Tubbataha Reefs Natural Park

Management Effectiveness Assessment Report

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Contents

Background and Introduction

The Project, "Development of a Network of Protected Areas to Safeguard Marine Turtles and their Habitats in the SSME Focusing on Connectivity and Climate Change" is among the components of the larger BMU-GIZ funded Project entitled, "Support to the Implementation of the Tri-National Sulu-Sulawesi Marine Ecoregion Comprehensive Action Plan". The BMU-GIZ SSME Project is anchored to the Memorandum of Understanding (MOU) between Indonesia, Malaysia and Philippines for the adoption of the SSME Ecoregion Conservation Plan (ECP) signed in 2004.

The BMU-GIZ SSME Project has two over-arching Outcomes:

1. Outcome 1 - Adjacent countries of the SSME develop, adopt, implement and monitor climate-smart spatial development plans that explicitly incorporate mitigation approaches as well as ecosystem-based adaptation to climate change, and learn through their joint implementation (Tri-national level); and

2. Outcome 2 - Adjacent countries of SSME coordinate more effectively their action within the framework of the SSME CAP and jointly implement selected bilateral or tri-national projects on:

   2.1 Sustainable Fisheries and Enhancement of Livelihoods;

   2.2 Protection of Threatened, Migratory and Charismatic Species; and

   2.3 MPA and MPA Networks.

In the Philippines, the implementation of Outcome 2 is divided into two components:

1. "Design and Implementation of an Ecosystem Approach to Fisheries Management (EAFM) Regime for Selected Marine-Managed Areas (MMAs) in the SSME" to be implemented by the Bureau of Fisheries and Aquatic Resources; and

2. "Development of a Network of Marine Protected Areas to Safeguard Marine Turtles and their Habitats in the SSME Focusing on Connectivity and Climate Change" to be implemented by the DENR-PAWB.[1]

The following are the expected outputs under the Network of MPAs Project component:

1. Preparation of necessary instruments for the Balabac Marine Conservation Area that will facilitate operationalization of the ST-MPAN;

2. Policy analysis and recommendations for operationalizing tri-national ST-MPAn in the SSME including establishment of a coordinating mechanism;

3. Basic M&E protocol for transboundary MPAs/Ns developed and implemented;

4. Ecosystem Based - Climate Change Adaptation Plan developed and incorporated in the TIWS management plan based on vulnerability assessment studies;

[1] For purposes of this report, this network of MPAs in the Philippines will be referred to as the Sea Turtle MPA Network for the Philippines or "ST-MPAN Philippines". In referring to the broader tri-national Sea Turtle MPA Network, I use only the acronym "ST-MPAN".

5. Enforcement Strategy for the ST-MPAN developed and implemented to facilitate effective communication and coordination between and among member MPAs within the ST-MPAN; and

6. Sea Turtle population studies (i.e. tagging, genetics and laparoscopy) conducted and climate parameters gathered to strengthen conservation efforts in the ST-MPAN.

Although the focal species of the ST-MPAN are sea turtles, successful conservation requires management of its habitats and associated ecosystems at appropriate spatial and temporal scales. In order to evaluate the management effectiveness of the component sites of the ST-MPAN for the Philippines (i.e., Turtle Islands Wildlife Sanctuary, El Nido Taytay Managed Protected Resource Area, Tubbataha Reefs Natural Park, and the Balabac Islands mKBA corridor), management effectiveness assessment workshops were conducted in the three NIPAS sites using existing tools, particularly the WB/GEF Management Effectiveness Tracking Tool (METT) and the Marine Protected Area Management Effectiveness Assessment Tool (MPA MEAT).

This report summarizes the results of the management effectiveness assessment for Tubbataha Reefs Natural Park conducted last July 2014.

Tubbataha Reefs Natural Park

The TRNP is a 97,030-hectare marine protected area located some 80 nautical miles southeast of Puerto Princesa City in Palawan. It has two uninhabited atolls (i.e., North and South Islet) with abundant marine life. It was initially declared as the Tubbataha Reef National Marine Park under the NIPAS through Presidential Proclamation No. 306 in August 11, 1998. It covered a total area of 33,200 hectares then. In 2006, the Park was expanded to cover the adjacent Jessie Beazley Reef through Presidential Proclamation 1126 and was renamed Tubbataha Reefs Natural Park. In 2010, the TRNP Act of 2009 or Republic Act 10067 was enacted. This provided for the establishment of an additional 10-nautical mile buffer zone from the Park's boundaries and provided more stringent sanctions and penalties for violation of statutes.

Figure 1. Map of TRNP (source: http://tubbatahareef.org/wordpress/wp-content/uploads/2012/10/Tubbataha-Map-2014-lowres.jpg).

Because of its highly diverse marine life, the TRNP gained international recognition. It is the country's only marine protected area inscribed in the UNESCO World Heritage List which was awarded in 1993. It is also considered as a one of the model MPAs of the Coral Triangle Initiative. TRNP harbors at least 360 species of corals, seven species of seagrass, 66 species of algae, over 600 species of fish, two species of marine turtles (Hawksbill and Green sea turtles), and 13 species of marine mammals, 19 species of rays and sharks. Notable bird species include an endemic sub-species of Black Noddy *Anous minutus worcestri* and the critically endangered Christmas Island Frigate.

