



Republic of the Philippines  
Department of Environment and Natural Resources  
Provincial Environment and Natural Resources Office

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DENR-MIMAROPA RECORDS SECTION  
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12 OCT 2022  
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DATE NO.

October 07, 2022

**MEMORANDUM**

**FOR** : The Regional Executive Director  
DENR MIMAROPA  
1515 L&S Bldg., Roxas Blvd.  
Ermita, Manila

**THRU** : The OIC, ARD for Technical Services

**FROM** : The Provincial Environment and  
Natural Resources Officer

**SUBJECT** : **3<sup>rd</sup> QUARTER ACCOMPLISHMENT REPORT OF RASA  
ISLAND WILDLIFE SANCTUARY FOR COASTAL AND  
MARINE ECOSYSTEMS MANAGEMENT PROGRAM  
(CMEMP) FY 2022**

Forwarded is the memorandum dated March 18, 2022 of CENRO Quezon along with the 3<sup>rd</sup> quarter report of El Nido-Taytay Managed Resource Protected Area (ENTMRPA) for Coastal and Marine Ecosystems Management Program (CMEMP) that serves as **Means of Verification (MOV)** to the target activity under Management of Coastal and Marine Resources/Areas.

Report revealed that the PAMO-RIWS conducted the activities under the Coastal and Marine Ecosystems Management Program (CMEMP) that include habitat monitoring and maintenance and protection within the protected area such as patrolling, threat observations, maintenance of equipment, and direct activities.

For information and record.



*[Signature]*  
**FELIZARDO B. CAYATOC**

DENR-PALAWAN  
PENRO-RECORDS  
**RELEASED**  
By: *[Signature]*  
Date: 10 OCT 2022 22-2664



Republic of the Philippines  
Department of Environment and Natural Resources  
MIMAROPA Region  
COMMUNITY ENVIRONMENT AND NATURAL RESOURCES OFFICE  
National Highway, Bgy. Alfonso XIII, Quezon, Palawan  
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September 28, 2022

## MEMORANDUM

FOR : The Provincial Environment and  
Natural Resources Officer  
Sta. Monica, Puerto Princesa City, Palawan

FROM : The Community Environment and  
Natural Resources Officer

SUBJECT : 3<sup>rd</sup> QUARTER ACCOMPLISHMENT REPORT FOR THE  
COASTAL AND MARINE ECOSYSTEM MANAGEMENT  
PROGRAM (CMEMP) OF RIWS FY 2022

Respectfully forwarded is the Memorandum of Protected Area Superintendent Rasa Island Wildlife Sanctuary dated September 22, 2022 re: above subject with attachment.

Please be informed that Protected Area Management Office of Rasa Island Wildlife Sanctuary conducted activities under Coastal and Marine Ecosystem Management Program (CMEMP). Habitat Assessment/Monitoring activity has been undertaken by the PAMO-RIWS such as Coral Reef Assessment (including Fish Visual Census), Seagrass Assessment and Mangrove Assessment) and Maintenance and Protection activities within the protected area such as patrolling and threats observations (from Habitat surveys activities) also conducted. This Office recommended the following:

- Continuous Information and Education Campaign to raise the awareness of the local residents adjacent to the protected area regarding on the importance of the marine ecosystem, proper waste disposal and segregation;
- Strict protection and monitoring of the coastal and marine habitats of Rasa Island Wildlife Sanctuary to prevent destructive anthropogenic activities and human exploitation; and
- Continuous conduct of coastal clean-up activity in coordination with BLGUs and local communities.

For your information and record.







Republic of the Philippines  
Department of Environment and Natural Resources  
MIMAROPA Region  
**COMMUNITY ENVIRONMENT AND NATURAL RESOURCES OFFICE**  
**PROTECTED AREA MANAGEMENT OFFICE – RASA ISLAND WILDLIFE SANCTUARY**  
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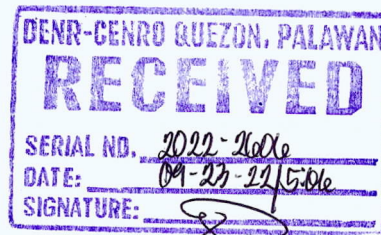
September 22, 2022

MEMORANDUM

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

FROM : The Protected Area Superintendent  
Rasa Island Wildlife Sanctuary

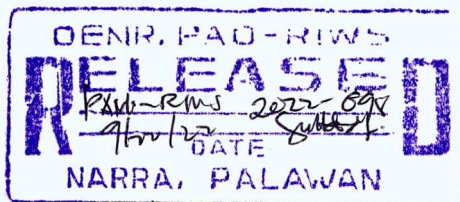
SUBJECT : **SUBMISSION OF 3<sup>RD</sup> QUARTER CMEMP REPORT FOR  
FY 2022**



Respectfully forwarded is the 3<sup>rd</sup> Quarter CMEMP report of PAMO-RIWS for FY 2022.

For your information, reference, and further instruction.

MA. TERESA V. AYSON



Protected Area Management Office –  
Rasa Island Wildlife Sanctuary

# **Coastal and Marine Ecosystems Management Program**

3<sup>RD</sup> Quarter Report FY 2022

By:

**PROTECTED AREA MANAGEMENT OFFICE  
RASA ISLAND WILDLIFE SANCTUARY**



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## **Protected Area Profile on Coastal and Marine Ecosystems**

### **Protected Area: Rasa Island Wildlife Sanctuary**

#### **Introduction**

Rasa Island is a small, flat coral island that surrounded by mangroves and tidal flats situated in the Sulu Sea and located within the municipal waters of Narra, Palawan, Philippines. It is within the geographic coordinates of 9°13'25" N latitude 118°26'35" E longitude. It has a total area of 1,983 ha which only about one third is permanently dry and two-thirds are occasionally exposed to the tides. Extensive tidal flats and pristine mangroves border the island.

It is the natural habitat of the critical endangered species Philippine Cockatoo (*Cacatua haematorupygia*) locally known as "katala". It holds the largest number of the Katala species which leads that the municipality of Narra known as the "Philippine Cockatoo Capital of the World", also, the island was named as "One of the Top 13 Bird Watching Sites in the Philippines" by the Philippine Department of Tourism (PDOT) and was promoted during the 2009 World Travel Market in London.

In order to protect this bird species whose number dropped sharply from as many as 4,000 in 1994 to only about 1,000 in 2001 due to illegal poaching and rapid deforestation of its coastal environment, the Philippine government declared the whole island and surrounding waters as protected area known as Rasa Island Wildlife Sanctuary through Philippine Presidential Proclamation 1000.

Activities in accordance to the work plan for PA-RIWS such as Maintenance and Protection under Coastal and Marine Ecosystem Management Program (CMEMP), Biodiversity Monitoring System (BMS), PAMB Meetings, Communication Education and Public Awareness (CEPA), and Integrated Protected Area Fund Updates. These activities were implemented and conducted under the direct supervision of the PASu of RIWS and are participated the Protected Area Management Board, CDU Staff under CENRO-Quezon, LGU-Narra and KFI.



