Republic of the Philippines
Department of Environment and Natural Resources
Provincial Environment and Natural Resources Office
MIMAROPA Region
Bgy. Sta. Monica, Puerto Princesa City, Palawan
E-mail: penropalawan@denr.gov.ph
Telfax No. (048) 433-5638 / (048) 433-5638

RED

June 09, 2023

MEMORANDUM

FOR : **The Regional Executive Director**
DENR MIMAROPA Region
1515 DENR by the Bay Building,
Roxas Boulevard, Bgy 668, Ermita, Manila

FROM : The Provincial Environment and
Natural Resources Officer

SUBJECT : **FINAL REPORT ON THE CONDUCTED MONITORING OF CORALS FOR MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE (MSPLS), TAYTAY- SAN VICENTE, PALAWAN**

Forwarded is the memorandum from CENRO Taytay dated May 31, 2023 along with the memorandum report of PASu Clarissa P. Pador and its documentation re Final Report on the Conducted Monitoring of Corals within Malampaya Sound Protected Landscape and Seascape, Taytay-San Vicente, Palawan dated May 29, 2023.

Please be informed that the activity were accomplished in collaboration with the Malampaya Foundation Incorporated from February to April 2023 following BMB TB 2019-04. A total of 246.18 hectares were monitored by the team within the five (5) established monitoring sites located in the following areas: Barge Laot, bgy Tumbod, Taytay,Palawan, Malapena island, Bgy. San Jose, Taytay, Palawan and Ta-tai Bay in Bgy. San Jose.

Eleven (11) males and one (1) female participated in the said activity for your information and record, record and review.

FELIZARDO B. CAYATOC

Republic of the Philippines
Department of Environment and Natural Resources
Region IV- MIMAROPA
COMMUNITY ENVIRONMENT AND NATURAL RESOURCES OFFICE
by the National Highway, Poblacion, Taytay, Palawan 5312
Contact No.: 09265059335 (Globe) / 09121713889 (Smart)
Email address: cenrotaytay@denr.gov.ph

DENR PENRO
PALAWAN RECORDS
RECEIVED
BY:
DATE: 06/06/2023 CN 23-5190

May 31, 2023

MEMORANDUM

FOR : The Provincial Environment and Natural Resources Officer- Palawan

FROM : The Community Environment and Natural Resources Officer

SUBJECT : **ACCOMPLISHMENT REPORT ON ACTIVITY PER WFP**
Malampaya Sound Protected Landscape and Seascape (MSPLS)

Activity: Monitoring of Corals, Mangroves and Seagrass

Performance Indicator: Hectarage of habitats per PA monitored (Corals) to be submitted on quarterly basis

Current submission:
Memo report of Protected Area Superintendent/In, Charge CDS/For. III Clarissa P. Pador dated May 29, 2023 (CN 3424 in the eDATS) submitting the final report on the monitoring of Corals for Protected Area Management Office of Malampaya Sound Protected Landscape and Seascape (MSPLS). A total of five (5) established monitoring sites were monitored with a total area of 246.18 hectares representing the total coral reef of MSPLS.

Attachment:
1. Memo report of CMEMP E.O Maria Lilibeth E. Arojo dated May 26, 2023.
2. Comprehensive report 19 pages)
3. Maps (6 pages)
4. Raw Data of Corals (20 pages)

Gender & Development (GaD) data	Male = 11	Female = 1	LGBTQ+ = 0	Prefer not to say = 0
Age Grouping	60 and above	18-59	17 and below	TOTAL
	0	12	0	12
Environmental Management System (EMS Compliance	✓ Compliant to **5S** organization techniques (**SORT** – keep only necessary items, **SET IN ORDER** – arrange items to promote efficient workflow, **SHINE** – clean the work area so it is neat and tidy, **STANDARDIZE** – set standards for a consistently organized workplace and **SUSTAIN** – maintain and review standard) ✓ Organizing of travel to maximize conveyance and observance of speed limit to practice the minimized used of fuel ✓ Carpooling ✓ No single use plastic ✓ PENRO Memo No. 2023-001 dated February 21, 2023			

This is our **Means of Verification (MoV)** on the activity. Please confirm your receipt hereof. Thank you.

DENR CENRO
TAYTAY, PALAWAN
RELEASED
BY:
DATE: JUN 01 2023 2069

For and in the absence of the CENRO:

JUN 01 2023
MARIANO P. LILANG, JR.
Development Management Officer IV
Per DAO-2022-09, page 3

Copy furnished:
PAMO-MSPLS

Republic of the Philippines
Department of Environment and Natural Resources
MIMAROPA Region
PROTECTED AREA MANAGEMENT OFFICE
MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE (MSPLS)
Taytay-San Vicente, Palawan
Barangay Old Guinlo, Taytay, Palawan
Email add: pamomspls@gmail.com/Contact #: 0938-786-3728 (SMART)

May 29, 2023

MEMORANDUM

FOR : The Community Environment and Natural Resources Officer
Taytay, Palawan

FROM : The In Charge, CDS/Protected Area Superintendent
Malampaya Sound Protected Landscape and Seascape (MSPLS)
Taytay-San Vicente, Palawan

SUBJECT : **FINAL REPORT ON THE CONDUCTED MONITORING OF CORALS FOR MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE (MSPLS), TAYTAY-SAN VICENTE, PALAWAN**

This pertains to the target activity on the Monitoring of Corals, Mangroves and Seagrass under 001 Management of Coastal and Marine Resources/Areas of Malampaya Sound Protected Landscape and Seascape (MSPLS), Taytay-San Vicente, Palawan.

Respectfully forwarded is the memorandum dated May 22, 2023 of CMEMP Extension Officer Maria Lilibeth E. Arojo concerning the above subject.

Please be informed that, this Office in collaboration with Malampaya Foundation, Inc. (MFI) conducted the monitoring of corals on February to April 2023 in accordance to BMB TB 2019-04. A total of five (5) established monitoring sites were monitored with a total area of 246.18 hectares representing the total coral reef areas of MSPLS.

The monitoring sites were located at Bancoro Reef, Barangay Liminangcong, Barge Laot, barangay Tumbod, Malapeña island, Barangay San Jose, Ta-tai Bay, Barangay San Jose and San Jose Island, Barangay San Jose, all within the municipality of Taytay, Palawan.

The monitoring team are composed of eleven (11) males and one (1) female.

This is our **Means of Verification (MoV)** on the said target activity.

For his information, record and consideration.

MSPLS TAYTAY/PALAWAN
RELEASED
BY:
DATE: MAY 29 2023
CN:

CLARISSA P. PADOR

Republic of the Philippines
Department of Environment and Natural Resources
MIMAROPA Region
PROTECTED AREA MANAGEMENT OFFICE
MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE (MSPLS)
Taytay-San Vicente, Palawan
Barangay Old Guinlo, Taytay, Palawan
Email add: pamomspls@gmail.com/Contact #: 0938-786-3728 (SMART)

May 26, 2023

MEMORANDUM

FOR : The Protected Area Superintendent
Malampaya Sound Protected Landscape and Seascape
Taytay, Palawan

FROM : CMEMP Extension Officer
MSPLS, Taytay, Palawan

MSPLS, TAYTAY, PALAWAN
RECEIVED
BY:
DATE: 5-24-23
CN: 0125

SUBJECT : **REPORT ON THE CONDUCTED MONITORING OF CORALS FOR MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE (MSPLS), TAYTAY-SAN VICENTE, PALAWAN.**

This pertains to the target activity on the monitoring of corals of Coastal and Marine Ecosystems Rehabilitation Sub Program Scaling up Coastal and Marine Management for Malampaya Sound Protected Landscape and Seascape (MSPLS), Taytay, Palawan.

Please be informed that the undersigned together with Forest Technician I Voltaire M. Delos Angeles, Forest Rangers Ricardo S. Tandoc, Francis Abe G. Bose, John Gil C. Lagrana and Office Support Staff of Protected Area Management Ofice in collaboration with Malampaya Foundation Inc. (MFI) conducted monitoring of corals on February to April, 2023 within the jurisdiction of MSPLS in accordance with Technical Bulletin No. 2019-04. The team were composed of eleven (11) males and one (1) female during the conduct of the activity. A total of five (5) established monitoring sites were monitored with a total area of 246.18 hectares representing the total coral reef areas of MSPLS. The monitoring sites were located at Bancoro Reef, Bgy. Liminangcong; Barge Laot, Bgy. Tumbod; Malapeña Island, Bgy. San Jose; Tai-Tai Bay Bgy. San Jose; and San Jose Island, Bgy. San Jose, Taytay, Palawan. The activity was conducted to monitor the current status of coral reefs within Malampaya sound.

Based on the result of monitoring, the coral cover of five (5) sites were belongs to HCC Category A. Coral cover in Malapeña Island obtained the highest value of 91.14% followed by Barge Laot with a value of 87.43%, Tai-Tai Bay with 82.66%, San Jose Island with 78.38% and Bancoro Reef with 71.09% coral cover. On the other hand, a total count of 1,732 reef fishes were recorded belonging to thirteen (13) families. Among these families, damsel/palata (Pomacentridae) were the dominant (i.e. occurring in all stations) followed by fusiliers/dalagang bukid (Caesionidae). As compared to the previous monitoring, more fishes were recorded and there was an increased in coral cover observed during the activity.

Attached are the maps, photos and complete corals data monitoring sheet using CPCe.

For information and record.

MARIA LILIBETH E. AROJO

Table of contents

I. Introduction.....3

II. Methods.....4

III. Results and Discussion.....6

a. Coral cover
b. Associated reef fishes
c. Graphs

IV. Conclusion and Recommendation.....11

V. References.....12

VI. Appendices.....13

Executive Summary

These coral reef assessment and fish visual survey are part of the Coastal and Marine Ecosystems Management Program (CMEMP) of the Department of Environment and Natural Resources (DENR) which aims to assess and monitor the current condition of the area to effectively manage and reduce the environmental stressors to the important marine ecosystems. When these marine ecosystems are healthy, their ability to provide ecological goods and services may improve and help the coastal communities in terms of food security, climate change resiliency and disaster risk reduction. This survey aimed to monitor the condition of coral reefs in selected sites in Malampaya Sound Protected Landscape and Seascape (MSPLS) in Palawan, Philippines.

A total of five (5) stations were monitored covering the total area of 246.18 hectares using the photo transect method while reef-associated fishes were monitored using fish visual census. Associated reef macroinvertebrates were also monitored .

Results showed that hard coral cover of all reefs belongs to HCC Category A (Malapeña Island-91.14%, Barge Laot-87.43%, Tai-Tai Bay-82.66%, San Jose Island-78.38 and Bancoro Reef-71.09%) which are mostly composed of *Acropora* branching, encrusting and foliose coral species. The number of invertebrates were generally low, and key indicator species were not observed.

There are 16 species of reef fishes from all locations and most of these species belongs to 13 families. Majority of the fish are under the "major" and "target". Malapeña and San Jose Islands have "high" fish densities (55.5509 MT/km2 and 79.7584 MT/km2), Tai-tai Bay has "moderate" fish biomass (19.8936 MT/km2) while both Bancoro reef and Barge Laot have "low" fish biomass (5.2245 MT/km2 and 3.2137 MT/km2).

Most of the surveyed reefs are potential eco-tourism sites where several water activities (e.g. kayaking, snorkeling, skin/scuba diving) can be conducted. Areas with "poor" condition should be monitored, protected, and properly managed for fast recovery. Coral transplantation can be conducted to rehabilitate degraded/damaged reefs. Information and education campaign (IEC) should be conducted in fishing communities to increase their understanding and appreciation of the marine ecosystems and increase public support to DENR's conservation efforts.

I. Introduction

Malampaya Sound Protected Landscape and Seascape (MSPLS) was proclaimed as protected area by virtue of Presidential Proclamation No. 342 dated July 12, 2000 which aimed to protect the whole Malampaya Sound due to its unique, distinct and scientifically significant ecological features and to enhance its biological diversity and protect against destruction from human exploitation. The sound is considered traditionally as the fish bowl of the Philippines considering its abundance on various marine resources including fishes, shells, shrimps and crabs. It is also a sources of green mussel (wild and cultured), and grouper fingerlings. The Malampaya Sound is also home to two endangered species of dolphins: the Irrawaddy dolphin that can be seen in the Inner Sound, and the bottle-nosed dolphin in the Outer Sound.

More than 16 fish species belongs to 13 families are found during monitoring. Majority of the fish are under the "major" and "target". Crabs and marine turtles like green sea turtle and hawksbill sea turtle are also observed in the sound. However, even with these unique characteristics the sound is not exempted from several threats. Thus this office provides programs that will monitor the current status of the habitat for planning and management intervention.

II. Methods

The activity was conducted on February to April, 2023 in Bancoro Reef, Bgy. Liminangcong; Barge Laot, Bgy. Tumbod; Malapeña Island, Bgy. San Jose; Tai-Tai Bay Bgy. San Jose; and San Jose Island, Bgy. San Jose, Taytay, Palawan. These are some of the barangays located in the Outer Malampaya Sound Protected Landscape and Seascape (MSPLS) where substrate are mostly sand rubbles. The monitoring sites were also identified as Strict Protection Zone (SPZ) covered by a Conservation Agreement between the Peoples Organization (PO's), Malampaya Foundation Inc. (MFI) and the department.

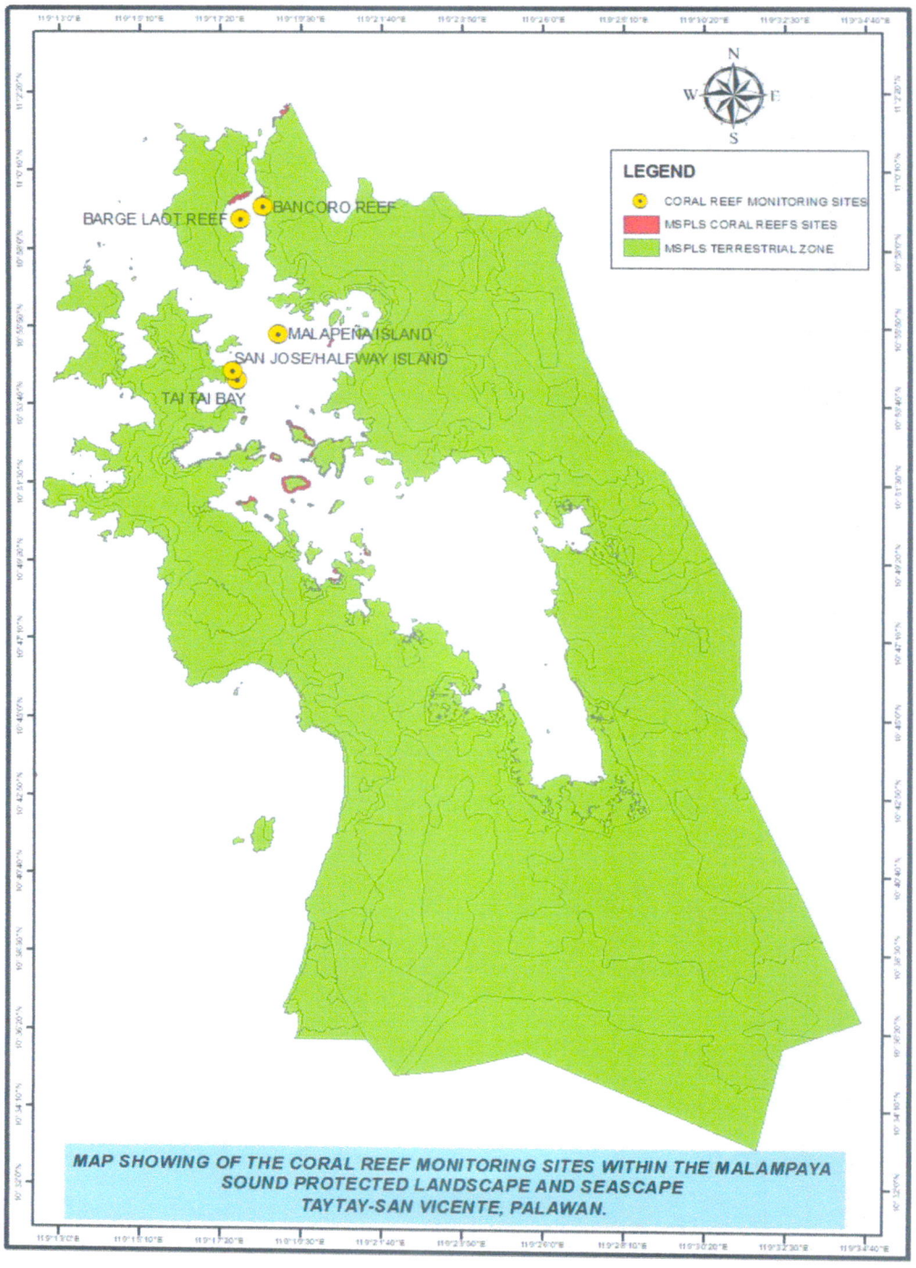


Figure 1. Map of Malampaya Sound showing the location of five (5) monitoring sites.

A 100-meter base transect were deployed following the contour of the reef, and was adjusted to 5m depth. A 50-meter transects on the shallower side of the base transect following random numbers were also deployed. Documentation and recording of coral reef at every 1m interval

III.Results and Discussion

Coral cover

In terms of hard coral cover, Malapeña Island Bgy. San Jose, Taytay, Palawan obtained the highest value of 91.14% (Table 1) followed by Barge Laot in Bgy. Tumbod with a value of 87.43%, Tai-Tai Bay with 82.66%, San Jose Island with 78.38% and Bancoro Reef, Bgy. Liminangcong with 72.09% coral cover. For soft coral, Barge Laot has obtained the highest value of 3.20% and the same site also obtained the highest value of 5.0% in terms of dead coral (Table 1). The good condition of coral reefs in the area can be associated with the establishment of Strict Protection Zone (SPZ) of the area where fishing are not allowed.

Table 1. Coral cover and other components in Bancoro Reef, Barge Lao, Malapeña Island, Tai-Tai Bay and San Jose Island.

