



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

MIMAROPA Region

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20 DEC 2022

INCOMING

OUTGOING

December 14, 2022

MEMORANDUM

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

THRU : The OIC, ARD for Technical Services

FROM : The Provincial Environment and
Natural Resources Officer

SUBJECT : **4TH QUARTER ACCOMPLISHMENT REPORT FOR
TUBBATAHA REEFS NATURAL PARK (TRNP) UNDER
COASTAL AND MARINE ECOSYSTEMS MANAGEMENT
PROGRAM (CMEMP) FY 2022**

Forwarded is the accomplishment report of Tubbataha Management Office for the 4th quarter 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 – Monitoring of Corals, Water Quality Monitoring, and Patrolling.

Attached are the following reports;

1. Coral Recruitment Monitoring Report
2. Water Quality Monitoring Report
3. Enforcement and Patrolling

For information and record.



FELIZARDO B. CAYATOC

DENR-PALAWAN
PENRO-RECORDS
RELEASED
By *Rhea*
Date: 16 DEC 2022 CN 2022-3372



Tubbataha Management Office

Tubbataha Reefs Natural Park & World Heritage Site

29 November 2022

**DENR PENRO
PALAWAN RECORDS
RECEIVED**

BY: *[Signature]*
DATE: 11-29-2022 EN 22-10982

FELIZARDO B. CAYATOC
DENR -PENRO
Sta. Monica, Puerto Princesa City
Palawan

Dear PENRO Cayatoc,

We respectfully furnish you a copy of the following TRNP research and monitoring reports for 2022, which consists of the following studies:

1. Reef fish
2. Reef Benthos
3. Coral Recruitment
4. Water Quality

We thank you for your assistance in completing the studies and the report. The fish, benthos, coral recruits, and water quality monitoring were co-funded with Coffee Bean & Tea Leaf, and Metro Pacific Investment Foundation.