The vision for the TRNP is:

"A World Heritage Site that is effectively conserved to maintain ecological integrity contributing to the equitable distribution of benefits and sustained socio-economic development of present and future generations."

Methodology

Two commonly-used management effectiveness assessment tools for protected areas in the Philippines were applied to evaluate the performance of TRNP. The first tool is called the Management Effectiveness Tracking Tool or METT developed by WWF for World Bank and GEF. It is an internationally-accepted tool that has been applied to and adopted for hundreds of protected areas around the world. The DENR currently uses it as the main tool for tracking progress of protected areas under the NIPAS. The other tool used is the Marine Protected Area Management Effectiveness Assessment Tool or MPA MEAT. This was developed by various NGOs, government agencies, and academic institutions under the MPA Support Network based on the Philippine experience in MPA management. Since the TRNP is primarily a marine protected area, the MPA MEAT was used previously by Conservation International (Dizon et al. 2013). It was re-used again for this year's assessment to allow comparison with the 2011 assessment.

Conservation International – Philippines conducted management effectiveness assessment of the TRNP in 2011 (Dizon et al. 2013). The results from this 2011 evaluation are summarized in this report for comparison with the current management effectiveness evaluation. They only used the MPA MEAT in their evaluation of TRNP.

Conduct of METT

A workshop was convened with PAMB members, representatives, observers, and the secretariat on July 28, 2014. A total of 17 participants attended the meeting. During the meeting, I facilitated the use of the METT form. Each of the participants was given one copy of the METT form to fill out. Each participant filled out the METT form sequentially while I discuss and explain each threat and issue in the form. This helped ensure that participants have the same understanding on the threats, issues, and criteria or choices per issue. The METT forms were then collated. I encoded the forms after the workshop and summarized the results using MS Excel (see Annex).

For each threat item, the number of responses per rating (i.e., Low, Medium, High, No Data, and Not Applicable) was counted. Each threat was assigned a classification whether the threat item was scored by more than 50% of the respondents or not (i.e., versus the number of respondents who either ticked "No Data" or "Not applicable"). Only the threats which were scored by more than 50% of the respondents were considered for the ranking. The threat list was then ranked based on the number of respondents that rated the threats as "high" this ranked list represented a priority list of threats for the PA.

Invalid forms were removed from the analysis. Some of the respondents were not able to follow the instructions and scored all METT criteria (i.e., 0, 1, 2, and 3) instead of just choosing one score per issue. The average score for each METT issue was calculated and then rounded off to the nearest unit same as what has been done in the 2011 evaluation of Conservation International. The rounded average ratings per issue were then added up to get the total score for METT for TRNP for 2014. This was divided by the total maximum score of 105 points to get the percentage rating which was then compared to the 2011 METT rating.

Conduct of MPA MEAT

After the participants filled out the METT form, the MPA MEAT form was filled out next in plenary. Instead of filling out a blank form, we used the MPA MEAT form from the 2011 evaluation which was in PDF format. The scores and remarks from the 2011 evaluation are still encoded in the PDF form. The task was simply to check the scores and remarks for each question in the MEAT form, validate, and/or update if there were changes since then (regardless of whether the score changed or not). The result was a 2014 version of the MPA MEAT for TRNP using the PDF form which builds on the 2011 evaluation. All remarks for the 2011 evaluation were kept in the 2014 form and updated as applicable.

Results

Review of previous MPA MEAT results

Data from the 2011 evaluation of TRNP gave the PA an effectiveness rating of 96% using the MPA MEAT (Figure 2; Dizon et al. 2013). It achieved a Level 3 or "Sustained" management effectiveness level. Compared to the other NIPAS seascapes evaluated by Dizon and colleagues (2013), the TRNP had the highest MPA MEAT results. It was three points shy of the perfect score. The only threshold question that was not met by TRNP was the one on sustainable financing. Although TRNP generates income from user fees, the PAMB believes that it still relies greatly on external funding sources to effectively manage the Park.

Name of MPA	MEAT Result		METT Result
	Level	Percentage Accomplishment	
MOBMR	Level 0	20%	37%
PIPLS	Level 0	31%	50%
ALLPLS	Level 0	31%	33%
PBPLS	Level I	79%	48%
TIWS	Level I	57%	No data yet
ENMRPA	Level I	57%	50%
SBPS	Level 2	64%	27%
ARNP	Level 2	88%	47%
TRNP	Level 3	96%	No data yet

Figure 2. MPA MEAT rating for Tubbataha Reefs Natural Park (Dizon et al. 2013).

METT and MEAT respondents

There were a total of 17 respondents for the METT assessment of TRNP (Table 1). Three (3) are official PAMB members while five (5) regularly represent other PAMB members during meetings. The rest are part of the Tubbataha Management Office or TMO.

Table 1. METT assessors for TRNP METT assessment conducted in 2014.

