



FINAL REPORT

Evaluating Management Effectiveness of Transboundary MPAs: the case of the Turtle Islands Heritage Protected Area in the Sulu Sulawesi Marine Ecoregion

By World Wildlife Fund, Inc.

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Table of Contents

Glossary	2
Final Report	3
Appendix 1:	10
Appendix 2:	12
Component 2: Philippines	Attached

Glossary

CCIF	Conservation Community Investment Forum
COT	Crown of thorns starfish
CRMP	Coastal Resources Management Project
DENR	Department of Environment and Natural Resources
GCRMN/NOAA/WCPA/AIMS	Global Coral Reef Monitoring Network/National Oceanic and Atmospheric Administration/World Commission on Protected Areas/Australian Institute of Marine Science
GEF-UNEP	Global Environment Facility – United National Environment Program
MPA	Marine Protected Area
NGO	Non-governmental Organization
NRM	Natural Resources Management
PAWB	Protected Areas and Wildlife Bureau
PCP	<i>Pawikan</i> (Marine Turtle) Conservation Project
SPAGS	fish spawning aggregation sites
SSME	Sulu Sulawesi Seas Marine Ecoregion
TIHPA	Malaysia Turtle Islands Heritage Protected Area
TIP	Turtle Islands Park
TIWS	Turtle Islands Wildlife Sanctuary
UMS	University of Malaysia-Sabah
USAID	United States Agency for International Development
WAP	WWF Action Plan
WCPA	World Commission on Protected Areas
WWF	World Wildlife Fund

Project Title

Evaluating Management Effectiveness of Transboundary MPAs: Turtle Islands Heritage Protected Area

Components: Malaysia and the Philippines

Implementers: WWF-Malaysia and WWF Philippines

Introduction

Sulu Sulawesi Marine Ecoregion

The Philippine-Sabah Turtle Islands lies within the Sulu-Sulawesi Marine Ecoregion (SSME), ranking among the most diverse and productive marine systems in the world. At the apex of the Coral Triangle, the SSME is shared by three countries, Philippines, Malaysia and Indonesia. Recently recognized as a marine hotspot, the region has a huge variety of tropical marine habitat types, ranging from the fringing reefs surrounding its thousands of islands, to some of Southeast Asia's largest and most intact stands of mangroves. The complex oceanography and tectonic history has produced unique features such as the jelly-fish lake at Kakaban in the Derawan Islands, the underground river in Palawan and a wide range of reef habitat types. These varied ecosystems nourish extreme biodiversity, with over 2,000 species of marine fish recorded in the shallow waters of the Philippines and Indonesia alone, not to mention at least 400 known species of marine algae, 16 species of sea grass, 33 species of mangroves, at least 400 species of corals, five of the world's seven species of sea turtles, and at least 22 species of marine mammals, including the endangered Dugong dugon and the rare Irrawaddy dolphin. It is also home to the prehistoric Indonesian coelacanth species. The Philippine-Sabah Turtle Islands harbors the largest nesting populations of green turtles (*Chelonia mydas*) in Southeast Asia.

The narrow channels between the major basins provide important corridors for migratory species including large populations of economically important marine species such as yellow fin, skipjack and big-eye tuna, shrimp, and many other species. The fisheries productivity of reefs is extremely high, and individual reefs have been estimated to support yields of between 3 and 36 tons of fish per km² per year. With average annual harvests reaching nearly a billion US dollars, this has provided food and livelihood security for millions of coastal peoples.

The region is also a popular marine tourism destination globally. It draws scores of tourists whose interests are diving, snorkeling and other marine-based tourism activities. Where mass tourism can pose a threat, well managed ecotourism is a potential source of financing to ensure the continued management and conservation of marine protected areas (MPAs) and could provide additional livelihoods and other economic benefits to the coastal communities.

Project Summary

The project will enhance the capacity of Sulu Sulawesi Marine Ecoregion (SSME) program and its partners in using the management effectiveness methodology developed by the WCPA-Marine/ WWF International Marine Protected Area (MPA) Management Effectiveness Initiative to a trans-boundary MPA specifically the Philippines and Malaysia Turtle Islands Heritage Protected Area (TIHPA). The project will bring together SSME program staff in the three SSME countries – Indonesia, Malaysia, and the Philippines. The project will bring MPA managers and technical staff of the Malaysia and Philippines, as well as the joint management committee of TIHPA to a training-workshop on the methodology developed by the WCPA-Marine/ WWF International MPA Management Effectiveness Initiative.

The project will also invite the two MPAs in the SSME, which are pilot sites that have field tested the methodology (Bunaken National Park, and Tubbataha National Park), to share their experience on the application of the methodology. On-site evaluation of the management effectiveness of the Turtle Islands will also be undertaken. The learning gained from this project will feed into the adaptive application of the methodology to MPAs in priority conservation areas (PCA level) in the SSME, which were defined during the SSME Biodiversity Vision development in 2001.

The project will deliver the following products and outcomes:

1. A regional workshop on the methodology for assessing management effectiveness. Target participants to the workshop will come from park management authorities of the Sabah-Turtle Islands and Turtle Islands management authorities, Bunaken National Park (Indonesia), Tubbataha Reefs National Marine Park. The workshop will also include universities and research institutions such as the University Malaysia-Sabah (UMS), and government agencies (Philippines-DENR PCP). A workshop report will be produced. The Report will include details of key indicators and indicator profiles for the two individual sites, and for the transboundary site as a whole.
2. On-site management effectiveness assessments of the Malaysia and Philippines Turtle Islands (TIHPA). Two types of reports will be produced: individual report on the Malaysia and Philippines side of the Turtle Islands and a TIHPA transboundary level assessment report. The reports will also include an assessment on the use of the management effectiveness tool in transboundary marine protected areas.
3. Presentation, by way of the written report, of the results of the on-site assessments to the management authorities of the Sabah-Turtle Islands and TIWS Protected Area Management Board as well as to the Joint Management Committee for the TIHPA.
4. Measurements of management effectiveness benchmarks based on on-site assessments using the WCPA-WWF-NOAA guidebook.

5. List of learning's and recommendations in applying the WCPA-WWF-NOAA guidebook for transboundary marine protected areas.

6. Increased organizational capacity of the WWF SSME Coordination Unit and WWF National Officers in Indonesia, Malaysia and Philippines in using the methodology for assessing management effectiveness and communicating the results of the assessments.

Final Report - Malaysia Component

Partner Roles

The proposed project will integrate the following SSME partners:

- WWF-Malaysia will work with Sabah Parks on on-site assessment surveys and provide administrative support to the conduct of the workshop. In addition, it will send a staff member to participate in the training workshop on the methodology developed by the WCPA-Marine/WWF International MPA Management Effectiveness Initiative.
- Sabah Parks will lead the on-site assessments of the Sabah side of the Turtle Islands and participate in the consolidation of the on-site assessments to the TIHPA level of analysis. Sabah Parks will also present results of the assessments to Sabah –Turtle Islands management authority and to JMC meetings by way of a written report. It will also provide logistical support to the conduct of the workshop and participate in the on-site assessment as a mentor. It will be responsible in preparing technical and financial reports, as necessary.

Project products and outcomes

Project Progress Report

Overall, the progress of this project has been slow and hard to gauge, but with some significant progress. The guidebook was used only in the initial stages of the project. The on-site assessment was conducted by Sabah Parks without input from WWF-Malaysia and will provide Sabah Parks with a baseline of marine resources for future assessments of the park's management. There is a seeming shift in attitudes about monitoring and understanding of the importance of clear goals and objectives. Sabah Parks' attitude toward collaboration and transparency remains ambiguous.

The nature of the project, evaluating the management effectiveness of Sabah Parks' Turtle Islands Park, is delicate and requires a large degree of diplomacy. In spite of the long and close relationship between WWF-Malaysia and Sabah Parks, there remain certain topics which can only be approached on an informal or personal basis. WWF-Malaysia worked as a facilitator for Sabah Parks to undertake this process. However, WWF-Malaysia allowed Sabah Parks a great degree of discretion in conducting the assessment.

Sabah Parks does not issue any annual statistics or monitoring reports on the status of its parks. Thus, it is difficult to judge, from the outside, the effectiveness of Sabah Parks' management activities. Reports are made to the Sabah Parks Board of Trustees, but these are not public documents. Resource monitoring and measurement has not been a priority for Sabah Parks in the past. This project has highlighted, to Sabah Parks' management and staff, the need for self-assessment and resource monitoring. As part of this shift,

Sabah Parks has begun a program of marine resource assessments through all of its marine parks (Pulau Tiga Park, Tunku Abdul Rahman Park, Tun Sakaran Marine Park, and Turtle Islands Park). The current project helped to guide and support that shift.

The Guidebook

The guidebook was found to be a useful tool for conceptualizing an assessment of management effectiveness but the indicators were not appropriate for the Turtle Islands Park. The biological, socioeconomic and governance indicators were deemed to be inappropriate for the Turtle Islands Park because of the park's long-time exclusive focus on turtles (nesting and hatchery), at the expense of the remaining habitats (terrestrial and marine) in the park.

The Turtle Islands Park has been managed, since its inception, for the turtles. This has concentrated on the nesting beach, the egg hatchery and tourism. The management plan does not mention corals, reefs or fish and has no baseline information about any of these resources. The biological indicators from the guidebook focus on the marine habitats of a park. The indicators were considered to be interesting, but not useful to a park whose sole purpose is to protect a single species.

Because there are no local communities living on the islands and all economic activities other than tourism are banned, there is also little support for assessing the socioeconomic and governance indicators. The education aspects of the park, centered on the tourists, were considered as a potential indicator, but this was not assessed.

Goals and Objectives

This project allowed Sabah Parks and WWF-Malaysia to examine the management of the Turtle Islands Park for the first time. Because the only step necessary for an assessment is to have "clear goals and objectives for your park", this was a good chance to examine Sabah Parks' goals and objectives for the Turtle Islands Park.

An important finding was that the management plan, written in 1996, had no clear goals or objectives. In fact, the management plan is actually a review of the resources with little guidance or discussion about management techniques and processes in the park.

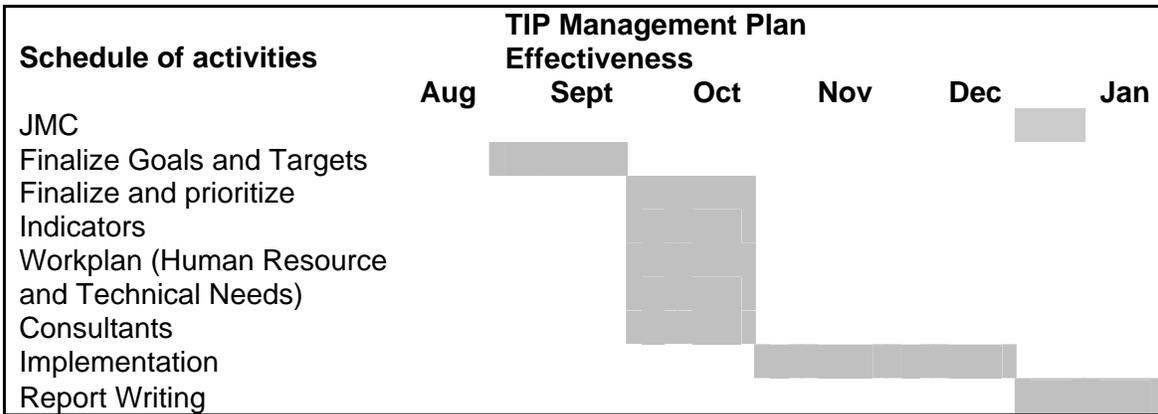
Sabah Parks determined that the objectives, goal and vision of Sabah Parks and the Turtle Islands Park were a good start, but acknowledged that specific goals and objectives were needed. These were articulated during a workshop held in 2005 and reported in the interim report (Appendix 1). Since that workshop, it is unclear if the goals and objectives have been presented to the Sabah Parks Board of Trustees or if they have been formally approved and adopted. Because of the postponement of 2005 Joint Management Committee of the TIHPA, their adoption may have been postponed.

On-site Assessment

The onsite assessment was planned during the August 2005 workshop. A tentative workplan was designed as one of the outputs of that workshop (output 2 below). This proposed workplan was never acted on through the contract with Sabah Parks and WWF-Malaysia.

WWF-Malaysia was informed in November 2005 that Sabah Parks had conducted a biological assessment Turtle Islands Park. As part of a program designed to collect baseline data in all of Sabah Parks’ marine parks, a modified ReefCheck program was completed in Tunku Abdul Rahman Park, Pulau Tiga Park and Turtle Islands Park in 2005. This was the first ReefCheck activity in Turtle Islands Park since 1998. Despite continued requests for information and reporting, according to the contract, no information or reports from this assessment were made available to WWF-Malaysia until April 2006. The Sabah Parks report of their assessment of the Turtle Islands is attached as Appendix 2.

Output 2: Workplan for conducting the management effectiveness evaluation



Conclusions

Sabah Parks’ capacity for marine conservation remains limited. This project has provided a platform for Sabah Parks to examine the management plan for the Turtle Islands Park and to reconsider the goals and objectives of the park. It has also provided a platform for Sabah Parks to identify management gaps in the park management and to commence with data collection to fill those management gaps. The on-site assessment will provide Sabah Parks with the first set of marine habitat and fauna (fish and invertebrate) data since the park’s inception.

The management effectiveness assessment has been a partial success. Sabah Parks recognizes that the Turtle Islands Park needs to be managed for more than simply the

turtles, although the turtles will remain the focus of the park. Data now exists to begin assessments in the coming years. Sabah Parks, however, did not use the opportunity to propose changes to the current management of the park. This may follow from suggested changes to park management in general. Because of the heavy emphasis of the guidebook on marine habitats and marine resources, Sabah Parks did not consider evaluating the turtle situation or the terrestrial habitats as part of the assessment.

Lastly, Sabah Parks has indicated on multiple occasions that the management structure of the agency requires an examination. There is a growing emphasis on marine parks within the system but most staff and programs focus on the terrestrial habitats. In the near future, Sabah Parks will manage 6 marine parks and just 3 terrestrial parks. The current organizational chart (Appendix 3) of Sabah Parks has very little emphasis on marine environments and puts extraordinary pressure on the park management team. The parks management team is proposing a new system (Appendix 4) for managing the parks of Sabah Parks.

Appendix 1. Revised Goals and Objectives of Turtle Islands Park.

Vision of Sabah Parks:

Toward becoming a regional center of excellence in protected area management and research in Tropical Ecosystem.

Vision of Turtle Islands Park (TIP):

Towards becoming a regional center of excellence in the management and research on sea turtles and small island ecosystems

Objective of Sabah Parks:

To preserve for all time areas which contain significant geographical, geological, biological, or historical features as a national heritage for the benefit, education and enjoyment of the people.

Objective of TIP:

To protect and preserve for all time the island ecosystems which contain significant sea turtle nesting, mating, and feeding habitats for the benefit, education and enjoyment of the people.

Goals of TIP:

1. To protect the turtles, their habitats and the associated small island ecosystems.
 - To promote safe passage for the turtles by supporting and participating in the regional sea turtles conservation initiatives.
 - Implement and maintain multi-lateral action plans for the management and conservation of the turtles of the Turtle Islands Park, Philippines Turtle Islands, and Indonesian Derawan Turtle Islands.
 - To eliminate light pollution on nesting beaches and nearshore habitats by strategic positioning and heavy shading of lights.
 - To enhance and maintain beach stability and nesting habitats by re-establishment of native vegetation and other appropriate measures.
 - To aim for at least 80% hatch success on all three islands, and production of healthy hatchlings with balanced sex-ratios.
 - To maintain and enhance coral reef and island natural flora and fauna

2. To manage recreation and ecotourism on a sustainable basis, emphasizing turtle conservation and education activities.

- To develop and enforce turtle watching regulations.
- To ensure that the number of visitors does not exceed carrying capacity of the TIP.
- To develop and carry out interpretation for the turtle watching programme.
- To enhance staff skills and knowledge on turtle interpretation by providing relevant training courses.
- To provide interpretative and education officer to be based at the Turtle Islands Park.

3. To conduct research and monitoring of the turtles, their habitats and the associated small island ecosystems.

- To provide research officer to be based at the Turtle Islands Park.
- To promote collaborative research on TIP.
- To use regular monitoring data to adapt management practices as needed.

Appendix 2:

CORAL REEFS MONITORING PROJECT 2005: TURTLE ISLANDS PARK

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ABSTRACT

The coral reefs monitoring project at Turtle Islands Park (TIP) has been carried out from 7 – 16 September 2005 and our unit have managed to cover a total of 5 surveying sites. The average percentage of coral cover at TIP was 50.5%, with a total of 335 individuals of fish and 124 of invertebrates are recorded during Reef Check survey.

INTRODUCTION

TIP, with total area of 1,740 ha, was gazetted in 1977 in order to protect the major nesting habitat of two species of sea turtles; Green and Hawksbill. It is located about 40 km to the North of Sandakan on the edge of the Malaysia-Philippines international border. The Park consists of three beautiful islands, namely Selingaan (P. Selingaan), Bakkungan Kechil (P. Bakkungan Kechil) and Gulisaan (P. Gulisaan). The Park lies between N 06°09' to N 06° 11' latitude and E 118° 03' to E 118° 06' longitude on the Sulu Sea.

The Park provides nesting habitats to one of the largest aggregations of Green Turtle and the largest remaining Hawksbill Turtle populations in the entire South-East Asian region (Chan & Liew, 1996). Unlike in other turtle nesting beaches in the world, the Turtle Islands Park is unique for its all-year-round nesting of both species.

Based on the importance of the park, we believe that monitoring of this marine park is extremely important as it can be useful tools to measure how our park functions and to sustain in this era, and hopefully for the future generation. Since the most ongoing or outgoing research is turtle base research either by outsider researchers or by the park's marine Unit. There is no long term intensive research has been carried within our marine park that concentrated to the coral reef ecosystems itself.

Although our Unit has done some coral reefs survey back in 1998, a lot of effort and focus has been concentrated towards the coral reefs monitoring within TARP alone, and the monitoring at TIP area has not been continued after 1998. So, we believe it is the right time for us to continue and expend our capability, and effort towards the monitoring to all marine parks under the Sabah Park jurisdiction as well.

This report is our final report of Coral Reefs Monitoring Project 2005 exclusive for Turtle Islands Parks that has been carried out from 7 -16 September 2005.

OBJECTIVES OF THE SURVEY

- a. To collected data on hard coral, fish and invertebrates using the Reef Check and Manta tow methods,
- b. To check on the status of the coral reefs within the Parks as a long terms monitoring program,
- c. To do some assessments on the function of our marine parks (MPAs) in terms of enforcement and the conservation for the long terms monitoring,
- d. To give any recommendation and suggestion to Park management when necessary.

