



## ***Ameliorating Threats to Manatees in the Heart of Belize***

CLP Project ID: 02107412

\*Jamal A. Galvez, Chantalle J. Clarke, Samir K. Rosado



**Host Country:** Belize

**Site Location:** Belize River Mouth, Belize City

**Institutions:**

Sea to Shore Alliance,

Coastal Zone Management Authority & Institute

Swallow Caye Wildlife Sanctuary

**Overall Aim:**

The coastal zone is one of Belize's greatest assets. However, the impacts from natural hazards and increasing deleterious human use threaten the wealth of biodiversity found within the coastal and marine area. Human-wildlife conflicts have become common, and the endangered West Indian Manatee is threatened on a daily basis. The overall goal of the project is to alleviate threats to the manatee in a small, but nonetheless important foraging area, by advocating the need for research, improved management, and awareness.

**Email:** [manateeczmai@gmail.com](mailto:manateeczmai@gmail.com)

**Websites:**

[www.sea2shore.org](http://www.sea2shore.org)

[www.coastalzonebelize.org](http://www.coastalzonebelize.org)

**Date Completed:** November 21, 2013

## **Acknowledgements**

We wish to thank the citizens of Belize that helped to make this project, “Ameliorating the threats to manatees in the heart of Belize”, a successful one. The team is grateful to its mentors located both in Belize and abroad. Whether you participated in our “Protect Our Manatees Belize” campaign, attended our “Manatee tour-guide Workshop”, or offered advice and support, your input was highly appreciated. The team would like to commend the organizations that served as co-implementers of the project. Specifically, these organizations include the Belize Coastal Zone Management Authority and Institute, Sea to Shore Alliance and Friends of Swallow Caye. The Belize Port Authority is commended for its cooperation in implementing and enforcing manatee “no wake” zones within the project area. The Belize Tourism Board was especially crucial in getting tour operators on board with the project. Bowen and Bowen Limited offered its expertise that helped with the launching of an effective media campaign. Special recognition goes out to all the volunteers who selflessly dedicated time out of their busy schedules throughout the entire project. Lastly, this project would not have been possible without the financial support and guidance from the visionary Conservation Leadership Programme. The project team is extremely grateful for the opportunity to build local capacity to reduce the threats to the endangered West Indian manatee.

# Table of Contents

<b>Acknowledgements</b> .....	i
<b>Table of Contents</b> .....	ii
<b>Acronyms</b> .....	iii
<b>Glossary of Terms</b> .....	iv
<b>List of Maps</b> .....	v
<b>List of Figures</b> .....	v
<b>Section 1:</b> .....	1
Project Summary .....	1
Introduction.....	2
Project Members:.....	7
<b>Section 2:</b> .....	9
Aims & Objectives .....	9
Methodology.....	10
Outputs and Results .....	12
Achievements and Impacts .....	19
<b>Section 3:</b> .....	20
Conclusion .....	20
Problems encountered and lessons learnt .....	21
In the Future.....	22
<b>Section 4:</b> .....	24
<b>Appendices</b> .....	24
Expenses .....	24
Communication.....	26
Scientific Equipment .....	27
Photography .....	28
Camping.....	32
Lodging.....	35
Food .....	35
Transportation.....	37
Customs .....	38
Outreach.....	39
Workshop.....	40
Administrative .....	44
Incidentals.....	45
Publicity.....	46

## **Acronyms**

BPA	Belize Port Authority
BTB	Belize Tourism Board
CLP	Conservation Leadership Programme
CZMAI	Coastal Zone Management Authority & Institute
FD	Forest Department
FOSC	Friends of Swallow Caye
IUCN	International Union for Conservation of Nature
NGO	Non-Government Organization
S2S	Sea to Shore Alliance
USGS	U.S. Geological Survey

## **Glossary of Terms**

**Manatee Zone** *refers to an area where special boating practices must be used in order to safeguard manatees in the area.*

**No Entry** *refers to an area where boats are not allowed to traverse.*

**No-Wake Zone** *refers to an area within which vessels are required to travel at idling speed – slow speed that creates no appreciable wake.*

**Stranding** *refers to an event where a marine animal comes ashore or near the shore. In order to encompass the many different scenarios by which this occurs, the definitions of “stranding” include:*

- *An event in the wild where a marine mammal is found dead on the beach or shore or floating in coastal waters.*
- *When a marine mammal is alive on the beach or shore, but unable to return to the water due to sickness or injury or some other obstacle.*
- *When a marine mammal is in the water, but is unable to return to its natural habitat without assistance.*

## List of Maps

Map 1: Location of Study Site .....	4
Map 2: Shows the designated “No wake zone” areas on the Belize River .....	14
Map 3: Shows the “No Wake Zone” along the Belize River as well as manatee sighting during the 2012 aerial survey within or around those zones.....	15

## List of Figures

Figure 1: Number of manatee stranding classified by cause of death for each year for the period of 2005-2010 (n=76) .....	2
Figure 2: Satellite image of the Belize River .....	5
Figure 3: Shows the percentage of captured animal with boat strike presence during health assessment of randomly captured animals at the Belize River mouth June 2012-May 2013. (N=15).....	12
Figure 4: Picture of recent watercraft collision on captured manatee.....	12
Figure 5: Manatee Scar Sheet.....	12
Figure 6: Satellite image showing the movements of the manatee with satellite transmitter attached in and around the study site.....	13
Figure 7: Graph showing changes in boat speed from June 2012 to August 2013 .....	16
Figure 8: Graph showing proportion of manatee deaths in the Belize River in comparison to the rest of the country from 2012 - 2013 .....	17

# **Section 1:**

## **Project Summary**

Belize has the largest surviving population of the endangered Antillean manatee. These herbivorous mammals, like dolphins, many fish species and even humans depend on the lower Belize River as a medium for migration and as a source of freshwater. Within the Belize River tributary the occurrence of manatee mortality directly related to watercraft collisions is very high. These events threaten to reduce the population of the endangered species. This project aimed to ameliorate the threats to the endangered manatee population within the Belize River mouth through strengthening inter-agency collaboration, policy development and public awareness activities. A comprehensive threat assessment was conducted within the Belize River mouth area in order to identify manatee migration routes most vulnerable to high speed watercrafts and to establish appropriate speed zones. Key stakeholder agencies and local communities were engaged through effective education campaigns in order to garner support for the development and implementation of a manatee conservation and management strategy. It is envisioned that the net outcomes of this project will be increased protection of manatees, reduced mortality resulting from boat strikes, and improved management of the area by all stakeholders with a vested interest in the perpetuation of the endangered species.

## Introduction

Belize is one of few countries in the Wider Caribbean region with the largest remaining population of the Antillean Manatee subspecies, *Trichechus manatus manatus*, classified as Endangered on the Global IUCN Red List of Endangered Species (<http://www.iucnredlist.org/>). They inhabit coastal lagoons and riverine systems, such as the mouth of the Belize River. The major threat to the survival of the Antillean Manatee in Belize is watercraft-related mortality. Other threats include illegal hunting and a general increase in human disturbance within the coastal zone. Belize's manatee population is threatened mainly because of human activities. Reports of 76 manatee strandings between 2005 and 2010 indicate the main verifiable cause of death was watercraft collision (Fig.1, Galves 2011). Others received sub-lethal strikes, as seen by body scars on roughly 50% of animals captured (Auil et al. 2007).