No.	Name	Designation	PAMB membership[1]
1	Angelique Songco	PASu	S
2	Clofe B. Favila	TPAMB Regular Rep LGU Cagayancillo	R
3	Conales Segundo Jr F	(blank)	-
4	Emmanuel F. Garcia	TPAMB Regular Rep Rep. Filanz Alvarez, 1st District, Palawan	R
5	ENS Michelle Angello A. Crisostomo	Philippine Navy/WESCOM/ Representative	R
6	Gerlie Gedoria	Admin Asst., Tubbataha Management Office	S
7	Glenda G. Simon	(blank)	-
8	Jeanne Tabangay	Conservation International representing Enrique Nunez (since 2003)	R
9	Jeffrey M. David	MPR, Tubbataha Management Office	S
10	Jehu P. Cayaon	TPAMP Member	M
11	Jenny Malgate	Tubbataha Management Office	S
12	Jeric Francisco Dejucos	Tubbataha Management Office	S
13	Ma. Elena A. Basaya	Provincial Fishery Office, BFAR 4B	M
14	Maria Retchie Pagliawan	Tubbataha Management Office	S
15	Marivel Dygico	WWF Phils Official TPAMB alternate rep of Lory Tan	R
16	Mary Grace D. Barber	Tubbataha Management Office	S
17	Salvador G. Rama	Envi. Prov. Board	M

[1] M= PAMB member; R = PAMB member representative; S = Secretariat

METT results

Threats

The top five highest threats to TRNP perceived by the METT assessors were: (1) nearby areas being used as shipping lane; (2) erosion or sediment shifting in the islets; (3) accumulation of solid wastes brought by the monsoons; (5) storm damage to reefs; and (5) extreme temperatures resulting to coral bleaching (Table 2).

Anthropogenic threats to the Park include the shipping lanes and accumulation of solid waste. The nearby waters of Tubbataha are used as shipping lanes. There have been previous incidences of ship groundings which resulted in severe damage to portions of the Park's reefs. Fortunately, these groundings did not result to significant oil spills but if such an event happens, the result could be devastating to the Park's marine and bird life. Ocean currents deposit and accumulate solid wastes (e.g., plastics, cans, etc.) along the beaches in the Park. The park rangers have to clean up often and the collected trash shipped out to mainland Palawan.

Natural threats to the Park include erosion and sediment shifting, storms, and extreme sea surface temperatures. Park rangers and managers have observed beach erosion and shifting of beach material brought about by currents, waves, and tides. Records show that the Bird Islet has been shrinking since the 1911. Further reduction in beach material could be detrimental to sea turtles nesting on the Park's beaches. Birds would also be affected by beach changes. Storms and extreme sea surface temperatures also threaten the integrity of coral reefs through mechanical damage and coral bleaching.

Table 2. Top twelve (12) threats to TRNP based on the METT.

Threats	L	M	H
1. Shipping lanes and canals	0	0	17
2. Erosion and siltation/ deposition (e.g. shoreline or riverbed changes)	0	1	16
3. Garbage and solid waste	1	1	14
4. Storms and flooding	0	2	11
5. Temperature extremes	5	1	6
6. Habitat shifting and alteration	6	5	1
7. Fishing, killing and harvesting aquatic resources	16	0	0
8. Recreational activities and tourism	14	0	0
9. Research, education and other work-related activities in protected areas	17	0	0
10.Activities of protected area managers (e.g. construction or vehicle use, artificial watering points and dams)	17	0	0
11. Isolation from other natural habitat (e.g. deforestation, dams without effective aquatic wildlife passages)	11	0	0
12. Sewage and waste water from protected area facilities (e.g. toilets, hotels etc)	16	0	0

Effectiveness rating scores

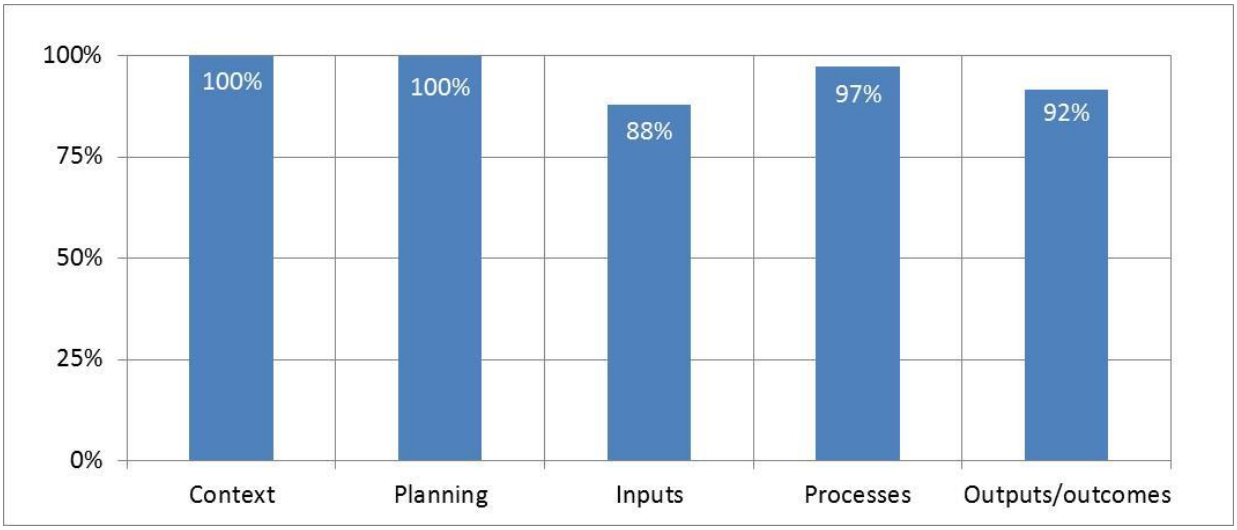

Figure 3. Percentage scores per IUCN-WCPA Element based on the METT response of TRNP PAMB members for 2014.