TEAM MEMBERS

During the implementation of the project, our unit had enormous support from the management of Sabah Parks, Park Managers, Rangers and others staff on each and every marine park we carried out the survey. Nevertheless, we feel very fortunate enough to have these team members in our survey project at TIP as shows at Table 1 below;

Table 1: List of team members during TIP Coral Reefs Monitoring Project 2005

Staff	Remarks
1. Irwan Isnain	Team Leader /Invertebrate
2. Koichi Sakamoto	Marine Biologist (JICA/JOCV)/Fish/Underwater photo
3. Mohd Nara Ahmad	Substrate/Invertebrate
4. Oktovorino Benedick	Substrate/Manta Tow
5. Roslee Karim	Manta Tow/Transect
6. Johny Buis	Research Assistant (TIP)
7. Mohd Kassim Karim	Fish survey (TIP)

SURVEY SITES

The selection of survey sites for TIP is base on the ‘best live coral cover’ from the manta tow survey results as well as sites representations for each area in these particular parks. Survey areas for TIP are concentrated mostly on the coral reefs area off three islands and one sub-merge reef which named as Mid Reef located between P. Selingaan and P.

Bakkungan Kechil (Figure 1). Manta tow survey was carried out a day earlier before the sites were surveyed using the diving equipments for further details.

METHODS & TECHNIQUES

A. Manta Tow Survey

Manta tow technique described in the Survey Manual for Tropical Marine Resource from Australian Institute of Marine Science (2nd edition) is used for the first part of the study to recorded the general status of coral cover of study area. This technique involves towing an observer, using a rope and manta board behind a small boat. Each tows will carried out at a constant speed (1 – 1.5 knots) around the reef slope and for 2 minutes duration (Figure 2).

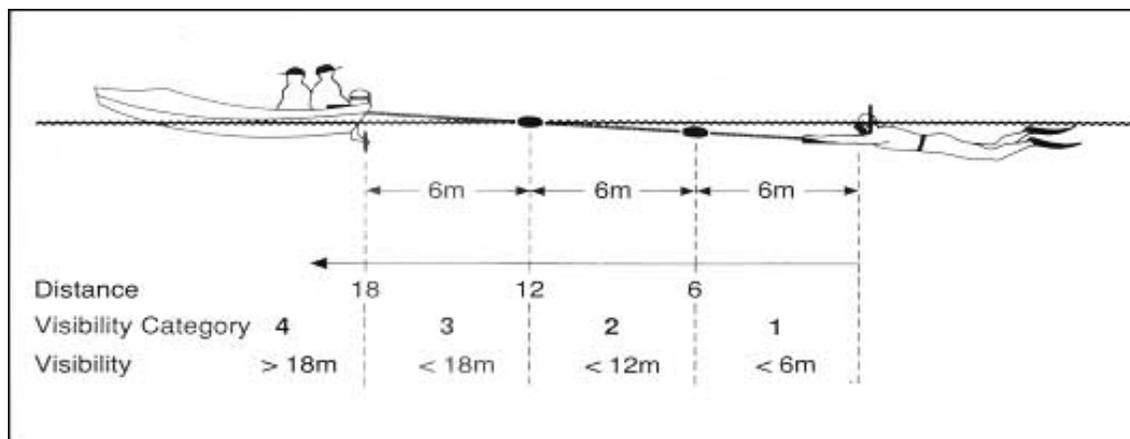


Figure 2: The Manta Tow technique showing the observer being towed along the surface of water behind a small boat (English et al., 1997).

During each 2 minutes tow, the observer will make an observation and record the percentage of live coral, dead coral, soft coral, sand and rubbles or even possible damage of the reef by fish booming activities or the COT on the water prove data sheets using categories (Figure 3). This special design manta board is about 40cm x 60cm in size with 17 meters tow rope connecting the board to the boat (Figure 4). Tow buoys are placed on the rope, one at 6 meters from the manta board and another at 12 meters. These buoys allow the observer to estimate visibility in a standard manner. Manta tow surveys are conducted by team of one or more pairs.

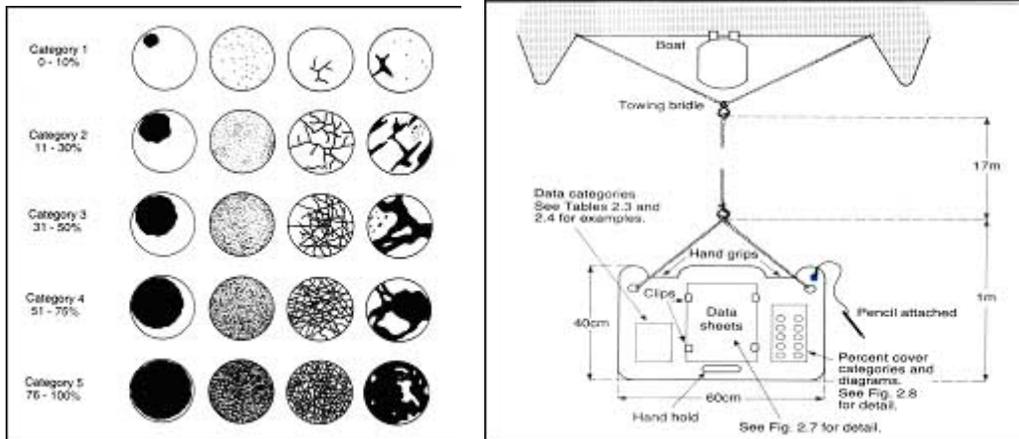


Figure 3 & 4: Left picture show schematic representations of percent cover and right picture show detail of the manta board and associated equipment (English *et al.*, 1997).

B. Reef Check Survey

The second and final stage of the monitoring is underwater study using SCUBA equipment. The underwater monitoring follows the guideline in the Reef Check Instruction Manual, A guide to Reef Check Coral Reef monitoring (2004 edition). As describe in the manual, single 100 meters or two 50 meters fibreglass measuring tape or transect are deployed on two depth contours, between 2 – 6 meters (shallow) and between >6 - 10 meters (deep) as the depth during the lowers low tide. These transect are placed seaward of the reef crest on the outer slope, parallel to shore (Figure 5). However the deployment of two transects is not a compulsory as it all depending on the reefs suitability and if the reefs areas are not suitable, surveying one contour depth is enough.

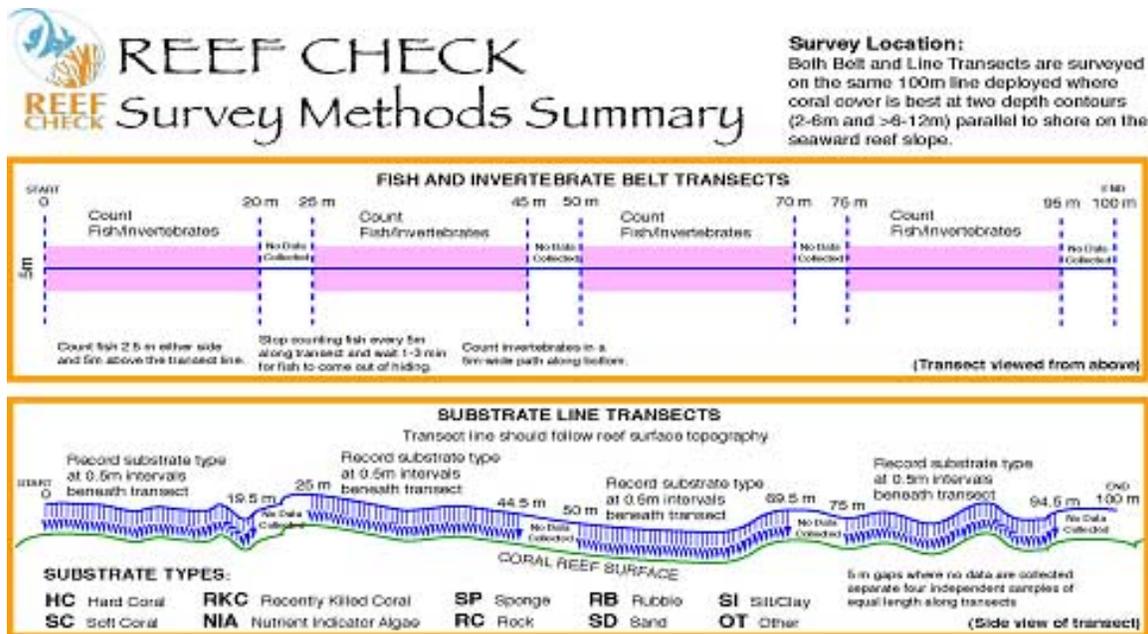


Figure 5: The diagram of transect (www.reefcheck.org)

One buddy pair needed to lay out a 100 meters transect line on each specific depth contour and it should go through the areas of high coral cover as possible. After deployment, the entire length of the transect line should be examined to ensure it is not snagged or floating more than 1 meter off the bottom. Small temporary floats should be attached to the both starting and ending points of each transect for easy to find. And as our long time monitoring purpose, at the starting point of each transects, an angel bar with buoys is hammered as permanent site marker for the future references and survey.

The Reef check survey are divided into 3 types of data recoding. These are;

i. Fish Belt Transect

About 15 minutes after the transect deployment, the Fish Belt Transect survey is carry out. This 'resting' periods are important to allow fish to resume their normal behaviors after been disturbed by the divers deploying the transect line. The fish belt survey only counted and recorded indicator fish; fish species typically targeted by fisherman, aquarium collectors and others. However, for our Unit purpose some fish species also added into our data and some underwater pictures are taken as a record. Diver will count fish while swim slowly along the transect counting the indicators fish (See Appendix i). The indicators fish are counted each 2.5 meters left and right from the centered on the transect line (5 meters wide) by 20 meters long segments, and fish seen up to 5 meters above the water column are counted as well. The diver will stop every 5 meters, and wait one to three minutes for the indicators fish come out of hiding before proceed the next stopping point. Each 100 meter transect are divided into 4 segments of 20 meters long with 5 meters gaps where no data are collected. Overall there are 400 m² combined timed and area restricted survey on each transects (four segments x 20 m long x 5 m wide= 400 m²). An additional data of any sightings of what are now becoming rare animals such as manta rays, sharks, turtles, Humphead Wrasse and Bumphead Parrotfish are also recorded.

ii. Invertebrate Belt Transect

When the fish belt transect survey is complete, the Invertebrate Belt Transect team can then carry out the invertebrates survey using the same belt transect as was used for the fish survey earlier. The invertebrate's survey is similar to the fish survey, however in this survey the diver does not stop at every 5 meters. For the invertebrate survey, it is extremely important to look into cracks, under large coral heads and overhangs to search for cryptic species such as lobster and banded coral shrimp (See Appendix ii). At all sites, estimating coral damage are made with focus on the damage made by the boat or anchoring, dynamite, COT and Others. Bleaching coral population and colonies for each site and sighted of any trash including fish nets are also made into the record. Estimating is made with rating from none=0, low=1, medium=2, and high=3.

iii. Substrate Line Transect

When the invertebrate belt transects is almost complete, the next designated buddy pair can begin the Substrate Line Transect survey. This sampling is based on 'point sampling' because it is least ambiguous and faster method of survey, plus easy to learn by non-scientists. The diver will simply look at a series of points where transect tape lies above the reef and note down what lies under those points. Substrate type will be recorded at 0.5 meters intervals along the line (Figure 6). There will be 40 data points will be recorded for every 20 meters transect segment (See Appendix iii).



Figure 6: A pair of buddy doing the Substrate line transects data collection

To minimize bias, plum line or pointer is used. The plum line or pointer is a 0.5 mm diameter metal rod (stainless steel) and about 15 cm in length will be used. Divers will recorded every substrate type on every point along the transect line.

C. Basic Water Quality

For each diving site (reef check survey), a four basic water qualities such as Secchi Disc, temperature, Salinity and Conductivity as well as the GPS (Global Positioning System) reading are also recorded for future references and study.

EQUIPMENTS AND LOGISTIC

Below is some of the equipments and logistic which is used during the study;

- a. Research vessel, Diving & Research equipments,
- b. At least 2 unit 100 meters fiberglass transect tape, 20 lb hammer, angels bars, buoys and rope,
- c. Underwater date sheets, slid board, underwater digital cameras and laminating underwater pictures (references),
- d. Manta board, aerial maps, and coral reef maps,
- e. GPS and references.

FIELD WORK SCHEDULE

Date	Field Works/Notes
7 – 16 September 2005	Field works at TIP: -Manta tow & Reef Check

RESULT

a. Manta Tow

Manta tow survey at TIP carried out during the second week of September 2005. A total of 90 tows were completed in order to cover the whole park. The details are shown as at Table 2 & 3 and on the Figure 7.

Table 2: Numbers of tows completed during Manta tow survey at TIP.

Sites	Sites Name	Number of tows
1	Pulau Gulisan	29
2	Mid Reef	18
3	Pulau Selingan	22
4	Pulau Bakungan Kechill	20
Total:		89 tow

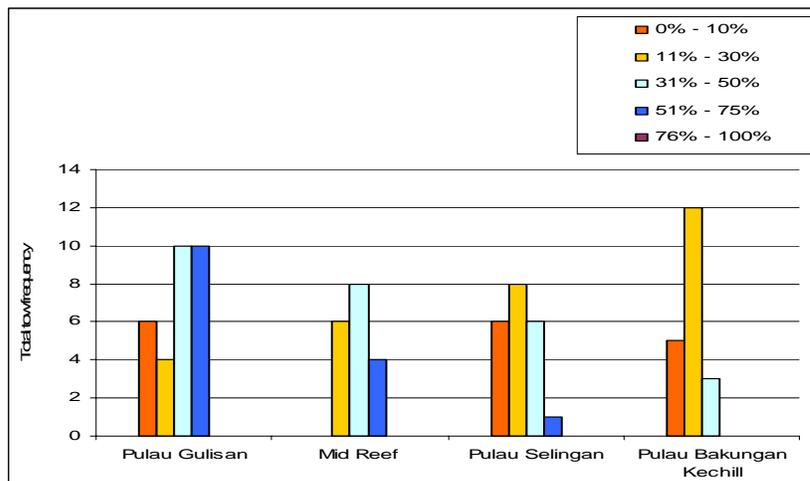


Figure 7: The graph above show the frequency of total tows.

Table 3: The number of tows completed under each category during Manta tow survey at TIP

Category*		Pulau Gulisan	Mid Reef	Pulau Selingan	Pulau Bakungan Kechill
1	0% - 10%	6	0	6	5
2	11% - 30%	4	6	8	12
3	31% - 50%	10	8	6	3
4	51% - 75%	10	4	1	0
5	76% - 100%	0	0	0	0
Total:		30	18	22	20

* Category 0: Poor, Category 1: Fair, Category 2: Moderate, Category 3: Good, Category 4: Very Good, Category 5: Excellent

b. Reef Check

A Total of 5 reef check sites were completed during this survey at TIP. Two sites were carried out at P. Selingaan reef area namely P. Selingan 1 and P. Selingan 2, while one site were deployed each at P. Gulisaan reef flat, at the reef slope of Mid Reef and P. Bakkungan Kechil, respectively. Three sites were completed with 2 depth contour (3-4 meters for the shallow and 8-10 meters for the deep) while the rest of the sites were only cover with one depth contour at 3 - 4 meters. The details of the data are as shows at Table 4 – Table 7, below;

i. Substrate line transect

Table 4: The percentage of substrates recorded for each sites and depth contour at TIP.

Site	Depth	HC %	SC %	RKC %	NIA %	SP %	RC %	RB %	SD %	SI %	OT %
Mid Reef	3m	71.3	0.0	0.0	1.3	0.0	15.6	10.0	1.9	0.0	0.0
	8m	30.0	0.0	0.0	0.0	0.0	17.5	27.5	25.0	0.0	0.0
PGL	2.5m	66.9	2.5	0.0	3.1	0.0	10.0	5.6	1.9	0.0	10.0
PSL1	3m	50.6	0.6	0.0	0.0	1.3	31.9	11.9	3.8	0.0	0.0
PSL2	5m	69.4	1.9	0.0	0.0	0.0	18.8	3.1	6.9	0.0	0.0
	10m	43.1	1.3	0.0	1.3	0.6	18.1	11.9	23.1	0.0	0.6
PBK	3m	46.9	3.1	0.0	0.0	0.0	22.5	16.3	8.8	0.0	2.5
	8m	25.6	1.9	0.0	0.0	0.6	27.5	34.4	7.5	0.0	2.5
Average		50.5	1.4	0.0	0.7	0.3	20.2	15.1	9.9	0.0	2.0

ii. Fish Belt Transect

Table 5: Numbers of targeted fish recorded for each sites and depth contour at TIP.

Site	Depth	Butterfly fish	Sweetlips	Snapper	Barramundi Cod	Groupers (>30cm)	Humphead wrasse	Bumphead parrot	Parrotfish	Moray eel	Total
Mid Reef	3m	4	0	0	0	2	0	0	0	0	6
	8m	18	0	10	0	0	0	0	9	0	37
PGL	2.5m	10	0	0	0	1	0	0	4	0	15
PSL1	3m	24	0	11	1	8	0	0	7	0	51
PSL2	5m	23	0	8	0	7	0	0	0	0	38
	10m	23	6	25	0	10	0	0	5	0	69
PBK	3m	13	0	15	0	9	0	0	5	0	42
	8m	28	2	24	0	13	0	0	10	0	77
Total:		143	8	93	1	50	0	0	40	0	335

iii. Invertebrate belt transect

Table 6: Numbers of invertebrates recorded for each sites and depth contour at TIP.

Site	Depth	Banded coral shrimp	Diadema urchin	Pencil urchin	Tripneustes	Sea cucumber	Crown of Thorns	Giant clam	Triton shell	Lobster	Total
Mid Reef	3m	0	28	0	0	0	0	2	0	0	30
	8m	0	10	0	0	1	0	0	0	0	11
PGL	2.5m	0	2	0	0	0	0	0	0	0	2
PSL1	3m	0	9	0	0	0	0	2	0	5	16
PSL2	5m	0	1	0	0	0	0	0	0	0	1
	10m	0	4	0	0	0	0	0	0	3	7
PBK	3m	0	18	0	0	21	0	0	0	0	39
	8m	0	7	0	0	11	0	0	0	0	18
Total:		0	79	0	0	33	0	4	0	8	124

c. Water Quality

At every surveys site, basic water quality data also taken and recorded as show at Table 7 below;

Table 7: The average of basic water quality recorded for each sites at TIP

Site	Salinity (ppt)	Secchi disc (meter)	Conductivity (μs)	Temperature (Average) °C
P. Gulisaan	35	6	53.4	30.2
PSL1	35	7	54	30.6
PSL2	35	8	54.1	30
Mid reef	35	6	53.6	30.3
PBK	35	10	52.8	30
Average	35	7.4	53.58	30.22

DISCUSSION

a. Manta tow:

Figure 1 and Table 3 shows that over **46.6%** (42 tows, n=90) of total tows were categories under good coral cover. Sites at P. Gulisaan and Mid Reef recorded the highest tows with 66.6% (20 tows, n=30) and 66.7% (12 tows, n=18), which categories as good coral cover. However, P. Bakkungan Kechil and P. Selingaan site recorded the lowers among all sites with 15% (3 tows, n=20) and 31.8% (7 tows, n=22), respectively.

From data analysis and general observation of TIP revealed that most “good coral cover” were limited to shallow areas, it is believed that if the surveys were carried out on the reef slope the result might be much lower. In addition, some un-experienced observer may have resulted an error during the surveys.

However, as mentioned in methods that manta tow surveys were carried out as general base-line data collection, the main study of the programme will be the Reef Check surveys.

b. Reef Check

i. Substrate

P. Gulisaan

(2.5m transect)

Reef flat at P. Gulisaan were among the largest at TIP, but the visibility was extremely low. That forced us to deploy only one permanent transect on the shallow reef flat at the depth of 2.5m.

