

Turtle conservation in Pulau Perhentian Marine Park



Project proposal for Phase 1

Written November 2009



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1 Executive Summary

Ecoteer Community Interest Company (Ecoteer) are seeking the approval to run a volunteer program based in the Perhentian Islands Marine Park using facilities at Bubbles Dive Resort in 2010 and the Perhentian village from 2011. The aim of the project is to further the understanding of the population dynamics and nesting behaviour of green turtles in the Perhentian Islands Marine Park and support the Department of Fisheries and Department of Marine Park with their conservation of sea turtles and the marine environment respectively, by increasing awareness, direct action and collection of relevant scientific data. The project will run over 5 phases with Phase 1 starting in 2010 focusing on education (running a fortnightly marine conservation club at Sekolah Kebangsaan Pulau Perhentian being named the Turtles need Trees club, awareness trips at Tanjung Tukas, and awareness talks to be given to guests of Bubbles Dive Resort), data collection to answer the question “Does a change in forest composition affect the nesting sea turtles of the Perhentian Islands?” (Tagging of nesting sea turtles, fortnightly coral reef, sedimentation, beach erosion, river discharge and forest surveys all at Tanjung Tukas) and providing new income for the local community through usage of the facilities of Bubbles Dive Resort (a Malaysian owned resort), regular hire of boatmen and fortnightly villagestays at Kampong Perhentian. Collaboration with local research institutions particularly Universiti Malaysia Terengganu and other related organizations are being proposed. Ecoteer proposes to start an annual event called ‘Walk for Turtles’ where a small group of people (max 5) walk on all the beaches of Terengganu (mainland and islands) collecting body pit and track data as well as increasing sea turtle awareness among the Malaysian public. The ‘Walk for Turtles’ will start on world sea turtle day, the 16th June every year, this is a suitable time to sample as it is in the middle of the high nesting period. The program in 2010 is projected to create between RM120,000-240,000 for services in the marine park with between RM13,000-20,000 going directly to the village. The financing of the project will be coming from volunteer fees (RM200,000) and donations from Ecoteer (RM20,000) and Chislehurst Grammar School, UK (GBP500). The balance sheet for 2010 predicts a profit of RM1,375.

If the project is approved, and the first year successful, the second year will be run by a new Malaysian sea turtle conservation organisation, named Help Our Penyu or HOPE. HOPE is being set up by Ecoteer in 2010 and it will manage and expand the conservation program started in 2010 to other sites in Malaysia focused primarily on increasing the nesting sea turtle numbers in Terengganu. At every project site HOPE will conduct conservation through community involvement, education, conservation of all adult life stages and research.

In 2011 and 2012 we propose to run an *in-situ* hatchery at Pinang Seribu with volunteers staying present 24hrs a day. To enable this to happen a small eco-friendly accommodation and storage space is required and will be built behind the tree line using solar panels, composting toilets, water brought in daily from the village and a board walk to reduce impacts on the stream and surrounding forest. The project also proposes to hire either Department of Fisheries staff or villagers to accompany the volunteers in case of illegal turtle egg collectors. The payment of the villagers needs to be discussed but we propose only the people working with us can take a small percentage

of each nest laid (which will be reduced each year) thus controlling illegal egg collection and respecting the villagers that sea turtle egg consumption is part of their culture until we can offer a greater number of alternative livelihoods. The project in 2011 will also include a maximum of 10 volunteers staying at the village 7 days a week and research which started in 2010 in Tanjung Tukas to be replicated at more sites around the marine park. The presence of the volunteers in the village will facilitate more contact time between the volunteers and the children further enhancing their marine awareness and English language skills. In 2011 and 2012 the project is estimated to create between RM220,000-400,000 per year for services in the marine park with RM81,000-140,000 (village accommodation, food, in-island boat trips and local employed staff) going directly to the village. The main financing for the shelter at Pinang Seribu (RM75,000) which is the main development in 2012 will come from a RM50,000 interest free loan from Ecoteer. However Ecoteer will be seeking sponsorship from the private sector to help fund this project to eliminate the need for the loan. HOPE will be employing new members of staff 1 position will be given to a local villager(s) and the other to a Malaysian to act as an onsite facilitator at Tanjung Tukas. In 2011 the project makes a profit of RM11,625 and an end of year balance of RM13,000.

In 2012 the main difference we propose is the volunteers to assist the Department of Fisheries staff in sea turtle egg collection on other beaches and a new weekly club as directed by the school headmaster. The year 2012 is a time for the project to settle and results in profits of RM8,300 inclusive of a RM10,000 loan repayment to Ecoteer. The project at the end of phase 1 is predicted to have a balance of RM21,000.

Overview

2010

- Turtles need Trees club at Sekolah Kebangsaan Perhentian with 1 nights stay in village accommodation;
- Environmental awareness for tourists staying at Bubbles Dive Resort;
- Tagging of nesting sea turtles at Tanjung Tukas;
- Terrestrial and marine research at Tanjung Tukas in collaboration with Universiti Malaysia Terengganu;
- Focus group in the village;
- Universiti Malaysia Terengganu intern (1) and thesis students (2) based at Tanjung Tukas;
- Walk for Turtles

2011

- Turtles need Trees club at Sekolah Kebangsaan Perhentian and other schemes as directed by the headmaster;
- Environmental awareness for tourists staying at Bubbles Dive Resort;
- Tagging of nesting sea turtles at Tanjung Tukas and Pinang Seribu and *in-situ* hatchery at Pinang Seribu;
- Terrestrial and marine research at Tanjung Tukas and other sites in Pulau Perhentian Marine Park in collaboration with Universiti Malaysia Terengganu;
- Focus group in the village;
- Universiti Malaysia Terengganu intern (3) and thesis students (10) based at Tanjung Tukas;
- Walk for Turtles;

2012

- Turtles need Trees club at Sekolah Kebangsaan Perhentian and other schemes as directed by the headmaster;
- Environmental awareness for tourists staying at Bubbles Dive Resort;
- Tagging of nesting sea turtles at Tanjung Tukas and Pinang Seribu and *in-situ* hatchery at Pinang Seribu;
- Volunteers to assist Department of Fisheries staff in collection of sea turtle eggs;
- Terrestrial and marine research at Tanjung Tukas and other sites in Pulau Perhentian Marine Park in collaboration with Universiti Malaysia Terengganu;
- Focus group in the village;
- Universiti Malaysia Terengganu intern (5) and thesis students (20) based at Tanjung Tukas;
- Walk for Turtles;

2 Introduction

Ecoteer Community Interest Company (Ecoteer) would like to propose a volunteer program to be run at Tanjung Tukas Perhentian Islands, using the facilities of Bubbles Dive Resort, starting from March 2010. If successful a new Malaysian sea turtle conservation non-profit organisation (Help Our Penyu or HOPE) will be created and take over the management and expansion of the project from January 2011.