Very truly yours,

[Signature]
ANGELIQUE M. SONGCO
PASu TRNP

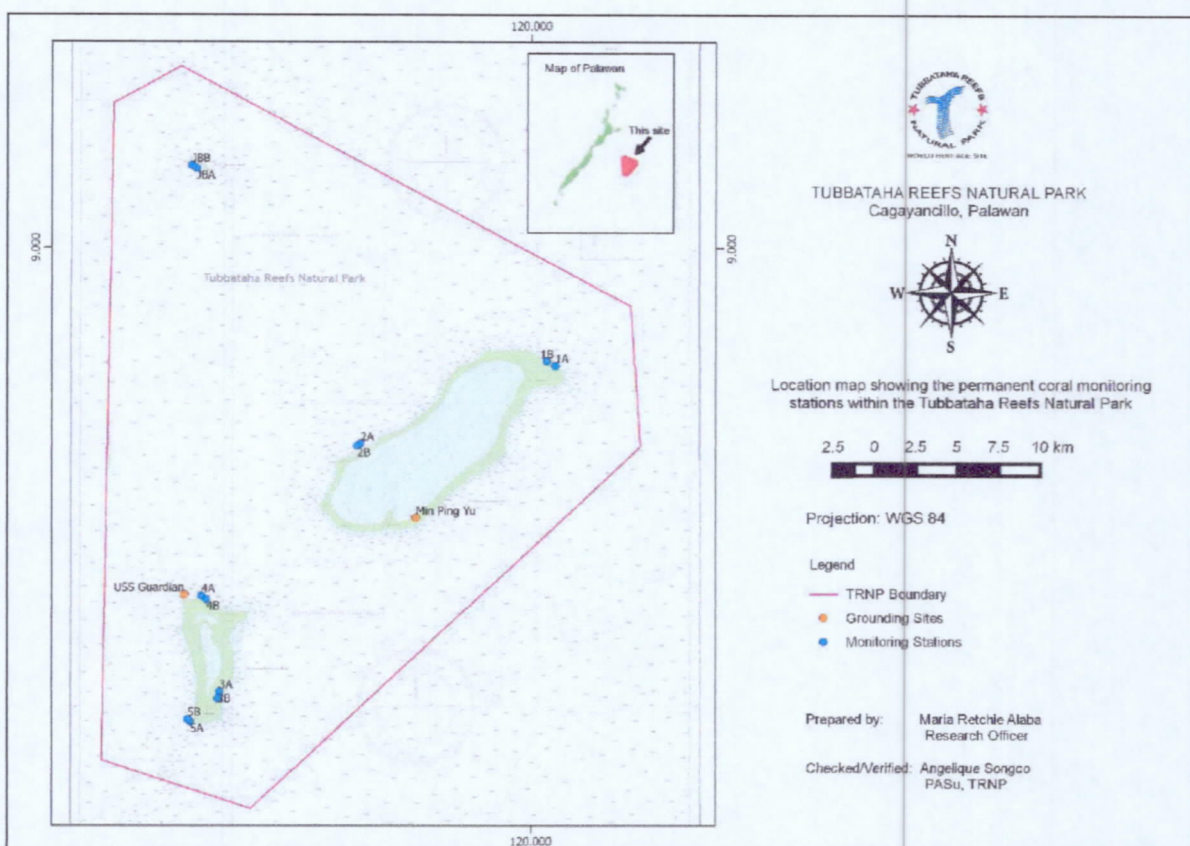


Protected Area Profile on Coastal and Marine Ecosystems

Protected Area: Tubbataha Reefs Natural Park and World Heritage Site

HABITAT ASSESSMENT/ MONITORING RESULTS

A. Coral Reef Assessment (including Fish Visual Census)



Brief narrative (maximum of 3 paragraphs) on the coral reef assessment conducted.

- Methodology

Coral monitoring in TRNP followed the methods described in DENR-BMB Technical Bulletin Nos. 2017-05 and 2019-04. The shallow area of the monitoring stations was located on the upper reef slope at a depth range of 2 to 6 meters, within the 75 x 25-meter area. The deepest limit of each station was demarcated by a 75-meter belt transect following the reef contour. Four 50-meter transects were then deployed at least 1 meter apart from the preceding transect and parallel to one another. In the deep area of the monitoring stations, four 20-meter transects were deployed five meters apart at a depth range of 6 to 10m. Photographs are taken every one meter on the shallow side of each transect.

- Results of the assessment

The coral monitoring report was submitted to DENR-PENRO on 29 November 2022.

Fish Visual Census

Brief narrative (maximum of 3 paragraphs) on the fish assessment conducted.

- Methodology

Three 50-meter replicate transects separated by a 10-meter buffer were laid in deep (~10 meters) and shallow (~5 meters) areas of each station. Each transect has an imaginary 5-meter coverage on both sides, establishing a 10 x 50-meter corridor. The transects were segmented into 5-meter stops along their length and surveyed one segment after another. The daytime Fish Visual Census (FVC) described by English et al. (1997) was employed to determine biomass, density, and species richness.

- Results of the assessment

The fish monitoring report was submitted to DENR-PENRO on 29 November 2022.

