

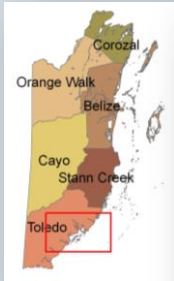
Toledo Institute for Development and Environment (TIDE). *Punta Gorda, Belize*

Presentation of good practices implemented in the MCPA with the
Project support

IMPLEMENTERS CONFERENCE. LIVINGSTON, GUATEMALA. APRIL 27 - MAY 1, 2015

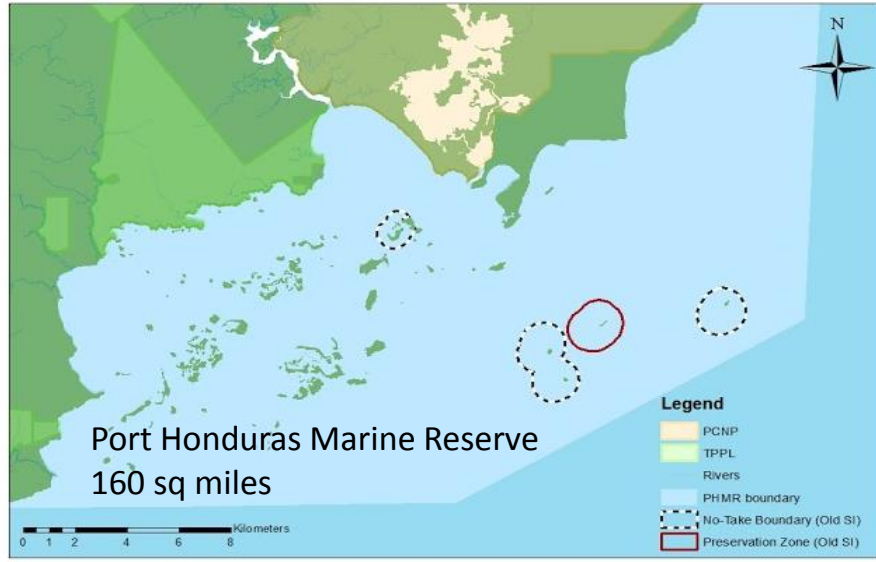
Project For The Conservation Of Marine Resources In Central America
Joe Villafranco, Project Manager





Current Enforced SI

Project site



Project For The Conservation Of Marine Resources In Central America



TYPE OF EXPERIENCE:

Support For The Implementation Of Monitoring And Evaluation Systems. *Providing scientific evidence to support the expansion of replenishment zones in the MCPA.*

- Use of monitoring program to measure enforcement effectiveness.
- Use of monitoring program to measure benthic commercial species population/densities. (Conch, Lobster, Sea Cucumber)
- Use of monitoring program to measure coral reef health
- Use of monitoring program to measure water quality.
- Conch Lip thickness study
- Lobster recruitment study
- Goliath Grouper study

BASELINE CONDITION:

- The implementation of Managed Access (TURF/Incentive-based) fisheries management tool in the MCPA in 2012.
- Small size of replenishment zones is not sufficient to replenish the fishery.



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OBJECTIVES from PHMR Mgt. Plan + Marfund/German Cooperation work plan:

- 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

ACTIONS

- Map habitats in the MCPA.
- Monitor water quality (Temp, DO, Salinity, pH, visibility, nitrates, phosphates sedimentation).
- **Monitor fish stock, queen conch, lobster, sea cucumber, goliath grouper, finfish and lobster recruitment and compare the health in both the general use zone and replenishment zones of the MCPA.**
- Monitor coral reef health, mangrove and sea grass cover and sea turtle nesting.

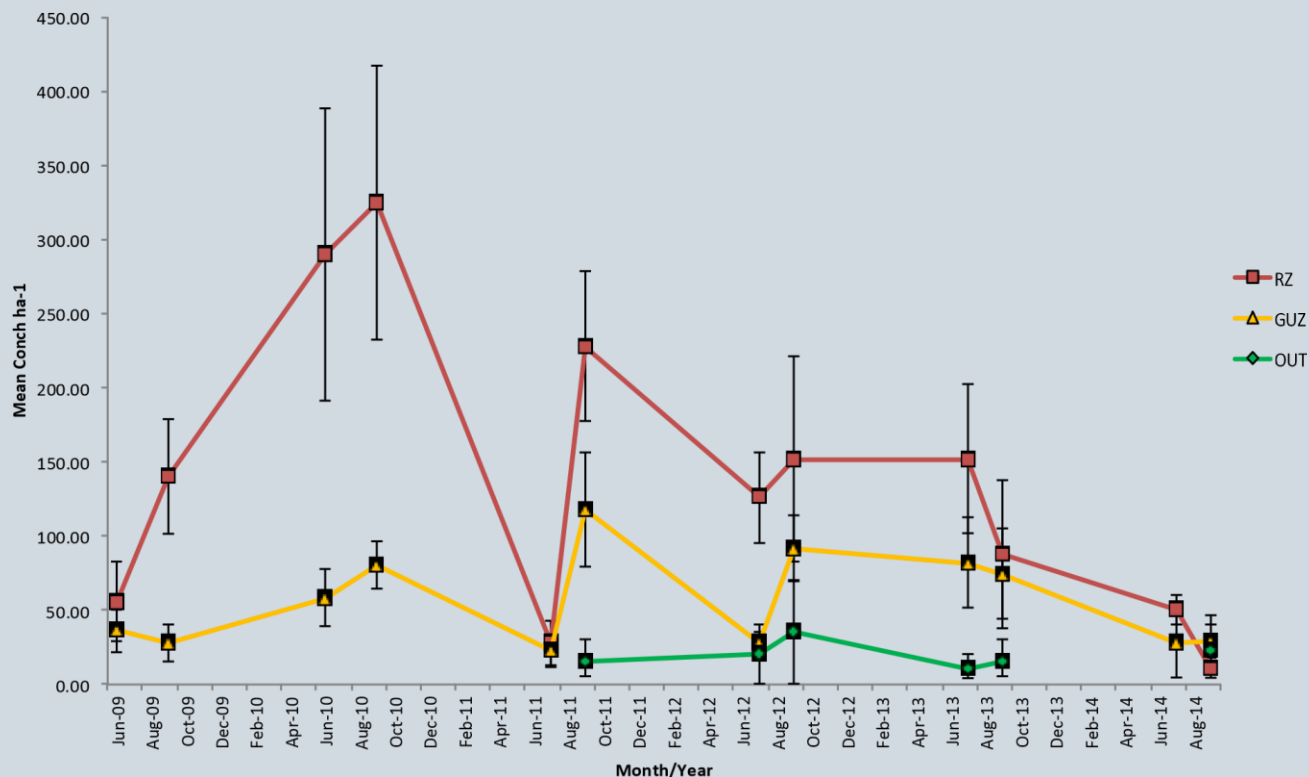
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RESULTS of CONCH MONITORING:

- Conch densities have continued to decline in **all zones**, and are now at a critical low.
- The closed seasons of 2013 and 2014 failed to achieve their intended purpose of increasing abundance by protecting conch during their reproductive period.
- While mean shell length continues to remain stable, mean lip thickness has increased in 2014, coinciding with a major decrease in density, indicating lack of juveniles (those conch left are not reproducing as much, possibly having a harder time finding each other to successfully reproduce due to low population)

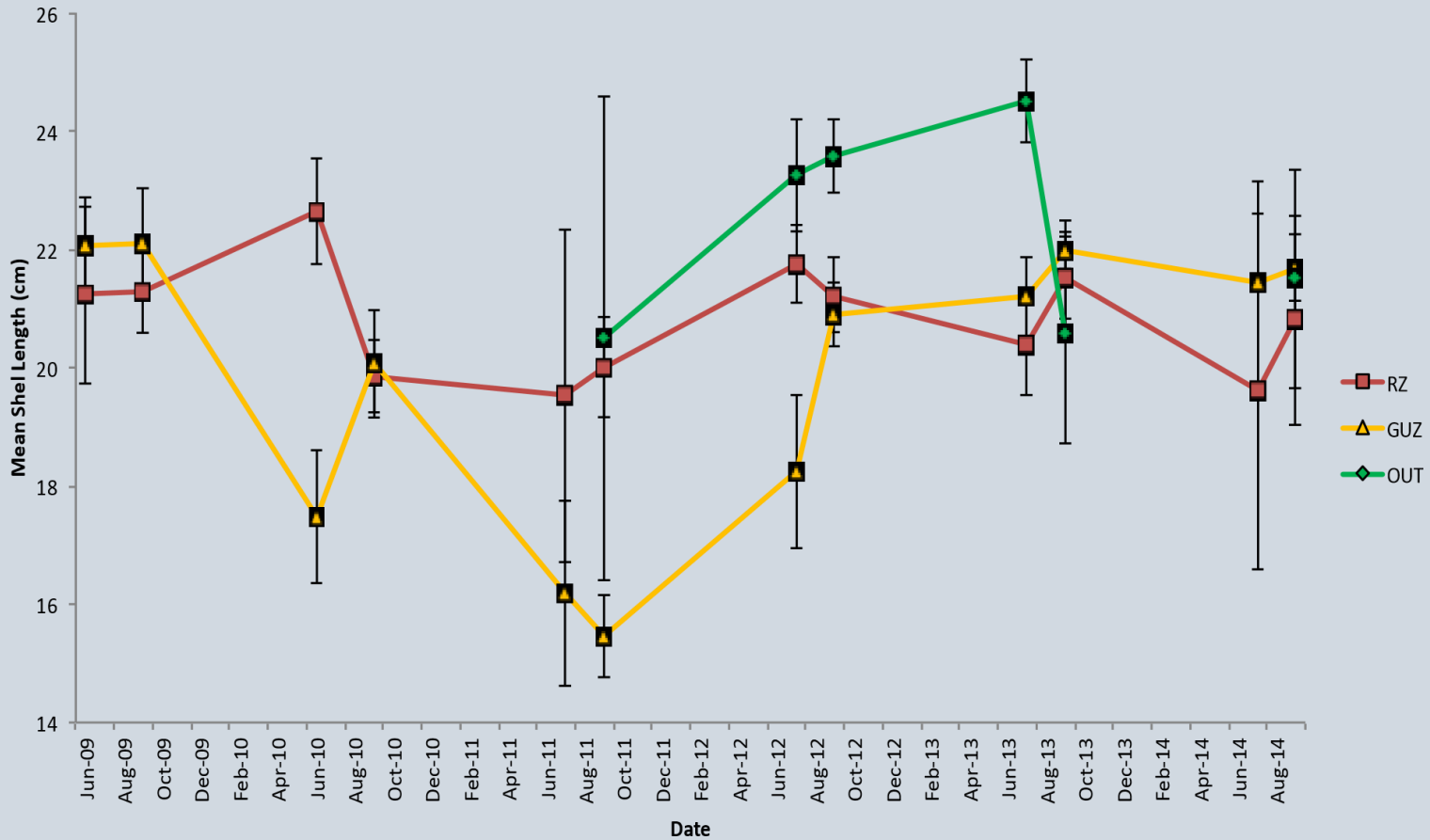
Mean conch density by zone 2009 - 2014



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Fig 3. Mean Conch Shell Length (cm) by Zone 2009-2014