Little is known about the sea turtle populations in the Perhentian Islands Marine Park due to limited resources and lack of tagging programs being conducted in the park. The best estimates of the turtle populations in the Perhentian Islands Marine Park come from data collected by the Department of Fisheries (DoF) at their *ex-situ* turtle hatchery at Tiga Ruang, with estimated nesting's per year being roughly 350 (this is an underestimate due to illegal egg collectors operating in the marine park). Four of the beaches in the Perhentian Islands Marine Park are designated as turtle sanctuaries these are Pasir Pinang Seribu, Pasir Tiga Ruang, Pasir Tanjung Tukas and Pasir Penglime Abu, *see fig 1*. At present DoF staffs go around the Perhentian Islands in the morning and collect any turtle eggs laid the previous night and transport them back to Tiga Ruang where the nests are replanted in an *ex-situ* hatchery. The nests are constantly protected from natural predators and poachers while they incubate over a two month period. When the turtles hatch they are released from the beach at Tiga Ruang.

Even with the efforts of the DoF the sea turtle populations in the Perhentian Islands Marine Parks are suffering from many problems including past and present illegal turtle egg collection, litter, lack of awareness among all stakeholders (villagers, tourists and resorts) and unsuitable beach development which is leading to degraded nesting beaches. This project proposal seeks to reduce the threat of each of the problems through various activities. Additionally the current method of turtle conservation of egg relocation to an *ex-situ* hatchery has been proven elsewhere to cause a significantly lower hatchling success rate (50-70%) (1) and may have potential effects for their future navigations back to the Perhentian Islands. This proposed project will address these issues by not removing the eggs but protect them *in-situ* leading to higher hatchling success rates upto 90% (1) and with no effects upon future navigation and sex ratios for the turtles. The practice of *in-situ* conservation is preferred by the DoF, as stated in the recently released National Plan of Action (2) but requires far greater resources including manpower and funding which at present is lacking but this project can provide.

Over the last few decades the watershed approach has been used successfully to increase seawater quality. A watershed is the area which drains into a single river/stream. The watershed approach works by reducing harmful direct and indirect inputs into a river system improving the overall condition of the sea where the rivers drains into. Reduction of direct inputs could involve reducing pollution from a resort whereas indirect inputs would be changing vegetation type which would change the natural water regime consequently the flow of sediments into the river. Our proposed project will use the watershed concept to guide our research and some of our conservation activities which will address issues in all ecosystems from the rainforest to the reef.

Volunteers in 2010 will help the team educate local school children and tourists about sea turtles and marine conservation issues and collect valuable data from the island ecosystems in the bay of Tanjung Tukas, *see fig 1*. In 2011 the project proposes to expand to run an *in-situ* hatchery and data collection at Pasir Pinang Seribu whilst continuing school programs started in 2010.

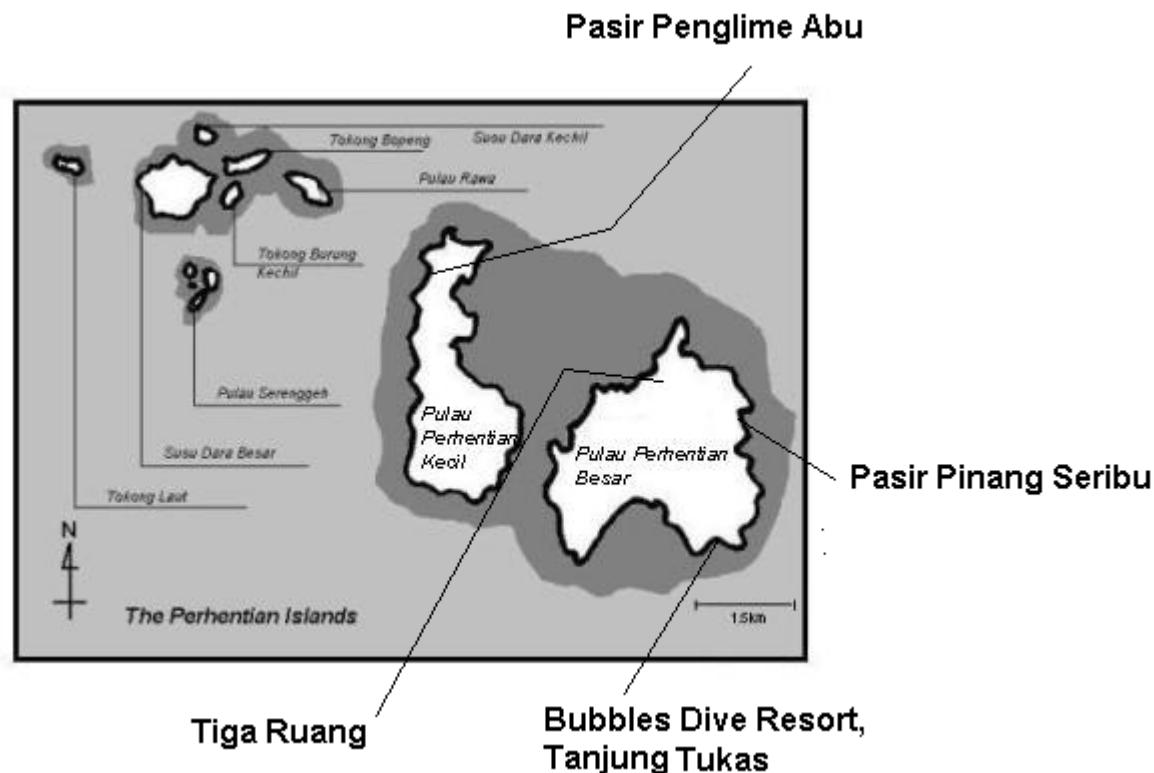


Figure 1: - Map of Perhentian Islands Marine Park with the four sea turtle sanctuaries identified.

The aim of the project – Further the understanding of the population dynamics and nesting behaviour of green turtles in the Perhentian Marine Park and further their conservation by running *in-situ* hatcheries on all turtle sanctuaries, increasing awareness and collection of relevant data

Objective 1: Establish *in-situ* hatcheries for all sea turtle sanctuary beaches in the Perhentian Islands.

Objective 2: Elimination of illegal turtle egg collection in the Perhentian Marine Park through public awareness and job creation in alternative livelihoods.

Objective 3: Data collection, and consequential conservation action, from the turtle population and various ecosystems including coral reefs, seagrass beds, beaches, mangroves and forest in the Perhentian Islands Marine Park.

Using volunteers to conduct and fund sea turtle conservation has recently been highlighted in the ‘National Plan of Action for the Conservation and Management of Sea Turtles’ (NPOA)(2) and they have proved to be successful in other areas of Malaysia and worldwide. Additionally in 2003 Coral Cay Conservation (CCC) used volunteers to conduct scientific surveys in the Perhentian Islands Marine Park whose findings included a recommendation for continual monitoring of the island environment (3); a role which volunteers in this program can provide starting at Tanjung Tukas in 2010.

