



**PROJECT FOR THE CONSERVATION OF MARINE RESOURCES IN CENTRAL  
AMERICA**

**Funding Agreement: (BMZ 2007 66 667)**

**Annual Work Plan (AWP)**

**January to December 2014**

**Port Honduras Marine Reserve, (PHMR) Belize.**

**Toledo Institute for Development and Environment (TIDE)**

## 1. CONTEX AND SENSITIVE POINTS

The Toledo Institute for Development and Environment's (TIDE) Annual Work Plan (AWP) 2014 is design with sustainability of the marine resources, the institution and the people in mind; as such, it is critical to continue to invest in infrastructure, equipment, people and communities surrounding the Protected Area. In the end TIDE hopes to accomplish several goals; to become more self-sustainable and less reliant on annual project funds to offset its operational costs; to improve stakeholders' stewardship of the resources and to increase support across Belize for conservation and sustainable management of natural resources. As TIDE enters its third year of the implementation of Managed Access - a new commercial licensing program for fishers in the Port Honduras Marine Reserve, it becomes more dependent on the full participation of the communities to ensure the program works as purported. Some of the decisions taken by the Government of Belize (GOB) can impact the implementation of the project, these points are listed below.

- Perhaps one of the most significant threats to the Port Honduras Marine Reserve in Southern Belize is offshore and/or near-shore oil drilling. Currently, an oil company is conducting an Environmental Impact Assessment to determine how their operation will affect the marine resources in and around the marine reserve. A coalition to save Belize's natural heritage had challenged the oil concession in the highest court in Belize but unfortunately lost the case. TIDE has also been in dialogue with the Government of Belize to ensure that all major developments including oil drilling in the marine reserve follow strict environmental compliance. TIDE is keeping abreast of this new threat.
- The plan to implement Managed Access (A form of Catch Share) across all marine reserves in Belize has commenced. All human and financial resources are in place and the necessary training of newly hired staff is on the way. Unfortunately, TIDE lost one of its staff members to the national initiative but has replaced that staff. There is still the possibility that there will be decreased attention given to existing pilot sites such as Port Honduras Marine Reserve. As a pilot site, it is important that PHMR continues to be developed so that other reserves can learn from our experiences here.
- The concern over the current co-management agreement between Government of Belize and some Non-governmental Organizations (NGO) for the co-management of Protected Areas has not been fully resolved. TIDE feels that in order for the smooth running of the KfW project, we must have a good working relationship with the government and the stakeholders of the marine reserve; hence the reason TIDE signed the agreement. Currently this issue is not a major threat to the implementation of this project.
- Another major threat to the marine resources in Southern Belize is illegal fishing by both Belizeans and Guatemalans. As indicated in the previous AWP, this continues to be a very sensitive issue given the current state of the border dispute between Belize and Guatemala and Guatemala's claim for Southern Belize. The claim hasn't moved since our last AWP so this still remains a sensitive issue for us. Law enforcement can be very sensitive especially when our rangers have to arrest and charge Guatemalan fishers. TIDE continues to be in the forefront of organizing Tri-national forums for fishers from Belize, Guatemala and Honduras through and alliance called the Tri-national Alliance for the conservation of the Gulf of Honduras (TRIGOH) where TIDE is the chair of the alliance.

## 2. HIGHER PROJECT OBJECTIVE

"To contribute to the conservation of the ecological functions of the Mesoamerican Reef System."

### 3. PROJECT OBJECTIVE.

“To consolidate the CMPA selected in the Project’s region and ensure the use and marine resources in the medium-term.”

#### **RESULT 1: Protection And Conservation Of Marine-Coastal Ecosystems In The Marine Area Are Secured.**

TIDE’s approach to protection and conservation of marine-coastal ecosystems is through sustainable development. Sustainable development takes a three prong approach focusing equally on Environmental, Economic and Social aspects. Raising the necessary funds to invest in all three equally has been a challenge for us in the past; however with projects such as this we are able to invest in social and economic developments in communities around protected areas. The protection and conservation of coastal-marine ecosystems require an integrated approach, and as such TIDE uses, Environmental Education and Outreach, Research and Monitoring, Resource protection such as surveillance and patrols and alternative/supplemental livelihoods programs in communities around the protected area. In our 2014 AWP for Component 1 we are proposing minor investments in infrastructure which include the repair of the substation on West Snake Caye along with a lookout tower in the marine reserve. In addition, we are proposing investments in several pieces of equipment, management plans, surveillance and patrols, institutional strengthening, research and monitoring and financial sustainability as these aspects will help us to protect and conserve critical marine habitats.

### 4. ACTIVITIES AND SUB-ACTIVITIES

#### **B.1.01 INVESTMENTS IN INFRASTRUCTURE**

In 2013, TIDE was able to extend the area designated for fish replenishment from less than 1% to 4.5% of the marine reserve. The new replenishment zone will require increased enforcement and increased presence until all users are familiar with the new boundaries. TIDE has a small ranger sub-station in the middle of the replenishment zone (West Snake Caye) which is a key location for enforcement. TIDE hopes to do minor repairs to this building and construct a new surveillance tower to assist with enforcement. Congruent with the management plan for Port Honduras Marine Reserve under section **4.5.4 Infrastructure Management Program** ‘The Infrastructure Management Program covers activities such as the maintenance of present infrastructure and equipment, and planning for future infrastructure and equipment needs. Site and infrastructure management is addressed under three sub-programs; **Infrastructure, Equipment and Maintenance**. Infrastructure required for this AWP is as follows; repairing of ranger sub-station along with a new surveillance tower and installation of a steel window bar for the TIDE lab to secure the newly acquired lab equipment.

#### **B.1.01.02 Improve security at TIDE office for the Science lab to ensure safety of lab equipment**

Through this project TIDE was able to obtain much needed lab equipment to properly do the marine research and monitoring in the marine reserve. The lab equipment is expensive and therefore need to be secured from possible burglary. The lab only has one glass window that poses a risk. In order to not draw attention to the lab the steel bars will be placed from the inside and will not be visible from outside. TIDE will invest \$200 from the project funds for the construction and installation of the steel window. In-kind contribution of \$50 will be in the form of electricity for construction and installation of window.

#### **B.1.01.10 Repair ranger sub-station and tower on West Snake Caye in PHMR**

With the increase in fishing pressure from non-Managed Access fishers who cannot legally access the resources in the marine reserve; TIDE decided to increase its ranger presence in the replenishment zones of the marine reserve. Our research has shown that even though the current replenishment zones are small

they can increase the fish stock if fishers comply with the no-extraction policy within the replenishment zone. By amalgamating 3 small circular zones into one larger zone with straight edges enforcement will become much more effective; in addition a bigger replenishment zone will increase the commercial fish stock. TIDE continuously get reports of night fishing and other illegal entry into the replenishment zones so there is a need to have greater presence in this zone.

We are proposing to invest a total of \$16,000 to repair the existing sub-station making it livable and functioning properly. A total of \$15,500 will be invested by the project and 500 will be contributed by TIDE through transportation to the site during construction. Of the \$15,500; \$2,000 will be used to repair the station and \$13,500 to construct the tower. A tower was constructed in 2008 on this location where clearance was given by the Department of Environment. That tower was destroyed by termites and is no longer there. TIDE is proposing to rebuild the tower in the same location using concrete columns to a height of 30ft. Note that in 2013, TIDE invested in the furniture and fixtures for the substation. TIDE also has a new Memorandum of Understanding (MoU) with the new owner of the caye on which the substation is constructed. The MOU allows us to build these structures on an island that TIDE does not own.

#### **B.1.01.12 Purchase of 20ft storage container for Science equipment with shelves inside; metal roof and concrete columns**

Since the recent procurement of additional science field equipment with this project TIDE needs to now have a secured storage place for the equipment. We are proposing to use project funds to purchase a 20ft steel container and convert it into a storage room. A contractor will be hired to create vents in the container, install a roof and place it on concrete columns 2-3ft above the ground in case of flooding. The cost of the container is budgeted at \$2,500; cost of contract to build roof and columns is \$4,500. TIDE will provide counterpart funds of \$500 to transport the container on site.

#### **B.1.02 INVESTMENTS IN EQUIPMENT**

Equipment constitutes a significant portion of the needs for effective ecosystem protection. In this section of the work plan there is a wide variety of equipment ranging from a patrol boat with engines, to patrol kits, storage container, laptop computer, dive compressor and children lifejackets. As indicated above in section B.1.01, the PHMR management plan in section 4.5.4 speaks to the investment in Equipment.

##### **B.1.02.01 Patrol boat with console, flooring lights, anchor etc.**

With the implementation of Managed Access and the extension to the replenishment (no-take) zone of the marine reserve enforcement has become critical. Fishers who were not qualified for a managed access license have been targeting the resources at night and in inclement weather. As a result, TIDE is proposing to increase ranger presence through several ways; 1.) Analysis of patrol logs to reveal "hot spots" in the reserve so that patrols can be more targeted, 2.) Increase presence within the replenishment zone by using the ranger sub-station and 3.) Purchase a larger patrol vessel that has the capacity to outrun most fishing vessels as well as being able to navigate safely during inclement weather.

TIDE will invest a total of \$16,000 as counterpart to procure the vessel and outfit it with necessary accessories to make it function as a patrol vessel. There will be no cost to the project for this activity.

##### **B.1.02.01 Purchase 1 100HP Yamaha boat engine and engine accessories for new patrol boat**

In 2013, TIDE purchased a boat engine with project funds for our research vessel. After discussing the needs of the research team with the increase in monitoring efforts, TIDE realized that the research team needed a bigger vessel to carry 10 passengers along with field equipment such as dive gears, field testing kits etc.; as a result a decision was made for the research team to use the current 28ft vessel that TIDE normally used for educational trips to the reserve. Trips are scheduled when the vessel is available to avoid conflicts with

schedule. This decision had left the boat engine purchased for research available to be used on the patrol vessel. TIDE will purchase one additional engine for the new 28ft vessel purchased in **activity B.1.02.01** above so that the vessel would have 2 engines.

A total of \$14,000 of counterpart funds will be used to purchase the boat engine and accessories – power steering kit, cables, hoses and fuel tank. There will be no cost to the project for this activity.

#### **B.1.02.02 Signs in English and Spanish featuring maps of new replenishment zones of PHMR**

Four signs highlighting a map of the new replenishment zone along with rules of the zone will be designed, printed and installed in 2014. Two signs will be made in Spanish and two in English to ensure all fishers fully understand where the new no-take zone is. The signs will be constructed of aluminum and installed at key locations in the reserve particularly in the replenishment zones and in the general use zone. Signs are needed to increase the visibility of the marine reserve for fishermen as well as visitors. Both signs will be designed by TIDE personnel and will be contracted out for printing. TIDE rangers will then install these signs on the locations specified above. The cost of the printing of the signs for a total of \$2,300 will be charged to the project. TIDE will contribute \$600 as counterpart through the use of its boat, transportation and boat captain.

#### **B.1.02.04 Purchase of 1 laptop computer**

In this year's AWP TIDE will purchase one laptop computer using project funds for a total of \$800. This laptop will be used by the Manager of the marine reserve whose computer desperately needs replacing. A computer is very essential to the manager as he is responsible for planning and reporting on daily activities in the reserve as well as implementing and reporting on some aspects of projects within the marine reserve. In order to get a better product for the funds budgeted, we will purchase the computer from abroad. TIDE will cover the cost of shipping and duty for the computer estimated at \$200 as counterpart.

#### **B.1.02.04 Furnishing of the TIDE's office extension for Rangers**

This activity is being deferred to 2014 AWP because of the timing with which the office extension was built. With the extension of the TIDE office to accommodate an office, training room for rangers, there is a need to also furnish the office space. A total of \$4,500 of the project funds will be used to procure the following items; 5 office desks, 5 office chairs, 1 small conference table with 10 chairs. Furniture will be purchased locally from vendors in Punta Gorda Town. TIDE will provide a total of \$500 as counterpart for 1 office desk and 1 chair.

#### **B.1.02.04 Purchase 1 multi-function wide format printer**

TIDE currently owns a large format multi-function printer that is over 10 years old and is costing too much in repairs. Since these are specialized machines TIDE has to pay for a technician from Belize city to travel to Punta Gorda by air in addition to pay for the repairs. The current machine is now having excessive failure resulting in high maintenance cost. The printer is central to documenting all aspects of management from financials to meeting minutes, reports etc. With the addition of this project, the volume of printed materials has also increased. In this AWP, TIDE proposes to use \$6,000 of the project funds to purchase the printer which is similar to the existing printer. The remaining cost of \$500 will be to cover the cost of shipping and taxes and will be covered by TIDE as counterpart.

