



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

REO

April 5, 2023

MEMORANDUM

FOR : The Regional Executive Director
DENR MIMAROPA
1515 DENR By the Bay Bldg., Roxas Boulevard,
Barangay 668, Ermita, Manila

THRU : The OIC, ARD for Technical Services

FROM : The Provincial Environment and
Natural Resources Officer

SUBJECT : **1ST QUARTER REPORT ON SEAGRASS MONITORING OF EL
NIDO MANAGED RESOURCE PROTECTED AREA (ENMRPA)
EL NIDO, PALAWAN CY 2023**

Respectfully forwarded is the memorandum dated March 22, 2023 of CENRO Taytay, Palawan re: the above subject.

Please be informed that the seagrass monitoring was conducted at Snake Island, Bgy. Bebeladan, El Nido, Palawan last March 9, 2023 covering an area of fourteen (14) hectares. Five (5) species of seagrass was identified with the most dominant species, *Enhalus acoroides* followed by *Thalassia hemprichii*, *Halophila ovalis*, *Halodule pinifolia* and *Cymodocea rotundata*, respectively.

Based on the results, the mean percentage of seagrass cover between year 2022 and 2023 has increased at 1.49%. Continuous monitoring in other established monitoring sites will be conducted.

This serves as **Means of Verification (MOV)** for the target activities in CY 2023.

For information and record.



HELIZARDO B. CAYATOC

DENR-PALAWAN
PENRO-RECORDS
RELEASED

By _____
Date: **13 APR 2023** CN.

Alma
2023-969



Contact No.: 09265059335 (Globe) / 09121713889 (Smart)

Email address: ceenr@ceenr.gov.ph

PALAWAN RECORDS
RECEIVED

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
El Nido-Taytay Managed Resource Protected Area (ENTMRPA)**

Activity: Monitoring of Corals, Mangroves and Seagrass				
Performance Indicator: Hectarage of habitats per PA monitored (Seagrass)				
Frequency of submission: 2 nd and 3 rd Quarter				
Current submission: Memo report of Assistant Protected Area Superintendent/PMF Jenuel P. Casel dated March 20, 2023 (CN 1918 in the eDATS) submitting the 1 st quarter report on monitoring of Seagrass for Protected Area Management Office of El Nido-Taytay Managed Resource Protected Area (ENTMRPA).				
Attachment:				
<ol style="list-style-type: none"> 1. Memo report of CMEMP E.O Mariel M. Paladan dated March 15, 2023. Based on the report, the monitoring of seagrass was covered by fourteen (14) hectares and a total of five (5) species were recorded at Snake island, Barangay Bebeladan, El Nido, Palawan. 2. Photo documentation 3. Seagrass Monitoring Data Sheet (Raw Data) 4. Map 5. Water Quality Monitoring Data Form 				
Gender & Development (GaD) data	Male = 4	Female = 2	LGBTQ+ = 0	Prefer not to say = 0
Age Grouping	60 and above	18-59	17 and below	TOTAL
	0	6	0	6
Environmental Management System (EMS Compliance)	<ul style="list-style-type: none"> ✓ 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 of plastic ✓ PENRO Memo No. 2023-001 dated February 21, 2023 			

Explanation: The submission of report on the monitoring of Seagrass per the WFP is supposedly on the 2nd quarter and 3rd quarter but the PAMO submit its report for promptly compliance of the same.

This shall form as part of the **Means of Verification (MoV)** on the activity. Please confirm your receipt hereof. Thank you.

DENR CENRO
TAYTAY, PALAWAN
RELEASED
BY:
DATE: MAR 29 2023 1185

CONRADO M. CORPUZ

Copy furnished:
PAMO-ENTMRPA



Republic of the Philippines
Department of Environment and Natural Resources
MIMAROPA Region
Community Environment and Natural Resources
EL NIDO-TAYTAY MANAGED RESOURCE PROTECTED AREA
Calle Real, Barangay Masagana, El Nido, Palawan, 5313
Telephone No. 048-716-0674
Email: entmrpa@gmail.com

MAR 20 2023

MEMORANDUM

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

FROM : The Protected Area Superintendent
El Nido Managed Resource Protected Area

SUBJECT : REPORT ON MONITORING OF SEAGRASS FOR THE 1ST QUARTER OF CY 2023 OF EL NIDO MANAGED RESOURCE PROTECTED AREA (ENMRPA) EL NIDO, PALAWAN

DENR CENRO
TAYTAY, PALAWAN
RECEIVED
3-21-23 CN 1918

Activity	Monitoring of seagrass per PA under MPA Management, Strengthening, and Networking			
Performance Indicator	Hectarage of habitats per PA monitored			
Frequency of Submission	2 nd quarter and 3 rd quarter			
Current Submission	Memo report of CMEMP Extension Officer dated March 15, 2023 covering 1 st quarter of CY 2023			
Gender and Development (GaD) data	Male= 4	Female = 2	LGBTQ+=0	Prefer not to say = 0
Age Grouping	60 and above =0	18-59 = 6	17 and below	TOTAL = 6
Environmental Management System (EMS) compliance	<div>✓ Compliant to 5S organization techniques (Sort – keep only necessary items, Set in Order – arrange items to promote efficiency 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).</div> <div>✓ No Single Use plastic was used during the activity.</div>			

This serves as our Means of Verification (MOV) of the target.