2.1 Ecoteer Community Interest Company (Ecoteer)

Ecoteer Community Interest Company (Ecoteer) is a UK registered non-profit (Registration number 06845139) organisation that aims at helping and setting up locally run grass root organisations (LRGRO). Ecoteer helps LRGRO’s by providing volunteers, consultation advice for improvements and assistance in setting up new LRGRO’s. Ecoteer’s over-arching statement is ‘Only through locally run grass root organisations can true sustainable development be achieved’. Ecoteer is helping over 150 LRGROs around the world in sectors such as conservation, ecotourism, teaching, organic farming, health and community development.

Please visit www.ecoteer.com for more information.

2.2 Bubbles Dive Resort

Bubbles Dive Resort Sdn. Bhd., Tanjung Tukas, is the proposed base for the volunteer program in 2010. Bubbles Dive Resort Sdn. Bhd. are very professional and have proved popular with many Malaysian and foreign guests, *see fig. 1* for location. At their core they have green ethics and are committed to turtle and marine conservation.

Please visit www.bubblesdc.com for more information.

3 2010 – Tanjung Tukas

Tanjung Tukas has approximately 80 green turtle nests per year which are subject to many issues such as illegal egg collection. In the first phase of the project assistance will be provided to the Department of Fisheries by protecting the nesting green turtles at Tanjung Tukas through continual surveillance of the nesting beach ensuring the eggs are not taken illegally. In addition we plan to run an *in-situ* hatchery and tagging program at this site in 2010 but this is, at writing of this document, subject to the land owner's approval. The program in 2010 has very strong educational aspects with volunteers teaching school children at Sekolah Kebangsaan Perhentian, hosting 6 day and 3 day environmental awareness holidays for groups of tourists, corporate staff or school children and educating tourists staying at Bubbles Dive Resort. The other aspect of the program is data collection. Following various international bodies the volunteers will collect data about the coral reef, beach and forest which will focus on answering the question: - "Does a change in forest composition affect the nesting sea turtles of the Perhentian Islands?"

The volunteers will conduct various activities, described below

3.1 *Environmental awareness trips*

Increasing the environmental awareness of the Malaysian public is vital for sea turtle and island conservation because their actions whilst on the island and in their general life may directly or indirectly harm sea turtles and various island ecosystems. These visits will be designed to increase the participant's awareness and consequently decrease their impact on the environment. Secondary schools in Malaysia will be the main target but other groups including Lion Clubs, families, corporate staff etc, will be sought as well. The trips will be either 6 day or 3 day with an overlap where the 6 day participants share what they have learned with the new 3 day tourists and will include aspects of sea turtle, coral reef conservation and litter awareness and how they can reduce their impacts on the environments. Learning about the environment, in the environment, and then sharing this knowledge is far more beneficial and will increase their learning, consequently increasing their passion towards marine conservation. The trips are designed with safety at the forefront and the volunteers teaching the participants about relevant issues – full project proposal can be given upon request.

3.2 *Turtles need Trees club at Sekolah Pulau Perhentian*

The Turtles need Trees (TnT) Club we propose will run on Thursday afternoons at Sekolah Kebangsaan Pulau Perhentian on a fortnightly basis for children in grades 3 and 4. The aim of the TnT club is to increase the awareness of the children in the village in conservation issues related to various island habitats and iterate the link between actions on land and the consequences to the sea. The objectives are to

provide a structured program for the children to learn about the island ecosystem and improve their English language skills in a fun environment. The children will be encouraged to speak and answer questions in English and to converse with the volunteers throughout the sessions. In addition a pen pal system will be set up with primary schools in the UK and Australia so the children can improve their reading and writing skills.

Volunteers will stay overnight in the village the evenings of the TnT Club at the Yellow House increasing cultural awareness and exchange and economic benefits to the village through increased spending in local shops, hiring of boats and accommodation. Before the volunteers can go to the village they will be given classes introducing them to Malaysian language and Malay culture including behaviour, religion and dress in order to minimise cultural sensitivity issues. The maximum number of volunteers will be limited to 10 with up to 3 facilitators. The TnT Club and village stay has been welcomed by Zulkipli bin Ismail the village head and Kammaruddin bin A. Aziz the school head master.

The regular sessions will reiterate conservation messages (improving information retention) and facilitate improvements in English language skills, a pen pal system and a related activity book. The activity book will encourage the children to learn away from the TnT Club and contain reward stickers for successful completion of activities ensuring pupils complete related activities. Continual education has often proved to have the biggest impact and makes the TnT Club stand out from other programs. Furthermore the revenue created by the TnT Club through volunteers staying in accommodation at the village further enhances the benefits of the club and sets it apart from other programs - full project proposal can be given upon request

3.3 Research

Question: “Does a change in forest composition affect the nesting sea turtles of the Perhentian Islands?”

To do this various ecosystems need to be monitored including reef, forest and beach as well as the nesting sea turtles. We have set ourselves the target of 2 research students from UMT to conduct their thesis studies at our project site based on either sea turtle tagging, alternative livelihood and/or oceanography studies at Tanjung Tukas. In addition we are also targeting 1 intern from UMT in 2011.

3.3.1 Sea turtle research

In 2010 we propose to start a tagging program at Tanjung Tukas, this will enable us to estimate the size of the nesting sea turtle population, how many times each turtles lays a successful nest per season, how many days between nests, does the same individual turtle lay in a

similar location et etc. This type of information is vital for any sea turtle conservation program and continual monitoring of the tagging program will give us indications as to whether the sea turtle nesting population is increasing or decreasing.

3.3.2 Reef Surveys

At present the Sustainable Islands Program (SIP), an initiative of Wild Asia and Reef Check Malaysia, conducts Reef Check surveys as part of its program, which provide invaluable data on the fish, invertebrates and reef health of the Perhentian Islands. The reef survey we are proposing to conduct is called Coral Watch and will provide the Department of Marine Park and the SIP program with additional data on coral bleaching and coral reef health. The simplistic Coral Watch method is suitable for a volunteer program as people with little experience can conduct the surveys with accurate results. Coral Watch is a global survey of coral bleaching set up by the University of Queensland and funded by PADI Aware.

To find out more about Coral Watch go to

www.coralwatch.org

To find out more about SIP go to

www.wildasia.org/main.cfm/sip

In 2010 the study site we propose to conduct Coral Watch are at Tanjung Tukas only. The continual data from this survey will show if the reef is changing and highlight patterns of coral bleaching on a monthly and annual basis.