	Sites	Bancoro Reef, Bgy. Liminangcong	Barge Laot, Bgy. Tumbod	Malapeña Island, Bgy. San Jose	Tai-Tai Bay, Bgy. San Jose	San Jose Island, Bgy. San Jose
Coral (HC)		71.09	87.43	91.14	82.66	78.38
Dead Coral (DC)		1.03	5.00	0.98	3.11	2.85
Soft Coral (SC)		0.27	3.20	0.08	0.34	0.61
Other Organisms (OO)		0.14	0.90	0.04	1.90	1.09
Algae (AL)		3.94	0.72	0.12	2.30	0.68
Abiotic Component (AB)		23.53	2.75	7.64	9.69	16.40
Tape, Water, Block (TWB)		1.14	0.79	0.74	1.53	1.53
Sum (excluding tape+shadow +wand)						

Figure 2. Coral cover of five (5) sampling sites in MSPLS.

Result shows that Bancoro Reef, Bgy. Liminangcong; Barge Laot, Bgy. Tumbod; Malapeña Island, Bgy. San Jose; Tai-Tai Bay, Bgy. San Jose; and San Jose Island, Bgy. San Jose, Taytay, Palawan belongs to HCC Category A based on Licuanan et al. 2019

Table 2. Range of coral cover values (in percent) used in determining coral cover category. (Licuanan et al. 2017)

% Hard Coral Cover (HCC)	**HCC Catergory**
>44% HCC	HCC Category A
>33%-44% HCC	HCC Category B
>22%-33% HCC	HCC Category C
0%-22% HCC	HCC Category D

Associated Reef Fishes

A total of 1,732 fish count belonging to 13 families and 16 species were recorded in five (5) monitoring sites in MSPLS. Eight (8) species belonging to six (6) families were listed in Bancoro Reef, Bgy. Liminangcong, 11 species with eight (8) families in Barge Laot, Bgy. Tumbod, 14 species with 10 families in Malapeña Island, Bgy. San Jose, 16 species with 13 families species in Tai-Tai Bay, Bgy. San Jose and 12 species in 10 families in San Jose Island, Bgy. San Jose, Taytay, Palawan. Among these species, *chrysiptera parasema* and *dascyllus trimaculatus* (Damsel/Palata) (Pomacentridae) were commonly occurring in all monitoring sites followed by *pterocaesio diagramma* (Fusilier/Dalagang Bukid) (Caesionidae). Malapeña Island, Bgy. San Jose site has the highest number of species recorded during monitoring. The number of fish species in five (5) monitoring sites for this current activity was higher compared to last year coral reefs surveyed in MSPLS. Majority of fish species indentified falls within the category of target and major fish species.

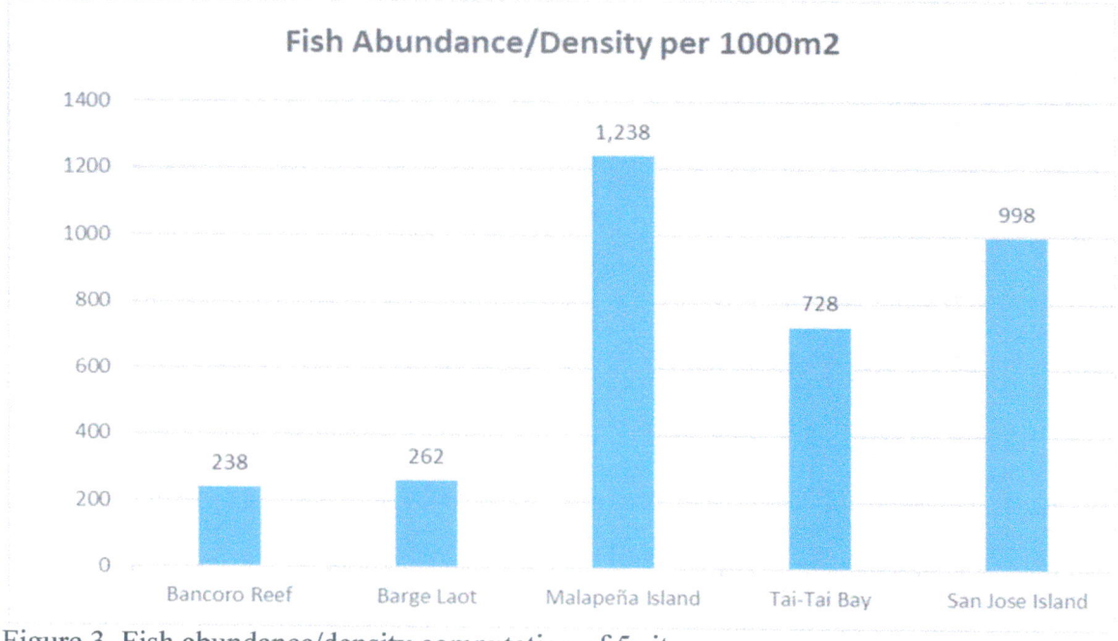
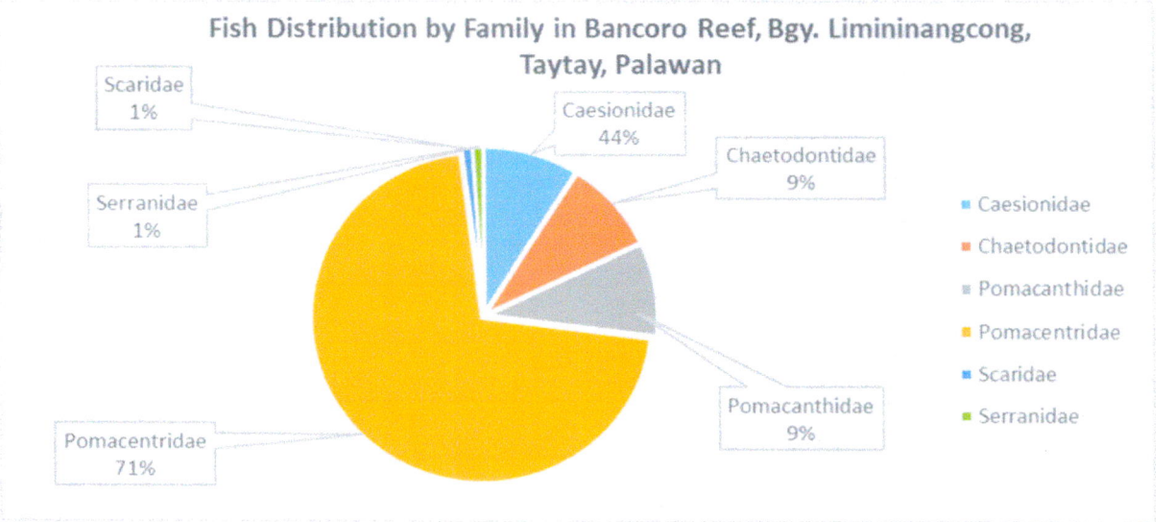


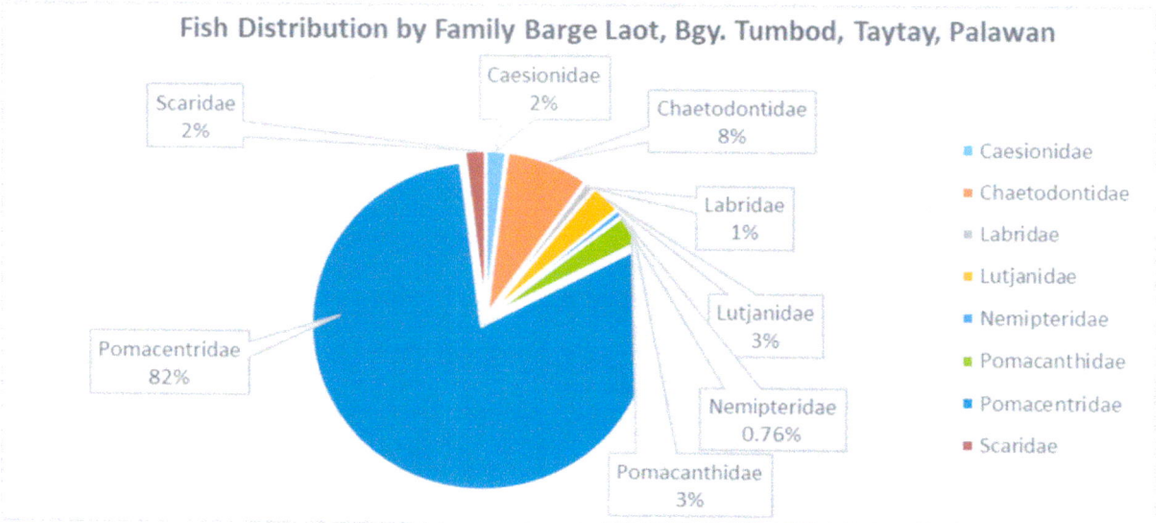
Figure 3. Fish abundance/density computation of 5 sites.

Figure shows the fish abundance/density per 1000m2 of five (5) monitoring sites of which the Malapeña Island had the highest value of 1,238 m^2 falling under moderate category followed by San Jose Island with a value of 998 and Tai-tai Bay with a value of 728. The Barge Laot with a value of 262 m^2 and Bancoro Reef with a value of 238 m^2 had the least value which falls under poor category based on Hilomen et al., 2000. This could be attributed to the location of the monitoring site which is surrounded by the community.

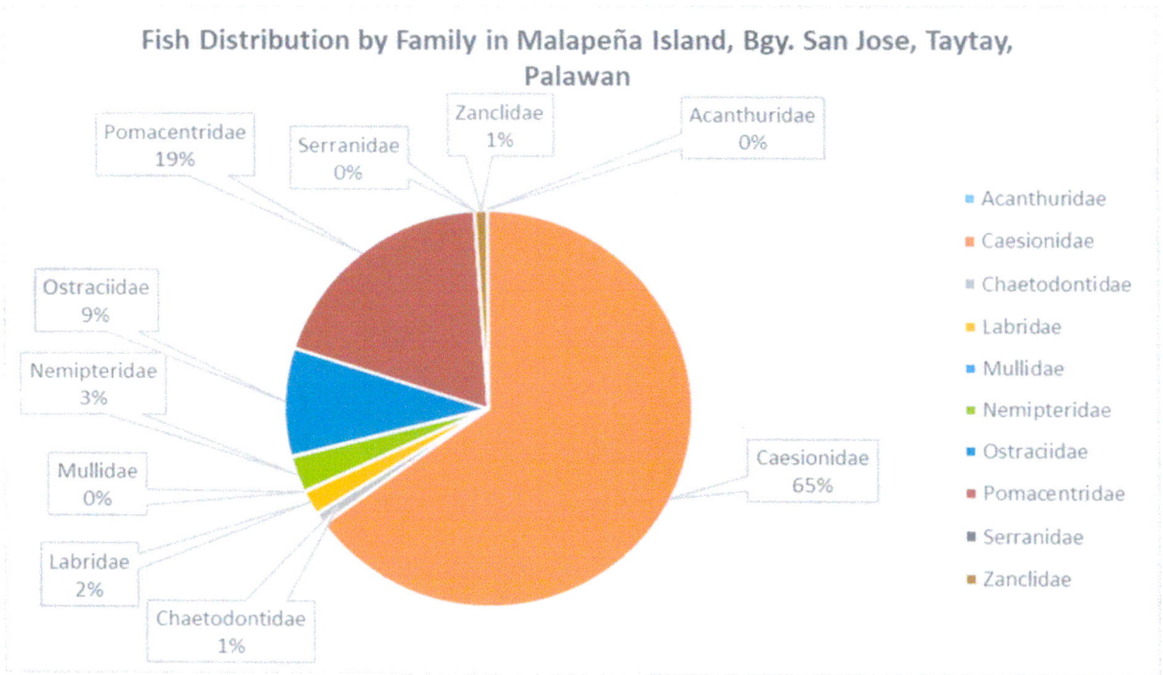
Figure 4. Distribution per fish family in five (5) sites.



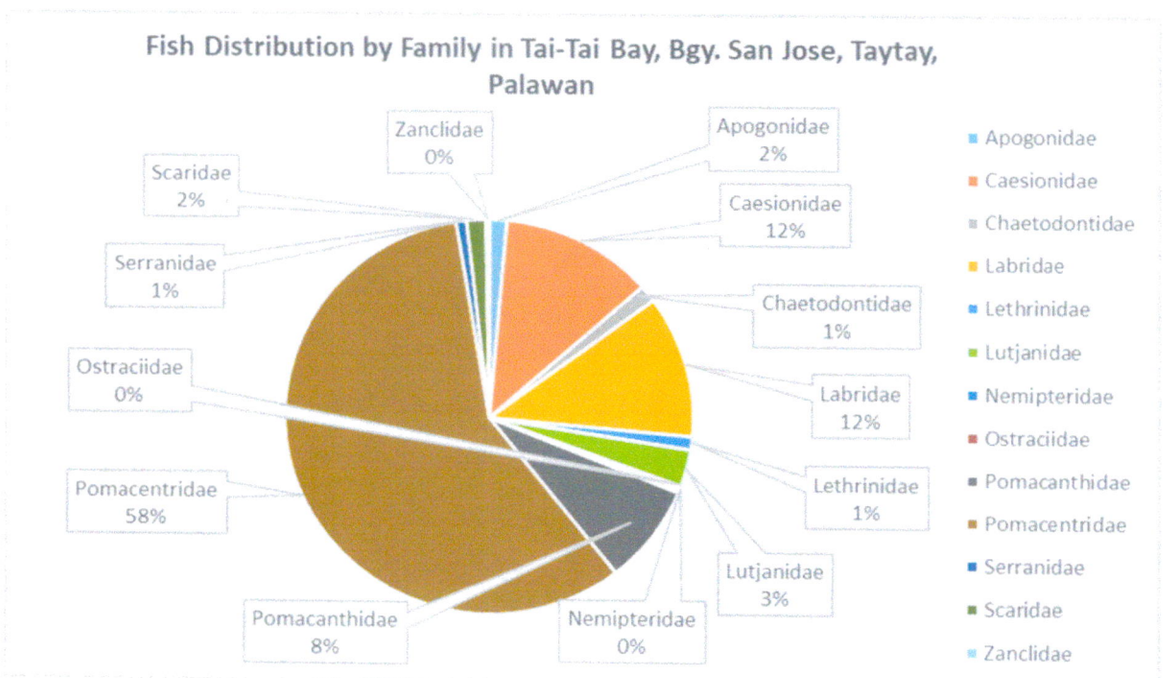
In Bancoro Reef, Bgy. Liminangcong, a total of six (6) families were identified and recorded of which Damsel (Pomacentridae) had the highest value of 71% followed by Fusilier (Caesionidae) with a value of 44%.



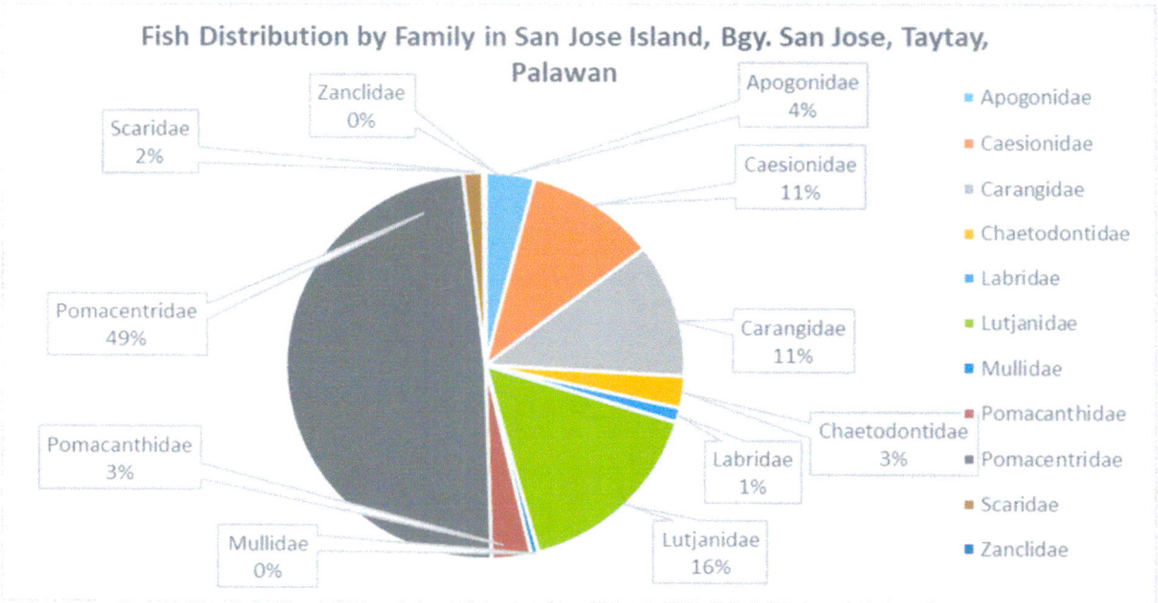
A total of eight (8) families were identified and recorded in Barge Laot, Bgy. Tumbod, Taytay,of which Damsel (Pomacentridae) had the highest value of 82% compared to other species.



For Malapeña Island, Bgy. San Jose, Taytay, Palawan, a total of ten (10) families were identified and recorded of which Fusilier (Caesionidae) had the highest value of 65% followed by Damsel (Pomacentridae).



Fish distribution in Tai-Tai, Bgy. San Jose, Taytay, Palawan, on the other hand, had a total of thirteen (13) families of which Damsel (Pomacentridae) had the highest value of 58% followed by Fusilier (Caesionidae) and Wrasse (Labridae).



Lastly, a total of eleven (11) families were identified and recorded in San Jose Island, Bgy. San Jose, Taytay, Palawan of which Damsel (Pomacentridae) had the highest value of 49% followed by Snappers (Lutjanidae).

Table 3. Fish biomass (MT/km2) in the five sites.