The percentage cover of 'hard coral' was 66.9%, followed by 'rock' with 10% and 'rubble' with 5.6%. This value of hard coral cover was the third highest among sites of TIP. The dominant genera of hard coral consisted of *Acropora*, *Montipora* and *Seriatopora* (Figure 8 & 9).



Figure 8 & 9: Dominant genera of hard coral in this transect were *Acropora*, *Montipora* and *Seriatopora* recorded at P. Gulisaan site at the depth 2.5 meter.

What came to our concern was that we found a few colonies of green algae, *Halimeda sp.*, which spreading large area and, in some places, covering over hard corals (Figure 10 & 11). Besides, filamentous algae were observed breeding over that *Halimeda* partly and smothering some hard corals as shown at Figure 12 & 13.

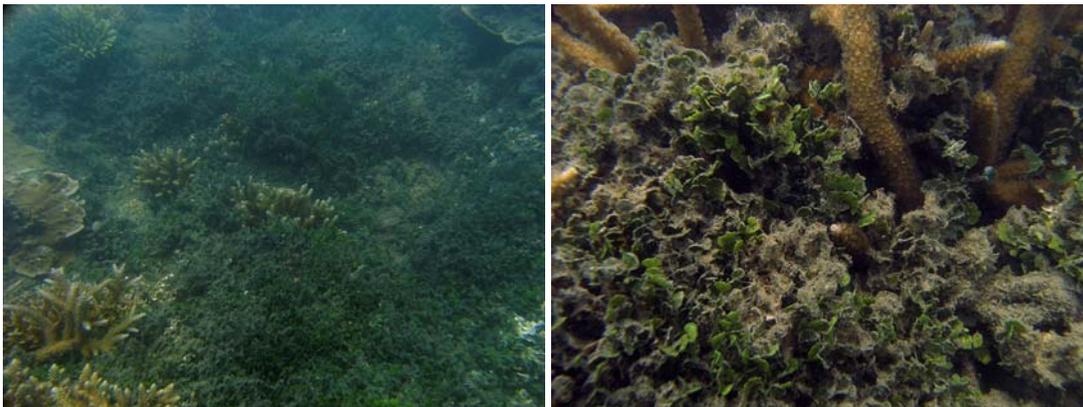


Figure 10 & 11: large colony of *Halimeda sp.*, which is one of the green algae and some of *Halimeda sp.* was covering over hard corals



Figure 12 & 13: Filamentous algae was breeding on the *Halimeda* and smothering some hard corals

Damage caused by “anchor”, “dynamite” and “COT” was not observed, while “other” damage was regarded as low on 1st to 3rd segment, medium on 4th segment with the filamentous algae aggression.

Although coral bleaching was found in 1st segment, it was estimated less than 1% of the total coral population.

P. Selinggaan 1
(3m transect)

Even though the visibility at this site was a little bit better than P. Gulisaan, deeper transect could not be set up because the visibility became worse at the deeper depth. Only one permanent transect was deployed at the shallow depth of 3 meter.

The percentage cover of ‘hard coral’ was 50.6%, followed by ‘rock’ with 31.9% and ‘rubble’ with 11.9%. Tabular and branching *Acropora* was dominant (Figure 14). We witnessed one large tabular *Acropora* in 2nd transect, which was over two meter in maximum diameter (Figure 15).



Figure 14 & 15: Large tabular and branching *Acropora*, and over 2 meter large tabular *Acropora* on the right picture.

On the other hand, many dead *Acropora* covered with algae caught our eyes. The reason was not clear, however what we can say that the disturbance which had caused such situation seemed to happen recently as we still can observed the structures were still remained (Figure 16 & 17).



Figure 16 & 17: Dead algae covering some *Acropora* plates, and some branching *Acropora* were dead and become rubbles.

Though damage caused by “anchor”, “dynamite” and “COT” was not observed, damage by “other” was regarded as medium on the 2nd, 3rd and 4th segment with dead algae covered *Acropora* mentioned above.

P. Selingan 2

(5m transect)

The percentage cover of ‘hard coral’ was 64.9%, followed by ‘rock’ with 18.8% and ‘sand’ with 6.9%. This value of hard coral cover was the second highest among sites of TIP. With reference to coral composition, there was not dominant species and rather were various kinds of corals (Figure 18), except the extensive tract of *Milepora* on the third segment (Figure 19).

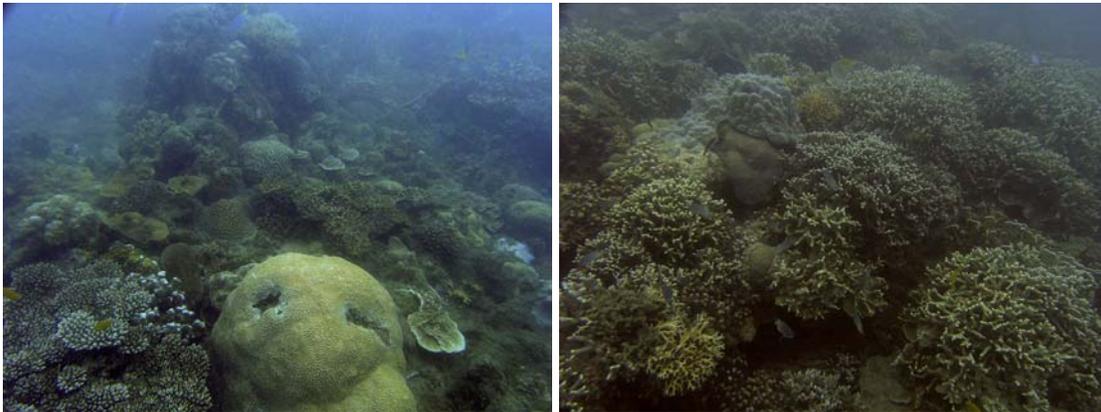


Figure 18 & 19: There was no dominant species and rather various kinds of corals were observed. Large colony of *Milepora* recorded on the third segment of transects.

Damage caused by “anchor”, “dynamite” and “COT” was not observed, damage by “other” was regarded as low from 1st to 4th segment some algae covered corals.

(10m transect)

At the deeper contour, the percentage cover of ‘hard coral’ was 43.1%, followed by ‘sand’ with 23.1% and ‘rock’ with 18.1%. Foliose, encrusting and massive forms of corals were common at this site. *Montipora*, *Pacyseris*, *Echinopora*, *Diploastrea*, *Oxypora*, *Mycedium*, *Pectinia*, *Porites* and *Faviidae* were some of the various species of corals observed at this site (Figure 20& 21).



Figure 20 & 21: Some of the various species of corals observed at this site

The damage caused by “anchoring”, “COT” or “dynamite” was not observed. On the other hand, we observed some area which sediment accumulating on corals (Figure 22), and algae growing and covering corals. The “other damage” was rated as medium from the 1st to 4th segments. While “general trash” was not recorded, abandoned fish net was observed on the 4th segment of transect (Figure 23).



Figure 22: High sediment also observes covered hard and soft coral.

Figure 23: Fish net, which was probably left for a long time also observed.

Mid Reef

(3 meter)

The percentage cover of ‘hard coral’ was 71.3%, followed by ‘rock’ with 15.6% and ‘rubble’ with 10%. This value of hard coral cover was the highest among sites of TIP. At this site, *Acropora* was the dominant corals (Figure 24), however at some points, a tract of *Pocillopora*, *Millepora*, *Porites* and *Montipora* were also observed (Figure 25).



Figure 24: *Acropora* rather dominant at this site.



Figure 25: A tract of *Pocillopora* also observed.

Coral cover from the first to the third segment of transect was generally high. However, at the 4th segment the percentage of coral had suddenly declined to just at 42.5%, instead dead coral stood out (Figure 26).



Figure 26: Dead coral are more stood out at the 4th segment.



Figure 27: Typical sheltered corals were dominant on the poor visibility and high sediments area.

Damage caused by “dynamite” and “COT” was not observed. However, a crack/hole about a meter in diameter was observed in the colony of branching *Acropora* few meters from transect at the shallow depth. This damage appeared to have been caused by boat anchoring (Figure 28). “Others damage” were recorded at low level from 1st to 4th segment with some algae covered dead corals.



Figure 28: A large hole was observed in this colony of *Acropora*, believed have been caused by anchoring.

(8 meter)

The percentage of ‘hard corals’ was 30.0%, followed by ‘rubble’ with 27.5% and ‘rock’ with 17.5%. The values of hard coral were significantly lower than the shallow transect (3m). Visibility is very poor and conspicuous sediments seemed to be one of the reasons which caused such condition. The dominant corals at this transect were rather the typical sheltered corals such as *Montipora*, *Pacyceris*, *Echinopora*, *Mycedium* and *Turbinaria* (Figure 27). Sponge, feather star, soft coral and sea fan were also observed in great number within the transect area (Figure 29 & 30)



Figure 29 & 30: Plenty of sponge, feather star, soft coral and sea fan at this site, with some low visibility as the back ground.

Coral damage causes by “anchoring”, “COT” and “dynamite” not been recorded. “Others” damage were recorded at medium level from 1st to 4th segment. No “general trash” or “fish net” recorded.

P. Bakkungaan Kechil

(3 meter)

The percentage of ‘hard coral’ cover was 46.9% on average, followed by ‘rock’ with 22.5% and ‘rubble’ with 16.3%. This hard coral percentage was the lowest value among the shallower transect of TIP. *Porites* was slightly outstanding (Figure 31), while soft coral rather abundant (Figure 32).

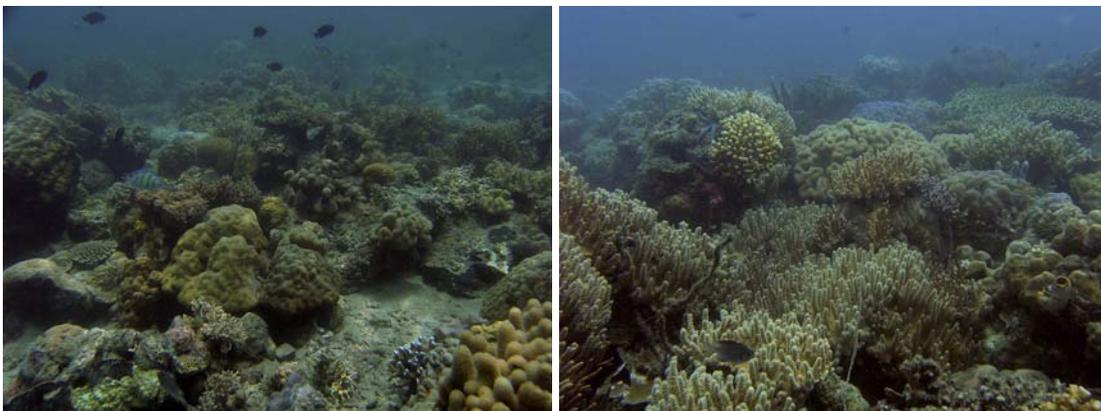


Figure 31 & 32: Left picture show that *Porites* was slightly outstanding with abundant soft coral on the right.

Coral damage causes by “anchoring”, “COT” and “dynamite” not been recorded. “Others” damage was recorded at low level from 1st to 4th segment. No “general trash” or “fish net” recorded.

(8 meter)

The percentage of ‘hard corals’ was 25.6%”, followed by ‘rubble’ with 34.4% and ‘rock’ with 27.5%. The hard coral value was the lowers among the deeper transect of TIP. Visibility is very poor and noticeable sediments seemed to be one of the reasons which caused such condition. There are no dominant corals at this transect, and it were rather consist of some typical sheltered corals as what can be observed at deeper transects on other sites of TIP (Figure 33). Hydroid and soft corals were abundant with some gorgonian (Figure 34 & Figure 35).



Figure 33 & 34: Left picture show a typical sheltered coral were among that can be observe at the deeper depth contour, while at right picture show some of the Soft coral at this site.

Coral damage causes by “anchoring”, “COT” and “dynamite” not been recorded. “other” causes damage were recorded at low level from 1st to 4th segment of transect.



Figure 35: Some magnificent sea fan at P. Bakkungan Kechil site.

Overall Discussion of Substrates at TIP

The average percentage of “hard coral” was 50.5%. On the shallow depth contours, the percentage of hard coral cover were between 46.9% - 71.3% with an average of 61.0%, while at the deeper depth contours those were between 25.6% - 43.1%

with an average of 32.9%. These indicate that most “good coral cover” was limited to shallow area compared to deeper one.

As we trying to answer the question of why those shallow transect recorded more good coral cover compared to deeper one, we assume that it might have some connection with the poor visibility during this surveys.

Theoretically the suspended sediment are believed to be carried from rivers of mainland and stirred up by water movement and current, which might bring about such a typical characteristic to a considerable area.

It is a fact that suspended sediment will prevent sun light, which is necessary for coral growing, from penetrating and reaching toward deeper area. Besides, suspended sediment supposedly accumulates on corals easier in deeper area than shallower one because of the expected low water movement. The sediment on corals will give a lot of stress and sometimes will let it dies with smothering.

Estimating for coral damage and trash mass was made at all sites. Though none of the damage by “COT” or “dynamite” was recorded, one damaged spot by anchoring was recorded just on the shallow transect at Mid Reef. “Other” damage was recorded at all sites rated as low or medium level, mainly caused by sediment, overgrowth of algae, or occurrence of many dead corals. No “general trash” was recorded at all sites, while fish-net was found at P.Selingaan 2.

However, despite the damage caused by fish-net and anchoring were recorded only one time each, it was shocking that those were recorded just on our 100m transects line. Judging from this finding, it will not surprise us if there were more damage within this park. Regular observations on these matters are crucial.

Bleaching coral at TIP sites recorded in very low percentage, which is less then 1% of the coral population. Coral diseases are not been recorded during the survey. However, we sighted a kind of sponge, *Terpios sp.*, which covered and kill hard corals (Figure 36)



Figure 36: A kind of sponge, *Terpios sp.*, which is likely to cover and kill hard corals, was observed at Pulau Selingaan 2 site.

ii. Fish

P. Gulisaan
(2.5 meter)

At this site, a total of 15 individuals of fish recorded and was the second lowest among all sites of TIP. The common fish are butterflyfish from *Chaetodon octofasciatus* species with 10 individuals, followed by the family of other parrotfish, *Scarus spp.* with 4 and grouper, *Epinephelus fasciatus* with 1.

P. Selingan 1

(3 meter)

A total of 51 individuals of fish from 5 groups recorded. Butterflyfish are common with 24 individuals, followed by snapper with 11, grouper with 8, other parrotfish, *Scarus spp.* with 7 and Baramudi cod, *Cromileptes altivelis* with 1.

Chaetodon octofasciatus is the major species with 17, followed by the *C. rostratus* with 3, *C. trifascialis* and *Parachaetodon ocellatus* both with 2. The number of butterflyfish recorded at these sites was the highest among the shallow transect of TIP.

The major species of snapper recorded is *Lutjanus carponottatus* with total 5 individuals, followed by *L. decussatus* with 3, *L. fulviflamma* with 2 and *L. quinquelineatus* with 1.

Only two species of grouper recorded; *Epinephelus fasciatus* with 5 individuals and *Cephalopholis formosa* with 3.

P. Selingan 2

(5 meter)

A total of 38 individuals of fish from 3 groups recorded. Butterflyfish are common sighted with 23 individuals, followed by snapper with 8 and grouper with 7.

Chaetodon octofasciatus is the major species recorded with 17 individuals, followed by the *C. trifascialis* with 3, *C. rostratus* with 2 and *C. trifascialis* with 1.

The major species of snapper recorded is *Lutjanus decussatus* and *L. fulviflamma* with 3 each and *L. carponottatus* with 2.

Two species of grouper recorded; *Epinephelus fasciatus* with 6 individuals and *Cephalopholis formosa* with 1.



Figure 37: Two Harlequin sweetlips, *Plectorhinchus chaetodonoides*, was sighted roaming near a coral head at P. Selingan 2 site.

(10 meter)

A total of 69 individuals of fish from 5 groups recorded. Still, butterflyfish are common sighted with 23 individuals, followed by snapper with 25, grouper with 10, sweetlips with 6 and other parrotfish, *Scarus spp.* with 5.

Chaetodon octofasciatus is still the major species recorded with 13 individuals, followed by the *C. rostratus* with 8 and *C. trifasciatus* with 2.

Three major species of snapper recorded were *Lutjanus decussatus* with 9 individuals, followed by *L. carponottatus* with 8, *L. lutjanus* with 6 and *L. fulviflamma* with 3. The number of snapper recorded at these sites was the highest among the deeper transect of TIP.

Two species of grouper recorded; *Epinephelus fasciatus* with 8 individuals and *Cephalopholis formosa* with 2. The number of grouper recorded at these sites was the second highest among the deeper transect of TIP

Three major species of sweetlips recorded were *Diagramma pictum* with 4 individuals, while *Plectorhinchus gibbosus* and *P. chaetodontoides* both with 1 individual each. The number of sweetlips recorded at these sites was the highest among sites of TIP.

Mid Reef

(3 meter)

A total of 6 individuals of fish from 2 groups recorded. Butterflyfish are the common sighted with 4 individuals, followed by grouper with 2.

Chaetodon octofasciatus is the major species with 4 individuals. While, 2 species of grouper were, *Cephalopholis formosa* and *Epinephelus fasciatus* were both with 1 individual.

(8 meter)

A total of 37 individuals from 3 groups of fish recorded. Butterflyfish are common with 18 individuals, followed by snapper with 10 and other parrotfish, *Scarus spp.* with 9.

Two major species of butterflyfish were *Chaetodon octofasciatus* with 14 individual and *C. rostratus* with 4 were recorded.

Three species snapper recorded were *Lutjanus decussatus* with 6 individuals, *L. lutjanus* with 3 and *L. carponottatus* with 1.

P. Bakkungan Kechil

(3 meter)

A total of 42 individuals of fish from 4 groups recorded. Butterflyfish are common with 13 individuals, followed by snapper with 15, grouper with 9 and other parrotfish, *Scarus spp.* with 5.

Three major species of butterflyfish recorded were *Chaetodon octofasciatus* with 9 individuals, followed by the *C. rostratus* and *C. trifasciatus* both with 2 each.

Three species of snapper recorded were *Lutjanus carponottatus* with 9 individuals, followed by *L. decussates* with 4 and *L. fulviflamma* with 3.

Two species of grouper recorded were *Epinephelus fasciatus* with 8 individuals and *Cephalopholis formosa* with 1.

(8 meter)

A total of 77 individuals fish from 5 groups recorded. Butterflyfish still lead with 28 individuals, followed by snapper with 24, grouper with 13, other parrotfish, *Scarus*

spp. with 10 and sweetlips with 2. The number of parrotfish recorded at these sites was the highest among the deeper transect of TIP.

Four species of butterflyfish recorded were *Chaetodon octofasciatus* with 15 individuals, *C. rostratus* with 10 and *C. trifasciatus* with 2, and *Henicohus varius* with 1. The number of butterflyfish recorded at these sites was the highest among the deeper transect of TIP.

Three species of snapper recorded were *Lutjanus carponottatus* with 14 individuals, followed by *L. decussates* with 6 and *L. fulviflamma* with 4. The number of snapper recorded at these sites was the second highest among the deeper transect of TIP.