3.3.3 Marine Sediment Traps

Forest health, beach development and sedimentation are all interconnected and a higher sedimentation rate will cause more stress on the coral reef system. We propose to set up sediment traps located around the Tanjung Tukas bay which are to be monitored on a fortnightly basis. The data collected from the sediment traps will compliment the water quality data being collected during the SIP. The data will give a better understanding of the stresses on the coral and how sedimentation changes through the year. The sediment traps will be deployed and analysed for as long as HOPE operates in the Perhentian Islands and thus can potentially create a database of annual sedimentation rates in the Perhentian Islands Marine Park – starting with Tanjung Tukas bay in 2010 and more sites from 2011.

3.3.4 Forest Survey

The composition of the forest needs to be studied. Coral Cay Conservation conducted a pilot study of the Pulau Perhentian Bear in 2003 (3) and created a basic checklist of faunal species in the islands but more detailed information and study sites are needed to further their

investigations. The surveys we are proposing to conduct are reptile (herpetofauna), small mammal surveys, birds, insects and vegetation. The surveys will be conducted on a 6 week rota monitoring the same sites over the duration of 2010. Ecoteer propose to work closely with FRIM and UMT to develop suitable survey methodologies.

3.3.5 Beach Erosion

Each quarter of the lunar cycle we propose to conduct beach erosion studies at Tanjung Tukas using beach profiles at constant locations through the non-monsoon season. The study will show how the beach is changing through the season and annually. The data collected from this study is vital for turtle conservation at Tanjung Tukas by providing an assessment of beach erosion rates and will highlight potential correlations between beach change and turtle nest density. In 2010 this study will focus on Tanjung Tukas and in 2011 include Pasir Pinang Seribu and other beaches around the Perhentian Islands.

3.4 Turtle Watch

Turtle watch involves the continual surveillance of the beach at Tanjung Tukas at night by a team of volunteers. The beach is an important green turtle rookery and can suffer from illegal turtle egg collection and disturbance to nesting turtles from tourists. The volunteers ensure no tourists go on the beach at night unless a nesting turtle has finished laying her eggs. The tourists are then allowed to view the turtle using a night vision camera and are under strict turtle watching protocol, managed by the volunteers. The continual presence of volunteers will decrease the likelihood of poachers on the beach and if poachers do approach the beach the Department of Fisheries staff at Tiga Ruang will be contacted. We would like to run an *in-situ* hatchery and tagging program at Tanjung Tukas in 2010 but this is currently subject to the approval from the land owner and the DoF.

See appendix for schedule of activities in 2010.

3.5 Rubbish Reused

The idea behind Rubbish Reused is to transform rubbish into sellable products. In April 2010 Helle Jorgensen is coming to Bubbles to demonstrate how to make crocheted sea creatures from plastic bags and wrappers and polystyrene will be used as stuffing for toys, cushions and bean bags. During 2010 the volunteers will make various craft from the rubbish for tourists to buy. The money created will go to the Perhentian Village Fund. Volunteers will be encouraged to utilise as much rubbish as possible and new ideas encouraged.

3.6 Economic benefits

The volunteer program will bring many benefits for the Perhentian Islands Marine Park including economic as the volunteers will be paying to volunteer, *see fig 2.*

| | Cost (2009), RM | Capacity | | |
|---|--------------------|------------------|-------------------|-------------------|
| | | Low | Half | Full |
| Average number of volunteers per week | | 2 | 5 | 10 |
| marine park fees | 5 | MYR 270.00 | MYR 675.00 | MYR 1,350.00 |
| Return boat transfer | 70 | MYR 3,780.00 | MYR 9,100.00 | MYR 18,200.00 |
| Accommodation and food | 110 | MYR 41,580.00 | MYR 103,950.00 | MYR 207,900.00 |
| Village stay - accommodation and food (once a fortnight) | 90 | MYR 2,520.00 | MYR 6,300.00 | MYR 12,600.00 |
| Wage of local facilitator (yearly) | 2000 per month | MYR 24,000 | MYR 24,000 | MYR 24,000 |
| In island boats | 100 per trip | MYR 7,600 | MYR 7,600 | MYR 7,600 |
| | | MYR 48,152.00 | MYR 120,030.00 | MYR 240,060.00 |

Figure 2:- Table of revenue generated by the volunteer program in 2010 for the Perhentian Islands Marine Park.

The best estimate of the money generated by the program in 2010 for the marine park will be significant with half volunteer capacity projections estimated at RM120,000 per annum with the village receiving RM13,000 (village stay and in island boats) directly.

3.7 *Walk for Turtles*

In 2010 Ecoteer would like to start an annual survey of sea turtle body pits and tracks along the entire coastline of Terengganu including the islands. The purpose of the survey is to assess the current turtle nesting densities in Terengganu and if the numbers are increasing, decreasing or turtles nesting in different areas. The Department of Fisheries collects data from their turtle hatcheries but not from the rest of the coastline. In the past sea turtles nested along the entire coastline of Terengganu but recent data of nests from the entire coastline is lacking. The survey will follow the procedures outlined in the Ningaloo Turtle Program Turtle Monitoring Field guide developed by the government of Western Australia in addition to collecting data from body pits. The guide demonstrates how to collect data from turtle tracks enabling unskilled volunteers to accurately identify turtle species and if the turtle laid eggs successfully. The other objective of the walk is to raise awareness to the plight of sea turtles in Malaysia but specifically in Terengganu where the decline has been the most dramatic. The walk may create a significant amount of media exposure via traditional and electronic media such as newspapers, newzapped.com, twitter and facebook consequently Ecoteer will be seeking sponsorship from outside sources to help fund equipment and logistics. The walk in 2010 will start on 16th June, World Sea Turtle Day, from Dungun to the northern border of Terengganu finishing at Tanjung Tukas, Pulau Perhentian Besar, the other islands along the coast will also be included these are Pulau Rhu, Kapas, Redang, Yu, Bidong, Gemia and Lang Tengah. The walk will last approximately 12 days. Starting the walk on World Sea Turtle Day is suitable as it is in the middle of the turtle nesting season increasing the likelihood of collecting data from turtle tracks and recent body pits but also for world exposure of the walk. Ecoteer is able to collect donations online and will be collecting for this event to go towards sea turtle conservation awareness in Terengganu. The main message of this walk is Turtles need Trees including how development affects turtles and how human impacts on land affect turtles.

3.8 *Merchandise*

Ecoteer will be producing merchandise for HOPE including t-shirts and bags. Ecoteer would like permission to use the logos of the Department of Fisheries, Department of Marine Park, Ministry of Education and UMT on all media. The merchandise will be sold online and in the Perhentian Islands with RM5 of every item sold going to the Perhentian Village Fund.

3.9 *Perhentian Village Fund*

The Perhentian Village Fund will be a fund which the HOPE focus group can use to spend on social or environmental projects in the village, for example, improvements to the community hall/mosque or youth club. The ultimate use of the fund will be decided by HOPE

after annual discussions with the HOPE focus group. 10% of the foreign volunteers fees will go towards the fund in addition to RM5 per merchandise sold.