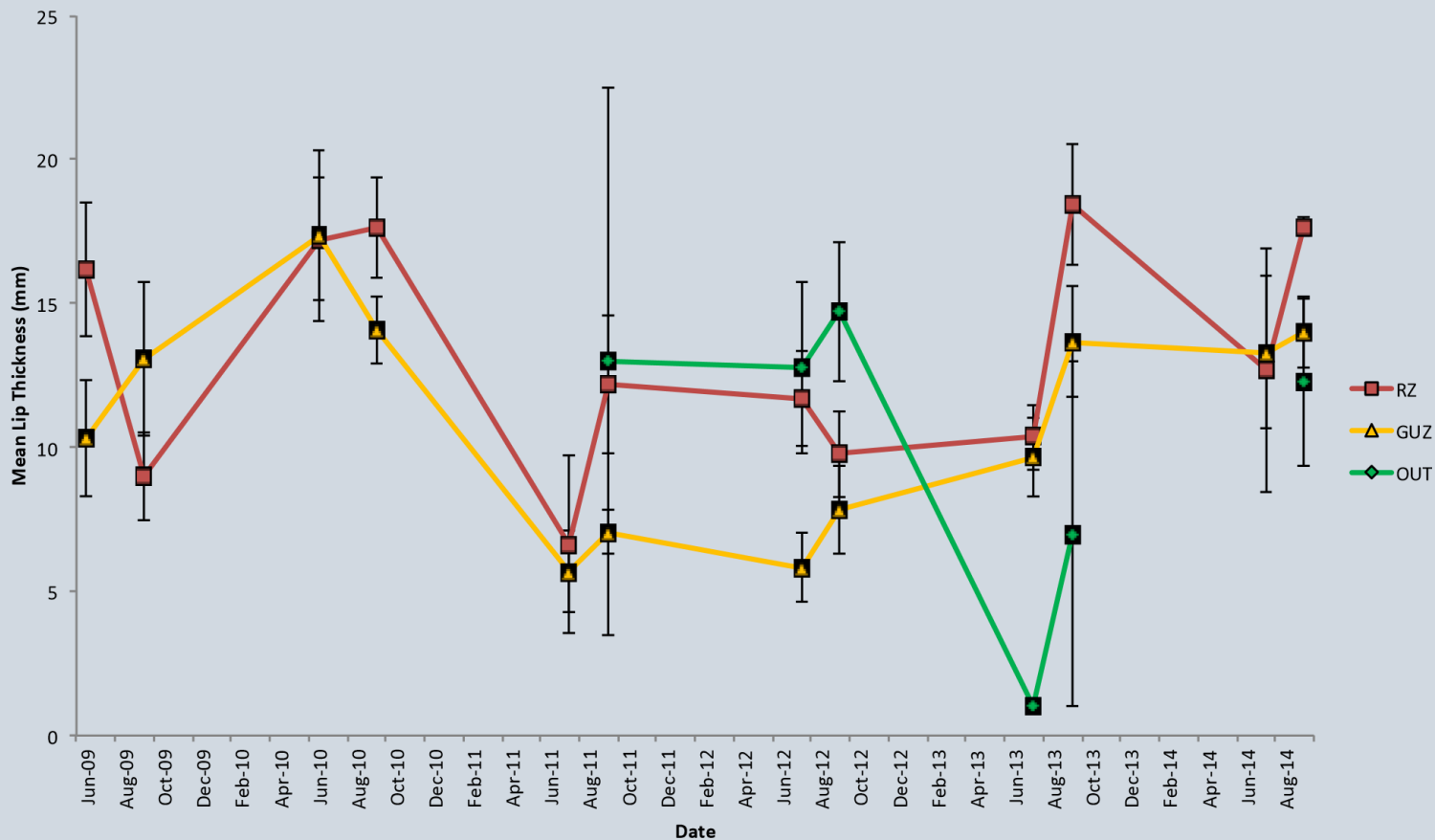


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- RESULTS of CONCH MONITORING:

Fig 4. Mean Conch Lip Thickness (mm) by Zone (2009-2014)

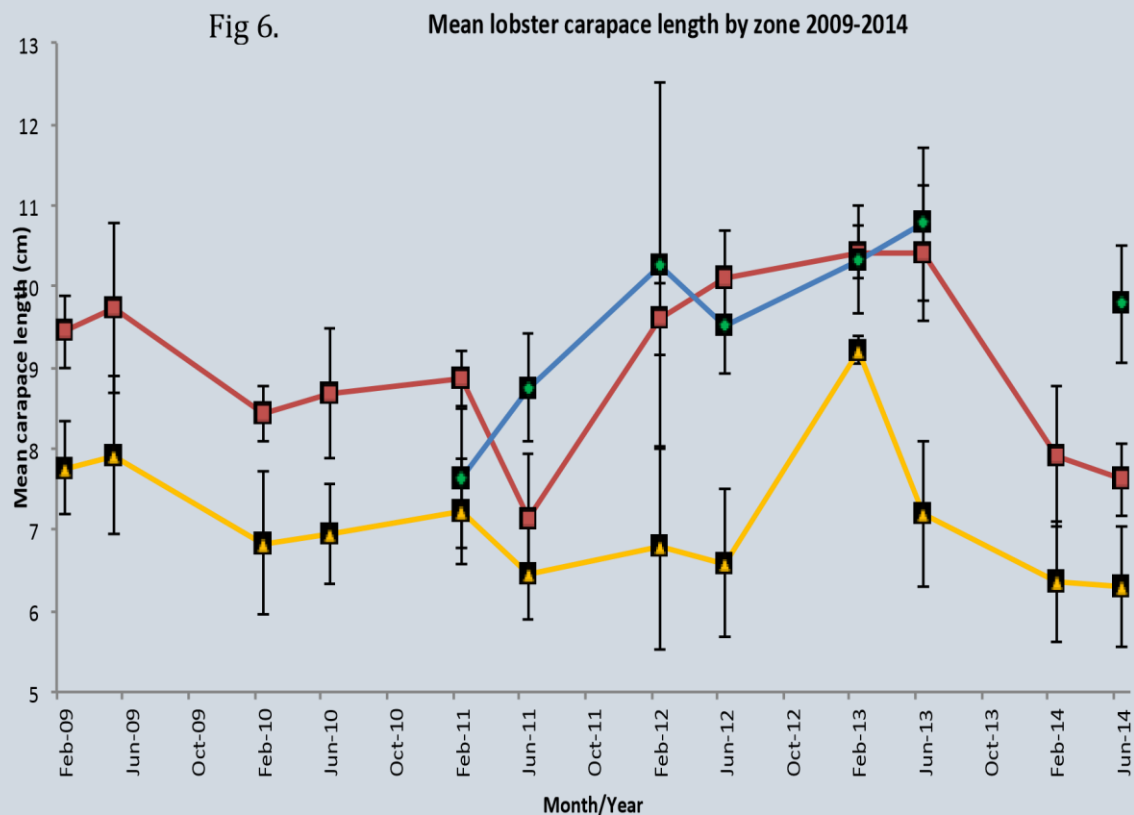


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RESULTS of LOBSTER MONITORING:

- Slight improvement from a bad situation in 2012-13 for lobster, although abundance is now higher in GUZ areas than in RZs in 2014.
- Mean carapace length has remained static in 2014 in the GUZ while mean abundance in the GUZ has increased, indicating good reproduction and good adherence to lobster fishery laws in GUZ areas.
- Mean carapace length in RZs has dropped significantly since 2013 while abundance has remained static, indicating reducing overall maturity in the RZs. Reduced maturity in RZs indicates possible illegal harvesting of large mature lobsters in RZs, or migration of mature lobsters to other areas, possibly to adjacent lobster shades located just outside RZs. Weather is another possible contributing factor. This trend could lead to reduced spillover into GUZ areas if overall maturity of RZ lobsters is decreasing

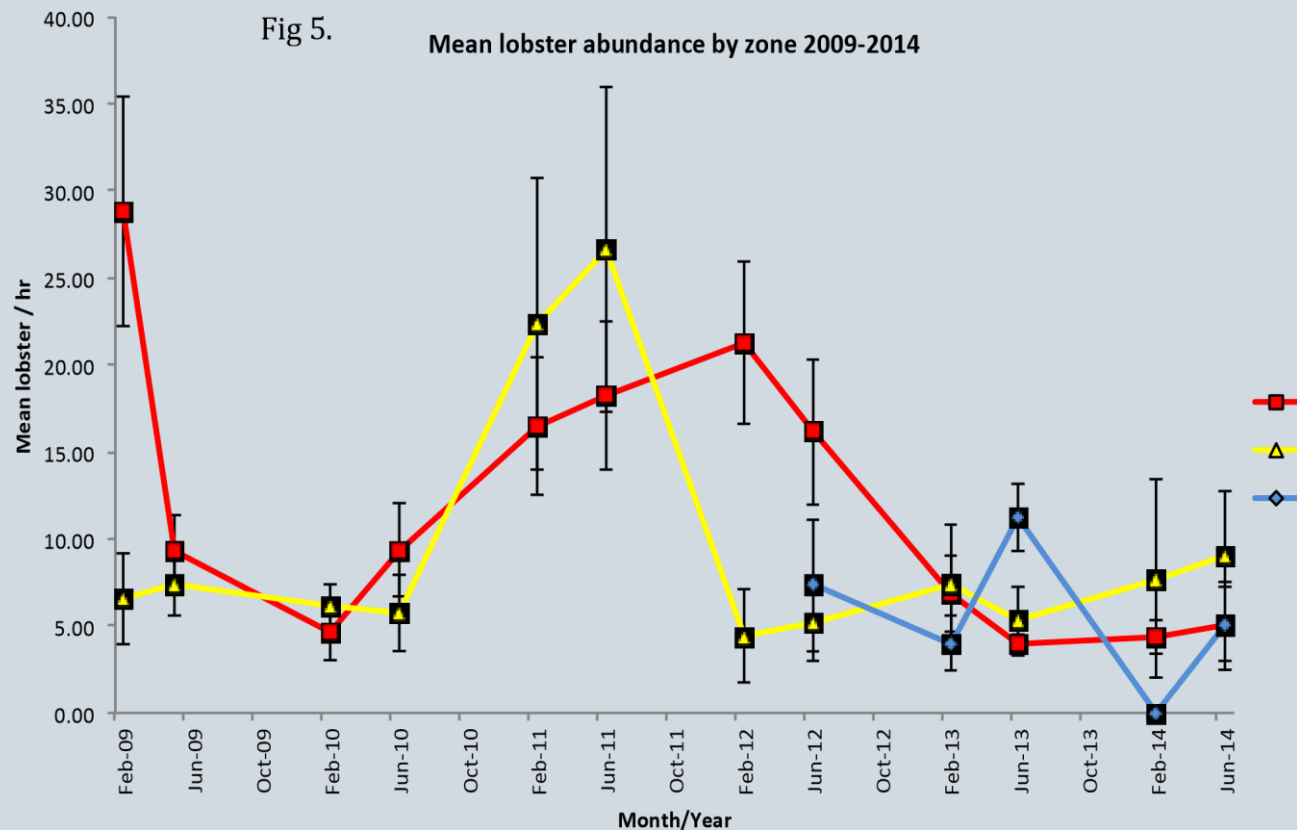


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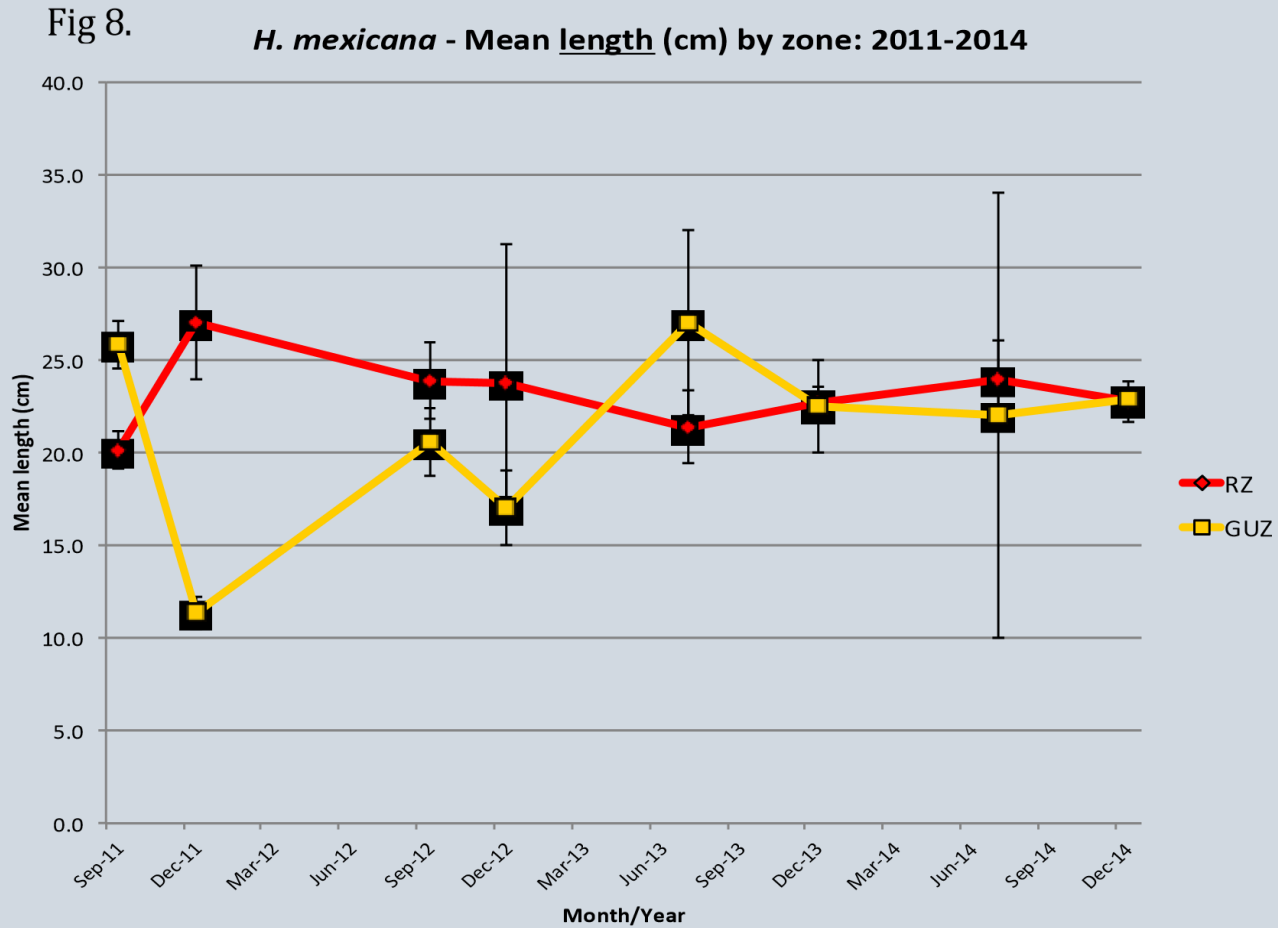
RESULTS of SEA CUCUMBER MONITORING:

- These observations indicate possible illegal harvesting of sea cucumbers in RZs, and over harvesting in GUZ areas.
- Sea cucumbers favor habitats typical of GUZ areas more than in PHMR's RZs, such that existing RZs may not be suitable for protecting the life cycle of sea cucumbers (PHMR RZs were established long before there was a sea cucumber commercial fishery. There may as a result be poor spillover from GUZ back into RZs.
