

PIFSC Bio-Sampling External Review



THE SAIPAN BIO-SAMPLING PROGRAM: A FEDERAL, STATE, AND PRIVATE SECTOR PARTNERSHIP



*NOAA, Pacific Islands Fishery Science Center
CNMI Division of Fish and Wildlife
Western Pacific Regional Fishery Management Council
Micronesian Environmental Services*



Hyatt Hotel, Garapan, Saipan
Chamolinian Room
26 January 2016





Development of the Saipan Bio-Sampling Program *and* Data Collection Program

Micronesian Environmental Services

John Gourley

Tony Flores

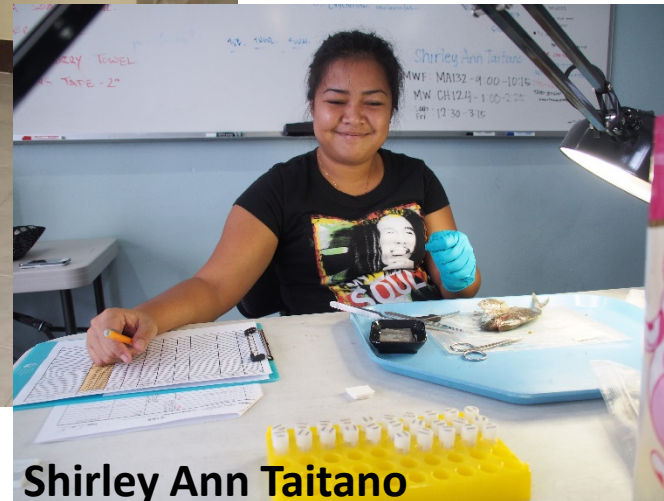
Manny Ramon

PIFSC Bio-Sampling External Review

Hyatt Hotel - Chamolinan Room

26 January 2016

2016 MES Bio-Sampling Team



Micronesian Environmental Services : Bio-Sampling Facilities



The MES Office and Fish Lab are private offices and therefore, not open to the public.

No signage identifies these offices to the public.

Micronesian Environmental Services - Bio-Sampling Facilities



OFFICE



FISH LAB



WASH DOWN AREA AFTER
TYPHOON SOUDELOR



Micronesian Environmental Services - Bio-Sampling Facilities



OFFICE



FISH LAB



K. LOWE MEMORIAL WASH DOWN AREA



The Saipan Bio-Sampling Program collects data only from commercial reef fish and bottomfish landed on the island of Saipan; therefore results should not be used to characterize the entire CNMI as a whole.

The single data source are the Saipan fresh fish businesses and do not include individual fishers.



Participating Fresh Fish Vendors in Bio-Sampling Program



Saipan Bio-Sampling Team Members:

Micro. Environmental Srvs.

**MJ Roadside Vendor
B&H Commerical Fishing
DJ Fish Mobile
Asin's Fish Market
Daystar Fish Store
JOH Fish Market
WJC Fish Market
Marianas Fishing**

Division of Fish and Wildlife

PIFSC Saipan Field Office

Location of Participating Fresh Fish Vendors on Saipan

- B&H Commerical Fishing
- Marianas Fishing
- Daystar Fish Store
- DJ Fish Mobile
- MJ Roadside Vendor
- WJC Fish Market
- WJC Fish Market
- Asin's Fish Market
- JOH Fish Market



Saipan Roadside Mobile Fish Vendors

MJ Roadside Vendor
B&H Commerical Fishing
DJ Fish Mobile



Saipan Brick and Mortar Fish Stores



Asin's Fish Market
Marianas Fishing
Daystar Fish Store
JOH Fish Market



Saipan Brick and Mortar Fish Stores with Mobile Units



WJC Fish Market



Development of Initial Market Sampling Methods

1

1 October 2010

- Pilot bio-sampling and life history contract commenced

October, November, and December, 2010

- understanding market dynamics
- getting to know the vendors personally
- identifying friends of the vendors
- learning about each vendors business operations

3 January 2011

- Vendor sampling commenced with the largest vendor on Saipan.

Development of Initial Market Sampling Methods

1

Initial Challenges:

Find a way to incorporate the bio-sampling program into an existing business operation without significantly disrupting its daily operations:

ASSUMPTION: Will need to understand how each business operates. The vendor will have control over when and where sampling can occur. Therefore, vendors may choose sample days and hours bio-sampling can take place.