3.10 HOPE focus group

Ecoteer proposes to start a HOPE focus group in the village. The group will start initially on an ad-hoc basis offering all the villagers free food and drink while we discuss the aims of HOPE and marine issues in general. After the initial meetings a focus group will be formed of interested individuals, and a chairman elected, the group will meet on a regular basis which is to be decided either weekly, fortnightly or monthly. The purpose of the group is to form a closer partnership between HOPE and the village and to understand the opinion and needs of the villagers on various issues such as volunteers, sea turtles, the health and importance of coral reefs and alternative livelihoods etc. The group can help with issues such as how to spend the Perhentian Village Fund but also discuss how the villagers feel about proposed conservation measures, such as eliminating all illegal turtle egg collection and protection of additional turtle nesting beaches.

4 Pinang Seribu - 2011

The second year of the project will be conducted by Help Our Penyu (HOPE) proposed Malaysian sea turtle conservation non-profit being initiated by Ecoteer. As of writing, HOPE will be the first non-university based Malaysian registered non-profit which focuses solely on sea turtle conservation and will initially focus in the State of Terengganu before expanding to other areas where the nesting turtles of Terengganu migrate to. HOPE will expand the project started in 2010, running an *in-situ* hatchery and tagging program at Pinang Seribu, increase benefits to the local villagers and collect data from new survey sites in the Perhentian Islands Marine Park.

4.1 HOPE

Aim

To double the nesting sea turtle population of Terengganu, Malaysia from the baseline level set in 2010 by 2060.

Objectives

- a) Education – Educating the general public and stakeholders about sea turtles and their conservation;
- b) Action - Empower relevant stakeholders and the general public in protection of sea turtles through developing a new passion, love for turtles and economic incentives with healthy sea turtle population numbers;
- c) Research - Increase scientific knowledge about sea turtles nesting in Terengganu and disperse the knowledge to relevant stakeholders and the general public;
- d) Empowerment – Allowing the general public to get involved in sea turtle conservation and using their ideas to further our programs thus empowering the general public consequently increasing their passion for sea turtles and giving them warranted HOPE that nesting sea turtles in Terengganu can be saved, if we all work together;

Education – Educating the general public and stakeholders about sea turtles and their conservation;

Through the development of educational programs including volunteering and tourism products and outreach awareness initiatives for relevant stakeholders HOPE will educate the general public and relevant stakeholders about Sea Turtle conservation.

Action - Empower relevant stakeholders in protection of sea turtles through developing a new passion, love for turtles and economic incentives with healthy sea turtle population numbers;

Only through empowering ‘the many’ can significant sea turtle conservation be performed. Volunteer programmes, tourism products and awareness campaigns will instill a passion and love for sea turtles among Malaysians. Once they love turtles the general public will change their lifestyle helping to assist sea turtle populations. If people or businesses lose money through the conservation of sea turtles HOPE will help to develop various sustainable economic incentives like tourism products, community-based volunteer programs and alternative livelihoods where suitable.

Research - Increase scientific knowledge about nesting sea turtles in Terengganu and disperse the knowledge to relevant stakeholders and the general public;

HOPE will work with relevant national and international research institutions throughout all its projects and is committed in the collection of long-term monitoring programmes such as tagging of sea turtles. The information gained will be given to the relevant organizations and presented on the HOPE website. HOPE is committed to spreading knowledge about sea turtles to various stakeholders for example running after-school clubs and field trips for school children, community-based conservation, creation of focus groups and awareness trips for villagers, working with relevant businesses regarding sea turtle conservation, sustainable tourism products, volunteer programmes and various traditional media like websites, press and regular newsletters.

Empowerment - Allowing the general public to get involved in sea turtle conservation and using their ideas to further our programs thus empowering the general public consequently increasing their passion for sea turtles and giving them warranted HOPE that nesting sea turtles in Terengganu can be saved, if we all work together;

Creation of an online and offline active community whom help design sea turtle outreach programs taking the message of sea turtle conservation to the rest of the world. HOPE will use groups of people either villagers, volunteers or the online community to assist in all design of sea turtle conservation projects for example the volunteers design activities for the TnT club and the online community are organising a turtle awareness song contest for the TnT Club to sing.

To find out more visit www.helpourpenyu.com – online from January 2010

4.2 *Environmental awareness trips*

Awareness trips will be continued at Bubbles Dive Resort in 2011 and for the foreseeable future.

4.3 *Turtles need trees club at Sekolah Kebangsaan Pulau Perhentian*

The TnT club at Sekolah Kebangsaan Perhentian will be run continually every year for the foreseeable future, demonstrating our commitment to long-term conservation through education. The aim is to expand the TnT Club to other schools throughout Terengganu and Kelantan with schools in Kuala Besut being initially targeted from 2012.

4.4 *Research*

The same overall research question will direct the research in 2011. In 2011, we have set ourselves the target of 10 research students from UMT conducting their thesis studies with HOPE studying sea turtles, coral reefs, seagrass, beach erosion, alternative livelihoods and rainforest composition. In addition we are also targeting 3 interns from UMT in 2011.

4.4.1 *Sea turtle research*

In 2011 we propose to continue the tagging program at Tanjung Tukas and to start at Pinang Seribu, this will enable us to further estimate the size of the nesting sea turtle population, how many times each turtles lays a successful nest per season, how many days between nests, does the same individual turtle lay in a similar location et etc. This type of information is vital for any sea turtle conservation program and continual monitoring of the tagging program will give us indications as to whether the sea turtle nesting population is increasing or decreasing.

4.4.2 *Reef Surveys*

The Coral Watch surveys will be expanded to other sites after consultation with the Department of Marine Park and SIP.

4.4.3 *Sediment Traps*

Sediment traps will be monitored at more survey sites after consultation with the Department of Marine Park and SIP

4.4.4 *Forest Survey*

Survey sites used by Coral Cay Conservation will be resurveyed and sites to the north east and on Kecil will be identified as recommended (3).

4.4.5 *Beach Erosion*

The survey will be expanded to include Pinang Seribu in 2011 and the other turtle sanctuaries from 2013.