## HABITAT ASSESSMENT/ MONITORING RESULTS

### a. Coral Reef Assessment (including Fish Visual Census)

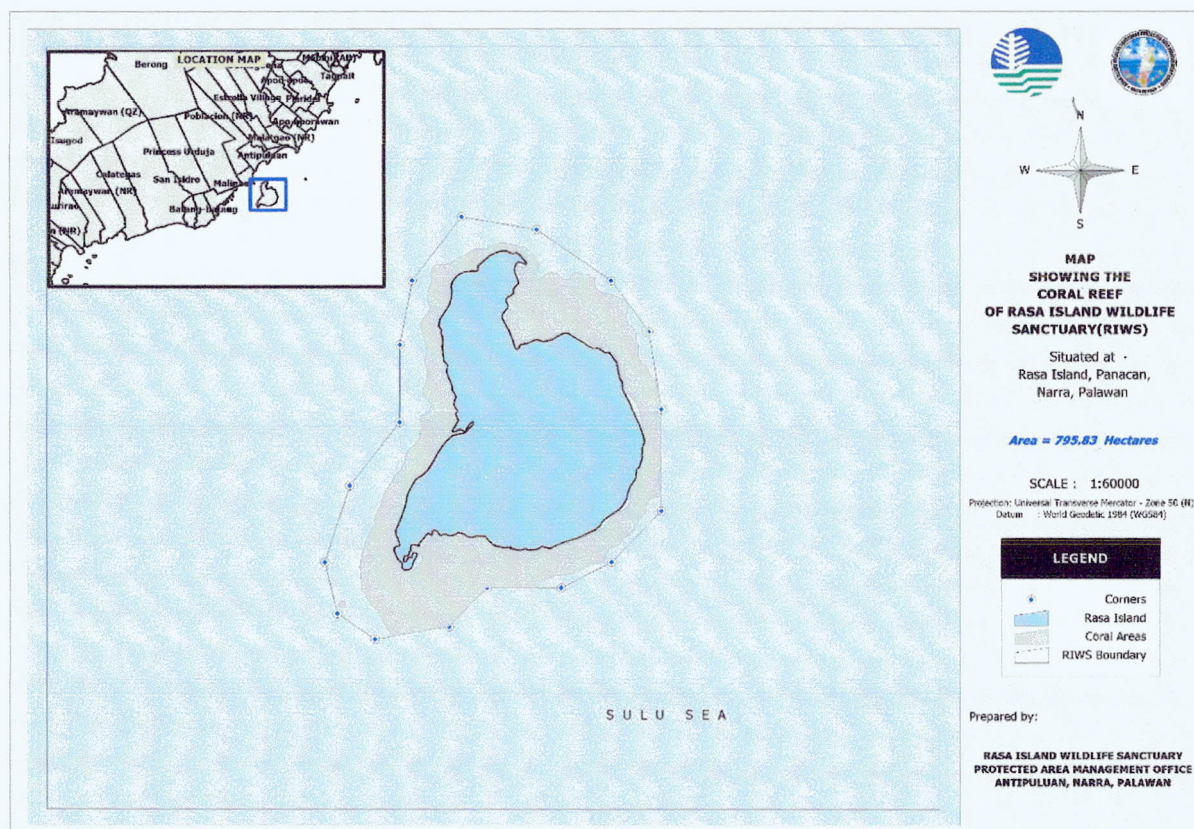


Figure 1. Map Showing the Coral Reef of Rasa Island Wildlife Sanctuary

Number of Hectares (Habitat Extent): 795.83 has

- Methodology

Coral reef assessment in RIWS was conducted on March 12-18, 2022 in collaboration with the DA-BFAR of LGU-NARRA using the method prescribed in Technical Bulletin 2019-05 or the "Technical Guide on Biodiversity Assessment and Monitoring System for Coastal and Marine Ecosystem". A total of three stations were established in RIWS, 100m transect were laid out in every station. Every meter of transect were photographed using a digital camera (Go-Pro Hero 6). These photos were analysed using Coral Point Count with Excel extensions (CPCe) in which benthos under each point was identified in Taxonomic Amalgamation Units (TAUs).

The coral cover and diversity were categorized based on the introduced category of Licuanan et.al (2017 and 2019) as shown in Table 1 and 2 below.



**Table 1.** New scale for coral cover

# of Taxonomic Amalgamation Units	HCC Category
>26 TAUs	HCC Category A
>22-26 TAUs	HCC Category B
>18-22 TAUs	HCC Category C
0-18 TAUs	HCC Category D

**Table 2.** New scale for coral generic diversity

# of Taxonomic Amalgamation Units	Diversity Category
>26 TAUs	Diversity Category A
>22-26 TAUs	Diversity Category B
>18-22 TAUs	Diversity Category C
0-18 TAUs	Diversity Category D

- Results

Out of three stations established, Station 3 has the highest cover of live corals with 35.45% which falls in Hard Coral Cover Category B. Likewise, this station got the highest number of TAUs present in the transect. (Fig. 2)