Sites	Biomass (MT/km2)	Category
Bancoro Reef, Bgy. Liminangcong, Taytay, Palawan	5. 2245	Very Low
Barge Laot, Bgy. Tumbod, Taytay, Palawan	3. 2137	Very Low
Malapeña Island, Bgy. San Jose, Taytay, Palawan	59. 5509	Very High
Tai-Tai Bay, Bgy. San Jose, Taytay, Palawan	20.5777	Medium
San Jose Island, Bgy. San Jose, Taytay, Palawan	78. 7658	Very High

Fish biomass determines the productivity and condition of reef areas. Among the five (5) sites, San Jose Island, Bgy. San Jose, Taytay, Palawan with a value of 78. 7658 MT/km2 had the highest biomass recorded followed by Malapeña Island, Bgy. San Jose, Taytay, Palawan with a value of 59.5509 MT/km2. Using the category of Nanola et al., 2006, the fish biomass in these sites was very high. The site of Tai-Tai Bay with 20.5777 MT/km2 biomass belongs to medium category while the Bancoro Reef (5.2245 MT/km2) and Barge Laot (3.2137 MT/km2) have the low biomass falling under very low category (Nanola et al.,2006).

IV. Conclusion and Recommendation

All sites are higher percent in terms of coral cover. Very few reef associated macroinvertebrates were noted, indicating signs of overexploitation. Fish densities and biomass are "high" for two (2) sites and moderate to low to three (3) other sites.

With the results of this study, the following actions are recommended:

1. Reefs in Malapeña Island with high coral cover can be potential eco-tourism sites where kayaking, snorkeling, and scuba diving activities can be conducted.
2. Those sites with low fish biomass should be rehabilitated to increase the coral cover by coral transplantation. A no-take policy should also be implemented for faster recovery of the degraded reefs;
3. Reefs areas should be protected and impact of human activities should be minimized;
4. Communication Education and Public Awareness (CEPA) should be conducted in fishing communities to increase their understanding and appreciation of the marine ecosystems and increase public support to DENR's conservation efforts; and
5. Collaboration with Barangay, POs, NGOs for the enforcement activity within Strict Protection Zone.

V. References

Benjamin Gonzales, The fishing gears of Malampaya Sound Protected Landscape and Seascape.

Gerald R. Allen and Mark V. Erdmann, Reef Fishes of El Nido

VI. Appendices

Appendix 1. Scoring images using CPCE of five (5) monitoring sites.

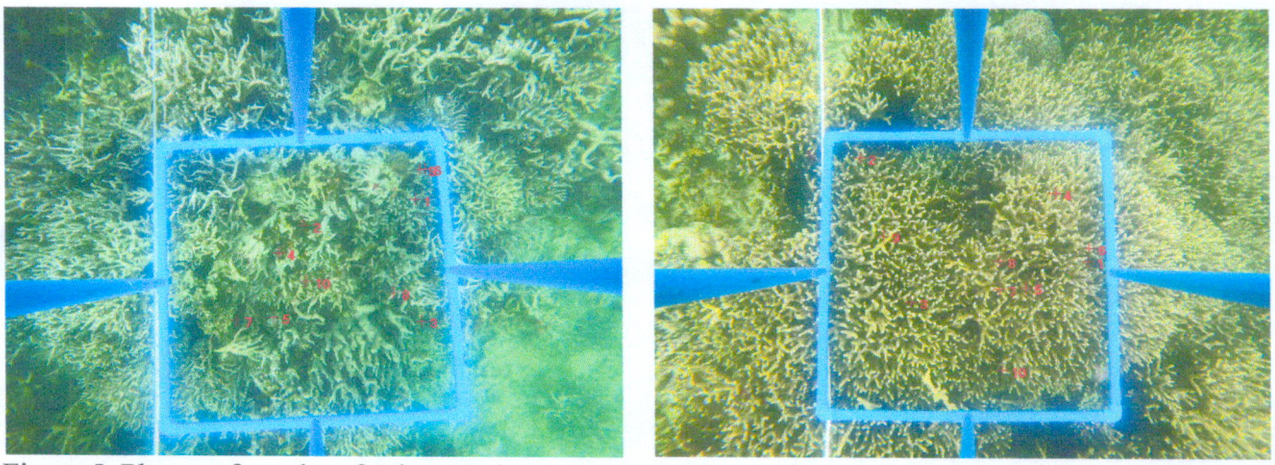


Figure 5. Photos of coral reef using scoring images of CPCe in Bancoro Reef

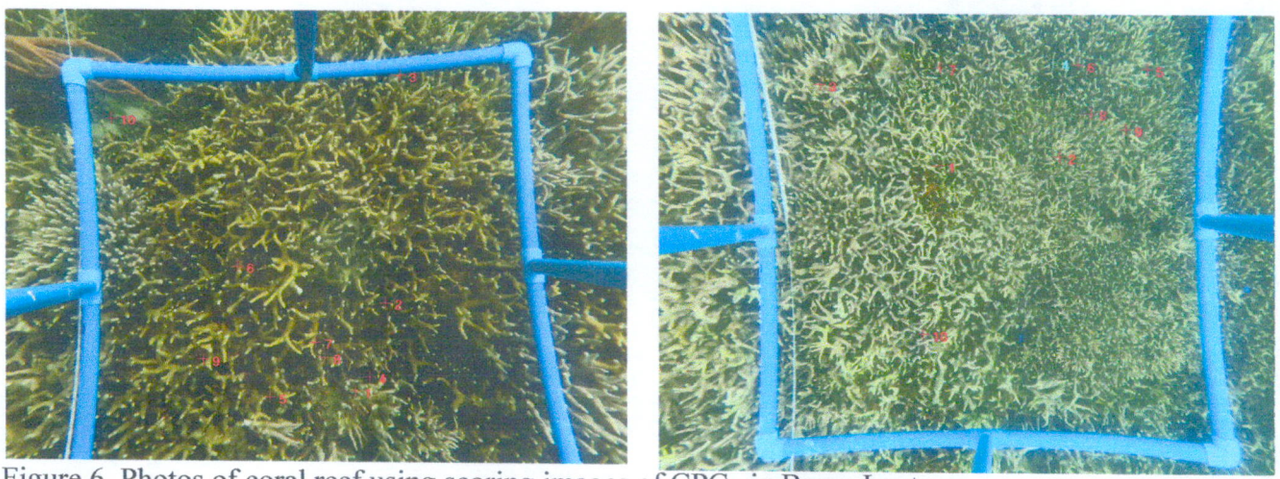


Figure 6. Photos of coral reef using scoring images of CPCe in Barge Laot

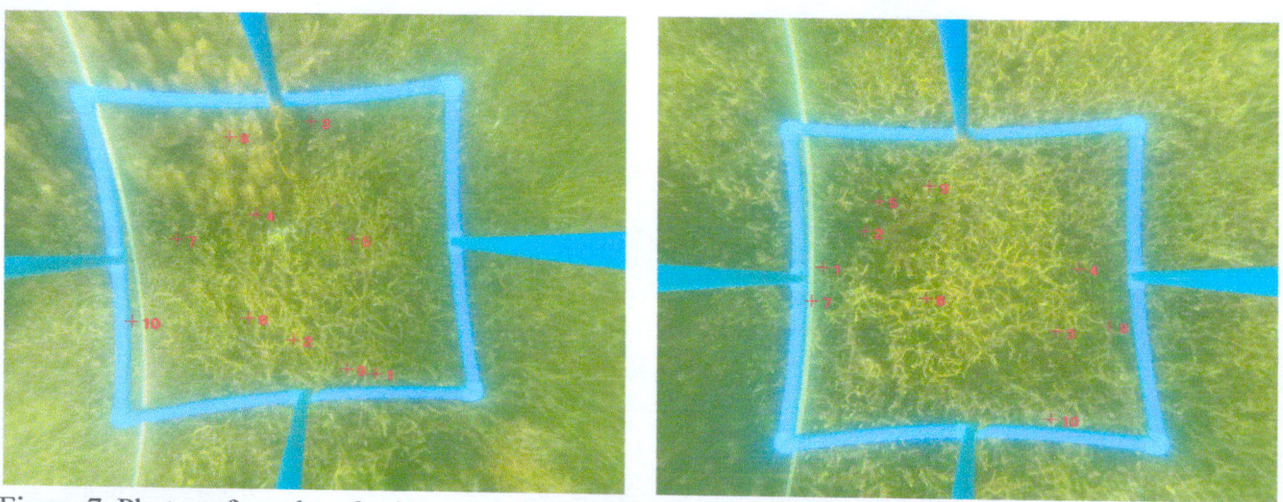


Figure 7. Photos of coral reef using scoring images of CPCe in Malapeña Island

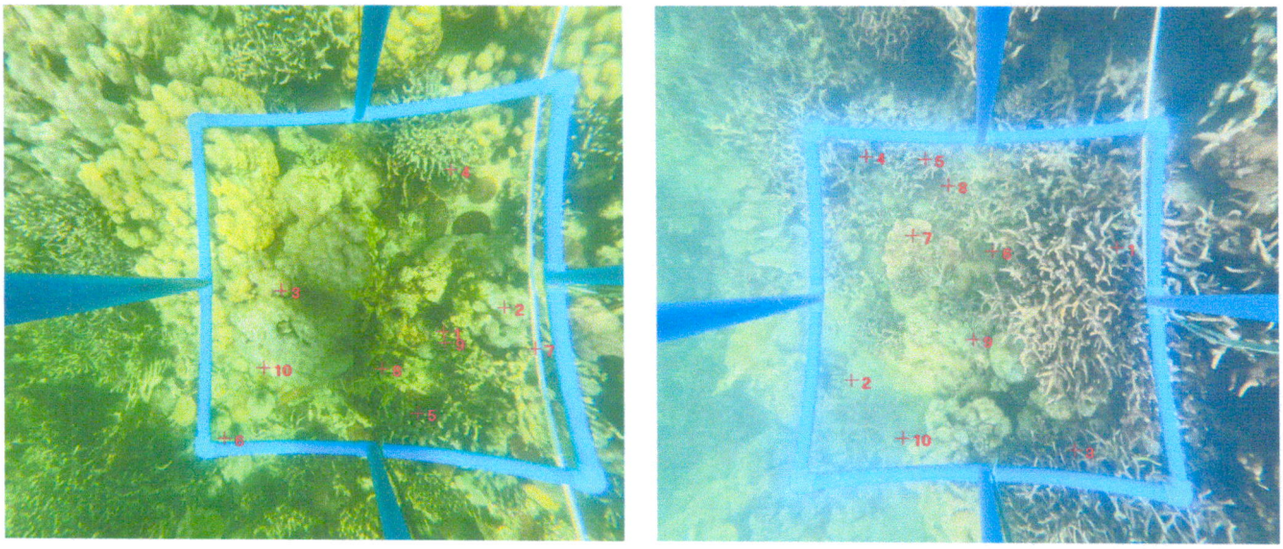


Figure 8. Photos of coral reef using scoring images of CPCe in Tai-Tai Bay

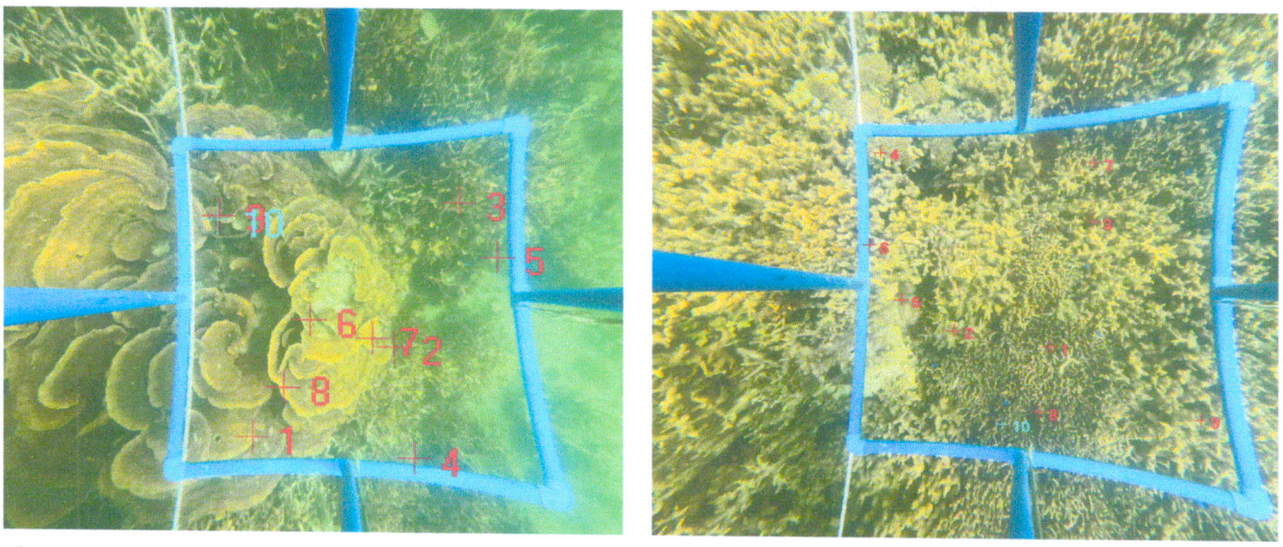


Figure 9. Photos of coral reef using scoring images of CPCe in San Jose Island

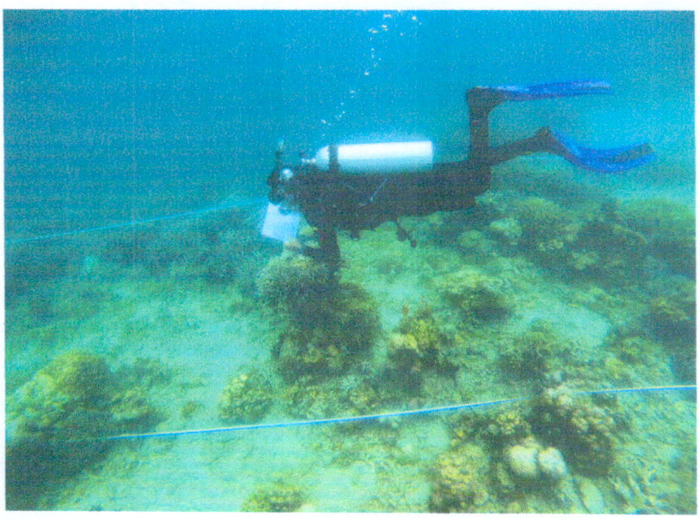
Appendix 2. Fish Families in five sampling sites of outer MSPLS.

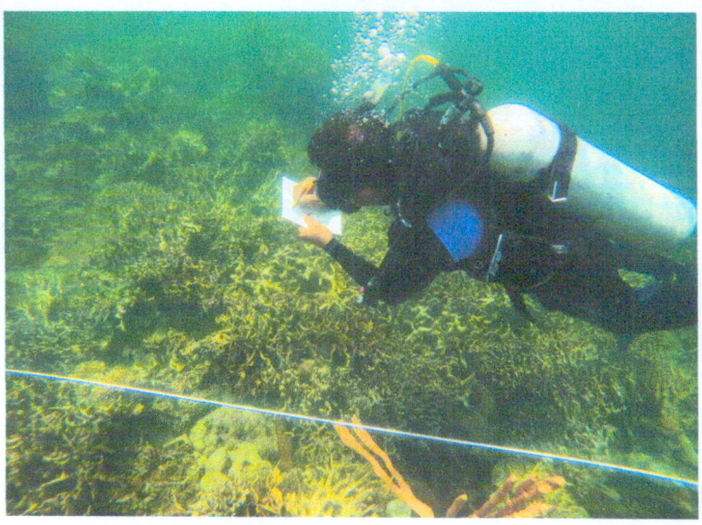
Acanthuridae
Apogonidae
Caesionidae
Carangidae
Chaetodontidae
Labridae
Lethinidae
Lutjanidae
Mullidae
Nemipteridae
Ostraciidae
Pomacanthidae
Pomacentridae
Scaridae
Serranidae
Zanclidae

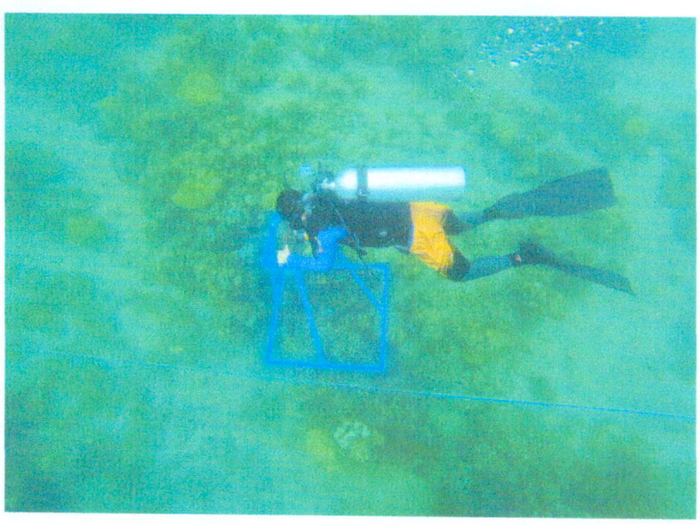
Appendix 3. Reef fished and associated fish species in six sites of five sapling sites of outer MSPLS.

