WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

Draft Report of Mariana Archipelago Fishery Ecosystem Plan Team Meeting

Wednesday and Thursday, January 19-20, 2011
Guam Hilton
Tumon, Guam
9 a.m. – 4 p.m.

DAY 1-January 19, 2011

1. Welcome and Introductions

Andrew Torres (PIRO), Justin Hospital (PIFSC-socioeconomics), Ben Richards (PIFSC-stock assessment), Brent Tibbats (DAWR), David Hamm (PIFSC), Michael Quach (WPacFIN), Bin Wei (WPacFIN), Michael Tenorio (DFW), Tom Flores (DAWR), Cecilio Raiukiulipiy (AP), and John Gourley (Consultant). Other in attendance included Layla Madge (sp?) (Anthropologist with consulting firm-Impact Assessment-small scale fisheries research), Manny Duenas (GFCA), Eric Cruz (PIFSC-JIMAR), Kendall Wong (PIFG) and Clay Tam (PIFG). Council staff included Mark Mitsuyasu, Joshua DeMello, and Marlowe Sabater.

2. Status of Fishery Monitoring Programs and Research Projects

A. DAWR

Brent presented preliminary tables and graphs on Guam's coral reef data and species that was presented at last year's meeting and updated the totals for 2010. Information presented was based on methods and gears used in the fishery and described a history of the data set which was divided by shore based and boat based. The data included expanded catch and CPUE as well as the commercial information. A problem with the expansion of the shorebased CREMUS throw net fishery was noted as a spike in 2009 brought about by the rabbit fish landing. The run is due to juvenile harvest which is a pulse fishery that may have been treated as a regular survey run. Pulse fishery cannot be properly handled by the expansion process.

There are a lot of refusals from the local fishermen in the data collection process especially high liners. These refusals result in the underestimation of the catch. However, mandatory reporting may be useful but there is still community resistance. The Guam Coop operates the voluntary reporting program which provides information to WPacFIN. It was identified that there need for outreach on importance of data collection and to engage the fishing community to identify incentives for providing data.

Plan Team recommends the Council provide additional resources on island to provide education and outreach materials to assist in data collection.

Tom presented on BF data; CPUE, landings, and revenue declined in 2010; Price and number of boats increased in 2010. He noted that he didn't have a chance to compare last year and this year's data. He presented a historical summary of BMUS species; 353 unique boats went BF;

about 555 for all methods. 65-70% of fishermen engage in some kind of BF over the year. There was a decrease in catch, CPE and price with a slight increase in the number of boats fishing. There were more encounters with the deep bottomfish fisherman. Access to the southern banks for the shallow fishermen has been restricted by the military. The creation of the PADI reserve had affected the decrease in shallow bottomfish fishermen. Several fishermen has been arrested and kept away from these areas. Even if the number of boats increased the number of trips per boat had decreased. The charter trips remained the same.

B. DFW

Michael Tenorio provided an overview of the CNMI coral reef fishery. The report was based on the draft Marianas Archipelago Fishery Ecosystem Plan 2009 Annual Report generated by the WPRFMC contractor. The major issue of the encountered by DFW was the shortage in man hours to conduct the survey due to cut backs in the operation hours. Increase in fuel prices also contributed to the decrease in fishery participation.

John Gourley mentioned that the report has been formatted by political boundary. The CNMI data could be misinterpreted since most of the data collection is concentrated in Saipan and Tinian and not include the northern islands.

C. PIFSC/WPacFIN

i. Report on 2010 Marianas Research Cruise David Hamm

David presented the various research cruises of the Pacific Island Fishery Science Center:

- NOAA insular surveys done on Feb 11-March 14, 2010;
- Cetacean survey (Jan 20 – Feb 6);
- Marianas Insular survey (Feb 11-Mar 14);
- Marianas Pelagic survey (Mar 20-April 20);

The main goal is to conduct benthic habitat mapping, quantitatively looking at banks deep reef assemblages; assess feasibility of non-extractive sampling gear (baited cameras, AUV, acoustics, etc) and calibrate camera/non-extractive with extractive methods (but didn't get to do extractive methods at this time-went back during summer 2010 to do the fishing experiments); support NOAA's Teacher at Sea Program;

Dave presented some of the information collected-multibeam bathymetric maps; AUV and Towed Optical Assessment Device (TOAD); baited camera stations (baited remote underwater video stations (from UOG-small scale botcam) and BotCams; Acoustics (echosounding); showed a breakdown of all the places they deployed surveys and total square miles.