For information and record.

For the Protected Area Superintendent;

DENR - PAO
ENTMRPA,
El Nido, Palawan
RELEASED
By:
Date: 03-20-2023
C.N.: 2023-0257

JENUEL P. CASEL
PMF/Assistant PASu
In-charge, ENTMRPA-PAMO



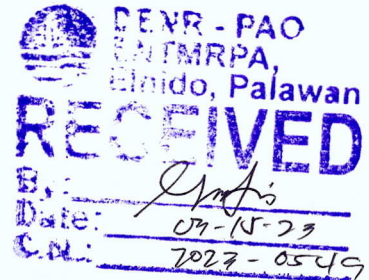
March 15, 2023

MEMORANDUM

FOR : **The Protected Area Superintendent**
El Nido Managed Resource Protected Area

FROM : **CMEMP Extension Officer**
El Nido Managed Resource Protected Area

SUBJECT : **REPORT ON SEAGRASS MONITORING OF EL NIDO MANAGED
RESOURCE PROTECTED AREA (ENMRPA)**



This pertains to the target activity 001 Monitoring of Seagrass per Protected Area (PA) under Marine Protected Area Strengthening and Networking of El Nido Managed Resource Protected Area (ENMRPA) – Protected Area Management Office (PAMO).

Please be informed that on March 9, 2023 the undersigned, together with ENMRPA-PAMO staff Steven John Andao and Reina Rose Abordo with the participation of Municipal Environment and Natural Resources Office (MENRO) staff conducted at Snake Island, Bgy. Bebeladan, El Nido, Palawan covering fourteen (14) hectares.

A total of five (5) species of seagrass identified and recorded during the monitoring which includes *Enhalus acoroides* (Ea), *Thalassia hemprichii* (Th), *Halodule pinifolia* (Hp), *Halophila ovalis* (Ho), and *Cymodocea rotundata* (Cr).

Table 1. Percent Cover of seagrass across transect stations at four (4) established monitoring sites.

Sites	Species	T1	T2	T3	Average
Snake Island, Bgy. Bebeladan	<i>Enhalus acoroides</i>	15.27	10.64	26.91	17.61
	<i>Thalassia hemprichii</i>	1.55	2	2	1.85
	<i>Halodule pinifolia</i>	1.45	0	0.82	0.76
	<i>Halophila ovalis</i>	0	3.45	0.09	1.18
	<i>Cymodocea rotundata</i>	0.09	0	0.55	0.21
Subtotal		3.67	3.22	6.07	

As seen in table 1 the most dominant species recorded and identified is *Enhalus acoroides* (Ea) which is found in transect 3 with a value of 26.91%.