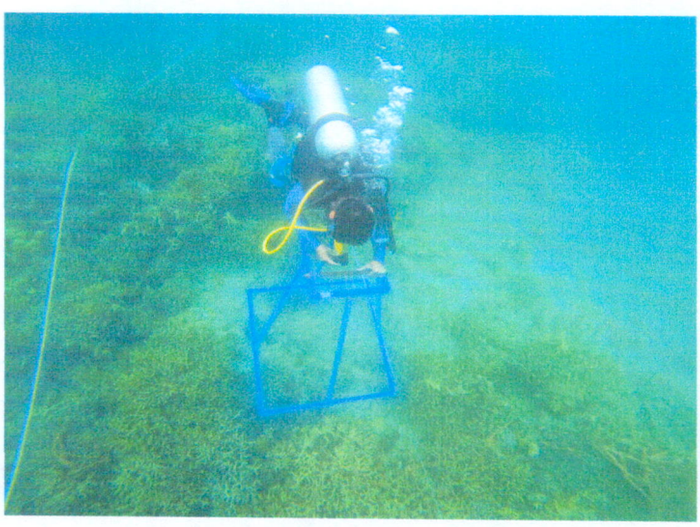
Abudefduf vaigiensis
Amphiprion ocellaris
Apogon trimaculatos
Caesio cuning
Caranx sexfasciatus
Cephalopholis boenak
Chaetodon octofasciatus
Chaetodontoplus mesoleucus
Chlorurus bleekeri
Chrysiptera parasema
Dascyllus trimaculatus
Halichoeres melanurus
Lethrinus nebulosus
Lutjanus decussatus
Naso lituratus
Neoglyphidodon crossi
Ostracion cubicus
Pentapodus aureofasciatus
Pomacentrus moluccensis
Pterocaesio diagramma
Scolopsis bilineata
Thalassoma unare
Upeneus tragula
Zanclus cornutus

Photo Documentation





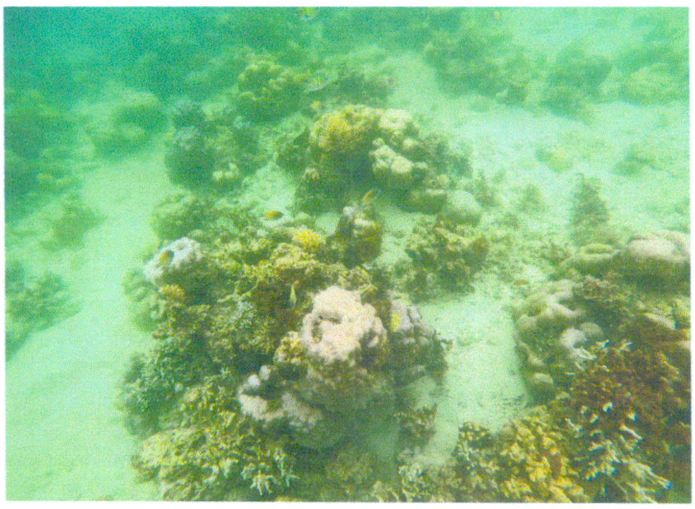


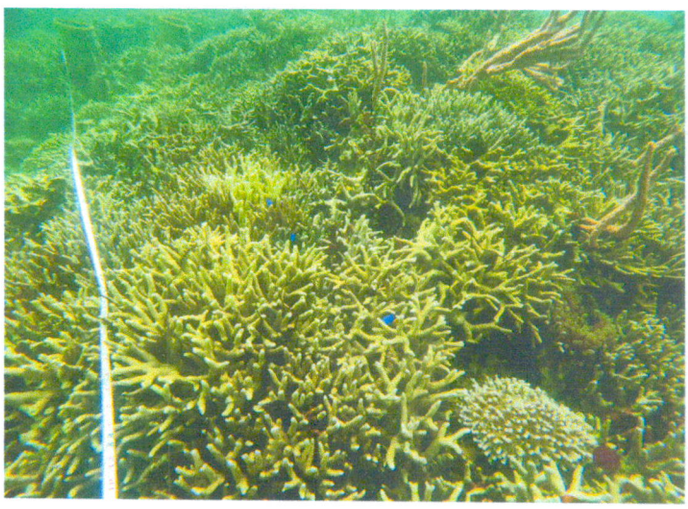


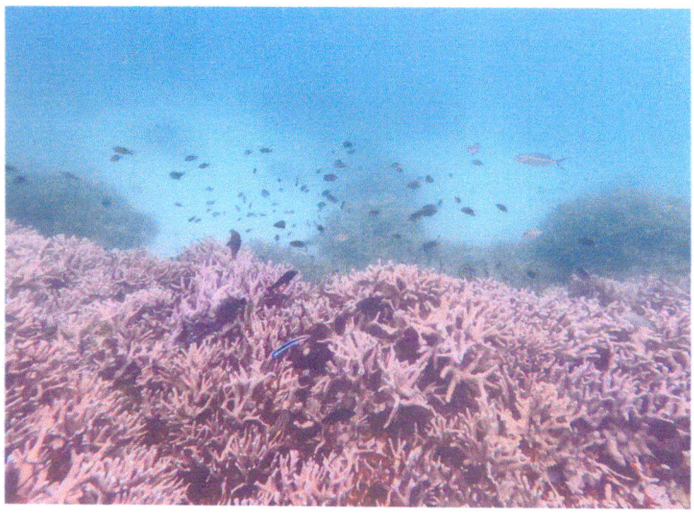
I hereby certify that the above photos are true and correct and taken during the conduct of corals monitoring within MSPLS.

MARIA LILIBETH E. AROJO

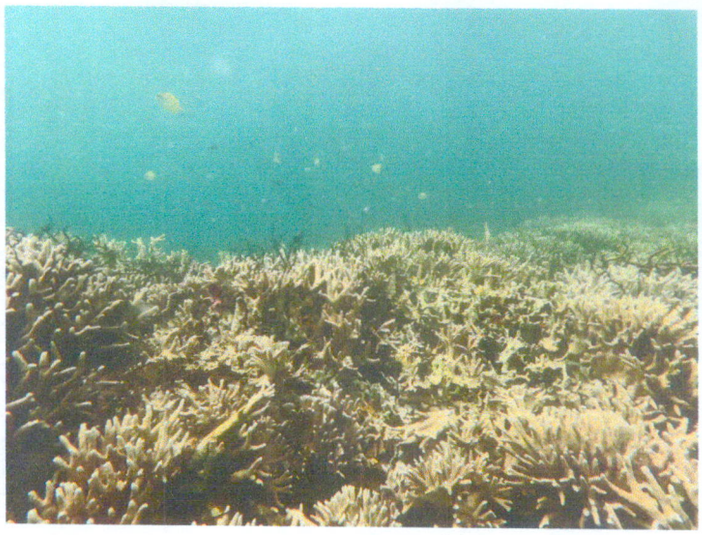
I. Some species of fish monitored within the five (5) monitoring sites.

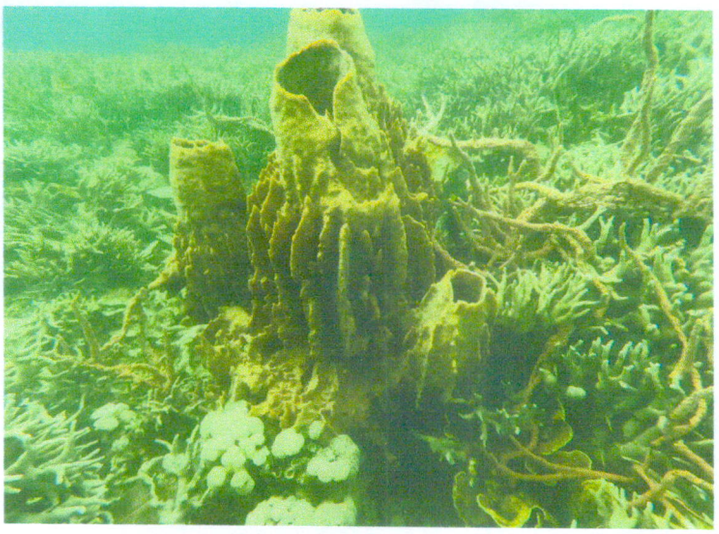


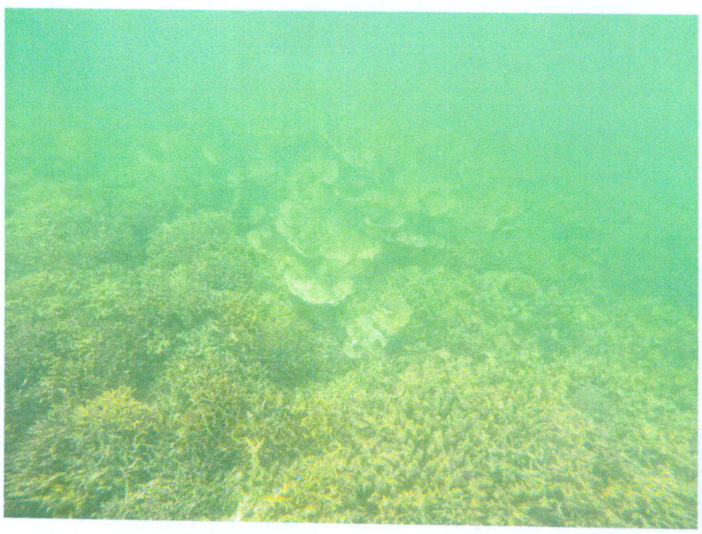


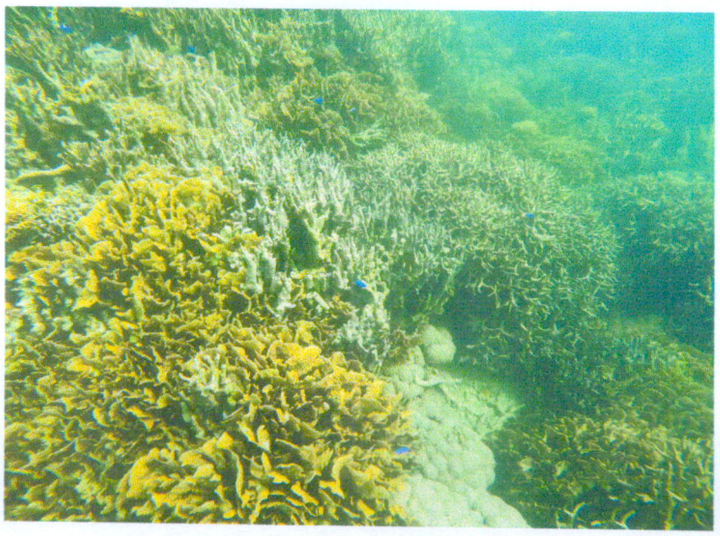


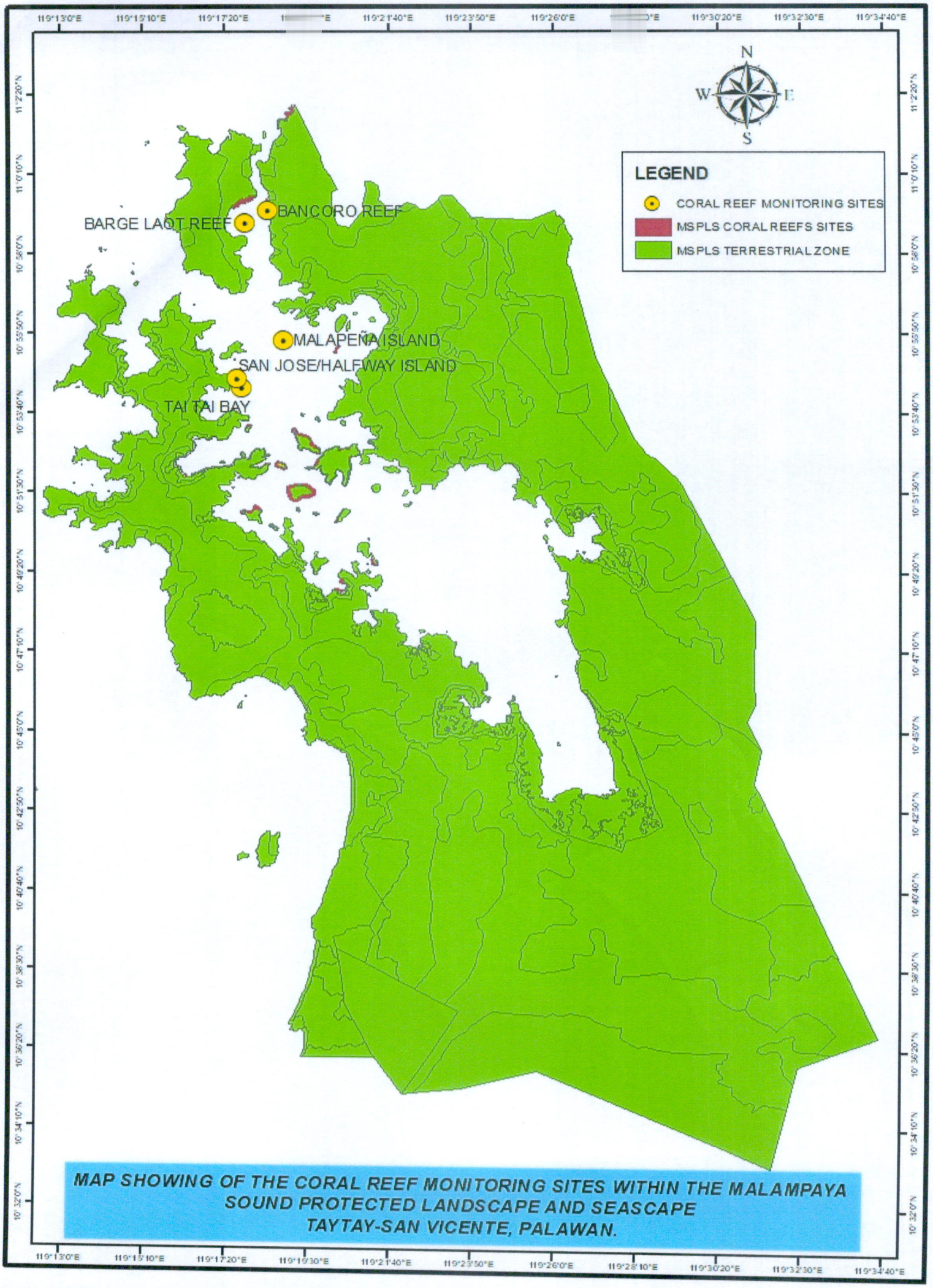
II. Some species of corals and sponge taken during the conduct of the activity in five (5) monitoring sites.











MAP SHOWING OF THE CORAL REEF MONITORING SITES WITHIN THE MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE TAYTAY-SAN VICENTE, PALAWAN.

Republic of the Philippines
Department of Environment and Natural Resources
MIMAROPA Region
PROTECTED AREA MANAGEMENT OFFICE
MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE (MSPLS)
Taytay-San Vicente, Palawan
Barangay Old Guinlo, Taytay, Palawan
Email add. pamomspls@gmail.com/Contact #:0936-786-3728

LOCATION MAP

SHOWING THE CORAL REFF MONITORING SITE LOCATED AT BANCORO REFF, BARANGAY LIMINANGCONG TAYTAY, PALAWAN. THIS SITE IS WITHIN THE MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE MARINE AREAS.

0 45 90 180 270 360 Meters

SCALE: 1:5,000

Projection: Transverse_Mercator

Projected Coordinate System: WGS_1984_UTM_Zone_50N

LEGEND

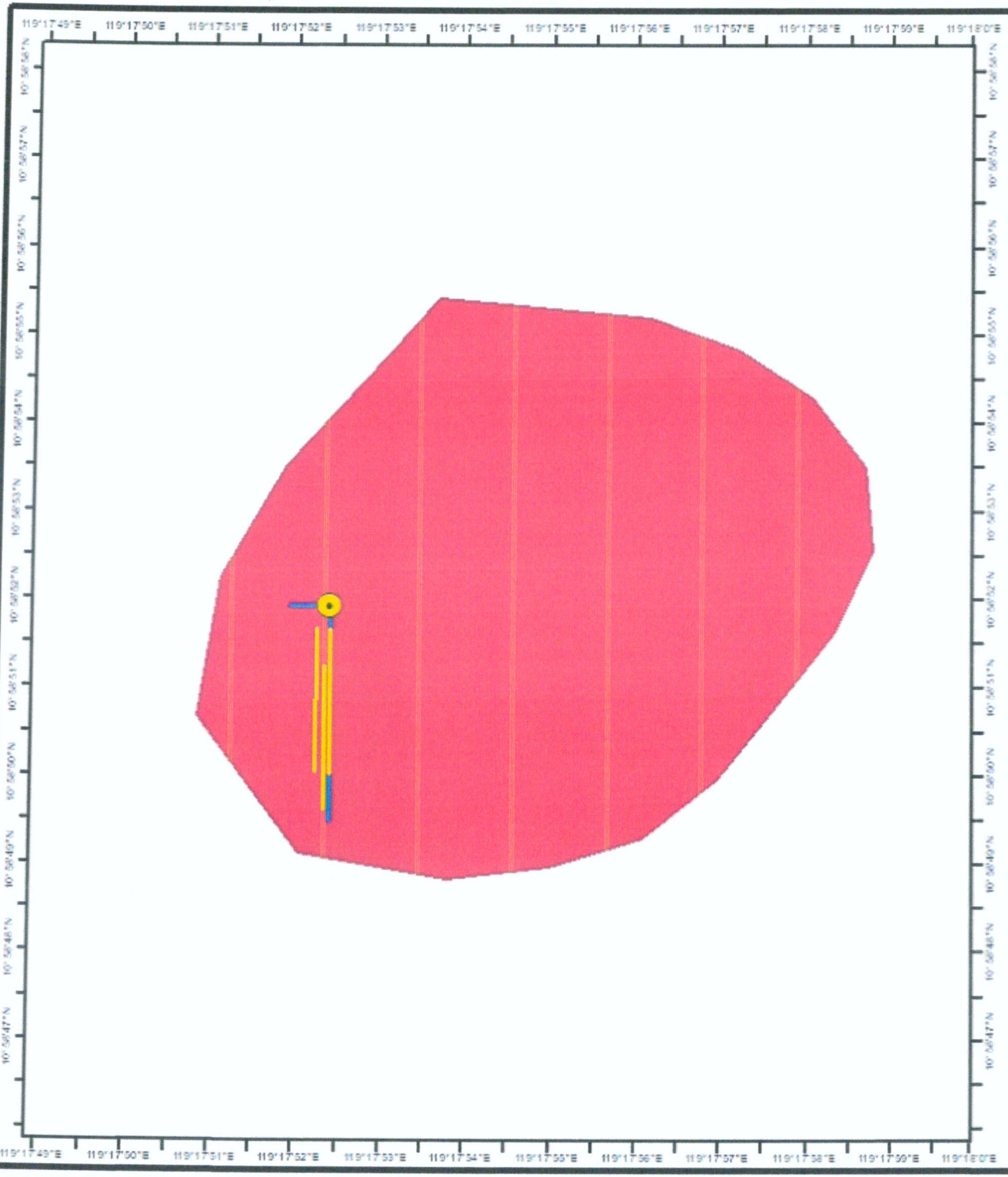
- CORAL REFF MONITORING SITES
- TRANSECT LINE
- BASELINE
- MSPLS CORAL REFF SITES.
- MSPLS TERRESTRIAL ZONE

CERTIFICATION

THIS IS TO CERTIFY that this area is within MALAMPAY SOUND PROTECTED LANDSCAPE AND SEASCAPE (MS per Presidential Proclamation No. 342 dated July 12, 2000

Digitized by: RONIEL C. SOLANA
GIS SPECIALIST

Checked/Verified: CLARISSA P. PADOR
For. III/PASu,MSPLS



Republic of the Philippines
Department of Environment and Natural Resources
MIMAROPA Region
PROTECTED AREA MANAGEMENT OFFICE
MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE (MSPLS)
Taytay-San Vicente, Palawan
Barangay Old Guinlo, Taytay, Palawan
Email add. pamomspls@gmail.com/Contact #:0938-786-3728

N
W E
S

LOCATION MAP

SHOWING THE CORAL REFF MONITORING SITE LOCTED AT BARGE LAOT, BARANGAY TUMBOD TAYTAY, PALAWAN.
THIS SITE IS WITHIN THE MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE MARINE AREAS.

