



Republic of the Philippines
Department of Environment and Natural Resources
Provincial Environment and Natural Resources Office
Sta. Monica, Puerto Princesa City, Palawan
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June 9, 2023

MEMORANDUM

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

THRU : The ARD for Technical Services

FROM : The PENR Officer
Puerto Princesa City

SUBJECT : **ACTIVITY REPORTS FOR RESEARCH AND MONITORING
ACTIVITIES OF TUBBATAHA REEFS NATURAL PARK -
PAMO**


Respectfully indorsed are the three (3) activity reports of Tubbataha Reefs Natural Park – PA Management Office in connection with our CY 2023 Target Activities.

Please be informed that these activity reports serves as milestone/progress report for the activities under D.1 Protected Area Management and Development – Support to Asian Heritage Park Activities and D.3 Management of Coastal and Marine Resources – Water Quality Monitoring.

For information and record.


FELIZARDO B. CAYATOC



**DENR-PALAWAN
PENRO-RECORDS
RELEASED**
By: 
Date: 13 JUN 2023 CN 23-5152/23-1627



Tubbataha Management Office

Tubbataha Reefs Natural Park & World Heritage Site

02 June 2023

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

DENR PENRO
PALAWAN RECORDS
RECEIVED

BY: [Signature]
DATE: 06.06.2023 CN 23-5152

Dear PENRO Cayatoc,

We respectfully submit the following Activity Reports for the research and monitoring trips in the Tubbataha Reefs Natural Park for your perusal.

- Fish and Benthos Monitoring (24 April – 4 May 2023)
- Seabird Monitoring (7-12 May 2023)
- Water Quality Monitoring (13-14 May 2023)

We will furnish your office with a copy of the technical reports once available. Also attached here are the Passenger Manifests for the above trips for your reference.

Thank you.

Very truly yours,

[Signature]
ANGELIQUE M. SONGCO
PASu, TRNP

Manalo Extension, Bgy. Milagrosa, Puerto Princesa City, 5300 Palawan

Telefax: (048) 716-1631 / +639985521174/+639175530909 Email: tmo@tubbatahareefs.org



Annual Water Quality Monitoring Tubbataha Reefs Natural Park

13 - 14 May 2023

Annual water quality monitoring in the Tubbataha Reefs Natural Park (TRNP) is conducted to track the changes and trends in water quality and identify the possible sources and impacts of these changes. The results also feed towards evaluating the management effectiveness in the park. We systematically monitor water quality at twenty (20) sites inside and outside the park to understand the current state and track changes over time. This monitoring covers fourteen (14) key parameters, providing valuable insights to guide the responsible use of TRNP waters, including its effect on the overall health of the coral and fish population.



Figure 1. Team loading the equipment and supplies from M/Y Navorca to patrol boat for water sampling.

The Tubbataha Management Office (TMO) led this year's water sampling efforts in collaboration with the Palawan Council Sustainable Development Staff (PCSDS). The activity was conducted in conjunction with seabird monitoring. Prior to departure, TMO researchers reviewed sampling protocols with PCSDS to ensure compliance with established standards.

Our designated sampling sites include seven (7) locations in the South Atoll and nine (9) sites in the North Atoll. We also established two sampling sites in Jessie Beazley Reef and three in the buffer zone. GPS equipment was used to determine precise coordinates, ensuring consistency in sampling locations.



Figure 1. In situ collection of water parameters using the Horiba U50 and collection of water samples using grab sampling. Marine park rangers assisted TMO researchers in collecting water samples.



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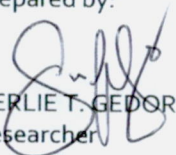


For *in-situ* analysis of surface water, we utilized the Horiba U50 multiparameter equipment, provided by the Department of Environment and Natural Resources (DENR) in July 2022. This equipment enabled us to collect important data on salinity, dissolved oxygen, pH, conductivity, temperature, total dissolved solids, and transparency. Simultaneously, water samples were collected from all designated sites using the grab sampling method, allowing for comprehensive laboratory analysis of other parameters such as nitrates, phosphates, total coliform, fecal coliform, and oil and grease. Preservatives (5ml hydrochloric acid) were added to samples for oil and grease analysis, to preserve the samples' integrity and minimize changes in their physical and chemical properties. The samples were carefully stored at low temperatures in insulated containers to maintain their quality.