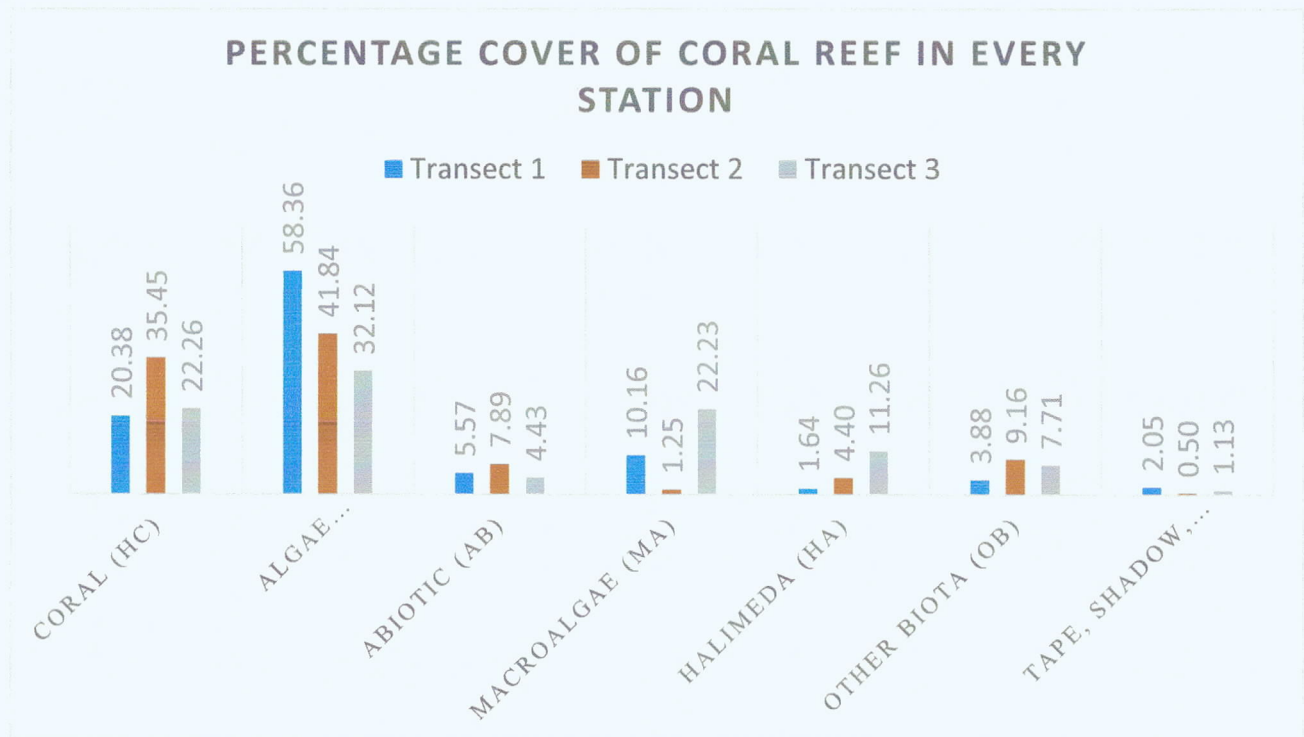


Figure 2. Percentage of corals in three stations

A total mean of 26.03% was computed for hard live corals. Meanwhile, corals with algal assemblage turns to have a higher mean percentage (44.11%). This implies that ecological factors deteriorating the community of coral reefs could be present. However, there is a presence of macroalgae with 11% mean cover in which contributes to the mortality of corals. In average Rasa Island Wildlife Sanctuary Coral cover falls in HCC Category B and generic coral diversity of Category B. (Table 3).

**Table 3.** Major Categories with mean percentage of every transect

MAJOR CATEGORY (% of transect)	Transect 1	Transect 2	Transect 3	AVERAGE
CORALS (HC)	20.38	22.26	35.45	26.03
ALGAE ASSEMBLAGE (AA)	58.36	32.12	41.84	44.11
ABIOTIC (AB)	5.57	4.43	7.89	5.97

MACROALGAE (MA)	10.16	22.23	1.25	11.21
HALIMEDA (HA)	1.64	11.26	4.40	5.77
OTHER BIOTA (OB)	3.88	7.71	9.16	6.92
TAPE, SHADOW, BLOCKS, IND (TWB)	2.05	1.13	0.50	1.22
Sun (excluding tape + shadow + wand)	100	100	100	100

## Fish Visual Census

- Methodology

Fish Visual Census activity was conducted in Rasa Island Wildlife Sanctuary in collaboration with the LGU-Narra DA-BFAR. Three (3) stations were surveyed by visual census using Line Intercept Transect (LIT) method in selected reefs of Rasa Island between depths of 5m-7m on March 12-18, 2022. In each station, a belt transect of 100m x5m was establish. All reef fishes encountered within 2.5m either side of the transect line with the aid of SCUBA was identified and recorded using underwater slate board.

Fish abundance was determined by actual counts. The total length of fish species was estimated and later used to estimate fish biomass. Parameter **a** and **b** were taken from Kulbicki et.al 1993. For fish species with no available **a** and **b**, the known values of the closest relative (e.g. same genus) with the most similar body size and shape were used.

Global Positioning System (GPS) was used to record the coordinates of each sampling station, so that it can be used for future monitoring plan. Reference used for fish identification were; Gonzales 2013, Allen.et.al 2003 and Myers 1999. Scientific names was also verified in FISHBASE (fishbase org.).

Fishes were categorized as Target, Major families and Indicator. Target species are those commonly utilized in fisheries with varying commercial value (e.g. grouper, (Serranids), rabbitfish (Siganids), snapper (Lutjanids), parrot fishes (Scarids) and fusilier (Caesionids). Major families are those species with less commercial value and less priority to fisherfolks. Indicator species are fishes that are highly territorial as such their appearance and abundance may indicate the condition of their habitat (e.g. butterfly (Chaetodontids) and damselfish (Pomacentrids).



- Results

The total number of fish species perceived in three (3) station was 87 individuals were identified to species level and distributed to 21 families. The families with higher species were Pomacentridae (damselfish 20), Labridae (wrasse 14) Chaetodontidae (butterflyfish 11) and Scaridae (parrotfish 8) (Table 4).

**Table 4. Number of Individuals of fish species and biomass in three sampling stations in Rasa Island, Narra, Palawan.**

Station	Family	Individual/1000 m <sup>2</sup>	Biomass (MT/Km)	Category
1	18	638	68.0	High
2	19	1,295	285.93	Very high
3	16	1,653	397.83	Very high
Total			<b>751.8</b>	
Ave.			<b>250.6</b>	

#### Fish biomass

In this survey, the highest individual counts (1,653) were station 3, followed by station 2 (1295) and station 1 with 638. The average fish biomass was estimated at 250.6 mt/km. Based on the category of Hilomen (1998), the average fish biomass of Rasa Island can be categorized as very high. The very high biomass of sampling stations might be attributed to its location and the condition of reefs in the areas (Table 4). Considering the surveyed areas made in the drop-off, it could be assumed that the large and variety of fishes are still concentrated at deep. Thus, favorable water movement carried out by water current influencing the diversity and productivity of the area.

**Table 5. Species composition and category of fishes in Rasa Island, Narra, Palawan.**

Station	Family	No. of species	Categories		
			Target	Major	Indicator
1	18	69	34	29	6
2	19	75	35	33	7
3	16	85	38	38	9
		<b>229</b>	<b>107</b>	<b>100</b>	<b>22</b>

## Species category

Of these fish species identified and recorded, 107 species (46.7%) were target species, 100 (43.7%) were major and 22 (9.6%) were indicator species (e.g. butterfly and damselfish) (Table 5). The number of indicator species was remarkably low. Butterfly fish have been used as indicator for reef health since they are highly associated with coral reef. Damselfish is known to be a highly territorial reef fishes. In this survey, this group has the highest number of species. The complete list of all fish species encountered from the sampling stations is listed in Table 6.

**Table 6. Summary of reef fishes encountered in three stations in Rasa Island with its categories: Target ,Major, Indicator.**

FAMILY	SPECIES	TARGET	MAJOR	INDICATOR
Acanthuridae	<i>Ctenochaetus striatus</i>	+		
	<i>Ctenochaetus binotatus</i>	+		
	<i>Naso unicornis</i>	+		
	<i>Acanthurus nigroris</i>	+		
	<i>Zebrasoma scopas</i>		+	
Balistidae	<i>Balistapus undulatus</i>	+		
Caesionidae	<i>Caesio cuning</i>	+		
	<i>Pterocaesio pisang</i>	+		
Chaetodontidae	<i>Chaetodon decussatus</i>			+
	<i>Chaetodon baronessa</i>			+
	<i>Chaetodon lunulatus</i>			+
	<i>Chaetodon lunula</i>		+	
	<i>Chaetodon melannotus</i>			+
	<i>Chaetodon octofasciatus</i>			+
	<i>Chaetodon rafflesi</i>			+
	<i>Chaetodon auriga</i>		+	
	<i>Chaetodon lineolatus</i>			+
	<i>Heniochus monoceros</i>		+	
	<i>Heniochus varius</i>			+
Ephippidae	<i>Platax teira</i>	+		
Fistularidae	<i>Fistularia commersonii</i>	+		
Haemulidae	<i>Plectorhincus lineatus</i>	+		
	<i>Plectorhincus pictus</i>	+		
Holocentridae	<i>Myripristis berndti</i>	+		
	<i>Sargocentron rubrum</i>	+		
Kyphosidae	<i>Kyphosus vaigiensis</i>	+		