- Managed Access logbook data for 2014 indicated it was the most lucrative species in terms of CPUE. Sea cucumbers are detritus feeders so there is concern of reduced benthic water quality affecting other benthic commercial species. Low densities may have difficulty recovering as likelihood of encountering other sea cucumbers to reproduce has decreased significantly.
- Lack of detritus feeders may result in increase organic sediments in the water column that could also drive down coral health with corals and seagrass struggling for light, in turn reducing oxygen concentrations at the sea floor from seagrass photosynthesis.



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CONCLUSION:

- The current size of the replenishment zones in PHMR is too small to protect the various habitats such as mangroves, sea grass and coral reefs for commercial species. Studies have shown that effective replenishment zones must include at least 10-15% of all habitats in a given area. The RZs in the MCPA is just under 5% and represents only one major habitat type – Coral reefs.
- Our monitoring of commercial fisheries indicates that generally, the current RZs are not effective in replenishing the general use zones of the MCPA.

CURRENT RESULT (after project implementation)

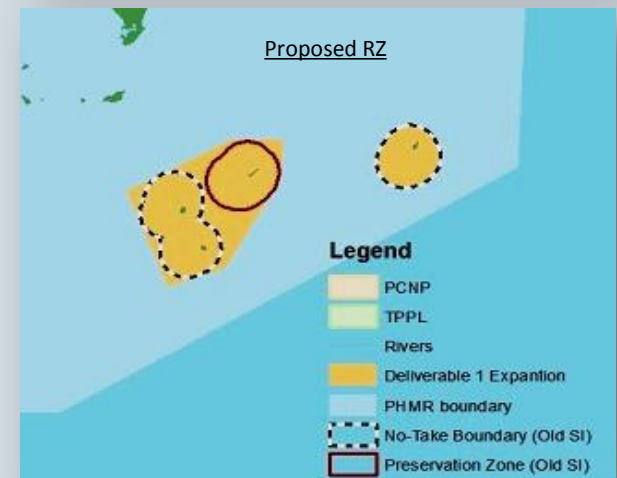
- After many public consultations, both TIDE and the fishers agree to join the current replenishment zones into one large zone making enforcement easier. This realignment resulted in a small increase in the size of the zone from about 3% to just under 5%.
- Previous 'Round' shape RZ will change to straight edges to improve enforcement.
- TIDE Belize Fisheries Department is ready to approve the proposed realignment but recommends that we continue to seek additional ways of increasing the RZ.