Upon return to Puerto Princesa City, the water samples were brought to the PCSD Environmental Laboratory for analysis. The result of this monitoring will form part of the Ecosystem Research and Monitoring Report and will contribute to our comprehensive understanding of the overall water quality within TRNP.

This year's water quality monitoring was made possible through the financial support provided by the Department of Environment and Natural Resources, Metro Pacific Investment Foundation, and the Pilipinas Shell Foundation, Inc.

Prepared by:


GERLIE T. GEDORIA
Researcher

Noted by:


ANGELIQUE M. SONGCO
PASU, TRNP

ACTIVITY REPORT

Annual Seabird Monitoring Tubbataha Reefs Natural Park 7 - 12 May 2023

Tubbataha Reefs Natural Park is one of the country's few remaining rookeries for seabirds, underscoring the need to preserve its seabird population. Marine park rangers conduct regular seabird monitoring activities to assess the status of their population. They undertake comprehensive inventories every quarter and conduct monthly population estimates specifically focused on the two islets within the park, namely the Bird and South Islets.



Figure 1. The team conducted a pre-departure briefing onboard M/Y Navorca before leaving for Tubbataha. PASu Songco discussed the objectives, schedule, activities (including water quality), and the park rules and regulations. Photo by JC Gonzalez

During the second quarter monitoring in May, TRNP avifauna consultant and volunteer ornithologists participate in the seabird monitoring efforts of the marine park rangers. TMO also invited PASu Krystal Villanada and Chief Ranger Roberto Beringuela of the Apo Reef Natural Park, to foster knowledge exchange and experience sharing between the two Marine Protected Areas (MPAs). This year's seabird survey was conducted along with the water quality monitoring.



Figure 2. Left: Seabird team met with the rangers at the ranger station to discuss the activity and the tasks. Right: Seabird teams off to Bird Islet to conduct distance count. Two teams were on the patrol boat (gray boat) and another in the dinghy (white). Distance counts give an estimate of the number of seabirds in the islet. Photo by: JC Gonzalez

Following the methods established by Mr. Arne Jensen for the TMO back in 2004, the team employed distance count techniques from the boats, and conducted daytime counts of adult birds, sub-adults, juveniles, pulli, and eggs of the seven breeding species found in the park: Red-footed Booby (*Sula sula*), Brown Booby (*Sula leucogaster*), Masked Booby (*Sula dactylatra*), Great Crested Tern (*Thalasseus bergii*), Sooty Tern (*Onychoprion fuscata*), Brown Noddy (*Anous stolidus*), and Black Noddy (*Anous minutus worcesteri*). Other species observed during the survey were documented and photographed, whenever feasible.



Figure 3. Other activities include islet measurement (left), in-flight count (middle), and early morning count (right).
Photos by Gerlie Gedorla, Lisa Paguntalan, and Erickson Tabayag

In-flight counts were conducted between 4:30 and 6:30 in the afternoon for both Bird and South Islets to account for birds that had gone out to fish during the day. Two teams were assigned to count each species to ensure consistency with previous years' methods. Islet measurements and permanent photo documentation were also carried out to enable comparison with previous years. Additionally, ring bands of the Brown Booby were read to track the return of individual birds to the islet.

Bird Islet is a breeding ground for all seven species. This year, the Great Crested Tern exhibited the highest number of breeding adults. Black Noddies continued to utilize the artificial nesting structures constructed since 2017. However, a significant mortality rate was documented within these structures, primarily attributed to gaps and slits in the nesting structure due to degradation over time. It was suggested to explore alternative design options that could potentially mitigate the mortality rate of the Black Noddy. Meanwhile, following the recommendation of the avifauna consultant, the rangers experimented with placing nesting materials in the structures to mimic the nests and monitor their effectiveness.