Labridae	<i>Thalassoma lunare</i>		+	
	<i>Choerodon anchorago</i>	+		
	<i>Choerodon oligacanthus</i>	+		
	<i>Chelinus chlorourus</i>	+		
	<i>Cheilinus trilobatus</i>	+		
	<i>Coris pictoides</i>		+	
	<i>Coris dorsomacula</i>		+	
	<i>Cirrhilabrus cyanopleura</i>		+	
	<i>Diproctacanthus xanthurus</i>			+
	<i>Gomphosus varius</i>		+	
	<i>Hemigymnus melapterus</i>	+		
	<i>Hemigymnus fasciatus</i>	+		
	<i>Labroides dimidiatus</i>		+	
	<i>Macropharyngodon meleagris</i>		+	
Lethrinidae	<i>Lethrinus olivaceus</i>	+		
Lutjanidae	<i>Lutjanus decussatus</i>	+		
	<i>Lutjanus russelli</i>	+		
	<i>Lutjanus bohar</i>	+		
	<i>Lutjanus carponotatus</i>	+		
	<i>Lutjanus fulviflamma</i>	+		
Monodactylidae	<i>Monodactylus argenteus</i>	+		
Mullidae	<i>Parupeneus bifasciatus</i>	+		
	<i>Parupeneus multifasciatus</i>	+		
Pomacanthidae	<i>Centropyge vrolikii</i>		+	
	<i>Pomacanthus sexstriatus</i>		+	
Pomacentridae	<i>Abudefduf vaigiensis</i>		+	
	<i>Pomacentrus smithi</i>		+	
	<i>Pomacentrus lepidogenys</i>		+	
	<i>Plectroglyphidodon lacrymatus</i>		+	
	<i>Neoglyphidodon melas</i>		+	
	<i>Pomacentrus moluccensis</i>		+	
	<i>Pomacentrus stigma</i>		+	
	<i>Amblyglyphidodon curacao</i>		+	
	<i>Pomacentrus littoralis</i>		+	
	<i>Amblyglyphidodon batunai</i>		+	
	<i>Dascyllus aruanus</i>		+	
	<i>Amphiprion frenatus</i>		+	
	<i>Amblyglyphidodon aureus</i>		+	



	<i>Dascyllus reticulatus</i>		+	
	<i>Amphiprion sandaracinos</i>		+	
	<i>Chrysiptera parasema</i>		+	
	<i>Chromis ternatensis</i>		+	
	<i>Neoglyphidodon bonang</i>		+	
	<i>Dischistodus prosopotaenia</i>		+	
	<i>Pomacentrus simsiang</i>		+	
Ptereleotridae	<i>Ptereleotris evides</i>		+	
Scaridae	<i>Chlorurus bleekeri</i>	+		
	<i>Chlorurus capistratoides</i>	+		
	<i>Chlorurus bowersi</i>	+		
	<i>Chlorurus sordidus</i>	+		
	<i>Scarus dimidiatus</i>	+		
	<i>Scarus schlegeli</i>	+		
	<i>Scarus globiceps</i>	+		
	<i>Cetoscarus bicolor</i>	+		
Serranidae	<i>Cephalopolis cyanostigma</i>	+		
	<i>Ephinepelus bontoides</i>	+		
	<i>Ephinepelus merra</i>	+		
Siganidae	<i>Siganus canaliculatus</i>	+		
	<i>Siganus guttatus</i>	+		
	<i>Siganus virgatus</i>	+		
Zanclidae	<i>Zanclus cornutus</i>		+	
<b>Total</b>	<b>87</b>	<b>43</b>	<b>35</b>	<b>9</b>

### Recommendations:

1. Continuous and intensive information education campaign (IEC) on the role of coral reef on the marine ecosystems;
2. Implementation of strict protection and monitoring in the coastal and marine habitats of Rasa Island Wildlife Sanctuary;
3. Incorporating adaptive mitigating measures on the effects of climate change and adverse anthropogenic activities on our coastal and marine ecosystems.

## Seagrass

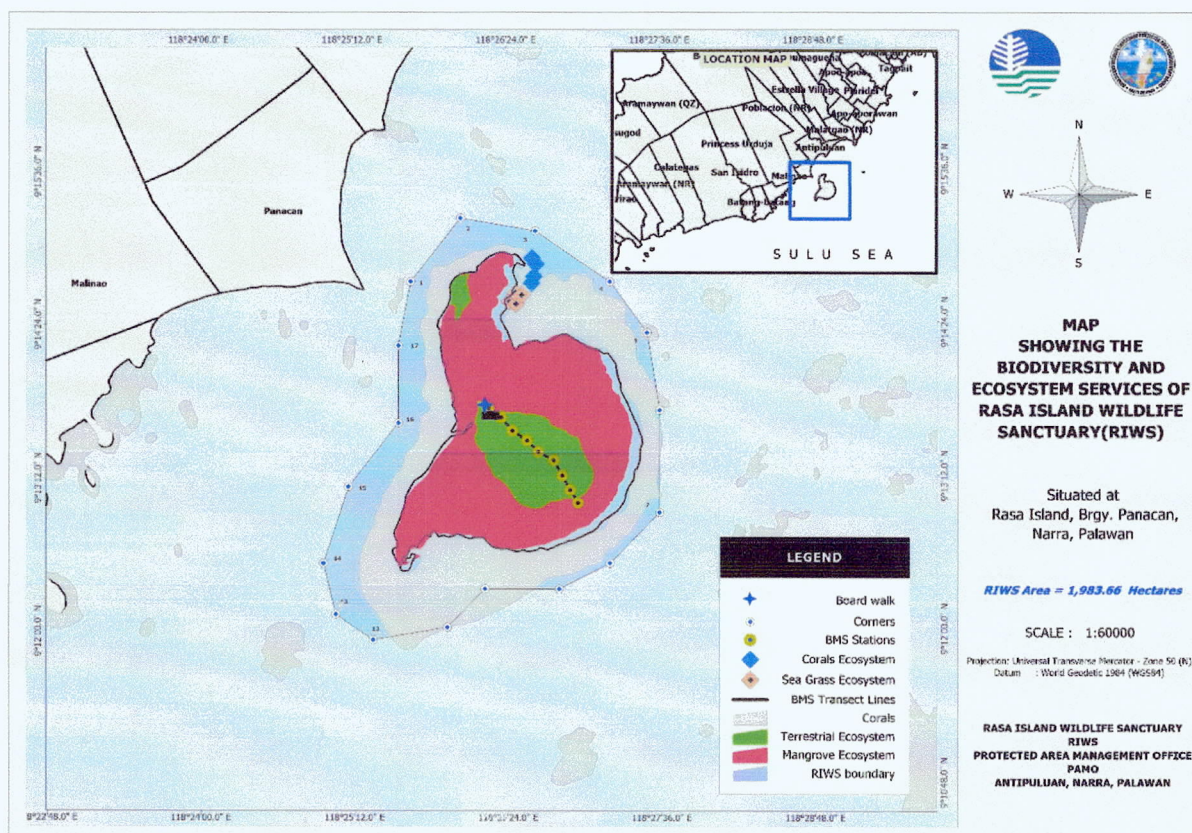


Figure 3. Map Showing the Seagrass Ecosystem of Rasa Island Wildlife Sanctuary

LOCATION (Province/Municipality/ Barangay)	NUMBER OF HECTARES ASSESSED	CONDITION	THREATS IDENTIFIED
<b>Rasa Island Wildlife Sanctuary</b>	<b>153.32</b>	<b>Fair</b>	<b>Wilting and Siltation</b>

Seagrass assessment in Rasa Island Wildlife Sanctuary was conducted from February 11, 2022 to May 21, 2022.