4.5 *Turtle Watch*

We propose to continue to run a tagging program at Tanjung Tukas and an *in-situ* hatchery and tagging program at Pinang Seribu from 2011. Pasir Pinang Seribu is the most significant turtle nesting beach in the Perhentian islands marine park with rough estimates of 150 to 200 nests per year. The method of running an *in-situ* hatchery as set out by the Department of Fisheries will be followed. Volunteers will be accompanied at night by either staff from the Department of Fisheries or a previous turtle egg collector who will be employed by HOPE on a day to day basis from a pool of interested villagers. The use of turtle egg collectors is an important aspect if illegal turtle egg collection in the marine park is to be significantly reduced. The payment and selections of the ex-turtle egg collectors needs further discussion by the Department of Fisheries and HOPE focus group. However if poachers do land on the beach the volunteers will call the DoF staff (if not present) and will not approach the poachers for safety reasons, approaching the illegal egg collectors will be the duty of the HOPE staff. The volunteers and staff will need to be provided shelter whilst staying at Pinang Seribu which would include electricity panels and sleeping and storage space. The shelter will be located behind the treeline and will be built on stilts using solar power, red lighting and composting toilets to reduce impacts on the nearby stream. A suitable location has been identified and will not be seen from the beach and will be sheltered from the effects of the monsoon.

4.6 *Rubbish Reused*

The volunteers in the first fortnight will make craft from the rubbish collected on beaches of Perhentian similar to 2010. In the second fortnight the volunteers will continue to make craft in the village and sell their products to tourists or shops to sell. This purpose is to

indirectly introduce the ideas and techniques needed to make the craft to the villagers with the hope some will consider making their own craft from everyday rubbish. In the future HOPE may give villagers money per item (plastic bag, polystyrene etc) collected.

4.7 Cultural understanding program

In 2011 the capacity of volunteers increases to 20 with 10 starting at Bubbles Dive Resort on a fortnightly basis where they will follow the 2010 two week volunteer program as stated in this proposal. The two week program at Bubbles Dive Resort in 2011 will have additional Malaysian language and cultural lessons as the second two weeks the volunteers will live at Kampong Perhentian. The two weeks of ‘training’ at Bubbles dive resort we give to the volunteers is to reduce cultural issues during their second fortnight which is based in the village. The volunteers will learn about behaviour, religion, social status, dress and addressing people. At this point there will be volunteers staying continuously in the village with the Yellow House providing a suitable base for them. The aim of the entire program is to involve the community as much as possible and the respect from the volunteers to the villagers is pivotal if the program is to be successful. In addition the volunteer activities whilst in the village will be adapted to the villagers. In other Ecoteer volunteer programs volunteers help with teaching English and other subjects, farming or helping willing villagers with daily chores these could all be discussed with HOPE focus group.

4.8 Economic creation

The program in 2011 will bring many more benefits to the villagers most significantly an increased direct income for the village with an estimated half capacity projection being between RM81,000-140,000 per annum. The vast majority of the extra revenue created for the village is from some of the volunteers living in the village fulltime. Please note the estimated revenue is just a minimum projection and does not include personal spending of volunteers at local shops, which will substantially increase in 2011. The half capacity projections for revenue creation in 2011 from the volunteer program for the Perhentian Islands Marine Park is estimated to be between RM220,000-400,000 per year, *see fig 3*.

| | | Capacity | | |
|---------------------------------------|-----------------|------------|--------------|--------------|
| | Cost (2009), RM | Low | Half | Full |
| Average number of volunteers per week | | 4 | 10 | 20 |
| Marine park fees | 5 | MYR 540.00 | MYR 1,350.00 | MYR 2,700.00 |

| | | | | |
|---|-------------------------------|-------------------|-------------------|-------------------|
| Return boat transfer | 70 | MYR 3,780.00 | MYR 18,200.00 | MYR 36,400.00 |
| Accommodation and food at Tanjung Tukas | 110 | MYR 41,580.00 | MYR 103,950.00 | MYR 207,900.00 |
| Village stay - accommodation and food | 90 | MYR 24,570.00 | MYR 61,425.00 | MYR 122,850.00 |
| Wage of two facilitators (yearly) | 2500 and 2000 per month | MYR 54,000.00 | MYR 54,000.00 | MYR 54,000.00 |
| In island boats | 100 per trip | MYR 7,600 | MYR 7,600 | MYR 7,600 |
| Local employee's | 50 per day | MYR 9,450.00 | MYR 9,450.00 | MYR 9,450.00 |
| | | MYR 133,920.00 | MYR 248,375.00 | MYR 433,300.00 |

Figure 3: - Table of revenue generated by the volunteer program in 2011 and 2012 for the Perhentian Islands Marine Park.

4.9 Walk for Turtles

The walk will be repeated starting on the same day, 16th June, but in 2011 will start at Terengganu's southernmost border. The main message of the walk in 2011 will be littering and include beach cleans with schools and other groups to increase awareness. This will then become an annual event with a different main message and relevant activities each year.

5 2012 – assisting the Department of Fisheries staff

The only two additions to the project in 2012 we propose is

- a maximum of 2 volunteers to assist the Department of Fisheries staff whilst they collect recently laid nests and help them replant them at Tiga Ruang;
- The volunteers will be spending a lot of time in the village and will have enough time to help at the school at least once a week. This will facilitate more after-school clubs at the primary schools and could include running a youth club, English classes or sports. The clubs will be directed by the headmaster and other teachers;

5.1 Economic creation

In 2012 the predicted economic creation from the project will be higher due to an expected higher number of volunteers. In 2011 Ecoteer has set a target of 160 volunteers for HOPE and 200 in 2012. The increase of 40 volunteers means a significant amount of spending in terms of accommodation, food and luxuries in the marine park.

6. Benefits

6.1 Terengganu State Government

6.1.1 Tourism

- 1) The volunteering program will boost the image of Terengganu for tourism, facilitating them to be able to promote a new sustainable community focused turtle conservation project;
- 2) Attracting more tourists increasing revenue through direct and indirect channels;
- 3) Significantly increase the revenue created by one of its marine parks (RM252,000 in 2010 and RM421,000 in 2011);
- 4) The annual turtle awareness walk will increase tourism along the coastline of Terengganu;

6.1.2 Education

- 1) Potential partnership with the Universiti Malaysia Terengganu will help them to become a turtle conservation research hub promoting Terengganu as a global leader in sea turtle and marine research;
- 2) Increase links with international research centres;
- 3) Increased environmental awareness amongst primary school children through the Turtles Need Trees club;
- 4) Fieldtrips by school groups will enhance the education of secondary school children;

6.1.3 Conservation

- 1) Increased understanding of the population dynamics and nesting behaviour of sea turtles in the Perhentian Marine Park;
- 2) Increased hatchling success rate of sea turtles in Terengganu;
- 3) Reinstate Terengganu as the 'turtle state' of Peninsular Malaysia;
- 4) Promotion of Terengganu's government as a good example of turtle and marine conservation globally where other states and/or countries could follow their example.