The Tubbataha Reefs Natural Park got a total METT score of 97 out of 103 maximum points or 95%. It got a perfect rating for Context and Planning. The Inputs element scored the lowest at 88% of maximum attainable points. Compared to all the NIPAS areas that have been evaluated using the METT (e.g., GIZ PAME-PH Project), the TRNP is the protected area under NIPAS with the highest METT rating. It should be emphasized that TRNP uses a more comprehensive effectiveness evaluation tool based on Pomeroy and colleagues (2004) "How is your MPA Doing?" (Dygico et al. 2013). However, METT applied to TRNP is still very useful for the ST-MPAN as it allows for comparability of management effectiveness rating across three of the four the Philippine sites in the network. Being one of the best managed protected areas in the country, the use of METT and MPA MEAT to TRNP also becomes a test of the limits and limitations of the tools for evaluating high effectiveness (i.e., if the tool has a low or high enough ceiling to be useful even for the most mature protected area management systems).

Context

As mentioned in the introduction, the TRNP has already completed all the steps in the NIPAS Act and is one of the few protected areas under the system to attain congressional action through a Republic Act (i.e., RA 10067 in 2009). With this, it has already achieved the highest score for this IUCN-WCPA element.

Planning

TRNP has an approved 10-year Management Plan (2011 to 2021). The plan was developed in consultation with various stakeholders using available scientific and monitoring information. The Park also has an operations and enforcement manual. The objectives are clearly presented in the management plan. In addition, specific outcomes are also identified in the plan. The design of the Park was further improved by increasing the original area three times, incorporating adjacent Jessie Beazley reef, and including a 10 nautical mile buffer area around the park.

Park regulations are implemented fully in the TRNP. Annual work and financial plans are prepared and approved by the PAMB. Recently, a buffer zone management plan has been developed by stakeholders for the Park to ensure increased protection of the core zone, particularly from further ship groundings.

Inputs and Processes: Financing

Current budget of the Park has been sufficient so far for most of the PA operations. PAMB members noted, however, that it could still be improved in terms of security. At present, 54% of the annual budget is sourced from conservation fees paid by the visitors (Figure 4). TRNP still relies significantly on external support to fully implement its management plan. Grants from NGOs and the private sector account for a third of the TRNP budget. From 2007 to 2011, the Provincial Government of Palawan has contributed 14% of the total budget of TRNP for that period. They were primarily used for personnel salaries, fuel, and purchase and maintenance of enforcement equipment.

Budget management of the Park is excellent. Transparency in the use of funds is ensured through regular annual reporting and shared to the public online via their website (http://tubbatahareef.org/). TRNP funds are deposited in the TRNP Trust Fund which is administered by the Tubbataha Management Office.

Seventy-two percent (72%) of the budget received by TMO from 2007 to 2011 was used for salaries and benefits of personnel and for field operations (Figure 4). Aside from direct financial support, TRNP also receives in-kind assistance from NGOs and private partners. Most researches and conservation awareness activities are conducted by NGOs and private partners using their own funds.