The methodology used in the conduct of seagrass assessment in Rasa Island Wildlife Sanctuary was in accordance with the BMB Technical Bulletin Nos. 2017-05 and 2019-04.



## Seagrass Assessment

- Methodology

Three 100 m transect lines, separated by a 25 m distance in between was laid parallel to each other. Transect lines was laid perpendicular to the shore, from the shallow intertidal zone to a depth until where seagrass are present. Start and end of the transect tapes was marked using a GPS. Pegs was used to hold transects in place until all sampling has been completed.

A 0.5 m by 0.5 m quadrat was laid starting from the 0-m mark on the right side of each transect at 5 m interval. Data recorder walked on the left side of transect to avoid any sediment disturbance on the quadrats measured.

Photograph of the quadrat was taken at 5-, 25-, and 45-m or on quadrats of particular interest (e.g. dugong trail, high algal abundance, lots of gastropods, etc.). Photos was taken before any measurements are taken to avoid sediment disturbance.

- Results

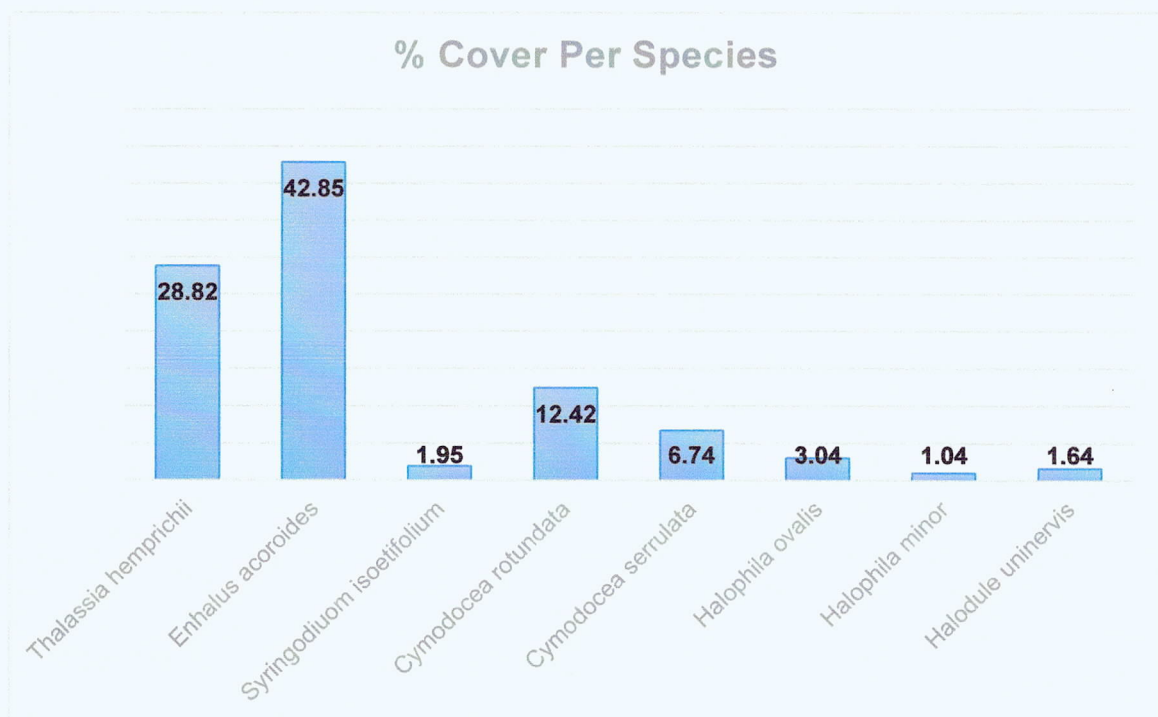


Figure 4. Percent Cover per species



Figure 4. shows the percentage cover of seagrass found in Rasa Island Wildlife Sanctuary. The highest percentage cover consist of *Enhalus acoroides* with a total percentage cover of 42.85% followed by *Thalassia hemprichii* with total percentage cover of 28.82 %, *Cymodocea rotundata* with total percentage cover of 12.42%, *Cymodocea serrulata* with total percentage cover of 6.74%, *Halophila ovalis* with total percentage cover of 3.04%, *Syringodium isoetifolium* with total percentage cover of 1.95%, *Halodule uninervis* with total percentage cover of 1.64% and *Halophila minor* with the lowest percentage cover of 1.04%.

○ **Category condition**

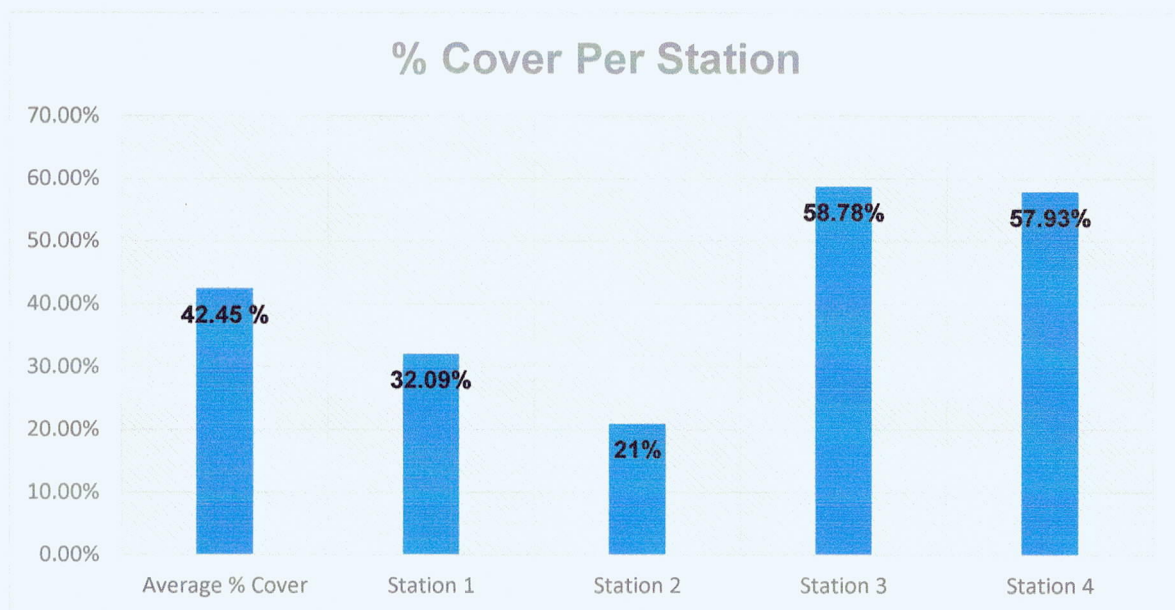


Figure 5. Category condition per station and average category condition

Figure 5. Shows the category condition of seagrass in Rasa Island Wildlife Sanctuary. It also shows that among the four stations that was assessed, Station 3 has the highest category condition which falls into good condition followed by station 4 which also falls into good condition, Station 1 which falls into fair condition and station 2 which falls into poor condition (Amran 2010). The total average category condition of seagrass in Rasa Island Wildlife Sanctuary is 42.45% which falls into Fair condition.