CONDITIONS for REPLICATION:

- Strong scientific evidence that supports the need for expansion.
- Support from government either through legislation or national legal instruments.
- Support from communities and resource users (obtained through 1 year of consultations including a couple of field trips with fishers)
- Plan for displacement of resource users

RESOURCES:

- Project staff (Field biologist, Science Director and 6 community researchers, education and outreach officer, administrative support staff and Executive Director). |
- Equipment: boat, water quality meter (YSI), BCDs, dive gears, measuring tapes etc., computer, lab equipment



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LESSONS LEARNED:

- Monitoring is time sensitive and must be done during certain times of year or you will miss the opportunity to collect critical data and have to wait until the following year resulting in gaps in data.
- Community consultation is a tedious and drawn-out process but it must occur in order to get support. It must also be noted that you will never get 100% support, but once you have majority its ok.
- Once you have community support it is a lot easier to get government support.
- It is a lot easier to conduct a field visit to the proposed area to get a real sense of the size as opposed to looking at it on paper.

RECOMMENDATIONS for FUTURE RZ EXPANSION:

- Examination of available scientific information.
- Stakeholder Engagement through Formal Mediation
- Replenishment study of the new zone
- Manatee and Goliath grouper Special Management Zones
- Sport Fishing Zone
- Deep River Special Management Zone with rotating RZs, rotating Sport Fishing Zone and rotating Open Zone
- Economic Diversification Zones

ADDITIONAL DOCUMENTS

- Full replenishment zone report available detailing what has been done and recommendations for future expansion.

Stage	Area (Ha)	% of PHMR
Current size	1322	3.3
Proposal	1781	4.4
Manatee and Goliath grouper Special Management Zone	3103	7.7
Protected Wetlands Sport Fishing Zone	1218	3.0
Conectivity of all snake cayes as RZ	2842	7.0
Whole of zone 4 as no fin-fishing	2915	7.2
Rotating RZ's (total area)	9999	24.8
Rotating RZ's 2	5000	12.4
TOTAL full replenishment zone	6061	15.0
Special Management Zones	6893	17

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TYPE OF EXPERIENCE 2:

Support for implementation of the control and surveillance systems.

- Tracking and digitalizing patrol information and collecting intelligence to become more effective in enforcement

BASELINE CONDITION:

- Spatial and temporal information on patrols were not available so it was difficult to plan the most effective patrols.
- Calculations of different patrol types (e.g. day patrols and night patrols) to calculate “total patrol time” were consistently incorrect
- Patrol time often included other activities such as time at other ranger stations or snorkeling to assist with research and monitoring activities
- Observations recorded as being “outside reserve” were recorded on patrols documented as “patrol within reserve”
- Little or no information on where the patrol was conducted
- Very limited information about vessel activity or location was recorded.

OBJECTIVES:

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.

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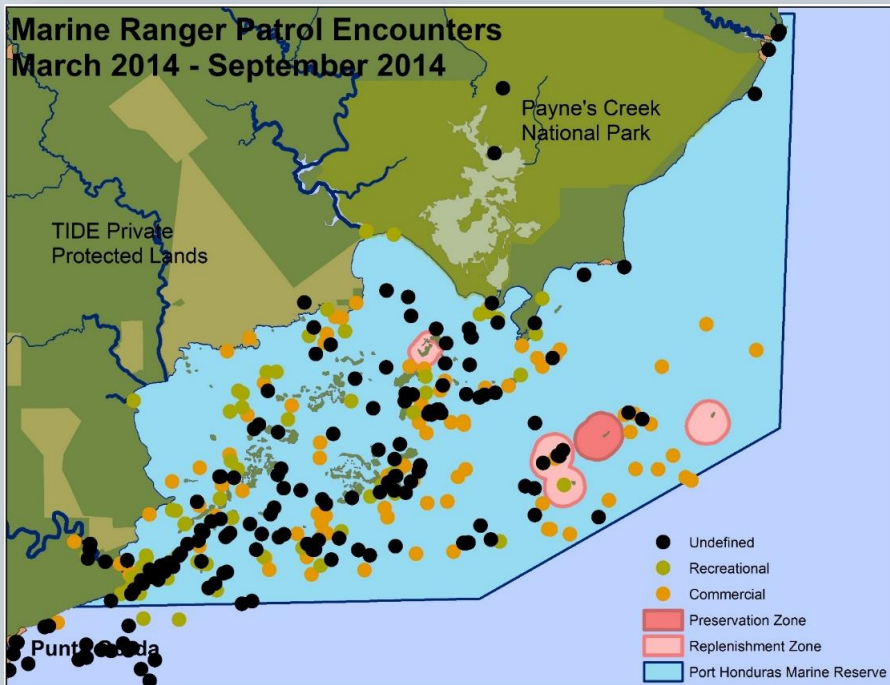


ACTIONS:

- Digitize patrol routes, fishing activities, illegal activities, wildlife sightings etc.
- Train rangers on the use of the Spatial Monitoring and Reporting Tool (SMART), GPS and GIS.
- Create maps showing spatial and temporal fishing/illegal patterns to determine patrol routes and times.
- Conduct patrols in gaps shown in the maps generated from the data captured through SMART.



