li presented a study which modeled management trade offs for the Hawaii longline fishery. The objective of the study was to provide timely scientific advice for Hawaii longline fishery management regarding optimization of the fishing opportunity under the current sea turtle cap. This presentation illustrated the application of the bio-economic model to evaluate possible management alternatives of season-area closure for the Hawaii swordfish fishery. The cap of annual allowable interaction limit of 17 loggerhead turtles or 16 leatherback turtles was integrated into the model for selecting alternative scenarios. From the distribution pattern of sea turtle takes, net revenues and fishing sets by month, by latitude and by longitude, this study simulated results of the net revenue changes of the Hawaii longline fishery in response to the seasonal closures (1-12 months), year-round area closure (one area, two areas, and three areas), and merged time-area closures (one time-area closure, two time-area closures, and three time-area closures) for each set type.

F. American Samoa and Hawaii Longline quarterly reports

Reports were given on the 2nd quarter 2006 for the two federally managed longline fisheries in the Western Pacific. A total of 113 Hawaii longliners conducted 357 trips, making nearly 4000 sets deploying 8.1 million hook. There was some discussion about the ability of longline vessels to switch from swordfish to tuna longlining once the turtle cap was reached, and about the seasonal concentration of effort in the US EEZ around Hawaii. **The SSC noted the upward trend in mahi mahi catches in the Hawaii longline fishery and asked for further information on mahi mahi CPUE in the longline fishery at its next meeting. Moreover, since the SSC also asked for information on the CPUE of mako and thresher sharks since there also appeared to be an upward trend in the numbers of these species landed by the Hawaii longline fishery, as noted under agenda item 8B.**

In American Samoa a total of 24 vessels set 2.8 million hooks. Catches comprised predominantly albacore, with catch rates improving from the poor performance in the fishery since 2004 and 2005.

G. Pelagic stock assessments

A synopsis was given by Keith Bigelow (PIFSC) of the most recent pelagic stock assessments from the WCPFC's Science Committee in August 2006. These included WCPO Bigeye, WCPO Yellowfin S. Pacific Albacore, SW Pacific Swordfish and SW Pacific Striped Marlin. The results for WCPO Bigeye and WCPO yellowfin were essentially unchanged, with the stocks being subject to over fishing but with the biomass being greater than that which would generate MSY. Bigelow noted that in order to maintain the bigeye stock at a level capable of producing the maximum sustainable yield the WCPFC Scientific Committee had recommended a 25% reduction in fishing mortality from the average levels for 2001-2004. If the Commission wishesd to maintain equilibrium average biomass at levels above BMSY, further reductions would be required In order to maintain the yellowfin stock at a level capable of producing the maximum sustainable yield the Scientific Committee had recommended a 10% reduction in fishing mortality from the average levels for 2001-2004.

Bigelow reported that no new assessment was conducted for skipjack in 2006 The 2005 stock assessment indicates over fishing is not occurring (Fcurrent / FMSY < 1), that the stock is not in an overfished state (Bcurrent / BMSY > 1) and that exploitation is modest relative to the stock's biological potential. A full stock assessment was not undertaken for South Pacific albacore in 2006, but the 2005 assessment was updated using new data for 2004-2005. The key conclusions were similar to those of the 2003 and 2005 assessments, i.e. that overfishing is not occurring and the stock is not in an over-fished state. Overall, fishery impacts on the total biomass are low (10%), although considerably higher impacts occur for the portion of the population vulnerable to longline.

Bigelow reported that the relative changes in total stock biomass of SW Pacific Swordfish predict that the biomass in 2004 was between 56% and 74% of the biomass in 1995. The total biomass in 2004 was between 31% and 69% of the unfished level. Spawning stock biomass in 2004 was between 15% and 65% of the unfished level. Most projections undertaken using 2004

effort levels predicted further declines in biomass over the next five years.

With respect to SW Pacific Striped Marlin, on the basis of this preliminary assessment, it is recommended as a precautionary measure that there should be no increase in fishing mortality (i.e. fishing effort) on striped marlin in the southwestern Pacific. This recommendation applies particularly to the area encompassing the Coral Sea and the Tasman Sea as these fisheries account for most of the striped marlin catch in the southwest Pacific.

H. HMS quotas and data

The Western Pacific Region is already subject to national longline quotas for bigeye tuna (BET) for the EPO and the WCPO stemming from the two RFMOs. Dalzell noted that there both long-term and short-term implications for the Council. In the short term what actions should the Council take to optimize BET allocations for the US Western Pacific? Whereas, in the long term, what should the Council recommend to the US delegation to WCPFC to conserve BET. This includes the allocation of the 2000 mt BET quotas to the US territories, and whether the Council should ultimately develop individual transferable quotas for longline vessels in the Western Pacific Region. It was also noted that there was

Dalzell explained to the SSC that in regional fisheries management organizations (RFMOs), the term "charter" is generally applied to a vessel that is operating under the control of a country other than its flag state. In other words, countries not utilizing their 2,000 mt limit have a mechanism whereby they can enter into charter agreements with foreign vessels allowing them access to fish in their EEZs. Examples of such arrangements were given for various nations around the Pacific such as Tonga, where Chinese vessels are entering into an arrangement to fish from Tonga and make use of Tonga's 2000 mt bigeye allocation. Dalzell noted that there was an urgent need for policy to be developed concerning how these developing Pacific Island State members to manage their 2,000 mt need BET allocation such that the result is not total annual harvest at levels of BET which exceed BMSY, as stated in the WCPFC resolution on tuna conservation.