- **Species richness**

A total of 8 endemic species of seagrass were found which are the following: *Thalassia hemprichii*, *Enhalus acoroides*, *Cymodocea rotundata*, *Cymodocea serrulata*, *Halophila ovalis*, *Halophila minor*, *Syringodium isoetifolium* and *Halodule uninervis*. *Enhalus acoroides* was the dominant species since it was also the most common seagrass occurring in Palawan. On the other hand, *Halophila minor* was the least dominant species found.

**Recommendations on how to maintain or improve current condition:**

1. Continuous and intensive information education campaign (IEC) on the role of seagrass on the marine ecosystems;
2. Implementation of strict protection and monitoring in the coastal and marine habitats of Rasa Island Wildlife Sanctuary;
3. Incorporating adaptive mitigating measures on the effects of climate change and adverse anthropogenic activities on our coastal and marine ecosystems.



## Mangroves

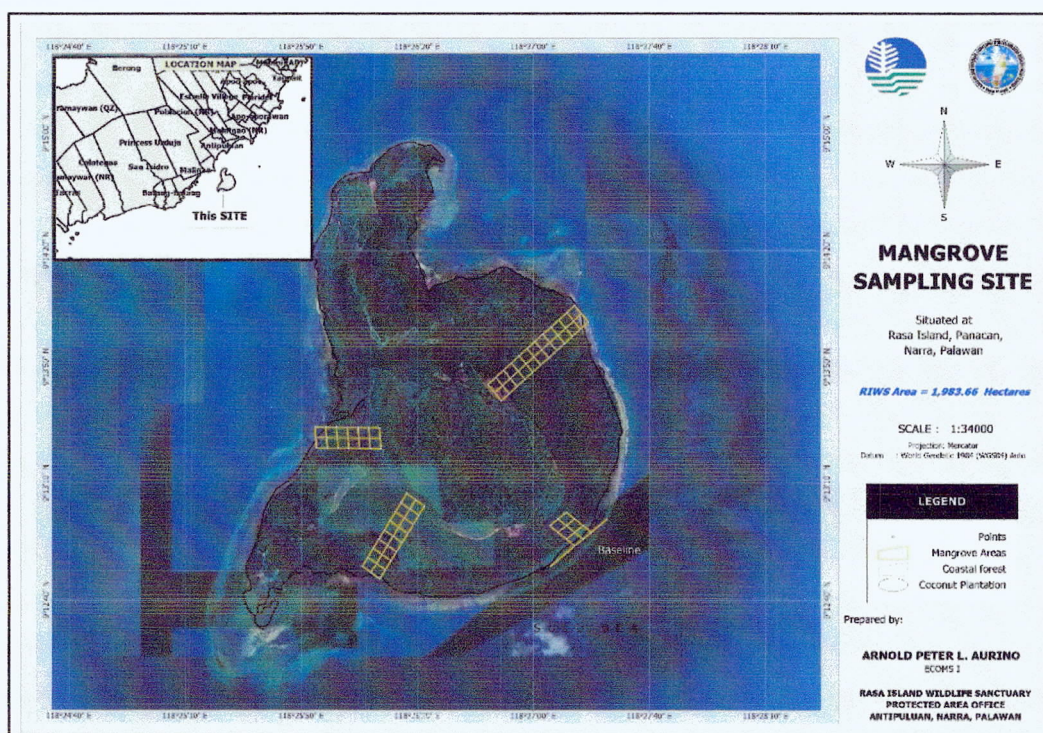


Figure 6. Map Showing the Mangrove Sampling Site in Rasa Island Wildlife Sanctuary

Number of Hectares Targeted for the Quarter: 709.71 ha  
 Total Hectares Assessed: 709.71 ha  
 Condition: Excellent

Mangrove assessment in Rasa Island Wildlife Sanctuary was conducted from May 2022 to July 2022. The methodology used in the conduct of mangroves assessment was in accordance with the BMB Technical Bulletin Nos. 2017-05 and 2019-04.

### Mangrove Assessment

- Methodology

Transect lines was established perpendicular to the baseline at every 100 meter interval (for contiguous forest). The length of transects lines started from the seaward and extends to the most landward zone.

A nester 10x10 quadrat was established at every 100-meter interval of the transect lines. All mangrove trees inside the 10x10 quadrat with diameter of equal or greater than 5 centimetres was identified and measured (DBH, MH, & TH). Small tress (<5 CM DBH), and non-tree flora (shrubs, vines, herbs, ferns etc.) was identified and counted inside the 2x2m quadrat. Collected data was analysed using the BMB Technical Bulletin 2017-05 and Technical Bulletin 2019-04.



## Results

A total of twelve (12) species of mangroves were identified during the assessment. Result shows that the most dominant species of mangroves in Rasa Island Wildlife Sanctuary (RIWS) was *Sonneratia alba* with 59.86 % relative dominance and *Ceriops tagal* as the least dominant species with 1.14% relative dominance. The result also show that *Rhizophora apiculata* has the highest relative density among the mangrove species in RIWS with a total of 18.16% relative density followed by *Bruguiera gymnorrhiza* with 17.52% relative density (Table 7).

Likewise, species with the highest relative frequency was *Rhizophora apiculata* with 16.12% relative frequency and followed by the *Rhizophora mucronata* with 12.04% relative frequency. Furthermore, the species with the most important value was *Sonneratia alba* with 77.32% importance value, followed by *Bruguiera gymnorrhiza* with 43.01%, *Rhizophora apiculata* with 37.32%, *Rhizophora mucronata* with 27.21 %, and *Ceriops tagal* with 22.87% importance value (Table 7).

On the other hand, the species with the least important value was *Lumnitzera littorea* with 11.31% and *Lumnitzera racemosa* with 10.50% importance value (Table 7).

**Table 7. Importance Value of Mangroves Trees in Rasa Island Wildlife Sanctuary**

Species	Relative Density	Relative Frequency	Relative Dominance	Importance Value
<i>Rhizophora apiculata</i>	18.16543262	16.12596422	3.033770417	37.32516725
<i>Rhizophora mucronata</i>	12.01922125	12.04925369	3.143742405	27.21221734
<i>Rhizophora stylosa</i>	12.38757075	6.082905767	2.319448204	20.78992472
<i>Ceriops tagal</i>	12.45682462	9.274254668	1.140139665	22.87121896
<i>Bruguiera gymnorrhiza</i>	17.52932896	18.69989344	6.783922683	43.01314508
<i>Bruguiera sexangula</i>	4.666825684	7.632656444	6.891807636	19.19128976
<i>Sonneratia alba</i>	8.050385735	9.414344487	59.86218685	77.32691707
<i>Avicennia officinalis</i>	4.141778748	6.013357004	8.595873136	18.75100889
<i>Lumnitzera racemosa</i>	4.028781085	4.89154716	1.58146853	10.50179678
<i>Xylocarpus granatum</i>	5.850808391	7.34205371	3.908764543	17.10162664
<i>Xylocarpus mollucensis</i>	7.767880688	7.899674387	3.988712746	19.65626782
<i>Lumnitzera littorea</i>	4.232804233	5.606060606	1.473557917	11.31242276



## Mangrove Condition

Based on the results shown in the tables 8, 9, and 10, the mangrove condition in Rasa Island Wildlife Sanctuary was excellent. All station are in excellent mangrove condition. The result emphasizes that there are no destructive activities occurring and destroying the mangrove forest in Rasa Island Wildlife Sanctuary.