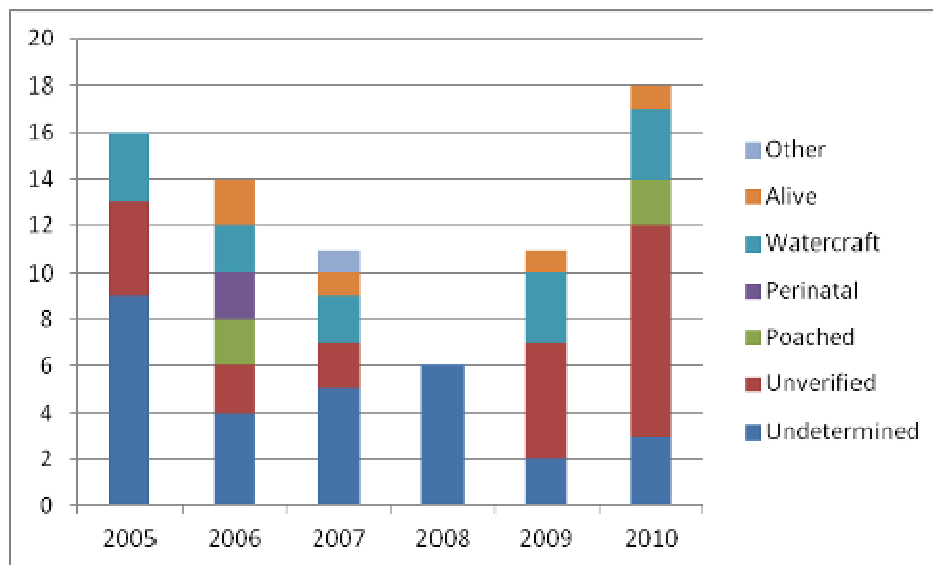
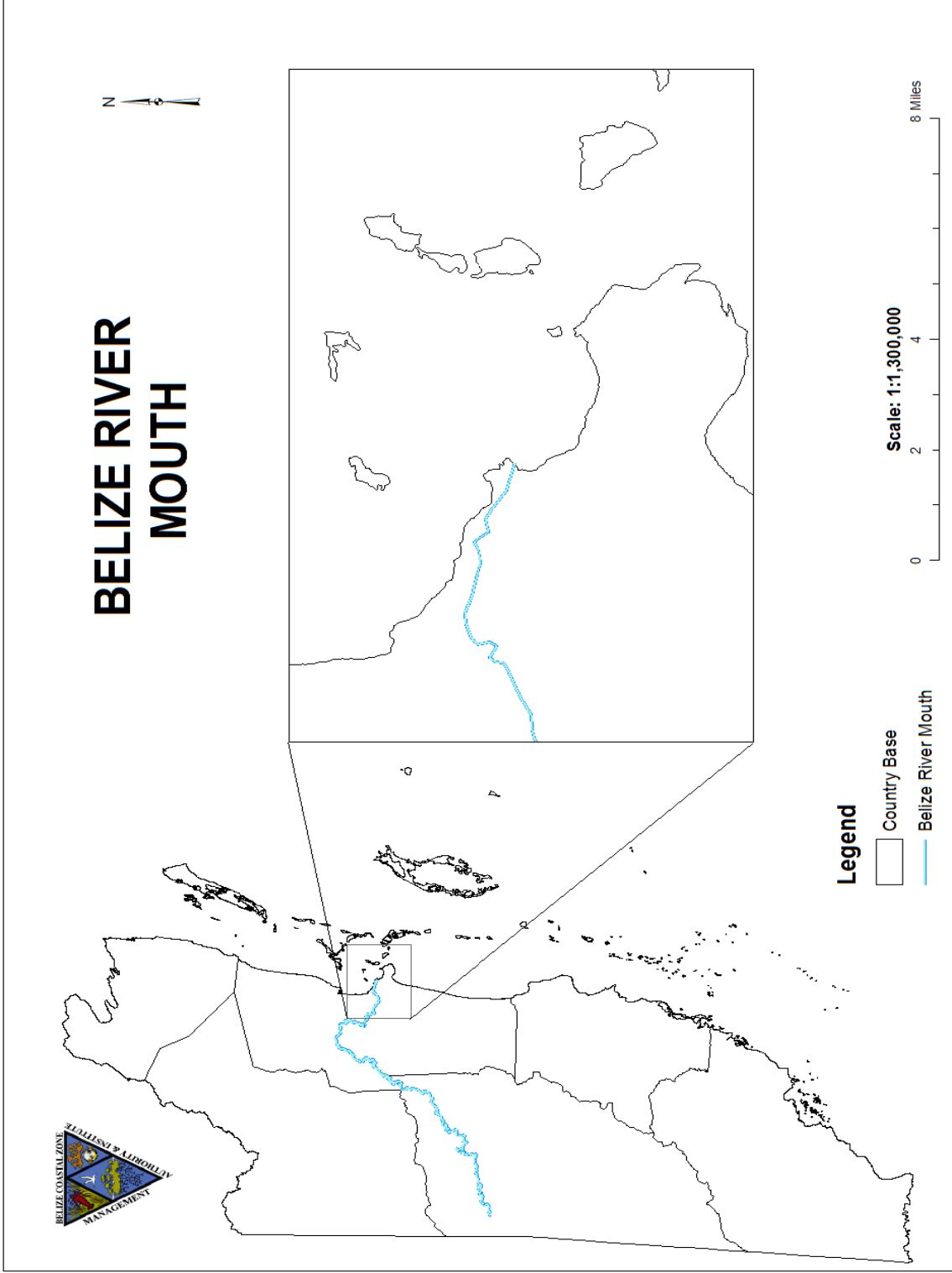


Figure 1: Number of manatee stranding classified by cause of death for each year for the period of 2005-2010 (n=76)

The lower Belize River is classified as in need of protection for its natural and cultural elements (Miller 1990). The Belize River is an outlet to the largest watershed in Belize. It is also important to the threatened manatee (Auil 1998), dolphins, many fish species, and is used by humans for freshwater and transportation. The Belize River mouth serves as a refugia for the manatees; its cool, fresh water and abundance of fresh-



brackish water vegetation makes the area an ideal foraging site. Sadly, this is also the area with the most recorded manatee deaths country-wide. The Belize River mouth area is the project site; it is located just north of the largest city in Belize (Map 1). The Belize River flows 290 km from the Maya Mountains of Belize and Guatemala, into the Caribbean Sea just north of Belize City. The river's banks are maintained by an extensive network of mangroves, which provide essential habitat for many species of fish and crab. Local Belizeans rely on the Belize River as a source of drinking water, fishing, travel and commerce.



Map 1: Location of Study Site: Belize River Mouth



Figure 2: Satellite image of the Belize River

This project determined the impacts to manatees in the mouth of the Belize River, and implemented associated amelioration activities. A management strategy was developed, which is aimed at protecting manatees and other species that use this system. Policies were also presented to the government for endorsement and adoption. Furthermore, through this project boat speed zones within the Belize River mouth were established and are currently being enforced by the Belize Port Authority. Finally, a national public awareness campaign was launched that involved the participation of key users of the river system in order to ameliorate the threats to this endangered species of global conservation significance.