#### **B.1.02.05 Purchase of dive compressor**

TIDE boasts one of the strongest marine research and monitoring program in Belize and arguably in the Gulf of Honduras. We have been collecting data on fish stocks, coral reef health, water quality and other marine habitat such as mangrove and sea grass since 2003. Over 90% of these monitoring activities require the

research team to SCUBA. Since 2003 TIDE has had one dive compressor filling the tanks, sadly that compressor is now having some major maintenance and repairs cost to keep running. In order to not have gaps in data because of a non-functioning compressor TIDE is proposing to purchase a dive compressor with project funds in 2014. The total cost of the compressor is \$12,200 including shipping and duty. TIDE will use \$8,000 from the project funds to purchase the compressor from abroad and the remaining \$4,200 will be counterpart to cover shipping and import duty costs.

#### **B.1.02.06 Purchase 20 children life vests for field trips to the marine reserve**

On an annual basis TIDE takes over 200 children to visit the marine reserve so that they can one day become stewards of the marine resources. We currently have only adult size life vests that these children use but do not fit well and as a result may not serve their purpose. To prevent possible accidents, TIDE will purchase 20 children life vests to be used to educational trips to the marine reserve. The vests will be purchased locally for a total of \$860 using project funds; TIDE will transport the vests from Belize City to its office in Punta Gorda as counterpart costing \$100.

#### **B.1.04 SUPPORT FOR IMPLEMENTATION OF THE CONTROL AND SURVEILLANCE SYSTEM**

In accordance with the PHMR management plan, section 4.5.1 describes the Resource Protection Program. It focuses on ensuring the maintenance of healthy, functional ecosystems, through direct management of the marine environment, surveillance and enforcement and direct biodiversity management interventions. This program falls under the responsibility of the Marine Manager and rangers. Two sub programs have been identified under this program: Surveillance and Enforcement and Marine Resource Management. The program goal is 'To protect the physical and biological resources of Port Honduras through protecting and enhancing key species, habitats and ecosystem functions and services'. To accomplish this goal, 6 objectives were identified as follows;

**Objective 1:** To preserve the value of the area for fisheries, through the protection and enhancement of habitats utilized by commercially important species.

**Objective 2:** To reduce fishing pressure in the PHMR by 30% by eliminating illegal fishing and illegal fishing methods.

**Objective 3:** To maintain diverse and healthy fish populations in the rivers of the Mayan Mountain Marine Corridor - MMMC.

**Objective 4:** By 2018, increase commercial species (conch, lobster, snapper, grouper) and parrotfish to viable population levels

**Objective 5:** By 2015, increase shark numbers by 15% based on 2006 levels, and the population of large (>110cm) Goliath Grouper by 15%, in PHMR based on 2006 levels.

**Objective 6:** By 2010, have nest monitoring and protection in place for 25% of all known marine turtle nests in PHMR.

In partial fulfillment of the objectives set out in the section of the plan, activities listed under section B.1.04 will be implemented in 2014.

#### **B.1.04.03 Support surveillance and patrols program in PHMR**

This activity is a continuation of 2013 AWP and an ongoing program at TIDE. Patrols and surveillance are done on a daily basis and sometimes at night to protect the marine fisheries from illegal harvesting. This program is in collaboration with the Belize Fisheries Department, which is the legal authority for fisheries management in Belize. TIDE operates this program from Abalone Caye in the marine reserve, where it employs eight law enforcement rangers equipped with two boats and a surveillance tower to monitor the area. The KfW project will support this year's operational plan through the provision of \$12,000 to cover

about 32% percent of the cost of fuel and oil. A total of \$26,500 as counterpart funding and support will be provided by another donor and TIDE. TIDE will also conduct servicing of boat engines, procurement of engine propellers and oil filters as counterpart.

In addition, TIDE is proposing to use project funds to increase the ration for marine rangers. For the past 6 years the rangers for the marine reserve have been getting \$50 per month from TIDE for ration. This allowance only constituted half of what they need, now that the cost of grocery has increased significantly. Rangers are currently using funds from their already meager salary to offset the increase in cost; each week, each ranger is contributing \$25 in addition to their allowance to purchase ration. We understand that increasing the ration for rangers through this project may not be sustainable, but it would give us additional time to find ways of sustaining it after the project is completed.

With an increase in ration allowance the total budget for 5 rangers for the year would be \$10,400. TIDE is proposing to use \$5,200 of the project funds for 5 rangers for 52 weeks. At any given time 4 rangers are on duty at all times so the cost was estimated based on 4 rangers per month for the year. Funds will be given to rangers on a weekly basis and they will procure their ration accordingly. TIDE will contribute the remaining \$5,200 as counterpart.

The support of the KfW project will increase the ranger presence in the area by 10%. TIDE has records of the number of infractions in the reserve in patrol logs that will be analyzed in 2014 to better target patrol routes and frequencies. The total cost of this activity is \$48,900; we are proposing to use a total of \$17,200 from the project funds and \$31,700 as counterpart. The purchase procedure will be of a single bid due to the fact that there is only one gas provider in Punta Gorda town.

#### **B.1.04.04 Analyze and document the spatial/temporal distribution of illegal activities to better target patrols**

TIDE has been collecting patrol information for the past 10 years. This information includes location, date and time of all illegal activities within the reserve but it hasn't been entered into a database or analyzed. This activity hopes to accomplish the analysis to identify areas where most of the illegal activities occurred as well as the type of illegal activities, date of that activity etc to better target patrols and become more effective. The main reason for this is that it is becoming increasingly expensive to conduct patrols with rising cost of fuel and general cost of living.

This activity is a part of a larger initiative to increase the cost effectiveness of the management of the reserve. The total cost of the activity is \$2,900; the project will cover \$515 out of that total to print new incident report forms x 5 sheets/d x 365 d/y (\$365) and \$150 to purchase 30 waterproof notebooks and pencils for rangers to document patrol information. Based on experience this activity will not require a special software and information can be stored in an excel database. TIDE will provide the remaining balance of \$2,385 as counterpart to hire a consultant to compile, analyze and report on the past patrol information.

#### **B.1.04.06 Public Relations training for TIDE rangers**

This activity is being deferred to 2014 AWP, its justification and cost remains the same. Rangers are considered first line employees, in many cases they are the face of the organization and visitors' perception of the organization is based on their first impression. Over the past there have been cases where fishers and visitors alike have had negative experiences with a few rangers. To mitigate such incidences, prevent future occurrences and build better relationship with the general public rangers need to be trained in public relations.

A total of \$250 of the project funds will be used to cover the cost of a consultant to train 10 rangers in this field. The training will last for 1 day and will be done at the TIDE office. An additional \$250 will be used to cover the cost of food and materials for the training. TIDE will provide \$300 as counterpart for

transportation and venue. The total cost of this activity is \$800; TIDE is proposing to use a total of \$500 from the project funds and \$300 as counterpart

#### **B.1.05 SUPPORT FOR THE IMPLEMENTATION OF MONITORING AND EVALUATION SYSTEMS**

In section 4.5.2 Research and Monitoring Program of the PHMR management plan; the plan speaks of providing ongoing information on the state of the marine resources, to providing information for adaptive management, to assisting in prioritizing monitoring and research activities, and to informing management decisions. This Program falls under the responsibility of the Science Director, and consists of four sub programs:

- Research Program
- Monitoring Program
- Staff
- Communication and Collaboration

To implement a clearly documented research and monitoring program that supports ecosystems planning and management in the Port Honduras Marine Reserve and the wider Maya Mountain Marine Corridor, the following key objectives are essential;

- To monitor viability of conservation targets and water quality
- To provide information on the ridge to reef connectivity of the Maya Mountain marine Corridor
- To effectively assess success of no take areas, managed access and PHMR as a whole in maintaining viable populations of key conservation species
- To identify sites/coral species resilience and develop recommended adaptations for climate change
- To establish comprehensive datasets and effective data management and analysis for providing information for informing adaptive management strategies and assessing the management effectiveness of the marine protected area
- To improve engagement of stakeholders of PHMR through involvement in research and monitoring activities within the Marine Reserve, to build capacity and improve support for conservation activities.
- To improve capacity and ability of staff, rangers and community researchers to conduct research and monitoring within PHMR

In 2013 100% of the cost for research and monitoring within the marine reserve was funded through counterpart funds. In 2014 TIDE is proposing to use the project funds to cover costs for research and monitoring including stipend for community researchers, materials and supplies and food. Since the stipend for community researchers is a direct support to community members, that cost is inserted into component 2 of the AWP.

##### **B.1.05.01 Generation of a baseline of mangrove cover and marine grassland in the four MCPAs**

In 2013 the generation of a baseline of mangrove and seagrass cover, started in the four protected areas of the project. This is an ongoing activity for 2014, through the pending payments of the contract services signed between RSS- Remote Sensing Solutions-GmbH and MAR Fund. The total cost of this activity through the project is US \$10,000.

##### **B.1.05.06 Habitat mapping of PHMR GIS and Ground-truthing**

TIDE is working with the Belize Fisheries Department, Wildlife Conservation Society, Environmental Defense Fund, University Santa Barbara California and Rare to develop life history based methods for determining total allowable catch limits for multiple commercial species. While TIDE has high quality size frequency distribution data for conch, lobster and finfish, a detailed habitat map is necessary in order to determine relative abundance of each species by habitat. This will allow population estimates to be made, an essential

step in developing models to determine total allowable catch. TIDE will use the information collected through the sea grass and mangrove cover study to help with the development of the habitat map.

The total cost for this activity is \$15,000 and is being funded through counterpart funds.

**B.1.05.07 Marine monitoring package that includes water quality, fisheries assessment, sedimentation and sea turtle monitoring**

In this marine monitoring package, all of the following monitoring activities will be carried out during one trip to PHMR each month: water quality, fisheries assessment, sedimentation and sea turtle monitoring. Water quality is monitored using electronic probes that measure temperature, dissolved oxygen, acidity, salinity and conductivity. Water is collected and tested in the laboratory by a community researcher to measure other parameters such as nitrates and phosphates. Fish stock assessments include measuring and documenting fishermen's catch at sea and at landing sites. Sedimentation assessments are done through the collection of sediment from traps that are brought back to the laboratory, dried and weighed to determine the rate of sedimentation. Sea turtle nesting is monitored by scouting the beach for evidence of nests and conducting beach profiling. All low-lying nests are relocated to higher elevation to ensure survival. The trip normally lasts four days and is done each month using 2 paid community researchers and 1 extra researcher for six months during turtle monitoring. The cost for this monitoring package is \$13,150. Of that total this project will fund \$2,445 for materials, supplies and food. The objectives of these monitoring activities are to gauge management effectiveness of PHMR as well as to monitor critically endangered species. This activity is done internally by TIDE's scientists and using TIDE's boat and captain. All other costs including fuel and oil (\$10,705) associated with these activities are funded by another donor and are considered counterpart support to this project.

**B.1.05.13 Monitoring of queen conch population density and dynamics in PHMR**

Queen conch is one of the main commercial species harvested in Belize for export to other countries. It is important that TIDE continues to monitor conch population densities and dynamics in PHMR to ensure fishers do not over fish this species. TIDE scientists monitor this species twice per year, once at the end of the closed season and once at the end of the open season. This is done by diving along predetermined belt transects and counting and documenting all queen conch. The total cost of this activity is \$2,160; we are proposing to use a total of \$1,120 from the project funds to cover the cost of materials, supplies and food. The remaining balance of \$1,040 will be provided through counterpart funds to cover cost of fuel for transportation.

**B.1.05.14 Conduct coral reef health monitoring in PHMR**

Coral reef health is important as most of the commercial fish species spend a large portion of their lifecycle on the reef. If reefs are unhealthy, commercial fish species will be unproductive, resulting in decreased or low income for fishing families. Reef health monitoring is done using established protocols as per the Mesoamerican Barrier Reef Systems Project (MBRS). This protocol is used across the Mesoamerican Barrier Reef in Mexico, Belize, and Honduras. MBRS monitoring is done twice per year in the reserve using paid community researchers along with the TIDE biologist and research assistant. Total cost of this activity is \$3,664; the project will fund \$2,364 to cover the cost of materials and supplies and food. The remaining balance \$1,300 for fuel and oil will be funded by another funder and are considered counterpart for this project.