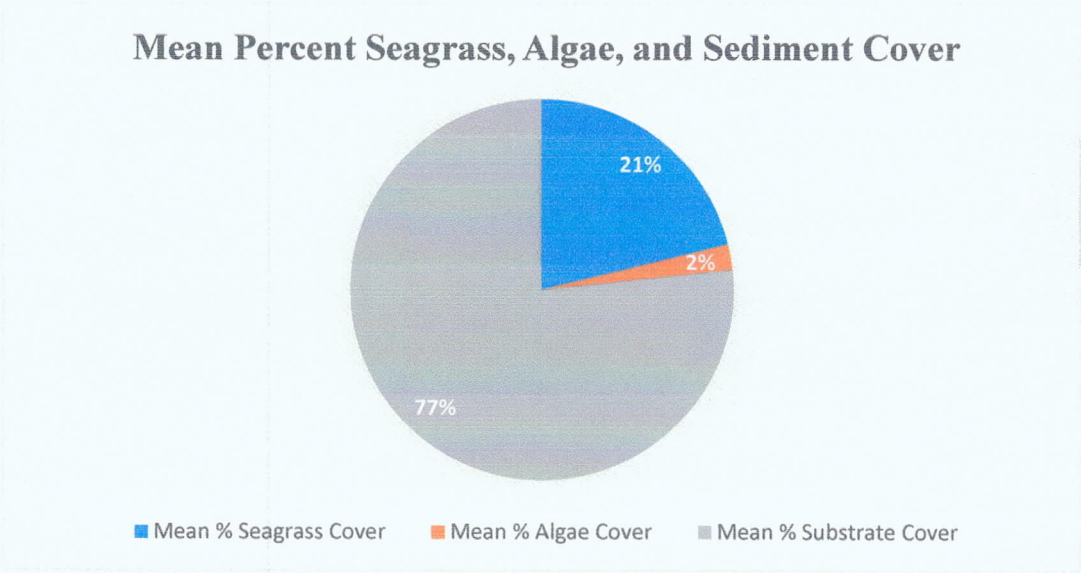


Figure 1. Mean percent seagrass, algae, and sediment cover in Snake Island

Figure 1 shows the computed mean percentage of seagrass, algae, and sediment cover at Snake Island. Bgy. Bebeladan, the value of mean percentage of seagrass cover is 21% which falls under poor condition based on Amran, 2010.

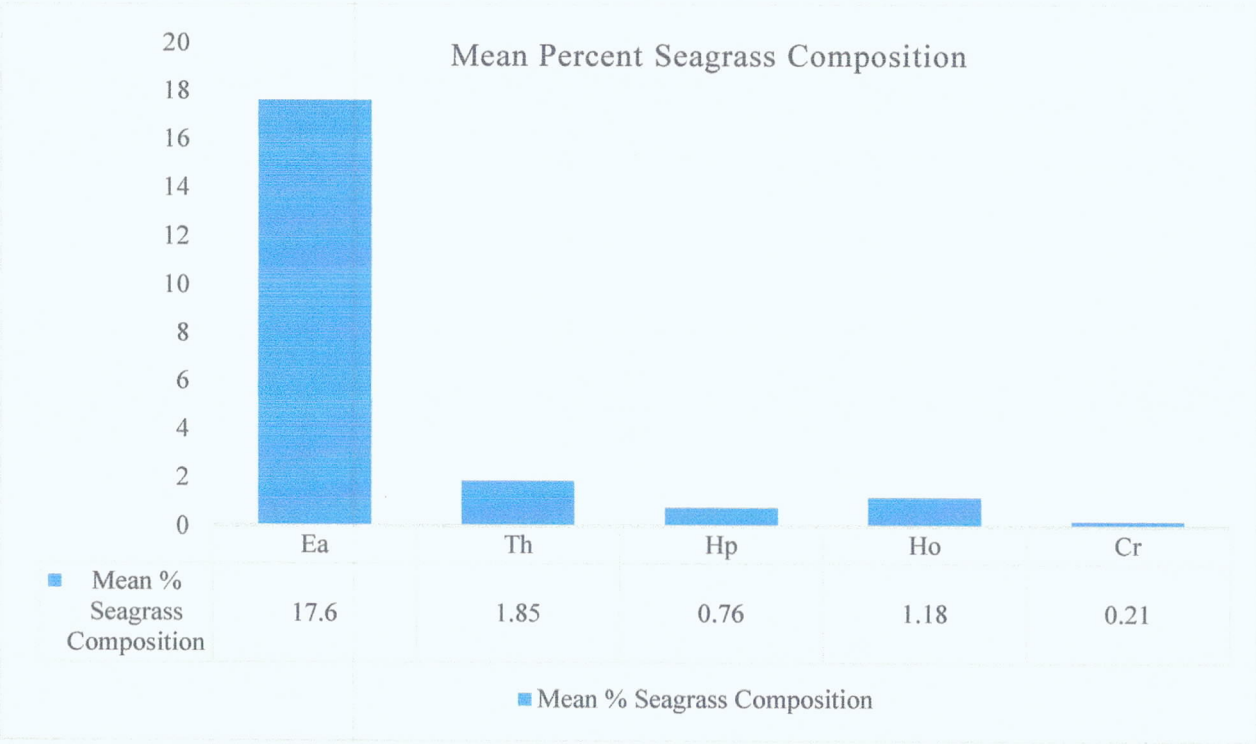


Figure 2. Mean percent seagrass composition at Snake Island

Figure 2 shows the computed mean percent seagrass composition at Snake Island. Among the five (5) species recorded *Enhalus acoroides* is the most dominant species with an average value of 17.6%, however the least dominant species is *Halodule pinifolia* with an average value of 0.76%.

