State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Aquatic Resources
Honolulu, Hawaii 96813

September 28, 2012

Board of Land
and Natural Resources
Honolulu, Hawaii

SUBJECT: 1) REQUEST APPROVAL TO USE NOAA FUNDING FROM THE WESTERN PACIFIC FISHERIES MANAGEMENT COUNCIL ("WESPAC") TO DEVELOP, IMPLEMENT AND IMPROVE UPON THE CURRENT DIVISION OF AQUATIC RESOURCES (DAR) ON-LINE COMMERCIAL FISHERIES MARINE LICENSING AND REPORTING SYSTEMS; AND
2) AUTHORIZE THE CHAIRPERSON TO ENTER INTO ANY RELATED AGREEMENTS AS NEEDED

This is a request to use funding from the Western Pacific Regional Fisheries Management Council ("WESPAC")to improve DAR's current licensing and reporting systems. Staff also requests authorization for the BLNR Chairperson to enter into any related agreements, if necessary.

WESPAC submitted a grant application to the National Oceanic and Atmospheric Administration (NOAA) on behalf of the Western Pacific region. The grant and funding request is to improve fisheries data collection in the Western Pacific Region (Hawaii, Guam, American Samoa, and the Commonwealth of the Northern Marianas Islands). The application is attached.

If NOAA approves the grant, WESPAC may receive up to $450,000 to improve upon DAR's current online reporting systems. Funds will be used to develop, implement, and maintain additional online reporting forms. These measures will enhance and improve the collection of commercial fisheries dependent data for fisheries management. Existing database software will be converted to new software to replicate collected data files for State use, and establish a database of collected data accessible via a new DLNR file server. These improvements will enhance fisheries management by both the State and Federal government (which relies on the State's collection of fisheries data).

RECOMMENDATIONS:

That the Board approve 1) use of NOAA funding (awarded to the Western Pacific Regional Fisheries Management Council) to develop, implement, and maintain the Division of Aquatic

Resources online reporting systems; and 2) authorize the Chairperson to negotiate and, subject to necessary approvals, enter into other necessary agreements to use the grant funds.

Respectfully submitted,

WILLIAM M. TAM
Acting Administrator

APPROVED FOR SUBMITTAL:

WILLIAM J. AILA, JR.
Chairperson

Attachment

WESTERN
PACIFIC
REGIONAL
FISHERY
MANAGEMENT
COUNCIL

Improving Fishery Data, Data Collection, and Status Reporting of the Near-Shore Fisheries in the Western Pacific Region:

Projects complementing the basic creel surveys to estimate total catch and catch per unit effort for stock assessments and Annual Catch Limits management

August 03, 2012

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COVER SHEET

Project Title:	**Improving Fishery Data, Data Collection, and Status Reporting of the Near-Shore Fisheries in the Western Pacific Region**
Applicant Organization:	Western Pacific Regional Fishery Management Council
Principle Investigator:	Kitty M. Simonds, Executive Director
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PRIORITIES ADDRESSED: The projects presented in this proposal package will be addressing the following Fishery Research Goals and Objectives described in the NMFS Strategic Plan for Fisheries Research (2007) particularly focusing on improving fishery data collection.

GOAL 1 – PROVIDE SCIENTIFICALLY SOUND INFORMATION AND AT A SUFFICIENT TO SUPPORT ECOSYSTEM-BASED FISHERY CONSERVATION ANDMANAGEMENT.

Objective 1.1: Periodically assess stocks to ascertain whether changes in their status due to natural or human-related causes have occurred. These stock assessments require adequate fishery monitoring and resource surveys and knowledge of the physical environment.

Objective 1.2: Provide stock assessments that include current and forecast abundance levels and trends, based on a comprehensive suite of ecosystem variables such as biological productivity, climatic and oceanographic information, ecological interactions, and economic and other social forces that will affect levels of fishing effort.

Objective 1.3: Determine and reduce the level of uncertainty associated with stock assessments through improved data collection and advanced analytical techniques.

Objective 1.5: Use stock assessment workshops, peer reviews, and other fora to ensure that NMFS' information and advice are developed through an open and collaborative process.

Objective 1.7: Collaborate with other management authorities and the Councils to explore and develop fishery management regimes and alternative governance systems that will effectively control exploitation and promote sustainability.

Objective 1.8: Provide guidelines to assist the Councils in assessing and specifying Maximum Sustainable Yield (MSY) for managed fisheries.

Objective 1.9: Work with the Councils to develop objective and measurable criteria for each managed stock to determine if the stock is overfished or approaching an overfished condition.

GOAL 5 – IMPROVE THE FISHERY INFORMATION SYSTEM.

Objective 5.1: Integrate and link existing regional and national fisheries information systems so that fisheries data and statistics are readily available at a regional or national level in a form that is easily utilized by fisheries managers, stock assessment scientists, other stakeholders, and the general public. Make all information accessible through a single regional or national web-enabled information portal.

Objective 5.2: Utilize a standard FIS web-enabled system (InPort) to compile and provide a metadata catalog of all critical fisheries data holdings.

Objective 5.3: Establish regional and national standards for information collection, management, and dissemination to ensure high quality, completeness, timeliness and accessibility. Implement improvements in quality control and assurance procedures for existing fisheries information collection, processing, and management activities as needed to assure the quality of fisheries information needed to support stock assessments, as well as timely monitoring of FMP compliance and related fishing quotas.

Objective 5.5: Determine minimum fisheries information needs, perform gap analyses of current data collection programs, and assure collection of information needed to fulfill the stewardship responsibilities of NOAA, the Fishery Management Councils, interstate fisheries commissions, and states.

Objective 5.7: Develop electronic systems for the collection, reporting, processing, and sharing of fisheries performance information for all major fisheries.

Geographic Location of the Project: Western Pacific Region (American Samoa, Hawaii, Guam, Northern Mariana Islands and the US Pacific Remote Islands of Palmyra Atoll, Kingman Reef, Howland, Baker and Jarvis Islands and Wake Island)

Amount of Grant Funding Requested: **$1,799,850**

Amount of Matching Funds Provided: $0

Project Start/End Date: October 1, 2012 to September 31, 2013

Summary of the Scope of the Project: This project proposal package aims to: 1) improve the fishery catch and effort estimated from creel surveys in American Samoa, Guam, and Commonwealth of Northern Mariana Islands through statistical analysis, modeling and optimization of the expansion process; 2) improve the estimation process by validating the spatial and temporal adjustment factors used in the expansion algorithms; 3) quantifying the fishery statistics from fisheries not adequately covered by the existing creel surveys design; 4) improve the fishery status reporting; 5) determine the minimum sampling size needed for a statistically valid estimation of catch and effort to support increasing the efficiency of the surveys with limited logistic resources; 6) enhance stakeholder participation in the data collection program. Four of the projects in this proposal package are interdependent and sequential where the results and products of the first project are utilized by the succeeding projects. All these projects will facilitate stock assessments of the near-shore fisheries in these island areas. These assessments will be used to upgrade the specification of annual catch limits (ACLs) from using catch only data to using MSY values generated from simple surplus production models derived from the standardized CPUEs of the creel survey time series.

PROJECT SUMMARY

(1) Status and magnitude of the issue(s) addressed in the jurisdiction where the project will occur.

The Western Pacific is the largest fishery management region in the whole United States. It is comprised of three territories of American Samoa, Guam and the Commonwealth of Northern Mariana Islands, the State of Hawaii and the Pacific Remote Island atolls. Each area has a system of collecting fishery data ranging from creel surveys to federal permit and reporting. Some of these data collection systems have been in operation for the past 30 years and yet there are only a handful of stock assessments available that can be used to make management decisions. The recent re-authorization of the Magnuson-Stevens Fishery Conservation Act that required the Councils to manage fishery stocks in federal waters to be managed through annual catch limits (ACLs) increased the need for more science to inform fishery management. The current state of the fishery data did not allow for ACL specification on higher tiers but instead settled for only reliable catch information which does not have any indication on where the stocks are in the production curve relative to the exploitation rates.

Thirty years had passed and the fishery database had not been used to its maximum potential. Several publications were generated out of these data sets but very little stock assessments. The cause of such shortcoming was no thorough statistical review was conducted on these time series to estimate level of accuracy to reflect the true status of the fishery and fish stocks. The methodology for collecting the data and the method for expansion also varied over the years thereby compounding the 30 year annual estimates. But the biggest factor that contributes to the reliability of the data set has to do with the limited capacity of the local fishery management agencies to conduct the survey in a consistent manner. Local realities such as high staff turn-over, limited training and knowledge base, cultural differences and beliefs, and limited funding play a huge role in the implementation side of data collection thereby affecting the quantity and quality of data that are being generated by this data collection systems. The funding to support the PIFSC-WPacFIN Program that provides technical support to the territories continued to decline over the past years. This limits the expansion of the data processing and upgrades in the programming as well as analysis of the existing data. The funding from Interjurisdictional Fisheries Agreement (IFA) that supports the boat-based creel survey in American Samoa, Guam and CNMI was recently cut that will result in the discontinuation of the data collection from the boat-based fisheries. The recent reduction in the Sportfish Restoration Grant program funding, the main funding source for the shore-based data collection in the Territories, will also affect maintaining the current level of data collection operations as well as the planned data improvements.

(2) Recent actions undertaken to address the issue(s).

The Council supported several data collection workshops over the years aiming to improve data collection in the different island areas. The 2000 Data Workshop aimed to identify: 1) the data needs for the fishery management plans; 2) identify the gaps in the existing data collection programs; 3) identify the solutions to sill the data gaps; and 4) review the institutional capacity to make data collection improvements. The 2006 Data Workshop aims to review the data needs, and reporting requirements for the transition of the Council's fishery management plans (FMPs) to archipelago fishery ecosystem plans (FEPs). The 2009 Data Workshop aims to gather available information to support the specification of annual catch limits. The 2011 Data Collection Improvement Workshop is a follow up on the Data 2000 Workshop seeking to enumerate additional and current data collection issues and provide solution for each prioritized issue. An evaluation of the data collection programs in the Territories was conducted through an independent contractor. The contract involved assessment of the survey design, implementation, estimation methods and expansion algorithm documentation. The evaluation was carried out in relation to suitability of the existing data collection for ACL-based management. Recommendations

from the 2011 Data Collection Improvement Workshop and the data collection evaluation contract were considered in the formulation of this project proposal.