**B.1.05.15 Conduct monitoring of sea cucumber population in PHMR**

Sea cucumber is a relatively new commercial marine species to be harvested from PHMR. Licenses to harvest sea cucumber were issued without a proper assessment on the fishery and populations in other

parts of the world have been quickly overexploited following commencement of harvesting. Furthermore, current open and closed seasons are not based on biological factors. Hence, it is important that TIDE closely monitors this species to alert the Belize Fisheries Department and fishers of the dynamics of the population. Total cost for this monitoring activity is \$810; the project will fund \$290 to cover the cost of materials and supplies and food. The remaining balance of \$520 for fuel and oil is being funded by another funder and is considered counterpart for this project.

#### **B.1.05.16 Monitoring of sea grass health in PHMR**

For the past 8 years TIDE has been conducting sea grass monitoring in PHMR looking specifically at sea grass biomass. Sea grass biomass is useful to determine the health of an area as it provides food for planktons as well as manatees. Sea grass also filters the water by trapping sediments resulting in improved water clarity necessary for coral growth.

TIDE will continue to monitor sea grass twice per year on an annual basis. All the costs (\$1,450) associated with sea grass monitoring such as supplies and materials, food fuel and oil will be provided by another funder and will be considered as counterpart for this project.

#### **B.1.05.18 Monitoring of lobster population in PHMR**

Lobster is by far the most profitable commercial fish species in Belize. Although lobster habitats are not very high in PHMR many fishers are now creating artificial habitats that increase yields. TIDE monitors lobster population twice per year in the general use and no-take zones of the PHMR. Ever since this monitoring started in 2003 we have seen a continuous decline in population density. It is expected that the population will increase with the implementation of Managed Access combined with the increase in the no-take zone acreage.

The total cost of this activity is \$2,135; of that total the project will fund \$1,095 to cover food, materials and supplies. The remaining balance of \$1,040 for travel and transportation will be covered by counterpart funds.

#### **B.1.05.18 Juvenile lobster recruitment study**

The Caribbean Spiny Lobster is the most economically important commercial species in all Belize, providing ~60% of fisheries revenue overall. PHMR Replenishment zone expansion consultations took place in 2013, and a small expansion was agreed to that will be signed into law in the next 6 months. Research indicates that a replenishment zone encompassing 15-20% of the protected area is necessary to have the desired effect of increasing larval recruitment of commercial species in RZs to ensure sufficient spillover to maintain sustainability of the stock. It is the goal of this study is therefore to compare the recruitment capacity of the existing RZs with the newly designated RZs before and after implementation of the expansion, and to identify areas in PHMR with high larval recruitment capacity. This will help build consensus for the concept of RZs as larval suppliers, and help inform future consultations on other areas of the reserve that could be designated as RZs in future. The total cost of this study is \$2,000; of that total the project will fund \$1,000 to cover the cost of materials and supplies. The remaining cost of \$1,000 for food, fuel and oil will be covered by counterpart funds.

#### **B.1.05.19 Fish stock market assessment**

This activity is a part of a comprehensive assessment that includes monitoring at sea which is included in activity B.1.05.07 above. This component requires that 2 community researchers conduct measurement of caught fish at the Punta Gorda market; an activity called fisheries dependent monitoring. The data from the fisheries assessment at sea and the data from the market is combined at the end of the year and analyzed to determine whether the volume of fish being caught is sustainable over time. The species monitored are

conch, lobster and finfish. The only cost for this activity is stipend for 2 community researchers for 4 days per month for 12 months. This cost is included in activity B.2.03.29 which is stipend for community members for research.

#### **B.1.05.20 Conch lip thickness at Maturity study**

The queen conch (*Strombus gigas*), a large marine gastropod, is of significant economic value to the Caribbean region due to its use as a food source and export value. A minimum shell length (SL) of 17.8cm, currently regulates the queen conch fishery of Port Honduras Marine Reserve (PHMR). However studies show that shell lip thickness (LT) is a more accurate indication of sexual maturity. Conch are of serious concern as overall maturity of the stock is decreasing rapidly based on lip thickness, yet this trend may be masked by the current shell length based minimum size limit. This study seeks to correlate LT to maturity in PHMR queen conch by use of gonad weight, histological analysis of gonad samples, as well as comparisons between germ cell abundance. Continued use of a minimum SL will not ensure fishing of solely mature conch, which ultimately poses a threat to the sustainability of the conch population within PHMR. This study has the ability to inform national policies that can help to ensure a sustainable conch fishery for Belize.

The total cost of this study is \$8,380; of that total, the project will cover \$2,380 for materials and supplies and food. The remaining balance of \$6,000 to cover additional supplies and materials, stipend for community researchers and travel and transportation will be covered through counterpart funds.

#### **B.1.05.21 Goliath Grouper fishery study**

The goliath grouper has been listed as critically endangered on the IUCN Red List since 1996. Its life history characteristics make it susceptible to overexploitation, with long life span, slow growth rate, late maturity and limited reproductive output as a result of small, brief spawning aggregations. Overfishing is widely recognized as the largest threat to goliath grouper populations, with habitat destruction another significant factor. Results from tagging exercises show that individuals from Port Honduras Marine Reserve in Belize travel as far as La Ceiba, Honduras, and Mahahual, Mexico. Thus, this nursery could be critical in restocking the whole Mesoamerican Reef Complex. Between 2005 and 2007, 98.9% of all landings had not yet reached the size of sexual maturity (Graham pers. comm.). Presently fishers are still landing juvenile groupers on a weekly basis. The goal of this study is to collate existing information on this species; collect additional data through market surveys for 4 months and recommend policies for the management of goliath groupers to the Belize Fisheries Department. The total cost of this study is \$5,731 for paying researchers to collect data, transportation, food and consultancy and will be funded entirely through counterpart funds.

### **B.1.08 INSTITUTIONAL STRENGTHENING FOR AREA MANAGERS**

One of the key investments in TIDE is its human resources. Without a properly trained staff TIDE would not be able to successfully accomplish its goals and objectives. On an annual basis, TIDE seeks opportunities to increase the capacity of its staff through various trainings, conferences and workshops.

A part of strengthening of the organization is also to ensure that the work the organization does is highly publicized to increase the visibility of the organization in the community. Because TIDE works in a dynamic community it is important that we utilize several means of communicating with our various stakeholders. In this AWP TIDE is proposing to use printed materials, radio and television to cover all local and national stakeholders, as well as the internet to reach international stakeholders.

There is also the need for TIDE to become more financially sustainable. This is a relatively new approach that TIDE is taking with the hope of decreasing dependence on financial grants from donors through generation of income from TIDE Tours and its ridge-to-reef expedition program which requires volunteers to

pay for their experience. The income earned from these two programs will assist with overhead and environmental education. All these aspects of institutional strengthening are discussed below.

#### **B.1.08.01 Develop, print and distribute PHMR brochure**

This activity is being deferred to 2014 AWP because of limited time to implement, the justification and cost remains the same. One of the ways in which we communicate with our stakeholders and the general public is through printed materials. In Southern Belize, only a small percentage of the population has access to internet, about half the population has a television with local cable and about 80% has a local radio. With these statistics, it is essential to have printed materials to distribute to communities not only around the marine reserve but to the wider district of Toledo.

TIDE will develop a brochure bearing information on the Port Honduras Marine Reserve and how people can become involved. A total of \$1,500 of project funds will be used to print 500 copies of the brochure. The brochures will be distribute to local communities in Southern Belize, but will also be used to market TIDE and the Marine Reserve internationally as a tourism destination at tourism trade shows and taken along when TIDE staff visits other countries. TIDE will contribute \$500 in transportation cost to get the brochures to Punta Gorda and to distribute them to various stakeholders.

#### **B.1.08.02 National radio show on TIDE and PHMR**

This activity is a repeated activity from the 2013 AWP. The cost overall cost is lower as it entails just one radio/tv show instead of 2 as in the past. As part of our Education and Outreach strategy, reaching out to everyone via national radio/tv is a priority for us. It is estimated that at least 80% of the population in Toledo has access to a radio. This then becomes a very useful means of communication for us and provides a medium through which we can communicate information regarding this project and everything else that TIDE is involved in. It is also an opportunity to market our fund raising event- the Annual Fisherman Festival.

The project funds will be used to cover the cost of the national show on radio and television which will be hosted from the TIDE office in Punta Gorda. A total of \$1,500 of the project funds will be used to cover the cost of the show in Punta Gorda through a contract with the radio station. TIDE will also use the opportunity to promote partners of the project including PACT, MAR Fund and KfW.

#### **B.1.08.04 To contribute to the effective national implementation of Managed Access**

Managed Access has reduced the number of commercial fishers using PHMR from around 300 to 130. Early indications suggest a positive effect on stocks of commercial species and Managed Access licensees' catches. Based on this success, the Fisheries Department has made the landmark decision to replicate Managed Access across the entire Belize MPA network by 2015. TIDE will support this process through lesson sharing, policy recommendations, community outreach, scientific advice and contributing to the design of a national marketing campaign.

In 2014, TIDE proposes to use \$1,250 of project funds and \$1,250 of counterpart funding to cover the cost of travel and accommodation for a member of staff to attend an international conference to promote the results of Managed Access in PHMR and encourage its replication. Several international conferences are available throughout the year. Most of them haven't set dates or venues yet but conferences related to fisheries management are of high importance to us. In addition, counterpart funding will cover the cost for TIDE's executive director to participate in six sessions of the national Managed Access Working Group (\$900). TIDE's science director will participate in a workshop to develop scientific protocols for monitoring fisheries and estimating maximum sustainable yield alongside fisheries scientists from the Environmental Defense Fund and Belize Fisheries Department. TIDE will also conduct two workshops to train rangers and

the PHMR Managed Access Committee in how to communicate the purpose and benefits of Managed Access.

**B.1.08.05 Set up and run initial ridge-to-reef expeditions for one year (after which the program will become self-sustaining)**

Becoming financially sustainable is perhaps one of the main challenges for non-profit, non-governmental organizations including TIDE. TIDE has had its tour operating arm for 10 years, and while funds generated have been minimal it has great potential. As a supplemental source of income, TIDE, based on market analysis has decided to invest in a paying volunteer program that will eventually be managed by TIDE Tours. This program was originally called Pay-to-Participate and was partially funded by this project through the printing of a brochure to market the program. In 2014 we are changing the name to Ridge-To-Reef Expedition to avoid negative connotation such as paying to volunteer. This is mainly for marketing purposes as the goals and objective of the program remains the same. In 2013 a total of 4 volunteer expressed interest and willingness to pay; however because we weren't fully operational, we decided to postpone expeditions to 2014. As with any business, an initial investment of cash is required to get it started; this activity is to partially invest in the initial startup of the financial sustainability program for TIDE since TIDE has already invested significantly in this program. According to the business plan for the ridge-to-reef expeditions, TIDE would reach breakeven point in year 3 and would be earning a projected income of \$50,000 per annum at year 5. This projected income would account for at least 20% of TIDE's administrative cost.

In 2013 TIDE had proposed to invest in some dive equipment and other supplies; however due to reasons beyond our control the budget had to be reduced; we hope to acquire these equipment now in 2014 so we are proposing to use \$6,000 to procure 4 sets dive gear (BCD, Regulator, Mask, Snorkel, Wetsuit, Booties, Fins, Rashguard, Dive Knife, Dive computer, Gear bag, Reel, SMB, Slate), \$1,000 for 1 Oxygen provider kit, \$1,000 for a 1,000 gallon-capacity water tank, \$1,510 for 4 sets of camping gears, and \$2,000 for a contract to improve the current water supply facility at the volunteer base located in Payne's Creek National Park bordering the marine reserve also co-managed by TIDE. The proposed improvement to the water supply includes expanding the existing well and plumbing/concrete works to allow additional extraction of water for cleaning, shower and bathroom purposes. This is a total of \$11,510 of project funds to be used in this AWP. As counterpart other investments will be for a total of \$46,660 to cover costs such as salaries, additional equipment and international insurance.

**B.1.08.05 strengthen TIDE's financial sustainability through marketing of ridge-to-reef expeditions program**

As indicated in the 2013 AOP the ridge-to-reef expeditions program started late 2012 due to the high number of volunteer requests TIDE receives annually. Our research indicates that volunteers pay high prices to foreign volunteer organizations like Pro-World, and Blue Ventures to get authentic experiences. These volunteer organizations usually place these volunteers at places like TIDE who are directly involved in resource management where the volunteers are sure to get an authentic hands-on experience. TIDE does not earn any income from the volunteers except the benefit of the work they do. The P2P program involves hiring someone to coordinate the activities, communicate with volunteers, make arrangements for volunteers housing, make arrangements for the activities that the volunteers will be involved in, ensure all necessary equipment, supplies and materials are available for the volunteers, etc. TIDE's biologist and research assistant will lead the volunteers' expedition in the marine reserve to conduct various activities.