B. Water Quality Monitoring

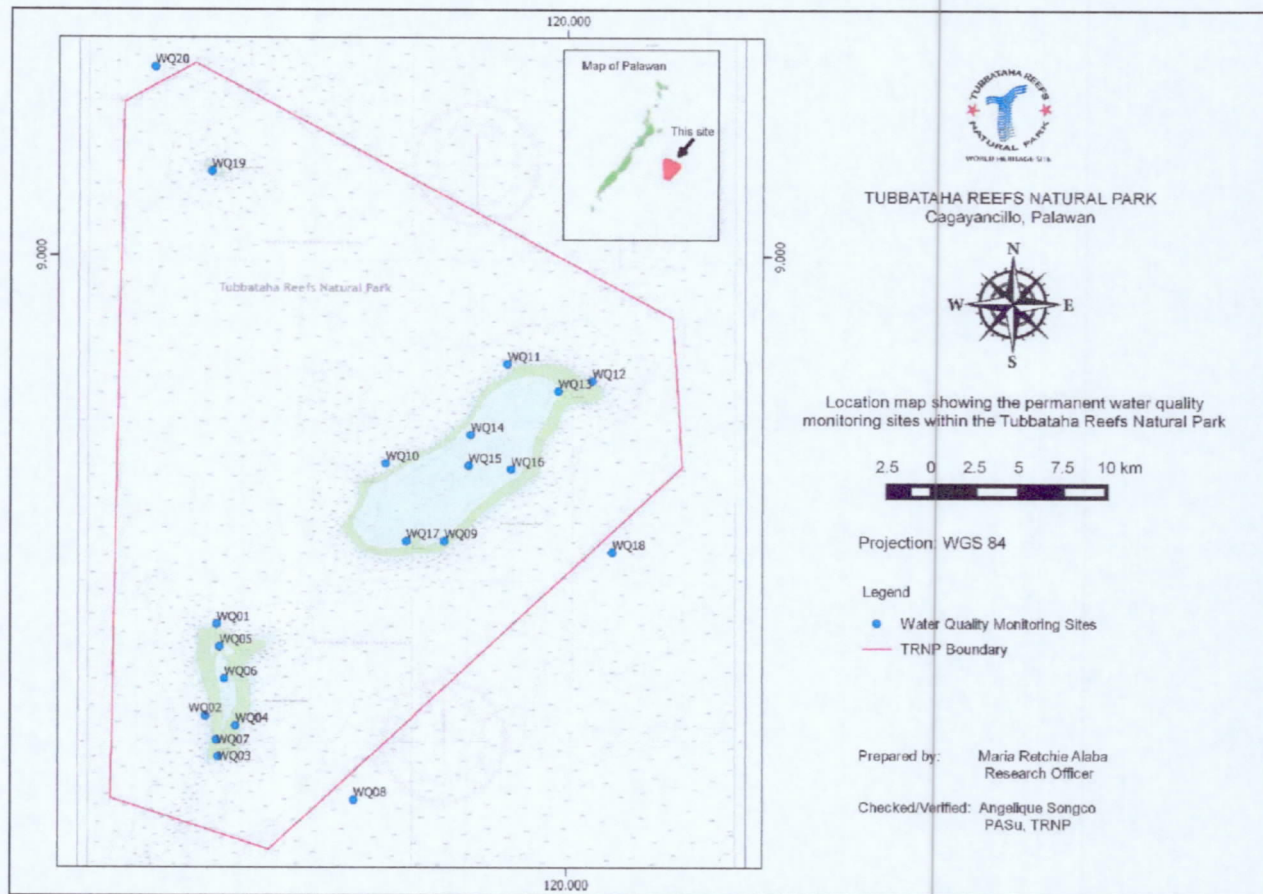


Figure 2. Water quality monitoring sites in TRNP.

Table 1. Water quality guidelines

| Table 3. Water Quality Guidelines for Primary Parameters | | | | | | | | | | |
|--|-----------|---------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Parameter | Unit | Water Body Classification | | | | | | | | |
| | | AA | A | B | C | D | SA | SB | SC | SD |
| BOD | mg/L | 1 | 3 | 5 | 7 | 15 | n/a | n/a | n/a | n/a |
| Chloride | mg/L | 250 | 250 | 250 | 350 | 400 | n/a | n/a | n/a | n/a |
| Color | TCU | 5 | 50 | 50 | 75 | 150 | 5 | 50 | 75 | 150 |
| Dissolved Oxygen ^(a) (Minimum) | mg/L | 5 | 5 | 5 | 5 | 2 | 6 | 6 | 5 | 2 |
| Fecal Coliform | MPN/100mL | <1.1 | <1.1 | 100 | 200 | 400 | <1.1 | 100 | 200 | 400 |
| Nitrate as NO ₃ -N | mg/L | 7 | 7 | 7 | 7 | 15 | 10 | 10 | 10 | 15 |
| pH (Range) | | 6.5-8.5 | 6.5-8.5 | 6.5-8.5 | 6.5-9.0 | 6.0-9.0 | 7.0-8.5 | 7.0-8.5 | 6.5-8.5 | 6.0-9.0 |
| Phosphate | mg/L | <0.003 | 0.5 | 0.5 | 0.5 | 5 | 0.1 | 0.5 | 0.5 | 5 |
| Temperature ^(b) | °C | 26-30 | 26-30 | 26-30 | 25-31 | 25-32 | 26-30 | 26-30 | 25-31 | 25-32 |
| Total Suspended Solids | mg/L | 25 | 50 | 65 | 80 | 110 | 25 | 50 | 80 | 110 |