6.2 Department of Marine Park

- 1) Implementation of sections of the National Plan Of Action for conservation and management of sea turtles in Pulau Perhentian Marine Park;
- 2) Continual monitoring of different island habitats will increase the understanding of the entire island ecosystem;
- 3) Acquiring structured scientific data for relevant monitoring of the terrestrial and marine environment in the Pulau Perhentian Marine Park;
- 4) Increased awareness amongst various stakeholders including tourists, villagers and school children;
- 5) Villagers have greater connection with the Department of Marine Park through the work of the project;
- 6) Promotion of the Department of Marine Park to other stakeholders national and international including international tourists and research centres;
- 7) Department of Marine Park, Terengganu, can be used as a good example of how to implement community-based turtle conservation to other Malaysian states and/or countries;

6.3 Department of Fisheries

- 1) Implementation of sections of the National Plan Of Action for conservation and management of sea turtles in Pulau Perhentian Marine Park;
- 2) Management of an *in-situ* hatchery at Tanjung Tukas and Pasir Pinang Seribu following the SOP written by the Department of Fisheries;
- 3) Protection of 100% of sea turtle eggs laid at Tanjung Tukas and Pasir Pinang Seribu;
- 4) 80%+ hatchling success rate, reduction of disturbance to eggs, at Tanjung Tukas and Pasir Pinang Seribu;
- 5) Acquiring structured scientific data for relevant monitoring of the turtle nesting population at Tanjung Tukas and Pasir Pinang Seribu, Pulau Perhentian Besar;
- 6) Collection of turtle track and body pit data from the entire coastline of Terengganu;
- 7) Possible identification of unknown significant turtle nesting beaches;
- 8) Increased awareness amongst various stakeholders including tourists, villagers and school children;
- 9) Villagers have greater connection with the Department of Fisheries through the work of the project;
- 10) Department of Fisheries kept in contact with other relevant stakeholders;
- 11) Promotion of Department of Fisheries to other stakeholders;
- 12) Department of Fisheries, Terengganu, can be used as a good example of how to implement community-based turtle conservation to other Malaysian states and/or countries;

6.4 Ministry of Education

- 1) Increased environmental awareness of children in grades 3 and 4 through free structured fortnightly programs;
- 2) Improved English skills and confidence of children in grades 3 and 4;
- 3) New fieldtrip study site where national and international secondary schools can learn about the environment of the Perhentian Islands in a structured safe and fun program;
- 4) Promotion of the Perhentian Islands as an international centre for environmental education;
- 5) Increased links between national and international research institutions promoting the Perhentian Islands as an international research study site;

6.5 Pulau Perhentian

6.5.1 Villagers

- 1) Increased revenue (full capacity estimates are 2010 – RM21,000 2011 RM140,000) given directly to the villagers for various services including – homestay, boat usage and assistance with turtle conservation;
- 2) Raising awareness amongst the villagers and greater involvement through HOPE focus group and the Turtles Need Trees clubs and other initiatives, as directed by villagers;
- 3) Respectful culture exchange between volunteers and the villagers;

- 4) Volunteers being present in the village gives the villagers the opportunity to improve their English skills;
- 5) Increased trade in the village at shops (not included in previous revenue estimates);

6.5.2 Environment

- 1) Increased knowledge of the population dynamics and nesting behaviour of sea turtles in the marine park;
- 2) Local stakeholders have a better understanding of their impacts on the environment;
- 3) Increased protection of nesting sea turtles and their eggs through *in-situ* hatcheries;
- 4) Cleaner and healthier beaches in the Perhentian Islands Marine Park;
- 5) Increased understanding of different habitats around the Perhentian Islands Marine Park;
- 6) Monitoring of the various habitats in the marine park can be use to direct future conservation measures in the marine park;

7. Financing Phase 1

7.1 2010

| Income/Expenditures 2010 | Income | Expenditure |
|--|---------------|---------------|
| Volunteer fees | 200000 | |
| Tourist program fee | 5000 | |
| Ecoteer donation | 20000 | |
| Chieslehurst Grammar School Donation | 2850 | |
| Merchandise | 3750 | |
| Donations | 10000 | |
| Accommodation/food Bubbles | | 103950 |
| Marine Park Fees and boat transfers | | 9775 |
| Volunteer Extras(t-shirt and snorkel tour) | | 9200 |
| Village trip | | 6300 |
| TnT Club | | 15000 |
| Focus Group | | 1500 |
| Walk for Turtles | | 20000 |
| Wages (Azimi and part time admin) | | 34800 |
| Donations to Perhentian Village Fund | | 20000 |
| Equipment | | 14000 |
| Merchandise | | 2700 |
| Accountant | | 3000 |
| Total | 241600 | 240225 |
| Profit / Loss | | 1375 |
| Balance | | 1375 |

Figure 4 – Income and expenditure sheet for 2010

The predicted profit/loss for 2010 is a profit of RM1,375. The majority of the income will be from volunteer fees (RM3500 for 3 weeks) with a goal of 80 volunteers being targeted. Ecoteer have set a target of 80 due to response for similar projects which they have helped to market before – for example a sea turtle project in Costa Rica called La Tortuga Felix. The volunteer program will be running an

environmental awareness holiday package for tourists to become more aware of their impacts on the environment. The program is being sold by Nature Interpreters with Ecoteer charging a program fee due to Ecoteer running the program onsite. In 2010 Ecoteer are donating RM20,000 and Chislehurst Grammar school, UK, are donating GBP500 to help with start up costs and the TnT club respectively. Ecoteer will be selling HOPE merchandise at the project site at the Bubbles Dive Resort and the jetty at Kuala Besut as well as online. Ecoteer as a registered non-profit can handle donations online and will be asking for donations from tourists at Bubbles Dive Resort and through the Ecoteer online network.

| Income/expenditure 2011 | Income | Expenditure |
|--|---------------|---------------|
| Balance from 2010 | 1375 | |
| Volunteer fees | 400000 | |
| Tourist program fee | 10000 | |
| Merchandise | 7500 | |
| Donations | 20000 | |
| Loan from Ecoteer (0% interest) | 50000 | |
| CSR Sponsorship | ??? | |
| Accommodation/food Bubbles | | 103950 |
| Accommodation/food village | | 61425 |
| Marine Park Fees and boat transfers | | 19550 |
| Volunteer Extras(t-shirt and snorkel tour) | | 13600 |
| Boats for research around Perhentian | | 13500 |
| TnT Club | | 15000 |
| Focus Group | | 3000 |
| Walk for Turtles | | 20000 |
| Wages (Azimi and part time admin) | | 78000 |
| Donations to Perhentian Village Fund | | 40000 |
| Equipment | | 15000 |
| Merchandise | | 5400 |
| Hut at Pinang Seribu | | 75000 |
| Wages for turtle watch villager | | 9450 |
| Accountant | | 3000 |
| Total | 488875 | 475875 |
| Profit / Loss | | 11625 |
| Balance | | 13000 |

Figure 5 – Income and expenditure 2011

In 2011 the expansion of the project to Seribu Pinang has increased expenditure significantly especially in the building of shelter at Pinang Seribu. The costs for the shelter will be offset by an interest free loan from Ecoteer for RM50,000 which may not be needed if HOPE can

obtain sponsorship from the private sector in the form of corporate social responsibility. Other significant changes are a significant increase in volunteer fees this is due to the need for extra volunteers which are needed in the village and working at Pinang Seribu.