(3) How the project will be applied towards the goals of improved data collection.

This project will, for the first time, have a holistic approach to improving the existing data and data collection by: 1) having a dedicated person overseeing the data collection and productions of fishery data and reports for the region; 2) conducting a comprehensive statistical analysis of the existing creel survey data resulting in a standardized data time series that can be used to generate biological reference points to major species/species groups for stock assessment; 3) conducting the pilot surveys to calibrate the existing creel survey data adjusting for the non-surveyed area will generate a statistically informed adjustment factors to estimate total island wide catches needed for estimating total removal and harvest rates for stock assessments; 4) total island wide estimates can be used to refine ACL specification using the current NMFS approved ABC Control Rules; 5) enhance the status reporting of the fishery stocks using biological reference point instead of simple catch, effort and CPUE time series; 6) increasing the potential of disseminating the information through online media; 7) enhancing fishermen and vendor participation by improving their understanding of the importance of data collection and reciprocating their cooperation via incentives; 8) enhancing the efficiency of the current data collection by meeting the minimum sample size requirement given the logistic limitations of each island area; 9) evaluating the contribution of the fishing methods not commonly captured by the current creel survey sampling design and those acute fishing events (recruitment runs and tournaments) on the overall fishery production; 10) finalizing data collection documentations and be made available for the stock assessment to support the Western Pacific Stock Assessment Review (WPSAR) process. These projects address the major aspect of the fishery data collection. Once completed, the whole data collection process will be streamlined from collection to reporting and ultimately stock assessment of the remaining management unit species in the Western Pacific Region. This will also conform to the established WPSAR process where data review will occur prior to the stock assessment of the scheduled MUS.

(4) Summary of the scope of work (specific tasks to be accomplished and proposed techniques).

The Western Pacific Data Coordinator will be housed at the Council Office and will report to the Council Executive Director. This position will be responsible for overseeing the data collection improvement in the Western Pacific region. This would be a salaried position and will require travel to the different Territories to follow up the project activities to completion. Majority of the funding will go to local contracts to carry out the different projects contributing to the general goal of improving the existing data, data collection implementation and data generation. Majority of the projects would involve rigorous statistical analysis of the existing data sets generating the products that could upgrade the estimation results. Fieldwork is required for the pilot surveys to determine the adjustment factors for the non-surveyed areas in the Territories and the quantification of the fishing methods and fishing events not covered by the existing creel surveys.

(5) Expected outcomes and how performance will be measured.

1. Review and optimization of existing 30-year creel survey data using statistical models to attain standardized catch, effort and CPUE for stock assessments

- Data benchmarks for the time series in all island areas;
- Optimization program and codes;
- Optimized time series of selected fisheries and species groups;
- Program codes for estimating variance in the time series; and
- Final report.

2. Developing biological reference points for priority species or species groups using fishery dependent and fishery independent data to facilitate species status determination

- Biological reference points for common species in the nearshore fisheries in American Samoa, Guam, CNMI, and Hawaii;
- Status determination reports; and
- Test stock assessment reports

3. Developing automated annual fishery status report modules, online status reporting and ACL monitoring reports
   - FEP Annual Report Modules for American Samoa, Guam, CNMI, and Hawaii;
   - Programming languages for the modules, Kobe plots, online status reports, and near-real-time landing reports;
   - Online tool/web products for the status reports and ACL landing monitoring; and
   - Documentations of the programming language

4. Pilot surveys at unsampled ports and shoreline to calibrate adjustment factors in the expansion of catch, effort and CPUE from the existing creel survey in American Samoa, Guam, and Commonwealth of Northern Mariana Islands
   - Preliminary report
   - Final report
   - Calibration factors that would be used for future and retroactive expansions

5. Developing and implementing specialized surveys to document fishing methods and event not adequately addressed by the existing creel survey
   - Preliminary report
   - Final report
   - Calibration factors that would be used for future and retroactive expansions

6. Determining coverage requirements and statistically-valid minimum sample size for all fisheries in the Western Pacific region
   - Preliminary report with recommendations on data improvements from a statistical perspective;
   - Workshop to discuss implementation of revised protocol;
   - Final report with workshop report

7. Documentation of the boat and shore-based creel survey protocol including the expansion methodology
   - American Samoa Boat-based Creel Survey Documentations (including the expansion algorithm documentations)
   - American Samoa Shore-based Creel Survey Documentations (including the expansion algorithm documentations)
   - American Samoa Boat and Shore-Based Creel Survey User-Manual
   - Guam Boat-based Creel Survey Documentations (including the expansion algorithm documentations)
   - Guam Shore-based Creel Survey Documentations (including the expansion algorithm documentations)
   - Guam Boat and Shore-Based Creel Survey User-Manual
   - Northern Mariana Islands Boat-based Creel Survey Documentations (including the expansion algorithm documentations)
   - Northern Mariana Islands Shore-based Creel Survey Documentations (including the expansion algorithm documentations)
   - Northern Mariana Islands Boat and Shore-Based Creel Survey User-Manual

8. Fishermen and vendor incentive and outreach programs to enhance participation in creel surveys and vendor reporting

- Number of fish measured;
- Number of catch interviews;
- Number of fishermen volunteering to participate versus number that declined/avoided; and
- Number of vendor report submission

9. Developing and online framework converting Hawaii's fisheries commercial trip reports and dealer reports to the web portal to enhance accuracy and timeliness of data collection for stock assessment

- Online Aquarium Fish Report
- Online Aku Boat Trip Report
- Online Deep-sea Handline Trip Report
- Online Tuna Handline Trip Report
- Online Net, Trap, Dive Activity Report
- Online Bait Report
- Online Commercial Aquarium Marine Dealer Report
- Online Commercial non-Aquarium Marine Dealer Report
- Online Personal Aquarium Cash Sales Report
- Online Personal Sales Report

(6) Anticipated partners

NOAA National Marine Fisheries Service
State of Hawaii Department of Aquatic Resources
CNMI Division of Fish and Wildlife
American Samoa Department of Marine and Wildlife Resources
Guam Department of Agriculture
Western Pacific regional Fishermen, and Fishing Suppliers

PROJECT DESCRIPTION AND BUDGET NARRATIVE

A. PERSONNEL AND ADMINISTRATION

1. Western Pacific Data Coordinator: The Council is requesting funds to support one full-time (i.e. 8 hrs/day @ 40 hrs/week) staff position directly involved with data collection program improvements. The WPDC is responsible for: (1) coordinating all activities described in this grant proposal with the appropriate federal, state, territorial, commonwealth agencies, non-governmental organizations and institutions including Council advisory bodies and the general public; (2) coordinating and monitoring all aspects of this cooperative agreement including the administration of contracts, filing of semi-annual performance reports and overseeing completion and dissemination of documents, products and materials generated from this grant; (3) preparing briefing papers, documents, reports and presentations to the Council on any activity that pertains to or may affect data collection programs in the Western Pacific Region; and (4) participating in any steering committee, advisory body, task force, working group or other form of coordinating body established by resource management agencies or organizations pertaining to data collection, where appropriate, and as assigned by the Council Executive Director. The WPDC time commitment to the Council's data collection program will be 100%.

WPDC Performance Metrics and Deliverables:

1. Generate detailed reports and presentations to the Council regarding activities and initiatives of the data collection program improvement initiatives. This is to ensure the Council is fully informed on all data collection initiatives and projects undertaken by participating members and to provide opportunities for increased coordination and collaboration in data collection efforts;

2. Prepare briefing documents and reports present this information to Plan Team members and other agencies for consideration and deliberations at each Archipelagic Plan Team meeting to ensure current information is available for any decision or recommendation;

3. Generate detailed reports and presentations to the Council and Plan Team member agencies regarding research, management and community needs and recommendations for each Archipelagic Fishery Ecosystem Plan. As a living document, FEPs utilize an adaptive management approach and rely on the information from member agencies and local communities to generate, refine and implement management programs and regulations;

4. Provide technical and coordination support to NOAA and other resource management agencies regarding data collection programs. This will include serving as a member of steering committees, assisting in the development of workshop goals and objectives, providing logistical and coordination support and presenting of technical information regarding Council activities related to data collection and improvements;

5. Coordinate the administrative processes to secure supplies necessary to support data improvement projects identified in this proposal. This will include developing request for proposals, request for quotations and other administrative requirements;

6. Coordinate logistical and administrative aspects of each contractual project and ensure that milestones identified for each project are fulfilled. Additionally, the WPDC will ensure that

reports for each project are disseminated to all project partners and disseminated widely through the Council's website or other appropriate distribution method; and

7. Participate as necessary in the execution of each project identified in this proposal.

The basic annual pay rate for this position will be $75,000. In addition, in accordance with the U.S. Office of Personnel and Management Cost Of Living Allowance (COLA) schedule for Honolulu, Hawaii, COLA for this position shall be set at 25% of the basic pay rate. The total allowance for this position, inclusive of basic pay rate and COLA shall **be $93,750.**

2. Administration: Administrative costs will be incurred for the WPDC in the leasing of office space and phone/internet services over the course of the grant (18 months).
Budget breakdown: Office lease: $48,042.17; Phone and internet service: $1,957.83
The total administrative costs: $50,000.00

TOTAL PERSONNEL AND ADMINISTRATIVE COSTS	**$143,750.00**

B. FRINGE BENEFIT

Fringe Benefit: Fringe benefits for WPDC position includes medical, dental and vision insurance, contributions to the Council's retirement plan and state and federal tax withholding. The fringe benefit package is calculated at 35% of the basic pay rate of $75,000. The total fringe benefit for the WPDC position is **$26,250.00.**

TOTAL FRINGE BENEFIT COSTS	**$26,250.00**

C. TRAVEL

The Western Pacific Region is by far, the largest and arguably the most culturally diverse fishery management area under the jurisdiction of the United States. Geographically, the four main island groups are spread across nearly the Pacific Ocean separated by at least 2,500 miles between each group. The management area is approximately 1.5 million square miles and is larger than the continental United States (See Attachment 2). Additionally, each of the island areas of our region comprises numerous individual islands, the major populated ones being Guam, Saipan, Tinian, Rota, Tutuila, Ofu, Olosega, Aunuu, Hawaii, Maui, Molokai, Lanai, Oahu, Kauai and Niihau. Air travel is the only mode of transportation to and between islands. Because meetings are a necessary to execute our responsibilities effectively, travel is a significant component of the Council's budget.