**Table 8. Average Height of Mangroves in Rasa Island Wildlife Sanctuary**

Station	Transect	Total Height	Total Number of Trees	Average Height
1	1	630	55	11.45454545
1	2	680	62	10.96774194
1	3	623.5	62	10.05645161
2	1	208	18	11.55555556
2	2	216	16	13.5
2	3	193	18	10.72222222
3	1	628	46	13.65217391
3	2	400.5	33	12.13636364
3	3	363	32	11.34375
4	1	379	38	9.973684211
4	2	254	23	11.04347826
4	3	242.5	23	10.54347826

**Table 9. % Crown Cover of Mangroves in Rasa Island Wildlife Sanctuary**

Station	Transect	Total Crown Diameter (cm)	Total Crown Cover (m2)	% Crown Cover
1	1	266.5	137141.0502	124.673682
1	2	266.1	107933.8129	98.12164813
1	3	271	127767.9393	116.1526721
2	1	85.5	110773.6505	369.2455016
2	2	85.5	104176.6341	347.255447
2	3	68	52766.11725	175.8870575
3	1	220.5	149245.635	186.5570438
3	2	173.5	133384.6784	166.7308479
3	3	173	111529.1562	139.4114453
4	1	172.5	101210.3747	144.5862495
4	2	115	72358.5093	120.5975155
4	3	114.5	101232.7586	202.4655171

**Table 10. Regeneration per sq. m. of Mangroves in Rasa Island Wildlife Sanctuary**

Station	Transect	Total Regeneration Count	Total No. of Regeneration Plot	Regeneration per sq. m.
1	1	98	9	10.88888889
1	2	79	8	9.875
1	3	103	11	9.363636364
2	1	23	3	7.666666667
2	2	15	2	7.5
2	3	12	3	4
3	1	56	7	8
3	2	45	6	7.5
3	3	39	6	6.5
4	1	45	6	7.5
4	2	38	5	7.6
4	3	29	5	5.8

**Recommendations:**

1. Continuous close patrolling and monitoring in the Rasa Island Wildlife Sanctuary to prevent destructive anthropogenic activities and human exploitation;
2. Continuous assessment and monitoring of mangrove ecosystem in Rasa Island Wildlife Sanctuary; and
3. Continuous protection and conservation of the biodiversity of Rasa Island Wildlife Sanctuary, the ecosystems and wildlife therein.



## MAINTENANCE AND PROTECTION ACTIVITIES CONDUCTED IN RASA ISLAND WILDLIFE SANCTUARY

### 1. Patrolling

AREAS PATROLLED Municipality/ Barangay / General location within PA	FREQUENCY	NUMBER OF HECTARES COVERED
Mangrove Ecosystem	Monthly	700 has.
Barangays Antipuluan, Panacan and Panacan II	Weekly	Coastal area of the 3 barangays
Perimeter of Rasa Island Wildlife Sanctuary	Weekly	1,983 hectares
Coastal Forest	Monthly	160 has.

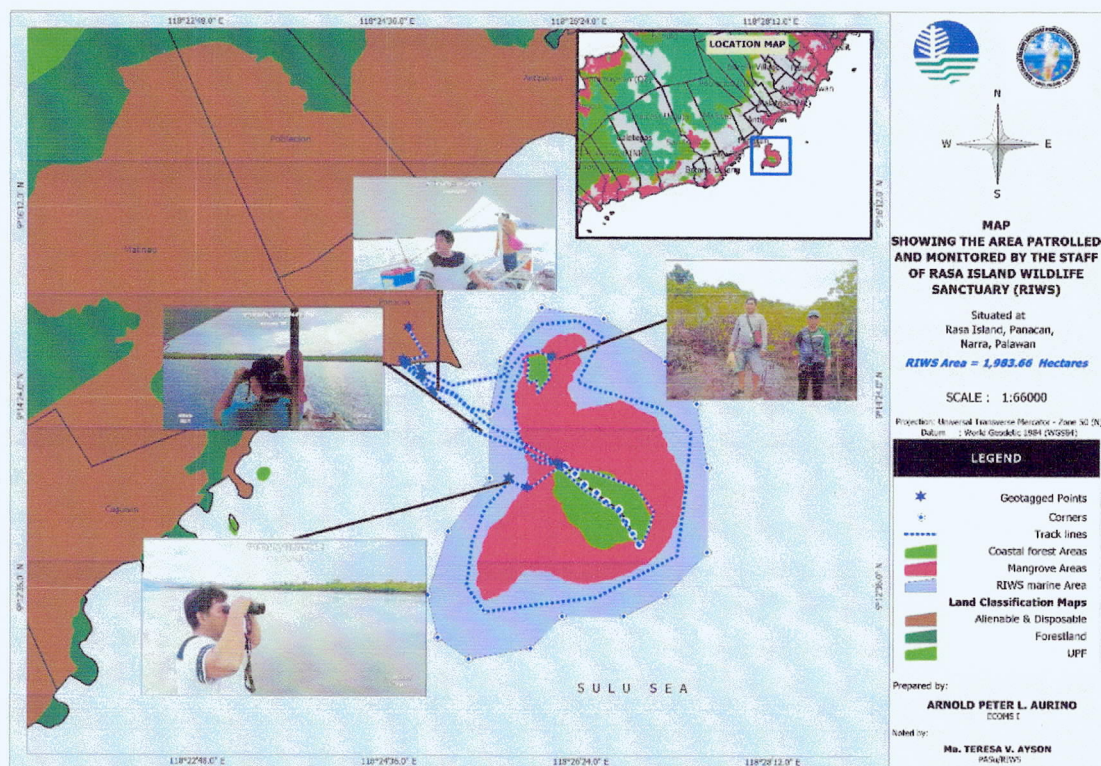


Figure 7. Map of Area Patrolled by PAMO-RIWS Monitoring Team for the 3<sup>rd</sup> Quarter of FY 2022

Mangrove and the coastal forests covered by the PA are patrolled by our Kataal wardens on daily basis. During this report period, no any illegal incidence was

monitored/observed. No adverse human activities observed on RIWS during monitoring.

## **2. Threats Observations (*From Habitat surveys activities*)**

No illegal incidence was reported, monitored and observed.

Seagrass wilting and siltation was observed. Accordingly, wilting and siltation of seagrass was usually due to agricultural runoff pollution, coastal development, unregulated fishing, boating activities, and climate change.