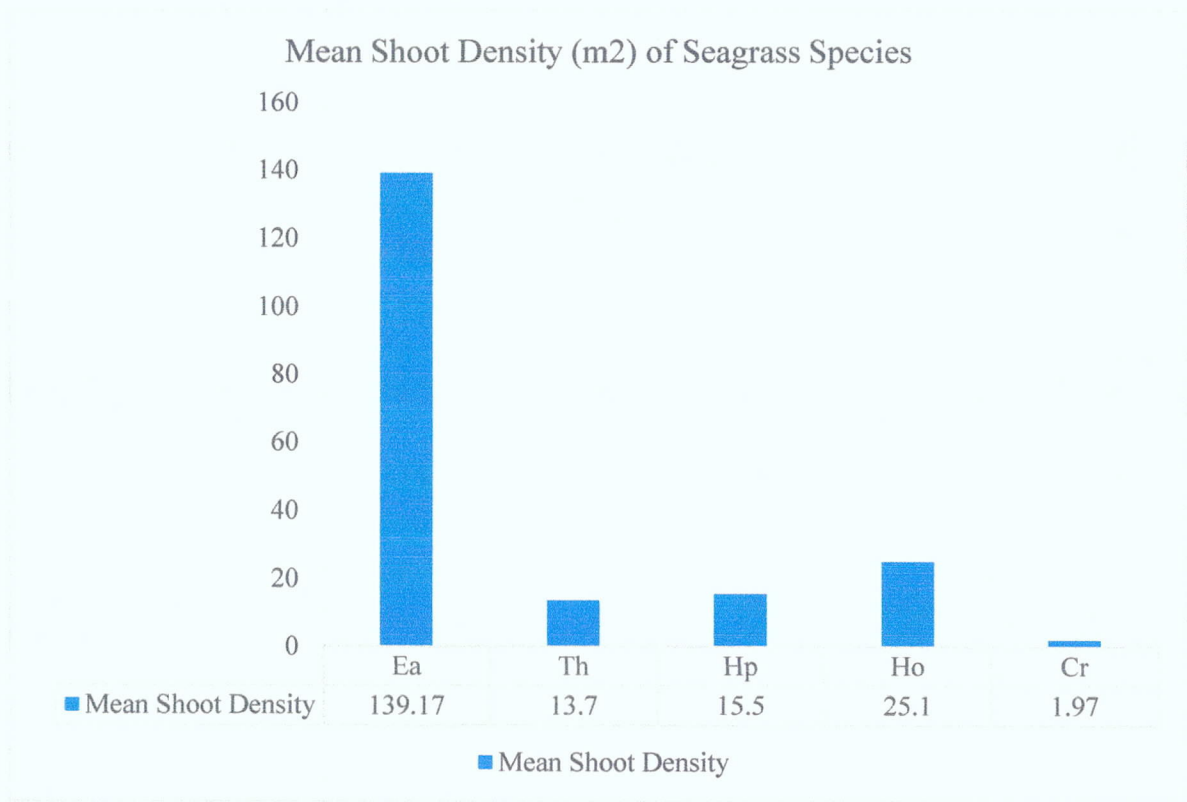


Figure 3. Mean shoot density (m²) of seagrass species at Snake Island

As seen in Figure 3, the result shows that *Emhalus acoroides* is the most dominant species in terms of mean shoot density with a value of 139.17 m², while *Cymodocea rotundata* has a value of 1.97 m² which is the least dominant species.