To compliment what has been done to date; TIDE is proposing to invest \$5,825 of the project funds for the cost of attending one international trade show in San Diego, California USA in March 2014 for 1 TIDE staff to promote tourism in Toledo/Belize as well as TIDE's ridge-to-reef expeditions. This trade show was recommended by the Belize Tourism Board as a means of promoting this program as well as promoting

Toledo District as a tourist destination. An increase in tourist would also mean increase in visitors to communities buffering the marine reserve which translates to increase in income for villagers. This cost will include cost of display booth, registration, travel, meals and accommodation. A total of \$20,518 as counterpart will be used to cover costs such as contract for management of marketing program, IT equipment, advertisements, printing and distribution of additional brochures and travel for another TIDE staff to the trade show and other travel within the US and UK.

#### **B.1.08.06 Familiarization tour of PHMR by Government officials and local government**

The Belize Fisheries Department and the Department of the Environment make crucial decisions regarding the management of PHMR. For instance, the Fisheries Department creates MPA and fisheries regulations while the Department of the Environment makes decisions regarding the approval or rejection of large-scale development projects that could affect the marine reserve. It is extremely important that TIDE maintains excellent working relationships with these government departments and that the departments are aware of TIDE's work and incorporate the results of TIDE's research activities into decision-making. Likewise, the Punta Gorda Town Council makes decisions that affect PHMR, such as decisions regarding the local dumpsite.

In 2013, we are proposing to strengthen our relations with senior officials from the Fisheries Department and Department of the Environment and local government officials by giving them a tour of PHMR and a presentation on TIDE research results and planned activities. We propose to use \$1,125 of the project funds to cover the cost of local flights and food for government officials. TIDE will provide \$500 as counterpart, covering the costs of fuel for sea transportation, use of boat and boat captain.

#### **B.1.08.09 Conduct mentoring of community members that are involved with implementation of micro-enterprise to ensure project success.**

In order for these community projects to be successful, there needs to be a qualified person mentoring the individuals involved with the project. The mentor will be there to ensure activities are carried out in the proper manner for quality assurance as well as to ensure business owners are managing their business in a professional manner using proper book keeping methods etc. Community members will have to show that they are earning additional income from their business after a certain period of time. TIDE currently cannot provide this mentoring with its current staff so we are proposing to use project funds to contract a mentor for a period of 6 months after which business owners would be managing their business on their own. The mentor is actually needed for 1 year; however since these activities are scheduled for the latter part of the year the cost for the mentor is budgeted for the last 6 months of 2014. TIDE will have to ensure the remaining 6 months for the mentor is programmed in the 2015 AWP. The cost of the mentor is \$1,000 per month including travelling to the communities to assist business owners; total, \$6,000.

## **Result 2. Best management practices and sustainable use of coastal and marine resources has been promoted**

We are increasing the direct investment in communities under this component of the project. In 2014 TIDE will implement some activities from the business plans for 3 communities developed during 2013 AWP. In particular, the communities along with consultants have identified the need to invest in an authentic cultural restaurant in Punta Negra. The kitchen will promote local cultural dishes for visitors to the village through a planned coastal communities' tour package for Southern Belize. There are also plans to train additional fly-fishing tour guides in Monkey River and provide them with necessary gears for them to get started, and finally, a solar fruit drying facility in Punta Gorda Town targeting women in fishing families. The solar fruit drying facility already has a local buyer who is willing and able to set up the facility, train participants and buy the dried fruit. In addition, TIDE will continue to strengthen the involvement of community groups in the management of the marine resources through networking, national and

international fishing forums, visits to the marine reserve for children, dive training for community researchers, training for teachers to enable them to better deliver teaching courses to children in primary schools in Toledo, train community members to enable them to assist with research, education and enforcement and continue to support the implementation of Managed Access fisheries management tool in Port Honduras Marine Reserve. TIDE is also proposing to construct a dock for Monkey River Village to facilitate landing of fish and access to the community by boats, continue to provide scholarships for children of fishers and facilitate an exchange visit to New England, USA for Managed Access fishers.

### **B.2.01 DEVELOPMENT OF THE PRODUCTIVE FABRIC OF COMMUNITIES/ASSOCIATIONS**

Under the **Sustainable Development Sub-Program** of the PHMR management plan, TIDE is engaged in strengthening community alternative livelihood options. This is done through targeted projects that fall within its remit that will reduce pressure on the natural resources, strengthen sustainable development and/or contribute towards alternative livelihoods. TIDE works with the communities to identify specific, community-driven projects that fill identified needs, locating funding for these community efforts.

Identified initiatives include:

- Location of new / alternative markets for fishers, providing greater value for products.
- Providing a link between restaurants and fishers.
- Providing materials and labors for rehabilitation of the fish market in Punta Gorda – also a place for distributing fisheries management messages / education
- Establishment of a barber shop in Punta Gorda
- Establishment of Mangrove Honey Production Apiary in Monkey River
- Establishment of 2 Seaweed farms (1 in Punta Negra for Women's Group and 1 in Monkey River)
- Installation of a freezing facility for traditional fishermen in Monkey River
- Construct a Multipurpose Centre in Punta Negra, where women can cater for tourists, sell crafts etc.
- Development of resource center and library in Monkey River and Punta Negra
- Provide a boat and engine to Punta Negra to facilitate community access
- Construct a dock at Punta Negra
- Assist communities in developing Community Development Plans

In this AWP TIDE will contribute to existing developments as well as invest in new micro-enterprises suitable for communities around the protected area. The activities listed are a part of the on-going consultancy to conduct feasibility study and create business plans for feasible business opportunities in buffer communities. In this section, TIDE is proposing investments using project funds including improvement of kitchen and dining facility in Punta Negra; fly-fishing techniques training and fly-fishing gears for Monkey River, and an individual home-canning operation to preserve and sell fresh fruits in Punta Gorda. The Punta Gorda Tour Guide Association is currently developing a tour package for 3 coastal communities including Punta Negra, Monkey River and Barranco along the coast of Southern Belize. The tour package will be marketed locally and internationally and is aimed at increasing tourism in these 3 communities. Local villagers will have an opportunity to sell crafts, food and other local items. TIDE believes that that tour package along with the ideas proposed here would complement each other to increase the overall experience of the visitor. The various investments in the communities will be marketed through this tour package and on TIDE Tours website. Below are the various activities proposed by TIDE to investment in the communities around the marine reserve based on the feasibility study that is expected to be completed at the end of November 2013. For the various investments, the community groups or individuals will sign a Memorandum of Agreement with TIDE to use the items/infrastructure for the purpose of which it is intended, and they are also required to track their expenses and income. To assist these individuals we

believe that they will need mentoring for at least 6-8 months before they are able to effectively manage their business on their own. With that in mind a mentor must assist them and work very closely with them.

**B.2.01.04 Invest in cultural kitchen for fisherwomen in Punta Negra Village with training in small business management, customer service and hospitality.**

Based on feasibility study, women who have remained in Punta Negra have the potential of supplementing their livelihoods by providing cultural food to visitors to the PHMR and PCNP. In order for this to occur, there will need to be several types of investments including the supply of kitchen utensils and kitchenware, training in small business management, customer service and hospitality, investment in infrastructure and marketing. Because of lessons learnt from similar projects in the past, the best approach is to equip the three individual women with kitchenware and stoves that will be located at their homes to be used for making meals. These items include 3 stoves, 3 BBQ grills, 3 sets of kitchen utensils including 3 pots, 2 baking pans, 2 cooking spoons and 2 cooking forks, 2 knives, 12 eating and drinking utensils each, and silver ware, 3 cupboards for proper storage of food. Total project cost at for these items is \$1,275 per family for 3 families is \$3,825. Families will provide their own kitchen structure and other small kitchen utensils as in-kind valued for a total of \$1,500.

The project will also need to invest in a communal dining facility where the women will take their cooked meals to be served to guests. Individual homes in Punta Negra do not have the facility to accommodate guests comfortably; even though women have unique food preparation skills that they can use to supplement their livelihood. According to feasibility study, it is more cost effective to build a communal 16 X 20 dining facility with 2 bathrooms and 4 picnic benches and 1 solar freezer to be stored in the dining facility at a central location (school compound) that can be used by the three families to serve food and drinks to guests. This approach is preferred to a full restaurant owned by the community members as lessons learnt indicated that taking ownership by all community members in Punta Negra doesn't work well as no one wants to take responsibility for maintenance of equipment such as stoves, and other kitchen utensils. By providing the stoves and kitchen utensils to individual women they will automatically take ownership and maintain such items. The dining facility would require minimal maintenance for at least 5 years; thereafter the women will need to provide the funds to do such repairs and maintenance as needed.

The dining facility will be marketed through TIDE Tours website and other printed materials by TIDE Tours. Other tour operators in Toledo will also be given this information so that they can also market it through their websites and to their customers. TIDE will have an agreement with the 3 women of Punta Negra for them to maintain the facility; however TIDE will own the facility to ensure that it continues to function as it were meant to function. The cost of this 16 X 20 facility with double bathroom and 4 picnic benches is \$15,000; and the cost of 1 solar freezer is \$2,400; TIDE is proposing to use the project funds for this. The village of Punta Negra will provide the land for the communal diner as in-kind valued at \$10,000 and TIDE will provide transportation for the freezer from Belize City to Punta Negra as in kind valued at \$350.

In order to ensure the success of the cultural kitchen in allowing the 3 women in Punta Negra to earn an income they have to be trained in various business skills. These basic skills include small business management, hospitality and customers service. The services of business personnel will be contracted to offer the 3 training sessions. Trainer will provide necessary materials and will provide his/her own transportation cost for the sessions. Each of the trainings listed above will cost \$400.00 for a total of \$1,200 to be funded using project funds. Three women will contribute their time as in-kind valued at \$300 and TIDE for use of conference room valued at \$150. For all the activities listed above the total cost to the project is \$22,425 and the total in-kind contribution is \$12,300 for an overall cost of \$34,725. As a small project with different sub activities which also includes the acquisition of very specific equipment not readily available in the local market, a three bid offer won't be applied according to the Operation Manual of the Project.

**B.2.01.11 Train 5 Monkey River tour guides in Fly-Fishing techniques and provide sports fishing kit to participants**

Sports fishing, proven to be an alternative to commercial fishing, is becoming popular in southern Belize and there are limited number of trained sports fishing guides to meet the demand of tour operators. Monkey River tour guides already have boats and engines and can supplement their livelihood by engaging in Sports Fishing. An economic valuation of PHMR done in 2008 indicated that Fly-fishing guides can earn up to \$350 per day within the marine reserve. TIDE proposes to use \$5,000 of the project funds to contract an experienced local fly-fishing company to conduct the training that includes practical field sessions to 5 tour guides and fly-fishing gears at the cost of \$1000 per guide. This training cost includes transportation out at sea with the trainees on a daily basis to practice their fly-fishing techniques as well as for the fly-fishing company for their consulting fee. In addition each fly-fishing guide will receive a sports fishing kit after successful completion of training; the kit will include 1 fly-fishing rod and reel, flies and 1 fly-line at a cost of \$1,000 per kit for a total of \$5,000 which will be charged to the project. Counterpart will be provided by trainees in the form of boats and engines valued at \$5,000.

**B.2.01.13 Invest in a small-scale solar fruit drying facility for 10 women in fishing families including training and first year operational cost**

After careful discussion with the consultant who is doing the feasibility it was confirmed that a more feasible option for preserving fruits in Toledo is by drying. While there is huge potential for canning; the market for canned fruits needs further development and may not provide the expected income in the short term. The market for dried fruits is more advance since there is already a buyer in Toledo for this product. This activity proposes an investment in a solar drying facility that is low-tech and can be easily replicated in villages like Punta Negra that does not have electricity. The entire operation requires a building 30ft X 15ft equipped with stainless steel cupboards and sinks, 3 solar dryers, and an assortment of plastic containers and stainless steel cutleries. There is also the need to do 2 weeks training for the 10 women in processing and packaging of fruits. In addition, it would be wise for the project to fund the first year of the operational cost to get the processing plant running with sufficient profits to cover its own operating cost thereafter.