Presented other notes: Hosted HS teacher under NOAA Teacher at sea program; Cooperative fish sampling conducted in July 2010

Ben Richards added that HI Cruise is set for Feb-Mar 201. He expressed that there is a need to figure out how to compare the results of the different methods and its outputs.

Manny Duenas inquired about water quality monitoring in the Marianas such as temperature, salinity, and dissolved oxygen and how the military exercises will affect such parameters and

could affect the fish resources. Ben Richards replied that CRED monitors the water quality and temperature during the cruise and long-term trends can be plotted but won't capture episodic events like weapons release.

ii. Bottomfish Offshore Monitoring **Clay Tam**

Clay Tam introduced the Pacific Islands Fisheries Group. PIFG works with the fishing community to enhance sustainable fishery using awareness and conservation practices. PIFG has been contracted through the Cooperative Research Program to conduct offshore bottomfish tagging project, implement a pilot fishery independent survey for bottomfish in waters around Oahu, Maui and Guam, expand on fishery dependent sampling of bottomfish in the MHI.

The fishery independent data collection involved test fishing of bottomfish on selected banks to determine biomass found on the banks followed by tagging.The project relied on the previous NMFS research cruise that utilized botcam and acoustic equipment to assess deep species complex and biomass. This was followed up through targeted observered bottomfish trips. Biosampling through the PIFSC program was included under this project.

Bottomfish tagging aimed to monitor the movement of fish, growth rates of deep 7, assess species distribution by area, test of safe release of fish (against barotraumas). Opakapaka moved from Penguin banks to Oahu and from Molokai to Lanai. PIFSC requested PIFG to explain this project to Guam under the second year funding.

iii. Report on PIFSC Bio-Sampling Program **Dave Hamm**

David reported the PIFSC biosampling program and noted that Hawaii has had lots of resources so the focus of their effort has been on the other island areas. Hamm mentioned that the Council hosted a BioSampling Workshop in 2009 in Guam in which fishery agency staff participated from American Samoa, Guam and CNMI. Since then PIFSC has hired Eric Cruz to conduct the biosampling in Guam. PIFSC contracted John Gourley in CNMI to intiate the collection of biosamples from local markets. Biosampled are collected for DNA barcode of life; Gonads for sex/ripeness; otoliths and bomb carbon dating for ages; length and weight for ratios; etc.

Hamm also reported that Eric Cruz supported the bottomfish observer trips last summer by collecting and processing bio-samples from all fish caught and recorded through the project previously reported by Clay Tam.

iv. Small Boat Economic Survey **Justin Hospital**

Justin Hospital presented the Marianas Boat-Based Fishing Valuation survey noting that fishing is important in Guam and CNMI. They are seeking to collect baseline information that will be valuable for future management of these fisheries. This study is called for under the Council's 5 year Research Priorities under MSA. The project will be survey based as was done in the Hawaiian Bottomfish Fishery. It is not an ongoing project and fisherman will only be interviewed once. PIFG was awarded the contract for implementation. It is a mixed mode of implementation combining survey booklets with return postage and intercept interview. A sample size of 300 fishermen is to be targeted to allow comparison between Guam and CNMI. This survey covers fisher behavior, fisher classification, market participation, vessel

characteristics, trip costs, fishing expenditures and other economic factors. The survey is still being reviewed by OMB but should be approved by March or April this year.

D. PIRO

i. 5-year EFH/HAPC Review **Andrew Torres**

Andrew Torres provided an overview and background on the EFH/HAPC Review process. Currently, PIRO has hired a contractor to review the current EFH/HAPC designations for bottomfish in the Mariana Islands and American Samoa. Michael Park from PIFSC has been working with Chris Kelley at HURL to conduct the literature review and develop recommendations for change

E. Community Monitoring **Michael Duenas**

Manny Duenas gave a brief presentation on the voluntary community reporting program that deals with reporting of catch and effort through the GCFA for management purposes. The Coop implemented the program 3 years ago by creating a receipt book system. Other fishermen call in the information. Compliance by fishermen brining in and reporting their catch has improved. As incentives, the Coop would ask for the information and provide free cleaning of their fish for that information. Participation in the survey is increasing as non-coop fishermen are now bringing their fish in to the Coop to be recorded and cleaned. Duenas noted that the receipt books are getting costly and needs to be improved. Carbonless copy books should be produced to ease reporting. The Team noted that support should be provided to produce those books.