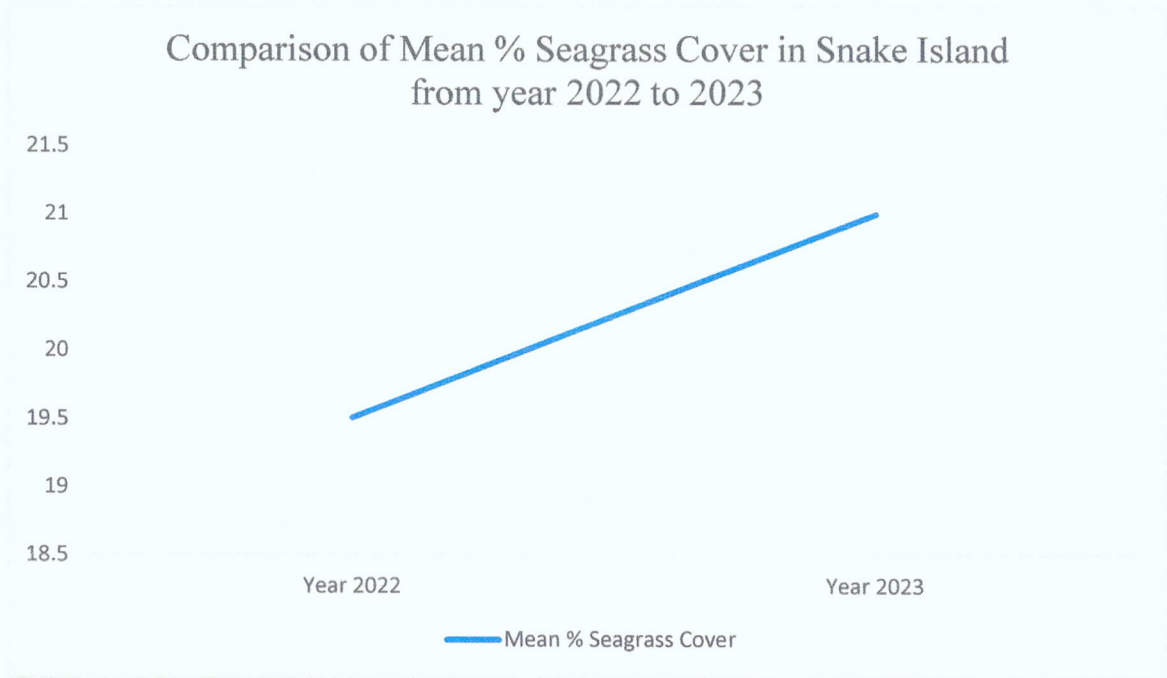


Figure 4. Comparison of Mean % Seagrass Cover in Snake Island from year 2022 to 2023

As seen in Figure 4, there is a significant increased of 1.49% between the mean percentage seagrass cover of year 2022 and 2023. The mean percentage seagrass covers for year 2023 is 21% which is higher than the mean percent seagrass cover in 2022 which has only 19.51%.

In table 2 shows the result and findings of the site characteristics and biodiversity indices at Snake Island which composed of eleven (11) quadrats for every transect. Shannon-Weiner Diversity Index was used to determine the seagrass diversity and categorized based on Odum (1983). Based on the result, Snake Island has acquired a value of 0.94 which falls under low diversity category.

Table 2. Site characteristics and Biodiversity Indices at four (4) monitoring sites

SITE CHARACTERISTICS	Bgy. Bebeladan
Sitio	Snake Island
Latitude	11° 5'33.97"N
Longitude	119°20'22.48"E
Number of quadrats	11
Sediment type	Sandy
Water condition	High Tide
Other observations/remarks	Tourist Spot
Estimated seagrass (ha)	14
Diversity Indices	
Shannon-Weiner diversity index (H')	0.94
Simpson's diversity index	0.53
Evenness of Species (E)	0.12
Number of seagrass species (in quadrats)	5

Table 3. Result of water parameters within established monitoring site

Primary Parameters	Snake Island (seagrass)	Remarks (Class SB Criteria)
Temperature (°C)	32.64	fail
pH	8.16	pass
Dissolved Oxygen (mg/L)	5.71	fail

Note: Water Body Classification and Water Parameters are based on DENR Administrative Order 2016-08

Other Parameters	Snake Island (seagrass)
Oxidation Reduction Potential (m/V)	122
Conductivity (µS/cm)	40.8
Turbidity (NTU)	0
Total Dissolved Solid (g/L)	24.9
Salinity (ppt)	26.03

Note: Water Body Classification and Water Parameters are based on DENR Administrative Order 2016-08

Table 3 shows that Snake Island failed to meet the desired temperature for protected and recreational waters, which is not less than twenty-six (26) degrees Celsius or not greater than thirty (30) degrees Celsius, and also the desired dissolve oxygen (mg/L). Based on the notes in Table 3 (Water Quality Guidelines for Primary Parameters) of DENR Administrative Order (DAO) 2016-08, it stated as follows: “(b) The natural background temperature as determined by EMB shall prevail if the temperature is lower or higher than the WQG; provided that the maximum increase is only up to 10 percent and that it will not cause any risk to human health and the environment.”

Furthermore, this office will continue to conduct seagrass monitoring in other established monitoring sites of ENMRPA.

Attached are the photo-documentation, map and raw data of the said activity.

This serves as our Means of Verification (MOV) of the target.

For information and record.


MARIEL M. PALADAN

PHOTO DOCUMENTATION



CERTIFICATION

I hereby certify that the above photos were true and correct and taken during the conduct of activities.


MARIEL M. PALADAN
CMBMP Extension Officer

SEAGRASS MONITORING DATA SHEET (RAW DATA)

Seagrass Monitoring Data Sheet

Observer: Mariel M. Paladian and Reina Rose Abordo
Location: Snake Island, Bgy. Bebeladan, El Nido, Palawan
Site: 1

Date: March 9, 2023
Transect No. 1

Start time: 10:12
Start of Transect:

QUADRAT	SEDIMENT	COMMENTS	PHOTO	% SEAGRASS COMPOSITION										SHOOT COUNT (m2)										CANOPY HEIGHT (CM)	% ALGAE COVER	% EPHYTE COVER					
				Ea	Th	Cs	Hp	Si	Hu	Ho	Cr	Ea	Th	Cs	Hp	Si	Hu	Ho	Cr												
1 (0m)	Sandy	Forams		50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	152	0	0	0	0	0	0	0	0	20,18,15	10	50	
2 (5m)	Sandy	Forams	x	15	0	0	5	0	0	0	0	0	0	0	0	0	0	0	80	0	0	112	0	0	0	0	0	15,20,17	0	50	
3 (10m)	Sandy	Forams		35	5	0	10	0	0	0	0	0	0	0	0	0	0	0	112	8	0	200	0	0	0	0	0	10,15,12	5	60	
4 (15m)	Sandy	Forams		20	17	2	0	1	0	0	0	0	0	0	0	0	0	0	104	16	0	8	0	0	0	0	0	10,15,18	0	80	
5 (20m)	Sandy	Forams/Sponge		10	8	2	0	0	0	0	0	0	0	0	0	0	0	0	60	32	0	0	0	0	0	0	0	10,10,14	0	70	
6 (25m)	Sandy	Forams	x	20	10	5	0	0	0	0	0	0	0	0	0	0	0	0	64	96	0	0	0	0	0	0	0	15,15,12	10	80	
7 (30m)	Sandy	Forams		10	8	2	0	0	0	0	0	0	0	0	0	0	0	0	68	12	0	0	0	0	0	0	0	10,12,15	0	80	
8 (35m)	Sandy	Forams		10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	0	0	0	0	0	0	0	12,14,15	0	70	
9 (40m)	Sandy	Forams		10	9	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	0	0	0	0	0	0	0	10,10,11	0	70	
10 (45m)	Sandy	Forams	x	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	40	4	0	0	0	0	0	0	0	10,10,8	0	80	
11 (50m)	Sandy	Forams		2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	10,8,7	0	80	
SUM				207	168	17	0	16	0	0	0	0	0	0	0	0	0	0	784	168	0	320	0	0	0	0	0	0	0	25	770
AVERAGE				18.82	15.27	1.55	0.00	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.3	15.3	0.0	29.1	0.0	0.0	0.0	0.0	0.4	0.0	2.27	70.00	

End Time: 10:48
End of Transect:

Seagrass Monitoring Data Sheet

Observer: Mariel M. Paladian and Reina Rose Abordo
Location: Snake Island, Bgy. Bebeladan, El Nido, Palawan
Site: 1

Date: March 9, 2023
Transect No. 2

Start time: 11:17
Start of Transect:

QUADRAT	SEDIMENT	COMMENTS	PHOTO	% SEAGRASS COMPOSITION										SHOOT COUNT (m2)										CANOPY HEIGHT (CM)	% ALGAE COVER	% EPHYTE COVER						
				Ea	Th	Cs	Hp	Si	Hu	Ho	Cr	Ea	Th	Cs	Hp	Si	Hu	Ho	Cr													
1 (0m)	Sandy	Forams		35	5	0	0	0	0	0	0	0	0	0	0	0	0	0	92	16	0	0	0	0	0	0	0	20,15,12	0	60	0	
2 (5m)	Sandy	Forams	x	35	32	3	0	0	0	0	0	0	0	0	0	0	0	0	96	4	0	0	0	0	0	0	0	12,10,14	0	40	0	
3 (10m)	Sandy	Forams		20	18	2	0	0	0	0	0	0	0	0	0	0	0	0	80	4	0	0	0	0	0	0	0	10,14,14	0	40	0	
4 (15m)	Sandy	Forams		10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	88	0	0	0	0	0	0	0	0	10,10,7	0	60	0	
5 (20m)	Sandy	Forams		10	10	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,14,13	0	50	0	
6 (25m)	Sandy	Hard Corals		10	10	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	4,4,2	8	70	0	
7 (30m)	Sandy	Dead Corals	x	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8 (35m)	Sandy	Forams		5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	10,17,14	0	60	0	
9 (40m)	Sandy	Forams		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 (45m)	Sandy	Forams	x	10	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	4,2,3	0	20	0	
11 (50m)	Sandy	Forams		20	2	0	0	0	0	0	0	0	0	0	0	0	18	0	0	4	0	0	0	0	0	0	0	12,4,3	10	90	0	
SUM				155	117	22	0	0	0	0	0	400	24	0	0	38	0	0	400	24	0	0	0	0	0	0	812	0	18	490		
AVERAGE				14.09	10.64	2.00	0.00	0.00	0.00	0.00	0.00	36.4	2.2	0.0	0.0	3.45	0.00	36.4	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.8	0.0	1.64	44.55		

End Time: 11:26
End of Transect:

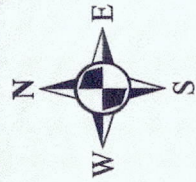
Seagrass Monitoring Data Sheet

Observer: Steven John Andao
Location: Snake Island, Bgy. Bebeladan, El Nido, Palawan
Site: 1