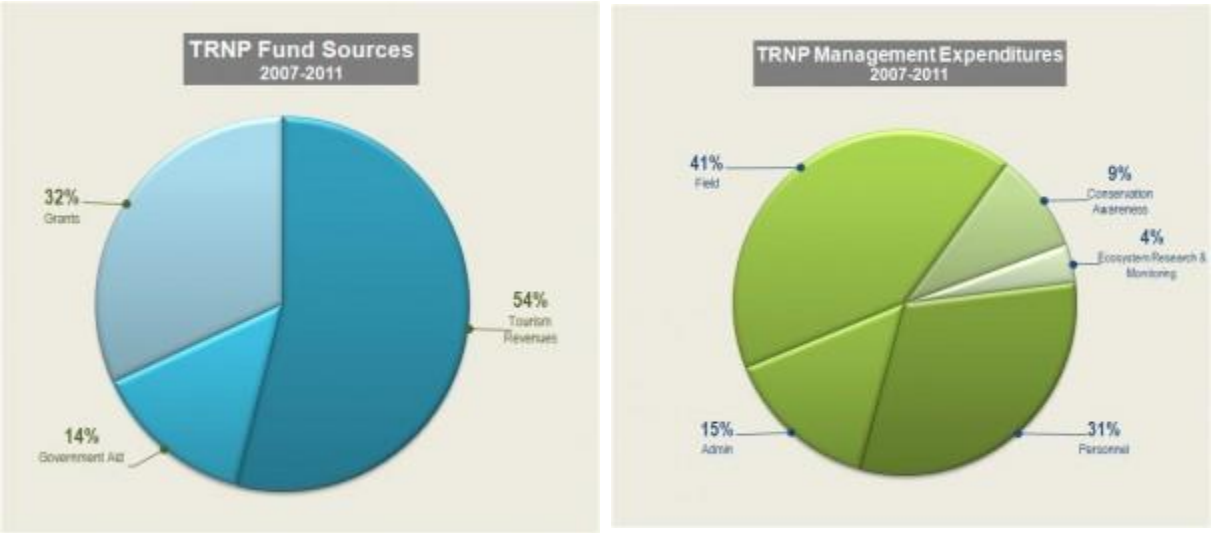

Figure 4. Fund sources and expenditures for TRNP from 2007-2011. (source: http://tubbatahareef.org/wordpress/?s=budget&submit=Search)

Inputs and Processes: Enforcement

The TRNP is managed by the Tubbataha Management Office (TMO) which employs 12 full time staff. Among these 12 staff, four are deputized Marine Park Rangers. The TMO is based in Puerto Princesa City. It serves as the TPAMB's executive arm, carrying out day-to-day park administration.

The Park itself is guarded 24/7 by armed rangers forming a composite team from the Philippine Navy, Philippine Coast Guard, Municipality of Cagayancillo, and the TMO. Rangers are required to take the "Comprehensive Training for Marine Park Rangers" to train them on law enforcement and also enhance their understanding of the conservation efforts of the Park. Although conduct of patrols and apprehension of violators are their primary concerns, they are also involved in research and monitoring, briefing visitors, conducting clean-ups along the shore and underwater, and reporting and responding to unusual incidents like crown-of-thorns (*Acanthaster plancii*) infestation.

Aside from the TMO in Puerto Princesa City, TRNP also has a ranger station on the southernmost tip of the North Atoll. The rangers are stationed in TRNP on two-month rotations all year round, and are equipped with two patrol boats, a utility boat, radar, radio communications, geo-positioning system (GPS) units, and basic research equipment.[2] The TMO has a plan for building a modern, Php 50-million ranger station to replace the current station. Funds are being solicited to initiate the project. The new station will feature solar panels to help augment electricity in the station and ensure continuous operation of the radar. It will also have a helipad for quick evacuations, if needed.

Active resource management is also being conducted in the Park. The invasive Ipil-Ipil trees in Bird Islet planted there by previous fishers for shelter and source of wood were cut down by the rangers to increase the area available for birds. Appropriate trees are now being planted in the area to replace the invasive Ipil-Ipil trees.

[2] Source: Tubbataha website (http://tubbatahareef.org/wordpress/?p=256)

Inputs and processes: Knowledge management

Being one of the few, relatively pristine, coral reefs left in the country, various resource assessments and researches have been conducted in TRNP. Research and assessment reports are archived by the TRNP and shared at their website (http://tubbatahareef.org/wordpress/?p=267). Monitoring and assessment is regularly conducted for coral reefs around TRNP. Monitoring stations have been set-up and academic institutions and scientists have been helping out the TMO in conducting scientific monitoring of reef conditions. In order to further enhance the capacity of TMO staff in reef surveys, three research staff and two marine park rangers were sent to participate in the Coral Reef Visualization and Assessment Training held in El Nido, Palawan in June 2014.

Processes: IEC and Stakeholder Relations

The PA has an education and awareness program which is implemented through the local government of Cagayancillo and partner NGOs and private sector. Residents of the Municipality of Cagayancillo are represented in the TPAMB by their Mayor and barangay officials. Since some of the officials of Cagayancillo live in Puerto Princesa City, they are often able to attend and actively participate in TPAMB meetings. The Municipality of Cagayancillo also gets a 10% share from the conservation fees collected for TRNP. This fund is often used for education programs and livelihood development in Cagayancillo. One PAMB member, however, noted that although the local government of Cagayancillo is represented in the TPAMB and actively participates, the people of Cagayancillo feel detached from the TRNP. Education and awareness activities are conducted according to an approved plan but these can be further improved to reach a greater mass base, especially in Cagayancillo.

Output and Outcomes

Local communities benefit directly and indirectly from effective management of TRNP. As mentioned, Cagayancillo receives 10% of the total conservation fees collected by the TMO. Indirectly, however, hydrodynamic simulations and fish egg and larval collections conducted by the University of the Philippines' Marine Science Institute and the UP Visayas show that adjacent reef areas in Cagayancillo, western Visayas, and Eastern Palawan benefit from the larvae exported from the TRNP. This means that fishing grounds outside TRNP receive substantial supply of fish recruits and helps sustain fish populations in these fishing grounds. This impact and benefit, however, have yet to be quantified through a properly designed research and assessment.

MPA MEAT results

The total MPA MEAT rating for TRNP in 2014 did not change compared to that of 2011 (Dizon et al. 2013) (Table 3). It remains at a 96% or a score of 81 out of 84 points. The TPAMB members still believe that they have not yet achieved financial sustainability despite the regular collection of conservation fees and its substantial contribution to the Park's budget. As mentioned in the METT section previously, a third of the budget of the Park still comes from grants and other external sources which are not sustainable.