Rangers being trained in the use of SMART



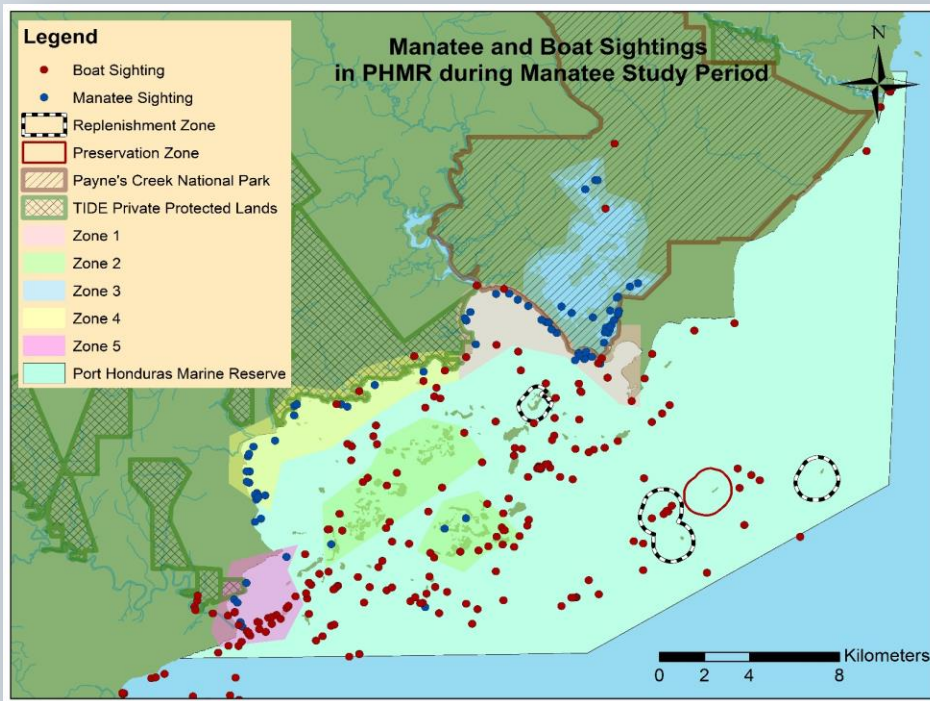
The high number of "undefined" patrol encounters present were taken with the GPS before SMART was implemented.

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RESULTS:

- Automation of the enforcement system where information was stored in one location.
- Revision of the SMART software based on feedback from TIDE rangers to capture information on catch, wildlife sightings and option for inclusion of 'in-transit' vessel completed.
- Wildlife sightings, both temporal and spatial can be recorded along with boat traffic. This could result in placing no wake zones in areas of high manatee sightings.



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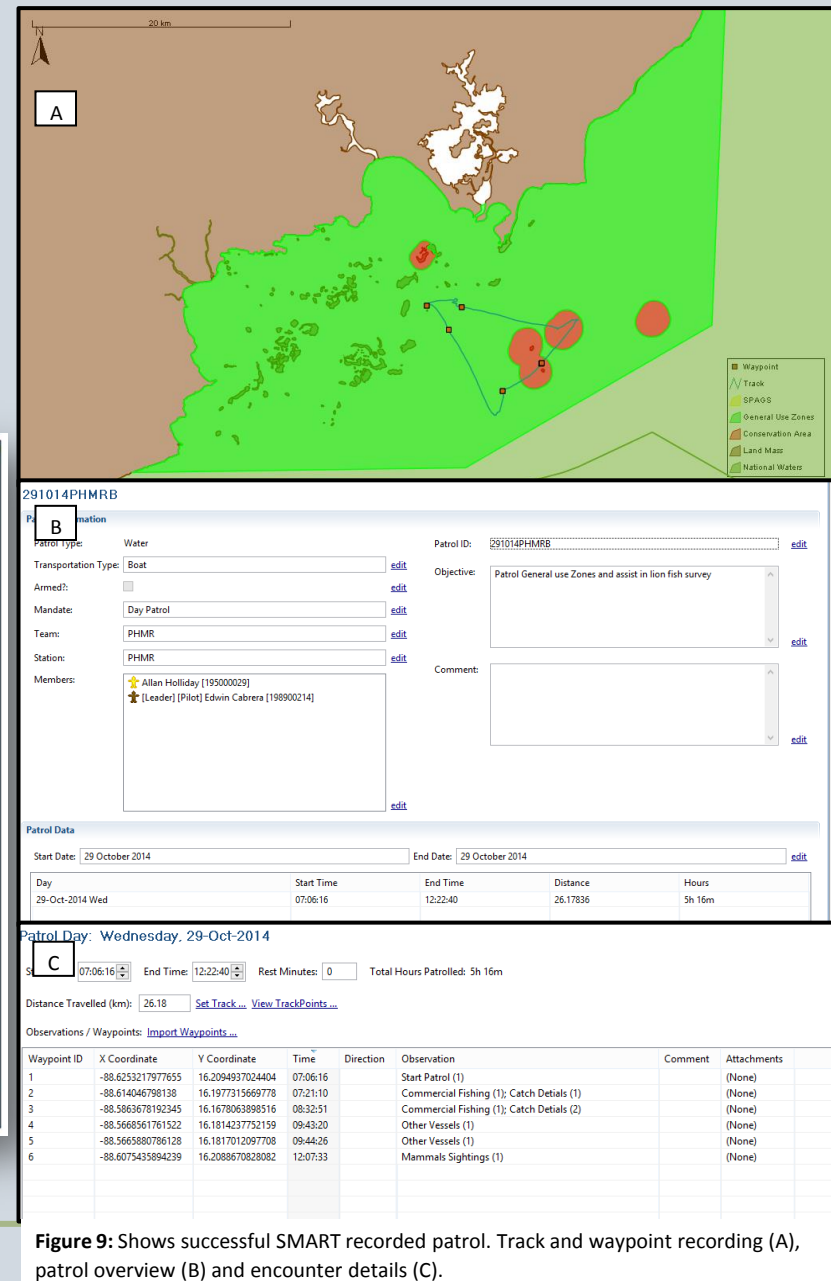


Figure 9: Shows successful SMART recorded patrol. Track and waypoint recording (A), patrol overview (B) and encounter details (C).

CONDITIONS for REPLICATION

- Collaboration with multi-agencies necessary to get a more comprehensive picture.
- Trained staff in the use of the SMART software, GIS and GPS
- Software developers must be flexible to make adjustments to the software to ensure all necessary data can be captured in the tablet and exported for analysis.