Many stakeholder groups participated in the project, which ranged from decision-making government agencies such as the Belize Port Authority (BPA), the Forest Department (FD) and Belize Tourism Board (BTB), as well as conservation partners. The BPA are the decision-makers that will approve and implement policies on boat speed zones. The Forestry Department is the government agency that protects the manatees and manage wildlife sanctuaries. The Forest Department is also a member of the National Manatee Working Group formed by the Belize Coastal Zone Management Authority and Institute (CZMAI), which helps provide recommendations for manatee related projects countrywide. S2S (Sea to Shore Alliance, CZMAI and Friends of Swallow Caye (FOSC) provides technical expertise of trained ecologists and biologists with the passion and enthusiasm of citizen volunteers to educate the public, protect endangered species, and conserve our coastal environments for both people and animals.

CZMAI and Friends of Swallow Caye will be key in steering current and future management of the area, and for ensuring that the responsible government agencies follow through with proposed management strategies. Also, CZMAI will continue to work with tour operators by educating them on manatees and proper techniques for conducting boat tours within manatee areas. The information that will be produced as an output of this project shall also be shared in schools to help students understand manatees, their lifestyle and their importance. The project will also provide useful data and information for NGOs, local and international, as well as research institutions.

## **Project Members:**

**Name:** Jamal A. Galves, Project Leader

**Current Employer:** Sea to Shore Alliance & Belize Coastal Zone Management Authority and Institute

**Job Title:** Manatee Research Associate

**Nationality:** Belizean

**Age:** 26

**Education with highest level completed:**

Associate's degree, St. John's College Junior College, 2008-2010

**Previous education experience:**

High School Diploma (Sciences), Gwen Lizarraga High School

**Relevant skills and experience:**

Manatee expert researcher, Environmental Education, Community Outreach

**Name:** Chantalle J. Clarke:

**Current Employer:** Belize Coastal Zone Management Authority and Institute

**Job Title:** Coastal Planner

**Nationality:** Belizean

**Age:** 31

**Education with highest level completed:**

Master of Environmental Management, Duke University, 2007-2009

**Previous education experience:**

Bachelor of Arts in Biology / Environmental Studies, Grinnell College, 2003-2006

Associate of Arts (Biology & Chemistry), Belize Technical College, 1998-2000

High School Diploma (Sciences), Anglican Cathedral College, 1994-1998

**Relevant skills and experience:**

Environmental Education, Community Outreach & Stakeholder Engagement, Marine Resources Planning & Management

**Name:** Samir K. Rosado

**Current Employer:** Belize Coastal Zone Management Authority and Institute

**Job Title:** Coastal Science Research Officer

**Nationality:** Belizean

**Age:** 26

**Education with highest level completed:**

Bachelor of Science in Biology / Chemistry, Sam Houston State University, 2006 - 2009

**Previous education experience:**

Associate of Arts (Biology & Chemistry), St. John's College Junior College, 2000-2006

High School Diploma (Sciences), St. John's College High School, 2000-2004

**Relevant skills and experience:**

Environmental Education, Community Outreach & Stakeholder Engagement, Field Research

## **Section 2:**

### **Aims & Objectives**

The coastal zone is one of Belize's greatest assets. However, the impacts from natural hazards and increasing human activities threaten the wealth of biodiversity found within the coastal and marine area. Human-wildlife conflicts have become common, and the endangered West Indian Manatee is threatened on a daily basis. The overall goal of the project is to alleviate threats to the manatee in a small, but nonetheless important foraging area, by advocating the need for research, improved management, and awareness. The project objectives are as follows:

- (1) To employ manatee scar analysis to categorize boat strikes
  
- (2) To tag and track wild manatees to identify usage patterns and travel corridors at the Belize River site using satellite tags
  
- (3) To increase monitoring of the Belize River site
  
- (4) To determine appropriate speed limits within "no-wake" zones that can be applied within the Belize River mouth
  
- (5) To assist local authorities with the implementation of speed zones.
  
- (6) To create and install speed zone signs, as well as develop and distribute education materials to increase local awareness of the importance of following speed restrictions
  
- (7) To educate local boat operators to become stewards of the area and the wildlife.

## **Methodology**

During manatee captures for in order to conduct annual health assessments, each animal is tagged and inspected for new or old boat scars. Using the scar analysis method, these scars are sketched on to a scar pattern data sheet. The size of propeller is estimated based on previous data and new information is used to update existing manatee files.

Using a uniquely designed boat wick is also called a net boat, nets and a trained crew, manatees were captured during June 2012 and May 2013. Individual health of manatees captured were assessed by experienced wildlife biologists and/or veterinarians of Sea to Shore Alliance and USGS. Biomedical samples (blood, urine, feces, parasites and skin tissue) were collected. Weights and measurements were also taken, including back fat as an indicator of body condition, and documentation of scar patterns. Individuals were each fitted with a satellite transmitter that was scheduled to be on the animal for six months. Tracking of tagged manatees was done weekly. Behavioural data, travel paths and frequency as well as environmental conditions during observations was made.

Weekly visits were made at the study site, several parameters of data were collected such as environmental condition, boat survey and manatee behavior. Based on past studies of boats and manatees collision, and the speed that was being used by traffickers of the area before the “No Wake Zone” “Manatee Area” “Slow Speed” and “No Entry” zones in designated areas. The team along with the Port Authority agreeded on a speed limit and zones locations for the area that gives manatees a chance to avoid colliding with watercrafts.

Numerous signs that have been previously used for demarcating manatees zones both locally and abroad were reviewed. This review helped the project team to select the design of the signage to be installed within the project area. Once the selection was made, a Graphic Arts Designer then brought the design to life. Bowen & Bowen Limited financed the designer, who in turn worked closely with the project team. The proposed design was shared with the Belize Port Authority (BPA) for their review and feedback. BPA recommended some changes to the signs, which were later made and approved. A boaters guide for tour operators that conduct tours within manatee zones was also created



in order to provide them with information about the signs and the zones. These guides were distributed by the BPA to each boater upon the renewal of their vessel registration and licenses.

The project team convened a meeting with the Belize Tourism Board (BTB) to discuss the best approach for getting support and participation from the tour operators and tour-guides support for the manatee tour-guide workshop. We came to an agreement to include the workshop as a part of BTB's mandatory training course all tour-guides. BTB shared the contact information for the operators that use the area. Formal letters of invitation for the workshop were sent out to the respective tour guides that operate within the Belize River area. The invitation was also placed in the local newspapers in an attempt to increase the level of participation in the workshop from boaters that use the project area.

## Outputs and Results

Some measurable outputs of the project has been observed in the different objectives within the project. The analysis of boat scars on manatee caught in the study site shows that about 53% of these randomly caught wild manatees has presence of boat collision scars (Figure 3,4,&5).