However, there were still major changes that have happened in the TRNP management since 2011. Although these changes no longer affected the MPA MEAT scores for TRNP, they are recorded in the remarks section of the form and will be updated if and when the MPA MEAT is used again. The changes noted in the remarks section between the 2011 and 2014 MPA MEAT forms are:

- Updating of the Management Plan due on 2014. Although the TRNP Management Plan is valid until 2021, the TPAMB will still conduct a mid-program review to incorporate recent changes and developments into the plan (e.g., development of a Buffer Zone Management Plan).
- Procedural guidelines for enforcement prepared in 2011 have already been included in the TRNP Enforcement Plan in 2013.
- No more violations were observed and reported from 2011 to 2013 other than the two ship groundings in 2013.
- Information, Education, and Communications Plan recently updated in 2014.
- Additional external financial support external support obtained from GIZ, DENR, UNESCO, and the Provincial Government of Palawan from 2011 to 2014.
- Management effectiveness evaluation using the "How is your MPA doing?" framework (Pomeroy et al. 2004) is due for completion on September 2014. The last evaluation was done in 2010.
- Regular participatory monitoring of sea birds and marine life have been continued and is now on its 17th year.
- Socioeconomic monitoring is programmed for 2014.
- The TRNP is part of the Sea Turtle Marine Protected Area Network or ST-MPAN which the DENR, with assistance from GIZ, is helping establish.

Table 3. Summary of METT scores per level (2011 vs. 2014).

MPA LEVEL	MANAGEMENT STATUS			Remarks to 2014 assessment
	Maximum Points	*Actual Score (2011)*	*Actual Score (2014)*	
1 (Established)	27	**27** (100%)	**27** (100%)	**PASSED**
2 (Strengthened)	15	**15** (73%)	**15** (73%)	**PASSED**
3 (Sustained)	21	**21** (38%)	**21** (38%)	**PASSED**
4 (Institutionalised)	21	**18** (10%)	**18** (10%)	Failed to meet threshold: **4.1.7** MPA financially self-sustaining
TOTAL	**84**	**81 (96%)**	**81 (96%)**	

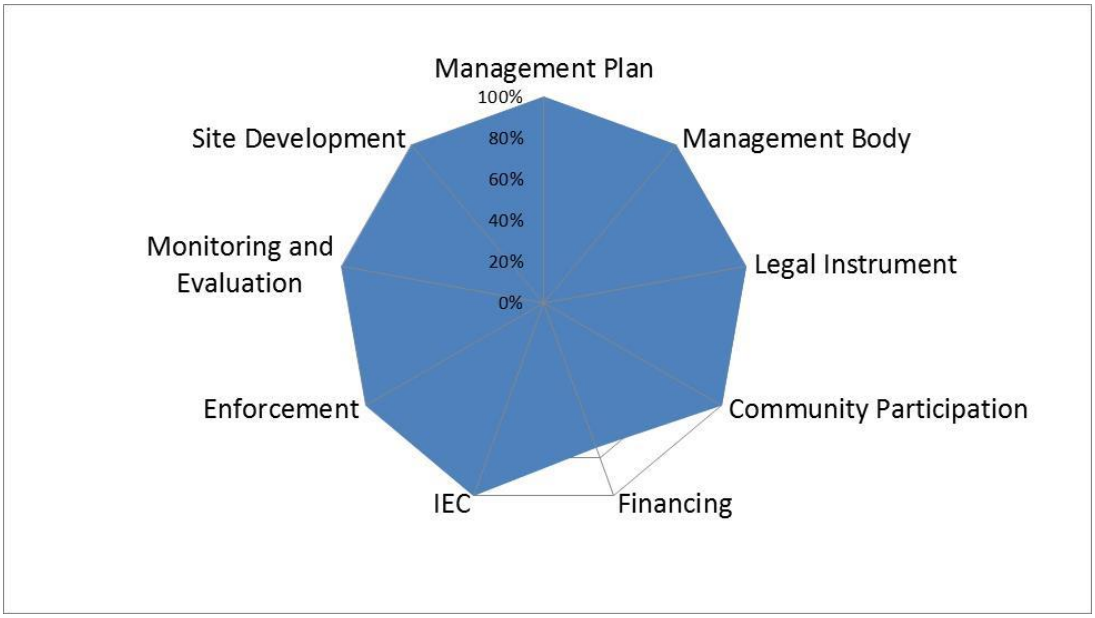

Figure 5. Status of management effectiveness of TRNP vis-a-vis different MPA management foci based on the MPA MEAT (2014).

Summary and Recommendations

As noted by Dygico and colleagues (2013), the TRNP is efficiently and effectively managed by the TMO and TPAMB despite the limited resources with which they operate to protect the 97,030 hectares of marine area. With a score of 95% and 96% in the METT and MPA MEAT, respectively, the Park is undoubtedly one of the most effectively managed protected areas in the country. After significantly reduced anthropogenic threats, the TMO is now able to plan and respond better to much more difficult natural threats such as storm and typhoon damage, erosion and sediment shifting, and sea surface temperature extremes.