\*Summary of Activities conducted

PA	ACTIVITIES CONDUCTED				
	PATROLLING	RESPONS E PLAN	THREATS OBSERV ED	DIRECT ACTIVITIES CONDUCTED	EQUIPMENTS MAINTAINED
Rasa Island Wildlife Sanctuary	Coastal Forest		No threats observed		Turn-over KFI boat was maintained
	Mangrove Forest		No threats observed		All scuba gears were inventoried and 2 scuba tank were hydro- tested.
	Periphery of the island		Seagrass wilting and siltation		3 sets of SCUBA gears unserviceable (lacking of scuba tank)



### 3. Maintenance of equipment

#### \*Inventory of Equipment

EQUIPMENT	NUMBER OF UNITS	YEAR ACQUIRED/ DEVELOPED	DATE LAST MAINTAINED	CONDITION
Quadrats	2 sets (seagrass & corals)	2016	3 <sup>rd</sup> Quarter 2022	Functioning
Diving tanks	2 sets	2016	2021 (tanks hydro tested)	Functioning
Buoyancy Control Device (BCD)	5 sets	2016 (2 set complete) 2019 (3 set, lacking of scuba tank)	3 <sup>rd</sup> Quarter 2022	Functioning
Mask and snorkel	2 sets	2019	3 <sup>rd</sup> Quarter 2022	Unserviceable
Diving Fins	2 sets	2019	3 <sup>rd</sup> Quarter 2022	Functioning
Underwater camera	1set	2016	2020	Unserviceable, for new procurement this 2022 subject to availability of fund
Boat	1	2021	3 <sup>rd</sup> Quarter 2021	Functioning
Binoculars	1 set	2016	3 <sup>rd</sup> Quarter 2022	Functioning

### 4. Direct Activities Conducted

DIRECT ACTIVITIES	LOCATIONS	FREQUENCY	REMARKS
<b>Coastal Clean-up Activity</b>	Panacan II, Narra, Palawan	1	On June 8, 2022, in celebration of World Oceans Day, the PAMO-RIWS personnel conducted coastal clean-up activity in Brgy. Panacan II, Narra, Palawan in collaboration with the BLGU and local fisher folk community.
<b>International Coastal Clean-up Activity</b>	Panacan II and Antipuluan, Narra, Palawan	1	On September 17, 2022, the PAMO-RIWS together with the DENR Narra sub-station, LGU Narra spearheaded by MENRO, KFI, BJMP, PNP, BFP, DPWH, Citi Nickel, BLGUs, Fisherfolks and

			other stakeholders in the municipality of Narra, Palawan Conducted Coastal Clean-up activity in celebration of the International Coastal Clean-up Day with the theme: <i>"fighting for trash-free seas Pilipinas: Ending the flow of trash at the source"</i> .
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### Recommendations:


1. Continuous implementation of IEC and CEPA activities focusing on proper waste disposal and segregation; and
2. Continuous conduct of coastal clean-up activity in coordination with the BLGUs and local communities.

### Establishment of markers/buoys within the boundary of RIWS

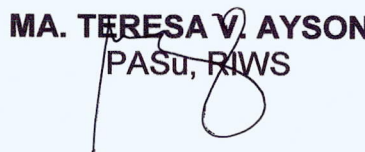
17 pcs of buoys/markers were already delivered in PAMO-RIWS this September 2, 2022. Construction of anchorage was already finished. IEC/Meeting activity for the establishment of markers/buoys in the boundary of Rasa Island Wildlife Sanctuary (RIWS) was also conducted in the Barangays adjacent. These activities were conducted in coordination with the BLGUs, fisher folks and local residents in the area. The establishment of markers/buoys was already coordinated with the LGU Narra, BLGU, and other stakeholders and this will be installed on September 29, 2022.

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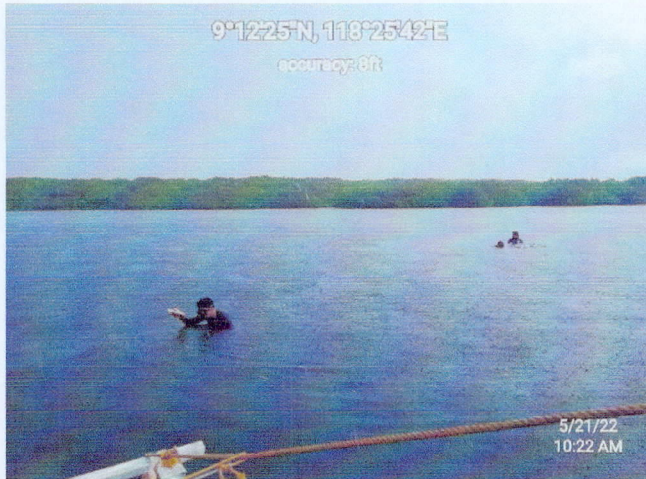
## ANNEXES

### A. Photo documentation during the conduct of patrolling, wildlife monitoring and habitat survey activity in Rasa Island Wildlife Sanctuary



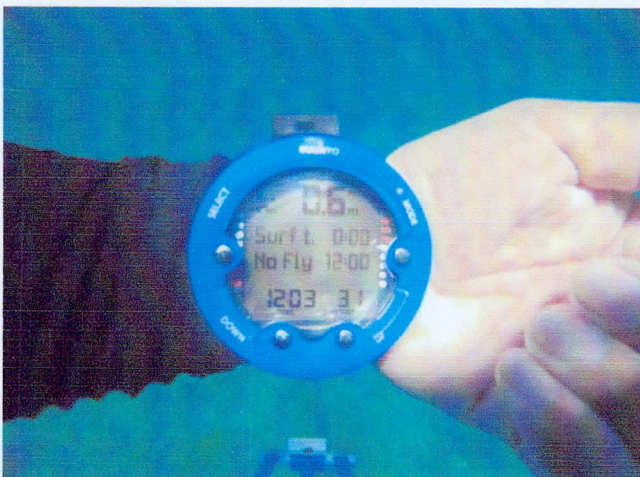


*B. Photo documentation during the conduct of seagrass assessment in Rasa Island Wildlife Sanctuary*



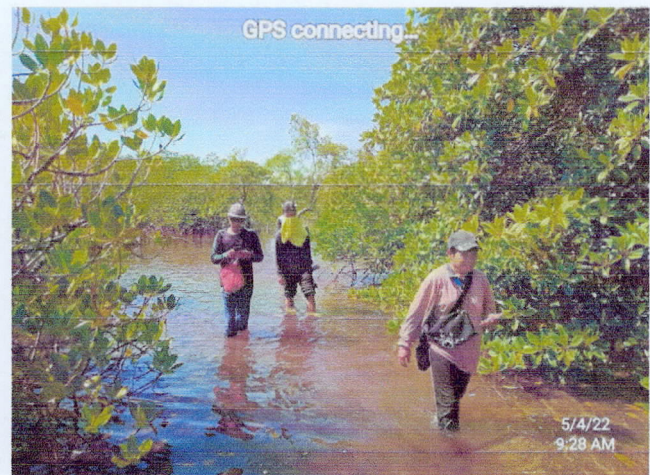


*C. Photo documentation during the conduct of corals assessment and fish visual census in Rasa Island Wildlife Sanctuary*





*D. Photo documentation during the conduct of mangrove assessment in Rasa Island Wildlife Sanctuary*





E. Photo documentation during the conduct of International Coastal Clean-up activity held on September 17, 2022





E1. Photo documentation during the conduct of International Coastal Clean-up activity held on September 17, 2022





E2. Photo documentation during the conduct of International Coastal Clean-up activity held on September 17, 2022