Ensure that the data collected is high quality and representative of the actual commercial catch:

ASSUMPTION: Sampling of catch needs to be conducted immediately after fish are sold to vendor and before vendor consolidates catch with other catches or pulls out special pre-order fish for customers.

ASSUMPTION: It was decided to focus sampling effort on commercial vendors rather than individual fishers due to the uncertainty of all fishers catch being accepted by the vendor.

Development of Initial Market Sampling Methods

1

Initial Challenges:

An earlier commercial reef fish sampling project by a local ENGO in 2010 left several vendors unhappy with sampling programs. One vendor was not initially receptive to participating in our program.

ASSUMPTION: Will need to address vendor complaints from previous catch sampling program and assure them that we will strive to work with them.

Several vendors had basically no infrastructure to sample catches at their place of business.

ASSUMPTION: Try to provide facilities that the vendor doesn't have to make their business operate smoother.

Vendors want an ear to listen to them.

ASSUMPTION: Converse intelligently with the vendors when they talk.

There is a lot of hard work and risk in fishing and selling a product that easily spoils; and not a huge profit.

ASSUMPTION: Pay retail for all life history samples - do not ask for a discount.

2011-2015 Saipan Bio-Sampling Data Collection Program

NOAA PIFSC Bio-Sampling Program



Reef Fish Sampling

- 169 species in markets
- 2,427 sampled catches
- 176,590 measured fish

Bottomfish Sampling

- 52¹ species in markets
- 57 sampled catches
- 4,714 measured fish



Life History Program

- 15 targeted species by MES
- 5 species completed
- MES purchases 3 species for DFW life history program
- Dr. DeMartini (PIFSC) conducted gonad maturity training with DFW/MES staff
- Dr. Allen Andrews and Dr. Brett Taylor (PIFSC) conducted training on otolith preparation for DFW/MES staff.

MES Commerical Reef Fish Landings Program



Daily Vendor Log

- 18,730 daily vendor logs for reef fish
 - Fisher's names
 - Fishing location
 - Boat vs. shore fishing
 - Total pounds sold to vendor
 - Date, fishing times
 - 'No fish purchased' days are documented

Annual Vendor Interview

Annual interview with all vendors to gain their opinion on the % of reef fish catch associated with spear, talaya, and H&L. Also asked about % of spear catch that was caught at night vs day-time fishing.

¹ Bottomfish species list overlaps with reef fish species list.

Current Protocols for Collection of Length & Weight Data and Accurate Identification of Landings to Species

2

Sampling Fish Catches:



- A minimum 2-person team; one measures and one records data;
 - If a third person is available, they sort fish by species groups and feed them to the person measuring;
 - Fish measured FL in centimeters on a PICKETT FISH MEASURING BOARD;
 - Fish weighted in grams on electronic ADAMS SCALE;
 - Fish not easily identified in the field are purchased, labeled, and stored in Fish Lab freezers for later identification during a joint DFW/MES fish identification day;
-
- Select sizes of targeted fish for the life history program are measured/weighted and placed individually in plastic bags. Data tag includes FL, weight, specimen number, vendor, and date. Full retail price is paid for life history fish samples;
 - At this point in the data collection program, individual fish weights are only obtained for a few species of certain sizes.

Current Protocols for Collection of Length & Weight Data and Accurate Identification of Landings to Species