The following recommendations came out of the discussion after filling out the evaluation of TRNP using the METT and MPA MEAT:

1. Although the proposed organization chart for TMO and TPAMB has been completely filled out, PAMB members noted that this is still not enough to effectively monitor and the Park and eliminate anthropogenic threats. A staff management planning is needed for the increasing responsibilities of the Park staff. Also, DENR should provide competency standards for PA staff to allow the Park to properly evaluate the skills and knowledge of its staff vis-à-vis their role in the TMO.
2. Continue lobbying for the designation of the Sulu Sea as a Particularly Sensitive Sealane Area to prevent future ship groundings. Increasing the available electricity to the ranger station is also needed to allow for continuous use of the radar system and track passing vessels.
3. Forge long-term partnerships with private sector partners to augment the budget sourced from conservation fees and increase budget security.
4. Continue assisting Cagayancillo residents in appropriate and strategic use of their allocated 10% from the conservation fees. Encourage NGOs and private partners to assist the municipality and its residents to further increase their awareness of the TRNP and compliance to rules and regulations. Cagayancillo can become part of live-aboard tours if it has appropriate facilities.

References

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Annexes:

Threat rating from METT

Threats	L	M	H	ND	N/A	>50% response
1. Residential and commercial development within a protected area						
1.1 Housing and settlement	0	0	0	0	0	no
1.2 Commercial and industrial areas	0	0	0	0	0	no
1.3 Tourism and recreation infrastructure	1	0	0	0	0	no
2. Agriculture and aquaculture within a protected area						
2.1 Annual and perennial non-timber crop cultivation	0	0	0	0	0	no
2.1a Illegal drug cultivation	0	0	0	0	0	no
2.1b Utilization of portions of PA to upland vegetable & other agricultural/plantation crop farms (pollutive inputs, e.g. insecticides, pesticides)	0	0	0	0	0	no
2.2 Wood and pulp plantations	0	0	0	0	0	no
2.3 Livestock farming and grazing	0	0	0	0	0	no
2.4 Marine and freshwater aquaculture	0	0	0	0	0	no
3. Energy production and mining within or outside a protected area						
3.1 Oil and gas drilling	0	0	0	0	0	no
3.2 Mining/quarrying	0	0	0	0	0	no
3.3 Energy generation, including from hydropower dams	0	0	0	0	0	no
3.4 Treasure Hunting/ship wreck recovery	0	0	0	0	0	no
4. Transportation and service corridors within a protected area						
4.1 Roads and railroads, include road-kill	0	0	0	0	0	no
4.2 Utility and service lines (e.g. electricity cables, telephone lines	0	0	0	0	0	no
4.3 Shipping lanes and canals	0	0	17	0	0	yes
4.4 Flight paths	0	0	0	0	0	no
5. Biological resource use and harm within a protected area						
5.1 Hunting, killing and collecting terrestrial animals (including killing of animals as a result of human/wildlife conflict)	0	0	0	0	0	no
5.2 Gathering terrestrial plants or plant products (non-timber)	0	0	0	0	0	no
5.3 Logging and wood harvesting	0	0	0	0	0	no
5.4 Fishing, killing and harvesting aquatic resources	16	0	0	0	0	yes
5.5. Trawling, blast and poison fishing	0	0	0	0	0	no
6. Human intrusions and disturbance within a protected area						
6.1 Recreational activities and tourism	14	0	0	0	0	yes
6.2 War, civil unrest and military exercises	0	0	0	0	0	no
6.3 Research, education and other work-related activities in protected areas	17	0	0	0	0	yes
6.4 Activities of protected area managers (e.g. construction or vehicle use, artificial watering points and dams)	17	0	0	0	0	yes
6.5 Deliberate vandalism, destructive activities or threats to protected area staff and visitors	5	0	0	0	0	no
7. Natural system modifications						
7.1 Fire including arson	0	0	0	0	0	no
7.2 Dams, hydrological modification and water management/use	0	0	0	0	0	no
7.3a Increased fragmentation within protected area	0	0	0	0	0	no
7.3b Isolation from other natural habitat (e.g. deforestation, dams without effective aquatic wildlife passages)	11	0	0	0	0	yes
7.3c Other 'edge effects' on park values	1	0	0	0	0	no
7.3d Loss of keystone species (e.g. top predators, pollinators etc)	1	1	0	0	0	no
8. Invasive and other problematic species and genes						
8.1 Invasive non-native/alien plants (weeds)	2	0	0	0	0	no
8.1a Invasive non-native/alien animals	7	0	0	0	0	no
8.1b Pathogens (non-native or native but creating new/increased	2	0	0	0	0	no