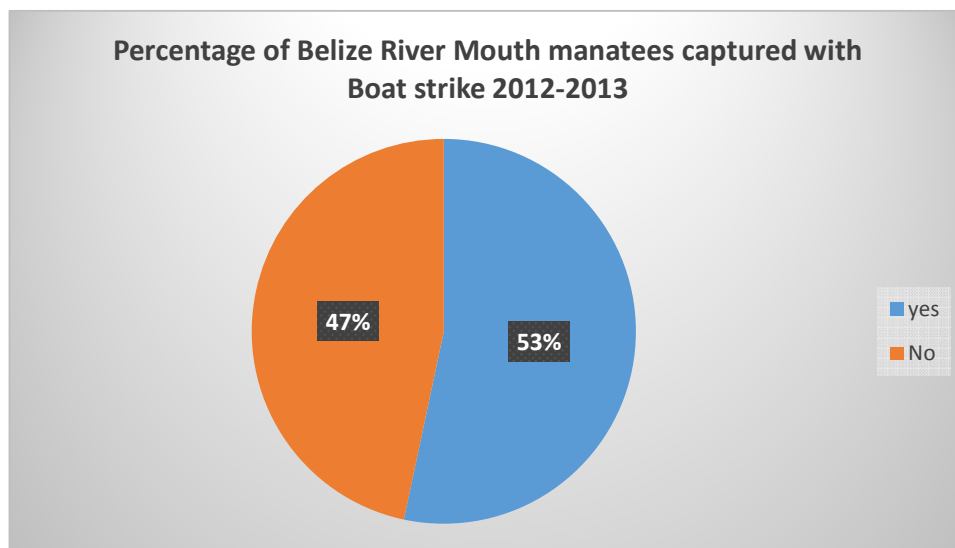


Figure 3: Shows the percentage of captured animal with boat strike presence during health assessment of randomly captured animals at the Belize River mouth June 2012-May 2013. (N=15)

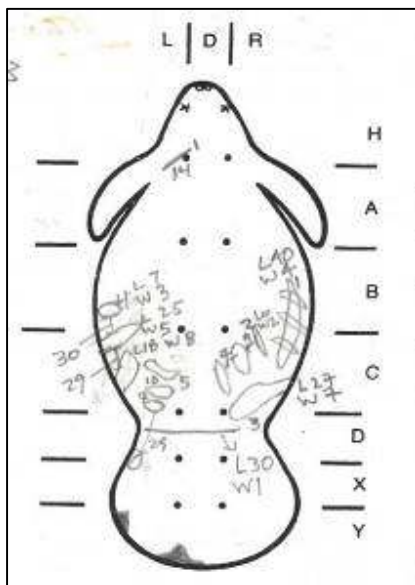


Figure 5: Manatee Scar Sheet



Figure 4: Picture of recent watercraft collision on captured manatee.

This evidence had a huge impact socially as the findings were shared with the individuals that attended the workshop, so as for them to see the impact they have on these animals. Many boaters stood up and voice their apology as some had no idea of the impact they were having on the manatees in the Belize River mouth area.

Satellite tagging wild animals in the area gave us a better understanding of these manatees and how they use the area (Figure 6). The data shows some individuals make daily visits to the river mouth. It also shows that others travel miles away from the area but still return on a weekly basis. The data were used to advocate for the installation of four “No

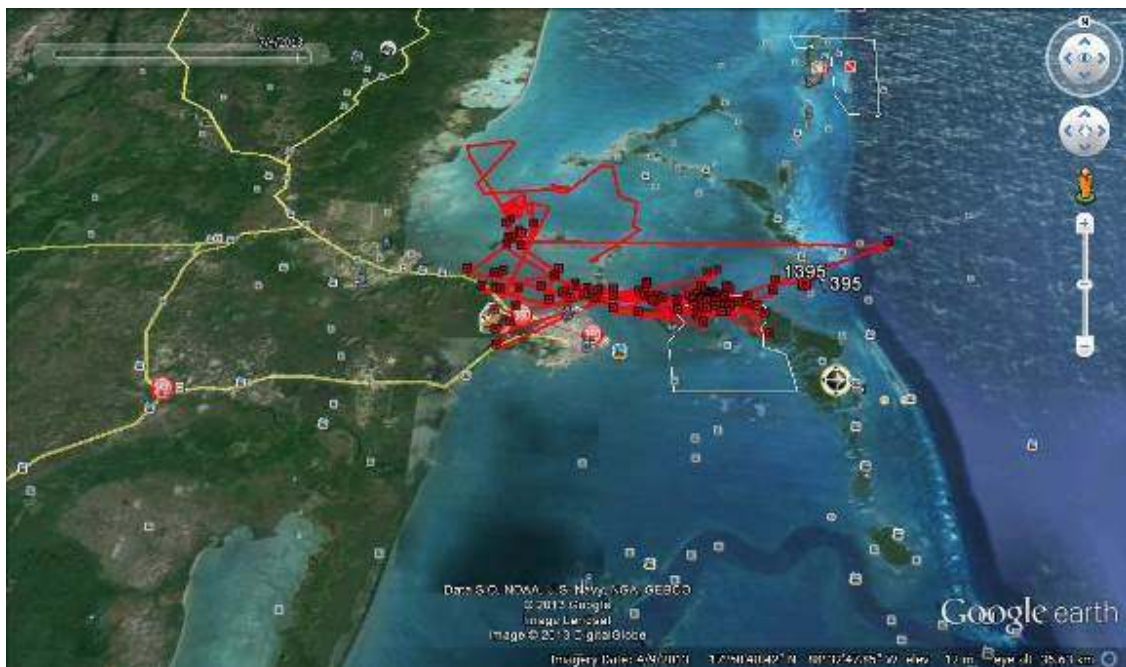
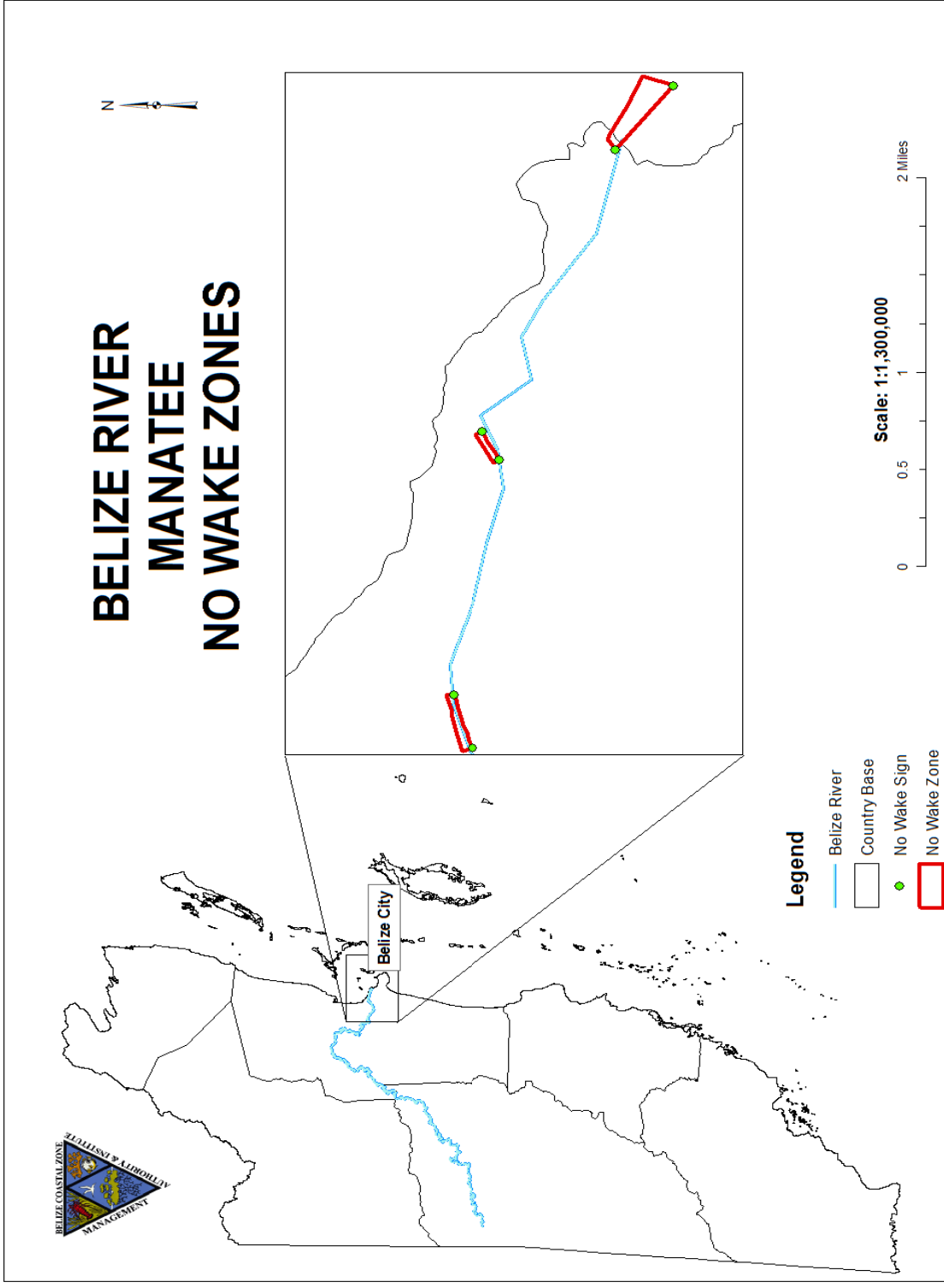
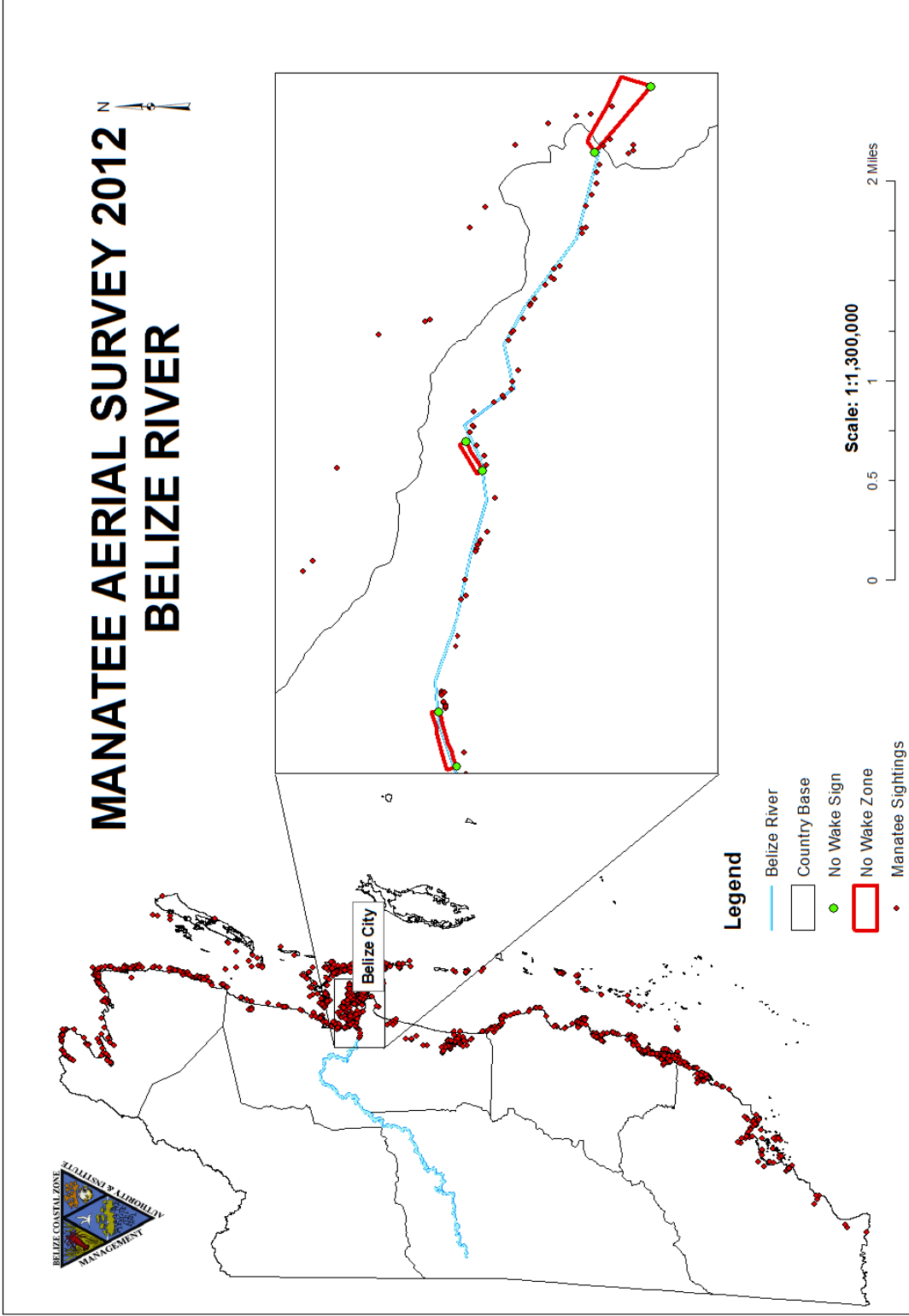