2

Scientific Name	≤ (smaller)	≥ (larger)
<i>Acanthurus blochii</i>	16	28
<i>Acanthurus lineatus</i>	15	23
<i>Acanthurus nigricauda</i>	15	24
<i>Acanthurus triostegus</i>	14	18
<i>Acanthurus xanthopterus</i>	16	35
<i>Calotomus carolinus</i>	18	29
<i>Cephalopholis argus</i>	18	33
<i>Cheilinus trilobatus</i>	17	30
<i>Chlorurus frontalis</i>	18	40
<i>Chlorurus microrhinos</i>	18	48
<i>Chlorurus sordidus</i>	18	28
<i>Epinephelus hexagonatus</i>	18	23
<i>Heteropriacanthus cruentatus</i>	19	27
<i>Hipposcarus longiceps</i>	17	42
<i>Kyphosus cinerascens</i>	17	38
<i>Kyphosus vaigiensis</i>	21	39
<i>Leptoscarus vaigiensis</i>	20	32
<i>Lethrinus atkinsoni</i>	15	30
<i>Lethrinus harak</i>	17	27
<i>Lethrinus obsoletus</i>	16	27
<i>Monotaxis grandoculis</i>	18	43
<i>Mulloidichthys flavolineatus</i>	9	28
<i>Mulloidichthys vanicolensis</i>	11	25
<i>Myripristis berndti</i>	15	22
<i>Myripristis murdjan</i>	15	20
<i>Myripristis violacea</i>	14	18
<i>Naso lituratus</i>	16	26
<i>Naso unicornis</i>	18	48
<i>Panulirus penicillatus</i>	7	14
<i>Parupeneus barberinus</i>	14	34
<i>Parupeneus ciliatus</i>	14	22
<i>Sargocentron spiniferum</i>	15	26
<i>Sargocentron tiere</i>	16	22
<i>Scarus altipinnis</i>	20	36
<i>Scarus ghobban</i>	19	31
<i>Scarus psittacus</i>	18	25
<i>Scarus rubroviolaceus</i>	20	48
<i>Selar crumenophthalmus</i>	14	25
<i>Siganus argenteus</i>	11	31
<i>Siganus punctatus</i>	12	28
<i>Siganus spinus</i>	12	24



Scientific Name	≤ (smaller)	≥ (larger)
<i>Acanthurus blochii</i>	16	28
<i>Acanthurus lineatus</i>	15	23
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<i>Calotomus carolinus</i>	18	29
<i>Cephalopholis argus</i>	18	33
<i>Cheilinus trilobatus</i>	17	30

In order to sample catches more efficiently, length-weight regressions were run on all species that had more than 500 lengths and weights. If the size range was adequate and the regression coefficient was good, then only lengths were obtained from that point forward. However, weights were still obtained on those fish that were higher or lower than the sizes in the regression equation.

This guidance is posted in the Fish Lab and carried in the field.

Current Protocols for Collection of Length & Weight Data and Accurate Identification of Landings to Species

2

If you don't know what the species is – BUY IT!

Unidentified species are purchased, labeled, and placed in the freezer for subsequent inclusion in a '*fish identification day*'. This is a group effort which DFW staff typically participates.



Data Collection Methods – Catch Information

3

**SAIPAN COMMERCIAL REEF FISH MARKET
DAILY VENDOR LOG SHEET**

DATE: 20 Feb 16 MARKET: B&H COMMERCIAL FISHING

NUMBER OF FISHERMEN: 3 FISHING GEAR: speck

START FISHING TIME: 7:30 pm STOP FISHING TIME: 11:00 pm

NAMES OF FISHERMEN: Manny Del Rosario; Germy; Lieto

FISHING LOCATION: Nemo's shop STARTING AT: Swan out & return ENDING AT:

BOAT BASED or SHORE-BASED ☒ FISHING TRIP

TOTAL WEIGHT OF FISH RECEIVED: 58 lbs

Assorted Reef Fish: 45 lb

Parrotfish/Rabbitfish: 13 lbs

Lobster: Slipper Lobster:

Octopus: Other:

NOTES: If no reef fish are received, please fill out the date and note "NO REEF FISH RECEIVED"
QUESTIONS ? Contact John Gourley - home office: 322.7289; cellular: 483.4000

Form date: June 2014

**SAIPAN COMMERCIAL REEF FISH MARKET
DAILY VENDOR LOG SHEET**

DATE: 11/12/15 MARKET: ASIN'S FISH MARKET

NUMBER OF FISHERMEN: FISHING GEAR:

START FISHING TIME: STOP FISHING TIME:

NAMES OF FISHERMEN: ; ;

FISHING LOCATION: STARTING AT: ENDING AT:

BOAT BASED or SHORE-BASED FISHING TRIP

TOTAL WEIGHT OF FISH RECEIVED: NO FISH

Assorted Reef Fish:

Parrotfish/Rabbitfish:

Lobster: Slipper Lobster:

Octopus: Other:

NOTES: If no reef fish are received, please fill out the date and note "NO REEF FISH RECEIVED"
QUESTIONS ? Contact John Gourley - home office: 322.7289; cellular: 483.4000