Two 2 species of grouper recorded were *Epinephelus fasciatus* with 8 individuals and *Cephalopholis formosa* with 5. The number of grouper recorded at these sites was the highest among the deeper transect of TIP.

Overall Discussion of Fish at TIP

A total of 335 individuals of targeted fish were recorded during the survey in all sites. Butterflyfish, Snappers, Groupers and other Parrotfish were commonly sighted and recorded almost at all sites.

Among five surveys sites, only three were set up with two transects (shallow and deep), and recorded more numerous number of individuals at the deep transect than the shallow one. The main reason for this difference between two depths could be attributed to the abundant records of Sweetlips and Snappers at the deep transects. In fact, Sweetlips, Snappers and large-size Grouper, in general, have a tendency to settle in deeper area.

But this did not necessarily mean that the deeper contours were more productive than the shallow ones. Because we observed various kinds and a lot of damselfish, wrasse, cardinalfish, and etc., mainly small and not highly prized in a market, on the shallow transect (Figure 38).



Figure 38: Some of the damselfish among *Acropora* at P.Bakkungan Kechil site (8 m).

Butterflyfish was commonly sighted almost at every dive and recorded at all sites. A total of 143 individuals were recorded. Wood, E., (1986) recorded 15 species of Butterflyfish in Turtle Islands Park, while our surveys recorded a total of 6 species; however this might be fairly attributed to the difference of research method and approach used. Two major species that stood out among the recorded six species were *Chaetodon octofasciatus* and *Chelmon rostratus* with 89.5% of total number of Butterflyfish

recorded at TIP. This fact really got us noticed and concerned whether these two species might adapt to the conditions so well or the biodiversity of this family might be declining.

Snappers were sighted occasionally and were recorded almost at all sites during this survey except at P. Gulisaan. Among five recorded species of Snappers, three major species that more dominant than others were *Lutjanus carponottatus*, *L. decussatus* and *L. fulviflamma* with 89.2% of total number of Snappers recorded at TIP.



Figure 39 & 40: Left picture is an interesting group of Panda Butterflyfish, *Chaetodon adiergastos*, were flocking around P. Selingaan 2 sites, and while on right is a school of Russell's snapper *Lutjanus russelli* at P. Selingaan 2.

Groupers were sighted occasionally at all sites. However, the numbers of grouper recorded were rather low with just 50 individuals. Only two species of groupers were recorded, *Epinephelus fasciatus* was the major species followed by *Cephalopholis formosa*.

Sweetlips were recorded at two sites with 8 individuals. Only three species of Sweetlips recorded. The dominant species among this three was *Diagramma pictum* with 6 individuals, while the other two species *Plectorhinchus gibbosus* and *P. chaetodonoides* with 1 individual each.

Amazingly, for the first time during our survey within all these three parks we were able to record a single individual of Barramundi cod, *Cromileptes altivelis*, on the shallow depth (3 m) at P. Selingaan 1. It was not only very rare within our parks, but also it was a very interesting finding for our whole study.

A total of 40 individuals of Parrotfish were recorded at all 5 sites during this survey. Unfortunately we could not find any Bumphead parrot, Humphead wrasse and Moray eels. These fish are now very rare and difficult to be seen within our water.



Figure 41: Singular bannerfish, *Heniochus singularis* sighted at P. Bakkungan Kechil.

iii. Invertebrates

P. Gulisaan

A total of 2 invertebrates of long-spined urchin, *Diadema spp.* recorded at P. Gulisaan site.

P. Selingan 1

At P. Selingan 1, a total of 16 individuals of invertebrates recorded from 3 groups of animals. Long-spined urchin, *Diadema spp.* are the dominant invertebrates with 9 individuals, followed by Giant clam, *Tridacna spp.* with 2 and lobster, *Panulirus spp.* with 5 individuals recorded.

P. Selingan 2

On the shallow depth of 5 meter, only 1 single individual of *Diadema spp.* recorded. While, at the deep depth of 10 meter, a total of 7 invertebrates recorded from 2 groups of animals. Long-spined urchin, *Diadema spp.* lead with 4 individuals and lobster, *Panulirus spp.* 3 individuals recorded.

Mid Reef

On the shallow depth at 3 meter, 30 individuals of invertebrates recorded from 2 groups of animals. Long-spined urchin, *Diadema spp.* is the major invertebrates recorded with 28 individuals and Giant clam, *Tridacna spp.* with 2.

On the deep depth at 8 meter, a total of 11 individuals of invertebrates from 2 groups recorded consist of long-spined urchin, *Diadema spp.* with 10 individuals and sea cucumber, *Holothuria edulis* with 1 individual recorded.

P. Bakkungan Kechil

On the shallow depth at 3 meter, a total of 39 individuals of invertebrates recorded. Long-spined urchin, *Diadema spp.* still the major species of invertebrates recorded with 18 individuals, followed by sea cucumber with 21 individuals. The number sea cucumbers recorded at this site were the highest among sites of TIP.

On the deep depth at 8 meter, a total of 18 individuals of invertebrates recorded. Sea cucumber is the major species recorded with 11 individuals and long-spined urchin, *Diadema spp.* with 7 individuals recorded.

Overall Discussion of Invertebrates at TIP

A total of 124 invertebrates were recorded during the Invertebrate Belt Transect survey. *Diadema* urchin recorded the highest numbers with 79 individuals, followed by sea cucumber with 33, lobster with 8 and giant clam with 4 (Figure 43).

Diadema urchin is an indicator of some overfishing of urchin-feeding fish such as triggerfish, pufferfish and all within particular area. *Diadema* urchin is also an indicator for overgrowth of algae as these animals were major algae grazer or algae feeder. Although the present situation of deadema urchin in TIP seemed not to be serious, the long termed monitoring based on these views is required.

Sea cucumber was particularly abundant in Pulau Bakkungan Kechil, compared to other sites (Figure 42). The reason is not clear now but will be revealed by further monitoring activity.



Figure 42 & 43: Some of the invertebrates recorded at P. Bakkungan Kechil site; Sea cucumber, *Holothuria edulis* and Giant clam, *Tridacna sp.*

Banded coral shrimp, *Tripneustes* urchin, triton shell and pencil urchin had not recorded during this survey. These animals are all under the threat of overfishing in the Indo-Pacific region. Either this result could be put on overfishing or not, the monitoring on fishing activity within the park is important.



Figure 44: Some of the Lobster, *Panulirus sp.* sighted at P. Bakkungan Kechil.

Lobster and giant clam were recorded 8 and 4 individuals respectively (Figure 44). These highly commercial animals were occurred despite of the supposed threat of overfishing.

There was no data of COT. And moreover we did not see any COT during the whole survey.

c. Water Quality

Four basic water quality parameters were recorded at all 5 sites at TIP (Table 7). Water temperature during the survey at the all sites was established ranged between 30.0 °C to 30.6 °C (average at 30.22 °C). This temperature range is considered as common sea water temperature in tropic region.

Excellent salinity readings are recorded constantly with 35 ppt average at all sites and different depth. Conductivity is considered in the average of it ranged and recorded between 54.8 μs to 54.1 μs .

However, turbidity on each survey sites consider as high as it shows in the secchi disc data. The secchi disc recorded slightly low with ranged between 6 m to 10 m (average at 7.4 m). The deeper the secchi disc can be seen from the surface, less turbid the water.

RECOMMENDATION

- a. It is extremely important for the management TIP to continue the regular patrols and enforcement especially at a few interesting coral reef and potential coral recovery area, for example at P. Gulisaan and Mid Reef; avoiding any anchoring and fishing activities.
- b. Regular monitoring which focusing on the sediments and algae at a few areas is also very important, since excessive of sediments and algae on the substrates will not only prevent new recruitment of corals, but also cause a various kind of problems, for example space competition, stress and smothering, disease and all.
- c. The targeted fish of Reef Check are emphasized on the commercial fish. So, we believed that for more comprehensive understanding of reef conditions, we need to add our own-targeted fish to our checklists.

CONCLUSION

The overall reef check analysis shows that 50.5% of the reefs survey of TIP recorded good live coral cover. However, the best live coral covers with more then 40% were recorded more frequent at the shallow depth compare to the deeper depth contours.

Even though at some part of reef were covered by extensive tracts of algae and sediments, the overall observation shows that the coral reefs at TIP are the most

outstanding among others. However, the present situation might not be sustained without serious action to protect this important area initiated.

The numbers of recorded fish are moderate and in some sites rather abundance. However, the decline in biodiversity of butterflyfish might get us concerned. In other hand, the numbers of recorded invertebrates are moderate, however the number of sea cucumbers recorded at TIP is the highest comparing to other surveying locations (TARP& PTP).

Anyway, one of the most important outcomes is to have recorded the present situations as it is necessary to have base-line data for continuous long-term monitoring programme that we have newly established.

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Final Report – Philippines Component

Descriptive Information

Name: Turtle Islands Wildlife Sanctuary
Country: Philippines
Location: 6°10' N latitude, 118°10'E longitude
Area: 242,967 hectares
Objective: Wildlife Sanctuary
Near City: Sandakan, Sabah Malaysia

The Turtle Islands Wildlife Sanctuary (TIWS) is composed of 6 islands found in the southern end of the Philippine archipelago which, together with 3 islands from Sabah, Malaysia form what is known as the Turtle Islands Heritage Protected Area or the TIHPA. The TIHPA is the world's first transborder marine protected area for sea turtles.

The TIWS covers an area of 242,967 hectares, 318 of which constitutes the aggregate land portion of the six islands: Taganak, Baguan, Boan, Bakkungan, Langaan and Lihiman.

Site map of Turtle Islands:



Ecological Features

Plant Life

Marine Flora. Typical of low-island flora, the Turtle Islands marine macrobenthic flora (large, bottom-dwelling plants) is characterized by low species diversity. The populations are sparsely distributed on the fringing reef and do not form apparent or distinct communities. Algae (seaweeds) grow among the piles of dead coral branches, on dead portions of coral heads and mixed with seagrasses, which form very thin stands on sandy bottoms near the shore. Of the 62 species found in the area, 27 are members of the

Chlorophyta (green algae), 22 are Rhodophyta (red algae) and six Phaeophyta (brown algae). The seagrass community at the Turtle Islands is represented mainly by pioneer species such as *Halophila ovalis*, *Cymodocea rotundata*, *Halodule pinifolia*, *H. uninervis* and *Syringodium isoetifolium*. These species colonize small sandy patches near the shore. Intermixed with the seagrasses are some seaweed populations such as *Halimeda macroloba*, *Udotea geppii* and *Caulerpa serrulata* (G.Trono 1998)

The seaweed and seagrass populations of the islands appear to be at their seral stages of development. This is shown by the presence of pioneer and ephemeral or opportunistic species. Almost all species have some known economic value. Only those food species, when developed, are likely to be of immediate economic benefit to the local populations, however. These include *Caulerpa racemosa*, *C. lentillifera*, *Gracilaria eucheumoides*, *Halymenia durvillaei*, *Gelidiella acerosa* and *Kappaphycus alvarezii*. *G. acerosa* is a known agar source, while *K. alvarezii* is a carrageenan source. These last two species are important raw materials for making gel-like desserts. *G. acerosa*, in particular, appears to have some commercial applications, but it does not seem to occur in the area abundantly enough for commercial harvest and utilization.

Terrestrial flora. Typical of most disturbed low-lying small island ecosystems, the terrestrial flora of the Turtle Islands group is a mosaic of remnants of sea coast or strand vegetation and ornamental and weed species attendant to agricultural and human settlement areas.

The vegetation of the islands is typically of limited growth, development and complexity, which is mainly a function of relatively recent geologic age and, more importantly, anthropogenic influence. Typical beach vegetation forms a narrow strip of woodland along the sandy and gravelly shores of the seacoast, gradually giving way to other types of forest formation depending on topography, size of the island and other factors. The principal woody species that occur in the Philippines in general and the Turtle Islands group in particular are *Terminalia catappa*, *Desmodium umbellatum*, *Pandanus tectorius*, *Premna serratifolia*, *P. obtusifolia*, *Erythrina variegata*, *Barringtonia asiatica*, *Thespesia populnea*, *Hibiscus tiliaceus*, *Sterculia ceramica*, *Callphyllum inophyllum*, *Guettarda speciosa*, *Xylocarpus moluccensis*, *Pongamia pinnata* and *Scaevola frutescens*.

Succession may be in more advanced stages in areas that are less influenced by human activity, such as slopes, enclosed area and the sanctuary, as well as in islands with larger areas. This is shown by the presence of pioneering tree species like *Macaranga tanarius*.

Agricultural crops, ornamental plants and associated weeds in human settlements comprise 60% of the plant species identified in all the islands. It is common practice for residents to propagate plants introduced from outside the Turtle Islands.

Most species are widely distributed and no local endemic species have been observed.

Animal Life

Marine fauna. The benthic communities of the Turtle Islands, especially on the north and northeast coasts of the islands, are of the fringing reef type, well-developed and in relatively good condition. Although the area experiences appreciable terrigenous run-off from Sabah, the islands have a fair hard coral cover (28-46%) and high coral diversity (24-27 genera).

Growth forms are mostly non-*Acropora* branched corals, which indicates that the reef slope has relatively calm conditions and has adapted to silt run-off. Great Bakkungan and some parts of Baguan have abundant branching *Acropora*, mostly *A. bruegemanni* in the former, and more silt-resistant species (e.g., *A. echinata*) in the latter. The other parts of Baguan, as well as Langaan, have more massive or dome-shaped corals. This indicates that the coral communities correspond with a gradient from offshore (clear, wave-exposed) to inshore (silted, wave-sheltered), complicated by depth and aspect. Comparison of the results of a survey conducted in 1998 indicates that the presence of *Acropora* corals is much higher at Baguan in the northeastern and northern side, where the fringing reef is widest, while the other sites have higher cover of corals other than the *Acropora* spp. There is no obvious difference in total hard coral cover among the sites, however.

Also noticeable is the higher algal cover in sites outside Baguan. Control of fishing activities and destructive fishing methods (such as dynamite and cyanide) around the Baguan Island Marine Turtle Sanctuary may have allowed for higher biomass of grazing or herbivorous fishes, which has controlled algal abundance.

The 1998 survey also recorded a total of 7,342 individual reef fishes representing 155 species and 25 families at Baguan; the other islands were found to have lower diversity and biomass. All told, 232 reef fish species in 33 families were observed in the entire Turtle Islands area.

The diversity in coral genera and high percentage of cover of branched live corals contribute to the high fish species diversity in the Turtle Islands. The reef fish assemblages are dominated by Pomacentridae (damselfishes) and Labridae (wrasses), with 44 and 45 species, respectively. The fishes of these families are generally characterized as small in size but often colorful and usually found hovering in large aggregations over reef slopes or at the bottom of the reef. The most common fish species in the area are *Pomacentrus alexanderae*, *Chromis ternatensis* and *Pomacentrus smithi* (damselfishes). The most common of the economically important species are *Caesio pisang* and *Pterocaesio chrysozona* (both species are commonly known as fusilier, or "dalagang bukid" in the local dialect). These fishes are mostly planktivores.

Terrestrial fauna. The terrestrial vertebrate fauna of the Philippine Turtle Islands is predominantly composed of avian species. Thirty-four avian species have been observed to occur in the entire Turtle Islands. Of this number, 30 species have been observed on Taganak, Langaan, Lihiman, Great Bakkungan and Boan. Baguan has four species not found on the other islands; these are the Lesser Frigatebird (*Fregata ariel*), Common Sandpiper (*Actitis hypoleucos*), Grey Imperial Pigeon (*Ducula pickeringii*), and the

Chestnut-cheeked Starling (*Sturnus philippensis*). Nine species found on the other islands, on the other hand, have not been recorded on Baguan; these include the Spotted Dove (*Streptopelia chinensis*), Island Collared Dove or Philippine Turtle Dove (*Streptopelia bitorquata*), Greater Coucal (*Centropus sinensis*), Pied Triller (*Lalage nigra*), Yellow-vented Bulbul (*Pycnonotus goiavier*), Yellow-breasted Wren-warbler (*Gerygone sulphurea*), Pied Fantail (*Rhipidura javanica*), Chestnut Munia (*Lonchura malacca*), and White-breasted Wood-swallow (*Artamus leucorhynchus*).

The species composition of the Philippine Turtle Islands is very similar to that of the Turtle Islands Park of Sabah, but species diversity in the Philippine Turtle Islands is relatively lower. None of the birds identified is endemic to the Philippines.

The only native terrestrial mammalian species observed on the islands is the large fruit bat, *Pteropus hypomelanus*, and the only other non-domesticated species found is the field rat, *Rattus argentiventer*. Residents of Taganak Island report a high incidence of rats in their homes, although the species has yet to be confirmed. Common domesticated mammals found on the islands include dogs (*Canis familiaris*), cats (*Felis catus domesticus*), cattle (*Bos indicus*), and goats (*Capra aegagrus*).

The islands are known primarily as a nesting area for sea turtles (*Chelonia mydas* and *Eretmochelys imbricata*). The other most common reptilian species seen in the area is the monitor lizard, *Varanus salvator*. The blue-tailed skink, *Emoia caeruleocauda*, is also often observed, especially on Great Bakkungan and Boan. The *Mabuya sp.* is also quite common on all the islands.

The Malay box turtle, *Cyclemys dentata*, has apparently been introduced on Great Bakkungan (the species is not seen on the other islands or even the Turtle Islands Park of Sabah). Sea snakes (*Lauticauda colubrina*) and terrestrial snakes (*Dendrolaphis caudolineatus*) are also encountered.

Regional Importance

The Turtle Islands Heritage Protected Area located in the borders of Philippines and Sabah and has been considered as the world's first transboundary effort to manage marine turtles.

Since the signing of the memorandum of agreement for the TIHPA in 1996, the two countries have adopted various conservation programs for their respective sites. There is a need therefore to evaluate the effectiveness of the programs and to be able to propose ways in which to improve their design and implementation.

The program "Evaluating Management Effectiveness of Transboundary MPAs: Turtle Islands Heritage Protected Area" sought to enhance the capacity of the Sulu Sulawesi Marine Ecoregion (SSME) program and its partners in using the management effectiveness methodology developed by the WCPA-Marine/ WWF International Marine Protected Area (MPA) Management Effectiveness Initiative to a trans-boundary MPA

specifically the Philippines and Malaysia Turtle Islands Heritage Protected Area (TIHPA).

With the support of the United States Department of Commerce- National Oceanic and Atmospheric Administration (NOAA) and WWF US, this project is a joint collaboration amongst WWF, Philippine Department of Environment and Natural Resources and Sabah Parks. Simultaneous efforts have been conducted by Philippine and Malaysian parties.

This report discusses the application of the evaluation tool using the MPA Guidebook specifically for the management systems of the Turtle Islands Wildlife Sanctuary or the Philippine side of the TIHPA.

Social Characteristics

The Municipality of Turtle Islands is within the MPA with approximately 3,600 (NSO, 2000) people living on the five populated islands of the TIWS (Taganak, Boan, Bakkungan, Lihiman, Langaan) while Baguan Island has been declared a turtle sanctuary since 1982 and only park rangers are present in the island for monitoring and research purposes. The majority of the people in the islands are Muslims of the Jama Mapun (45%) and Tausug (46%) tribes coming from the mainland Mindanao and the island of Cagayan de Mapun.. The minority (9%) is a good mixture of other Muslim tribes and Christians from the Visayas and Mindanao.