Date: March 9, 2023
Transect No. 3

Start time: 10:48
Start of Transect:

QUADRAT	SEDIMENT	COMMENTS	PHOTO	% SEAGRASS COMPOSITION										SHOOT COUNT (m2)										CANOPY HEIGHT (CM)	% ALGAE COVER	% EPHYTE COVER				
				Ea	Th	Cs	Hp	Si	Hu	Ho	Cr	Ea	Th	Cs	Hp	Si	Hu	Ho	Cr											
1 (0m)	Sandy	Forams		9	0	0	9	0	0	1	0	192	0	0	192	0	0	0	15	0	192	0	0	192	0	0	12.10.5	5	50	0
2 (5m)	Sandy	Forams	x	25	10	0	0	0	0	0	0	300	100	0	0	0	0	0	0	0	300	100	0	0	0	0	25.10.12	0	50	0
3 (10m)	Sandy	Sponge/Forams		68	0	0	0	0	0	0	2	360	0	0	0	0	0	0	0	0	360	0	0	0	0	8	35.10.15	0	60	0
4 (15m)	Sandy	Forams		30	5	0	0	0	0	0	0	360	40	0	0	0	0	0	0	0	360	40	0	0	0	0	30.25.10	10	70	0
5 (20m)	Sandy	Forams		35	0	0	0	0	0	0	0	400	0	0	0	0	0	0	0	0	400	0	0	0	0	0	45.30.30	5	20	0
6 (25m)	Sandy	Forams/Univalves	x	20	18	0	0	0	0	0	2	280	0	0	0	0	0	0	40	0	280	0	0	0	0	0	25.20.12	1	40	0
7 (30m)	Sandy	Forams		10	0	0	0	0	0	0	0	320	0	0	0	0	0	0	0	0	320	0	0	0	0	0	35.30.50	2	30	0
8 (35m)	Sandy	Forams		20	0	0	0	0	0	0	0	400	0	0	0	0	0	0	0	0	400	0	0	0	0	0	40.30.50	5	30	0
9 (40m)	Sandy	Forams/Cut leaf		35	0	0	0	0	0	0	2	388	0	0	0	0	0	0	0	0	388	0	0	0	0	12	20.15.10	0	70	0
10 (45m)	Sandy	Forams	x	28	7	0	0	0	0	0	0	28	120	0	0	0	0	0	0	0	28	120	0	0	0	0	30.10.10	0	60	0
11 (50m)	Sandy	Forams/Cut leaf		20	20	0	0	0	0	0	0	380	0	0	0	0	0	0	0	0	380	0	0	0	0	0	8.18.15	0	70	0
SUM	335			296	22	0	9	0	0	1	6	3408	260	0	192	0	0	16	60	3408	260	0	192	0	0	28	550			
AVERAGE	30.45			26.91	2.00	0.00	0.82	0.00	0.00	0.09	0.55	309.8	23.6	0.0	17.5	0.0	0.0	1.5	5.5	30			17.5	0.0	0.0	2.55	50.00			