F. Coral Reef Funded Projects

i. Guam Projects **Guam Plan Team Members**

Mitsuyasu asked the Team members to provide an overview of the coral reef related projects currently being conducted in their area and also list the projects that they know will be done in the future. Guam Team members noted the following projects:

- Life history project for emperor fish Lethrinus harak;
- Identifying spawning aggregation sites for surgeon, snappers and groupers;
- Rehabilitating freshwater habitats and reservoir through restocking and habitat enhancement;
- Using rabbitfish as an indicator species for pollution effects on reef fish population (physiological assays on fish liver whether the pollution trigger is turned on when exposed to PCBs);
- Laurie Raymundo to submit a coral reef rehabilitation project for watershed rebuilding;
- UOG received funding for invasive species work to identify new species seen on reefs and mapping of sighting/collection location to monitor spreading of invasive species. This contributes to the Biosecurity Plan;
- The next CRED cruise to Marianas is March April 2011

Dave Hamm noted that many research projects done by local agencies and temporary contractors are often lost for whatever reason. There is a need to establish a repository offsite to ensure backup files are created and archived. This could be done through the WPacFIN main frame. Manny Duenas suggested that if this is to be done, caveats need to be placed on the data to ensure that the data will not be misinterpreted.

Andrew Torres commented on developing an off-site back up facility to store data and other important information from the island areas. Many research projects have been done and data has been collected by people, but often the data and research is lost. WPacFIN proposes to house all this data and research to provide a centralized place to archive the data/create a repository.

ii. CNMI Projects **CNMI Plan Team Members**

Mike Tenorio reported on the following projects in CNMI:

- CRM has Laulau bay watershed project, which includes education and outreach programs;
- CRM humphead wrasse project;
- PMRI money for training;
- CRI proposal to expand creel program;
- Council's oceanographic sensor project, which is waiting Coast Guard approval for for deployment;
- Life history projects focusing on bottomfish -otoliths, gonads (for Kalekale-Pristipimoides auricilla);
- Completed orangespine surgeonfish

Cecilio Raiukiulipiy stated that the marine rehab money from DJ funding programs was used to build new ramps for the Marina.

John Gourley raised an inquiry on the status of Starmer's funded project to do humphead and bumphead dynamic stock assessment model and archipelagic plan wherein DAWR and UOG were identified as collaborators. None of the PT members are aware of the status and it is better to ask UOG c/o Jenny McIlwain.

G. Other Initiatives

Andrew Torres announced that an FR Notice came out for MET/CDPP funding availability. Joe Paneta has cultural fishing ideas; Mike Gawel interested in partnering in stuff;

Josh DeMello went over the Council 2010 and 2011 Grant Projects from CRCP and WSSF funding.

2010 - Characterizing the spearfishing fishery. Finding an alternative way of collecting the data. Look at the spatial distribution of the spearfishery. Building capacity in the island areas involving local kids to get higher degree in marine science research and stock assessment on coral reef species. Assess the recreational coral reef fishery. Support HMRFF and creel survey in Guam and CNMI. Look at the existing data and analyze the data for the recreational fishery. Coordinate with local community for the life history project through training workshop on the island areas. Coral reef fishery ecosystem assessment looking into the impacts of perturbation aside from fishing.

2011 – Community monitoring with Jason Biggs. Pollution assessment and impacts of coral reefs.

3. Update on Marianas Recommendations from 2009 Fishery Data Workshop

Council staff presented an overview of the 2009 recommendation Fishery Data Workshop. For Guam, (1) data digging for the spearfish fishery, identify data gaps and commercial data; (2) base access for data collection. For CNMI, (1) addressing fishery data gaps for Tinian and Rota; (2) to re-instate Northern Islands bottomfish survey. Commercial boats fishing in the area fails to submit fishery reports. The problem is more on education and outreach on the importance of this report. Mike Trianni will be hired as PIFSC local liaison that will address this data gaps.

4. Marianas Archipelago Fishery Ecosystem Plan draft annual report structure

The Plan Team member had a thorough discussion on structuring the annual report, data that are to be included, assignment of modules to PT members and a process on how to attain the final report products. The final report structure is attached as an appendix (Appendix 1).