To ensure that this operation is successful, TIDE will provide the land necessary for the building to be located next to its offices in Punta Gorda Town. TIDE will also be the owner of the building and the equipment to ensure they are secured and maintained properly. There will be an application process with strict criteria that will allow us to select only those women that have the potential and willingness to participate in this venture. A selection process is preferred since there isn't a registered women's group in Punta Gorda that can implement this project. TIDE will work with the Department of Cooperatives and Credit Unions in Belize to get the women who are willing and able to implement this project to form an official women's cooperative. That cooperative will be legally registered and will be prepared to take on the ownership and management of the drying facility from TIDE. TIDE envisions that the facility will be moved to a location owned by the women's group and will no longer be overseen by TIDE; this process may take 1 to 2 years.

A meeting with the owners of the company in Toledo registered as 'El toque Moho Limited' ([www.fruit-full.com](http://www.fruit-full.com)) indicated that they are willing and able to set up the facility, train women and purchase dried fruit at USD \$9.00/pound. This company has been doing this as a successful business for the past 3 years in Toledo and is preparing to start exporting their products abroad in the near future. Their website has more information on the process, facilities etc. TIDE proposes to use \$20,000 of the project funds for funding the drying facility and equipment; this includes the main building structure for processing (\$12,550), 1 solar dryer room (indirect dryer) and support system (\$2,750), 4 direct dryers (\$1,500), cutlery and cutting boards (\$150), aprons, shoes and hairnets (\$150), two scale measure 10lbs (\$250), wood stove and heat exchanger plus piping (metal) (\$750), plastic containers and buckets all sizes (\$150), utility connection, plumbing and electrics (\$500), maintenance tools (\$500), stainless sink on metal legs plus stainless table on metal legs (\$750). TIDE will provide the land for housing the facility for an in-kind value of \$15,000.

A total of \$2,100 of the project funds will also be used to conduct the two-week training. Because 'El Toque Moho Limited' is familiar with the process, they will be contracted to provide the training which will

be in fruit processing, including drying and packaging for 10 women. The training will be done over a two-week period so that the women can get a comprehensive understanding of all aspects of the process. The contract will include cost of materials and supplies, transportation and lunch for the participants for the two-week period. The training will be done at the facility owned by the company in Toledo using their equipment. There is no fee for the venue and use of the equipment by the company but these are considered in-kind contribution by the company and valued at \$1,500. The 10 women would also contribute their time as in-kind for the 2 weeks training calculated at \$15/person/day for 10 days for a total of \$1,500.

TIDE also believes that in order to ensure the success of this venture the operational cost for the first year should be funded by the project. Since this AWP is just for 2014, we are budgeting for 6 months in 2014 with plans to budget another 6 months in 2015; this is because the mentor will actually start on the last 6 months of the year and not from January 2014. As with all business ventures, start-up capital is required. As expected, these fishing families cannot access credit from lending institutions because they do not meet the stringent requirements. Based on the business plan for the Company the following recurrent/operational expenses are required for the first year of operation; salaries for workers based on 2 persons per day at \$30/day for 20 days per month for 6 months (\$3,600); Fruit purchase based upon averages \$1,000 per month for 6 months is \$6,000; maintenance supplies for the dryers at \$75/month for 6 months is \$450; social security at \$20/month for 6 months is \$120; licenses, fees and taxes \$50 annually and administration and book keeping at \$50/month for 6 months is \$300 for a grand total of \$10,520 for the six-month period. We are proposing to use the project funds to cover the operational costs listed above. The company will hire a staff to conduct quality control inspections and oversee the cleanliness of the operation and ensure that workers perform their duties based on the methods established by the company. It is expected that the workers which will be the women trained will work on rotational basis; they will be paid a salary but will also benefit from the profit. TIDE will dialogue with the group to consider the operational investment in the first year as a no-interest loan which they would repay over a 5 year period starting in year 2.

Dried fruit production with a facility of this size is estimated at maximum production is 268lbs of product per month. El Toque Moho Limited will purchase all of the dried fruits at \$9.00 per pound. Projected income per month is \$2,412 or \$28,944 per year. At this rate the facility would have recovered its investment within one year and start making a profit by the second year. This facility would also have the capacity to expand into canning of whole/sliced fruits after a period of time if the participants choose to expand.

For all of the activities listed above TIDE is proposing to use a total of \$32,620 of the project funds. The total value of the in-kind contribution by TIDE and community members is estimated at \$18,000.

The schedule of implementation is as follows; develop the application forms in February; getting women to apply and selecting 10 women (February-March), training 10 women in processing and packaging in April, building facility in May, procuring equipment, materials and supplies in June and starting full operation in July on to December 2014. As a small project with different sub activities which also includes the acquisition of very specific equipment not readily available in the local market, a three bid offer won't be applied according to the Operation Manual of the Project.

### **B.2.03 INVOLVEMENT OF ORGANISED COMMUNITY GROUPS IN THE MANAGEMENT OF NATURAL RESOURCES.**

TIDE's mission is to foster community participation in resource management. TIDE achieves this through various programs such as 'Community Researchers Program' where youths that have graduated from high school or college are trained in marine resource monitoring by TIDE, and they are also hired to assist with research and monitoring. TIDE also has a 'Community Stewards Program' where fishers are trained on the various marine and fishing laws; they are given incentives for reporting catch and assisting rangers with

resource protection. The community stewards are also tasked with the responsibility of teaching other fishers about the various marine ecosystems and how to document catch data for Managed Access Program. TIDE has an annual summer camp where children are granted an opportunity to learn about conservation and visit the various protected areas managed by TIDE. In this section of the AWP TIDE will work with Managed Access fishers, community leaders, other NGOs and children as a way on involving them in the management of the natural resources.

#### **B.2.03.01 Conduct 3 Managed Access Forums in Punta Gorda**

This activity is a continuation from 2013 AWP. Communication with the fishers of the Port Honduras Marine Reserve is very important. In 2012 TIDE started a quarterly forum for Managed Access fishers, the forums proved to be very essential for fishers as they were all very well attended. Fishers shared their concerns with Managed Access, made recommendations to TIDE and the Fisheries Department, exchange ideas with other fishers and learn from each other in the process. The goal of the forums is to change fishers' mentality of seeing TIDE and the Fisheries Department as the sole managers of the reserve, eventually they will begin to see that they need to be more actively involved in the management (including protection) of the resources that they depend on for their livelihoods.

TIDE will use \$4,000 of the project funds to cover the cost of 3 forums such as meals, accommodation, travel, materials and supplies. Based on the attendance from previous forums, it is expected that 40-50 fishermen will attend the forums. Forums last for one day only and focus on the implementation of Managed Access with an aim to improve the program and make it easy for fishers to comply. Some Government officials will travel by air, some fishers will travel by land and others will travel by sea. TIDE will provide \$1,490 to cover the administrative cost of organizing the forums such as telephone calls, printed invitations, and fuel to invite fishers as counterpart.

#### **B.2.03.01 Networking - PHMR advisory council meetings, APAMO, Coral Reef Network, TRIGOH, SPAGs, etc**

This activity is a continuation of 2013 AWP, costs have changed slightly but justification remains the same. One of the best ways to ensure protection of fragile ecosystems is to effect policy changes and drafting of new policies that may eventually become laws. It is with this reasoning that TIDE sits on a few critical national networks such as the Association of Protected Areas Management Organization (APAMO), the Coral Reef Network, the Tri-national Alliance for the Conservation of the Gulf of Honduras, the Spawning Aggregation Group and others. TIDE is proposing to use \$2,000 of the project funds to cover air travel to participate in approximately 12 (1 per month) one-day work sessions and/or meetings mainly in Belize City.

Another very important aspect of decision making with respect to the management of the Marine Reserve is the involvement of the Advisory Councils. They represent the interest of the communities, the business community, institution and the government and they can recommend certain rules regulations for the management of the marine reserve. TIDE is proposing to use \$1,000 of the project funds to cover the cost of 3 of the advisory meetings; these costs will include reimbursement for travel and provision of food for community members. A total of 12 community members representing the stakeholder communities of Punta Negra Village, Monkey River Village and Punta Gorda Town sit on the Advisory Council for the management of the marine reserve. TIDE will provide \$1,000 to cover the cost of 1 advisory committee meeting, 1 additional airfare and for the use of venue for meetings as counterpart.

#### **B.2.03.01 Visit to Stonington, Maine USA for 3 Fishers and 1 TIDE staff for 3 days**

Fishers in Stonington, Maine have been implementing catch shares (Similar to Managed Access) for the past 5-6 years. They have been through many changes and have a wealth of experiences that fishers in Port Honduras Marine Reserve can learn from. In the first few years of implementation of catch shares the fishers were not pleased so they had to change certain policies to allow catch shares to work for them.

Today most, if not all of the fishers are much more comfortable and are seeing the benefits financially because of catch shares. Some fishers in Southern Belize claim that they are not seeing benefits from Managed Access, while others are saying they have seen some benefits. The goal is to have 6 fishers from Southern Belize dialogue with fishers from Maine to learn what the fishers from Maine had done to gain more benefits from their fishery. TIDE already has direct contact with the founder of the Belize Federation of Fishers who actually lives in Stonington, Maine and has done a trip for some fishers from another part of Belize to Maine. It is also important for a TIDE staff to accompany the fishers to manage the group and to also hear the stories of success that can be applied to our situation. TIDE proposes to use \$7,500 of the project funds to cover the cost of travel from Punta Gorda, Belize to Stonington, Maine USA and back, ground transportation for 3 days in Maine, accommodation for 4 nights and meals for 5 days for three fishermen. In-kind contribution by fishers via their time and TIDE to organize the visit through phone calls etc. and the participation of one staff totaled \$4,000.

#### **B.2.03.02 Field visit to PHMR for school children.**

This activity is a continuation of the 2013 AWP, counterpart cost changed slightly but justification remains the same. TIDE has a strong environmental education program that has been on-going for the past 10 years. The goal of the program is to raise environmental awareness across a wide cross section of the communities in southern Belize. This project will support our program by increasing the opportunity for youths to visit the marine reserve. We plan to make three visits to the marine reserve for children from inland communities during their regular class sessions during the year. TIDE will use \$3,000 of the project funds to cover the cost of three trips for classes of 20 children from schools in the following inland communities to visit PHMR; Bladen Village, Forest Home Village and San Marcus Village. These schools were targeted in 2013 and we are proposing them again because we haven't done enough trips with these schools. Although the trips are for the same schools we will target a different set of students to give most of the children an equal opportunity to visit the marine reserve. The cost for this trip will include charter for bus to transport students from school to the TIDE dock; charter for a boat to take children out to the marine reserve and lunch for students and 5 teachers/parents. TIDE will provide \$1,000 in fuel to travel to these communities and phone calls to arrange the trips.

#### **B.2.03.05 Host fifth Tri-national Fishermen Forum in Belize**

Fisheries management in the Gulf of Honduras is critical for Belize, Guatemala and Honduras. At these tri-national fishers' forums, fishers from all three countries get together for 2 days to find common solutions for fisheries management and also to network and build relationships. Past tri-national forums were held in Guatemala and Honduras. With funding through this project the forum can be held in Belize in 2014.

Invitees to the forum from the representative fishing groups in the Gulf of Honduras will include fishers from Northern Belize, Central Belize and Southern Belize. A total of 20 Belizean fishers/representatives will be invited; 12 from Southern Belize, 3 from Central Belize, 3 from Northern Belize and 2 Fisheries Department Government of Belize Officials. TIDE understands that TRIGOH is covering the cost of 20 fishers from Guatemala and Honduras to attend the forum in Belize so this budget is for the Belizean fishers/representatives only. The project will cover local travel \$1,000, venue for 2 days \$150 and meals \$250, to make a total cost of \$ 1,400; other costs including arranging logistics for forum phone calls, local travel etc to secure food, venue, hotels etc. are counterpart and total \$400.

#### **B.2.03.08 Training for 6 fishers in fisheries laws and public relations to facilitate their participation in enforcement**

The involvement of fishers in enforcement can have significant impacts for TIDE and the resources. This activity will not only improve the trust between the users and the 'custodians' of the resources, but will improve the commercial fish stocks as well. Fishers have been asking TIDE to include them in enforcement

for the past 3-5 years, but because of not being able to train them and provide a reasonable stipend we were not able to do so. In order for them to participate fully in this activity they will need to be trained in the fisheries laws to know whether an activity is illegal or legal as well as in learning how to speak with users of the resources in a proper manner. The proposed training is a one day session that will focus on fisheries laws and rules of the marine reserve. TIDE is proposing to use \$260 of the project funds to cover the stipends for two trainers, food and materials and supplies for the participants. TIDE will provide the venue for the training as counterpart valued at \$100.