Form date: June 2014

**SAIPAN COMMERCIAL REEF FISH MARKET
DAILY VENDOR LOG SHEET**

DATE: 7/12/15 MARKET: ASIN'S FISH MARKET

NUMBER OF FISHERMEN: 1 FISHING GEAR: SLING

START FISHING TIME: 11:30 STOP FISHING TIME: 5 pm

NAMES OF FISHERMEN: William Wetta; ;

FISHING LOCATION: STARTING AT: LAULAU Bay ENDING AT:

BOAT BASED or SHORE-BASED ☒ FISHING TRIP

TOTAL WEIGHT OF FISH RECEIVED: 22

Assorted Reef Fish: 22

Parrotfish/Rabbitfish:

Lobster: Slipper Lobster:

Octopus: Other:

NOTES: If no reef fish are received, please fill out the date and note "NO REEF FISH RECEIVED"
QUESTIONS ? Contact John Gourley - home office: 322.7289; cellular: 483.4000

Form date: June 2014

Data Collection Methods – Catch Information

3

2401

Surveyors: TRF/PC/GBS/ASM Page: 1 of 5

Commercial Fisheries Bio-Sampling Project (CNMI)

ISH DATE: 04-12-15 TOTAL NO. FISHERS: 4 VENDOR: BH

GEAR: SLING START FISHING TIME: 8AM STOP FISHING TIME: 1AM

AREA FISHED: TANAPAG REEF FISHERS: BEN JESS JULIAN TAN JOHN

No. Pcs	SPECIES	FORK LENGTH (centimeters)	FISH WEIGHT (grams)	COMMENTS
	<i>N. LITURATUS</i>	18.7		
		18.7		
		18.3		
		19.2		
		20.9		
		18.1		
		17.0		
		18.7		
		16.7		
		17.2		
		20.2		
		19.8		
		19.0		
		20.9		
		18.3		
		18.6		
		20.9		
		20.0		
		20.5		
		18.4		
		18.9		
	<i>N. UNICOENIS</i>	21.0		
		21.6		
		21.9		
		25.0		
		28.9		
		38.2		
		25.6		
		21.0		
		22.0		

This bio-sampling data form is used to record the catch species, lengths, weights and other relevant information (e.g., parrotfish phase).

When the catch is completely worked up, these forms are checked by the Project Manager, the life history fish recorded on the tracking form, and the data sheet is given to the Data Manager for processing.

2606

Surveyors: DCI/GBS/TRF Page: 1 of 6

Commercial Fisheries Bio-Sampling Project (CNMI)

ISH DATE: 11/21/16 TOTAL NO. FISHERS: 3 VENDOR: BH

GEAR: SPINN START FISHING TIME: 7:30pm STOP FISHING TIME: 11:00pm

AREA FISHED: GARAPAN BOAT ROAD FISHERS: DEL ROSARIO GERALD LIED

No. Pcs	SPECIES	FORK LENGTH (centimeters)	FISH WEIGHT (grams)	COMMENTS
	<i>CHEILODIETUS MACRODON</i>	16.3	74	
	<i>N. OPERCULARIS</i>	16.9	94	
		18.0	108	
		20.6	162	
		19.7	138	
	<i>M. ADUSTA</i>	16.5	118	
		18.1	100	15F
		15.5	104	
	<i>M. VIOLEACEA</i>	13.4	80	
		13.2	72	
		12.6	68	
		13.3	74	
		12.1	62	
		13.2	74	
		13.4	80	
		13.4	80	
		12.6	72	
		15.2	72	
		12.9	64	
		13.5	80	
		15.0	72	
		13.0	72	
		13.9	84	
		13.7	86	
		13.1	76	
		12.4	58	
		12.8	68	
		13.2	74	
	<i>A. LINEATUS</i>	14.0	74	
	<i>A. TRIOSTEUS</i>	15.0		

Data Collection Methods in the Fish Lab

3



Data Collection Methods in the Fish Lab

3



Packed and ready to deliver back to the vendor just as they open for business

Life history samples to be purchased



Data Collection Methods at the Vendors

3



Input of Field Data into Database

4



- The Data Manager has sole responsibility over data entry;
- No one else enters data into the computer;
- Catch data is usually entered during the same day the data was collected;
- Data entry software was developed by WestPacFin specifically for the regional bio-sampling programs. The Saipan data entry software program has been further modified to deflect the whines of project managers.