Table 2. Water quality monitoring results in TRNP in 2022.

| Stations | 2022 | | | | | | | | | | | | | |
|----------|------|-------|-------|------|------|----------|------------|----------------|----------------|----------------|----------|------|----------------|--------------|
| | pH | Temp | Color | TSS | DO | Nitrates | Phosphates | Oil and Grease | Fecal Coliform | Total Coliform | Salinity | TDS | Turbidity, NTU | Conductivity |
| | | °C | PCU | mg/L | mg/L | mg/L | mg/L | mg/L | MPN/100 mL | MPN/100 mL | % | g/L | NTU | US/cm |
| 1 | 8.5 | 29.4 | <5 | <1 | 7.23 | 1.2429 | 0.1097 | <1 | <1.8 | <1.8 | 31.6 | 29.6 | 0 | 48.6 |
| 2 | 8.39 | 29.25 | <5 | 4 | 7.51 | 1.7791 | 0.1082 | <1 | <1.8 | 4.5 | 29.6 | 27.7 | 0.4 | 49.7 |
| 3 | 8.45 | 29.44 | <5 | <1 | 7.29 | 1.4926 | 0.1219 | <1 | <1.8 | <1.8 | 31.8 | 29.7 | 0 | 48.7 |
| 4 | 8.48 | 29.39 | <5 | <1 | 7.01 | 1.642 | 0.0983 | <1 | <1.8 | <1.8 | 32.4 | 30.2 | 0 | 49.5 |
| 5 | 8.41 | 29.38 | <5 | <1 | 8.4 | 1.5155 | 0.1091 | <1 | <1.8 | <1.8 | 31 | 29.1 | 0 | 47.6 |
| 6 | 8.42 | 29.76 | <5 | 9 | 7.88 | 2.0003 | 0.1082 | <1 | <1.8 | 2 | 30.7 | 28.9 | 0 | 47.4 |
| 7 | 8.39 | 29.25 | <5 | 2 | 7.51 | 1.8011 | 0.1183 | <1 | <1.8 | 4.5 | 29.6 | 27.7 | 0.4 | 49.7 |
| 8 | 8.46 | 29.48 | <5 | <1 | 6.62 | 2.037 | 0.2369 | <1 | <1.8 | 6.8 | 30.9 | 29 | 0 | 47.6 |
| 9 | 8.52 | 29.43 | <5 | 6 | 7.1 | 2.2451 | 0.154 | <1 | <1.8 | <1.8 | 30.8 | 28.7 | 0.1 | 47.3 |
| 10 | 8.57 | 29.46 | <5 | 4 | 7.97 | 2.2206 | 0.1206 | <1 | <1.8 | <1.8 | 31.8 | 29.7 | 0 | 38.7 |
| 11 | 8.65 | 30.05 | <5 | 2 | 8.87 | 1.7309 | 1.7309 | <1 | <1.8 | <1.8 | 31 | 29 | 0 | 47.6 |
| 12 | 8.65 | 29.57 | <5 | <1 | 7.2 | 1.4885 | 1.4885 | <1 | <1.8 | 2 | 31.7 | 29.6 | 0 | 48.5 |
| 13 | 8.76 | 33.05 | <5 | 5 | 9.92 | 2.4312 | 0.1638 | <1 | <1.8 | <1.8 | 23.7 | 21.5 | 5.6 | 37.4 |
| 14 | 8.57 | 31.37 | <5 | <1 | 6.31 | 1.8338 | 0.1108 | <1 | <1.8 | <1.8 | 32.2 | 30.1 | 0 | 49.3 |
| 15 | 8.55 | 30.81 | <5 | <1 | 6.19 | 2.1178 | 0.1186 | <1 | <1.8 | <1.8 | 30.7 | 28.8 | 0 | 47.2 |
| 16 | 8.65 | 30.54 | <5 | 10 | 7.39 | 2.4997 | 0.3401 | <1 | <1.8 | <1.8 | 31 | 28.9 | 0 | 47.6 |
| 17 | 8.32 | 29.17 | <5 | 14 | 7.65 | 2.3561 | 0.1227 | <1 | <1.8 | <1.8 | 31.8 | 29.7 | 0 | 35.7 |
| 18 | 8.65 | 30.65 | <5 | 12 | 6.07 | 2.3332 | 0.1189 | <1 | <1.8 | <1.8 | 31.6 | 29.6 | 0 | 48.5 |
| 19 | 8.6 | 29.3 | <5 | 5 | 7.98 | 2.6882 | 0.152 | <1 | <1.8 | <1.8 | 31.5 | 29.5 | 0 | 48.3 |
| 20 | 8.61 | 29.53 | <5 | 3 | 6.71 | 2.4581 | 0.254 | <1 | <1.8 | <1.8 | 31.9 | 29.8 | 0 | 48.9 |