7.3 2012

| Income/expenditure 2012 | Income | Expenditure |
|--|---------------|---------------|
| Balance from 2011 | 13000 | |
| Volunteer fees | 500000 | |
| Tourist program fee | 10000 | |
| Merchandise | 15000 | |
| Donations | 30000 | |
| CSR sponsorship | ??? | |
| Accommodation/food Bubbles | | 166320 |
| Accommodation/food village | | 98280 |
| Marine Park Fees and boat transfers | | 15000 |
| Volunteer Extras(t-shirt and snorkel tour) | | 17000 |
| Boats for research around Perhentian | | 20250 |
| Village trip | | 12600 |
| TnT Club | | 15000 |
| Focus Group | | 3000 |
| Walk for Turtles | | 20000 |
| Wages (Azimi and part time admin) | | 86400 |
| Donations to Perhentian Village Fund | | 50000 |
| Equipment | | 15000 |
| Merchandise | | 5400 |
| Wages for turtle watch villager | | 9450 |
| Accountant | | 3000 |
| Repayments (20%) Ecoteer loan | | 10000 |
| Total | 568000 | 546700 |
| Profit / Loss | | 8300 |
| Balance | | 21300 |

Figure 6 – Income and expenditure 2011

In 2012 the project does not significantly expand this is to raise funds for phase 2 and to start repaying the interest free loan back to Ecoteer. The profit/loss is predicted to be about RM8,300 and this is inclusive of a RM10,000 repayment to Ecoteer. As in 2011 HOPE will be seeking funding from the private sector in this period for the 'Walk for Turtles' event and also to raise funds for phase 2 and will only be used for further developments and not to cover costs in 2012.

8. Future Phases

8.1 Phase two – Mainland – 2013-2014

The mainland affects the environment of the Perhentian Islands in many ways including sedimentation, rubbish, pollution and the major demand for turtle eggs from the islands comes from the mainland. The project will expand to the mainland to reduce these threats.

Aim reduce the threats to the nesting sea turtles in the Perhentian Islands from the mainland

Objectives

1. Increase the awareness of the children from mainland schools;
2. Reforest coastal mangrove and peat swamp areas;
3. Educate the majority of tourists visiting the Perhentian Islands Marine Park about how they impact the environment at the jetty;
4. Collect regular nesting data from the mainland beaches of Terengganu and Kelantan;

8.2 Phase Three – Protecting all Perhentian – 2015 - 2016

Once the demand for turtle eggs has started to reduce the more heavily poached beaches of Perhentian can be protected this is Penglime Abu. If the demand is reduced the poaching will decrease meaning it is safer to protect the turtles eggs laid on this beach. Due to the significantly increased protection of beaches in Perhentian HOPE will seek to establish alternative livelihoods in the islands including increasing the impact of Rubbish Reused and exploring the option for a community-based turtle watch program and mariculture in the marine park. In addition if trials for biorock, mangrove and seagrass replanting is successful the local community will be involved in helping to restore significant areas of these environments creating more jobs.

Aim – to protect all turtle nests in Perhentian

Objectives

1. *In-situ* hatchery and tagging program at Penglime Abu and take over management of Tiga Ruang;
2. Establish alternative livelihoods for villagers (rubbish reused, restoration of ecosystems, mariculture and turtle watch program);
3. Work with the local resorts to protect the sea turtle nests laid on their beaches;

8.3 Phase Four – Redang -2017 - 2019

The most significant island for sea turtles in West Malaysia is Pulau Redang. The island does have some hatcheries at present but it has unprotected turtle sanctuaries. HOPE proposes to run *in-situ* hatcheries on the unprotected turtle sanctuaries of Pulau Redang. This program will be based on the same principles as the Perhentian Project and include the local villagers and tourists as much as possible. The mainland volunteer program will cover the jetty at Marang which is the only gateway into Redang Island. In addition to Redang HOPE will satellite track turtles from Perhentian and mainland beaches to establish data on turtle movements, migrations and feeding grounds.

Aim – reduce turtle threats in Pulau Redang

Objectives

1. *In-situ* hatchery at all of the unprotected turtle sanctuaries;
2. Education for tourists at Marang Jetty;
3. Involvement of local villagers on Redang – focus group and TnT Club;
4. Enhancement of current or establishment of new alternative livelihoods;

8.4 Phase Five – Feeding grounds and Migration routes – 2020+

Turtles do not live all their lives in one area, they are migratory and have feeding and nesting grounds which could be thousands of miles apart. The best method to track turtles movements is through satellite tracking which was conducted in Phase 4. The project in phase 5 will act upon the data given through the satellite tracking of green turtles from Perhentian and Redang. HOPE will then explore significant feeding grounds and ask for migration routes to be closed during the migration season whilst working with fishermen to reduce turtle bycatch and teach resuscitation skills. Protecting the entire adult lifestage of the turtles is the best method to save these creatures. In addition further research is needed in the Perhentian Islands and a research centre is planned at Tanjung Tukas.

Aim – protect all adult lifestages of sea turtles nesting in Terengganu.

Objectives

1. Explore all feeding grounds;
2. Run community-based projects at significant feeding grounds;
3. Petition for closure of fishing during significant migration periods and locations;
4. Increase research in Perhentian through establishment of a research centre;

9. Contacts

For further information about this proposal please contact:-

Mr. Daniel Quilter, Founding Director, Ecoteer.com

Tel: (+44) 845 371 3070

Email: contact@ecoteer.com or daniel@helpourpenyu.com– email is the preferred method of contact

Or

Wan Ahmad Azimi bin Wan Azmin, Ecoteer Perhentian Manager

Tel: (+6) 012 605 3449

Email: azimi@helpourpenyu.com

10. Official Backing

The current proposal has the official backing from the people listed below and we are seeking further approval from other connected individuals and organisations.

Zulkipli bin Ismail,

Village head of Kampong Perhentian.

Kammaruddin bin A. Aziz,

Headmaster of Sekolah Kebangsaan Perhentian.

Assoc. Prof. Dr. Mohamed Kamil bin Abdul Rashid

Deputy Dean (Graduate Studies & Research), Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

Dr Juanita Joseph

Member of Malaysian NPOA Sea Turtle working group, current manager of Chagar Hutang volunteer program and marine biology lecturer at Universiti Malaysia Terengganu.

Dr Nicolas J. Pilcher,

Co-Chair, IUCN SSC Marine Turtle Specialist Group, Founder and Executive Director, Marine Research Foundation, Sabah, Malaysia.

Peter Caron

Previous owner of Watercolours and Impiani Resorts in Pulau Perhentian and current environmental consultant.

11. References

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