#### **B.2.03.08 Hire 2 fishers on a monthly rotational basis to assist with night patrols in PHMR**

Illegal fishing within a replenishment zone is one of the most destructive type of fishing practices that can occur in a marine reserve. Since the introduction of Managed Access in PHMR we have been getting reports of illegal night fishing in the area. It appears that the fishers who did not qualify for a Managed Access license are now targeting the replenishment zones at night. It is with this in mind that TIDE is involving a few trustworthy fishers to assist with enforcement at night. Their primary role will be to guide rangers to certain hotspots with precise timing to catch illegal fishers. The enforcement fishers will not do any arrests as they won't be qualified but they will play a very important role in getting illegal fishers arrested. TIDE believes that this activity will also improve the relationship between TIDE and the fishers who will eventually become the custodians of the resources even without the monetary compensation. The idea is that fishers, through this and other programs like Managed Access will become stewards of the resources and start taking care of it themselves as in the case of Punta Allen in Mexico.

For this activity TIDE proposes to use \$2,400 of the project funds to pay 2 fishers for 2 nights per month for 8 months at \$75/night.

#### **B.2.03.09 Open water dive training for 6 community researchers**

This activity is a continuation of the training activity in 2013 AWP. TIDE intends to train 6 new community researchers open water SCUBA certificate. Community researchers are vital in assisting TIDE with marine research and monitoring. They are provided with the training and in return they have to commit to assisting TIDE with its research and monitoring for at least 3 monitoring sessions. Subsequent to their free assistance to TIDE, they are paid for every dive they do with us; this is one way in which TIDE involves the communities in resource management while they still earn an income.

TIDE will use \$3,000 of the project funds to cover costs such as materials supplies, food and an assistant dive instructor during the training. As counterpart, TIDE's Science Director, who is a dive instructor, will lead the training with the help of the assistant instructor. TIDE will provide the transportation, use of dive tanks, compressor and dive gear for a total counterpart of \$1,800. The training will last for 5 days.

#### **B.2.03.14 Support TIDE annual summer camp through school trips and first-aid kits**

TIDE hold summer camps for children from at least 15 communities in 7 locations. The camps are usually for 2 weeks focused around the international theme designated by the United Nations, and for 2014 that theme is 'International Year of Small Island Developing States'. Belize is considered a 'Small Island Developing State' and TIDE in Belize is focusing on raising environmental awareness so this theme fits perfectly with our mission. The aim of the theme is to raise recognition of environmental problems that small island states are facing. There are many fun and learning activities along with trips from the rivers out to the marine reserve and the coral reef highlighting environmental problems and discuss ways to prevent and mitigate them.

In 2014 we are proposing to use \$3,000 of the project funds to cover the cost of 3 school trips to the reserve for children from Punta Gorda Town and the villages of San Marcos, Big Falls, Bladen, Trio, Bella Vista, Punta Negra and Monkey River. We are expecting a total of 60 children participating in the summer camp. These children will be divided into 3 groups of 20 children each per trip. The costs for the trips are charter for bus,

charter of boat for transportation to the marine reserve and food for the children. TIDE will provide \$1,000 as counterpart through logistical arrangements (Travel to schools to organize camps and trips). In order to ensure safety of participating children, TIDE will also purchase a first-aid kit for each summer camp location with project funds. Each kit will contain various first-aid medications including alcohol, hydrogen peroxide, band-aid, gauze etc. Each kit will cost \$150 for a total of \$1,050 to be paid for by the project.

#### **B.2.03.18 To enhance the capacity of teachers in Toledo to teach environmental science**

Being aware of the ways in which humans depend upon the environment and the ways in which humans can impact the environment are important prerequisites for environmental stewardship. TIDE raises awareness among school children through various environmental education activities, including a summer camp, youth conservation competition and the Freshwater Cup. By increasing the number of schoolteachers effectively teaching about coastal and marine environments, TIDE intends to greatly increase the reach of its environmental education program. TIDE's environmental educator can raise the awareness of many more children by building the capacity of school teachers to teach environmental science than by teaching children directly.

There are plenty of good quality resources available to teachers on most marine and coastal environmental issues (created by MBRS, the Southern Environmental Association and TIDE, among others) but that the vast majority of teachers in Toledo are unaware of the materials and are not using them. Additional resources are also required for some subject matters, such as watershed science, and some of the existing materials need updating to align with the new science curriculum. The teaching materials will be developed in line with the curriculum approved for environmental science and will only be materials that are pre-approved by the Ministry of Education. TIDE will work with the local Education Department in Toledo to ensure the teaching materials conform to the current curriculum.

TIDE proposes to build the capacity of 18 primary school teachers in the middle division in Toledo to teach students about marine and coastal ecosystems by conducting training workshops, providing follow-up support to teachers, designing additional teaching materials to fill existing gaps and highlighting how existing materials contribute to the new Belizean science curriculum. TIDE proposes to use \$8,648 of project funds to support this activity. This would cover the cost of food for three workshops (\$648), teaching materials (\$1,800), printing (\$200) and a contract to design a new teaching unit and highlight how existing materials contribute to the objectives of the new science curriculum (\$6,000). Counterpart funding of \$3,650 would cover the cost of fuel for the workshops (\$2,160) and fuel for follow-up teaching support and monitoring and evaluation (\$1,490).

In 2015, TIDE plans to collate the teaching materials identified/created in 2014 on its website and distribute a poster inviting teachers to download the resources.

#### **B.2.03.19 Existing Community Stewards (5) helping other fishers with implementation of Managed Access in PHMR especially documenting catch**

One of the conditions to qualify for a Managed Access license is to report accurate catch data. Since Managed Access was first introduced in PHMR in 2011 the proportion of fishers submitting accurate data catch has greatly increased; however some fishers are still struggling to report accurate data. TIDE proposed to contract 5 community stewards previously trained in Managed Access by TIDE, to conduct outreach with 95% of Managed Access fishers building their capacity to report accurate catch data. Catch data is analyzed annually to determine fish population in response to current fishing pressure. A total of \$1,600 of the project funds will be used to pay for 32 days of community stewards' time where each steward is paid \$50 per day.

#### **B.2.03.20 RYA person to train 4 community researchers and 3 community stewards to Powerboat Level 2 / Safety Boat**

In order to implement the financial sustainable program called ridge-to-reef expeditions, TIDE is obligated to have boat captains trained to international standards to be able to transport volunteers to marine expeditions. As such the 4 community researchers together with 3 community stewards will be trained to Royal Yachting Association (RYA) power boat 2 and safety boat level by a certified instructor. The instructor will either be sourced in the USA or in Canada. For the purpose of this budget the instructor flights are calculated from Canada to Belize. The training will last for 10 days and will contribute to TIDE's safety and long-term financial security and improve employment opportunities for community members. A total of \$3,716 of the project funds will be used to pay for travel local and international (\$2,976), accommodation (\$500) and food (\$240) for the trainer. The remaining balance of \$1,050 to cover the cost of food, travel materials and supplies for trainees will be provided through counterpart. The trainer will also contribute his time as counterpart valued at \$5,000.

#### **B.2.03.21 Beach clean-up twice per year**

For the past 7 years TIDE has been organizing bi-annual beach cleanup in collaboration with worldwide beach cleanup activities as well as local annual cleanup activities in Punta Gorda Town which is considered a stakeholder community of the marine reserve. These beach cleanup activities are attended by hundreds of community members including schools, tour guide association, fishermen associations, Police and Belize Defense Force personnel, among other individual citizens. This annual event is very successful in raising awareness for the environment as well as fostering civic pride among members of the community. Information on the type and volume of trash is documented on special reporting sheets and this data is sent to the Ocean Conservancy to form part of the data on reported on a global scale. TIDE proposes to use \$400 of the project funds to cover the cost of materials (Gloves, garbage bags), water for participants and fuel to collect and transport garbage to disposal site. TIDE's counterpart is in organizing the bi-annual events and is valued at \$100.

#### **B.2.03.22 Stipend for boat captain from the community to assist with research and monitoring trips**

In 2013, TIDE's marine biologist resigned for better opportunities leaving a gap in that program for data collection, but also as a boat captain. TIDE has already replaced the biologist but the new individual does not have any experience with boats nor have a boat captain's license. TIDE intends to hire a captain from the community to assist with marine research and monitoring. The community boat captain will also train the new marine biologist for a period of six months while on monitoring trips so that she will eventually be the boat captain. This activity will also improve the direct benefits to community members through this project in that this person is also a community steward and TIDE proposes to use project funds to pay the boat captain \$37.50 per day for 4 days per month for 6 months totaling \$900.

#### **B.2.03.29 Stipend for community researchers to assist with monitoring and research**

The community researchers program has been a very successful program in building the capacity of community members to participate meaningfully in TIDE's work as well as increasing the trust between TIDE and the fishers as some of the community researchers are children of fishers. Some fishers have expressed their satisfaction with the scientific data from TIDE because their children are involved with data collection. In 2014 the existing community researchers will continue to assist TIDE with data collection for all of TIDE's marine resource monitoring mentioned in the main activity **B.1.05 Support for the implementation of assessment and monitoring systems**. TIDE proposes to use project funds to cover the cost of the stipends for 6 community researchers who are not employees of TIDE, but are contracted to collect data. Based on the needs for the various monitoring activities the cost of the stipend for these community researchers varies between months but totaled \$13,275. Because people already trained and selected for TIDE, the procedure three tenders in the Project Operational Manual will be made.

## **B.2.04 STRENGTHENING OF COMMUNITY/ASSOCIATIONS**

As indicated above, TIDE's mission is to foster community participation in resource management. TIDE achieves this through various programs such as the Community Researchers Program, the Community Stewards Program, the Freshwater football conservation competition (Freshwater cup), annual summer camps and building the capacity of fishing associations/groups in governance, program implementation, planning etc. In this section of the AWP TIDE will work with Managed Access fishers and community leaders involving them in the management of the natural resources.

### **B.2.04.07 Provide 22 scholarships to high school students of the Managed Access Fishers for one year**

This activity is a continuation of 2013 AWP. The number of students has increased by 2 in comparison to 2013. As a way of assisting the Managed Access fishers who are struggling to earn an income from fishing, for the past 10 years TIDE has been awarding scholarships to those fishers' children who are attending high school. The program has been very successful in giving the children the option to take up a new career if they choose not to go into fishing. It has also brought relief to the fishers who are struggling to make ends meet.

Using the project funds, TIDE will expand its scholarship program to include 20 additional high school children to cover the cost of tuition, books, uniforms and other small fees for the students. Each student is expected to assist TIDE with conservation projects such as summer camps, clean up campaigns, tree planting events etc. They will present their semester reports to TIDE at the end of the semester, if their average is below the passing score, the scholarship will be revoked. A total of \$375.00 will be used to fund items for each student for a total cost of \$8,250 to the project. Since the students attend various high schools, is not possible to have 3 quotations as the cost of tuition, books and fees vary among schools. The contribution by the students will be considered as in-kind and is valued at \$200 each for a total of \$4,400. Since the students attend various high schools, is not possible to have 3 quotations as the cost of tuition, books and fees vary among schools.

### **B.2.04.09 Build new dock at Monkey River (Community to contribute labor)**

The fishing community of Monkey River makes most of their income from fishing both inside and outside of the marine reserve. The community came together about 5 years ago to build a dock in front of the village in the river. This has been the main dock for the village since that time and is used by fishers, students, tourists, other visitors and community members. The dock is currently in a deplorable state and in need of being replaced. Through this project, TIDE is proposing to use \$12,500 of the project funds to assist in constructing a new dock for the Village of Monkey River. The funds will cover the cost of materials and supplies for the dock and a stipend for one community member to oversee the construction process. TIDE will work with the project supervisor to procure the materials and supplies needed. The community is expected to cover the cost of labor for the construction; this cost is estimated as \$5,000 and makes up the counterpart.

### **B.2.05.02. Cost of wire transfer of project funds for payment of goods and services under the project**

With every wire transfer of funds from the project account held by TIDE for payment for services or goods acquired under the project, there are bank charges. These charges can become significant depending on the number of transactions involving wire transfer. TIDE will use \$500 of the project funds to offset this cost in order to ensure the vendors get the exact amount of funds as per their invoices.

## **5. SUSTAINABILITY STRATEGY**

The global economic downturn over the past couple of years isn't showing any signs of improvement. Many of the donors that TIDE relies on have decreased their funding over the last 4 years. Coupled with the decrease available grant funds is the rise in cost of living mostly due to the rise in fossil fuel cost. TIDE's Board of Directors has been adamant in guiding the organization to become financially sustainable. This goal remains difficult to achieve but one that TIDE's board and employees are determined to obtain.