Brief narrative discussion

The water quality monitoring report was submitted to DENR-PENRO on 29 November 2022.

C. Maintenance and protection activities conducted within the PA

1. Patrolling

| AREAS PATROLLED Municipality/ Barangay / General location within PA | FREQUENCY | NUMBER OF HECTARES COVERED |
|---|----------------------|-------------------------------|
| Jessie Beazley Reef | Once every two weeks | 97,030 hectares |
| North Atoll | Once a week | |
| South Atoll | Once a week | |

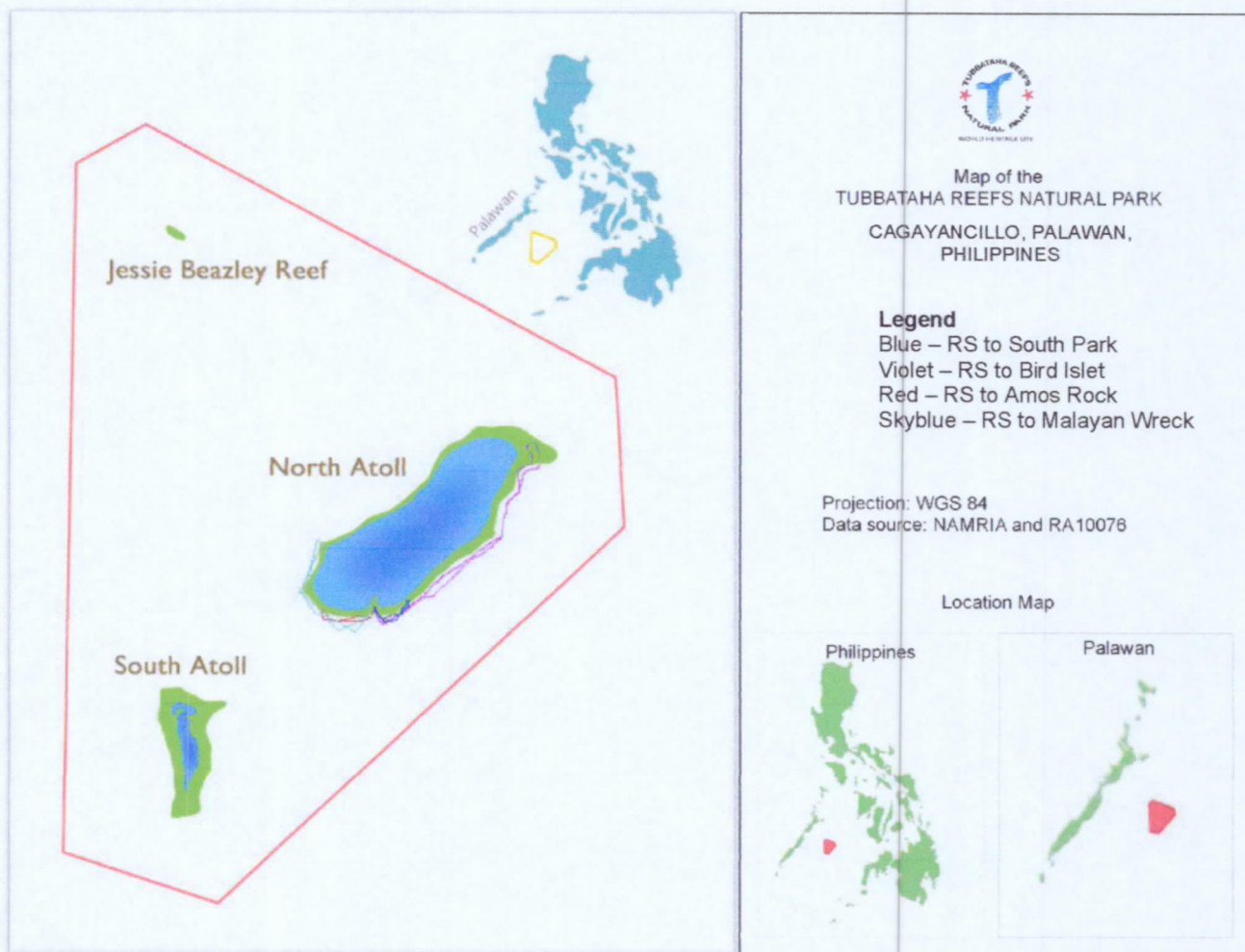


Figure 3. Map of TRNP showing the areas covered during patrolling.

- **Brief narrative** (maximum of 2 paragraphs) on the issues identified during patrolling activities as well as recommendations/ actions to be undertaken to address these.

Weather condition is the main limitation in the conduct of seaborne patrols by marine park rangers. The conduct of 120 patrols per year is the minimum requirement for the number of patrols. These are generally exceeded, especially during the calm season. However, in this 4th quarter, the outboard engine of the patrol boat was broken which limited the distance and number of patrols.

Marine debris is also a problem when doing seaborne patrols. Debris like sacks and nets get entangled in the propeller causing delays and sometimes damage.

2. Response Plan

Narrative on the status of the response plan and list of activities identified to be included