Population growth in the islands has been below the national average from 1980 to 1985 with an annual growth below 1%. In the period of 1995 to 2000, the population growth surged to 8.8% annual growth, but the highest recorded population growth rate in the area was between the periods of 1975 and 1980 with 22.4%. The trend in population growth coincides with the unstable peace and order situation in Mindanao and the Sulu archipelago. Eruption of armed conflicts triggers the influx of migrants to Turtle Islands.

Another factor affecting the population movements in Turtle Islands is the state of enforcement of the immigration laws of Malaysia. Such enforcement dictates the intensity of trans-border crossing to Malaysia where economic and political conditions are more stable compared to the Philippines. The Turtle Islands serve as the jumping point to Malaysia.

The primary source of income for the inhabitants is marine extraction which includes fishing, gleaning and turtle Egg collection. Even though egg collection has been considered a traditional source of livelihood, only 11% of the population has been benefiting from this (Cola, 1998).

Because of the proximity of the area to Malaysia, Malaysian trawlers also exploit the marine resource of Turtle Islands, as well as other Philippine-owned commercial fishers.

MPA Establishment and Mandate

In 1999, the whole Turtle Islands Municipality and its surrounding waters were declared as a Wildlife Sanctuary under Presidential Proclamation 171. This gives the mandate and management jurisdiction of the area to the Department of Environment and Natural Resources (DENR) pursuant to the terms and conditions of the National Integrated Protected Areas System (NIPAS) Act of 1992.

Historically, however the *Pawikan* (Marine Turtle) Conservation Project or the PCP which was created as a special unit of the DENR under the Protected Areas and Wildlife Bureau (PAWB) has been present in the area since 1940 undertaking various activities on conservation, research and monitoring. With the advent of the Presidential Proclamation, an Integrated Protected Areas System Office under the jurisdiction of DENR Region 9 was created with a Superintendent in charge of TIWS management.

The table below lists the historical highlights of various legislations in the management of the marine turtles in the Philippines.

Year of Issuance	Title	Main Provision
1932	Commonwealth Act No 4003: An Act to Amend and Complete the Laws Regulating Fish and Other Aquatic Resources of Philippine Islands and Other Purposes	Requiring license of marine turtle collection and submission to customs for exportation
1940	Fisheries Administrative Act No. 18: Amending and Compiling Laws Relating to Fish and Other Aquatic Resources of Philippine Islands and for Other Purposes	Closure of San Miguel Islands to collection of marine turtles and eggs
1948	Fisheries Administrative Order No. 23: Regulation Establishing Closed Season Period for Conservation of Turtle Eggs and shells in Turtle Islands	Alternate closure of islands comprising Turtle Islands four months a year to turtle and egg harvesting
1951	Fisheries Administrative Order No 29: Rules and regulations governing the gathering of aquatic turtle eggs	Grant of lease agreement to collect turtle eggs for P4000.00/km of coastline per year
1952	Fisheries Administrative Order No. 29-1: Amending Sections 8 and 9 of Fisheries Administrative Order No 29	Grant of concession for gathering turtle eggs in Turtle Islands for P10,000.00
1954	Fisheries Administrative Order No. 36: To Establish Closed Season Period for Gathering or Killing Marine Turtles, Turtle Eggs or Shells	Ban in collection of turtles, turtle eggs and shell for 2.5 months while authorizing collection of old and no-layer female turtles
1962	Fisheries Administrative Order No. 68: Amending Section 2 of Fisheries Administrative Order No 36	Banning the collection of hawksbill turtles less than 18 inches and all egg-laying turtles
1964	Fisheries Administrative Order No. 76: Regulations Governing Collecting and Gathering of Marine Turtles	Lifting of ban on marine turtle collection which are more than one foot across the body
1967	Fisheries Administrative Order No. 88: Regulations for the Conservation of Turtle, Eggs and Shells in the Philippines	Ban of collection of marine turtle and eggs for five years

1972	General Administrative Order No. 68: Transferring Administration of Turtles to the Parks and Wildlife Office	The Philippine Fisheries Commission lost control of marine turtles
1974	Administrative Order No 1: Regulations Governing Collection, Gathering and/or Disposing Marine Turtles, Eggs and its By-Products	Sets licensing procedures, required retention of 100 eggs and ban of collection for half a year.
1979	Executive Order No 542: Creating Task Force Pawikan and Appropriating Funds Thereof	Provides a council in Office of the President and financial support to turtle conservation
1980	Bureau of Forest Development Circular No 8: Regulations for Conservation of Marine Turtles in the Philippines	Banned permit issuance except in Regions 9 and 12 .
1980	Special Order No 201: Creation of an implementing organization of the Pawikan Task Force to Implement Pawikan Conservation Program	Provision for the recruitment of personnel and setting up of separate office for Task Force Pawikan
1981	Executive Order No 708: Reorganizing the Office of the President and Creating the Office of the Prime Minister	Transfer of Task Force Pawikan Council from Office of the President to MNR
1982	Special Order No 98: Delegation of Authority to Conduct Inventory and Marking of Marine Turtles	Control of turtle-based goods through authentication and serial number issuance.
1982	Memorandum Order No 6: Suspension of permits on marine turtle exploitation	Totally banned exploitation activities of marine turtles
1982	Administrative Order No 8: Establishment of Certain Islands in Tawi-tawi, Palawan and Antique as Turtle Sanctuaries	Seven islands including Baguan Island of Turtle Island is set aside as sanctuaries
1982	Administrative Order No 10: Deputizing the Governor, Vice-governor of Tawitawi and Mayor and Barangay Captains of Taganak as Conservation Officers	Use of local officials to enforce laws to support MNR organizational capability
1982	Administrative Order No 34: To Declare the Municipality of Caluya as Marine Sanctuary	Withdrawal from alienation and exploitation of the island for turtle conservation
1982	Administrative Order No 357: Creating a Council of Deputy Conservation Officers in Tawi-tawi	Enlisting local officials and Southern Command to enforce conservation laws
1982	Administrative Order No 33: Regulations Governing the Collection of Marine Turtle Eggs in Tawi-Tawi and Reiterating the Duties and Responsibilities of Deputy Conservation Officers and Game Wardens	Establishment of arrangement wherein 30% of the turtle eggs are for conservation, 10% for a Foundation and 60% for exploitation
1983	Administrative Order No. 1: Deputizing Provincial Governors and Municipal Mayors in Areas Critical for Protection of Marine Turtles as Conservation Officers	Expansion of organizational capability of the conservation effort by involving the local executives
1992	Republic Act No. 7586 An Act Providing for the Establishment and Management of National Integrated Protected Areas Systems (NIPAS)	Establishment of protected areas for biodiversity conservation and sustainable development
1992	Administrative Order No 25: NIPAS Implementing Rules and Regulation	Set the steps for the establishment of NIPAS area
2001	Republic Act 9147 Known as The Wildlife Act	Ban on the exploitation of endangered species including its byproducts which includes marine turtle eggs

Institutional Arrangements

Protected Area Management Board

Under the NIPAS, the PA should be governed by the Protected Area Management Board (PAMB) which is a multi-sectoral body tasked to overlook management through policy making. The TIWS PAMB is composed of the following;

- a. The DENR Regional Executive Director as the chairman,
- b. 1 representative of the Autonomous Regional Government,
- c. The Provincial Planning and Development Officer PPDO
- d. 1 representative from Municipal Government
- e. 1 representative from each barangay (local government body) with territory within the PA
- f. 1 representatives from local Non-Government Organizations
- g. 5 from community organizations (civic, people's and tribal organization) who are based in or near the PA
- h. 1 representative from other national government departments that may be involved in protected area management.

In the case of the Philippine Turtle Islands where a municipality is within the wildlife sanctuary, the local government unit is being represented by the municipal mayor.

Stakeholder participation is expected to be seen in the conduct of PAMB meetings and activities. The composition of the PAMB covers a good range of the stakeholders in the area. Ideally, representatives per stakeholder group have a voice in the management board.

The Initial Protected Area Plan

A PA management plan has been drafted by the PAMB however it did not go through a process of consultation, validation and endorsement. Therefore in lieu of a management plan for the PA, the evaluation team used the Initial Protected Area Plan as the basis for the assessment. The goals and objectives are stated below:

Goal of the TIWS as stated in the Initial Protected Area Plan

To enhance biodiversity and promote sustainable development with the active participation of the local communities. To conserve and provide ample protection for the marine turtles and biodiversity of their habitat thru the preservation of sample ecosystems in their natural state, maintenance of ecological diversity, conservation of genetic resources as well as the maintenance and protection of natural and scenic areas which are of national and international significance for scientific and recreational uses.

Objectives of the TIWS

1. To preserve the various habitat types in the TIWS;
2. To develop the ecotourism potential of TIWS;
3. To establish and develop and develop infrastructure support system to facilitate the operations and management of the TIWS as Protected Area;
4. To install proper consciousness and right attitude on conservation and sustainable use of the marine resources and the marine turtle population through information, education and communications (IEC) campaign among the local population and at the same time empower the stakeholders in the area;
5. To implement community livelihood programme to improve the standard of living and uplift the socio-economic conditions of the local population;
6. To protect and artificially propagate and/or systematically manipulate the endangered Marine Turtle population to ensure the perpetuation and continued survival of the species in the area;
7. To provide baseline data and alternative plans for the future zoning and delineation of the area for specific compatible uses allowable in the PA and regulate issuance of tenurial instruments to qualified migrants and ancestral domain claimants;
8. To delineate and establish the boundaries of the Turtle Islands Wildlife Sanctuary (TIWS);
9. To implement community-based coastal resource management scheme in the protected area;

MPA Challenges

There are many challenges besetting the TIWS.

Egg Collection

In 1973, a scheme for regulation of turtle egg harvest was put in place allowing 60% of turtle eggs' laid to be collected and 30% transplanted to hatcheries for conservation and the remaining 10% to be put in the Marine Turtle Foundation Fund. This system was not perfect but it was recognized and respected by the stakeholders and accounted for conservation of turtle eggs in the Philippine side. But in 2001, the national conservation and wildlife act was passed which banned the harvest of endangered species including turtle eggs. The lack of consultation, enforcement capacity and confusion in the changing policies on turtle egg harvesting have not led to its regulation but have in fact led to a breakdown in management systems. This particular move of the national government made the local communities defiant and non-compliant to regulatory laws as they felt marginalized even more. The PA warden and other staff were unable to perform protection and conservation activities.

Commercial Fishing

The MPA is part of the Sulu Sea which is one of the most abundant fishing areas in the country. The area of Turtle Islands is a magnet for commercial fishermen from the Philippines and Malaysia. Estimated 200 shrimp trawlers from Malaysia regularly encroach and operate within the Philippine territory, inside the Protected Area. Philippine-owned commercial fishing fleets from Luzon and Visayas also operate within

the MPA occasionally or near the boundaries of the MPA using superlights. These commercial fishers, especially those coming from Malaysia use nets with very small mesh size catching even the smallest juvenile fishes. They sometimes operate so close to the shore that nesters also get entangled with their nets. They are said to be paying protection money to local authorities. These trawlers are not only destructive to the reefs but are also seen to compete with the local fishermen whose boats and equipment are not as big and as effective in catching fish.

Destructive Fishing Activities

Dynamite and cyanide fishing are also a threat to the population of marine turtles in the area as well as to the marine environment. Especially on the islands far from the center of the municipality where no enforcement agencies are present, coral reefs have been totally wiped out due to these activities. Aside from the locals practicing destructive fishing, other perpetrators also come from as far as Visayas islands and Palawan. Some locals argue that this fishing method is a way to compete with the trawlers for its efficiency compared to conventional methods.

Administrative Conflicts

Lack of resources, confusion in terms of jurisdiction and political will continue to plague the management bodies. Although the Turtle Islands has been one of the priority sites for conservation, very little support and attention has been given by the mandated government agencies for its protection due to geographic constraints and complicated political dynamics in the area.

Evaluation Conditions (Need for the Evaluation)

Since the early seventies, government and non-government agencies have been present in the Turtle Islands and have conducted a great number (and a great variety) of conservation and development programs. Some evaluations have been conducted (specifically by WWF for its ICD programs), but to date none have been conducted with respect to the effectiveness of the MPA.

Advantages of the Evaluation (Actual and Anticipated)

1. Since its establishment in 1999, only a draft of the management plan for the Turtle Islands Wildlife Sanctuary is available. In lieu of this, the mother document for the MPA remains to be the Integrated Protected Area Plan which needs to be revisited. Especially in the light of a high rate of turn-over of protected area personnel and PAMB members, the evaluation activity is hoped to be an opportunity for the park management staff to go back to the goals and objectives of the park and to pursue improvements in terms of implementation. The outcome of the evaluation is hoped to be incorporated into a management plan that is suited and implementable in the area.
2. Possibility of using the evaluation process as a means to lobby support for the MPA from the regional, national and local level.

3. The evaluation should be able to generate important data and information that is hoped to lead to greater awareness of stakeholders with regard to progress and effectiveness of the area.

Guidebook Application—The Evaluation Process

Indicator Selection and pre-evaluation activities

A regional training was conducted to enhance capacity for management effectiveness assessments in March 2004 in Quezon City, Philippines. Field personnel from Sabah and Philippine Turtle Islands attended the training. The sessions were designed to familiarize the implementers to the guidebook and to be able to determine a set of clear and realistic indicators with which to evaluate the effectiveness of an MPA. The workshops also initiated the process of evaluation planning for the on-site country assessments. Each workgroup was able to prioritize a set of indicators and draft a plan for its assessment.

In the course of the workshop and discussion, it became clear that the indicators and framework for the individual MPAs are not entirely suited for assessments at the TIHPA-level. Therefore, the applicability of the methodology might not be feasible for the transboundary level. It was decided that on-site assessments will be prioritized after which the indicators for the TIHPA level will be drafted and designed.

After the Regional Management Effectiveness Training Workshop for Turtle Islands Heritage Protected Area (TIHPA), a core group for the Turtle Islands Wildlife Sanctuary was formed composed of the following: 4 government staff and 2 WWF project team. During the initial workshop, a total of 33 indicators were selected as all these matched the goals and objectives of the PA described in the Initial Protected Area Plan. However because of limitations in terms of time and accuracy of data, several follow-up workshops were conducted and the indicators were trimmed down finally to a total of 17 indicators (3 Biophysical, 5 Socio-economic and 9 Governance) which is deemed more manageable.

Most of the indicators selected already have existing data which can be used as baseline for the management evaluation of the Turtle Islands Wildlife Sanctuary. The evaluation team felt that these indicators will be essential in providing input for the Protected Area Management Plan (or PA Bill) and will be most useful in terms of management of the area.

Table 1. Summary of Indicators Selected

MPA Goal	MPA Objectives	Indicators
To enhance biodiversity and promote sustainable development with the active participation of the local communities. To conserve and provide ample protection for the	1. Preserve Various habitat types in TIWS	B1, B7, B9 G6, G9, G10, G13,
	2. To develop the ecotourism potential of TIWS	B1, B7, B9, S1, S7, S8, S9, S11, G1, G6, G13
	3. To establish and develop infrastructure support system to facilitate the operations	

MPA Goal	MPA Objectives	Indicators
marine turtles and biodiversity of their habitat thru the preservation of sample ecosystems in their natural state, maintenance of ecological diversity, conservation of genetic resources as well as the maintenance and protection of natural and scenic areas which are of national and international significance for scientific and recreational uses.	and management of the TIWS as Protected Area;	
	4. To install proper consciousness and right attitude on conservation and sustainable use of the marine resources and the marine turtle population through information, education and communications (IEC) campaign among the local population and at the same time empower the stakeholders in the area;	S1, G6, G13, G9, G10,
	5. To implement community livelihood programme to improve the standard of living and uplift the socio-economic conditions of the local population;	B1, B7, S1, S7, S9, S11, S8, G10,
	6. To protect and artificially propagate and/or systematically manipulate the endangered Marine Turtle population to ensure the perpetuation and continued survival of the species in the area;	B1, B7, B9, G9, G13,
	7. To provide baseline data and alternative plans for the future zoning and delineation of the area for specific compatible uses allowable in the PA and regulate issuance of tenurial instruments to qualified migrants and ancestral domain claimants;	S1, G1, G5, G9, G13
	8. To delineate and establish the boundaries of the Turtle Islands Wildlife Sanctuary (TIWS);	B1, B7, B9, G6, G13,
	9. To implement community-based coastal resource management scheme in the protected area;	B1,B7, B9, S1,G1, G2, G5, G6, G13

Biophysical Indicators

B1: Focal Species Abundance → Proxy Indicator: Turtle Egg Production, Number of Nesters

Obviously, green sea turtles (*Chelonia mydas*) are the focal species for the area. However, there is no means to measure the abundance of this marine turtle species due to its highly migratory nature. But there is available data on turtle egg production, number of nesters and number of complete nests as monitored by the Pawikan Conservation Project since 1984. These data are seen to be good proxies for the B1 indicator as turtle egg collection is a major threat to the species. Measuring these proxy indicators give an indication of the impact of conservation management in the MPA. These then can be used as baseline and reference for future study and evaluation of turtle population.

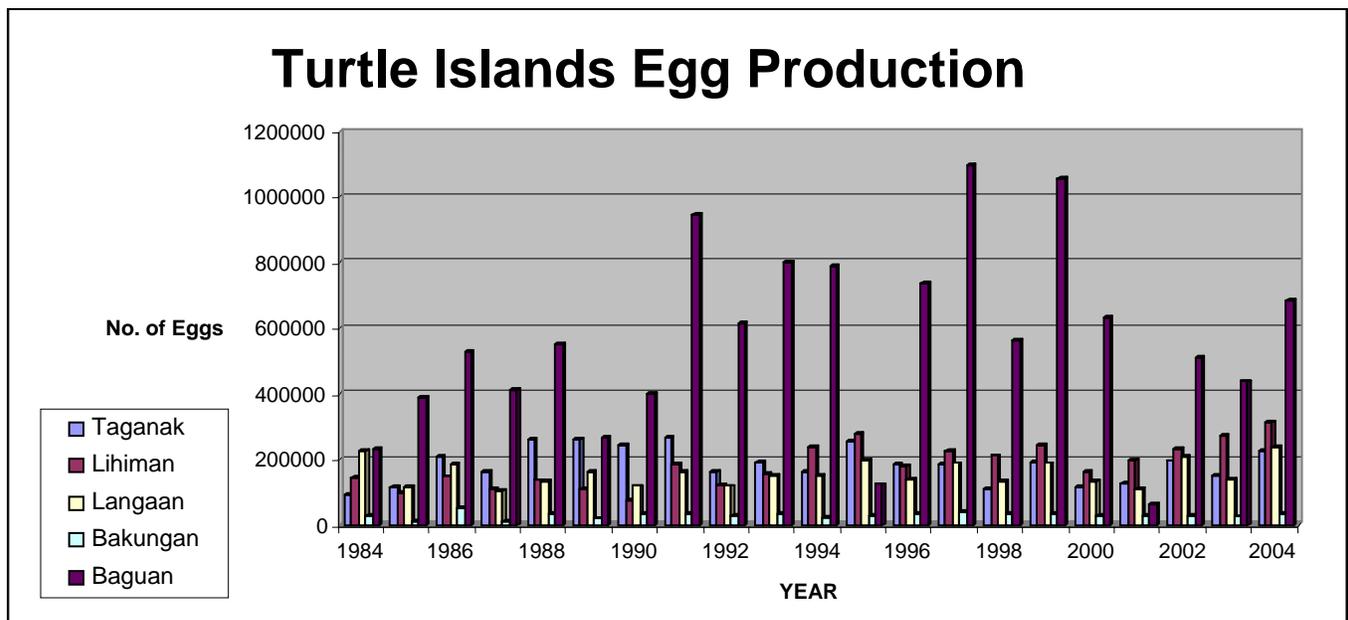
Methods Used to Measure the Indicator

The Pawikan Conservation Project has in place a system of monitoring nesting incidences, turtle egg production. Every night, a park warden would do the rounds of the

nesting beaches and record the number of nests and the number of eggs laid per nester. Records from 1984 to 2004 were taken for the collection islands.