The plan team supported the structure, module assignments and process by which it was agreed that first week of February of every calendar year will be the best time to meet to discuss the data. This will give time for local agencies to complete QA/QC of the data set and have WPacFIN generate the various graphs and module. The second meeting will be held in Honolulu prior to the June Council meeting in which by then the Annual Report should have been completed. The following are the PT member module assignments:

a. Graphs and data crunching - WPacFIN
b. Introduction - Council
c. Fishery Module
    i. Guam Chapter
        1. Bottomfish/Crustacean – Tom Flores
        2. Coral Reef – Brent Tibbats
    ii. CNMI Chapter
        1. Bottomfish – Mike Tenorio
        2. Coral Reef – Ray Roberto
d. Other socio-economic projects – Justin Hospital
e. University research – Jason Biggs (Guam); John Gourley (CNMI)
f. Backend stuff (Admin/enforcement/fishing community/PT actions) - Council

Council staff will follow up with PIFSC and plan team members to make sure that the data needed for the report is generated and written up in a timely manner

Ben Richards suggested that if the main goal of the reports is to determine if there is anything wrong in the fisheries and raise a red flag for attention of management, then it will be worthwhile to invest on using a data framework that can automatically detect these red flags real-time instead of writing annual reports. Parameters will have to be determined in order to achieve this process. This suggestion was noted by the PT members.

The PT recommends an initial PT meeting to review and analyze available data from previous year in early February of the following year (alternate years with American Samoa dependent upon March Council Meeting Schedule) with a follow-up meeting to finalize interpretations at a joint PT meeting in May.

DAY 2-January 20, 2011
Ray Roberto and Jason Biggs also participated on Day 2

5. Proposal for Improving Fishery Data Collection for Stock Assessments
Council staff presented MSA 5-year research priorities. The team went over the priorities that need to be addressed and what were the needs identified by the team previously.

A. Guam Proposal **Mark Mitsuyasu**
B. CNMI Proposal **Mark Mitsuyasu**

C. Discussion and Recommendations
The Plan Team recommended the following projects to enhance quality of data collection for stock assessments:

1. Staff training to enhance fish identification skills
The Plan Team recognizes that this is an ongoing process and will likely be done on a regular basis at the local agencies to be effective. There were several identified means to achieve this objective: 1) utilize electronic coral reef identification tools developed by CRED; 2) hire an external contractor (Rob Myers) to provide support, training and coordination; 3) create a waterproof key for species ID which will be useful during field operation.

2. Bolster the Bio-Sampling Program
The Plan Team supports contracting 1 FTE to support Eric Cruz on the Biosampling Program in Guam. The amount of workload for bio-sampling is beyond a one-man capacity. The Bio-sampling ceases whenever the current staff is not available resulting in gaps in the data sets and lost opportunity for sampling.

3. Additional support for the creel surveys
The Plan Team recommends augmenting the days that the government declares as furlough in CNMI. Government cutbacks resulted in decreased work hours affecting the normal creel survey operations thereby resulting in data gaps. For Guam, PT recommends supplementing the DAWR staff with 1 FTE dedicated to creel survey. The Plan Team also supports working with village mayors governing villages with large fishing pressure and explore alternative means of data collection.

4. Support on data processing
The Plan Team recommends contracting 1 FTE to process the fishery voluntary data collected by GFCA in Guam. The PT also recommends that the Council provide support in printing the voluntary logbooks for the Guam fishermen. PT recognizes that there are a several life history data that are available but are not processed in order for it to be useful

for management. PT supports the notion of assisting graduate students to work up the available data to generate reports and publications.

In addition, the Plan Team recommends a review of creel survey data to determine the validity of the data for stock assessment and management purposes (i.e. ACLs) by hiring a top-notch statistician from HQ to review the survey methods and data from the creel surveys in the WPR.

Coral Reef Grant Projects Ideas

The Plan Team had several discussions on additional potential coral reef grant projects. One project would involve support for a graduate student to work on existing data to conduct stock assessment. John Peterson from the Marianas Research Center was identified to be a person of interest. Bob Richmond from UH and Jenny McIlwain of UOG were identified as advisers that may have graduate students who are interested.

The Plan Team discussed the Characterization of Marianas Spear Fishery Project. This project aims to properly describe the fishery and ultimately determine whether it warrants additional management intervention. It was noted that SCUBA spear is being used for the boat-based lobster fishery. The PT suggested including market pathways and analysis of existing data and identifying data gaps and needs. Additional suggestion includes providing additional support to the local spearfishing tournament to win the cooperation of the spearfishers on the project.