RESOURCES:

- Enforcement staff - 1 Park Manager, 6 rangers, 1 GIS specialist
- Support staff – Project manager, financial administrator
- Equipment - 1 Rugged GPS tablet, 1 boat, 1 laptop computer
- Supplies – 100 gals of fuel per week, USD \$100 food ration per week

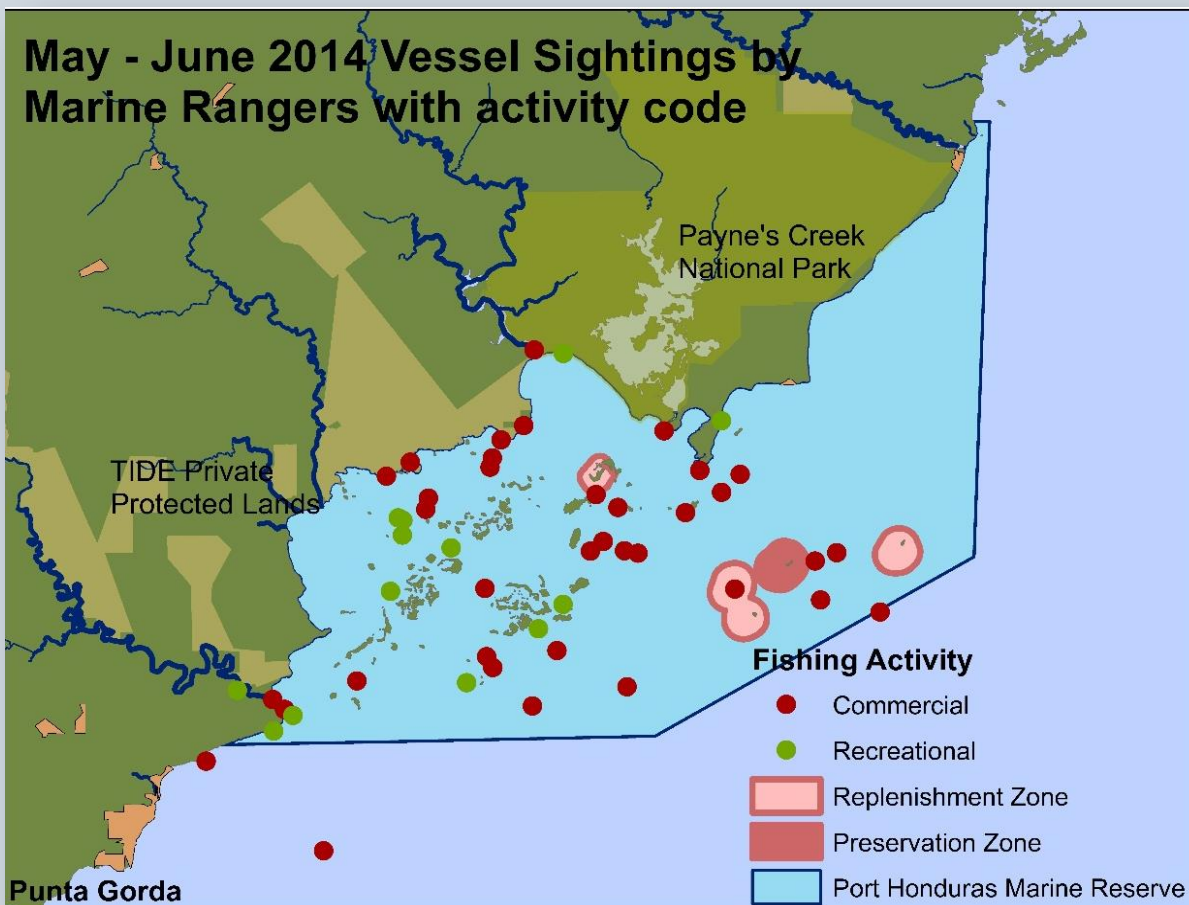


Figure 8: May – June 2014 ranger vessel encounters while on patrol.

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PROBLEMS/LESSONS LEARNED:

- The software has to be tailored to fit the park needs. TIDE had to request changes in order to capture all the information we need.
- Not all park rangers are tech savvy, even after training. Use of tablet/GIS should be done by those who are familiar with that type of technology to avoid errors in reporting.
- Must have data over long periods of time (More than a year) to use the technology to plan effective patrols.

ADDITIONAL DOCUMENTS

- Full report on the use of SMART available



Gillnet confiscated within the MCPA

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OTHER GOOD MANAGEMENT TIPS:

- **INTERNAL PLANNING PROCESS:**
- At least have a five-year strategic plan created with input from all staff, Board of Directors and community leaders.
- 3 year detail work plan and budget created from Strategic Plan.
- Action plan and budget (More detailed) created from 3-year work plan. Work plan includes a log frame complete with '*Activities, outputs, outcomes, means of verification and monitoring and evaluation*'. Each park manager, scientists and education officer create their own plan which is presented to TIDE's management team for input and discussion. Plans are then revised and once completed are presented to the Board of Directors for vetting and input. Plans are usually sent back to staff for revision by the board and a final presentation is done where the board approves the plan.
- Development Director uses these plans and budget to write grants
- Examples of these documents are available to share.

- **EDUCATION and OUTREACH:** *(Not funded by project)*
- International award-winning Freshwater Cup for over 10 years.
- Football competition for children with conservation outcomes. Each football team has to complete an environmental project before qualifying to play in the cup.
- In 2014 there were 38 teams – 17 female teams and 21 male teams.
- Competition is done through schools and community participation in projects is highly encouraged.
- Prizes include school supplies for winning team members as well as the school they represent.



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OTHER GOOD MANAGEMENT TIPS:

- **COMMUNITY GROUPS MENTORING:**
- Community development plans and feasibility studies must be completed before investing in communities. These plans must be done through consultation with communities to obtain buy-in and support.
- Groups are encouraged to register as a Cooperative or Association or Company
- Training in small business management, conflict resolution, organizational management and business planning completed before establishing businesses.
- Continuous direct engagement with groups through the mentor help groups to stay focus and gives the assurance that TIDE is serious about the success of their business.



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Financial Sustainability: TIDE Tours

- ✓ Introduction of Ridge to Reef Expeditions
- ✓ 2014 success of program
- ✓ new volunteers for 2015
- ✓



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THANKS FOR YOUR
ATTENTION
QUESTIONS????



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