Figure 4. Segundo Conales counts the nests and eggs of Black Noddy in one of the bamboo structures. Red-footed Booby (white bird), the larger competitor of the Black Noddy, occupies the top level of the structure. Photo by Gerlie Gedorla

TMO brought materials to construct protective boxes around the surviving saplings planted in 2020, to safeguard them against the Red-footed Booby. Ten beach forest saplings were also transported from Puerto Princesa and planted in Bird Islet.

The two previously tagged adult pairs of Masked Boobies were present throughout the survey. However, their fledging was not present on the islet. A few weeks before the survey, marine park rangers also reported the presence of a new and untagged Masked Booby on the islet. The new individual was not seen during the survey.

This year, six species were recorded breeding in South Islet: Black Noddy, Brown Noddy, Great Crested Tern, Sooty Tern, Red-footed Booby, and Brown Booby. The most notable population was of the Great Crested Tern, with approximately 8,000 breeding individuals, the highest among all the species. The transformation of this once-barren island into a highly suitable habitat for ground-breeding species is evident.



Figure 5. PASu Angelique Songco and PASu Krystal Villanada led the planting of saplings of beach forest trees. In 2020, around 300 saplings were planted in the islet but less than five (5) survived. Photo by: JC Gonzalez



Figure 6. Left: The team loads the equipment and materials from M/Y Navorca (big boat) to the patrol boat (gray boat). Right: Researchers count the eggs of the Great Crested Tern in the South islet. Photos by Gerlie Gedoria and Lisa Paguntalan

The following were also documented during the survey in Tubbataha: frigatebirds, egrets, whiskered terns, little terns, sandpipers, tattlers, and tropic birds.

The findings derived from this monitoring will serve as valuable inputs for assessing the park's management effectiveness and in formulating conservation strategies for this taxon. It will also be an integral part of the Ecosystem Research and Monitoring Report.



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Figure 7. This year's seabird monitoring team. Photos by Darius Cayanan and Godfrey Jakosalem

The success of this year's seabird and water quality monitoring was attributed to the generous financial support provided by the Department of Environment and Natural Resources, Metro Pacific Investment Foundation, and the Pilipinas Shell Foundation, Inc.

Prepared by:

GERLIE T. GEDORIA
Researcher

Noted by:

ANGELIQUE M. SONGCO
PASu, TRNP

ACTIVITY REPORT

Annual Fish and Benthos Monitoring Tubbataha Reefs Natural Park 24 April to 4 May 2023

The annual fish and benthos monitoring is one of the core activities in the park. This activity is conducted to determine reef health and gather scientific information for management decisions in Tubbataha. This year, TMO researchers were joined by researchers from the De La Salle University, University of the Philippines-Cebu, and WWF-Philippines. The five (5) monitoring sites, plus the two ship grounding sites (USS Guardian and Min Ping Yu) were revisited on 24 April to 4 May 2023.



Figure 1. Gears are set up and equipment are checked prior to the conduct of fish visual census. Here is a photo of the team loading their gears from MY Navorca to the dinghy, prior to a dive.

For the fish survey, the team followed the national standard of monitoring set by the DENR. The daytime Fish Visual Census (FVC) described by English *et al.* (1997) was employed to determine the attributes of the fish community such as biomass, density, and species richness. Data from this survey will provide the basis to determine fish abundance and biomass in Tubbataha.

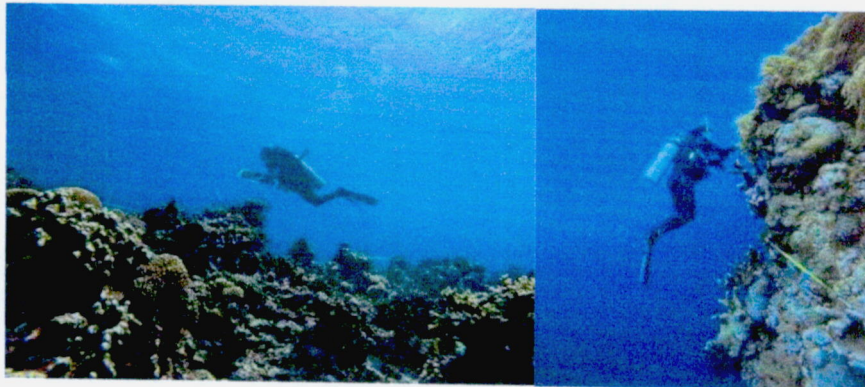


Figure 2. TMO researcher Gerlie Gedoria (left) and Dr. Hazel Arceo - University of the Philippines - Cebu (right) conducts Fish Visual Census at the shallow and deep areas.