1. Data improvement coordination in American Samoa, Guam and CNMI
Part of the responsibility of Western Pacific Data Coordinator is to monitor the progress of the project activities and consult with the local fishery management agencies on the status of their data collection. Constant communication and interaction with the partners increases collaborative atmosphere amongst partners.

Frequency: semi annual
Cost: $8,000.00

2. Fishery Data Coordinating Committee
The FDCC is the Council body that coordinates fishery data collection and makes management decisions on how data collection should be carried out and the future direction of data collection. This body is comprised of the heads of the local fishery management agencies from American Samoa, Guam, CNMI, and Hawaii; NMFS-Pacific Island Fisheries Science Center; NMFS-Pacific Island Regional Office; and the Council.

Frequency: annual
Cost: $20,000.00

TOTAL TRAVEL COSTS	$ 28,000.00

D. SUPPLIES

The Council requests funding to purchase paper and other materials necessary in preparation of meetings and printing of reports and other educational materials produced solely under this grant. Such materials include, but are not limited to card stock, pens, pencils, erasers, staples, glue, liquid paper, and tape. Funding will also support copying of documents, reports and other briefing material prepared for workshops, forums or public dissemination completed under this grant.

TOTAL SUPPLIES COST	$5,000.00

E. EQUIPMENT

No equipment is being requested for this grant proposal.

F. CONTRACTUAL

1. Review and optimization of existing 30-year creel survey data using statistical models to attain standardized catch, effort and CPUE for stock assessments

Background:
Creel surveys had been established in the early 1980 for American Samoa, Guam and late 1980s for Commonwealth. However, standardization of the creel survey methodologies occurred at various points in the time series for the different island areas. This and other factors affecting the fisheries such as: participation, changes in the fishing gear, natural event affecting the fishing fleet and participants, makes interpretation of the time series of catch, effort and CPUE challenging. The creel survey data also represent on a fraction of the fishery and does not represent the true island catch (stock removal) and CPUE (proxy for stock abundance). These shortcomings limit the ability to generate biological reference points for some species of interest and elucidate the status of the fisheries stocks. Despite the shortcomings, these are the best scientific data available and are currently under utilized. The Re-authorization of the Magnuson-Stevens Act in 2006 mandated the Regional Fishery Management Councils to develop a process that would specify Annual Catch Limits (ACLs) for all management unit species under the Council's Fishery Ecosystem Plans. The fishing year 2012 specification utilized the best

available scientific information from the creel surveys to determine the Acceptable Biological Catch (ABCs) and expert opinion on specifying ACLs. Despite being the best scientific information available, this still resulted in restrictive ACLs due to the nature of the data being a subset of the true island level catch. There is a need to optimize the existing data set to represent the true island level catch. Once optimized, the data can be used to refine the ACLs and possibly generate stock assessments for species commonly captured by the survey.

The fishery data collection review conducted by Bak (2012) focused on the data collection sampling and estimation framework. It also described to possible sources of bias from the sampling design, implementation, to the estimation methods used to generate estimates of total catch, effort and CPUE. Documenting these sources of bias enables the second phase of data improvement to delve into the evaluation of the data generated by such methods.

Project Description:
The goal of the project is to optimize the catch, effort, CPUE time series to reflect representative island scale harvest as a proxy for total mortality and stock abundance from the different fisheries covered by the creel survey. The project has the following objectives:

1. Determine benchmarks in the time series where there was a significant change in:
    a. Fishery participation;
    b. Fishing regulations;
    c. Dominant fishing methods;
    d. Environmental events affecting the fishery;
    e. Data collection procedure and local logistics;
    f. Data reporting;
2. Determine the bias and effect of such benchmark on the data;
3. Verify the assumptions and changes on the expansion algorithm;
4. Recalculate the standardized catch, effort and CPUE time; and
5. Estimate variance associated with the time series to determine significance in trends over time.

Once the data is optimized the data time series can then be used to re-specify ACLs and generate biological reference points to determine status of the stocks and ultimately species level stock assessments.

Approaches and Methods:
A consortium of statisticians will be contracted to conduct an in-depth statistical review of the 30 year data series. These data series had been collected for several years and the information it contained were not maximized. The contractors will coordinate with the following offices to request access to the data:

1. Department of Marine and Wildlife Resources – American Samoa
2. Division of Fish and Wildlife – Commonwealth of Northern Mariana Islands
3. Division of Aquatic and Wildlife Resources – Guam
4. Division Aquatic Resources - Hawaii
5. Western Pacific Fishery Information Network – PIFSC

In addition to the request for data access, the contractor will gather all documents related to the data collection programs. A primary information source would be Bak (2012) that reviewed the data collection programs in the Western Pacific region. These documents will enable the contractor understand how the data are collected and the theoretical basis for the sampling design and estimation methods.

Consultation Meetings – establishing benchmarks in the time series
An initial meeting will be set between the contractor and the Council and the Stock Assessment Program (SAP) of PIFSC to determine the product needs from the existing data. The Council will provide an

overview of the types of products it needs for management as well as for its annual fishery status reporting. The SAP will provide an overview of the data products it needs for stock assessment purposes.

An intrinsic part of the body of statisticians involved in this project is the contractor that conducted the initial evaluation of the data collection programs. The evaluation of the data collection program sets the stage for the re-examination of the data outputs.

The consultation of the statisticians with the different staff, data collection supervisors, current and previous agency directors in collaboration with WPacFIN would be critical in this project. They would be providing a historical account of the changes in all aspects of the fisheries that may have contributed to the three decades worth of time series information. They could also provide the much needed local knowledge on the fishery dynamics and changes in the implementation of the prescribed protocol and changes in the fishery regulations. As part of the overall assessment of the data, the contractors will have to determine what fishing methods and species as adequately represented by the creel surveys and the commercial purchase systems. Another aspect of the benchmarks that may have an influence on the time series are the 'interviewer bias' brought about by changes in the data collection staff. Over and under estimation are prevalent to novice observers and decreases as experience is gained. These would be critical for the standardization of the time series.

The consultation meetings with WPacFIN will provide the technical aspect of the estimation and expansion methods. They would also be a good source in providing historical information on the changes in the data collection and estimation protocols. There is less turnover in the critical WPacFIN staff compared to the local fishery resource management agencies thus has a reliable institutional memory.

Data Screening and Filtering

Once all information had been gathered and granted access to the data, the data will then be screened for outliers and missing values. Trip definitions had changed for some of the fisheries and this could affect the estimation of effort. Transitioning from a single day trip to multi-day trips could severely underestimate the effort and the resulting expanded catch. Any anomalous entries in the data sets will be corrected when possible. Any reports not verified will be flagged and not be used in the analysis.

Review of assumptions behind the borrowing and expansion

The assumptions behind the expansion (quarterly or annual) and the burrowing of data from a: 1) priority list; 2) pre-computed CPUEs from historic data; and 3) pooling method were deemed to produce unknown effect on the resulting expanded catch, effort, and CPUE (Bak 2012). These assumptions and methods needs to be reviewed at depth to determine its specific effect on the reliability of the results it generate.

Statistical Review of Data Series

The contractors will then review the time series and establish benchmarks based on the historical accounts by the collaborating agencies. These benchmarks will serve as control points for the time series. The bias of each of the factors will be evaluated to determine the effect on the data estimation using jackknifing or bootstrapping methods. Once the effect had been determined, the bias will be corrected using statistical procedures like weighting or Generalized Linear Model. For each of the species/species group under their respective fishing methods that are adequately represented by the data collection systems, standardization procedures will be employed on their respective catch, effort and CPUE time series.

Estimating variance

Currently, the system is able to generate an estimate of the coefficient of variations but since there are numerous sources of bias and unverified assumptions these estimate of variations cannot be attributed to any particular factor. Once the data have been standardized and benchmarked then it would be easier to

pin point the sources of variations. This would provide level of significance in the time series whether the fluctuations seen are true fluctuations and not an artifact of the expansion. Variance estimation methods will be employed to determine degree of variabilities along the time series. Other parameters that will have to be evaluated in terms of the effect on variance are the pooling methods when there is shortage of interviews for various strata. The execution of the pooling algorithm will have to be evaluated for auto-pooling and the effect of the current "rule-of-two" interviews has to assessed.

Activity Timetable, Milestones and Work Products:

Activities	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Hiring of contractors	X											
2. Introductory meetings/document review	X	X										
3. Data access and explorations		X	X									
4. Data screening and filtering			X	X								
5. Review of borrowing and expansion assumptions				X								
6. Consultation meetings					X							
7. Establishing benchmarks and interpretations					X	X						
8. Statistical review						X	X	X	X	X		
9. Variance estimation									X	X		
10. Feedback on initial optimization									X	X	X	
11. Report writing											X	X

This project entails significant consultation and preparatory work prior to the actual data optimization. Five months will cover the preparatory work and another five months to run the optimization routine. The last two years will be for variance estimation and report writing. The products of the project are as follows:

1. Data benchmarks for the time series in all island areas;
2. Optimization program and codes;
3. Optimized time series of selected fisheries and species groups;
4. Program codes for estimating variance in the time series; and
5. Final report.