TIDE is in the process of developing a sustainability strategy which will be used to guide our activities and ensure that everything is done with sustainability in mind. Ongoing sustainability activities include building the capacity of the staff and the community members around the protected areas, engaging in activities that allow us to earn an income such as sustainable tourism and a ridge-to-reef program, implementation of activities that promotes the general improvement of the environment, the use of appropriate technology in communities to ensure they have the capacity to maintain such technology to their benefit and engaging community members in activities that promote sociocultural sustainability such as marine monitoring using SCUBA diving, manufacturing of craft from natural and available materials, promotion of the activities of the daily lives of fishermen through competition at events such as the TIDE's Fisherman Festival.

### **5.1 Institutional Sustainability**

TIDE's strength lies in the capacity of its employees to effectively perform their duties. Over the years TIDE invested in training and capacity building not only for its staff, but also for the community members surrounding the Protected Areas TIDE manages. Staff has been trained in various disciplines ranging from technical capacities to basic manual capacities. The staff is evaluated on an annual basis where their capacities are noted; any increase in salary or benefits is based on capacity and performance so it is imperative that training occurs annually.

The field staff also participates in exchange visits to other protected areas to broaden their knowledge and appreciation of conservation and sustainable development. In this AOP, the TIDE rangers' capacity will be enhanced through training such as public relations and the analysis of the patrol information to better target patrols.

In addition, TIDE invests in building the capacity of the community members around the protected areas it manages. TIDE's mission is to foster community participation in resource management and sustainable use of those resources by the communities. TIDE works on the premise that empowering community people will result in their effective participation in resource management along with TIDE; therefore, the communities also help in institutional sustainability.

### **5.2 Financial sustainability**

It has been documented in various institutional assessments that TIDE plays a key and vital role in the unbiased development of the people of the Toledo District in Southern Belize and by extension the rest of the country. It is noted that TIDE, one of the largest employers in Toledo fills certain financial and gap that otherwise would have been critically lacking; therefore TIDE must continue to exist. Parallel to other non-profit, non-governmental institutions, TIDE relies on donations to sustain all of its programs. In the current economic climate, it is becoming increasingly difficult to fundraise to sustain these programs; as a result, TIDE must strive to become financially independent to continue filling this critical gap in this society.

Currently, TIDE has a tour operating arm called TIDE Tours where its income is primarily from tourism. Profits from TIDE Tours are used to fund TIDE's education and outreach activities. Over the past 10 years, TIDE Tours profits has been minimal due to the many challenges with tourism not being as

lucrative as it used to, as well as our vision of empowering communities while at the same time trying not to compete with local tour operators in the community.

In 2012, TIDE initiated a program called 'ridge-to-reef expeditions'. Ridge-to-reef targets students from universities who must do an internship as a part of their curriculum as well as other students who plan to volunteer and get experiences that make them more competitive and marketable. Students would pay a fee to TIDE to get the experience they need and TIDE would get some of its work done as well as earn a profit in the process.

At least 3 volunteer organizations are currently benefitting from such programs in Belize. In fact some of these volunteer organizations are using TIDE as a way of marketing their program since they send volunteers to TIDE to get field experience. TIDE does not benefit from the income paid by volunteers, but rather just from the work the volunteers do. Income earned by these volunteer organizations for sending their volunteers to TIDE should be earned by TIDE instead. A recent business plan developed for this program indicates that TIDE can start making a profit in year 3 with net profit of \$50,000 annually after year 5.

TIDE also owns an endowment fund obtained through a debt for nature swap between the governments of Belize and the United States of America. Under that agreement, TIDE can only use 5% of the endowment to manage its Private Protected Lands. 25% of that portion is used for administrative purposes which pays salaries for admin staff. The endowment as at the end of 2012 is over \$800,000.

### **5.3 Environment**

TIDE's focus is environmental protection and conservation; its 4 program areas are based on conservation at all levels so consideration for the environment is of utmost importance. All of the planned activities at TIDE, for this project as well as others fall under either one of the following program areas; (1) Resource Protection – Where rangers conduct patrols and surveillance, install signs with the rules and regulations of the reserve as well as training in law enforcement etc, all towards the protection and conservation of natural resources; (2) Education and Outreach – Increasing conservation and sustainable development awareness in community members from children to adults through a variety of ways including school visits, community meetings, school trips, summer camps and conservation athlete's program; (3) Research and Monitoring – to inform management of the status of the resources used for commercial purposes or the status of the biophysical parameters that affect the productivity of the resources that communities depend on for their livelihoods; and (4) Community Development – A relatively new program that seeks to invest in communities through capacity building to create marketable individuals, building support for conservation through the creation of community stewards, creating employment opportunities in specialized fields such as using SCUBA to do marine biodiversity monitoring and investment in infrastructure that supports sustainable development.

### **5.4 Appropriate technology**

With respect to the use of technology, TIDE ensures that with every new investment in the communities that a feasibility study is carried out to ensure community members are able to adequately benefit from those investments and that the planned activities are using available resources so that they can be sustainable. One activity worth mentioning here is the feasibility study for a business enterprise to be implemented in Punta Negra Village. Punta Negra doesn't have electricity; there is one solar panel that powers the village telephone so any business investment here has to take that limitation into consideration, hence the need for the feasibility study.

Other investment at TIDE office and ranger station that has 24hr electricity can be more updated with current technology that can be sustained over time.

### **5.5 Sociocultural sustainability**

For years the people of the communities along the border of the marine reserve have been saying they want better opportunities to earn a secure income and increase their living conditions. In Southern Belize, there is no industry that has high employment rates or many opportunities for people to create their own jobs simply because they are not qualified to access funds from lending institutions. In the district with the highest poverty rate in Belize, and an extremely unbalanced distribution of wealth, people need affordable loans or grants to sustain themselves.

TIDE has been managing the marine reserve for over 12 years, and though there hasn't been a significant increase in the population of harvestable marine resources, there hasn't been a drastic loss of resources either. In reality, if there were no management of the marine resources, there would be nothing left to manage today. The proposed investments in this AOP place high considerations for the sustainability of the sociocultural aspects of the communities in which they are being implemented. Coastal community members that have always been interacting with marine resources are being trained in SCUBA diving and marine biodiversity monitoring. These trainings and capacity building sessions adds value to something that they have always been a part of so naturally they will appreciate it even more.

TIDE also organizes an annual Fisherman Festival where sociocultural activities in the daily lives of fishers such as coconut husking, cast net throwing, fishing etc. are promoted through competition. The fest is attended by over 2,000 individuals from all over Belize and even visitors from abroad so it is an ideal way for other people to know a little about the lives of fishers.

To ensure the investments are not gender biased fishermen as well as women will benefit directly. A women's group from Punta Negra will benefit from a business enterprise tailored to suit their capacities and needs.

6. PROJECT DEVELOPMENT TABLE

Objective	Expected result	Main Activity	Sub-activity	Unit of time												Performance indicator	Impact indicator	Sources of verification	Suppositions Risks	% Execution	
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
Consolidation of the Marine-Coastal Protected Areas (MCPAs) selected in the region of the Project, with conservation and sustainable use of marine and coastal resources secured in the medium term	Result 1. Protection And Conservation Of Marine-Coastal Ecosystems In The Marine Area Are Secured	B.1.01 Investment in Infrastructure	B.1.01.02 Improve security at TIDE office for the Science lab to ensure safety of lab equipment													Burglar bars on window to science lab / office	Science equipment is not stolen	TIDE inventory	Burglar bars are sufficient to prevent burglary		
			B.1.01.10 Repair ranger sub-station on West Snake Caye in PHMR														Ranger presence in conservation zone	Decrease in illegal fishing in conservation zone	Refurbished sub-station and surveillance log & PHMR Inventory	No natural disaster destroys the sub-station	
			B.1.01.12 Purchase of 20ft storage container for science equipment with shelves inside; metal roof and concrete columns															Science equipment is maintained in good condition	Complete and consistent dataset is being used for critical management decisions	Meeting minutes reflect management decisions taken	A shade constructed over the shipping container will keep the contents cool enough to be stored safely.

		<b>B.1.02 Investment in Equipment</b>	B.1.02.01 Patrol boat with console, flooring lights, anchor etc.												Patrols are being conducted regularly	Night fishing and other illegal activities have decreased	PHMR Inventory & Patrol Boat with complete furnishing.  PHMR manager's monthly reports, infraction reports, written warnings and court proceedings.	Boat is not stolen or damaged		
			B.1.02.01 Purchase 1 100HP Yamaha boat engine and engine accessories for patrol boat													100 HP Yamaha boat engine is being used on new patrol vessel	Night fishing and other illegal activities have decreased	PHMR Inventory & 100 HP Engine on newly acquired patrol boat PHMR manager's monthly reports, infraction reports, written warnings and court proceedings.	Engine is not stolen or damaged	
			B.1.02.02 Signs in English and Spanish featuring maps of new replenishment zones of PHMR													Signage with information on new replenishment zones in PHMR are erected in conservation zone and on Abalone caye	Decreased illegal fishing within the conservation zones – Maintained populations of commercial species	Bilingual signs on West Snake Caye (Conservation Zone). Decreased illegal activities verified by PHMR manager's monthly reports Maintained populations of commercial species verified by research reports.	Destruction or defacing of signs - vandalism	

B.1.02.04	Purchase of 1 laptop computer for Marine Reserve Manager													Reports and networking/communication for PHMR done	Reports are used in management decision	PHMR/KFW Inventory ; meeting minutes reflect decisions	Computer free from factory defects	
	B.1.02.04 Furnish extension to TIDE office for Rangers													Furnished office building with work space for PHMR field staff	Improved infraction reports and improved communication with relevant personnel from other marine reserves Improved ranger morale	PHMR/KFW inventory and furnishing in building. Infraction reports. Ranger morale will be verified by staff appraisals.	Natural disaster or burglary	
	B.1.02.04 Purchase 1 multi-function wide format printer													Financial documents narrative reports, publications etc are being printed regularly as needed	Information from TIDE reaches its intended target who accepts information	Reports from field and feedback from donors		
	B.1.02.05 Purchase of dive compressor													Reliable compressor available for dive training and research purposes thus ensuring consistency of data collection	Data from research used to make management decisions	PHMR/KFW inventory and compressor at PHMR ranger station	No major risk or assumptions identified with new equipment	

		<b>B.1.04 Support for the implementatio n of the control and surveillance system</b>	B.1.02.06 Purchase 20 children life vests for field trips to the marine reserve.												Life vests available for use for field visits as required by Port Authority	No injuries or loss of lives due to field visits	Filed reports	No risks identified				
			B.1.04.03 Support surveillance and patrols program in PHMR															Decreased number of infractions as measured by PHMR manager's monthly reports and monthly reports	No significant decrease in commercial species	PHMR manager's monthly reports and fisheries assessment report	Safety of park rangers during night patrols	
			B.1.04.04 Analyze and document the spatial/temporal distribution of illegal activities to better target patrols															Map showing the location of illegal activities in PHMR	Increased cost-effectiveness of PHMR patrols, as indicated by decreased operating costs per infraction intercepted	Patrol logs and TIDE's audited accounts	Assumption: that there is scope for making cost savings through improved targeting of patrols	
B.1.04.06 Public Relations training for TIDE rangers															10 TIDE rangers attended Public relations training	Improved relations between fishers and visitors to PHMR	Fishers reporting illegal activities and visitors comment on positive experience in PHMR as verified in PHMR manager's monthly reports and visitor log book	Rangers willing to apply training in Public Relations				

		B.105 Support for the implementation of assessment and monitoring systems	B.1.05.01 Generation of a baseline of mangrove cover and marine grassland in the four MCPAs												Volunteers and community researchers are collecting data for mangrove and sea grass cover in PHMR	Knowledge of the status of mangrove and sea grass cover in PHMR is improved	Baseline report of mangrove and sea grass cover in PHMR	Weather condition permits satellite to obtain image of the area. Volunteers and community researchers engage in data collection	
			B.1.05.06 Habitat mapping of PHMR GIS and Ground-truthing												Quantity and quality data regarding GIS habitat mapping and ground truthing population in PHMR is collected	Habitat distribution closely understood, informing fisheries sustainability initiatives. Results of the monitoring are used to make informed management decisions	Research and monitoring reports; TIDE board meeting minutes reflect decisions taken	Satellite imagery not adequate for purpose. Bad weather precludes ground truthing	
			B.1.05.07 Marine monitoring package that includes water quality, sediment, sea turtle and fish stock monitoring												Quantity and quality of data regarding water quality, sediment, sea turtle populations and fish stocks being collected	Utility of results of monitoring activities for informing adaptive management	Research and monitoring reports; management meeting minutes	Weather conditions permit monitoring	