Figure 6: Satellite image showing the movements of the manatee with satellite transmitter attached in and around the study site.



Map 2: Shows the designated “No wake zone” areas on the Belize River. These are also areas with high manatee presence.



Map 3: Shows the “No Wake Zone” along the Belize River as well as manatee sighting during the 2012 aerial survey within or around those zones.

Wake” zones, three “Manatee Zones” and one “No Entry” manatee area (Map 2). These signs and zones can now be readily identified by boaters that frequent the area as well as new visitors.

These data are very valuable in presenting to BPA and FD whom are the law makers, as it proves substantial use of the river and that better protection for these animals is needed. We took about a hundred individuals including tour-guides and boat operators to track and observe these animals’ behavior at the river mouth (Map 3).

The increase in the monitoring of the site both by the team and BPA has forced boaters to slow down and respect the “No Wake” signs. Compliance has gone from non-compliance to over 70% of the boaters complying with the “No Wake” zone speed limit. We now get reports from other boaters and area residents of the boaters that do not abide. This has gotten boaters and residents involved since they are now aware.

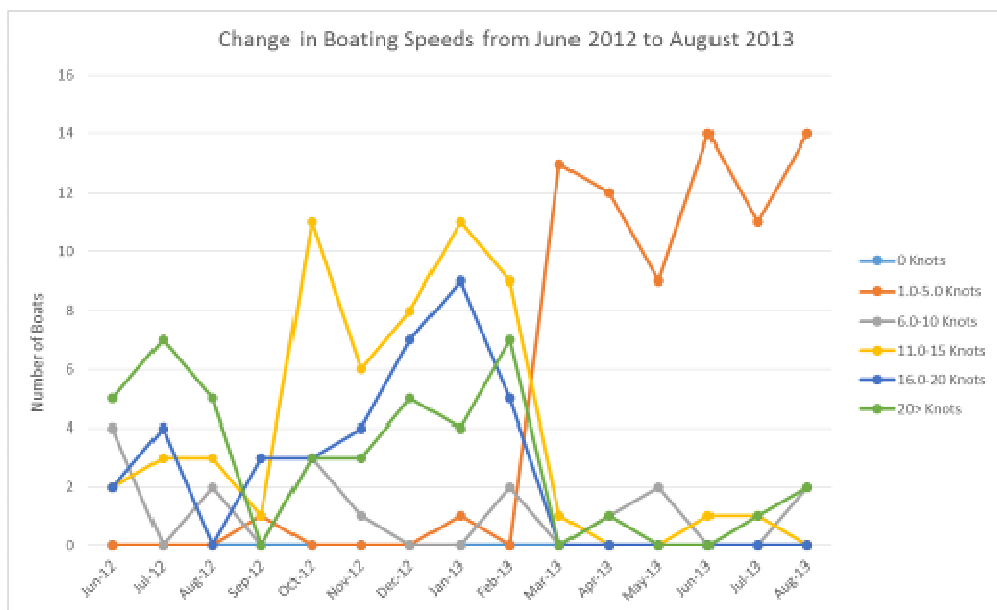


Figure 7: Graph showing changes in boat speed from June 2012 to August 2013

Figure 7 show the results from the boat surveys. Showing how boats used to travel a high speed through the area where manatee’s hangout, to slowing down in February 2013 when the “no wake” zones and signs were implemented. You can see that prior to Feb 2013, boats were travelling in the area at speeds within the range of 11-20 knots with a significant amount of boats travelling well above 20 knots. However, as of February 2013 the number of boats that are travelling within 1-5 knots has increased. This we believe is