0 15 30 60 90 120
Meters

SCALE: 1:2,000

Projection: Transverse_Mercator

Projected Coordinate System: WGS_1984_UTM_Zone_50N

LEGEND

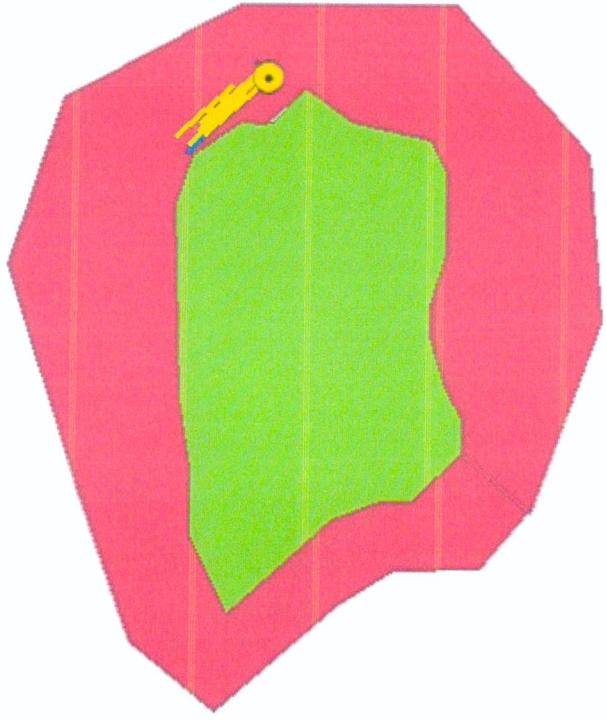
- CORAL REFF MONITORING SITES
- TRANSECT LINE
- BASELINE
- MSPLS CORAL REFF SITES.
- MSPLS TERRESTRIAL ZONE

CERTIFICATION

THIS IS TO CERTIFY that this area is within MALAMPAY SOUND PROTECTED LANDSCAPE AND SEASCAPE (MS per Presidential Proclamation No. 342 dated July 12, 2000

Digitized by: ROMIEL C. SOLANA
GIS SPECIALIST

Checked/Verified: CLARISSA P. PADOR
For. III/PASu,MSPLS



Republic of the Philippines
Department of Environment and Natural Resources
MIMAROPA Region
PROTECTED AREA MANAGEMENT OFFICE
MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE (MSPLS)
Taytay-San Vicente, Palawan
Barangay Old Guinlo, Taytay, Palawan
Email add. pamomspls@gmail.com/Contact #:0938-786-3728

N
W E
S

LOCATION MAP

SHOWING THE CORAL REFF MONITORING SITE LOCATED AT MALAPEÑA ISLAND, BARANGAY LIMINANGCONG TAYTAY, PALAWAN. THIS SITE IS WITHIN THE MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE MARINE AREAS.

0 45 90 180 270 360 Meters

SCALE: 1:5,000

Projection: Transverse_Mercator

Projected Coordinate System: WGS_1984_UTM_Zone_50N

LEGEND

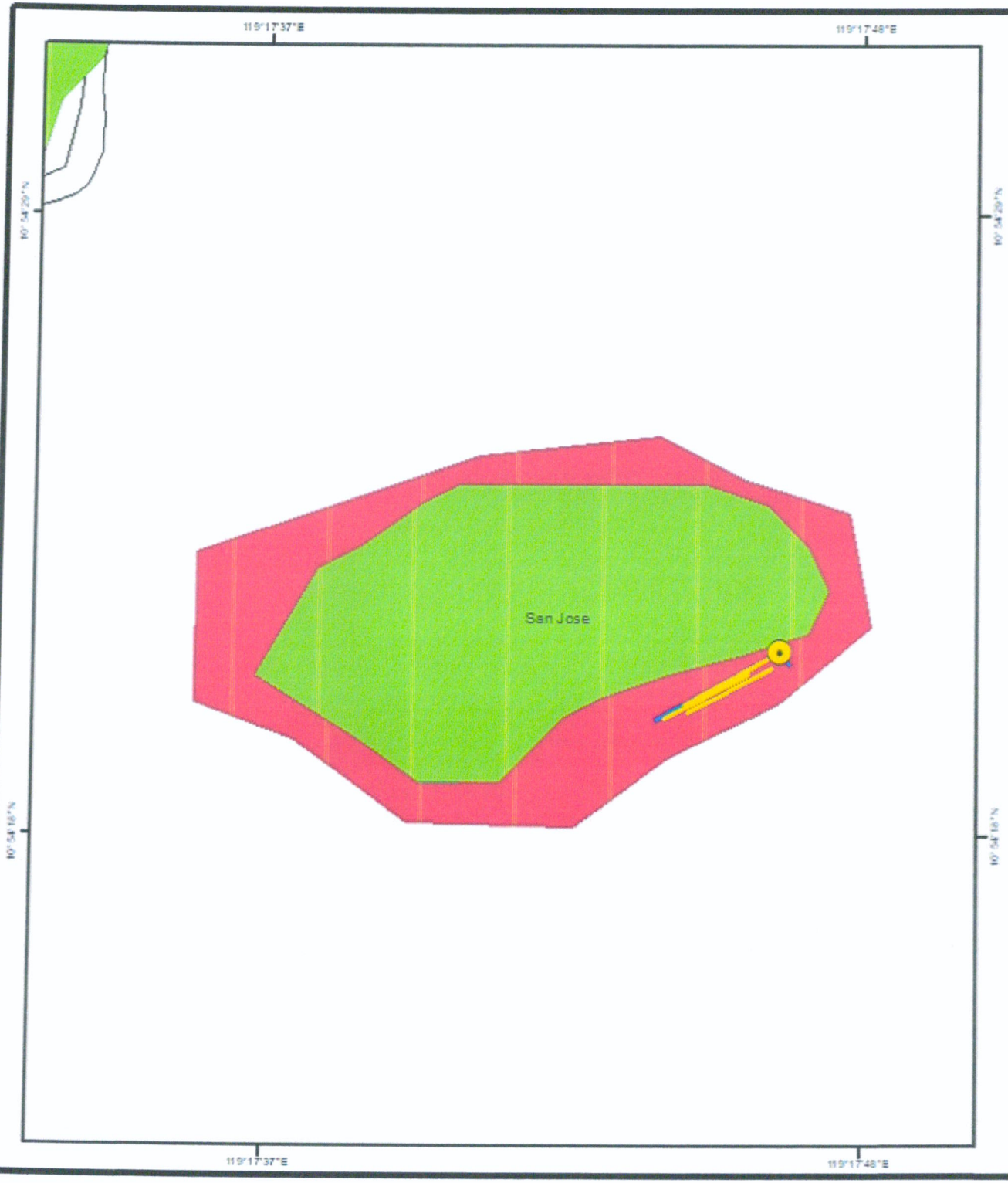
- CORAL REFF MONITORING SITES
- TRANSECT LINE
- BASELINE
- MSPLS CORAL REFF SITES.
- MSPLS TERRESTRIAL ZONE

CERTIFICATION

THIS IS TO CERTIFY that this area is within MALAMPAY SOUND PROTECTED LANDSCAPE AND SEASCAPE (MS per Presidential Proclamation No. 342 dated July 12, 2000

Digitized by: RONIEL C. SOLANA
GIS SPECIALIST

Checked/Verified: CLARISSA P. PADOR
For. III/PASu,MSPLS



Republic of the Philippines
Department of Environment and Natural Resources
MIMAROPA Region
PROTECTED AREA MANAGEMENT OFFICE
MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE (MSPLS)
Taytay-San Vicente, Palawan
Barangay Old Guinlo, Taytay, Palawan
Email add. pamomspls@gmail.com/Contact #:0938-786-3728

LOCATION MAP

SHOWING THE CORAL REFF MONITORING SITE LOCATED AT TAI-TAI BAY, BARANGAY SAN JOSE, TAYTAY, PALAWAN. THIS SITE IS WITHIN THE MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE MARINE AREAS.

0 25 50 100 150 200 Meters

SCALE: 1:3,000

Projection: Transverse_Mercator

Projected Coordinate System: WGS_1984_UTM_Zone_50N

LEGEND

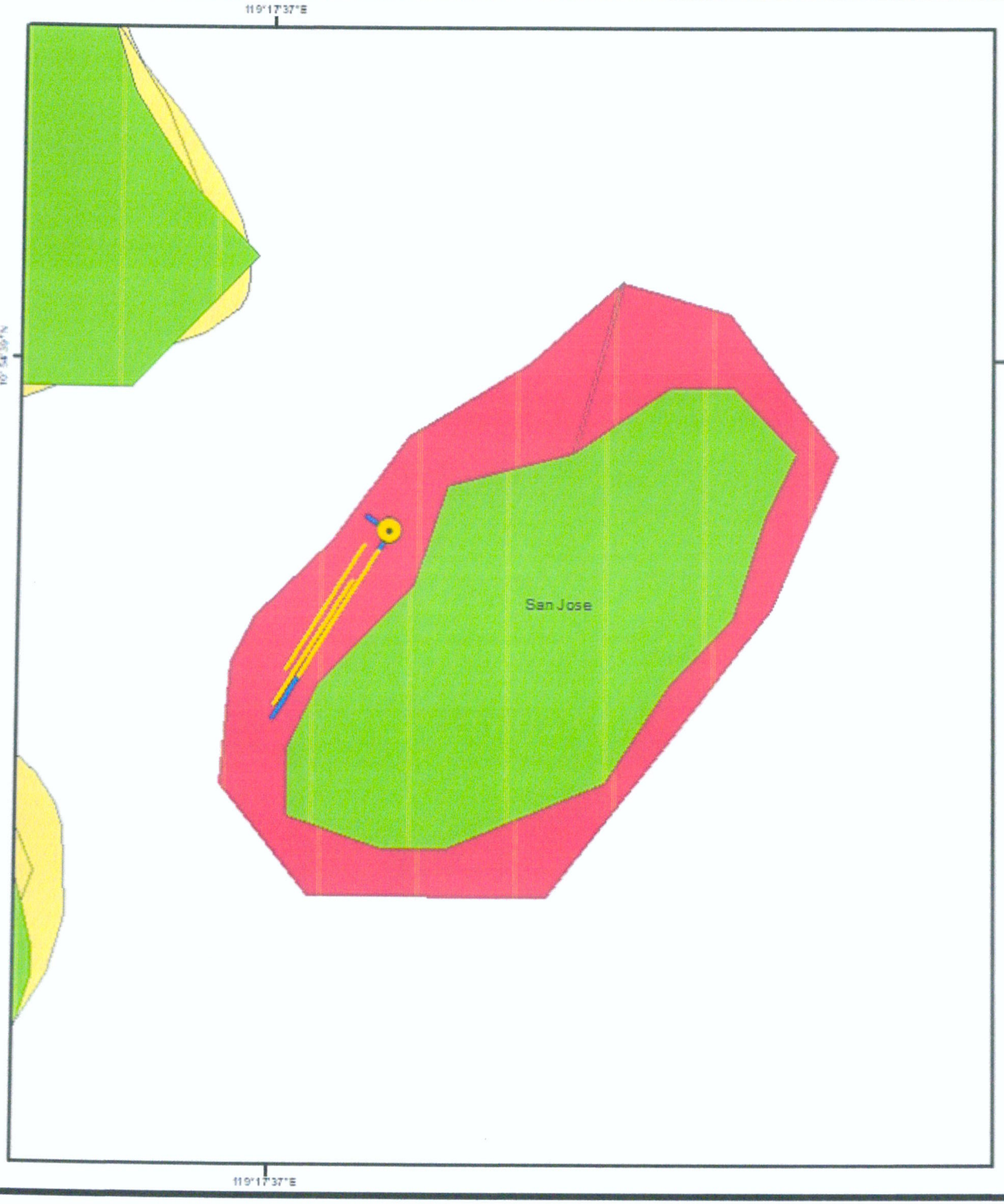
- CORAL REFF MONITORING SITES
- TRANSECT LINE
- BASELINE
- MSPLS CORAL REFF SITES.
- MSPLS TERRESTRIAL ZONE

CERTIFICATION

THIS IS TO CERTIFY that this area is within MALAMPAY SOUND PROTECTED LANDSCAPE AND SEASCAPE (MS per Presidential Proclamation No. 342 dated July 12, 2000

Digitized by:
RONIEL C. SOLANA
GIS SPECIALIST

Checked/Verified:
CLARISSA P. PADOR
For. III/PASu,MSPLS



Republic of the Philippines
Department of Environment and Natural Resources
MIMAROPA Region
PROTECTED AREA MANAGEMENT OFFICE
MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE (MSPLS)
Taytay-San Vicente, Palawan
Barangay Old Guinlo, Taytay, Palawan
Email add. pamomspls@gmail.com/Contact #:0938-786-3728

LOCATION MAP

SHOWING THE CORAL REFF MONITORING SITE LOCATED AT HALFWAY/SAN JOSE ISLAND, BARANGAY SAN JOSE, TAYTAY, PALAWAN. THIS SITE IS WITHIN THE MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE MARINE AREAS.

0 15 30 60 90 120
Meters

SCALE: 1:2,000

Projection: Transverse_Mercator

Projected Coordinate System: WGS_1984_UTM_Zone_50N

LEGEND

- CORAL REFF MONITORING SITES
- TRANSECT LINE
- BASELINE
- MSPLS CORAL REFF SITES.
- MSPLS TERRESTRIAL ZONE

CERTIFICATION

THIS IS TO CERTIFY that this area is within MALAMPAY SOUND PROTECTED LANDSCAPE AND SEASCAPE (MS per Presidential Proclamation No. 342 dated July 12, 2000

Digitized by: RONIEL C. SOLANA
GIS SPECIALIST

Checked/Verified: CLARISSA P. PADOR
For. III/PASu,MSPLS

Raw data of Fish Visual Census in Bancoro Reef, Bgy. Liminangcong, Taytay, Palawan

Scientific name	English name	Size (cm)	Total Count	a	b	wt	T. Biomass
Amphiprion ocellaris	False Clown Anemonefish	**5**	**3**	0.01445	3.00	1.80625	5.41875
Caesio cuning	Red-bellied Fusillier	21	8	0.01487	3.121	199.0478	1592.3824
Caesio cuning	Red-bellied Fusillier	21	3	0.01487	3.121	199.0478	597.1434
Cephalopholis boenak	Brown-banded Grouper	15	1	0.0106	3.1	46.90172	46.9017
Chaetodon octofasciatus	Eight-banded Butterflyfishes	10	8	0.038	2.921	31.679885	253.4391
Chaetodon octofasciatus	Eight-banded Butterflyfishes	22	3	0.038	2.921	316.95693	950.8708
Chaetodontoplus mesoleucus	Vermiculated Angelfish	13	6	0.0601	2.692	59.925267	359.5516
Chaetodontoplus mesoleucus	Vermiculated Angelfish	15	5	0.0601	2.692	88.087065	440.4353
Chrysiptera parasema	Yellowtail blue Damsel	3	7	0.0377	2.702	0.7337075	5.1360
Chrysiptera parasema	Yellowtail blue Damsel	3	5	0.0377	2.702	0.7337075	3.6685
Chlorurus bleekeri	Bleeker's Parrotfish	21	1	0.0169	3.049	181.691	181.6910
Dascyllus trimaculatus	Three-spot Dascyllus	5	32	0.108	2.75	9.0279941	288.8958
Dascyllus trimaculatus	Three-spot Dascyllus	5	25	0.108	2.75	9.0279941	225.6999
Dascyllus trimaculatus	Three-spot Dascyllus	7	12	0.108	2.75	22.774212	273.2905
SUM			**119**				**5224.5248**
							5.2245

Raw data of Fish Visual Census in Barge Laot, Bgy. Tumbod, Taytay, Palawan

Scientific name	English name	Size (cm)	Total Count	a	b	wt	T. Biomass
Amphiprion ocellaris	False Clown Anemonefish	**5**	**2**	0.01445	3.00	1.80625	3.6125
Caesio cuning	Red-bellied Fusillier	22	2	0.01487	3.121	230.15062	460.3012
Chaetodon octofasciatus	Eight-banded Butterflyfishes	10	7	0.038	2.921	31.679885	221.7592
Chaetodon octofasciatus	Eight-banded Butterflyfishes	21	3	0.038	2.921	276.68534	830.0560
Chaetodontoplus mesoleucus	Vermiculated Angelfish	12	2	0.0601	2.692	48.30926	96.6185
Chaetodontoplus mesoleucus	Vermiculated Angelfish	15	2	0.0601	2.692	88.087065	176.1741
Chrysiptera parasema	Yellowtail blue Damsel	3	15	0.0377	2.702	0.7337075	11.0056
Chrysiptera parasema	Yellowtail blue Damsel	3	8	0.0377	2.702	0.7337075	5.8697
Chrysiptera parasema	Yellowtail blue Damsel	3	4	0.0377	2.702	0.7337075	2.9348
Chlorurus bleekeri	Bleeker's Parrotfish	21	2	0.0169	3.049	181.69097	363.3819
Dascyllus trimaculatus	Three-spot Dascyllus	5	33	0.108	2.75	9.0279941	297.9238
Dascyllus trimaculatus	Three-spot Dascyllus	5	22	0.108	2.75	9.0279941	198.6159
Dascyllus trimaculatus	Three-spot Dascyllus	7	15	0.108	2.75	22.774212	341.6132
Halichoeres melanurus	Three-eyed Wrasse	10	1	0.0156	3	15.6	15.6000
Lutjanus decussatus	Checkered Snapper	6	2	0.0239	2.906	4.3621986	8.7244
Lutjanus decussatus	Checkered Snapper	6	2	0.0239	2.906	4.3621986	8.7244
Neoglyphidodon crossi	Cross' Damsel	5	8	0.02344	2.98	2.8371887	22.6975
Pentapodus aureofasciatus	Yellow-Striped Whiptail	22	1	0.01479	2.98	148.04296	148.0430
SUM			**131**				**3213.6558**
							3.2137