The photo-transect method was employed for the reef benthos monitoring to determine the diversity and status of corals in the reefs. This method was set by the DENR as a national standard for coral reef monitoring and is widely used in many reefs in the Philippines. Turf algae height was also assessed in the shallow areas. The presence of turf algae in an area is an indicator of a possible disturbance to the reef.

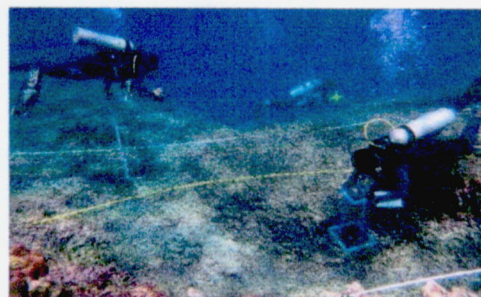


Figure 2. TMO, WWF and DLSU researchers simultaneously collect data on reef benthic cover, coral recruitment, and turf algae height in Delsan Wreck.



Figure 1. Volunteer diver Alexander Austria performed the randomized sampling for the turf algae along the transects (left). Joan Pecson – WWF researcher carefully taking photos of the quadrat for coral recruitment at the grounding site (right).

Meanwhile, data collected from the coral recruitment at both depths provide insight into the reef's ability to replenish its coral populations. A permanent quadrat was established in Station 5B to provide insights into how corals in the area respond to nutrient discharges from the South Atoll lagoon. The team revisited the permanent quadrats of the *Terpios* area in Site 3 and in front of Ranger Station, and the corallimorphs in Jessie Beazley, Station B. A new quadrat in Jessie Beazley Station A was established to monitor the growth of *Montipora* corals that were possibly damaged by dynamite fishing and typhoons in the past years.



Figure 4. Coral colonies (encircled) observed thriving with *Terpios* sponge in Station 3B (left). Princess Mordeno of DLSU takes photos of corallimorphs in the permanent quadrat in Jessie Beazley Station B (right).

Establishing permanent quadrats is essential to determine the growth rate of corals and other species thriving within the fixed plot and provide a basis for detecting changes through time. *Terpios hoshinota* or the coral-killing sponge is still present in Station 3B, adjacent to the monitoring station. This year, we observed that the branching *Hydnopora*, *Pocillopora* and *Acropora* competes with *Terpios* sponge in the area.

No major disturbances were observed in most stations, except in Jessie Beazley A, where a small portion of the reef was damaged due to possible dynamite fishing in 2021. This year, thick colonies of soft corals and smaller colonies of *Porites*, *Pocillopora*, and *Acropora* corals were observed thriving in the area, which could be related to a possible sign of recovery from the disturbances.

This year's annual fish and benthos monitoring was made possible through financial support from the Department of Environment and Natural Resources, Metro Pacific Investment Foundation, and the Pilipinas Shell Foundation, Inc.

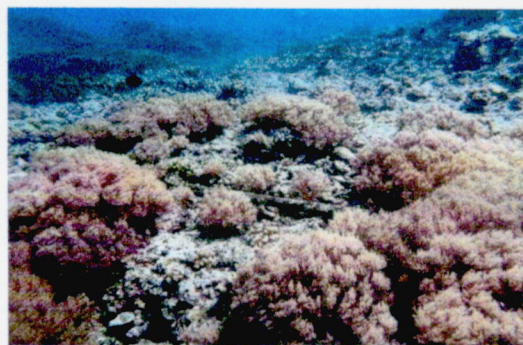


Figure 5. Small colonies of hard and soft corals thrive in the possibly blasted area in Jessie Beazley Station A.

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Noted by:


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