Budget:

Line Item	Estimated Cost
Personnel	
Professional fee – Team of statistician	**$200,000**
Travel	
American Samoa, Guam, CNMI	**$50,000**
Equipment	
Supplies	
Other	
TOTAL	**$250,000.00**

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2. Developing biological reference points for priority species or species groups using fishery dependent and fishery independent data to facilitate species status determination

Background:

Available biological and fishery data are poor for all coral reef ecosystem management unit species in the Mariana Archipelago. There is scant information on the life histories, ecosystem dynamics, fishery impact, community structure changes, yield potential, and management reference points for many coral reef ecosystem species. Additionally, total fishing effort cannot be adequately partitioned between the various management unit species (MUS) for any fishery or area. Biomass, maximum sustainable yield, and fishing mortality estimates are not available for any single MUS. Once these data are available, fishery managers will then be able to establish limits and reference points based on the multi-species coral reef ecosystem as a whole.

When possible, the MSY control rule should be applied to the individual species in a multi-species stock. When this is not possible, MSY may be specified for one or more species; these values can then be used as indicators for the multi-species stock's MSY.

Standardized values of catch per unit effort (CPUE) and effort (E) are used to establish limit and reference point values, which act as proxies for relative biomass and fishing mortality, respectively. Limits and reference points are calculated in terms of $CPUE_{MSY}$ and E_{MSY} included in the table below.

CPUE-based Overfishing Limits and Reference Points for Coral Reef Species

Value	Proxy	Explanation
MaxFMT (F_{MSY})	E_{MSY}	0.91 $CPUE_{MSY}$
F_{OY}	0.75 E_{MSY}	suggested default scaling for target
B_{MSY}	$CPUE_{MSY}$	operational counterpart
B_{OY}	1.3 $CPUE_{MSY}$	simulation results from Mace (1994)
MinSST	0.7 $CPUE_{MSY}$	suggested default (1-M)B_{MSY} with M=0.3*
B_{FLAG}	0.91 $CPUE_{MSY}$	suggested default (1-M)B_{OY} with M=0.3*

*interim value of M=0.3 is applied

When reliable estimates of E_{MSY} and $CPUE_{MSY}$ are not available, they are estimated from the available time series of catch and effort values, standardized for all identifiable biases using the best available analytical tools. $CPUE_{MSY}$ is calculated as one-half a multi-year moving average reference CPUE ($CPUE_{REF}$).

The fishery dependent data in the WPacFIN database provide the time series of catch and effort values needed to generate these E_{MSY} and $CPUE_{MSY}$ proxies. Biomass estimates can be derived from the Rapid Ecological Assessment surveys by the Coral Reef Ecosystem Division using standardized stationary point counts. These biomass estimates are expanded to hard bottom habitats from 0-30 m depths that allows for a proxy for standing stock biomass (Williams 2009). The fishing and natural mortality estimates can be derived from the length estimates from the stationary point counts and the length-weight samples from the creel surveys using a modified Beverton-Holt model (Ehrhardt and Ault 1992; Ault et al. 2008) for species in the exploited phase of the population.

The availability of these data will support the development of biological reference points needed for stock status determination of coral reef species or species groups. The only stock that currently has a status determination is the Territory Bottomfish Management Unit Species that comprise a species complex (shallow and deep snapper, emperor, grouper and jack/trevally) (Moffitt et al 2007). Maximum

sustainable yield estimates are the standard metric for fishery management and it is expected that this can be attained through this project.

Project Description:
After the completion of project #1 where the time series had been standardized, optimized and benchmarked, this project will utilize the product of project #1 as the data set to base the biological reference points from. The aim of this project is to generate biological reference points for species that are commonly caught in the different fisheries in the Western Pacific region (American Samoa, Guam, CNMI, and Hawaii). The objectives of this project are:

1. Determine dominant species and fishing method in the boat-based and shore-based fishery;
2. Analyze the fishery dependent data sets to determine reference points for the different species under the coral reef MUS;
3. Utilize biomass data from fishery independent methods to calibrate the biomass proxy and incorporate such biomass information when possible in the status determination;
4. Analyze the length estimates from both fishery dependent and fishery independent data sets to estimate fishing and natural mortalities to inform the estimation of the minimum stock size threshold and stock biomass flag; and
5. Consolidate all information in a simple surplus production model to determine status of the stock of selected species/species complex that comprise the dominant fisheries in the Western Pacific region

These biological reference points will be used as the basis for management decisions. This would be a significant enhancement of the scientific information available for managers and would also enhance the management of the stock via annual catch limits.

Approaches and Methods:
A contractor will be hired to conduct this analysis preferably a fishery biologist who has a stock assessment experience. This project would entail close collaboration with the local fishery resource management agencies of American Samoa, Guam and Northern Mariana Islands, PIFSC-Fishery Research and Monitoring Division particularly WPacFIN and the Stock Assessment Program. Preliminary analysis of the creel survey data to determine the dominant species in the catch had been conducted in the ACL specification process (WPRFMC 2011 Options paper for ACLs). However, this analysis did not look at the number of data points associated with each of the species in the fisheries from the creel database. A meta-analysis of the creel survey data will be conducted to determine which species had the most data point in terms of length and weight from the interview files. This could also be done for the stationary point count data from CRED.

Once the meta-analysis is complete, the species will be ranked based on the amount of data available and whether that species is part of the dominant fishing method in the fisheries. Biomass data will be extracted for these species from the stationary point count data of the PIFSC-Coral Reef Ecosystem Division. The biomass densities for each species will be expanded using habitat maps generated by CRED depending on the type of habitat these species are known to inhabit. This will serve as a proxy biomass. These biomass estimates will be compared to the standardized CPUE proxy for biomass at MSY ($CPUE_{MSY}$ is calculated as one-half a multi-year moving average reference CPUE ($CPUE_{REF}$)).

Fishing and natural mortalities will be estimated using Ehrhardt and Ault (1992) from the stationary point count data and the creel survey interview data. This method was derived from the Beverton-Holt model but is more robust for species that are in its exploited phase.

Other reference points will utilize the participation count estimates to derive proxy fishing effort at MSY. The Maximum Fishing Mortality Threshold is defined as 91% of the CPUE at MSY. Once all these MSY

proxies had been computed, the $F:F_{MSY}$ and $B:B_{MSY}$ will be plotted and this will be the basis for the status determination for each species/species groups per fishing method these species are harvested from.

All these biological reference points will be compiled and reported in the Fishery Ecosystem Plan Annual Reports. These reference points will be updated when new information becomes available. A test species will be selected for a simple stock assessment using index based methods or simple surplus production model. Candidate species will depend on the amount of localized information on biomass, fishery dependent, and life history information. The BioSampling Program of PIFSC will be a good source of life-history information that can feed into this test stock assessment.

Activity Timetable, Milestones and Work Products:

Activities	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Hiring of contractual fishery biologist/modeler	X											
2. Data access and retrieval	X	X										
3. Data familiarization and compilation		X	X									
4. Development of biological reference points			X	X	X	X	X	X				
5. Drafting of status determination						X	X	X				
6. Simple stock assessment							X	X	X	X	X	X
7. Drafting and finalization of reports												X

The project is the second phase of the data improvement process utilizing the products from the first project to generate biological reference points for various species in the nearshore fisheries in the Western Pacific region. This project is for 12 months bulk of which is dedicated to developing biological reference points for the different species in the four island areas. One or two test species will undergo a stock assessment with would require another 6 months.

The following are the products of this project:

1. Biological reference points for common species in the nearshore fisheries in American Samoa, Guam, CNMI, and Hawaii;
2. Status determination reports; and
3. Test stock assessment reports

Budget:

Line Item	Estimated Cost
Personnel	
Professional fee – Team of fishery biologist/Stock assessment modeler	**$100,000**
Travel	
Equipment	
Supplies	
Other	
TOTAL	**$100,000.00**

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3. Developing automated annual fishery status report modules, online status reporting and ACL monitoring reports

Background:

Part of the Council process is to evaluate the performance of the different fisheries under the Council's jurisdiction. The Archipelagic Fishery Ecosystem Plan (FEP) Team (Plan Team) oversees the ongoing development and implementation of the American Samoa, Hawaii, Mariana, and PRIA FEPs and is responsible for reviewing information pertaining to the performance of all the fisheries and the status of all the stocks managed under the four Archipelagic FEPs. These teams monitor the performance of the FEP through production of an annual stock assessment and fishery evaluation (SAFE) report and provide information on the status of the fish stocks and other components of the ecosystem. The FEP Plan Teams also make recommendations for conservation and management adjustments under framework procedures to better achieve management objectives.

Monitoring activities that document fishery information are an intrinsic part of the agency's responsibilities. Members of the Plan Teams are full-time employees of their respective fishery management agencies as data collection supervisors. Being full-time employees, drafting the annual fishery status report modules are additional burden to staff. WPacFIN provides technical support to the local fishery management agencies by compiling the data collected into a central database and generates data summaries for management purposes. Part of the data summarization is utilized for the generation of the annual report module. An automated system of data and report module generation exist for the bottomfish and pelagic annual report module. The automatic report generation does not exist for the coral reef, crustacean, and precious coral management unit species. The shift from single species management to ecosystem-based management merged the bottomfish, coral reef, precious corals and crustacean into a single ecosystem by island areas. This altered the reporting system in which the report for each MUS should be merged into a single coherent archipelagic report. An automated annual report generation that consolidates all the fishery information is needed to alleviate the formatting and compiling tasks of the Plan team members. This automated annual report generation will also ensure consistency in the formatting and information presented across the different island units.