directly linked to the installation of the signage presence of monitoring, the tour-guide workshop, public awareness and enforcement by Belize Port Authority. With the boats slowing down this year has shown a decrease in manatee stranding reports in the area. The number of reports of dead manatee in the area has gone down from previous years (Figure 8). This is the lowest recorded number of dead manatee within the study site for over 5 years.

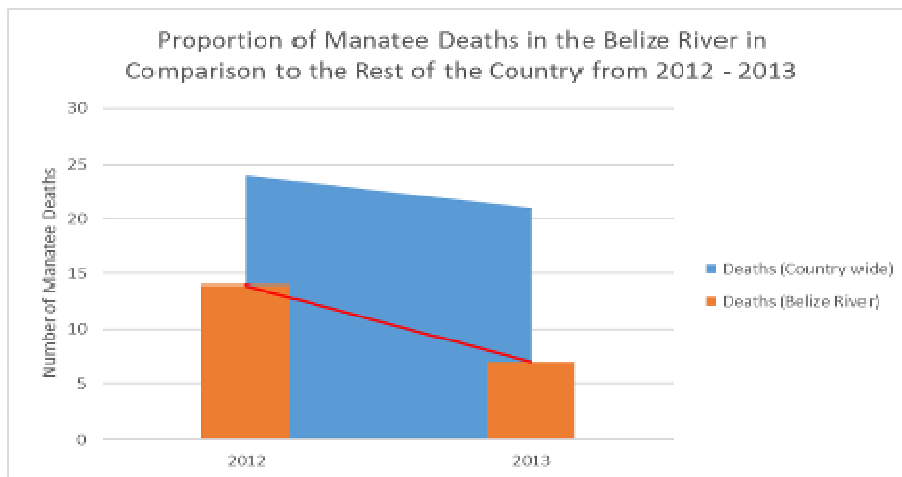


Figure 8: Graph showing proportion of manatee deaths in the Belize River in comparison to the rest of the country from 2012 - 2013

With the designation of the zones and manatee areas, boaters have become more aware of the area where manatees occupy. In addition, tour guides also have a much better chance of carrying out tours that tourists will enjoy, and with reduced chances that manatees will be affected by boat propeller strikes. This also has made the boaters more alert and on the lookout for these animals when passing through the area, as one tour-guide explained. If boaters are aware of where the animals are in the area, they can now travel with caution and avoiding these manatee hotspots.

Our outreach campaign has been the biggest of any year since the manatee program has started. Making appearances at nine public events country-wide reaching well over one thousand individuals. We have gone into 12 schools throughout the country, those visits sums up for about another four thousand. The tour-guide workshop brought together just about one hundred participants that are now certified manatee tour-guides. Many of these individuals has been active in assisting in campaigns, reporting

incidents, assisting or offering their assets during manatee rescue and now also a voice out there for the manatees. The outreach commercial that was created has had over twelve thousand online viewers in all the many locations it has been posted. It has also been seen on the local television stations which is available to over 50% of the Belizean people. The commercial clearly illustrate the threats these animals are facing and how each individual has a role in helping.



## **Achievements and Impacts**

This project has accomplished all objectives listed, also achieved some objectives that were not a part of this specific project. This project required working with individuals from many sectors. The first and one of the greatest achievements the team felt, is the welcoming response not only by the residents of the immediate area where the site is located but from districts outside of Belize. We have had many requests for us to extend the project activities such as awareness and manatee workshop to their area. That is also one of the impacts of this project. We have also secured cooperative sponsor with one of the biggest companies in the country, Bowen & Bowen (Crystal Water). They have what is considered the best marketing team in the country now marketing manatees. A “protect our manatee Belize” logo was created that is now not only country-wide but even abroad. The impact this has had has brought so much more attention to the protection of this species, reaching many more people. With that many more people now have a better understanding of the troubles, these gentle giants are facing. With the manatees we have tagged we gathered very valuable data on travel routes that guided us in deciding best places to be designated manatee areas. This data was worthy enough to convince the Port Authority of how these animals use the area and had some weight in approval of the “No-Wake” zones. Our team carried out what is considered today the biggest manatee workshop to be held in country, with 93 participants. This was done with many of our stakeholders’ cooperation and support and was grateful to have the minister responsible for forestry and fisheries present certificates and give the closing message. The effect this workshop has had on this project and the main goal to lower the amount of manatees and boat collisions at the Belize River, might be the biggest of all. Reaching the boaters and individuals that use the area, letting them know of the issue at the river mouth and how they can help, is still today showing the message has gotten across based on the change in their previous actions. One of the greatest achievements so far is that our study site will be considered by cabinet as a potential special management area for manatees.

## **Section 3:**

### **Conclusion**

Preliminary findings indicate that the Belize river mouth is an area highly used both by manatees and humans. Reports have shown that majority of manatee and boat collision occurs at the Belize River mouth. This is due to the shallow depth of the water at the mouth that makes it difficult for manatees to get away from the fast moving boats. Majority (53%) (Figure 3) of the manatees captured in the area had visible signs of boat scars. The satellite tracking data shows that individual animals spend loads of time at the site and it is also a travel rout from one water way to another (Figure 6). The implementation of the “no wake: zone has shown a decrease in speeding boats, which is a shadow of the decrease in manatee deaths in the study area (figure 7). The Belize River mouth provides key habitat for manatees in the area, providing fresh water which is essential to theses animals and one of the only fresh water source in this area. The participation of the tour operators that visit the area is essential to the continued success of ameliorating the threats to manatees in the heart of Belize. The workshop and many communication shows that getting people involved in the effort is huge ground gained. This project is one to be recommended and considered to be implemented in other areas where manatees are greatly impacted by human activities. This project has also shine some light on how important this area is to manatees and will be used as ground work to campaign to the government, for them to consider the area for recognition as a special manatee area.

## Problems encountered and lessons learnt

### **Which project activities and outcomes went well and why?**

For the most part the project went very smoothly, which I have to credit first our team and to all the authorities, organization and individuals that had an impact in making this project a success thus far. One of the activities that went very well is the tagging and tracking of manatees in the site area. This gave us data that we have not covered yet, and a very good understanding of the importance of this site. The data collected from this project also give us the ability to paint a better picture to the government as to why this are should be considered for special management. Our outreach activities were way more successful and productive that we initial thought. The amount of attention it have captured both locally and international is overwhelming.