Summary of Results

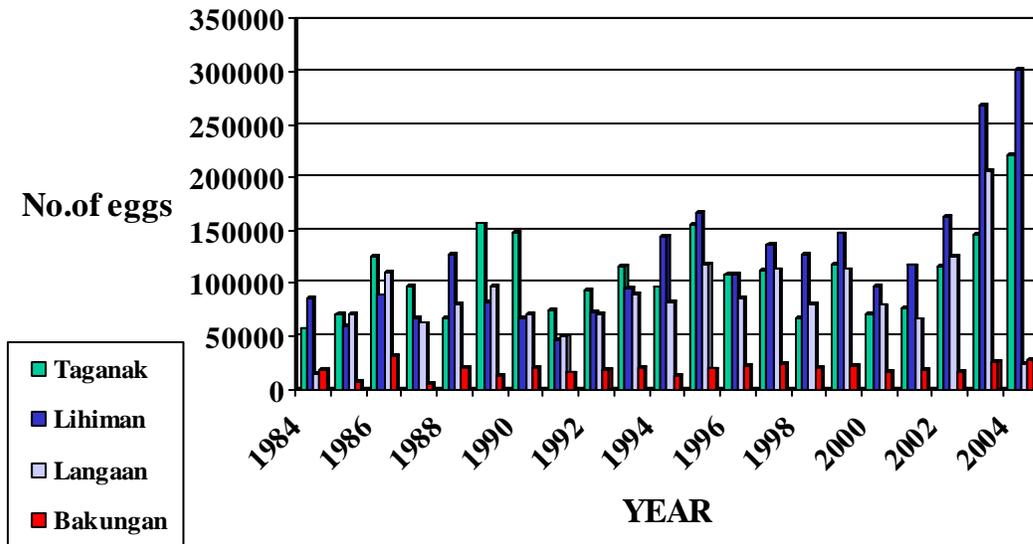
Graph 1 shows the data for turtle egg production over a span of 20 years. No significant changes or patterns that can be seen on the egg production it is fairly stable, despite incidents of turtle stranding (mortality) from anecdotal reports. Some islands show a decrease in number of eggs produced but the other islands have shown an increase in some years which could suggest that some nesters could be laying eggs on different islands per nesting season. Egg production per se would not provide a conclusive picture of the effect of the conservation initiatives in the area as of now with regards to the turtle population and so take a look at the collection data.



Graph 1: Number of Eggs Produced in the TIWS

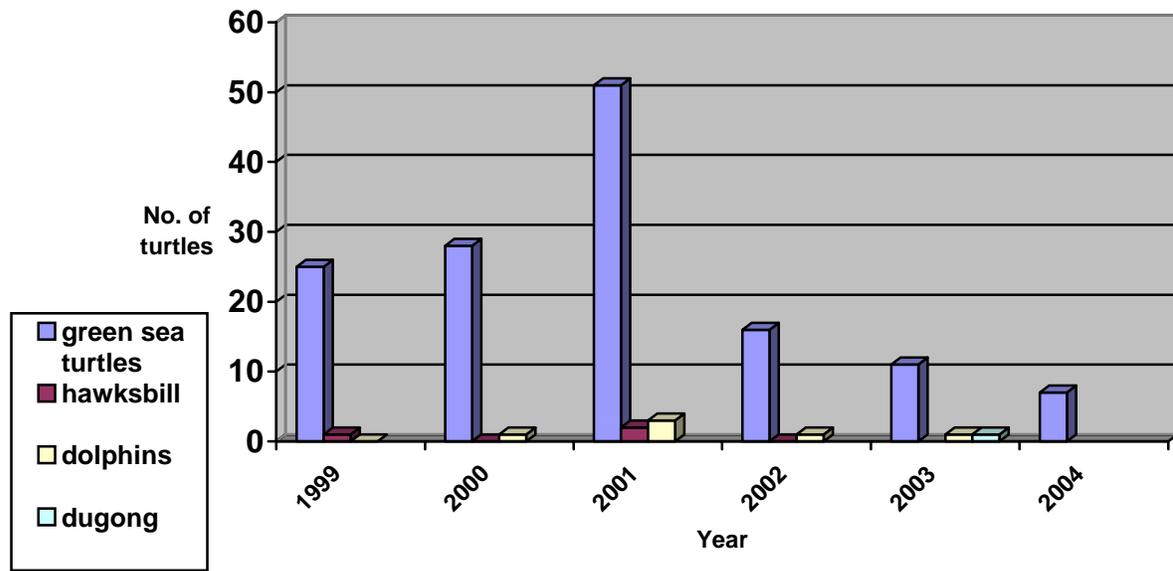
Since 1982, the DENR has put in place a regulatory scheme through Ministry Administrative Order 33, which allows collection in the islands of Taganak, Bakkungan, Boan, Lihiman and Langaan during the period April to December (open season). Permits are granted to qualified residents of the area. Each permittee is allowed to harvest 60% of the eggs produced while the remaining 40% goes to conservation. Thirty per cent of the eggs are transplanted to the hatcheries and the remaining 10% are sold but proceeds turned over to the Marine Turtle foundation for conservation. Graph 2 shows the yearly data for the number of eggs collected. Comparing Graph 1 and 2, we note that the years 1984 to 2000 indicate that regulation took place. However, the last few years show a drastic increase in the number of turtle eggs being exploited in all the collection islands. Data for 2004 show a near 100% collection—clearly indicating a breakdown in the regulatory and management system. This was brought about by the implementation of Republic Act 9147 or the Wildlife Conservation Act in 2001. This law was supposed to

aid in the conservation of endangered species and in fact called for the ban wildlife harvest. However in the case of the Turtle Islands, the opposite effect was achieved: communities reverted to massive exploitation claiming lack of community preparation and alternative livelihood programs. The government’s weak capacity for enforcement and jurisdictional and administrative conflicts were also other factors in the management breakdown.



Graph 2: Egg exploitation in Collection Islands of the TIWS

Graph 3 provides anecdotal data on turtle stranding as recorded and reported by community residents. Recorded turtle mortality peaked in 2001. The major cause of mortality was drowning due to by-catch of trawlers. It is to be noted that during this time, the authorities became lax in terms of patrolling the borders and a great number of trawlers were allowed to fish in the area. There were also a number of incidents where community members killed the turtles by slashing its side in order to collect the eggs. The trend in graph 3 is not conclusive on the cause of the rise and fall of the reported stranding or whether there is already a decrease in the turtle population.



Graph no. 3: Community-Based Turtle Stranding report

Recommendations

The data on turtle egg production, collection and turtle strandings all show the impact of conservation management or the lack of it. A working regulatory system gives a fairly stable picture of turtle egg production. However, massive exploitation and numerous incidents of stranding highlight the threats faced by the sea turtle population in the area.

These data emphasizes the need to reinforce management systems in the area. This means putting in place a system of regulation that is realistic, implementable and acceptable to all stakeholders in the area. Fishery law enforcement must be pursued in order to curb the entry of Malaysian trawlers in the municipal waters of turtle islands, which is a major cause of turtle mortality. Another recommendation is to promote further IEC on conservation as well as engaging the stakeholders in monitoring and patrolling of nesting areas. As of now since alternative livelihood is limited and is not enough to cover the affected families in the area—policy amendments are needed as a total ban on egg collection would only mean disaster for conservation.

Other recommendations:

- A. Implementation and enforcement of Environmental and fishery laws (National and Local Government laws e.g. RA 7586 (NIPAS act) and RA 9147 (Wildlife Act), Creation of *Bantay Dagat*, formulation of relevant ordinances and implementation by the local government.
- B. Monitoring and Protection Activities for turtles
 1. Tagging operation, Patrolling and monitoring in all sites
 - 2.. monitoring of turtles eggs in all sites.

C. Research, surveys and assessment

1. Research and Assessment of resources by DENR, BFAR, OGAs and NGOs
2. Continuation of coral reef monitoring

D. Information Drive

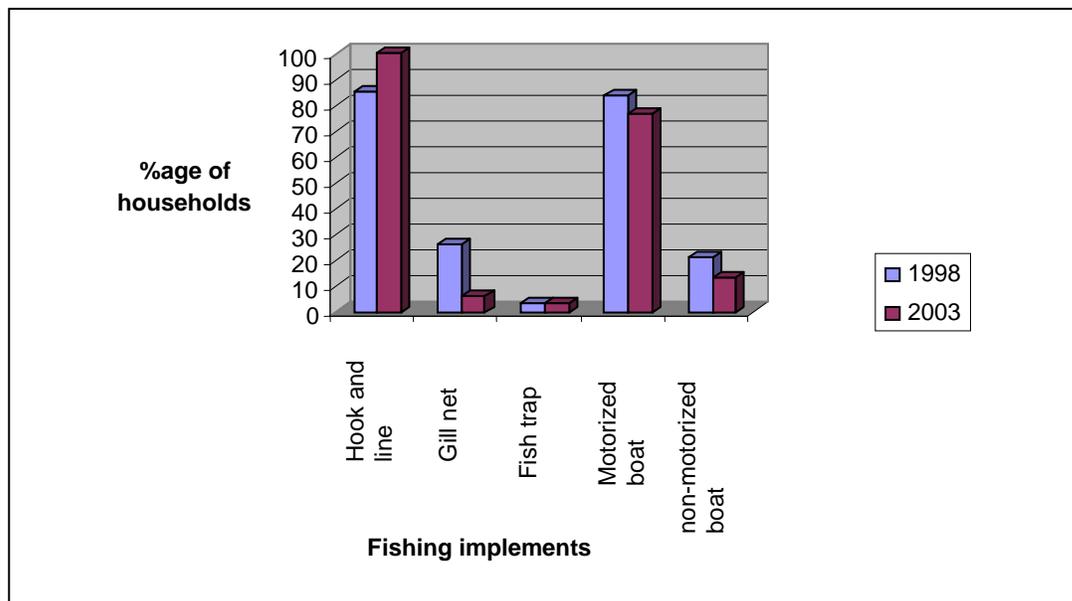
1. Conduct extensive information campaign in the area
2. Conduct regular coastal clean-up

E. Proper Management Zoning

1. Resettle houses outside the nesting ground.

B7: Type, Level and Return on Fishing Effort

This indicator is in direct relation to the livelihood aspect of the Initial Protected Area Plan; being a coastal community, it will assess the needs to improve fish stock thru proper management of fishery resources and in turn to provide (better) livelihood for the community.



Graph no. 4: Types of fishing gears used by households

Analysis:

Hook and line fishing gear uses hooks and fishing line (nylon) of different gauges depending on the target species. The species being caught ranges from sharks to reef fishes.

Gill nets are used to catch reef fishes. Mesh size ranges from a fine one, less than an inch to 4 inches, which are sometimes used to catch sharks. It is set and left overnight before hauling.

Fish cage is made from bamboo or chicken wire made into a cage with a small opening. The fish can go in and unable to get out since spikes in the opening are pointing inwards thus preventing the fish from escaping. It is set in a certain depth and left there for days before being checked by the fishermen again. It captures the fish alive and can survive for days.

There was a noted shift on the use of fishing gears among the community. Hook and line users increased and the gill net users decreased, shifting to the use of hook and line. Aside from the fact that hook and line requires lower acquisition cost, its extractive capability could also equal that of the gill net (average catch per engagement is 39kg). Fish trap users remained the same. There was also a fall on the ownership of motorized boat.

Majority of the respondents still uses the hook and line which is a sustainable way of fishing. This kind of fishing activity also uses the most the affordable fishing gear and is equally productive as the other gears. Instead of changing to another gear to increase fish catch, the respondents invested in boat engines. The people were concerned about the disposal of their catch as well as to be able to cross to Sabah for other personal reasons like access to health and other services.

Recommendation

The importance of conducting a fisheries assessment, i.e. getting the catch per unit effort (CPUE), fish stock assessment, gear and boat inventory, gear and boat registration can be seen in the fact that the Turtle Islands is a coastal community and marine extraction is the main form of livelihood, specifically fishing. Fisheries assessment is imperative in order to evaluate the status of the resources and to come up with a management plan that will cater to the needs of the fishing sector such as an enhanced/alternative livelihood and to conservation/ sustainable use of this resource.

B9 Areas Showing Signs of Recovery

Recovery as defined by the MPA Guidebook is measured as the proportion of the total MPA area or focal species population that has experienced or 'been restored' to assumed 'original' target levels. For the case of the Turtle Islands MPA indicator, the focus is coral reef cover. It is to be noted that in the past, incidents of dynamite fishing have been cited in the Turtle Islands. This indicator measures the amount of coral cover over a span of 4 years.

Methods Used to Measure the Indicator

Data from surveys conducted in October 1996 for three sites in Baguan island; and April 1997 in Bakungan, Langaan and Taganak islands were used as baseline for this indicator. Monitoring surveys in October 2002 followed the same video methodology as during the baseline surveys. Concrete blocks deployed every 5 meters along four 25-meter transects were used in each monitoring station. Transects were sampled using two Sony digital cameras recording the reef area beneath 100m of transects per site, with the camera perpendicular to and about 30 cm from the bottom. In the laboratory, the images were then digitized (“framegrabbed”) from the video tape at 5 second intervals into a series of still photographs (jpg files) using a PC-mounted Firewire card. The scoring of a systematically chosen subset of at least 30 frames per 25m line was then done by identifying and counting the life-form (Table 1) underneath five marks (one in the middle and four near the corners). The relative frequencies of the lifeforms counted were then used as an estimate of their percentage cover.

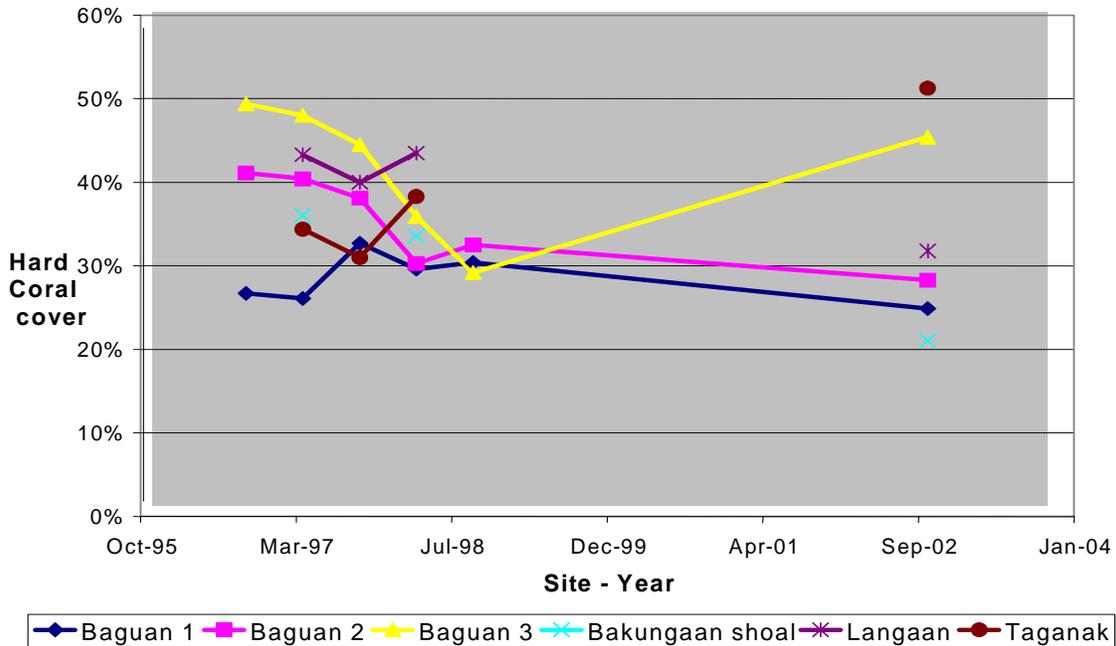
Summary of Results

Graph No. 3 provides a picture of percentage of hard coral cover for the six sites monitored over time. Data points for most sites were collected on October 1996, April 1997, October 1997, April 1998, October 1998, and October 2002. The results were mixed in terms of changes in the abundance of corals. Coral cover have increased in two sites (Baguan Site 3 and Taganak), and is likely fluctuating but stable in one (Baguan Site 1), but has declined in three others (Baguan Site 2, Bakungaan, and Langaan) especially in the last two where impact of sedimentation, and reportedly, of blast fishing is greatest. Comments for individual sites are indicated below:

Baguan Site 1: Coral cover here has fluctuated only by a maximum of 8% over the past six years suggesting the community here is changeable but cover has remained about the same. The community will likely survive the recent decline of 5.5% over the past four years as this is about the error level expected from the video monitoring method used, and since examination of cover of individual life-forms (Table 2) suggests no important change in dominance or diversity patterns. As before, branching *Acropora* (mostly *A. bruegemanni*) are the most dominant corals. Soft corals (mostly xeniids) now were not as abundant as in October 1998 but remains within previous cover levels.

Two monitoring sites in Baguan (Baguan 1 and 3) and in Taganak showed improvement in coral cover during the 4-year monitoring period.

Since the island of Baguan has been zoned as a strict protection zone and human activities are kept to the minimum with only the DENR personnel working in the area, the vicinity was able to recover from a number of incidents of destructive fishing activities. The same thing with the coral area of Taganak fronting the main populated area where an improvement in coral cover was recorded. The immediate presence of the agencies is a deterrent to would-be destructive fishing activities.



Graph No. 5: Percentage of Hard Coral Cover over Time

Recommendation:

The importance of protection of the marine environment is once again highlighted in this indicator. Enforcement of environmental and fishery laws are important in maintaining and recovery of systems that have been under pressure and threats. Lack of presence of conservation personnel in the outlying islands of Langaan and Bakungaan need to be addressed as this can be a factor in the proliferation of illegal and destructive activities in the area. Furthermore, monitoring and recording of status of the physical area and its flora and fauna should be continuous for proper management actions.

Socioeconomic Indicators

S7 Material Style of Life

Material style of life and trends in their asset acquisition can indicate changes in economic status of a community. In the case of turtle islands, appliances such as television are considered top assets representing wealth. Housing materials are not accurate indicator for changes in economic status brought about by the MPA due to the sources of these materials, especially wood. There have been quite a number of incidences of cargo ships carrying processed woods, like lumber and plywoods, passing near Turtle Islands and have sunk near the area and the cargo/boat owners no longer sought the recovery of these loads of materials. These wood products were salvaged by the community and were used in their homes. A lot of timbers coming from the island of Sabah are washed ashore in Turtle Islands which are being cut into usable sizes such as

for posts and walls. Another viable indicator is the number of children per household being sent to school.