Threats	L	M	H	ND	N/A	>50% response
problems)						
8.2 Introduced genetic material (e.g. genetically modified organisms)	1	0	0	0	0	no
9. Pollution entering or generated within protected area						
9.1 Household sewage and urban waste water	3	0	0	0	0	no
9.1a Sewage and waste water from protected area facilities (e.g. toilets, hotels etc)	16	0	0	0	0	yes
9.2 Industrial, mining and military effluents and discharges (e.g. poor water quality discharge from dams, e.g. unnatural temperatures, de-oxygenated, other pollution)	0	0	0	0	0	no
9.3 Agricultural and forestry effluents (e.g. excess fertilizers or pesticides)	0	0	0	0	0	no
9.4 Garbage and solid waste	1	1	14	0	0	yes
9.5 Air-borne pollutants	0	0	0	0	0	no
9.6 Excess energy (e.g. heat pollution, lights etc)	1	0	0	0	0	no
10. Geological events						
10.1 Volcanoes	0	0	0	0	0	no
10.2 Earthquakes/Tsunamis	0	0	0	0	0	no
10.3 Avalanches/ Landslides	0	0	0	0	0	no
10.4 Erosion and siltation/ deposition (e.g. shoreline or riverbed changes)	0	1	16	0	0	yes
11. Climate change and severe weather						
11.1 Habitat shifting and alteration	6	5	1	0	0	yes
11.2 Droughts	1	1	2	0	0	no
11.3 Temperature extremes	5	1	6	0	0	yes
11.4 Storms and flooding	0	2	11	0	0	yes
12. Specific cultural and social threats						
12.1 Loss of cultural links, traditional knowledge and/or management practices	3	1	0	0	0	no
12.2 Natural deterioration of important cultural site values	1	0	0	0	0	no
12.3 Destruction of cultural heritage buildings, gardens, sites etc.	0	0	0	0	0	no
12.4 Effect of Influence groups on IP values and freedom to decide	0	0	1	0	0	no
12.5 Loss of support to communities and projects due to changes in political leadership	2	0	0	0	0	no

Raw data matrix

Question No.	Issue	Elements	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Rounded Avg Score
1	Legal status	**Context**	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2	PA regulations	**Planning**	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	3	3	3
3	Law Enforcement Capacity	**Input**	3	3	3	3	3	3	2	2	3	3	3	3	2	3	2	2	2	3
4	PA Objectives	**Planning**	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5	PA Design	**Planning**	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3
6	PA Boundary demarcation	**Process**	3	2	3	2	3	3	3	3	3	3	3	3	3	3	3	2	3	3
7	Management Plan	**Planning**	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
7a	- stakeholder involvement	**Planning**	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7b	- established review process	**Planning**	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7c	- Monitoring input in planning	**Planning**	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7d	- Operations manual	**Planning**	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7e	- Enforcement manual	**Planning**	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	Regular Work Plan	**Planning**	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3
9	Resource Inventory	**Input**	3	3	3	3	3	3	2	3	3	3	3	2	2	2	3	2	3	3
10	Protection System	**Process**	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3
11	Research	**Process**	3	3	3	3	3	3	2	3	3	3	3	2	3	3	3	3	3	3
12	Resource Management	**Process**	3	3	3	3	3	3	2	3	3	2	3	2	3	2	2	3	3	3
13	Staff numbers	**Input**	3	3	2	3	3	3	3	2	3	3	3	2	3	3	2	2	3	3
14	Staff training	**Input**	2	3	2	3	3	3	2	2	2	3	3	2	2	2	2	2	3	2
15	Current budget	**Input**	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
16	Security of budget	**Input**	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	3	1
17	Management of budget	**Process**	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18	Equipment	**Input**	3	3	2	3	3	2	2	2	3	3	3	2	2	3	2	2	3	3
19	Maintenance of equipment	**Process**	3	3	3	3	3	3	2	3	3	3	3	3	2	3	2	2	3	3
20	Education and awareness	**Process**	3	3	2	3	3	2	2	3	2	2	2	3	3	2	2	2	3	2
21	Planning for adjacent land and water use	**Planning**	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3
22	State/commercial neighbors	**Process**	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	NA
23	Indigenous people's	**Process**	3	3	2	3	3	3	3	3	3	3	3	2	2	2	3	3	3	3
24	Local communities	**Process**	3	3	2	3	3	3	2	3	3	3	3	2	3	3	3	2	3	3
25	Economic benefits	**Outcome**	3	2	3	2	2	3	3	3	3	1	3	3	3	3	2	3	2	3
26	Monitoring & evaluation	**Process**	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	3	3
27	Visitor facilities	**Output**	2	3	0	0	2	2	2	2	2	0	2	2	2	2	2	2	2	2
28	Commercial tourism operators	**Process**	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	3
29	Fees	**Input**	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3
30	Condition of values	**Outcome**	3	0	3	3	3	3	3	3	3	3	3	2	3	3	3	3	2	3
21a	- Habitat conservation	**Planning**	1	0	1	0	1	1	1	0	1	1	1	1	1	1	1	0	0	1
21b	- Connectivity	**Planning**	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1
21c	- Ecosystem services & species conservation	**Planning**	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1
24a	- Open communication and trust	**Process**	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
24b	- Enhance community welfare	**Process**	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1
24c	- Actively support the PA	**Process**	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1
29a	- 20% IPAF allocated for financing	**Input**	1	0	0	0	1	1	0	1	1	0	1	0	1	0	1	1	0	1
30a	- Based on research / monitoring	**Outcome**	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1
30b	- Programmes address threats	**Outcome**	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1
30c	- Activities maintain values routinely	**Outcome**	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1
															TOTAL SCORE					97
															MAXIMUM SCORE					103
															% OF MAXIMUM SCORE					94%

* Note: Column number corresponds to the METT assessor based on Table 1. NA = Not applicable.