- **Please detail any problems that the project encountered or deviations from original project plans. Describe how these problems were addressed and what solutions were found to deal with these issues.**

The only small problem we had encountered was having to be patient but yet not relaxed, as dealing with governmental organization, processes can be slow. Some approval took time, specifically with the approval of the boat speed signs. We also had some issue with the installment of the signs as the approve spots for installments by the Port Authority were deeper than the areas we normally install signs. This was addressed with some research, a local business were able to create poles strong enough, long enough and tough enough to withstand the heavy winds, waves and salt environment that usually quickly eats away on the sign poles.

- **Briefly assess the specific project methodologies and conservation tools used.**

The methodologies of this project that were used are all methodologies that have been used either locally in different sites, or internationally on the same or similar species. They have been proven to work and is with the intention to be as least invasive on the species as possible. These methodologies also takes closely into attention both human and animal safety. They are the consistent methodologies

and standard so the data can be compared to others in other parts of the world. There is always a possibility of a percentage of human error once not carefully carried out, however these methods has been proven to help aid in the conservation of this species.

- **Please state important lessons which have been learnt through the course of the project and provide recommendations for future enhancement or modification to the project activities and outcomes.**

We have learned that it is important to have an open level of communication between the team. In which we can speak our mind offer advice or suggestion and to all be with the intention to do well in our efforts. Working together is very important, it makes the project more achievable. A lesson that we have learn as well it is crucial to have good, supportive and advisors that are knowledgeable of the project. So when they are called on they immediately know how to advise or simply put us in a position to figure it issues out. An important lesson learn is when dealing with outreach always be aware of who your audience is and to try and accommodate everyone. One person not understanding can make a difference. This take a lot of effort, but it has paid off in our project.

## **In the Future**

This project does not ends here, they are still much more to do. The group will continue to work with the respective authorities in “Ameliorating the Threats to Manatees in the Heart of Belize. Site visits will continue, perhaps not as frequent as it was during the duration of the project. Response to reports in the area to address live and dead stranding. Boat survey will continue on a monthly basis, with more presence during tourism high season. Communication between the authorities and the boat operators that use the area will continue to be open and active. We will be working even closer with the Belize Port Authority to ensure that enforcement of the signs are uphold. Also, we will continue to seek funds for more signs and to replace or change any damage ones. We have been talking closely to the tour operator’s listening to their suggestions and ideas. A future project will be to outline the boat channel, this will be done to keep boats on one

consistent path, rather than driving on random paths through the river mouth. This should give the manatees a better understand of where the boat are going to be crossing, and to have a better chance of not being hit by these boats. We would also like to attach more transmitter on manatees in that area and continue the yearly health assessment of these individuals, this will give us more data and enough to look at consistency and better understanding of how they use the river mouth and how we can put better measurement in place to protect them.

## Section 4:

### Appendices

#### Expenses

Table 1: Table showing breakdown of expenses

Itemized expenses	Total CLP requested (USD)	Total CLP used (USD)	Notes
<b>PHASE I - PROJECT PREPARATION</b>			
<b>Administration</b>			
Communications (telephone/internet/postage)	300.00	300.00	
Books and printing journal articles/materials			
Insurance			
Visas and permits			
Team training (Please detail: )	300.00	300.00	We have manage to get team-training done while doing another project which covered the expenses. This funds (300) that was assign here was moved to awareness
<b>Reconnaissance</b>			
Medical supplies/first aid			
<b>Equipment</b>			
Scientific/field equipment and supplies (Please detail:	800.00	658.43	The balance (\$141.57) from the proposed \$800 was moved to awareness efforts
Photographic equipment (Please detail: Batteries)	900.00	900.00	We went over (\$79.92) with these items. This was balanced off using incidentals fund to mark up.
Camping equipment (Please detail main items: )	50.00	69.95	We went over (\$19.95) with these items. This was balanced off using incidentals fund to mark up.
Field guides			
Maps			

Boat/engine/truck			
Fuel	3,000.00	2,934.95	
Other (Please detail: )			
<b>PHASE II - IMPLEMENTATION EXPENSES</b>			
<b>Administration</b>			
Insurance			
<b>Transportation</b>			
Fuel			
Trip to Brasília to present Protectec Area proposal for government authorities			
Field vehicle maintenance			
Accommodation for team members and local guides	600.00	216.64	The balance (\$383.36) will be used more towards the end of the project doing awareness in other areas of the country.
(Please detail: During transportation (\$50 per day for 4 people * 8 days in the cities) 400.00			
In the field (\$210 per week for 6 people * 12 weeks) 2520.0)			
Food for team members and local guides	350.00	218.00	The balance (\$133.36) was moved to awareness efforts
(Please detail: Food in field (\$210 per week for 6 people * 12 weeks) 2520.00)			
Transportation	400.00	55.00	The balance (\$345) was moved to awareness efforts
Customs and port duties	150.00	105.00	The balance (\$45) was moved to awareness efforts
<b>Workshops</b>			
Outreach/education activities and materials (brochures, posters, video, t-shirts, etc.) (Please detail:	3,600.00	4,968.68	

Workshop for tour guide	3,000.00	2,993.25	
posters (150 items) 150			
t-shirts (50 items) 100 )			
Other (Please detail: Manatee captures )	500.00	345.31	
<b>PHASE III - POST- PROJECT EXPENSES</b>			
<b>Administration</b>			
Report production and results dissemination	500.00		
Administration	300.00	300.00	
Other (Please detail: Incidentals )	250.00	99.87	
<b>Total US\$</b>	<b>15,000.00</b>	<b>14,465.08</b>	<b>Any other area where funds is not completed closer to the end of the project we would like to put into awareness effort and or fuel</b>

## Communication

Table 2: Table showing breakdown of communication budget

Receipt number	Date	Description	Unit costs	Quantity	Total price in local currency	Total price, US \$	Justification
	15/06/2013	cell phone allowance	25	12	BZ\$150.00	\$ 300.00	A telephone allowance is given to the team leader as many hours are spent in the field responding to reports etc.



## Scientific Equipment

**Table 3: Table showing breakdown of budget for scientific equipment**

<b>Receipt number</b>	<b>Date</b>	<b>Description</b>	<b>Unit costs</b>	<b>Quantity</b>	<b>Total price in local currency</b>	<b>Total price, US \$</b>	<b>why is this bought?</b>
W2EE38 A4BD79	08/01/2012	Secchi Disk	27.5	1	BZ\$55.00	\$ 27.50	To collect turbidity data
		Data logger Waterproof shuttle	227	1	BZ\$454.00	\$ 227.00	To collect temperature at site
		Pendant temperature Logger	40.5	1	BZ\$81.00	\$ 40.50	To collect temperature at site
		100'L open Reel Long tape Measure, m,cm, in, and 8ths	14.3	2	BZ\$57.20	\$ 28.60	To measure turbidity disk and depth
		Shipping and handling	15.05	1	BZ\$31.00	\$ 15.50	
		Tax	22.67	1	BZ\$45.34	\$ 22.67	
357-SO-453176	08/01/2012	HD HERO NAKED Camera	199.99	1	BZ\$399.98	\$ 199.99	To have footage of boat activities when not able to be on

							site
		Shipping and handling	9.95	1	BZ\$19.90	\$ 9.95	
		Tax	17.59		BZ\$35.18	\$ 17.59	
120987	21/02/2013	Nuts and Bolts	35.8	1	BZ\$35.80	\$ 17.90	for installing no wake zone signs
18539	07/03/2013	garbage bags		13	BZ\$86.45	\$ 43.23	garbage for a river cleanup we had
97648	03/04/2013	Battery CR2025	7.11	2	BZ\$16.00	\$ 8.00	for temperature pendant
						\$ -	
<b>TOTAL</b>					<b>BZ\$1,316.85</b>	<b>\$ 658.43</b>	