Raw data of Fish Visual Census in Malapeña Island, Bgy. San Jose, Taytay, Palawan

Scientific name	English name	Size (cm)	Total Count	a	b	wt	T. Biomass
Abudefduf vaigiensis	Seargent Major	15	10	0.03	2.8	58.90834	589.0834
Abudefduf vaigiensis	Seargent Major	8	7	0.03	2.8	10.13382	70.9367
Abudefduf vaigiensis	Seargent Major	21	1	0.03	2.8	151.1246	151.1246
Abudefduf vaigiensis	Seargent Major	8	6	0.03	2.8	10.13382	60.8029
Amphiprion ocellaris	False Clown Anemonefish	5	2	0.01445	3.00	1.80625	3.6125
Cephalopholis boenak	Brown-banded Grouper	22	1	0.0106	3.1	153.7504	153.7504
Chaetodon octofasciatus	Eight-banded Butterflyfishes	7	5	0.038	2.921	11.17674	55.8837
Chaetodon octofasciatus	Eight-banded Butterflyfishes	5	3	0.038	2.921	4.182876	12.5486
Chaetodon octofasciatus	Eight-banded Butterflyfishes	11	1	0.038	2.921	41.84963	41.8496
Chrysiptera parasema	Yellowtail blue Damsel	3	2	0.0377	2.702	0.733708	1.4674
Dascyllus trimaculatus	Three-spot Dascyllus	7	15	0.108	2.75	22.77421	341.6132
Dascyllus trimaculatus	Three-spot Dascyllus	5	3	0.108	2.75	9.027994	27.0840
Dascyllus trimaculatus	Three-spot Dascyllus	13	64	0.108	2.75	124.9591	7997.3840
Dascyllus trimaculatus	Three-spot Dascyllus	5	7	0.108	2.75	9.027994	63.1960
Naso lituratus	Striped-face unicornfish	15	2	0.0216	2.988	70.56908	141.1382
Ostracion cubicus	Spotted boxfish	7	53	0.101	2.588	15.53943	823.5898
Pterocaesio diagramma	Black-tipped fusilier	18	400	0.00691	3.341	107.98	43192.0163
Pomacentrus moluccensis	Lemon Damsel	5	3	0.0703	2.65	5.002946	15.0088
Scolopsis bilineata	Bridled Monocle Bream	22	4	0.0149	3.141	245.3217	981.2867
Scolopsis bilineata	Bridled Monocle Bream	20	12	0.0149	3.141	181.8534	2182.2411
Thalassoma unare	Moon Wrasse	22	5	0.0238	2.749	116.6533	583.2663
Thalassoma unare	Moon Wrasse	9	3	0.0238	2.749	9.995157	29.9855
Thalassoma unare	Moon Wrasse	24	3	0.0238	2.749	148.1759	444.5278
Upeneus tragula	Freckled Goatfish	20	1	0.0166	2.989	128.4952	128.4952
Zanclus cornutus	Moorish Idol	20	5	0.0172	3.171	229.6649	1148.3243
Zanclus cornutus	Moorish Idol	22	1	0.0172	3.171	310.7068	310.7068
SUM			**619**				**59550.9238**
							59.5509

Raw data of Fish Visual Census in Tai-tai Bay, Bgy. San Jose, Taytay, Palawan

Scientific name	English name	Size (cm)	Total Count	a	b	wt	T. Biomass
Abudefduf vaigiensis	Seargent Major	8	15	0.03	2.8	10.1338	152.0073
Abudefduf vaigiensis	Seargent Major	5	15	0.03	2.8	2.71792	40.7689
Apogon trimaculatus	Cardinalfish	22	5	0.02174	2.971	211.64	1058.1990
Amphiprion ocellaris	False Clown Anemonefish	5	2	0.01445	3.00	1.80625	3.6125
Amphiprion ocellaris	False Clown Anemonefish	5	4	0.01445	3.00	1.80625	7.2250
Caesio cuning	Black-tipped fusilier	20	44	0.01487	3.12	170.933	7521.0463
Cephalopholis boenak	Brown-banded Grouper	22	1	0.0106	3.1	153.75	153.7504
Cephalopholis boenak	Brown-banded Grouper	20	1	0.0106	3.1	114.419	114.4192
Cephalopholis boenak	Brown-banded Grouper	22	1	0.0106	3.1	153.75	153.7504
Chaetodon octofasciatus	Eight-banded Butterflyfishes	12	5	0.038	2.921	53.96	269.8000
Chaetodontoplus mesoleucus	Vermiculated Angelfish	10	16	0.0601	2.692	29.5716	473.1452
Chaetodontoplus mesoleucus	Vermiculated Angelfish	12	3	0.0601	2.692	48.3093	144.9278
Chaetodontoplus mesoleucus	Vermiculated Angelfish	9	12	0.0601	2.692	22.2687	267.2247
Chlorurus bleekeri	Bleeker's Parrotfish	21	14	0.0169	3.049	181.691	2543.6735
Chlorurus bleekeri	Bleeker's Parrotfish	22	2	0.0169	3.049	209.379	418.7583
Chrysiptera parasema	Yellowtail blue Damsel	3	8	0.0377	2.702	0.73371	5.8697
Chrysiptera parasema	Yellowtail blue Damsel	3	37	0.0377	2.702	0.73371	27.1472
Dascyllus trimaculatus	Three-spot Dascyllus	5	30	0.108	2.75	9.02799	270.8398
Dascyllus trimaculatus	Three-spot Dascyllus	7	22	0.108	2.75	22.7742	501.0327
Dascyllus trimaculatus	Three-spot Dascyllus	5	66	0.108	2.75	9.02799	595.8476
Lethrinus nebulosus	Spangled Emperor Fish	22	4	0.01871	2.996	196.776	787.1040
Lutjanus decussatus	Checkered Snapper	24	1	0.0239	2.906	245.071	245.0709
Ostracion cubicus	Spotted boxfish	25	1	0.101	2.588	418.977	418.9769
Pentapodus aureofasciatus	Yellow-Striped Whiptail	22	1	0.01479	2.98	148.043	148.0430
Thalassoma unare	Moon Wrasse	22	20	0.0238	2.749	116.653	2333.0653
Thalassoma unare	Moon Wrasse	9	13	0.0238	2.749	9.99516	129.9370
Thalassoma unare	Moon Wrasse	24	10	0.0238	2.749	148.176	1481.7593
Zanclus cornutus	Moorish Idol	22	1	0.0172	3.171	310.707	310.7068
SUM			**354**				**20577.7087**
							20.5777

Raw data of Fish Visual Census in San Jose Island, Bgy. San Jose, Taytay, Palawan

Scientific name	English name	Size (cm)	Total Count	a	b	wt	T. Biomass
Apogon trimaculatus	Cardinalfish	15	3	0.02174	2.971	67.8308	203.4923
Apogon trimaculatus	Cardinalfish	9	17	0.02174	2.971	14.8701	252.7918
Caesio cuning	Red-bellied Fusillier	24	3	0.01487	3.12	301.961	905.8817
Caesio cuning	Red-bellied Fusillier	10	50	0.01487	3.12	19.6477	982.3833
Caranx sexfasciatus	Bigeye Trevally	30	1	0.0318	2.93	676.694	676.6941
Caranx sexfasciatus	Bigeye Trevally	32	55	0.0318	2.93	817.554	44965.4813
Chaetodon octofasciatu	Eight-banded Butterflyfis	21	2	0.038	2.921	276.685	553.3707
Chaetodon octofasciatu	Eight-banded Butterflyfis	24	9	0.038	2.921	408.677	3678.0967
Chaetodontoplus mesol	Vermiculated Angelfish	8	3	0.0601	2.692	16.2178	48.6535
Chaetodontoplus mesol	Vermiculated Angelfish	12	4	0.0601	2.692	48.3093	193.2370
Chaetodontoplus mesol	Vermiculated Angelfish	12	9	0.0601	2.692	48.3093	434.7833
Chlorurus bleekeri	Bleeker's Parrotfish	15	5	0.0169	3.049	65.1312	325.6559
Chlorurus bleekeri	Bleeker's Parrotfish	18	3	0.0169	3.049	113.557	340.6700
Chrysiptera parasema	Yellowtail blue Damsel	3	39	0.0377	2.702	0.73371	28.6146
Chrysiptera parasema	Yellowtail blue Damsel	2	25	0.0377	2.702	0.24532	6.1329
Chrysiptera parasema	Yellowtail blue Damsel	3	29	0.0377	2.702	0.73371	21.2775
Dascyllus trimaculatus	Three-spot Dascyllus	5	90	0.108	2.75	9.02799	812.5195
Dascyllus trimaculatus	Three-spot Dascyllus	11	45	0.108	2.75	78.9321	3551.9444
Dascyllus trimaculatus	Three-spot Dascyllus	7	15	0.108	2.75	22.7742	341.6132
Lutjanus decussatus	Checkered Snapper	24	80	0.0239	2.906	245.071	19605.6731
Thalassoma unare	Moon Wrasse	15	3	0.0238	2.749	40.7054	122.1161
Thalassoma unare	Moon Wrasse	21	1	0.0238	2.749	102.65	102.6497
Thalassoma unare	Moon Wrasse	18	2	0.0238	2.749	67.1925	134.3851
Upeneus tragula	Freckled Goatfish	20	3	0.0166	2.989	128.495	385.4855
Zanclus cornutus	Moorish Idol	15	1	0.0172	3.171	92.2388	92.2388
SUM			**497**				**78765.8419**
							78.7658

RAW DATA OF CORALS IN BANCORO REEF USING CPCe

TRANSECT NAME	T1	T2	T3			
Number of frames	49	29	39			
Total points	490	290	390			
Total points (minus tape+wand+shadow)	485	286	386			
MAJOR CATEGORY (% of transect)				**MEAN**	**STD. DEV.**	**STD. ERROR**
CORAL (HC)	73.20	78.67	61.399	71.09	8.83	8.83
DEAD CORAL (DC)	1.03	0.00	2.0725	1.03	1.04	1.04
SOFT CORAL (SC)	0.21	0.35	0.2591	0.27	0.07	0.07
OTHER ORGANISMS (OO)	0.41	0.00	0	0.14	0.24	0.24
ALGAE (AL)	2.68	5.24	3.886	3.94	1.28	1.28
ABIOTIC COMPONENT (AB)	22.47	15.73	32.383	23.53	8.37	8.37
TAPE, WATER, BLOCK (TWB)	1.02	1.38	1.0256	1.14	0.21	0.21
Sum (excluding tape+shadow+wand)	100.00	100.00	100			
SUBCATEGORIES (% of transect)				**MEAN**	**STD. DEV.**	**STD. ERROR**
CORAL (HC)						
Acropora branching (ACB)	56.91	74.83	52.332	61.35	11.89	11.89
Acropora digitate (ACD)	0.00	0.00	0	0.00	0.00	0.00
Acropora submassive (ACS)	0.00	0.00	0.2591	0.09	0.15	0.15
Acropora tabulate (ACT)	0.00	0.00	0	0.00	0.00	0.00
Bleached coral (BLEC)	0.00	0.00	0	0.00	0.00	0.00
Heliopora (CHL)	0.00	0.00	0	0.00	0.00	0.00
Millepora (CME)	0.00	0.00	0	0.00	0.00	0.00
Mushroom coral (CMR)	1.24	1.05	3.6269	1.97	1.44	1.44
Other branching corals (CB)	1.65	0.00	0.5181	0.72	0.84	0.84
Other encrusting corals (CE)	0.21	0.00	0.2591	0.16	0.14	0.14
Other foliose corals (CF)	0.41	0.00	0.5181	0.31	0.27	0.27
Other massive corals (CM)	0.00	0.00	0	0.00	0.00	0.00
Other submassive corals (CS)	12.78	2.80	3.886	6.49	5.48	5.48
DEAD CORAL (DC)						
Dead Coral (DC)	0.82	0.00	0.7772	0.53	0.46	0.46
Dead coral with algae (DCA)	0.21	0.00	1.2953	0.50	0.70	0.70
SOFT CORAL (SC)						
Soft coral (SC)	0.21	0.35	0.2591	0.27	0.07	0.07
OTHER ORGANISMS (OO)						
Other animals (OT)	0.00	0.00	0	0.00	0.00	0.00
Sponge (SP)	0.41	0.00	0	0.14	0.24	0.24
Zoanthids (ZO)	0.00	0.00	0	0.00	0.00	0.00
ALGAE (AL)						
Algal assemblages (AA)	0.00	0.00	0.2591	0.09	0.15	0.15
Coralline algae (CA)	2.68	5.24	3.6269	3.85	1.30	1.30
Halimeda (HA)	0.00	0.00	0	0.00	0.00	0.00
Macroalgae (MA)	0.00	0.00	0	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)						
Rubble (R)	7.84	5.94	13.212	9.00	3.77	3.77
Sand (S)	14.64	9.79	19.171	14.53	4.69	4.69
Silt (SI)	0.00	0.00	0	0.00	0.00	0.00
TAPE, WATER, BLOCK (TWB)						
Tape, Water, Block (TWB)	1.02	1.38	1.0256	1.14	0.21	0.21
NOTES (% of transect)				**MEAN**	**STD. DEV.**	**STD. ERROR**
Bleached coral (BLEC)	0.00	0.00	0	0.00	0.00	0.00
NOTES (% of coral)						
Bleached coral (BLEC)	0.00	0.00	0	0.00	0.00	0.00

MAJOR CATEGORY (occurring in transect)				MEAN	STD. DEV.	STD. ERROR	SW INDEX	SIMPSON (1-D)
CORAL (HC)	355	225	237	272.33	71.84	71.84	0.60	0.27
DEAD CORAL (DC)	5	0	8	4.33	4.04	4.04	0.66	0.47
SOFT CORAL (SC)	1	1	1	1.00	0.00	0.00	0.00	0.00
OTHER ORGANISMS (OO)	2	0	0	0.67	1.15	1.15	0.00	1.00
ALGAE (AL)	13	15	15	14.33	1.15	1.15	0.24	0.12
ABIOTIC COMPONENT (AB)	109	45	125	93.00	42.33	42.33	0.68	0.48
TAPE, WATER, BLOCK (TWB)	5	4	4	4.33	0.58	0.58		
TOTAL TRANSECT POINTS	**490**	**290**	**390**					

SUBCATEGORIES (occurring in transect)				MEAN	STD. DEV.	STD. ERROR	SW INDEX	SIMPSON (1-D)
CORAL (HC)							0.60	0.27
Acropora branching (ACB)	276	214	202	230.67	39.72	39.72	0.14	0.73
Acropora digitate (ACD)	0	0	0	0.00	0.00	0.00	0.00	0.00
Acropora submassive (ACS)	0	0	1	0.33	0.58	0.58	0.02	0.00
Acropora tabulate (ACT)	0	0	0	0.00	0.00	0.00	0.00	0.00
Bleached coral (BLEC)	0	0	0	0.00	0.00	0.00	0.00	0.00
Heliopora (CHL)	0	0	0	0.00	0.00	0.00	0.00	0.00
Millepora (CME)	0	0	0	0.00	0.00	0.00	0.00	0.00
Mushroom coral (CMR)	6	3	14	7.67	5.69	5.69	0.17	0.00
Other branching corals (CB)	8	0	2	3.33	4.16	4.16	0.04	0.00
Other encrusting corals (CE)	1	0	1	0.67	0.58	0.58	0.02	0.00
Other foliose corals (CF)	2	0	2	1.33	1.15	1.15	0.04	0.00
Other massive corals (CM)	0	0	0	0.00	0.00	0.00	0.00	0.00
Other submassive corals (CS)	62	8	15	28.33	29.37	29.37	0.17	0.00
DEAD CORAL (DC)							0.66	0.47
Dead Coral (DC)	4	0	3	2.33	2.08	2.08	0.37	0.14
Dead coral with algae (DCA)	1	0	5	2.00	2.65	2.65	0.29	0.39
SOFT CORAL (SC)							0.00	0.00
Soft coral (SC)	1	1	1	1.00	0.00	0.00	0.00	1.00
OTHER ORGANISMS (OO)							0.00	1.00
Other animals (OT)	0	0	0	0.00	0.00	0.00	0.00	0.00
Sponge (SP)	2	0	0	0.67	1.15	1.15	0.00	0.00
Zoanthids (ZO)	0	0	0	0.00	0.00	0.00	0.00	0.00
ALGAE (AL)							0.24	0.12
Algal assemblages (AA)	0	0	1	0.33	0.58	0.58	0.18	0.00
Coralline algae (CA)	13	15	14	14.00	1.00	1.00	0.06	0.87
Halimeda (HA)	0	0	0	0.00	0.00	0.00	0.00	0.00
Macroalgae (MA)	0	0	0	0.00	0.00	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)							0.68	0.48
Rubble (R)	38	17	51	35.33	17.16	17.16	0.37	0.17
Sand (S)	71	28	74	57.67	25.74	25.74	0.31	0.35
Silt (SI)	0	0	0	0.00	0.00	0.00	0.00	0.00
TAPE, WATER, BLOCK (TWB)								
Tape, Water, Block (TWB)	5	4	4	4.33	0.58	0.58		1.00