			B.1.05.13 Monitoring of queen conch population density and dynamics in PHMR												Quantity and quality of data regarding conch population density and dynamics	Knowledge of conch population dynamics improved. Effectiveness of RZs for recruitment, nursery and spillover determined, informing adaptive management.	Research and monitoring reports; TIDE board meeting minutes reflect decisions taken	Weather and sea conditions permit monitoring	
			B.1.05.14 Conduct coral reef health monitoring in PHMR												Quantity and quality of data regarding coral reef health	Utility of results of monitoring activities for informing adaptive management	Research and monitoring reports; TIDE board meeting minutes reflect decisions taken	Weather and sea conditions permit monitoring	
			B.1.05.15 Conduct monitoring of sea cucumber population in PHMR												Quantity and quality of data regarding sea cucumber population	Impact of fishing pressure on sea cucumber population better understood. Utility of results of monitoring activities for informing adaptive management	Research and monitoring reports; TIDE board meeting minutes reflect decisions taken	Weather and sea conditions permit monitoring	
			B.1.05.16 Monitoring of sea grass in PHMR												Quantity and quality data regarding sea grass health in PHMR is collected	Results of the monitoring are used to make informed management decisions for riverine impact, sport fishing, manatee conservation etc.	Research and monitoring reports; TIDE board meeting minutes reflect decisions taken	Weather and sea conditions permit monitoring	

			B.1.05.18 Monitoring of lobster population in PHMR												Quantity and quality data regarding lobster population in PHMR is collected	Lobster population dynamics & impact of management tools e.g. RZs & seasons better understood. Results of the monitoring are used to make informed management decisions	Research and monitoring reports; TIDE board meeting minutes reflect decisions taken	Weather and sea conditions permit monitoring	
			B.1.05.18 Juvenile lobster Recruitment study													Quantity and quality data regarding Lobster in PHMR is collected	Knowledge of lobster population dynamics improved. Effectiveness of RZs for recruitment, nursery and spillover determined, informing adaptive management.	Research and monitoring reports; TIDE board meeting minutes reflect decisions taken	Traps are stolen or tampered with

			B.1.05.19 fish stock market assessment												Quality, reliable data collected from market in Punta Gorda.	Fish stock data feeds into various analytical tool to assist with management of the fishery	Research and monitoring reports; TIDE board meeting minutes reflect decisions taken	Fishers don't want to share habitat knowledge for fear of giving away trade secrets or perception that data will be used against their immediate interests (e.g. perception of establishing new RZs based on fisher information of good fish habitat)	
			B.1.05.20 Conch lip thickness at maturity study												Quantity and quality data regarding conch lip thickness at maturity in PHMR is collected	Conch population structure and % mature better understood. Catch quotas can be set more accurately. Results of the monitoring are used to make informed management decisions	Research and monitoring reports; TIDE board meeting minutes reflect decisions taken	Study determines poor relationship between conch lip thickness and sexual maturity (unlikely based on regional studies). Fishers could be unwilling to cooperate if perceived info to be used to reduce conch quota.	

			B.1.05.21 Goliath grouper fishery study												Quantity and quality data regarding Goliath grouper in PHMR is collected	Goliath grouper better protected through management and legislation informed by research. Fisher awareness and support increased. Results of the monitoring are used to make informed management decisions	Research and monitoring reports; TIDE board meeting minutes reflect decisions taken	Fishers could be unwilling to cooperate if perceived info to be used to reduce catch quota/ increase size limit, increase other protection measures.	
		<b>B.1.08 Institutional Strengthening for area managers</b>	B.1.08.01 Develop, print and distribute PHMR brochure												Proportion of Managed Access licensees receiving the brochure.	Increased awareness of revised MPA regulations (including newly expanded replenishment zones)	Awareness will be verified by a stakeholder survey in 2015.	Fishers are receptive to information about PHMR.	
	B.1.08.02 National radio show on TIDE and PHMR													Information regarding TIDE's work is aired nationally to thousands of people	Increased awareness of the benefits of PHMR and environmental stewardship	Awareness will be verified by a stakeholder survey in 2015.	Fishers are receptive to information about PHMR.		
	B.1.08.04 To contribute to the effective national implementation of Managed Access.													Number of Managed Access Working Group meetings attended. Scientific protocols for monitoring fisheries developed.	All of Belize's MPA are under MA by 2015. All aspects of Managed Access work to the economic benefit of fishers and for the fishery	Science monitoring reports	Meetings will go ahead as planned		

			B.1.08.05 Set up and run initial ridge-to-reef expeditions for one year												At least 10 paid volunteers are enrolled in program	Income earned. Increased capacity to run expeditions, as verified by Ridge to Reef Expeditions documents (e.g. organizational chart, staff ToRs, scientific protocols, training materials, health and safety protocols, etc.)	TIDE Tours audited accounts. Ridge to Reef Expeditions program documents.	There is demand for the volunteer travel services that Ridge to Reef Expeditions will provide.	
			B.1.08.05 To strengthen TIDE's financial sustainability through marketing of ridge-to-reef expeditions program at an international trade show event in San Diego, California USA												Customers book of Ridge to Reef Expeditions at trade show.	TIDE is profiting from program after 5 years	TIDE Tours audited accounts.	There is demand for the volunteer travel services that Ridge to Reef Expeditions will provide.	
			B.1.08.06 Familiarization tour of PHMR by Government officials and local government												Government and local officials have improved knowledge of the marine reserve and the goals therein	Government officials are supporting policies regarding management of the reserve	Establishment of new policies as document in government gazette and Statutory Instrument governing the marine reserve	Government officials are willing to participate and able to utilize new knowledge in their decision making.	
			B.1.08.09 Conduct mentoring of community members that are involved with implementation of micro-enterprise to ensure project success.												Micro-enterprises are performing well and earning an income	Lives of the families of the those involved in micro-enterprises have improved	Socio-economic surveys	Market prices for products remain competitive	

	<b>COMPONENT 2 - BEST MANAGEMENT PRACTICES AND THE SUSTAINABLE USE OF MARINE-COASTAL RESOURCES ARE APPLIED.</b>	<b>B.2.01 Development of the production bases of communities/ associations</b>	B.2.01.04 Invest in cultural kitchen for fisherwomen in Punta Negra Village with training in small business management, customer service and hospitality												Women in Punta Negra are earning an income from local cultural food	Quality of life improves for 3 women and their families in Punta Negra	Socio-economic survey results	No natural disaster destroys homes in Punta Negra. Tourists and other visitors book trips to Punta Negra	
			B.2.01.11 Train 5 Monkey River tour guides in Fly-Fishing techniques and provide sports fishing kit to participants												5 new fly-fishing guides are taking tourists on fly-fishing trips	Lives of the new fly-fishing guides and their families have improved	Socio-economic surveys	Sport fishers book trips with new guides	
			B.2.01.13 Invest in a small-scale solar fruit drying facility for 10 women in fishing families including training and first year operational cost													At least 8 out of 10 fishing families are using the training to can fruits	Along with other aspects of canning, this activity contributes to overall improvement in the lives of fishing families.	Socio-economic surveys	Local consumers purchase canned fruits
		<b>B.2.03 Participation of organized community groups in the management of natural resources</b>	B.2.03.01 Conduct 3 Managed Access Forums in Punta Gorda																
			B.2.03.01 Networking- PHMR advisory council meetings, APAMO, Coral Reef Network, TRIGOH, SPAGs, etc.													Attendance at relevant meetings and conferences	Improved relationship with partner organizations and recommendations from meetings are incorporated in management	Reports and minutes from meetings.	Networking and meetings will produce desired results. Partners and advisory council attend meetings

			B.2.04.09 Visit to Stonington, Maine USA for 5 Fishers and 2 TIDE staff for 3 days												Fishers of Punta Gorda learn about the positive impacts of catch shares—a form of Managed Access from fishers who have been implementing it for over 5 years.	Fishers and TIDE personnel inspired by successful examples of rights based fishing and marketing of sustainable seafood by organized fishers groups.	Impact will be monitored in interviews with participants and an action plan on how to use the lessons learned.	The successes in Maine can be replicated here.	
			B.2.03.02 Field visits to PHMR for school children												Number of school children taken out to PHMR each year	Enhanced appreciation for marine resources among local youth	Photos and reports from trips, fuel logs	Weather may prohibit visits. Children are willing to apply lessons learned to their behavior	
			B.2.03.05 Host fifth Tri-national Fishermen Forum in Belize												Fishers from Guatemala, Belize and Honduras exchange ideas and renew their commitment to fish sustainably in the gulf of Honduras	Improved communication among 3 countries and sustainable fishing practices are employed by fishers	No cross boundary illegal fishing occurs based on ranger patrol logs	Fishers uphold the sustainable fishing practices agreed to in forums.	
			B.2.03.08 Training for 6 fishers in fisheries laws and public relations to facilitate their participation in enforcement												6 fishers complete training	Reduce number of fishing infractions. Greater involvement of fishers in management activities.	Ranger patrol logs	Fishers are willing to utilize training and participate in enforcement	
			B.2.03.08 Hire 2 fishers on a monthly rotational basis to assist with night patrols in PHMR												A total of 4 fishers are assisting with enforcement	Management of the marine reserve is greatly improved with fishers involvement in enforcement	Ranger patrol logs	Fishers are willing to participate in night patrols	

			B.2.03.09 Open Water dive training for 6 community researchers												6 researchers complete Open Water dive training course	Enhanced capacity of research team	Photos, copies of individual dive certificates	Researchers will put in the necessary work to earn certificate	
			B.2.03.14 Support TIDE annual summer camp through school trips and first-aid kits												All scheduled visits and trips are conducted	Enhanced appreciation for marine resources among local youth	Photos and reports from trips, fuel logs	Weather may prohibit visits. Children are willing to apply lessons learned to their behavior	
			B.2.03.18 To enhance the capacity of teachers in Toledo to teach environmental science												Teachers in Toledo are using the environmental science units developed by this activity	Students are much more knowledgeable on environmental science	Results of tests in comparison to previous years	Teachers are willing to use resources and incorporate new lessons	
			B.2.03.19 Existing Community Stewards (5) helping other fishers with implementation of Managed Access in PHMR especially documenting catch												100% of Managed Access fishers are submitting accurate data.	Accurate data is used to better manage fishery	Catch logs and MA reports	MA fishers are will to accept help from community stewards	
			B.2.03.20 RYA person to train 4 community researchers and 3 community stewards to Powerboat Level 2 / Safety Boat												4 community researchers and 3 community stewards complete training	High safety record maintained. No impact with corals. Compliance with international boating standards.	Copies of individual certificates, reports	Training is effectively applied to boating practices	
			B.2.03.21 Beach clean-up twice per year												Over 400 community members from groups and schools have increased awareness on the importance of a clean environment	Reduced amount of trash around beaches.	Reports and photos from clean up noting trends in garbage volume and type. Attendance sheet of participants	Community will participate in clean up. Weather conditions will be favorable	

			B.2.03.22 Stipend for boat captain from the community to assist with research and monitoring trips												Quality data is collected on PHMR	Results of monitoring feeds into management decisions	Data sets from monitoring	No identified risk	
			B.2.03.29 Stipend for community researchers to assist with monitoring and research												Quality data is collected on PHMR	Results of monitoring feeds into management decisions	Data sets from monitoring	No risk identified	
		<b>B.2.04 Strengthening communities/ associations</b>	B.2.04.07 Provide 22 scholarships to high school students of the Managed Access Fishers for one year												Number of children attending and remaining in high school as a result of the scholarships.	Enhanced earnings of recipients of scholarships once they graduate.	Employment of alumni will be monitored after they graduate.	Scholarship recipients apply themselves to their studies.  There are greater employment opportunities for high school graduates.	
			B.2.04.09 Build new dock at Monkey River (Community to contribute labor)													Safety at Monkey River is greatly enhanced for visitors, students and other users of the docking facility	Tourists reports of their experience in Monkey River is 100% positive resulting in increased visitation. Improved relations between TIDE and the community	Tourist reviews on Trip Advisor and other similar websites.  Improved relations will be measured by participation of Monkey River stakeholders in TIDE events.	Community members will be willing to contribute labour.  No natural disaster like flood destroys the dock.