There is concern, however, that unregulated use of charters may lead to an increase or transfer in fishing effort that could undermine the effectiveness of Commission measures. Section 204 of the MSA allows for authorization of foreign fishing within the EEZ adjacent to a PIA through a permit authorized under a PIAFA agreement, however, this provision has not yet been utilized. Now that the bigeye U.S. harvest level is being allocated through the WCPFC there may be some future interest in PIAFAs. However, there is no mechanism, however, whereby island nations may transfer their unused BET quotas domestically, such as between U.S. territories and the United States.

The SSC recommends that the US delegation to the WCPFC pursue policies which would include the administration of any tuna quota under the Magnuson-Stevens Act, implement effective conservation measures such as limited entry programs for longline fisheries across the WCPFC convention area, and support the development of pelagic fisheries in the US territories.

Further the SSC also recommends that some form of monitoring implemented by WCPFC which would report the number of pieces of bigeye caught by of purse seiners. If properly designed this action would identify those vessels which are catching large volumes of juvenile bigeye tuna, and would help to improve understanding of the ecosystem impacts of juvenile bigeye fishing mortality.

I. BET quota in the EPO

Dave Hamm (PIFSC) provided an overview of some of the difficulties inherent in generating real-time estimates of bigeye catches in the Eastern Pacific Ocean based on logbook catches as opposed to daily reports from vessels. Hamm noted that although there are still challenges in monitoring the quota through logbooks, PIFSC have made great strides in improving the accuracy of the methods employed.

J. PIFSC International fisheries capabilities

The responsibilities stemming from both the WCPFC and IATTC regional fishery management organizations (RFMOs) are increasing. Currently, there are now few months of the year when there is not some meeting being conducted under the aegis of these two RFMOs. Moreover, there are also other important international fisheries meetings occurring in 2007 such as a joint meeting of all tuna RFMOs in January.

K. International Fisheries

1. IATTC Annual Meeting
2. WCPFC (Science Committee, Northern Committee , Compliance Committee, Plenary)
3. Council South Pacific Albacore Workshop

Paul Dalzell and Erig Kingman gave summaries of the annual meetings of the Pacific RFMOs or their subsidiary bodies. Dalzell noted that the recent IATTC meeting in Korea had been problematic with the meeting failing to select a chair until half way through the meeting duration. The conservation resolution for 2007 was an interim measure by mean that the US quota (500 mt) was a more realistic quota level that the previous resolution.

Dalzell briefly reviewed the Science Committee and Northern Committee reports. These included the following items for consideration:

- A review of the fisheries in the Western and Central Pacific Fisheries Commission Convention Area (WCP-CA) and the Eastern Pacific Ocean;
- A review of the key stocks, including bigeye, yellowfin, skipjack and South Pacific albacore tunas, as well as swordfish and striped marlin in the southwest Pacific Ocean, with a focus on requests for advice and recommendations arising from the second regular session of the Commission at Pohnpei, Federated States of Micronesia in December 2005
- By-catch mitigation issues associated with sea birds, sea turtles and juvenile bigeye and yellowfin

- Issues associated with the priorities and objectives of the regional observer programme
- Data confidentiality and dissemination
- Cooperation with other relevant organizations
- The special requirements of small island developing states and territories;
- The future work program for the Scientific Committee
- Administrative matters associated with the functioning of the Scientific Committee.

Dalzell noted that the stock assessments were covered under item 8 G, and expanded on the bycatch mitigation measures covered by the Ecosystem and Bycatch Specialist Working Group EBSWG), of which he was the chair. Following the EBSWG session, the Science Committee recommended a suite of mitigation measures to WCPFC, and advice on the implementation of circle hooks in longline fisheries and turtle mitigation measures in general.

Eric Kingma reviewed the work of the WCPFC Compliance Committee, which among other issues focused on a regional VMS program, regional observer program and boarding procedures. Kingma noted that many decisions on these issues were deferred but that there may be a decision on the VMS program at WCPFC3 in December.

Dalzell reported on the Council's Workshop on South Pacific Albacore longline fisheries, held in Honolulu, between September 19-21, 2006. Dalzell explained that the meeting which stemmed initially from a Council recommendation in 2002 for fishery scientists and managers from Samoa and American Samoa to begin looking at research and management issues of mutual interest with respect to their longline fisheries. However, all the Pacific Islands longline fisheries south of the equator have a substantial albacore component in their catches, and some fisheries such as Samoa and American Samoa, are highly dependant on albacore for the continuity of their longline industries. The Workshop provided the countries and territories of the South Pacific with domestic longline fisheries catching albacore a greater opportunity to exchange views and perspectives on issues important to the long term continuity of their fisheries. The meeting also provided more opportunities to review biological and economic research on albacore, albacore stock assessments and trends in domestic longline fisheries targeting albacore in the South Pacific.

There were several recommendations arising from the Workshop including a recommendation that this forum focusing on South Pacific Albacore and issues and other species of mutual interest (e.g. South Pacific swordfish) be reconvened on a regular basis, possibly in conjunction with one of the meetings of the regional fishery organizations. The Workshop also underscored the key importance of the Pago Pago canneries to the long term continuity of South Pacific longline fisheries, especially to the countries clustered around the American Samoa EEZ (Cook Is, Niue, Tonga, and Samoa) and more broadly across the region. The Workshop recommends that the Secretariat convey these sentiments to the appropriate US Government Agencies and to the American Fishermen’s Research Foundation. Other recommendations included research on factors affecting the abundance of South Pacific albacore, encouragement for the Forum Fisheries Agency to conduct further research on economic indicators for these Pacific Islands domestic longline fisheries and ways to improve collaboration and cooperation between the participating countries and territories at the workshop.

The SSC expressed their appreciation to the Council for convening the South Pacific Albacore Longline Workshop, concurred with the sentiments expressed by Workshop participants regarding the utility of this forum and with the recommendations made by the Workshop participants. The SSC encouraged the Council to convene additional albacore South Pacific longline workshops in the future.