This indicator still needs to be assessed further since source of income for some locals are sourced outside of the MPA.

S8 Quality of Human Health

Majority of the population in Turtle Islands are below the poverty level and economic issues like livelihood and income is their priority over health. Delivery of basic services like health is almost negligible and awareness to sound health and sanitation practices are low that illnesses and malnutrition is rampant. Improvement in their quality of health can be a result of an improvement in their livelihood and income. This is an essential indicator in evaluating changes in their social and economic status.

Method used to Measure the Indicator

Data from the 2000 monitoring of common illnesses from all the islands was used as baseline for this indicator. The 2000 data was taken from the records of the Rural Health Unit and from the results of the monitoring conducted by the Barangay Health Workers in partnership with the WWF-Phils. A follow up monitoring on these common illnesses was conducted in 2001 and in 2002 and was compared to the 2000 data (table 2). Validation with the RHU and key BHW was conducted last 2005 in Turtle Islands

Table 2. Reported common Illnesses

	2000	2001	2002
Cough/cold	26	132	17
Fever	64	82	14
Parasitism	27	52	4
Diahrrea	4	73	1
Skin Diseases	25	51	13
Total	156	390	49

ICDP Health report 2004

Summary of results

Increase in the number of incidents in 2001 was brought about by the increase in population in the islands due to migration from Mainland Mindanao and the deportees from Sabah, hoping to try again their luck in Sabah using Turtle Islands as their jump off point. Crackdown operations by the Immigration Department of Malaysia, particularly in Sabah, led to the mass deportation of Filipinos in Sandakan and Kota Kinabalu.

Majority of the deportees are from Mindanao entering Malaysia through the backdoor Turtle Islands. Some also opted to return to the Philippines and let the tension subside, staying in Turtle Islands for easy access once all is clear to return and resume work in Sabah. 2001 was the onset of the health program by WWF-Philippines in partnership with the rural health unit of the municipality. Initially not all households bought the idea of proper hygiene and sanitation like the use chlorine to purify their drinking wells. They were not used to the taste of the 'purified' water. Some found these practices a waste of

time and rather spend it on other things they find more important. In 2002 after seeing improvements in the others' overall health, 90% of the residents adopted the proper practices thus improving their health quality, reducing the number of cases of the common illnesses. A great portion of the population has learned to prevent rather than cure which translates to savings and better performance in livelihood activities.

Recommendation

It is imperative that health programs be integrated in the management plan of TIWS since the community within the PA plays a major role in its resource management. Health problems create disinterest from the people to participate in conservation and would mean intensified resource extraction to cope with financial needs.

HH Income and Distribution Data (Combined S1 S9 and S10)

The Turtle Islands Wildlife Sanctuary is about 242,967 hectares of which 242,649 hectares constitute the marine portion. The marine portion has a 250 hectares is a no take zone (Baguan Island with 500 meters buffer zone from the shore). It is about ---% of the total marine area. Like any coastal community, marine extraction is the main source of livelihood for the community. Proper resource management is critical on the fishery resource for sustainability.

Summary of Results

Fishing remains to be the major source of livelihood for the people. It is also the major income contributor for a household with multiple income sources (Table 3 and 4). Of the different fishing methods, the use of hook and line, followed by the use of gill nets, is still the most prevalent method of fishing among the community. (Graph no.4 of indicator B7). Table 5 shows the different marine related activities in the islands. There was a noted significant shift in livelihood practices from 1998 to 2003 particularly to marine extraction.

Table 3. Household Income Composition per household in Percent

Income Source	1998	2003
Salaries and wages	26%	10%
Marine resource extraction	60	85
Farming	5	1
Poultry and livestock	1	1
Pension	1	
Business proceeds	6	2
Others (remittances, etc)	1	1
Mean monthly average income/hh	P 4,538	P 9,300

2003 Post Term Socio-eco Analysis

Table 4. Percentage of Household by Type of Income Sources

Income Source	1998	2003
Salaries and wages	8%	28%
Marine resource extraction	74	84
Farming	35	55
Poultry and livestock	60	65
Remittances	2	7
Business proceeds	14	19
Others	3	20
Average number of income sources	2 sources	3 sources

2003 Post Term Socio-eco Analysis

Among the marine extraction activities, fishing is the main activity in terms of the percentage of its contribution to the total income derived from marine extraction activities and the households engaged in it.

Table 5. Marine Extraction Activities

	1998	2003
Average income per month	P 3,544	P 9,429
Income Composition		
Fishing	62%	80%
Gleaning	1	1
Turtle egg collection	37	19
Total	100%	100%
Percentage of income from turtle egg collection to total income	23	16
Percentage of Households by Type of Marine Extraction Activities to Total Number of Households		
Fishing	74%	71%
Gleaning	3	27
Egg collection	11	35

2003 Post-term Socio-eco Analysis

S14 Distribution of Formal Knowledge

This indicator refers to the degree of awareness of the stakeholders (especially the community within the PA) with regards to the status of the area as a Protected area.

Method used

A perception survey was conducted by the team, sampling 10% of the total households or 85 households from all the islands randomly. A questionnaire was handed for the recipients to answer. The following are the guide questions:

Table 6. Perception Survey Form

<p>About the Protected Area</p> <p>→Did you know that the Turtle Islands is already a protected area? If yes, how did you know?</p> <p>→What is a 'protected area' to you? How did you get this information?"</p>
--

Benefits from the Protected Area

→ Did you or any community members benefit from Turtle Islands? From this protected area? Enumerate

About Marine Resources Extraction

→ In your experience, are there any changes in the amount of fish catch through the years particularly before and after declaring the place as a protected area?

→ Does this have to do with the place being a Protected area?

PA Management System

→ Who do think are the ones managing the PA? Refer to guide--table 6.1

→ Do you have any suggestions with regards to the management of the protected area?

Resource Management

→ What are the problems and issues regarding the resource management are you experiencing?

→ What do you think are the problems and threats that your marine resources will encounter in the future?

→ How do you see the protected area 10 years from now?

Table 6.1

	Management System	How many years	Are you satisfied with their system
LGU			
DENR-IPAS			
DENR-PCP-PAWB			
PAMB			
PNP			
Navy			
Marines			
MARINA			
Coast Guard			
Maritime			
DA-BFAR			
NGO			
Others			

Summary of results

The survey resulted in 57.65% (49 out of 88) of the total sample households said they are **not aware** that Turtle Islands is a protected area and 42.45% knew that it is a protected area.

Although some did not know that the Turtle Islands is a protected area, a number had been informed regarding protected area. 24 households said that they got the information regarding PAs from the DENR, 9 respondents said that they learned it from WWF, 7 said it was from the LGU and another 7 saying that they learned it from the other community members.

A couple of reasons revolve around the interpretation of the data since more than half of the respondents were not aware of the PA status of Turtle Islands and just half of the total respondents got informed of what a PA is considering that the PCP-PAWB-DENR has been present in the area since their commissioning in the 1940s and WWF has been doing conservation work in the area for almost 10 years already.

Since the sampling of the respondents has been random, some respondents could have been transients and only present in the area just recently. WWF has been doing extensive IEC activities in the area until 2004 during its ICDP phase, so these respondents could have been around in the area for 2 years or less. Another reason why such low awareness on the issue on protected areas could be that there is still a need for continuous IEC in the area. Another reason could be that issues regarding conservation and environment could be that it is the least priority of the community, giving priority attention to their social and economic issues especially on the livelihood and income.

S15 Percentage of Stakeholders Groups in Leadership

In the case of Turtle Islands, leaders' involvement in the MPA management is through their membership to the PAMB. They represent sectors of the community within the PA (please refer to section II for the composition and creation of the management board).

Although each sector is represented, the representatives often overlook the importance of providing their constituents with the necessary information regarding the management of the MPA, which is one of their main duties as PAMB member. This creates problem in terms of awareness in the development within the MPA.

Governance Indicators

For the governance indicators, the evaluation team used a tool developed by the Coastal Conservation and Education Foundation (CCEF) for MPAs in order to obtain part of the data needed especially for Indicator G6. A workshop with the PAMB and the PA staff served to validate and analyze the initial data obtained from the use of the CCEF tool.

G1 Level of Resource Conflict

There is a need to identify level of resource conflicts due to the broad base of stakeholders in the Turtle Islands and the wide range of their interests. This indicator determines the effectiveness of management response when conflicts arise and the degree in which they are addressed.

During the workshop and interviews with stakeholders, 2 major conflicts were recurring themes:

A. Conflict Turtle Eggs Collection and Issuance of permits

Turtle eggs are a resource that the people in the Turtle Islands feel they have a “right” to use. Turtle egg harvest has been a traditional source of livelihood for the community. The social analysis conducted in 1999¹ showed that turtle egg collection is not a regular source of income but an occasional bonus. The permit provides the local community members the opportunity to access capital to buy boats, repair houses and send children to school. Currently, this also provides the only source of income for the Municipality of Turtle Islands

Egg collection was identified as a critical source of income—while the returns are not stable and regular, it is perceived as a non-disposable income. The government recognized the need to regulate harvest in the interest of conservation. So in 1982, the 60/40 scheme through DENR Ministry Administrative Order 33 was instituted. During open season from April to December every year, this allowed permit holders to harvest 60% of turtle eggs, turn-over 30% to hatcheries and 10% for marine turtle foundation. This was the system in place for more than 20 years.

In 2001, however, due to the enactment of RA 9147 (Wildlife Conservation Act) which totally bans harvest of endangered species, this system broke down leading to major conflicts in the area.

In compliance with the law, DENR through the PCP stopped issuance of permits in 2001. The community and the local government did not want to comply as this meant loss of income for the communities as well as loss of municipal revenue. During the period 2001 to 2004, as an act of goodwill to the people, LGU decided to take over the issuance of permits and continue with the 60-40 scheme. However, PCP could not accept the 30% of turtle eggs for transplanting from the LGU as this would mean tolerance of law violation. Furthermore, due to the antagonism of community to PCP because of the ban, local PCP wardens were unable to perform monitoring and patrolling. During this time, it was speculated that 100% of the eggs produced in the collection islands were harvested.

A summary of stakeholders involved, their interests, the issues and impact on goals of protected area are shown in Table 7. Status of conflict resolution is also indicated.

¹ Cola, Raoul Social and Institutional Assessment. 1998

Table 7 Stakeholder conflict on Turtle Egg Collection

Stakeholder Action	Stakeholder Interests	Issues	Impact on goals of Protected Area	Status of Resolution
DENR Implement a total ban through non-issuance of permits	Conservation of resources for sustainable livelihoods; National and International commitments	Limited resources and lack of capacity hindered DENR from enforcing the total ban. They also lost community support and trust as community felt their right to harvest and benefit from the resource were taken from them and that DENR was not sympathetic to their needs.	There was a breakdown in terms of management systems in the area. DENR through PCP lost control of regulated harvest and have difficulty getting it back because of lack of legal basis. Exploitation believed to reach 100%	Dialogues and feedback with stakeholders
LGU takeover	Benefits for the community; Only source of municipal income is from egg collection	LGU don't have legal mandate to regulate and issue permits due to Wildlife Act. LGU does not have technical capacity to manage hatchery. Awarding of permits are claimed to be politically motivated.	Inequitable sharing of benefits	Filed municipal resolution; sent position to DENR
Community members (buyers, permit holders)– noncompliance to the law, continued harvest of turtle eggs	Food and livelihood	Community members have difficulty of letting go of this “bonus” which they’ve claimed as their “right”	Limited access to the permits, benefits from egg collection only go to a few people	Community starting to feed back during consultations/dialogues

Process of conflict resolution

1. In 2001, LGU wrote a petition to the Office of the Philippine President requesting for exemption from the total ban as per RA 9147. This was also endorsed by the Regional Governor of ARMM.
2. Office of the Philippine President has sent directives for a 5 –year phase in phase out scheme to allow TIWS local community a 5-year moratorium on total ban on egg collection (letter signed 2002)
3. DENR has also taken steps to resolve the conflict. Stakeholder meetings are ongoing. They are looking at co-management in the area with the LGU and Provincial Government through a MOA. This agreement is hoped to come up with decisions in terms of meeting the various conflicting interests of the stakeholders.
 - 60/40 scheme put back in place in November 2004 after dialogues between DENR-PAWB, Municipal Mayor and Provincial Government
 - Recommendation for issuance of permits to come from the OPASu to be an agenda for PAMB meeting to be held sometime in October 2005

To resolve the issue of to ban or not to ban, a couple of options are being explored:

- 1) Exemption of the Turtle Islands from the wildlife act through legislation (i.e. PA bill)
- 2) Total phase-out with the entry of alternate livelihoods.

Open communication lines, stakeholder involvement were factors that allowed the process of resolution to take place. Constant dialogues, proper information and building of common objectives and goals were important in moving towards peaceful solutions.

STRATEGIES THAT WORKED

Consultation meetings on-site and dialogues between officials of DENR, Provincial Governor and Mayor was a big factor in beginning the process of conflict resolution pertaining to the issues associated with egg collection. Follow-up by the PASu onsite and pressure from various sectors also serve to support the resolution process initiated.

DISCUSSION

There remains a lot of confusion on the moratorium as approved by the Office of the Philippine President:

There is still no legal basis for DENR to issue permits as the national law clearly stated that this act is illegal. The next question is, when is the duration of the moratorium? There are 3 interpretations on the instructions from the Office of the President: 1) 5-year moratorium starts 2001 – 2006 based on effectiveness of the Wildlife Act 2) 5-year moratorium will start upon signing of the Memorandum of Agreement between LGU and DENR 3) 5-year moratorium to start on the date of the moratorium (2003-2007). To date, the MOA has not been finalized and signed.

RECOMMENDED ACTIONS

Short-term:

Issues about permit issuing body to be resolved through a PAMB resolution targeted for 4th quarter 2005. Anticipating the end of the 5-year moratorium in 2006, this issue will be incorporated in the Memorandum of Agreement between the Provincial, Municipal governments and DENR.

During the workshop and review, a future conflict on resource use was identified. After the moratorium is over, the question of whether a total ban is realistically implementable arose. Will the Office of the PASu have the operational means to enforce the total ban considering the present set-up with limited staff, credibility problems and lack of resources? There remains a big challenge in terms of patrolling the nesting beaches (total of 5.9 kilometers) of 6 islands, five of which have people residing near the beaches. Even the question of the legality of the moratorium is still unclear.

A more long-term solution identified would be to incorporate an exemption from the Wildlife Conservation Act for the TIWS through the Protected Area Bill being drafted by DENR.

There is a need to come up with a SYSTEM for better (Implementing Rules and Regulation of the laws) processes for egg collection (to promote honesty and credibility of all concerned) and to make the system more efficient. It is also critical that issues on the involvement of enforcement agencies in illegal activities be resolved as soon as possible.

Another issue that needs attention is on fishery resource use concerning the Malaysian shrimp trawlers and other commercial fishermen competing with small-scale municipal fishers.

Stakeholders involved

Malaysian shrimp trawlers encroach in the waters surrounding the Turtle Islands Wildlife Sanctuary regularly. These trawlers are violating international treaty limits, Fisheries Code of the Philippines and Protected Area boundaries. They lead to sea turtle mortalities and destruction of soft-bottom communities. And most recently, local fishermen are feeling the effects of the presence of commercial fishermen in their waters through decrease in their fish catch. There is a growing perception that the trawlers are depriving local fishermen of fish catch.

Around 200 plus Malaysian trawlers were estimated to have been allowed by local government and agencies to operate in the area through informal arrangements. However, in November 2004, the Municipal Mayor has advised DENR during the consultation meeting that the municipal government has taken initiatives to reduce the number of Malaysian trawls in the area. Unofficial sources report that tampasak has been

reduced from 200 to 18. The remaining 18 vessels are claimed to be owned by Filipinos residing in the Turtle Islands. Provincial Governor is also supportive of this effort.

RECOMMENDED ACTION

1. The DENR should file cases of apprehended illegal entrants.
2. PAMB should come up with a resolution in order to impose administrative fines for destructive fishing within the PA waters

G2 Existence of Decision-Making and Management Body

Summary of Results

Republic Act 7586 (National Integrated Protected Areas System Act) has a provision for the creation of a Protected Area Management Board (PAMB) which is a policy-making body. In the case of TIWS, the PAMB is composed of 15 multi-sectoral representatives of the community and the Regional Executive Director of the DENR Region with jurisdiction over the PA:

1. Chairman: DENR 9 Regional Executive Director (RED)
2. Municipal Mayor
3. Provincial Government representative - Provincial Planning & Development Officer (PPDO)
4. Fisheries Office Municipal Agriculture Office, Department of Agriculture and Fisheries-ARMM (MAO-DAF-ARMM)
5. Provincial Environment and Natural Resources Officer, Tawi-Tawi -(PENRO)
6. NGO - (WWF Philippines) Program Manager
7. People's Organization - Turtle Islands Fishermen Association
8. Autonomous Region in Muslim Mindanao - Director, PAWB-ARMM
9. Local NGO- SAHAYA Foundation
10. People's Organization - Christian/Catholic Community Org.
11. Barangay Captain - Dambilah,
12. People's Organization - President, Mapun Cultural Com.
13. People's Organization - Islamic Religious Sector
14. Barangay Captain Likod
15. People's Organization - Tausog Cultural Com

It is to be noted that 5 members out of 15 (or more than 33%) are not based on site. The RED, who sits as chairman of the board and who has the authority to convene meetings, is based in Zamboanga City approximately 460 km away (26 hours away by boat). The PPDO, PENRO and the NGO Sahaya Foundation are based in the provincial capital, Bongao approximately 200 km away. The DENR ARMM representative is based in Cotabato City 700km away. Furthermore, it is to be noted that the municipal officials like the Mayor, Barangay Captains and the MAO are rarely present in the area and are also based either in Zamboanga or Bongao. The PAMB meeting is very difficult to

organize. During the period 1999 to 2001, there have only been 3 PAMB meetings conducted and these were all in Zamboanga City and not on-site (table 8).

Table 8. Matrix of the PAMB Meetings

Meeting Date and Venue	Attendance
First PAMB meeting – July 27-29, 1999 Bongao, Tawi-Tawi	CPPAP Finance and Legal rep CPPAP desk officer 4 TIWS Mayor Tang PENRO Jonel and staff CENROS PPDO RTD PAWD n staff TIWS staff
Second PAMB meeting – November 2000 Zamboanga City	CPPAP director PAWB director PCP staff KKP Legal from region 9 Desk officer for TIWS LGU TI Mayor Tang PENRO Jonel CENRO PAMB members PPDO RED 9 RTD PAWD Chief TIWS staff
Third PAMB meeting – September 3-5, 2001 Zamboanga City	<u>PAMB members</u> RED Maximo O. Dichoso - DENR IX Hon. Sarajul Jihim represented by Ryan Satal Dir. Romeo Manzan - PAWB-DENR ARMM PENRO Jonel I. Moh Monel represented by CENRO Khonrad Mohammad PPDO Engr. Nestor Delasas Brgy. Chairman Bibo H. Adil Brgy. Chairman Basun Ibnosali Sonny Musilim - Mapun Cultural Community Bashir Ingkoh - Sahaya Foundation, Tawi-tawi Mukhtar Basri - Tausug Cultural Community Quirino Duhaylungsod - Christian/Catholic Organization Misaral Tang - Turtle Islands Fishing and Livelihood Project Association Joel Palma - Kabang Kalikasan ng Pilipinas

The NIPAS Act states that PAMB should meet en-banc at least twice yearly and that a quorum of more than half of the membership is needed to constitute a valid PAMB meeting. Due to the geographical distance and the need for action and meetings on the

ground, there was a PAMB resolution² in September 2001 authorizing on-site PAMB members to convene meetings. However, these were still subject to approval from en-banc PAMB.