Evolving from manually updating the text in the annual report module, an online and user friendly fishery status reporting system needs to be developed. Once the products of the project #2 have been finalized these products can be converted to online reporting matrices where the status for each species will be reported as labeled figures. This takes away bulk of the manual labor in updating the status reports modules. The interpretations can be made available via links for each species-fishery combination.

Annual catch limit monitoring is also a critical component of fishery management in the Western Pacific region. Currently, there is no real time monitoring of the catches in American Samoa, Guam, and the Northern Mariana Islands because catch monitoring is done using creel surveys. Hawaii, on the other hand, utilizes mandatory commercial trip level reporting of the catches which makes real-time monitoring to be more feasible. If the data compilation from creel surveys becomes up-to-par with the trip level reporting in Hawaii then a real-time monitoring of ACLs would be possible. An online tool can be developed to track the landings relative to the ACLs to which would be the basis for triggering accountability measures.

Project Description:
The project will attempt to develop an automated template generator for the Archipelagic FEP Annual Report Modules that the Plan Team will utilize to satisfy the reporting requirements. The narratives will be filled in by the team and reported back during its annual meetings. The goal of this project is to alleviate the reporting burden by creating an automated system of status reporting. The objectives of the project are as follows:

1. Develop a program compatible with the WPacFIN database to generate a template for the Archipelagic FEP Annual Report Modules;
2. Develop a web-based status reporting structure for the stock status of the species in the Western Pacific fisheries; and

3. Develop a web-based framework for monitoring of catches relative to ACLs including projections on when the accountability measures will be triggered.

Approaches and Methods:
In the Joint Meeting of the Plan Teams from American Samoa, Guam and Northern Mariana Islands, the Plan Team members will be discussing in-depth all the information in the template manually generated by the Council. Included in the discussion will be other information that will go into the report as well as the type of analysis and graphical format the team prefers for the module. All these information will be compiled for the contractor to implement in the programming.

A contractor will be hired to design a programming language compatible with the WPacFIN database [NOTE: it would be more prudent if PIFSC programmers are willing to take on this job since they know the intricacies of their relational database]. This programming language will be built into the software that generates the data summaries as a standard reporting function.

Once all the data had been encoded and undergone the quality assurance screening, WPacFIN will run the program to generate report templates that will be disseminated to the Plan Team members to draft the trends and interpretations. Once the first report has been generated, this will be saved in the database for updating the following year. This system of reporting will be used until the product of project #2 is finalized.

Once project 2 products had been finalized, these will be used to generate fishery status determination instead of merely looking at temporal trends in catch, effort, and CPUE per family of fish under each fishing methods. A programming language will be written based on the method for developing biological reference points to generate $F:F_{MSY}$ and $B:B_{MSY}$ plots (Kobe plots). These species/species group-specific plots will be the basis for the online description of the stock status. A species by gear matrix will be developed with symbols associated with stock/fishery status. Notations may include information from the Kobe plots (stock not overfished : not experiencing overfishing – stock overfished : experiencing overfishing). This reporting system will replace the annual reports.

The ongoing efforts to improve data collection hoped to aims the data collection at the different island areas to be near-real-time. If this can be achieved, a web-based framework needs to be developed to report on the near-real-time catch relative to the existing biomass. This is more realistic for Hawaii where the commercial landing reports had recently been changed from monthly reporting to trip level. This web-based monitoring tool can be linked to the database and can be updated on a weekly basis. A pre-programmed forecasting tool will be developed to project when the closure is going to be expected over a certain range of uncertainties and variance.

These approaches will alleviate the workload of manually updating the annual reports and makes status reporting more timely for the stakeholders. It allows for maximum information dissemination through the online media. In the advent of social networking, these information can be further disseminated to target audience.

Activity Timetable, Milestones and Work Products:

Activities	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Hiring of contractor	X											
2. Data familiarization and consultations	X	X										
3. Development of programming language/online reports												
A. Generate automated annual report modules		X	X	X	X	X	X					

B. Generate Kobe plots from boil. ref. points				X	X	X	X	X	X			
C. Generate online status reports						X	X	X	X	X	X	
D. Generate landing reports relative to ACLs						X	X	X	X	X	X	
4. Delivery of final products, documentations and incorporation in the WPacFIN database												X

Tangible outputs from this project are the following:

1. FEP Annual Report Modules for American Samoa, Guam, CNMI, and Hawaii;
2. Programming languages for the modules, Kobe plots, online status reports, and near-real-time landing reports;
3. Online tool/web products for the status reports and ACL landing monitoring; and
4. Documentations of the programming language

Bulk of the work would be done in coordination with island representatives and WPacFIN. Several runs may need to be done to tweak the final products.

Budget:

Line Item	Estimated Cost
Personnel	
Professional fee – software programmers and web designers	**$80,000**
Travel	
Equipment	
Supplies	
Other	
TOTAL	**$80,000.00**

4. Pilot surveys at unsampled ports and shoreline to calibrate adjustment factors in the expansion of catch, effort and CPUE from the existing creel survey in American Samoa, Guam, and Commonwealth of Northern Mariana Islands

Background:

The creel surveys being conducted in American Samoa, Guam and Northern Mariana Islands that aims to collect fishery dependent information are based on a stratified systematic sampling design on periods and areas representative of the different fisheries. These surveys generate catch, effort, CPUE, and species composition information based on samples from a subset of sampling frame. These subsamples are then expanded on a larger scale based on adjustment factors (p_1 – for temporal adjustment and p_2 – for spatial adjustment) from expert opinion.

The evaluation done by Bak (2012) on the sampling design and creel survey methods showed the current sampling design is not capable of generating an estimate of total island-wide catch because the sampling frames are not complete. There are some areas and periods not sufficiently covered by the existing design. Those unsampled periods and areas are accommodated by using the p1 and p2 adjustment factors. Since these adjustment factors are based on expert opinion, based on the evaluation, it factors as an unverified assumption that may infuse an unknown bias in the final estimation. One cannot generalize the level of fishing and fishery characteristics would be represented in the samples if there is no information available to infer such generalizations. Several factors could contribute to the differences between areas covered and not covered ranging from population number, economic status, topography and accessibility to the

fishing grounds etc. These have to be considered prior to any assumptions that the fishery dynamics between these areas and periods are similar.

There are other data sources needs to be evaluated on their utility as sources of adjustment factors for areas that are not surveyed. Guam had a long time series of aerial surveys that is not being utilized to inform the expert opinion for the spatial and temporal adjustment factors built into the expansion algorithm to estimate catches in non-surveyed areas.

Project Description:
The goal of the project is provide calibration estimates inform the adjustment factors for a more accurate estimation of total catch, effort and CPUE. The project objectives are:

1. Conduct a statistical review of the alternate data sources (e.g. Guam aerial survey) as sources of adjustment factors for non-surveyed areas;
2. Formulate a sampling design compatible with the current creel survey to cover areas and periods not addressed by the current creel surveys;
3. Conduct surveys on areas and periods not covered by the current creel surveys;
4. Collect catch, effort, CPUE, species composition, and other meta-data associated with the fishing activity;
5. Calibrate adjustment factors (p_1 and p_2) taking into account seasonality and rare events;

Feeding these adjustment factors with statistically valid means using actual data will significantly enhance the confidence in the data being generated by the creel surveys. This will minimize the over-reliance on expert opinion that infuses bias and subjective depending on who provides the opinion. Calibrated adjustment factors can be updated every 3 or more years depending on the rate of change in fishery characteristics. This can also be timed with the schedule of stock assessments.

Approaches and Methods:
The project will be an independent contract in collaboration with the local fishery management agencies in American Samoa, Guam, Northern Mariana Islands and WPacFIN. A statistical review of the Guam aerial surveys will be conducted to determine variabilities and reliability as adjustment factors for areas not covered by the current creel surveys. Expanded data will be simulated using the current adjustment factors expert opinion and will be compared to simulations based on the aerial surveys alone. Analysis of Variance will be used to determine significant differences between the two simulations.

This project will cover areas and ports not regularly accounted for by the current creel survey. This will also cover periods that are not adequately sampled by the current survey. A survey design will be established for this independent data collection that is comparable to creel surveys (i.e. another creel survey) or a data collection system that is compatible (i.e. statistically designed opportunistic survey, observations, or community interviews) with the current collection system. The survey design will depend on the logistics involved in conducting the data collection. The critical condition is that the results should be statistically comparable with the existing creel survey design.

A team of data collectors will be hired as temporary staff under this project and will be trained in fish identification and survey protocol. This will be done in collaboration with the data collection staff of the local fishery management agencies in the respective territories. The data collection team should be versed with the species normally caught in the different fisheries. A review of the species composition list and close communication with the local data collection agents will provide good support for the getting the team up to speed.

The team will coordinate the surveys with the local data collection agents in terms of scheduling for the area-calibration study. The surveys will be conducted simultaneously to have instantaneous estimates of effort and CPUE to estimate the calibration between areas to provide an informed area adjustment factor.

The temporal calibration study will be in relation to the schedule of the local data collection team. If the team is scheduled to cover periods between 5 am to 10 pm then the contractual team will cover 11pm to 4 am the following day at the same route/ports the local team covered previously.

The survey will be conducted regularly spanning for a whole year to capture the seasonality in catch landings and changes in species composition. All data will be inputted into the WPacFIN database to ensure that the data is treated similarly but will be separated from the data gathered by the local data collectors. The data gathered by the contract team will be compared against the data gathered local data collectors. Calibration ratios for each parameter (catch, effort, CPUE) would be determined for every fishing method - species/species group combination. The adjustment factors will not be used in determining the calibration ratios. These calibration ratios will be used to inform the adjustment factors.

Once the adjustment factors have been calibrated, the time series of catch, effort and CPUE will be simulated using the calibrated and non-calibrated (expert opinion) adjustment factors. This would determine how the accurate the expert opinion is in adjusting for areas not covered by the survey.