MAP

SHOWING THE SEAGRASS SITE
MONITORED WITHIN EL NIDO-TAYTAY
MANAGED RESOURCE PROTECTED AREA
(ENTMRPA), EL NIDO, PALAWAN

Area : 14.0 Hectares

Specific site : Snake Island, Bgy. Bebeladan,
El Nido, Palawan

SCALE : 1:4,762



LEGEND

- Transect Line
- Seagrass
- Political Boundary
- PA Boundary

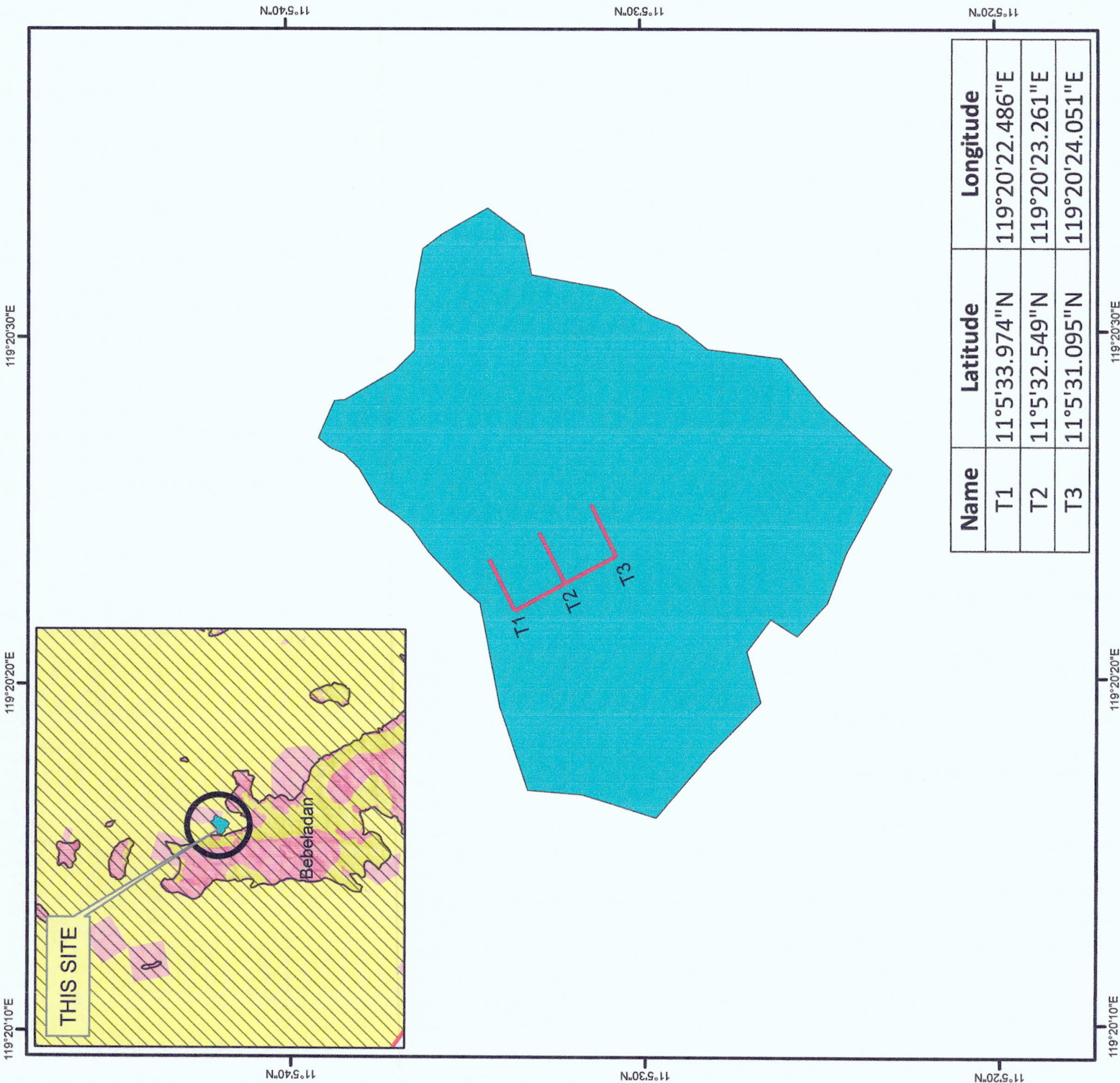
Projection : Universal Transverse Mercator Z50N
Datum : World Geodetic System 1984



Republic of the Philippines
Department of Environment and Natural Resources
Region IV - MIMAROPA
Community Environment and Natural Resources Office
Taytay 5312, Palawan

PREPARED BY :

THE PROTECTED AREA MANAGEMENT
OFFICE - EL NIDO-TAYTAY MANAGED
RESOURCE PROTECTED AREA
(PAMO-ENTMRPA)



Name	Latitude	Longitude
T1	11°5'33.974"N	119°20'22.486"E
T2	11°5'32.549"N	119°20'23.261"E
T3	11°5'31.095"N	119°20'24.051"E

WATER QUALITY MONITORING FIELD DATA FORM

SITE : ENMRPA
Date of Sampling : February 9, 2023
Sampling Team : ENMRPA-PAMO

Parameter	Sampling Station	
	1. Snake Island (seagrass)	2. Depeldet Island (coral reef)
GPS Coordinates	11°S'37.27"N, 119°20'25.69"E	11°8'31.58"N, 119°23'32.60"E
Time of Sampling	12:52 PM	1:40 PM
Cloud Cover (%)	15%	50%
Weather Condition	Fair	Cloudy
Visual Color of Water	Clear	Clear
Other Observations	Tourism activity observed (swimming)	Crown of Thorns infestation
In situ Analysis (Multiparameter Checker)		
pH	8.16	8.25
Temperature (°C)	32.64	• 31.1
Dissolved Oxygen (mg/L)	5.71	6.4
Conductivity (uS/cm)	40.8	41.3
Turbidity (NTU)	0	0
Salinity (ppt)	26.03	26.42
Total Dissolved Solid (g/L)	24.9	28.2
Oxidation Reduction Potential or ORP (mV)	122	120
Transparency (cm)	NA	NA

Remarks:

on-site validated by:

STEVEN  ANDAO