During the period 2001 to 2004 however due to lack of funds, unstable political situation and the absence of PASu and DENR staff on the ground rendered the PAMB members became inactive. A factor in re-vitalizing and re-instituting systems was the presence of Higher Officials in the PA. The PAWB director’s visit to the Turtle Islands together with some senior officers in November 2004 was important in initializing and mobilizing the PAMB and the PA staff. Currently, membership terms are being renewed. The on-site PAMB members have started to meet regularly again and are getting involved in management issues for the area.

The PAMB as an institution mechanism to ensure cooperation between National government, local government and concerned private organizations is ideal but there continues to be a need to ensure that proper sectoral representation will be accomplished for the TIWS. There is a need to build up capacity of the PAMB and to make it work. It is important for orientation and clarification of functions and roles. PAMB and LGU overlaps should also be clarified, mapped out and resolved in order to prevent conflict and confusion. Internal rules/regulations for PA management need to be drafted. This will systematize conduct of business of the TIWS PAMB. This should cover who should call regular and special meetings, agenda formulation, quorum, conflict resolution processes, frequency of meetings, venue of meetings etc. An en-banc PAMB meeting targeted for last quarter of 2005 is hoped to set up systems and to put them in place for improved performance of the PAMB.

G5 Existence and Adequacy of Enabling Legislation

There exist a number of policies and legislation pertinent to the area and in line with the goals and objectives of the PA. However, most of them are general. The most specific policy is the Presidential Proclamation which mainly defines the boundary delineations and does not detail management, operations and budget:

Table 9. Summary of Major Policies Pertinent to Management of the TIWS

Title	Main Provision	Year of Issuance	Agencies involved
MNR Administrative Order No. 8- Establishment of Certain Islands in Tawi Tawi, Palawan and Antique as Turtle Sanctuaries	Seven islands including Baguan of Turtle Islands as set aside as sanctuaries	1982	LGU, DA-BFAR, DENR
Presidential Proclamation 171- Declaring the Turtle Islands Municipality and its Surrounding Waters Reckoned 15 Kms. from the	Establishment of the 6 islands of Turtle Islands as a Protected Area	1999	LGU, DA-BFAR, DENR, Congress, NGOs

² PAMB RESOLUTION 2001: “Authorizing Barangay Captain Basun Ibnosali to facilitate/Lead On-Site PAMB meetings in the Event of Emergency Cases Requiring immediate action. Barangay provided that there is going to be a clarification on his functions and limits of the authority of the on-site PAMB”.

Shoreline of each Island pursuant to the NIPAS Act, and shall be known as Turtle Islands Wildlife Sanctuary.			
Republic Act 7586- An Act Providing for the Establishment and Management of National Protected Area System	Establishment of protected areas for biodiversity conservation and sustainable development	1992	
Turtle Islands Heritage Protected Area (TIHPA)- Joint management of TIHPA Between Philippines and Malaysia and to protect TIHPA as a Hawksbill and Green sea Turtle Sanctuary through an integrated management program	Establishment of the first trans-border protected area for sea turtles	1996	National government of Philippines and Malaysia
MNR Administrative Order No. 33- Regulations Governing the Collection of Marine Turtle Eggs in Tawi Tawi and Reiterating the Duties and Responsibilities of Deputy Conservation Officers and Game Wardens	Establishment of arrangement wherein 30% of the turtle eggs are for conservation, 10% for a Foundation and 60% for exploitation	1982	DENR
MNR Administrative Order No. 10- Deputizing the Governor, Vice Governor of Tawi Tawi and Mayor and Barangay Captains of Taganak as Conservation Officers.	Use of local officials to enforce laws to support MNR organizational capability	1982	
MNR Administrative Order No. 357- Creating a Council of Deputy Conservation Officers in Tawi Tawi	Enlisting local officials and Southern Command to enforce conservation laws	1982	
MNR Administrative Order No.1- Deputizing Provincial Governors and Municipal Mayors in Areas Critical for Protection of Marine Turtles as Conservation Officers	Expansion of organizational capability of the conservation effort by involving the local executives	1983	
Local Government Code of the Philippines	Devolution of power/authority to the local gov't of its territory from the national government	1991	LGU
Republic Act 8550 – Fisheries code of 1998	Provides for the development, management and conservation of the fisheries and aquatic resources and integrating all laws pertinent to it	1998	LGU, PNP-Maritime Group, PCG, DA-BFAR, deputized fish wardens, Phil. Navy, DENR
Republic Act 9147- provides for the Conservation and Protection of wildlife Resources and their Habitat	Conservation of endangered wildlife species in its natural habitat	2001	
DENR Administrative Order no. 15- Listing all marine turtles as endangered species	Alignment to the Philippines' commitment to the Convention on	2004	

	International Trade for Endangered Species (CITES)		
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Policy Environment in the TIWS

There are many policies affecting and influencing management in the area. All of the republic acts were created at the national level. Most of the national laws are driven by international commitments (e.g. Convention on Biological Diversity, Convention on International Trade of Endangered Species). There is a lack of consultation prior to passage of these national laws and a number of them are not suited to the needs on the ground. In the case of the Turtle Islands, instead of providing an enabling environment for conservation, the national policies in fact deter and are not effective due to its inapplicability at the ground level. Communities’ lack of participation in the passage of the law does not create ownership of the process which eventually leads to non-compliance. Furthermore, there is a major gap in terms of capacity and resources to enforce policies which create a vacuum as more and more laws are being passed at the national level with no system of social preparation for communities affected by the law.

The NIPAS Act centralizes management authority with the DENR. For the case of the Turtle Islands, geographical location and jurisdictional conflicts exist. DENR Region 9 based in Zamboanga City has management control under NIPAS. However since Turtle Islands is remote, access and transportation is difficult, TIWS is not a priority of the regional office and in the past, PA personnel prefer working off-site and have difficulty reporting to the area. No funds have been allocated. Furthermore, the whole municipality of Turtle Islands has been declared under the TIWS. NIPAS does not have any specific provisions for jurisdictional conflicts in cases of municipalities entirely covered inside a PA. There is a need for integration with the LGU Code RA 7160 as possible conflicts have been identified. Political and administrative jurisdiction of the TI also falls under Tawi-Tawi Province and under the Autonomous Region in Muslim Mindanao. There have been talk in the past of turning over jurisdiction to the ARMM but to date, this has not been resolved.

In the case of The Wildlife Conservation Act, this not only failed to reach its objective of conservation but actually became the source of major conflict in the area and led to a breakdown in a regulatory mechanism that was acceptable and working for the past 20 years. Park wardens were forced to adhere to the law and stop resource harvesting but had no capacity to enforce which eventually led to massive exploitation which is contrary to the objectives of the Wildlife Act and the TIWS protected area. Furthermore, there was a loss of management control as threats to DENR personnel prevented them from conducting regular PA management business.

Also, since some of the laws are general and ambiguous, interpretation varies and is very subjective. The most specific law pertaining to the area is the Presidential Proclamation declaring the site as the Turtle Islands Wildlife Sanctuary. However, this lacks the power

and the strength of a Protected Area Bill which is a requirement for PAs included in the NIPAS.

RECOMMENDATION

The PA bill for Turtle Islands should be an encompassing law drafted specific to the needs of the PA already. It should be able to correct and address provisions that need to be resolved in order to provide a true enabling environment for PA management. The process by which this law is to be drafted is also crucial. If possible, the law should be collaboratively drafted by the major stakeholders in the area. In the past, Municipal Mayor has expressed that they have been continuously left out in the process of drafting PA bills etc.

G6 Existence and Allocation of MPA Administrative Resources

Resources for MPA management and administration are very important and can be a factor for the MPA’s success. TIWS has been declared a PA through a presidential proclamation and thus receives an allocation from the National Government. A closer look should reveal if this is actually happening and describe the scenario of the PA administration on the ground.

The data for this section was generated using the evaluation tool of CCEF.

From Table 10, we can see that a total of 11 PA staff is based in the area. However, there is a big gap in terms of skills and capacity

Table 10. Human Resources as of 2005

Protected Areas Staff	Actual No. of Persons engaged	Years in Present Position	Remarks
Protected Area Superintendent – Chief Operating DENR officer of the PA. She is directly responsible to PAMB	1	2	PASu is committed and based in the area but lack technical capacity; position not yet stable, limited institutional support due to geographical distance; very limited staff to work with
Protected Area Technical staff	1	5	
park wardens	9	>10 years	local wardens of the PCP are currently detailed under the Office of the PASu. These wardens are trained in turtle

			monitoring and research and has limited capacity for PA management
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Table 11. Equipment and Facilities

Equipment and Facilities	No. of Units	Status of Functionality	Estimated Age in years	Remarks
PA Office	1	Functional		
Rangers station	3	Functional but needs repair	>5	
Speedboat	1	Not serviceable	5	Barely used
1 boat (40HP+25HP)	1	Functional but needs maintenance		Can carry 4 passengers, maximum of 5
Computers	1	functional		1 available for use by OPASu but owned by TI High School
Radio	6	4 Fully Functional, 2 functional but needs repair		
Telecommunications	Satellite phone	Functional but needs load		
Generator Set	1	Needs repair		1 personal unit genset owned by PASu made available for use of OPASu

Income for the PA is generated from a 10% share from egg collection. Since 1982, the accumulated collection amounted to P908,000. The collection of the 10% was stopped during the period 2001-2004 due to the breakdown in management. Resumption of collection started this year after dialogues with LGU and provincial government and members of the PAMB. This is currently being used for day to day operations. Under the NIPAS Act, this forms part of the Integrated Protected Area Fund (IPAF)

RECOMMENDATIONS

The following needs have been identified

Staffing

1. Additional Staff is needed to fully cover the whole area of the MPA.

Equipment:

1. service boat (2) for monitoring
2. computers
3. videocam/camera
4. tape recorder or documentation

5. generator set – 1 taganak

Research and monitor

1. GPS devices
2. transect lines,
3. diving gears

Funds for Operations:

Base funding on actual management and financial workplan
Infrastructures present in the area needs to be finished

G9 Degree of interaction between Managers and Stakeholders

The degree of interaction between TIWS managers and the stakeholders was measured by generating information about attendance to PAMB and inter-agency meetings. There are a great number of stakeholder groups in the area but the major groups are identified thus: Local Government Unit, Provincial and Regional Government and PAMB. It has been described earlier that local stakeholder groups are supposed to be represented by the LGU and the PAMB.

The records of meetings were obtained from the Protected Area Superintendent Office. It was found out that 3 en banc PAMB meetings were conducted during the period 1999-2001 and these happened in Zamboanga City. The PAMB en-banc meetings had the dual role of capacity-building for the members and policy-making for the PA. Orientation about the roles and functions of the PAM, presentation of pertinent policies affecting the area and discussion of status of conservation projects were some of the agenda. The management plan, protected area bill, ecotourism development, permit system and membership to the PAMB were common topics in the agenda.

No en-banc PAMB meetings were recorded during the period 2001 to 2004 due to a management breakdown. A major consultation meeting attended by the regional government (ARMM), Provincial Government, LGU and DENR was conducted in August 2003 in Zamboanga to resolve issues brought about by the implementation of the controversial Wildlife Conservation Act. Community consultations were recorded in September 2003 which was an outcome of the agreements in the August meeting. The follow-up to this happened a year after. In November 2004, DENR pursued consultation dialogues with the municipal government, provincial government and local PAMB members. These dialogues served to open communication lines between the major stakeholders and some compromise agreements were reached. This time also saw the assignment of an Officer-in Charge Protected Area Superintendent who is based in the Turtle Islands. The new PASu was able to follow up on the agreements and regularly organized meetings for on-site PAMB members and inter-agency officials. Review of the records indicate that the on-site PAMB held monthly meetings since November 2004.

Analysis

During the period 1999 – 2003, since on-site PA staff had limited presence in the Turtle Islands, there was minimal interaction with stakeholders onsite.

Activation of PAMB occurred only after the Office of the PASu was established through the assignment of an on-site staff as OIC PASu and the detailing of the local wardens of PCP under the Office of the PASu.

It is to be noted that interaction has been limited to attendance to formally organized meetings. It was only in 2005 that the conduct of regular meetings on the ground with various members of local agencies and PAMB has started. Furthermore, it is not yet determined if the sectoral representation in the PAMB is sufficient to represent majority of the stakeholders (i.e. do PAMB members feedback to their respective groups about outcome of meetings, decisions etc?)

G10 Proportion of Stakeholders Trained in Sustainable Use

This indicator reviews the capacity-building program for the area and seeks to find out if PA staff and stakeholders were trained in protected area management and sustainable use.

The files of the Office of the PASu were reviewed and the training reports were accessed. Below lists the trainings conducted:

Table 11. Trainings Acquired

Date	Training	Number of participants
June 11 1999	PAMB Orientation	11 participants
Nov 1999	Fish Warden Deputation Training (conducted by WWF)	4 PAMB members, local community Fish Warden
Feb 2001	BMS Training	1 PAMB/MPDO; 1 PASu
Sep 2001	Cross-visit to Olango Island Community-based Ecotourism (WWF)	9 PAMB/Reg 9 staff
Sep 2004	Wildlife Identification	PASu
March 2005	Management Effectiveness Evaluation Training	1 PASu, 1 Reg 9 TIWS Desk Officer

Discussion

There were a number of training activities conducted but there was no comprehensive program to build up capacity of staff as well as members of the PAMB. There was initial investment for 3 trainings for a former PASU but he was not able to apply any of the skills on the ground as he got reassigned elsewhere. Based on the reports and the interviews conducted on the ground, it was found out that most of the on-site staff and stakeholders have not received any form of training on PA management.

During the evaluation, the need for trainings was highlighted and the following were identified as important for management of the TIWS:

- Para-legal training
- Policy orientation training
- Biological Monitoring System Training.
- Cross-visits/Study Tours to other MPAs
- Education Program for Youth (Ecology Camp, Turtle Watching)
- Dalaw-turo

The evaluation team as well as the PA staff and stakeholders believe that capacity-building should be an ongoing process.

G13 Level of stakeholder involvement in surveillance, monitoring and enforcement

Enforcement was seen as important to management of the protected area. However, it was discovered that there were no mechanism/guidelines formulated regarding enforcement for TIWS. It was decided to keep this indicator since the absence of an enforcement program also describes an aspect of marine protection.

Furthermore, during the conduct of the review, it was established that there is a need for a comprehensive enforcement program for the area since there are major threats to the resources. A number of policies are in place but without the capacity and the resources to enforce and clear guidelines for it, these policies would be in vain. There have been some sporadic efforts to enforce, but there are a lot of factors that have rendered these efforts futile. First, there remain a lot of confusion regarding apprehension procedures and jurisdiction. Second, the great geographical distance to the nearest prosecuting body and limited communication access to provincial and regional offices is a great challenge in terms of following through with filing of cases for apprehended offenders. Thirdly, illegal fishers are known to pay protection money to influential leaders of the local community, municipal, provincial and national government, and enforcement agencies based in the area.

In terms of organization, there are more than enough enforcement agencies based in Turtle islands, however there is a lack of coordination between these agencies and some jurisdictional conflicts exist. Furthermore, assignment of personnel is temporary in nature due to constant rotation and shuffling since they are part of the military. This tended to make enforcement dependent on the capacity and willpower of the senior officers. There were periods when the Commanding Officer of the Philippine Marines was active in pursuing illegal fishers and poachers. But when the officer was replaced, the enforcement activities were not pursued.

The following recommendations were generated during the evaluation:

- Consider a MOA/ agreement between inter-agencies/DENR on-site for enforcement
- Capacity-building/training on enforcement procedures
- Operational costs to be shouldered by Office of the PASu. Funds will be allocated from the IPAF.
- Procedures for enforcement and rules/regulations need to be clarified. Standard operating procedures/manual of operations should be drafted.

IV Lessons Learned

The Turtle Islands Wildlife Sanctuary has been considered as a top ten priority site for the implementation of the National Integrated Protected Areas Systems. This evaluation process was timely and much needed for the MPA. Since its establishment as a protected area in 1999, PA staff did not have a chance to revisit and review the Initial Protected Area Plan. In fact, because of the high rate of turnover of PA staff and administrative shuffling on the ground, the incumbent team is not familiar with the actual IPAP. For

some, it was the first time to view the goals and objectives as stated in the IPAP document.

During the process of evaluation, it was found out that there is a need to redefine the goals and objectives of the TIWS in order to make it clearer and more measurable. It was challenging to select indicators for measurement of effectiveness as most would apply based on the objectives of the TIWS as stated in the IPAP.

The evaluation activity also served to highlight the need for an updated and workable plan for the area. The results of the assessment will be used for the formulation of a realistic and workable management plan for the area. The TIWS staff and the members of the PAMB are motivated to pursue the finalization of this plan. The data generated from the assessment can be used as baseline data and existing indicators can further be streamlined and made suitable to the area. The evaluation can be a basis for the setting up of monitoring and evaluation systems so that indicator measurements can provide meaningful results over time.

Implications for the Management of TIWS

The evaluation activity was an opportunity for the PA management team to step back and analyze/interpret the outcome of conservation program and activities for the area. This exercise helped to document the factors and the issues related to effective management. Because of the review, it was found out that most of the threats currently being experienced by the TIWS can be traced to the breakdown of management and administration systems during the implementation of a national policy which was unacceptable for stakeholders in the area. It was important to acknowledge past mistakes and system failures so that improvement could take place. It was found out that the centralized system of management by the DENR is not effective in protecting and conserving the area. Conservation managers need to be present. Continuous communication and engagement of all stakeholders are important especially because of the different (occasionally conflicting) interests. It will be noted that the assignment of area-based personnel was a factor in putting back in place a system of management which while imperfect is seen to be working for the area.

Benefits of the Experience

The evaluation process also provided the venue by which resolution of conflicts was initiated. The various stakeholders were engaged in the process of evaluation and the results once presented, brought to attention the many issues besetting the management of the TIWS. The process facilitated communications and dialogue between the multiple stakeholders in the area.

During the evaluation period the Protected Area Bill for the Turtle Islands Wildlife Sanctuary was submitted to the Senate. Learning from past experiences of legislation

submitted at the national level without prior consultation and collaboration on the ground, the evaluation team was able to come up with policy recommendations based on the discussions on the field during the evaluation activity during the subsequent senate hearings and investigation. The evaluation results served as a basis for lobbying and bringing into focus the need for an appropriate and acceptable policy for the area. Attention was also focused on administrative concerns especially lack of personnel, lack of capacity and lack of resources for management of the area.

The results of the assessment will enable those in charge of the TIWS to make management decisions that are appropriate and also work towards the attainment of the objectives for the area.