Activity Timetable, Milestones and Work Products:

Activities	Month													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Hiring of contractor	X													
2. Fish identification and survey protocol training	X	X												
3. Data collection		X	X	X	X	X	X	X	X	X	X	X	X	
4. Data validation and verification		X	X	X	X	X	X	X	X	X	X	X	X	
5. Calibration of adjustment factors							X						X	
6. Data simulation							X						X	
7. Report writing: preliminary/final							X							X

Month 1 will be allocated for hiring of contractors and conducting training. The project will entail one year of pure data collection with monthly data validation and verification. Simulating the effects of the calibration of the adjustment factors on the expanded fishery data will be done after six months worth of data had been gathered. A preliminary report will be drafted on the sixth month of data collection and the final report is due on the month 14. The products would be the following:

1. Preliminary report
2. Final report
3. Calibration factors that would be used for future and retroactive expansions

Budget:

Line Item	Estimated Cost
Personnel	
Professional fee – Project lead and data collection staff	**$230,000**
Travel	
NONE	
Equipment: digital weighing scale, binoculars, fishboard, etc	**$20,000**
Supplies: Fuel for survey vehicle	**$150,000**
Other	
TOTAL	**$400,000.00**

5. Developing and implementing specialized surveys to document fishing methods and event not adequately addressed by the existing creel survey

Background:
The current data collection programs are capable of documenting common fishing methods occurring regularly on fishing grounds represented in the sampling frame of the surveys. Fishing methods and events such as village atulai fishing, night time spearfishing, fishing tournament, chenchulu fishing etc. are poorly documented by the existing survey design. Incorporation of such acute fishing events tends to overestimate landings during the expansion process. Unless these fishing methods are evaluated against the common fishing activities in terms of its relative landings and effort, one cannot assume that such fisheries are minor components and could be disregarded.

A more serious complication of not accounting for fishing methods beyond the current scope of the creel surveys is the specification of ACLs for CNMI reef fishes. The limitation of the current creel survey design in capturing the night spearfishery in CNMI resulted in a low ACL for parrotfish and surgeonfish. The catch for these reef fish families were severely underestimated due to under-representation in the creel surveys that are conducted at day-time resulting in a low 75th percentile. This also applies for the hand harvest of slipper lobsters for all island areas.

Project Description:
This project aims to document the fishery statistics for these fishing methods and events and compare the results with the statistics from the creel surveys in order to evaluate the contribution of these methods and events in the overall fishery production. The objectives of this project are:

1. Design and conduct surveys to document fishery statistics of methods not adequately captured by the creel surveys;
2. Calibrate the results from this survey with the results taken from the creel surveys;
3. Evaluate these fisheries relative to the common fisheries to determine importance on these fisheries in the overall fishery production; and
4. Determine how to statistically incorporate the results into the creel survey expansions.

Approaches and Methods:
An independent contractor will be hired to conduct the activities under this project. The team that conducted the field data collection for project #4 would be best suited for this project due to familiarity with the fisheries and would minimize training and familiarization time. A complementary survey will be conducted in which the survey and statistical design will be compatible with the existing creel survey protocols and expansion algorithm. A series of consultation will be held with the data collection staff of DMWR, DAWR, DFW and the managers if WPacFIN to design the survey and determine the range of inadequately represented fishing methods and fisheries. An evaluation of the existing data will be done in order to estimate how much of these fishing methods and events are represented in the existing creel. This will be the basis for the calibrated against the information gathered through this project.

The contractor will conduct one year worth of data. The method used will be through opportunistic surveys for fishing events like village atulai runs and fishing tournaments. Fishing methods that are not in synch with the existing creel survey due to the period it is conducted, this could be documented through project #4. Once the adjustment factors are determined from one year data, the time series will be adjusted to correct the time series. The corrected time series of catch, effort, and CPUE will be evaluated to determine the contribution of these inadequately covered fisheries to the overall fishery production. The adjustment factors will be incorporated in the expansion algorithm to correct for the under estimation of other fisheries.

Activity Timetable, Milestones and Work Products:

Activities	Month													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Hiring of contractors	X													
2. Consultation meeting	X	X												
3. Design sampling protocol		X												
4. Review of data to determine existing coverage of these fishing methods		X	X											
5. Data collection			X	X	X	X	X	X	X	X	X	X	X	X
6. Data validation and verification			X	X	X	X	X	X	X	X	X	X	X	X
7. Calibration of adjustment factors								X						X
8. Data simulation								X						X
9. Report writing: preliminary/final														X

Month 1 will be allocated for hiring of contractors and consultation meetings. The project will entail one year of pure data collection with monthly data validation and verification. Simulating the effects of the calibration of the adjustment factors on the expanded fishery data will be done after six months worth of data had been gathered. A preliminary report will be drafted on the sixth month of data collection and the final report is due on the month 14. The products would be the following:

1. Preliminary report
2. Final report
3. Calibration factors that would be used for future and retroactive expansions

Budget:

Line Item	Estimated Cost
Personnel	
Professional fee – Project leader; data collectors	**$80,000**
Travel	
NONE	
Equipment: digital weighing scale, binoculars, fishboard, etc	**$20,000**
Supplies: fuel for survey vehicle	**$50,000**
Other	
TOTAL	**$150,000.00**

6. Determining coverage requirements and statistically-valid minimum sample size for all fisheries in the Western Pacific region

Background:

Three decades of fishery data collection using creel surveys have been implemented in the different island areas in the Western Pacific region. During this period, the fishery evolved and participation had changed over the years. A general trend of decreasing fishery participants had been seen in American Samoa (Sabater and Carroll 2009; Sabater and Tulafono 2011). Guam experiences a stable fishery participation in the bottomfish fishery in the past decade (Bottomfish Plan Team Report). With changes (or lack thereof) in the fishery, the data collection methods needs to be evaluated to determine if it is still sufficient in capturing the essential components of the fishery to determine its status. Not only did the fisheries change over the years but the capabilities of the local fishery resources management agencies had fluctuated of the years as well. There were periods where the data collection staff was reduced to minimal therefore the quantity of data had been severely reduced and relied severely on the expansion method therefore affecting the resulting fishery information. The Fishery Data Collection Improvement

Workshop convened by the Council on December 2011 and the data collection evaluation done by Bak (2012) recommended and expansion of the data collection program to complete the sampling frame and to increase the efficiency of the existing creel survey to account for the dominant fisheries. However, the institutional capacity in expanding its data collection programs will have to be evaluated to determine if the agency can accommodate additional workload without sacrificing the quality of data it generates.

Project Description:
Bak (2012) recommended that an analysis of the existing data be done in order to determine the coverage requirement and statistically valid minimum sampling size for the different fisheries in American Samoa, Guam and Northern Mariana Islands. The goal of this project is to provide advice on how the current data collection procedures can be revised to increase efficiency in implementation, increase accuracy of data generated, increase coverage with minimal increase in demand for manpower and funding. The objectives of the project are as follows:

1. Analyze the existing creel survey data to determine adequate sample sizes to generate robust estimates of catch, effort and CPUE for each methods in the fishery for each jurisdiction;
2. Analyze the existing creel survey for spatial distribution of fishing effort to determine adequate sample size per area coverage; and
3. Provide recommendations on how the current creel surveys can be revised to increase efficiency with the current level of institutional capabilities

Approaches and Methods:
This project will cover American Samoa, Guam and CNMI. A contractor will be hired to conduct the analysis. Documentations of the creel surveys will be given to the contractor to provide an idea on how the data was collected. The data framework and the expansion documentations can be derived from Bak (2012). The contractor will be tasked to work with WPacFIN in collaboration with DMWR, DAWR, and DFW. Access to the data will be requested from the collaborators. Once the data access had been provided, the data will be analyzed using a variety of statistical tools like (but not limited to): 1) power analysis; 2) re-sampling methods such as bootstrapping, jackknifing, cross-validation, and permutation test; and 3) sample size analysis.

These methods allow for determination of appropriate number of samples to be gathered to within the bounds of defined confidence interval or define coefficient of variation. The results will be summarized and interpreted against the realities of implementation within each island jurisdiction specifically: 1) level of funding; 2) manpower available; 3) characteristics of the fishery; and 4) logistics involved. The comprehensive analysis will be provided in a form of a report and recommendations will be reviewed and evaluated by the Fishery Data Coordinating Committee comprised of: 1) representatives from each of the fishery management agencies in American Samoa, Guam, CNMI, and Hawaii; 2) Western Pacific Regional Fishery Management Council; 3) Pacific Island Fisheries Science Center. A workshop will be convened to discuss the possible changes in the survey protocol. A workshop report will be included in the final report.

Activity Timetable, Milestones and Work Products:

Activities	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Hiring of contractor (statistician)	X											
2. Data access and familiarization	X	X										
3. Data analysis		X	X	X	X	X	X					
4. Report writing						X	X					
5. Briefing of results							X					
6. Workshop for data collection revision								X				
7. Final report									X			

This project will have nine month duration. Data analysis will comprise the bulk of the work. The follow products will be produced:

1. Preliminary report with recommendations on data improvements from a statistical perspective;
2. Workshop to discuss implementation of revised protocol;
3. Final report with workshop report

Budget:

Line Item	Estimated Cost
Personnel	
Professional fee - statistician	**$40,000**
Travel	
American Samoa, Guam, CNMI	**$20,000**
Equipment	
Supplies	
Other	
TOTAL	**$80,000.00**

7. Documentation of the boat and shore-based creel survey protocol including the expansion methodology

Background:
Initial documentations of the creel survey protocol were initiated by WPacFIN in 2008 through a contractor with funding from the Marine Recreational Information Program. These documentations covered both the shore and boat-based creel surveys in American Samoa, Guam, and the Commonwealth of Northern Mariana Islands. These documentations, to date, have not been finalized and published either a PIFSC Technical Memo or Internal Report. Lacking on these documents are the detailed steps and descriptions of the expansion algorithms used to estimate total catch, effort and CPUE. Programmers that are involved in designing the expansion had already left the Division leaving the remaining programmers the task of decoding the existing expansion framework.