Individual comments and notes are found in Appendix 2.

6. Council Meeting Actions

A. CNMI Bottomfish Regulatory Change to allow spear fishing of BMUS

Mark presented Daniel Luck's paper on BF in CNMI; also a problem is those spearfishermen catching bottomfish but swimming from shore (how to assign a vessel number);

B. Federal Annual Catch Limit Scoping Meetings

Mark presented the results of Richard's ACL scoping meetings

C. Discussion and Recommendations

The Plan Team recommends that if NOAA is going to force the Councils to move forward with catch shares, we should be receiving funding and resources NOW for information and data collection program upgrades to prepare for catch shares and facilitate informed decision making.

7. Other Business

PT reorganization:

Mark Mitsuyasu headed the meeting in absence of a new chairperson due to the recent PT reorganization. Included in the PT reorganization is a shift to a two 2 meeting system, one early in the year to look at data, and second meeting in summer of all PTs from other jurisdiction to generate the FINAL annual reports and discuss Council actions.

It was brought up by one PT member they DFW wants to add Trey Dunn to Plan Team membership.

8. Public Comment

There were no public comments

9. Discussion and Recommendations

In summary, the Plan Team submitted the following recommendations:

Plan Team recommends the Council provide additional resources on island to provide support and outreach for data collection in order to increase fisherman participation.

The Plan Team recommends the following for the Annual Report Structure (see appendix 1 for details):

- **Provide annual report fishery data modules by gear types important to landings**
- **Keep Guam and CNMI separate**
- **Add fishery-independent research to the fishery data section, where applicable**
- **Include crustaceans into the different methods under the CRE reports**
- **Combine Guam and CNMI for other sections (bycatch, economic, etc)**

The Plan Team recommends an initial PT meeting to review and analyze available data from previous year in early February of the following year (alternate years with American Samoa dependent upon March Council Meeting Schedule) with a follow-up meeting to finalize interpretations at a joint PT meeting in Honolulu prior to June Council Meeting.

The Plan Team recommends an external review of creel survey data to determine the validity of the data for stock assessment and management purposes (i.e. ACLs).
(Data Workshop Recommendation #14)

The Plan Team recommends that if NOAA is going to force the Councils to move forward with catch shares, we should be receiving funding and resources NOW for information and data collection program upgrades to prepare for catch shares and facilitate informed decision making.

The Plan Team supports the following proposals for improving fishery data collection for stock assessments in the Marianas as presented:

1. Staff training to enhance fish identification skills

The Plan Team recognizes that this is an ongoing process and will likely be done on a regular basis at the local agencies to be effective. There were several identified means to achieve this objective: 1) utilize electronic coral reef identification tools developed by CRED; 2) hire an external contractor (Rob Myers) to provide support, training and coordination; 3) create a waterproof key for species ID which will be useful during field operation.

2. Bolster the Bio-Sampling Program

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In addition, the Plan Team recommends a review of creel survey data to determine the validity of the data for stock assessment and management purposes (i.e. ACLs) by hiring a top-notch statistician from HQ to review the survey methods and data from the creel surveys in the WPR.

APPENDIX 1

Structure of the Archipelagic Fishery Annual Report

The following points have been agreed upon:

1) Keep Guam and CNMI separate given that the data collection system is different;
2) There will be a General Introduction of the Marianas Archipelago Fishery
    a. Description of the Guam data collection system
    b. Description of the CNMI data collection system
    c. Description of the CRED underwater census system
3) Chapter of the Guam Fishery
    a. Fishery performance and metrics
        i. Bottomfishing metrics
            1. Catch
            2. Effort
            3. CPUE
            4. Revenue
            5. Fishery independent data (if available)
        ii. Trolling metrics
            1. Catch
            2. Effort
            3. CPUE
            4. Revenue
            5. Fishery independent data (if available)
        iii. Spearfishing metrics
            1. Catch
            2. Effort
            3. CPUE
            4. Revenue
            5. Fishery independent data (if available)
        iv. Rod and reel metrics
            1. Catch
            2. Effort
            3. CPUE
            4. Revenue
            5. Fishery independent data (if available)
        v. Shoreline spearfishing metrics
            1. Catch
            2. Effort
            3. CPUE