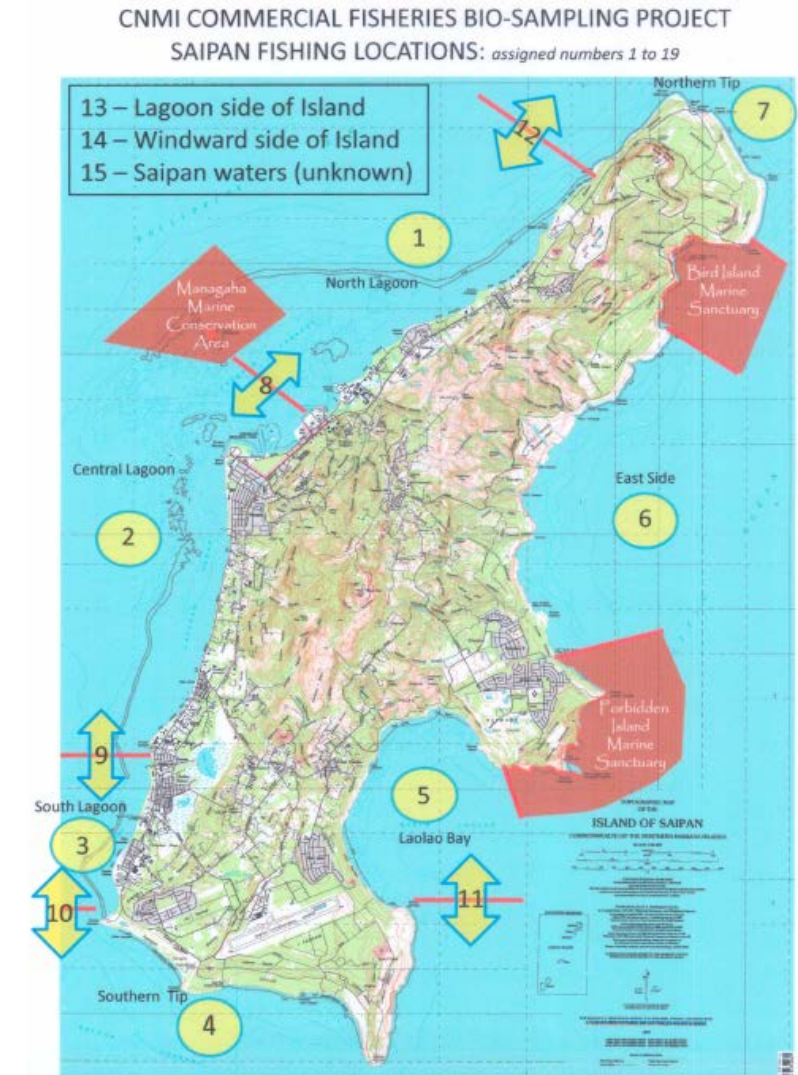
Input of Field Data into Database

Fishing Location

4

Based on the fishing location written on the data sheet, the Data Manager enters the general fishing location according to the areas shown on the map to the right.

Fishing areas have been identified (e.g., coded) for all islands in the CNMI.



Quality Control Measures Implemented

5

- The Data Manager has sole responsibility over data entry and no one else enters data;
- Data errors are usually discussed by the Project Manager, Data Manager, and/or Program Manager and resolved. Specific errors are marked on the data sheet with a note on how it was resolved. For example, if we get a length and weight value that is obviously incorrect, we typically will delete the weight value and keep the length value.
- WestPacFin has placed audio alarm system that beeps whenever values are entered that lie outside a certain threshold.
- The Project Manager checks all header information on bio-sampling data sheets prior to giving it to the Data Manager.
- Data from the bio-sampling data base has been used multiple times for presentations and acts as an additional check that identifies outliers.

Quality Control Measures Implemented

5

- All bio-samplers attend fish identification day for those species which couldn't be identified at the market, DFW staff typically joins MES on these lab days;
- MES/DFW/PIFSC-Saipan developed their own identification key of certain species groups that are difficult to identify (e.g., Mullidae, *Myripristis*, and parrotfish).

Questions ?

MES BIO-SAMPLING TEAM

Tony Flores – Project Manager
Manny Ramon – Data Manager
Patrick Ito – Fish Technician
George Salas, Jr. - Fish Technician
Shirley Ann Taitano – Fish Technician