The protocol documents are critical in the Western Pacific Stock Assessment Review process. These documents details how the data were collected; coverage of the data; the assumptions behind estimation method; and how the estimates were attained. These will have to be examined as part of understanding the quality of the data that goes into the assessment model. Having these documentations available will allow the reviewers to focus questions about the data rather than spending time interviewing the data source on how these numbers were estimated.

Project Description:
The goal of this project is to finalize the data collection documentation and update the documents on a regular basis. The objectives of the projects are:

1. Incorporate the documentation of the expansion algorithm in the protocol documents;
2. Incorporate the chronologies the described changes in the fisheries and data collection procedures;
3. Convert the protocol document into a user-friendly manual for the field agents to follow during training and conduct of their data collection.

Once these objectives are met, the WPSAR process will more efficient in performing review of the data and more attention can be focused on the actual stock assessment. It is envisioned that once this process is set, more assessments can be generated and be made available for fishery management.

Approaches and Methods:
This project would cover the boat and shore-based data collection systems of American Samoa, Guam and Northern Mariana Islands. This project would entail contracting the retired programmers in charge of the designing the expansion algorithms to draft the expansion documentations. This documentation will include the historical changes in the algorithms that had significant effect on the time series. Once the expansion algorithm section has been completed, this will be merged to the existing survey protocol documentation.

The existing protocol documentations will have to be updated by another part time contractor to include the historical changes in the survey protocols and changes in the fisheries leading to changes in the time series. This contractor will also be responsible in converting the documents to a user-manual for current and future data collectors. This manual will provide consistency in the implementation of the creel surveys.

Activity Timetable, Milestones and Work Products:

Activities	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Hiring of contractor												
A. Expansion algorithm documentation	X											
B. Update of survey documentations and user-manual	X											
2. Documentation of expansion algorithms		X	X	X								
3. Update of survey protocol documents		X	X	X								
4. Drafting of user-manual					X	X						
5. Review, revisions and finalization of documents							X	X				
6. Publication of documents and manuals									X			

The project would initiate as soon as the funds are made available. The project duration will be for 9 months. The expansion algorithm documentation can occur simultaneously with the update of the survey documentations since both area are independent from each other. However, the drafting of the user-manual will depend on the finalization of the documentations thus will occur 5 months after the initiation of the project. A review process of the output is critical since the accuracy of the documentations is essential if this would be the basis for the data outputs that will go into the stock assessment and the succeeding WPSAR.

The performance metrics and deliverables will be the generation of the following documents:

1. American Samoa Boat-based Creel Survey Documentations (including the expansion algorithm documentations)
2. American Samoa Shore-based Creel Survey Documentations (including the expansion algorithm documentations)
3. American Samoa Boat and Shore-Based Creel Survey User-Manual
4. Guam Boat-based Creel Survey Documentations (including the expansion algorithm documentations)
5. Guam Shore-based Creel Survey Documentations (including the expansion algorithm documentations)
6. Guam Boat and Shore-Based Creel Survey User-Manual
7. Northern Mariana Islands Boat-based Creel Survey Documentations (including the expansion algorithm documentations)

8. Northern Mariana Islands Shore-based Creel Survey Documentations (including the expansion algorithm documentations)
9. Northern Mariana Islands Boat and Shore-Based Creel Survey User-Manual

Budget:

Line Item	Estimated Cost
Personnel	
Professional fee - Programmers	
Travel	
Equipment	
Supplies	
Other	
TOTAL	**$60,000.00**

8. Fishermen and vendor incentive and outreach programs to enhance participation in creel surveys and vendor reporting

Background:
The fishery data collection in American Samoa, Guam and Commonwealth of Northern Mariana Islands rely heavily on the cooperative participation of the fishing community. These catch interview disrupts the market delivery of fish and creates inconvenience to fishermen after a long day/night out fishing. The voluntary nature of data collection on these areas results in low compliance for vendors that are supposed to submit data on the sale of fish. In addition, there is also no clear understanding of what the data is used for. There are notions that the information being submitted will be used to further constrain the fishery.

Enhancing fishermen and vendor participation in the data collection would enhance the quality and quantity of fishery data and would decrease reliance on the data expansion process. Giving data collectors ample time to collect fishery information through interviews and measure representative weight and length of fishes in the catch would increase the accuracy of the data. Complete voluntary reporting of commercial sales by vendors would allow for a better estimate of the commercial component in the catch. The commercial data is being used to validate the interview data since the total fish sold cannot exceed those caught. In order to enhance participation in data collection, an incentive program needs to be developed to supplement the implementation of the current creel survey. This has been proven to be effective from the BioSampling project being conducted in Saipan and American Samoa. In addition, enhancing the understanding of the fishing community on the importance of the data they provide by education and outreach will enhance future compliance even without incentives. Enhancement of participation is considered as the last resort prior to making the ultimate measure of mandatory reporting and compliance.

Project Description:
The main goal of this project is to increase the quantity and quality of data being gathered through the creel survey. In order to attain this goal, the cooperation of the fishing community needs to be enhanced through knowledge-base and/or incentives. The project objectives are as follows:

1. Develop an incentive system for the fishermen and vendors participating in the data collection;
2. Develop outreach materials explaining the importance of the fishery data they provide and how this is used;
3. Develop outreach materials showing the results of the data being collected; and

4. Convene a meeting with fishermen and vendors to scope for issues and at the same time train them on data collection and filling up the vendor reports.

Approaches and Methods:
This work will be carried out by data collection staff of the local fishery management agencies in American Samoa, Guam, and CNMI. An incentive system will be developed for these island areas by providing small items in exchange for a chance/time to adequately sample the catch and receive information on the effort and other fishing data. The incentive system will be done at random and in an equitable manner. Port samplers may provide ice to the fishermen to ensure that the fish remain fresh in the course of the data collection. Other items may include fishing hooks, nylon lines, lures, etc. A more appealing incentive is fuel subsidy particularly in the Mariana Island where fuel cost restricts fishing activities. Shore-based data collectors can provide small fishing items like hook, sinker, float, nylon line etc. Names of fishermen will be taken and included in the monthly raffle for a chance to win bigger prizes such as snorkeling gear, spear, rods etc. The names of the winner will be announced in the local radio station and advertised in the local newspaper. A compatible incentive program will be developed for the fish vendors to enhance their volunteer data submission.

Printed outreach materials will be developed and disseminated to the fishing community describing the importance of data collection and correcting the wrong notions that data collection is linked to enforcement, fishery closures, tax etc. Posters will be distributed to vendors that they could post in their shops. These posters will contain information about the fishery and promote conservation and sustainable fishing practices. The printed materials will also contain the latest status of the different fisheries within each jurisdiction and highlight the important role of the fishing community as data sources and their contribution to fishery management.

A meeting involving fishermen and vendors will be convened to scope fishery-related issues, fishery management, and data collection issues. This meeting will also provide training for the participants on how to collect their own data for possible voluntary reporting of catch and also how to accurately fill up the vendor commercial receipt books. This meeting would be a chance for the data collection staff to give feedback to the fishing community on the data previously collected and provide an overview of how these help in the overall management of the fishery.

In order to assess the effectiveness of this incentive program, an evaluation will be conducted towards the end of the year. The evaluation will include a before-after impact analysis looking at the number of data acquired against the number of catch interview carried out. The evaluative factors will include:

1. Number of fish measured;
2. Number of catch interviews;
3. Number of fishermen volunteering to participate versus number that declined/avoided;
4. Number of vendor report submission;

Activity Timetable, Milestones and Work Products:

Activities	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Purchase of incentives	X											
2. Dissemination of incentives		X	X	X	X	X	X	X	X	X	X	X
3. Data collection		X	X	X	X	X	X	X	X	X	X	X
4. Development of outreach materials	X	X	X									
5. Dissemination of outreach materials			X	X	X	X	X	X	X	X	X	X
6. Meeting with fishery stakeholders						X						X
7. Evaluation of incentive program						X						X

What needs to get done, when its going to get done, performance metrics, deliverables

Budget:

Line Item	Estimated Cost
Personnel	
Travel	
Equipment	
Supplies: fishing supplies	
Other	
TOTAL	**$20,000.00**

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9. Developing and online framework converting Hawaii's fisheries commercial trip reports and dealer reports to the web portal to enhance accuracy and timeliness of data collection for stock assessment

Background:

The Division of Aquatic Resources, Department of Land and Natural Resources (DLNR-DAR), State of Hawaii maintains the longest time series of commercial marine fisheries dependent data collection since 1948. For the past 20 years WPacFIN, NOAA Fisheries provided technical support to develop database applications to process and store the fisheries data into annual files for analysis. Several versions of the database applications were developed to incorporate revisions to the report forms or to improve the data quality control procedures used to process the fisheries reports. A major revision to the fishing report forms was implemented in 2002 to improve the collection of fishing effort and total catch including bycatch information (releases and lost to predation.) The fisheries data is used by the Stock Assessment group, NOAA Fisheries to conduct fishing stock analysis. The Deep 7 bottomfish fishery is a prime example of how the data is used and analyzed to determine the re-authorized MSFCA fishery quota requirements of annual ACL and ACT to manage this fishery in the MHI. Approximately 80% of the reported commercial marine landings were taken from waters in the EEZ and beyond. The commercial fisheries dependent data also contains landings for many nearshore species that are classified as regulated pursuant to the federal Coral Reef Ecosystem Plan. Since 1999 with technical support from WPacFIN, DLNR-DAR has added the commercial marine fish dealer reporting system. The dealer report information provides fisheries information to estimate the ex-vessel value of the commercial fishing industry. It is also useful to verify and validate the accuracy of landings reported by fishers. Microsoft Visual FoxPro (MS VFP) is the database application software that is used to develop and run the commercial fisheries reporting systems to process and store the fishing and dealer reports.