4. Revenue
5. Fishery independent data (if available)

vi. Throw net metrics
1. Catch
2. Effort
3. CPUE
4. Revenue
5. Fishery independent data (if available)

vii. Gleaning metrics
1. Catch
2. Effort
3. CPUE
4. Revenue
5. Fishery independent data (if available)

viii. OTHER GEAR TYPE metrics
1. Catch
2. Effort
3. CPUE
4. Revenue
5. Fishery independent data (if available)

b. Description of any bycatch in all fishery
c. Description of protected species interaction in all fishery
d. Description on non commercial fishery
e. Description on ecosystem components/habitat in all fishery
f. Status of archipelagic research
i. Local agencies
ii. Federal agencies
iii. Educational institutions (UOG)
g. Status of stock assessment
h. Fishing community
i. Community demonstration projects
ii. Outreach and education
i. Administration and enforcement actions
i. Administrative actions
ii. Enforcement actions
iii. Plan Team recommendation

4) Chapter of the CNMI Fishery
a. Fishery performance and metrics
i. Bottomfishing metrics
1. Catch

2. Effort
3. CPUE
4. Revenue
5. Fishery independent data (if available)

ii. Trolling metrics
1. Catch
2. Effort
3. CPUE
4. Revenue
5. Fishery independent data (if available)

iii. Spearfishing metrics
1. Catch
2. Effort
3. CPUE
4. Revenue
5. Fishery independent data (if available)

iv. Rod and reel metrics
1. Catch
2. Effort
3. CPUE
4. Revenue
5. Fishery independent data (if available)

v. Shoreline spearfishing metrics
1. Catch
2. Effort
3. CPUE
4. Revenue
5. Fishery independent data (if available)

vi. Throw net metrics
1. Catch
2. Effort
3. CPUE
4. Revenue
5. Fishery independent data (if available)

vii. Gleaning metrics
1. Catch
2. Effort
3. CPUE
4. Revenue
5. Fishery independent data (if available)

viii. OTHER GEAR TYPE metrics
    1. Catch
    2. Effort
    3. CPUE
    4. Revenue
    5. Fishery independent data (if available)

b. Description of any bycatch in all fishery
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d. Description on non commercial fishery
e. Description on ecosystem components/habitat in all fishery
f. Status of archipelagic research
    i. Local agencies
    ii. Federal agencies
    iii. Educational institutions (UOG)
g. Status of stock assessment
h. Fishing community
    i. Community demonstration projects
    ii. Outreach and education
i. Administration and enforcement actions
    i. Administrative actions
    ii. Enforcement actions
    iii. Plan Team recommendation

5) General Conclusion for the Marianas Archipelago

APPENDIX 2

Priority matrix for Guam and CNMI data collection improvement projects

Priority	CNMI	Guam
1	Training for new local agency staff – Fish Identification and Biosampling - Training would be done at the PIFSC Aiea Lab for Biosampling - Fish Identification will be a problem in Aiea if we have ship fish; Better to Hold separate series of ID workshops (contractor) in Marianas where fish are available - Need to think about job placement after recruiting and training	Training for new local agency staff – Fish Identification and Biosampling - Training would be done at the PIFSC Aiea Lab for Biosampling - Fish Identification will be a problem in Aiea if we have ship fish; Better to Hold separate series of ID workshops (contractor) in Marianas where fish are available - Need to think about job placement after recruiting and training
2	Bolster Bio-Sampling in CNMI - Currently supported through JG contract. - Support/contract aid to help collect/ process samples	Bolster Bio-Sampling in Guam - Currently supported through local hire – Eric Cruz - Contract 1 FTE to help collect/process samples
3	Augment the CNMI creel survey - Pickup additional days by contracting existing staff if Gov cut backs continue - Contract separate staff to conduct interviews - Pilot effort survey to validate the ratio of percent coverage of expansion factors (including Tinian and Rota)	Supplement Guam Creel Survey - Contract 1 FTE to work with DAWR staff. - Village mayors
4	Provide support to process life history data analysis -James Cook, UH (Histology prep), UOG (local otoliths) -Provide support for analysis of data to describe age and growth, sexual maturity, etc. to publish papers -Enlist graduate students to work up data	Contract FTE to process GFCA data collected from Coop members. -Voluntary Data Collection Program expanding to collect Protected Species, Ecosystem information