NOTES (occurring in transect)				MEAN	STD. DEV.	STD. ERROR
Bleached coral (BLEC)	0	0	0	0.00	0.00	0.00
NOTES (occurring in coral)						
Bleached coral (BLEC)	0	0	0	0.00	0.00	0.00

Shannon-Weaver Index	**0.74**	**0.65**	0.8866
CORAL (HC)	0.23	0.19	0.2995
DEAD CORAL (DC)	0.05	0.00	0.0803
SOFT CORAL (SC)	0.01	0.02	0.0154
OTHER ORGANISMS (OO)	0.02	0.00	0
ALGAE (AL)	0.10	0.15	0.1262

ABIOTIC COMPONENT (AB)	0.34	0.29	0.3651
TAPE, WATER, BLOCK (TWB)			
Simpson Index of Diversity (1-D)	**0.41**	**0.35**	0.5162
CORAL (HC)	0.54	0.62	0.377
DEAD CORAL (DC)	0.00	0.00	0.0004
SOFT CORAL (SC)	0.00	0.00	7E-06
OTHER ORGANISMS (OO)	0.00	0.00	0
ALGAE (AL)	0.00	0.00	0.0015
ABIOTIC COMPONENT (AB)	0.05	0.02	0.1049
TAPE, WATER, BLOCK (TWB)			

RAW DATA OF CORALS IN BARGE LAOT USING CPCe

TRANSECT NAME	T1	T2	T3			
Number of frames	56	38	35			
Total points	560	379	350			
Total points (minus tape+wand+shadow)	556	377	346			
MAJOR CATEGORY (% of transect)				**MEAN**	**STD. DEV.**	**STD. ERROR**
CORAL (HC)	74.82	91.512	95.954	87.43	11.14	11.14
DEAD CORAL (DC)	13.67	1.3263	0	5.00	7.54	7.54
SOFT CORAL (SC)	2.70	3.4483	3.4682	3.20	0.44	0.44
OTHER ORGANISMS (OO)	0.54	1.8568	0.289	0.90	0.84	0.84
ALGAE (AL)	0.54	1.3263	0.289	0.72	0.54	0.54
ABIOTIC COMPONENT (AB)	7.73	0.5305	0	2.75	4.32	4.32
TAPE, WATER, BLOCK (TWB)	0.71	0.5277	1.1429	0.79	0.32	0.32
Sum (excluding tape+shadow+wand)	100.00	100	100			
SUBCATEGORIES (% of transect)				**MEAN**	**STD. DEV.**	**STD. ERROR**
CORAL (HC)						
Acropora branching (ACB)	65.11	87.003	91.618	81.24	14.16	14.16
Acropora digitate (ACD)	0.00	0	0	0.00	0.00	0.00
Acropora submassive (ACS)	0.00	0	0	0.00	0.00	0.00
Acropora tabulate (ACT)	0.00	0	0	0.00	0.00	0.00
Bleached coral (BLEC)	0.00	0	0	0.00	0.00	0.00
Heliopora (CHL)	0.00	0	0	0.00	0.00	0.00
Millepora (CME)	0.00	0	0	0.00	0.00	0.00
Mushroom coral (CMR)	6.65	2.9178	0.578	3.38	3.06	3.06
Other branching corals (CB)	2.34	0.2653	1.1561	1.25	1.04	1.04
Other encrusting corals (CE)	0.00	0	0	0.00	0.00	0.00
Other foliose corals (CF)	0.00	0	1.1561	0.39	0.67	0.67
Other massive corals (CM)	0.00	0.2653	0.578	0.28	0.29	0.29
Other submassive corals (CS)	0.72	1.061	0.8671	0.88	0.17	0.17
DEAD CORAL (DC)						
Dead Coral (DC)	13.13	0.7958	0	4.64	7.36	7.36
Dead coral with algae (DCA)	0.54	0.5305	0	0.36	0.31	0.31
SOFT CORAL (SC)						
Soft coral (SC)	2.70	3.4483	3.4682	3.20	0.44	0.44
OTHER ORGANISMS (OO)						
Other animals (OT)	0.54	0	0	0.18	0.31	0.31
Sponge (SP)	0.00	1.8568	0.289	0.72	1.00	1.00
Zoanthids (ZO)	0.00	0	0	0.00	0.00	0.00
ALGAE (AL)						
Algal assemblages (AA)	0.00	0	0	0.00	0.00	0.00
Coralline algae (CA)	0.54	1.3263	0.289	0.72	0.54	0.54
Halimeda (HA)	0.00	0	0	0.00	0.00	0.00
Macroalgae (MA)	0.00	0	0	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)						
Rubble (R)	0.36	0.5305	0	0.30	0.27	0.27
Sand (S)	7.37	0	0	2.46	4.26	4.26
Silt (SI)	0.00	0	0	0.00	0.00	0.00
TAPE, WATER, BLOCK (TWB)						
Tape, Water, Block (TWB)	0.71	0.5277	1.1429	0.79	0.32	0.32
NOTES (% of transect)				**MEAN**	**STD. DEV.**	**STD. ERROR**
Bleached coral (BLEC)	0.00	0	0	0.00	0.00	0.00
NOTES (% of coral)						
Bleached coral (BLEC)	0.00	0	0	0.00	0.00	0.00

MAJOR CATEGORY (occurring in transect)				MEAN	STD. DEV.	STD. ERROR	SW INDEX	SIMPSON (1-D)
CORAL (HC)	416	345	332	364.33	45.21	45.21	0.24	0.09
DEAD CORAL (DC)	76	5	0	27.00	42.51	42.51	0.67	0.48
SOFT CORAL (SC)	15	13	12	13.33	1.53	1.53	0.00	0.00
OTHER ORGANISMS (OO)	3	7	1	3.67	3.06	3.06	0.00	0.00
ALGAE (AL)	3	5	1	3.00	2.00	2.00	0.00	0.00
ABIOTIC COMPONENT (AB)	43	2	0	15.00	24.27	24.27	0.00	0.00
TAPE, WATER, BLOCK (TWB)	4	2	4	3.33	1.15	1.15		
TOTAL TRANSECT POINTS	**560**	**379**	**350**					

SUBCATEGORIES (occurring in transect)				MEAN	STD. DEV.	STD. ERROR	SW INDEX	SIMPSON (1-D)
CORAL (HC)							0.24	0.09
Acropora branching (ACB)	362	328	317	335.67	23.46	23.46	0.05	0.90
Acropora digitate (ACD)	0	0	0	0.00	0.00	0.00	0.00	0.00
Acropora submassive (ACS)	0	0	0	0.00	0.00	0.00	0.00	0.00
Acropora tabulate (ACT)	0	0	0	0.00	0.00	0.00	0.00	0.00
Bleached coral (BLEC)	0	0	0	0.00	0.00	0.00	0.00	0.00
Heliopora (CHL)	0	0	0	0.00	0.00	0.00	0.00	0.00
Millepora (CME)	0	0	0	0.00	0.00	0.00	0.00	0.00
Mushroom coral (CMR)	37	11	2	16.67	18.18	18.18	0.11	0.00
Other branching corals (CB)	13	1	4	6.00	6.24	6.24	0.02	0.00
Other encrusting corals (CE)	0	0	0	0.00	0.00	0.00	0.00	0.00
Other foliose corals (CF)	0	0	4	1.33	2.31	2.31	0.00	0.00
Other massive corals (CM)	0	1	2	1.00	1.00	1.00	0.02	0.00
Other submassive corals (CS)	4	4	3	3.67	0.58	0.58	0.05	0.00
DEAD CORAL (DC)							0.67	0.48
Dead Coral (DC)	73	3	0	25.33	41.31	41.31	0.31	0.36
Dead coral with algae (DCA)	3	2	0	1.67	1.53	1.53	0.37	0.16
SOFT CORAL (SC)							0.00	0.00
Soft coral (SC)	15	13	12	13.33	1.53	1.53	0.00	1.00
OTHER ORGANISMS (OO)							0.00	0.00
Other animals (OT)	3	0	0	1.00	1.73	1.73	0.00	0.00
Sponge (SP)	0	7	1	2.67	3.79	3.79	0.00	1.00
Zoanthids (ZO)	0	0	0	0.00	0.00	0.00	0.00	0.00
ALGAE (AL)							0.00	0.00
Algal assemblages (AA)	0	0	0	0.00	0.00	0.00	0.00	0.00
Coralline algae (CA)	3	5	1	3.00	2.00	2.00	0.00	1.00
Halimeda (HA)	0	0	0	0.00	0.00	0.00	0.00	0.00
Macroalgae (MA)	0	0	0	0.00	0.00	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)							0.00	0.00
Rubble (R)	2	2	0	1.33	1.15	1.15	0.00	1.00
Sand (S)	41	0	0	13.67	23.67	23.67	0.00	0.00
Silt (SI)	0	0	0	0.00	0.00	0.00	0.00	0.00
TAPE, WATER, BLOCK (TWB)								
Tape, Water, Block (TWB)	4	2	4	3.33	1.15	1.15		1.00

NOTES (occurring in transect)				MEAN	STD. DEV.	STD. ERROR
Bleached coral (BLEC)	0	0	0	0.00	0.00	0.00
NOTES (occurring in coral)						
Bleached coral (BLEC)	0	0	0	0.00	0.00	0.00

Shannon-Weaver Index	**0.84**	0.4138	0.19
CORAL (HC)	0.22	0.0812	0.0396
DEAD CORAL (DC)	0.27	0.0573	0
SOFT CORAL (SC)	0.10	0.1161	0.1166
OTHER ORGANISMS (OO)	0.03	0.074	0.0169

ALGAE (AL)	0.03	0.0573	0.0169
ABIOTIC COMPONENT (AB)	0.20	0.0278	0
TAPE, WATER, BLOCK (TWB)			
Simpson Index of Diversity (1-D)	**0.41**	0.1606	0.0781
CORAL (HC)	0.56	0.8374	0.9207
DEAD CORAL (DC)	0.02	0.0002	0
SOFT CORAL (SC)	0.00	0.0012	0.0012
OTHER ORGANISMS (OO)	0.00	0.0003	8E-06
ALGAE (AL)	0.00	0.0002	8E-06
ABIOTIC COMPONENT (AB)	0.01	3E-05	0
TAPE, WATER, BLOCK (TWB)			

RAW DATA OF CORALS IN MALAPEÑA ISLAND USING CPCe

TRANSECT NAME	T1	T2	T3	T4	T5			
Number of frames	50	43	35	50	43			
Total points	500	430	349	500	430			
Total points (minus tape+wand+shadow)	495	427	348	495	427			
MAJOR CATEGORY (% of transect)						**MEAN**	**STD. DEV.**	**STD. ERROR**
CORAL (HC)	82.42	96.25	88.51	98.59	89.93	91.14	6.44	6.44
DEAD CORAL (DC)	0.00	0.00	4.89	0.00	0.00	0.98	2.18	2.18
SOFT CORAL (SC)	0.00	0.00	0.00	0.40	0.00	0.08	0.18	0.18
OTHER ORGANISMS (OO)	0.20	0.00	0.00	0.00	0.00	0.04	0.09	0.09
ALGAE (AL)	0.61	0.00	0.00	0.00	0.00	0.12	0.27	0.27
ABIOTIC COMPONENT (AB)	16.77	3.75	6.61	1.01	10.07	7.64	6.11	6.11
TAPE, WATER, BLOCK (TWB)	1.00	0.70	0.29	1.00	0.70	0.74	0.29	0.29
Sum (excluding tape+shadow+wand)	100.00	100.00	100.00	100.00	100.00			
SUBCATEGORIES (% of transect)						**MEAN**	**STD. DEV.**	**STD. ERROR**
CORAL (HC)								
Acropora branching (ACB)	67.88	79.86	66.38	76.97	61.83	70.58	7.56	7.56
Acropora digitate (ACD)	0.81	2.58	3.74	0.00	0.47	1.52	1.58	1.58
Acropora submassive (ACS)	1.82	0.00	0.00	0.00	2.34	0.83	1.15	1.15
Acropora tabulate (ACT)	0.00	0.00	0.00	0.00	0.47	0.09	0.21	0.21
Bleached coral (BLEC)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heliopora (CHL)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Millepora (CME)	0.00	0.00	0.00	0.20	0.00	0.04	0.09	0.09
Mushroom coral (CMR)	0.00	0.23	0.00	0.00	0.23	0.09	0.13	0.13
Other branching corals (CB)	0.40	0.70	6.32	1.62	2.11	2.23	2.39	2.39
Other encrusting corals (CE)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other foliose corals (CF)	0.61	3.28	1.44	0.81	0.00	1.23	1.26	1.26
Other massive corals (CM)	5.45	5.39	5.75	12.93	14.29	8.76	4.45	4.45
Other submassive corals (CS)	5.45	4.22	4.89	6.06	8.20	5.76	1.52	1.52
DEAD CORAL (DC)								
Dead Coral (DC)	0.00	0.00	4.89	0.00	0.00	0.98	2.18	2.18
Dead coral with algae (DCA)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOFT CORAL (SC)								
Soft coral (SC)	0.00	0.00	0.00	0.40	0.00	0.08	0.18	0.18
OTHER ORGANISMS (OO)								
Other animals (OT)	0.20	0.00	0.00	0.00	0.00	0.04	0.09	0.09
Sponge (SP)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zoanthids (ZO)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALGAE (AL)								
Algal assemblages (AA)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coralline algae (CA)	0.61	0.00	0.00	0.00	0.00	0.12	0.27	0.27
Halimeda (HA)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Macroalgae (MA)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)								
Rubble (R)	0.00	0.00	0.29	0.00	0.70	0.20	0.31	0.31
Sand (S)	16.77	3.75	6.32	1.01	9.37	7.44	6.06	6.06
Silt (SI)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TAPE, WATER, BLOCK (TWB)								
Tape, Water, Block (TWB)	1.00	0.70	0.29	1.00	0.70	0.74	0.29	0.29
NOTES (% of transect)						**MEAN**	**STD. DEV.**	**STD. ERROR**
Bleached coral (BLEC)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTES (% of coral)								
Bleached coral (BLEC)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MAJOR CATEGORY (occurring in transect)						MEAN	STD. DEV.	STD. ERROR	SW INDEX	SIMPSON (1-D)
CORAL (HC)	408	411	308	488	384	399.80	64.52	64.52	1.02	0.49
DEAD CORAL (DC)	0	0	17	0	0	3.40	7.60	7.60	0.00	1.00
SOFT CORAL (SC)	0	0	0	2	0	0.40	0.89	0.89	0.00	1.00
OTHER ORGANISMS (OO)	1	0	0	0	0	0.20	0.45	0.45	0.00	1.00
ALGAE (AL)	3	0	0	0	0	0.60	1.34	1.34	0.00	1.00
ABIOTIC COMPONENT (AB)	83	16	23	5	43	34.00	30.69	30.69	0.25	0.13
TAPE, WATER, BLOCK (TWB)	5	3	1	5	3	3.40	1.67	1.67		
TOTAL TRANSECT POINTS	**500**	**430**	**349**	**500**	**430**					

SUBCATEGORIES (occurring in transect)						MEAN	STD. DEV.	STD. ERROR	SW INDEX	SIMPSON (1-D)
CORAL (HC)									1.02	0.49
Acropora branching (ACB)	336	341	231	381	264	310.60	61.30	61.30	0.26	0.47
Acropora digitate (ACD)	4	11	13	0	2	6.00	5.70	5.70	0.03	0.00
Acropora submassive (ACS)	9	0	0	0	10	3.80	5.22	5.22	0.10	0.00
Acropora tabulate (ACT)	0	0	0	0	2	0.40	0.89	0.89	0.03	0.00
Bleached coral (BLEC)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Heliopora (CHL)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Millepora (CME)	0	0	0	1	0	0.20	0.45	0.45	0.00	0.00
Mushroom coral (CMR)	0	1	0	0	1	0.40	0.55	0.55	0.02	0.00
Other branching corals (CB)	2	3	22	8	9	8.80	7.98	7.98	0.09	0.00
Other encrusting corals (CE)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Other foliose corals (CF)	3	14	5	4	0	5.20	5.26	5.26	0.00	0.00
Other massive corals (CM)	27	23	20	64	61	39.00	21.62	21.62	0.29	0.03
Other submassive corals (CS)	27	18	17	30	35	25.40	7.77	7.77	0.22	0.01
DEAD CORAL (DC)									0.00	1.00
Dead Coral (DC)	0	0	17	0	0	3.40	7.60	7.60	0.00	0.00
Dead coral with algae (DCA)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
SOFT CORAL (SC)									0.00	1.00
Soft coral (SC)	0	0	0	2	0	0.40	0.89	0.89	0.00	0.00
OTHER ORGANISMS (OO)									0.00	1.00
Other animals (OT)	1	0	0	0	0	0.20	0.45	0.45	0.00	0.00
Sponge (SP)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Zoanthids (ZO)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
ALGAE (AL)									0.00	1.00
Algal assemblages (AA)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Coralline algae (CA)	3	0	0	0	0	0.60	1.34	1.34	0.00	0.00
Halimeda (HA)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Macroalgae (MA)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)									0.25	0.13
Rubble (R)	0	0	1	0	3	0.80	1.30	1.30	0.19	0.00
Sand (S)	83	16	22	5	40	33.20	30.59	30.59	0.07	0.87
Silt (SI)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
TAPE, WATER, BLOCK (TWB)										
Tape, Water, Block (TWB)	5	3	1	5	3	3.40	1.67	1.67		1.00

NOTES (occurring in transect)						MEAN	STD. DEV.	STD. ERROR
Bleached coral (BLEC)	0	0	0	0	0	0.00	0.00	0.00
NOTES (occurring in coral)								
Bleached coral (BLEC)	0	0	0	0	0	0.00	0.00	0.00

Shannon-Weaver Index	**0.50**	**0.16**	**0.44**	**0.08**	**0.33**
CORAL (HC)	0.16	0.04	0.11	0.01	0.10
DEAD CORAL (DC)	0.00	0.00	0.15	0.00	0.00
SOFT CORAL (SC)	0.00	0.00	0.00	0.02	0.00
OTHER ORGANISMS (OO)	0.01	0.00	0.00	0.00	0.00