In 2002, DLNR-DAR obtained a sole source contract with the State's web portal vendor to implement the Commercial Marine Licensing System (CMLS) to issue and renew commercial marine licenses and to record the submission of the monthly fish report on a historical report log. Since February 2010, DLNR-DAR contracted the State's web portal vendor to implement the Online Fishing Report (OFR) web portal system to allow both fishers and DLNR-DAR staff to enter the generic monthly fish report online. Online submission of the Deep 7 bottomfish fishing trip report followed in September 2011.

Until recently, MS Windows operating system no longer provides technical support for the MS VFP database application. This means except for the web portal CMLS and OFR, all of the fisheries database application reporting systems for the fishing report, fish dealer report and document imaging archival system must be re-written in software that can be supported by the current MS OS.

Project Description:
The project goals are to improve and modernize the commercial fisheries dependent reporting systems for DLNR-DAR in order to continue providing State and Federal fisheries agencies with data to manage the fisheries and marine resources in State and EEZ waters.

WPacFIN and DLNR-DAR has decided to phase out the MS VFP applications and move all of the front end data entry operations for the fisheries reports over to the OFR web portal. The first step is to convert the other fishery specific and fish dealer report forms for online processing. Data quality control processing functions must be implemented in the online database application to ensure that the processed fisheries data is accurate and complete, and the fisheries report log is properly credited. In the last step WPacFIN will provide technical support to re-write software for the back end processing to compile the user report module functions and assist the DLNR-DAR staff to use computer software to query and summarize the processed fisheries data.

Approaches and Methods:
Organize and Setup Commercial Fisheries Database File Server
Because all of the front end fisheries report processing will be handled by the State's web portal vendor, the master annual database files are stored and maintained on their secured file server. Due to web portal security, the vendor does not permit any external link to their file server to directly access the database files. It would also be too cost prohibitive to have the vendor perform the backend processing of compiling the user report modules online. Therefore an external file server operated by a MySQL database application running on Linux Suse operating system is needed to store a 'mirror' image of the entire commercial fish and dealer report relational database files and CMLS license files stored in Oracle on the web portal file server. The process of copying the fisheries database Oracle files from the web is called replication. A perpetual software license for Dbvisit must be purchased to 'replicate' the data, and it must be installed at both sites, including the source (web portal) and the target (MySQL database.) A software maintenance fee is needed to renew the license annually. This replication process needs to be updated on a daily basis and may require temporary suspension of web portal services to the online users. A schedule to run the replication process during low-user periods, which occur in the early morning hour, is being considered. Temporarily, the file server for the MySQL database will be situated in DLNR-DAR and serviced by DLNR Data Processing office (DLNR-DP) staff. The permanent location for the file server is the DLNR-DAR office when additional space becomes available. One of the Pentium workstations in DLNR-DAR will be re-built by WPacFIN and converted into the file server. DLNR-DAR will have to purchase a new rack to mount the file server.

WPacFIN will have user authority file rights to the MySQL database to down load the fisheries data. WPacFIN will re-write database application programs such as the report modules for DLNR-DAR staff to use the fisheries data. The current annual fisheries data that is processed online will be stored in the MySQL database in a schema. All of the annual historical fisheries database files will be stored in a separate schema. This organization of annual fisheries database files will facilitate editing, querying and compiling the fisheries information.

Convert Fishery Specific Report and Fish Dealer Report Forms to Online
The following fishery specific report forms need to be placed on the web:

- Aquarium Fish Report
- Aku Boat Trip Report

- Deep-sea Handline Trip Report
- Tuna Handline Trip Report
- Net, Trap, Dive Activity Report
- Bait Report

The following fish dealer report forms need to be placed on the web:

- Commercial Aquarium Marine Dealer Report
- Commercial non-Aquarium Marine Dealer Report
- Personal Aquarium Cash Sales Report
- Personal Sales Report

The State web portal vendor will modify the Online Fishing Report (OFR) web application to add the fishery specific and fish dealer report forms so fishers and dealers can submit these reports online. DLNR-DAR staff will also use the modified OFR to enter any 'paper' fishery specific or fish dealer report online. Some of the system design specifications to modify the OFR include implementing a historical or master database file structure that retains all data record transactions, develop separate relational tables for each report form, facilitate record editing features for all users, and install end of month email reminders to online users to submit reports.

For existing fish dealers who submit various types of electronic reports, a special database application will be compiled by WPacFIN and executed from the MySQL database to convert the information into standard database records, which can then be imported into the web application for further processing.

Activity Timetable, Milestones and Work Products:

Activities	Month 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Rebuild and install MySQL File Server	X																	
Purchase Dbvisit software and install in MySQL file server; test and debug Dbvisit and Linnux OS software	X																	
Test replication process between web portal and MySQL file server; create schema for current fisheries data		X																
Test connection from MySQL file server to WPacFIN			X															
Download historical fisheries files to MySQL file server; create separate schema for history files			X															
Prepare Statement of Work specifications – modify OFR to add specific fishery reports and dealer reports				X	X	X	X											
Develop and modify OFR; test web application								X	X	X	X	X						
Implement various specific fishery report forms online													X	X				
Implement fish dealer report online															X	X		
Develop data query or fisheries report generation modules (WPacFIN)																	X	X
Modify CML report log history and add internal function to send online users a reminder letter to submit monthly fish reports																		X

Establishing the file server for the MySQL database in DLNR should be simple and straight forward. DLNR-DAR needs to prepare a formal written request for approval to purchase the replication and Linux Suse OS software and technical support assistance from DLNR-DP staff to maintain the file server. With technical support from the web portal vendor and WPacFIN, the MySQL database should be implemented and ready for operation in a few months. WPacFIN, DLNR-DAR and the web portal vendor must further discuss the system design specifications to modify the OFR web application to add the other fishery specific report and fish dealer reports for online reporting. A Statement of Work must be furnished by the

web portal vendor to outline the products and services of the web project along with an estimate for the development costs. The start of the web portal development depends on the existing amount of workload incurred by the vendor for other State projects. Therefore, the activity timetable above is a projection only. Based on previous web projects, WPacFIN and DLNR-DAR anticipates that the actual timetable to complete the proposed project is expected to take 2 to 3 years. This may necessitate requesting a no-cost extension of the project at the end of the 18-month period.

The online reporting performance is based on the adoption rate by the public (fishers) who use the OFR. Basically, a business web application that attains an adoption rate of at least 30% is considered satisfactory. DLNR-DAR currently experiences an online adoption rate of about 58% for the monthly fish report from the 2,700 commercial fishers who are required to submit fish reports, and 35% for the Deep 7 Bottomfish Fishing Trip Report from 463 commercial bottomfishers who are required to submit the bottomfish trip report. The online adoption rate for the fishery report forms and dealer report forms can be measured from the CMLS report log and the processed fisheries report records. On a daily basis DLNR-DAR and WPacFIN will receive a replication of the entire commercial marine license and fisheries report records from the web Oracle database files. These database files or data deliverables will be copied onto the MySQL database. WPacFIN will convert the Oracle database records into software for storage into annual database files in the MySQL database. The commercial fishery dependent data is available to the NMFS Pacific Islands Regional Office, their Pacific Islands Fisheries Science Center (under existing data share agreement between NMFS and the DLNR, and DAR biologists for analysis, for monitoring fishery trends, and for calculating federal annual catch quotas.

Budget:

Line Item	Estimated Cost
Personnel	
Travel	
Equipment: server mount rack	**$3,000**
Supplies: Oracle database replication software license renewal	**$3,850**
Other: Web portal development contract	**$450,000**
TOTAL	**$456,850**

TOTAL CONTRACTUAL COSTS	**$ 1,596,850**

G. OTHER

No other costs are anticipated

TOTAL BUDGET REQUEST $1,799,850

FY 2013 PROPOSED BUDGET SUMMARY BY CLASS CATEGORY

Class Object Category		Total
A. Personnel and Administration:		**$143,750**
1. Western Pacific Data Coordinator (WPDC)	($93,750)	
2. Administrative Costs	($50,000)	
B. Fringe Benefits (35% of WPDC)		**$26,250**
C. Travel:		**$28,000**
1. Coordination Meeting	($8,000)	
2. FDCC Meeting	(20,000)	
D. Supplies:		**$5,000**
E. Equipment:		**$0**
F. Contractual		**$1,596,850**
#1 Review and optimization of existing 30-year creel survey data using statistical models to attain standardized catch, effort and CPUE for stock assessments ($250,000)		
# 2 Developing biological reference points for priority species or species groups using fishery dependent and fishery independent data to facilitate species status determination ($100,000)		
#3 Developing automated annual fishery status report modules, online status reporting and ACL monitoring reports ($80,000)		
#4 Pilot surveys at unsampled ports and shoreline to calibrate adjustment factors in the expansion of catch, effort and CPUE from the existing creel survey in American Samoa, Guam, and Commonwealth of Northern Mariana Islands ($400,000)		
#5 Developing and implementing specialized surveys to document fishing methods and event not adequately addressed by the existing creel survey ($150,000)		
#6 Determining coverage requirements and statistically-valid minimum sample size for all fisheries in the Western Pacific region ($80,000)		
#7 Documentation of the boat and shore-based creel survey protocol including the expansion methodology ($60,000)		
#8 Fishermen and vendor incentive and outreach programs to enhance participation in creel surveys and vendor reporting ($20,000)		
#9 Developing and online framework converting Hawaii's fisheries commercial trip reports and dealer reports to the web portal to enhance accuracy and timeliness of data collection for stock assessment ($456,850)		
G. Other		**$0.00**
TOTAL OPERATIONAL BUDGET		**$1,799,850**