A radar and Automatic Identification System (AIS) are installed at the ranger station for surveillance and detection. This enables marine park rangers to conduct targeted patrols and take preventive measures against potential violations. TRNP was declared an Area to be Avoided (ATBA) by the International Maritime Organization in 2017. The radar and AIS help detect possible incursions into the park by giving rangers time to establish radio contact and advise ship captains to navigate away from park boundaries.

Purchasing a new outboard engine to replace the broken one.

While doing regular patrols, marine park rangers also conduct surface and coastal clean-up to lessen the volume of marine debris in TRNP.

3. Threats Observations (From Habitat surveys activities)

| PA | ACTIVITIES CONDUCTED | | | | |
|------|--|---|------------------------------------|--|---|
| | PATROLLING | RESPONSE PLAN | THREATS OBSERVED | DIRECT ACTIVITIES CONDUCTED | EQUIPMENT MAINTAINED |
| TRNP | -Patrol Outboard engine failure -Bad weather conditions -Marine Debris | -Purchased new patrol outboard engine -Frequent monitoring of Automatic Identification System (AIS) and radar -Conduct frequent surface and coastal cleanup | -Marine Debris -Coral Bleaching | -Surface and coastal clean-up -Monitoring reefs for coral bleaching | -2 patrol boats, 30' -1 dinghy, 17' -Radar -AIS -Scuba gear -Snorkeling gear -Marine band radio -Single sideband Radio -Desalinator |