ALGAE (AL)	0.03	0.00	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)	0.30	0.12	0.18	0.05	0.23
TAPE, WATER, BLOCK (TWB)					
Simpson Index of Diversity (1-D)	**0.29**	**0.07**	**0.21**	**0.03**	**0.18**
CORAL (HC)	0.68	0.93	0.78	0.97	0.81
DEAD CORAL (DC)	0.00	0.00	0.00	0.00	0.00
SOFT CORAL (SC)	0.00	0.00	0.00	0.00	0.00
OTHER ORGANISMS (OO)	0.00	0.00	0.00	0.00	0.00
ALGAE (AL)	0.00	0.00	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)	0.03	0.00	0.00	0.00	0.01
TAPE, WATER, BLOCK (TWB)					

RAW DATA OF CORALS IN TAI-TAI BAY USING CPCe

TRANSECT NAME	T1	T2	T3			
Number of frames	50	50	50			
Total points	500	500	500			
Total points (minus tape+wand+sha	491	492	494			
MAJOR CATEGORY (% of transect)				**MEAN**	**STD. DEV.**	**STD. ERROR**
CORAL (HC)	72.51	93.50	81.98	82.66	10.51	6.07
DEAD CORAL (DC)	2.65	1.22	5.47	3.11	2.16	1.25
SOFT CORAL (SC)	0.20	0.41	0.40	0.34	0.12	0.07
OTHER ORGANISMS (OO)	4.28	0.41	1.01	1.90	2.08	1.20
ALGAE (AL)	1.22	1.83	3.85	2.30	1.37	0.79
ABIOTIC COMPONENT (AB)	19.14	2.64	7.29	9.69	8.51	4.91
TAPE, WATER, BLOCK (TWB)	1.80	1.60	1.20	1.53	0.31	0.18
Sum (excluding tape+shadow+wand)	100.00	100.00	100.00			
SUBCATEGORIES (% of transect)				**MEAN**	**STD. DEV.**	**STD. ERROR**
CORAL (HC)						
Acropora branching (ACB)	21.18	35.37	46.36	34.30	12.62	7.29
Acropora digitate (ACD)	0.00	0.00	0.00	0.00	0.00	0.00
Acropora submassive (ACS)	0.00	0.00	0.00	0.00	0.00	0.00
Acropora tabulate (ACT)	0.00	0.00	0.00	0.00	0.00	0.00
Bleached coral (BLEC)	0.00	0.00	0.00	0.00	0.00	0.00
Heliopora (CHL)	1.63	1.42	1.21	1.42	0.21	0.12
Millepora (CME)	8.76	19.72	12.15	13.54	5.61	3.24
Mushroom coral (CMR)	3.67	2.03	6.48	4.06	2.25	1.30
Other branching corals (CB)	0.41	0.00	0.00	0.14	0.24	0.14
Other encrusting corals (CE)	5.09	2.03	4.86	3.99	1.70	0.98
Other foliose corals (CF)	1.02	1.42	2.02	1.49	0.51	0.29
Other massive corals (CM)	19.35	30.69	2.83	17.62	14.01	8.09
Other submassive corals (CS)	11.41	0.81	6.07	6.10	5.30	3.06
DEAD CORAL (DC)						
Dead Coral (DC)	1.43	0.41	4.05	1.96	1.88	1.08
Dead coral with algae (DCA)	1.22	0.81	1.42	1.15	0.31	0.18
SOFT CORAL (SC)						
Soft coral (SC)	0.20	0.41	0.40	0.34	0.12	0.07
OTHER ORGANISMS (OO)						
Other animals (OT)	4.07	0.41	0.61	1.70	2.06	1.19
Sponge (SP)	0.20	0.00	0.40	0.20	0.20	0.12
Zoanthids (ZO)	0.00	0.00	0.00	0.00	0.00	0.00
ALGAE (AL)						
Algal assemblages (AA)	0.00	0.00	0.00	0.00	0.00	0.00
Coralline algae (CA)	1.22	1.83	3.85	2.30	1.37	0.79
Halimeda (HA)	0.00	0.00	0.00	0.00	0.00	0.00
Macroalgae (MA)	0.00	0.00	0.00	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)						
Rubble (R)	2.24	0.20	0.81	1.08	1.05	0.60
Sand (S)	16.90	2.44	6.48	8.61	7.46	4.31
Silt (SI)	0.00	0.00	0.00	0.00	0.00	0.00
TAPE, WATER, BLOCK (TWB)						
Tape, Water, Block (TWB)	1.80	1.60	1.20	1.53	0.31	0.18
NOTES (% of transect)				**MEAN**	**STD. DEV.**	**STD. ERROR**
Bleached coral (BLEC)	0.00	0.00	0.00	0.00	0.00	0.00
NOTES (% of coral)						
Bleached coral (BLEC)	0.00	0.00	0.00	0.00	0.00	0.00

MAJOR CATEGORY (occurring in transect)				SUMS	MEAN	STD. DEV.	STD. ERROR	SW INDEX	SIMPSON (1-D)
CORAL (HC)	356	460	405	1221	407.00	52.03	30.04	1.63	0.74
DEAD CORAL (DC)	13	6	27	46	15.33	10.69	6.17	0.66	0.47
SOFT CORAL (SC)	1	2	2	5	1.67	0.58	0.33	0.00	0.00
OTHER ORGANISMS (OO)	21	2	5	28	9.33	10.21	5.90	0.34	0.19
ALGAE (AL)	6	9	19	34	11.33	6.81	3.93	0.00	0.00
ABIOTIC COMPONENT (AB)	94	13	36	143	47.67	41.74	24.10	0.35	0.20
TAPE, WATER, BLOCK (TWB)	9	8	6	23	7.67	1.53	0.88		
TOTAL TRANSECT POINTS	**500**	**500**	**500**	**1500**					

SUBCATEGORIES (occurring in transect)				SUMS	MEAN	STD. DEV.	STD. ERROR	SW INDEX	SIMPSON (1-D)
CORAL (HC)								1.63	0.74
Acropora branching (ACB)	104	174	229	507	169.00	62.65	36.17	0.36	0.17
Acropora digitate (ACD)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Acropora submassive (ACS)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Acropora tabulate (ACT)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Bleached coral (BLEC)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Heliopora (CHL)	8	7	6	21	7.00	1.00	0.58	0.07	0.00
Millepora (CME)	43	97	60	200	66.67	27.61	15.94	0.30	0.03
Mushroom coral (CMR)	18	10	32	60	20.00	11.14	6.43	0.15	0.00
Other branching corals (CB)	2	0	0	2	0.67	1.15	0.67	0.01	0.00
Other encrusting corals (CE)	25	10	24	59	19.67	8.39	4.84	0.15	0.00
Other foliose corals (CF)	5	7	10	22	7.33	2.52	1.45	0.07	0.00
Other massive corals (CM)	95	151	14	260	86.67	68.88	39.77	0.33	0.05
Other submassive corals (CS)	56	4	30	90	30.00	26.00	15.01	0.19	0.01
DEAD CORAL (DC)								0.66	0.47
Dead Coral (DC)	7	2	20	29	9.67	9.29	5.36	0.29	0.40
Dead coral with algae (DCA)	6	4	7	17	5.67	1.53	0.88	0.37	0.14
SOFT CORAL (SC)								0.00	0.00
Soft coral (SC)	1	2	2	5	1.67	0.58	0.33	0.00	1.00
OTHER ORGANISMS (OO)								0.34	0.19
Other animals (OT)	20	2	3	25	8.33	10.12	5.84	0.10	0.80
Sponge (SP)	1	0	2	3	1.00	1.00	0.58	0.24	0.01
Zoanthids (ZO)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
ALGAE (AL)								0.00	0.00
Algal assemblages (AA)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Coralline algae (CA)	6	9	19	34	11.33	6.81	3.93	0.00	1.00
Halimeda (HA)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Macroalgae (MA)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)								0.35	0.20
Rubble (R)	11	1	4	16	5.33	5.13	2.96	0.25	0.01
Sand (S)	83	12	32	127	42.33	36.61	21.14	0.11	0.79
Silt (SI)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
TAPE, WATER, BLOCK (TWB)									
Tape, Water, Block (TWB)	9	8	6	23	7.67	1.53	0.88		1.00

NOTES (occurring in transect)				SUMS	MEAN	STD. DEV.	STD. ERROR
Bleached coral (BLEC)	0	0	0	0	0.00	0.00	0.00
NOTES (occurring in coral)							
Bleached coral (BLEC)	0	0	0	0	0.00	0.00	0.00

Shannon-Weaver Index	**0.85**	**0.33**	**0.71**
CORAL (HC)	0.23	0.06	0.16
DEAD CORAL (DC)	0.10	0.05	0.16
SOFT CORAL (SC)	0.01	0.02	0.02
OTHER ORGANISMS (OO)	0.13	0.02	0.05
ALGAE (AL)	0.05	0.07	0.13

ABIOTIC COMPONENT (AB) TAPE, WATER, BLOCK (TWB)	0.32	0.10	0.19
Simpson Index of Diversity (1-D)	**0.43**	**0.12**	**0.32**
CORAL (HC)	0.53	0.87	0.67
DEAD CORAL (DC)	0.00	0.00	0.00
SOFT CORAL (SC)	0.00	0.00	0.00
OTHER ORGANISMS (OO)	0.00	0.00	0.00
ALGAE (AL)	0.00	0.00	0.00
ABIOTIC COMPONENT (AB) TAPE, WATER, BLOCK (TWB)	0.04	0.00	0.01

RAW DATA OF CORALS IN SAN JOSE ISLAND USING CPCe

TRANSECT NAME	T1	T2	T3			
Number of frames	50	50	50			
Total points	500	500	500			
Total points (minus tape+wand+shadow)	496	492	489			
MAJOR CATEGORY (% of transect)				**MEAN**	**STD. DEV.**	**STD. ERROR**
CORAL (HC)	95.16	83.54	56.44	78.38	19.87	11.47
DEAD CORAL (DC)	1.21	2.44	4.91	2.85	1.88	1.09
SOFT CORAL (SC)	0.60	0.61	0.61	0.61	0.00	0.00
OTHER ORGANISMS (OO)	0.60	1.02	1.64	1.09	0.52	0.30
ALGAE (AL)	0.40	1.63	0.00	0.68	0.85	0.49
ABIOTIC COMPONENT (AB)	2.02	10.77	36.40	16.40	17.87	10.32
TAPE, WATER, BLOCK (TWB)	0.80	1.60	2.20	1.53	0.70	0.41
Sum (excluding tape+shadow+wand)	100.00	100.00	100.00			
SUBCATEGORIES (% of transect)				**MEAN**	**STD. DEV.**	**STD. ERROR**
CORAL (HC)						
Acropora branching (ACB)	51.81	41.06	44.58	45.82	5.48	3.17
Acropora digitate (ACD)	0.00	0.00	0.20	0.07	0.12	0.07
Acropora submassive (ACS)	0.00	0.00	0.00	0.00	0.00	0.00
Acropora tabulate (ACT)	0.40	0.00	0.00	0.13	0.23	0.13
Bleached coral (BLEC)	0.00	0.00	0.00	0.00	0.00	0.00
Heliopora (CHL)	13.31	5.08	4.91	7.77	4.80	2.77
Millepora (CME)	17.54	19.31	1.84	12.90	9.62	5.55
Mushroom coral (CMR)	3.63	3.05	3.07	3.25	0.33	0.19
Other branching corals (CB)	0.00	0.00	0.00	0.00	0.00	0.00
Other encrusting corals (CE)	0.20	0.61	0.20	0.34	0.23	0.14
Other foliose corals (CF)	4.44	0.61	0.00	1.68	2.40	1.39
Other massive corals (CM)	1.21	11.59	0.20	4.33	6.30	3.64
Other submassive corals (CS)	2.62	2.24	1.43	2.10	0.61	0.35
DEAD CORAL (DC)						
Dead Coral (DC)	1.21	2.24	2.66	2.03	0.75	0.43
Dead coral with algae (DCA)	0.00	0.20	2.25	0.82	1.24	0.72
SOFT CORAL (SC)						
Soft coral (SC)	0.60	0.61	0.61	0.61	0.00	0.00
OTHER ORGANISMS (OO)						
Other animals (OT)	0.00	0.81	1.64	0.82	0.82	0.47
Sponge (SP)	0.60	0.20	0.00	0.27	0.31	0.18
Zoanthids (ZO)	0.00	0.00	0.00	0.00	0.00	0.00
ALGAE (AL)						
Algal assemblages (AA)	0.00	0.00	0.00	0.00	0.00	0.00
Coralline algae (CA)	0.40	1.63	0.00	0.68	0.85	0.49
Halimeda (HA)	0.00	0.00	0.00	0.00	0.00	0.00
Macroalgae (MA)	0.00	0.00	0.00	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)						
Rubble (R)	0.00	0.00	2.66	0.89	1.53	0.89
Sand (S)	2.02	10.77	33.74	15.51	16.39	9.46
Silt (SI)	0.00	0.00	0.00	0.00	0.00	0.00
TAPE, WATER, BLOCK (TWB)						
Tape, Water, Block (TWB)	0.80	1.60	2.20	1.53	0.70	0.41
NOTES (% of transect)				**MEAN**	**STD. DEV.**	**STD. ERROR**
Bleached coral (BLEC)	0.00	0.00	0.00	0.00	0.00	0.00
NOTES (% of coral)						
Bleached coral (BLEC)	0.00	0.00	0.00	0.00	0.00	0.00

MAJOR CATEGORY (occurring in transect)				SUM	MEAN	STD. DEV.	STD. ERROR	SW INDEX	SIMPSON (1-D)
CORAL (HC)	472	411	276	#	386.33	100.30	57.91	1.35	0.62
DEAD CORAL (DC)	6	12	24	#	14.00	9.17	5.29	0.60	0.41
SOFT CORAL (SC)	3	3	3	9	3.00	0.00	0.00	0.00	0.00
OTHER ORGANISMS (OO)	3	5	8	#	5.33	2.52	1.45	0.56	0.38
ALGAE (AL)	2	8	0	#	3.33	4.16	2.40	0.00	0.00
ABIOTIC COMPONENT (AB)	10	53	178	#	80.33	87.27	50.39	0.21	0.10
TAPE, WATER, BLOCK (TWB)	4	8	11	#	7.67	3.51	2.03		
TOTAL TRANSECT POINTS	**500**	**500**	**500**	#					

SUBCATEGORIES (occurring in transect)				SUM	MEAN	STD. DEV.	STD. ERROR	SW INDEX	SIMPSON (1-D)
CORAL (HC)								1.35	0.62
Acropora branching (ACB)	257	202	218	#	225.67	28.29	16.33	0.31	0.34
Acropora digitate (ACD)	0	0	1	1	0.33	0.58	0.33	0.01	0.00
Acropora submassive (ACS)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Acropora tabulate (ACT)	2	0	0	2	0.67	1.15	0.67	0.01	0.00
Bleached coral (BLEC)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Heliopora (CHL)	66	25	24	#	38.33	23.97	13.84	0.23	0.01
Millepora (CME)	87	95	9	#	63.67	47.51	27.43	0.30	0.03
Mushroom coral (CMR)	18	15	15	#	16.00	1.73	1.00	0.13	0.00
Other branching corals (CB)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Other encrusting corals (CE)	1	3	1	5	1.67	1.15	0.67	0.02	0.00
Other foliose corals (CF)	22	3	0	#	8.33	11.93	6.89	0.08	0.00
Other massive corals (CM)	6	57	1	#	21.33	30.99	17.89	0.16	0.00
Other submassive corals (CS)	13	11	7	#	10.33	3.06	1.76	0.10	0.00
DEAD CORAL (DC)								0.60	0.41
Dead Coral (DC)	6	11	13	#	10.00	3.61	2.08	0.24	0.51
Dead coral with algae (DCA)	0	1	11	#	4.00	6.08	3.51	0.36	0.08
SOFT CORAL (SC)								0.00	0.00
Soft coral (SC)	3	3	3	9	3.00	0.00	0.00	0.00	1.00
OTHER ORGANISMS (OO)								0.56	0.38
Other animals (OT)	0	4	8	#	4.00	4.00	2.31	0.22	0.56
Sponge (SP)	3	1	0	4	1.33	1.53	0.88	0.35	0.06
Zoanthids (ZO)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
ALGAE (AL)								0.00	0.00
Algal assemblages (AA)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Coralline algae (CA)	2	8	0	#	3.33	4.16	2.40	0.00	1.00
Halimeda (HA)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
Macroalgae (MA)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)								0.21	0.10
Rubble (R)	0	0	13	#	4.33	7.51	4.33	0.16	0.00
Sand (S)	10	53	165	#	76.00	80.02	46.20	0.05	0.90
Silt (SI)	0	0	0	0	0.00	0.00	0.00	0.00	0.00
TAPE, WATER, BLOCK (TWB)									
Tape, Water, Block (TWB)	4	8	11	#	7.67	3.51	2.03		1.00

NOTES (occurring in transect)				SUM	MEAN	STD. DEV.	STD. ERROR
Bleached coral (BLEC)	0	0	0	0	0.00	0.00	0.00
NOTES (occurring in coral)							
Bleached coral (BLEC)	0	0	0	0	0.00	0.00	0.00

Shannon-Weaver Index	**0.26**	**0.63**	**0.94**
CORAL (HC)	0.05	0.15	0.32
DEAD CORAL (DC)	0.05	0.09	0.15
SOFT CORAL (SC)	0.03	0.03	0.03
OTHER ORGANISMS (OO)	0.03	0.05	0.07
ALGAE (AL)	0.02	0.07	0.00

ABIOTIC COMPONENT (AB)	0.08	0.24	0.37
TAPE, WATER, BLOCK (TWB)			
Simpson Index of Diversity (1-D)	**0.09**	**0.29**	**0.55**
CORAL (HC)	0.91	0.70	0.32
DEAD CORAL (DC)	0.00	0.00	0.00
SOFT CORAL (SC)	0.00	0.00	0.00
OTHER ORGANISMS (OO)	0.00	0.00	0.00
ALGAE (AL)	0.00	0.00	0.00
ABIOTIC COMPONENT (AB)	0.00	0.01	0.13
TAPE, WATER, BLOCK (TWB)			