## Photography

**Table 4: Table showing breakdown of Photography Budget**

Date	Description	Unit costs	Quantity	Total price in local currency	Total price, US\$	why is this bought?
05/22/2012	Tamron AF 10-300mm	199	1	BZ\$398.00	\$ 199.00	To capture high quality video and pictures in the field from distance away

	zoom lens					eg. During aerial survey.
05/22/2012	Pelican 1400 case with foam	78.95	1	BZ\$157.90	\$78.95	To capture high quality video and pictures in the field from distance away eg. During aerial survey.
05/22/2012	Transcend 16GB SDHC Class memory card	13.99	1	BZ\$27.98	\$13.99	To capture high quality video and pictures in the field from distance away eg. During aerial survey.
05/22/2012	Nikon D3100 Digital SLR Canera with 18.55mm f/3.5-5.6 AF-S DX	549	1	BZ\$1,098.00	\$549.00	To capture high quality video and pictures in the field from distance away eg. During aerial survey.
05/22/2012	PLR optic High Resolutio n 3 piece Filter set	12.99	1	BZ\$25.98	\$12.99	To capture high quality video and pictures in the field from distance away eg. During aerial survey.
05/22/2012	Shipping and handling	14.56	1	BZ\$29.12	\$14.56	To capture high quality video and pictures in the field from distance away eg. During aerial survey.
05/22/2012	Squar Trade 3-Year Camera Accidental Protection Warranty	94.87	1	BZ\$189.74	\$94.87	To capture high quality video and pictures in the field from distance away eg. During aerial survey.
05/22/2012	52mm Hard Tulip lens Hood for	3.13	1	BZ\$6.26	\$3.13	To capture high quality video and pictures in the field from distance away eg. During aerial survey.

	Nikon D3100					
05/22/2012	Lens Cap Keeper Holder for Nikon	1.29	1	BZ\$2.58	\$ 1.29	To capture high quality video and pictures in the field from distance away eg. During aerial survey.
05/22/2012	Leather hand grip strap for Nikon	4.15	1	BZ\$8.30	\$ 4.15	To capture high quality video and pictures in the field from distance away eg. During aerial survey.
	Shipping and handling	2.99	1	BZ\$5.98	\$ 2.99	To capture high quality video and pictures in the field from distance away eg. During aerial survey.
08/01/2021	LCD Screen Protector for Nikon D3100	2.02	1	BZ\$4.04	\$ 2.02	To capture high quality video and pictures in the field from distance away eg. During aerial survey.
	Shipping and handling	2.98	1	BZ\$5.96	\$ 2.98	To capture high quality video and pictures in the field from distance away eg. During aerial survey.
				BZ\$1,959.84	\$ 979.92	

Receipt number	Date	Description	Unit costs	Quantity	Total price in local currency	Total price, US \$	why is this bought?
103-3069648-6181062	08/01/2021	Columbia Men's Watertight Jacket	69.95	1	BZ \$139.90	\$ 69.95	The team leader spend majority of time in the field and some conditions are very heavy rain with no where to shelter.
						\$ -	
						\$ -	
						\$ -	
						\$ -	
						\$ -	
						\$ -	
						\$ -	
					BZ \$139.90	\$ 69.95	

## Camping

**Table 5: Table showing the breakdown of Camping Budget**

<b>Date</b>	<b>Description</b>	<b>Unit costs</b>	<b>Quantity</b>	<b>Total price in local currency</b>	<b>Total price, US \$</b>	<b>why is this bought?</b>
02/08/2012	regular gas	11.07	5	BZ\$55.35	\$ 27.68	site visit & manatee tracking
15/08/2012	regular gas	11.07	15	BZ\$166.05	\$ 83.03	site visit & manatee tracking
26/08/2012	regular gas	11.07	9.85	BZ\$109.40	\$ 54.70	site visit & manatee tracking
07/09/2012	regular gas	11.95	5.00	BZ\$59.75	\$ 29.88	stranding rescue
11/09/2012	regular gas	11.95	15.00	BZ\$179.25	\$ 89.63	site visit & manatee tracking
	nautilus lube	13		BZ\$13.00	\$ 6.50	site visit & manatee tracking
14/09/2012	regular gas 1	11.95	7.00	BZ\$83.69	\$ 41.85	
19/09/2012	V-Power Gas	12.97	12.00	BZ\$155.64	\$ 77.82	site visit & manatee tracking
25/09/2012	V-Power Gas	12.97	10.00	BZ\$129.70	\$ 64.85	site visit & manatee tracking
18/10/2012	regular gas	11.95	10.00	BZ\$119.50	\$ 59.75	site visit & manatee tracking
	nautilus lube 1	13		BZ\$13.00	\$ 6.50	
29/10/2012	V-Power Gas	12.97	10.00	BZ\$129.70	\$ 64.85	site visit & manatee tracking

07/11/2012	regular gas	12.07	10.00	BZ\$120.70	\$ 60.35	site visit & manatee tracking
07/11/2012	V-Power Gas	12.97	10.00	BZ\$129.70	\$ 64.85	site visit & manatee tracking
16/11/2012	V-Power Gas	11.67	10.00	BZ\$116.70	\$ 58.35	site visit & manatee tracking
21/11/2012	nautilus lube 3	13		BZ\$38.31	\$ 19.16	site visit & manatee tracking
21/11/2012	regular gas	10.78	5.00	BZ\$215.60	\$ 107.80	site visit & manatee tracking
03/12/2012	V-Power Gas	11.18	10.00	BZ\$111.80	\$ 55.90	site visit & manatee tracking
11/12/2012	V-Power Gas	11.18	10.00	BZ\$111.80	\$ 55.90	site visit & manatee tracking
03/01/2013	V-Power Gas	10.9	7.00	BZ\$76.30	\$ 38.15	site visit & manatee tracking
10/01/2013	V-Power Gas	11.25	7.00	BZ\$78.75	\$ 39.38	site visit & manatee tracking
14/01/2012	Diesel	10.78	14.84	BZ\$160.00	\$ 80.00	Manatee tracking via road and retrieving lost tag
17/01/2013	V-Power Gas	11.25	9.00	BZ\$101.25	\$ 50.63	site visit & manatee tracking
27/01/2013	V-Power Gas	11.38	9.00	BZ\$102.42	\$ 51.21	site visit & manatee tracking
02/02/2013	V-Power Gas	11.38	9.00	BZ\$102.42	\$ 51.21	site visit & manatee tracking
07/02/2013	regular gas	11.03	115.00	BZ\$1,268.45	\$ 634.23	site visit with tour-guides attending the workshop
09/02/2012	V-Power Gas	11.38	16.00	BZ\$182.08	\$ 91.04	visit to scout different locations for commercial shoot
20/02/2013	regular Gas		29.00	BZ\$332.65	\$ 166.33	fuel for boat to take out film crew to shoot commercial
20/02/2013	Nautilus lube		6.00	BZ\$76.60	\$	lube to mix the

13					38.30	fuel for the commercial shoot
21/02/2013	V-Power Gas	11.87	9.02	BZ\$107.09	\$53.55	trip to the river to shoot second segment of commercial
23/02/2013	V-Power Gas	11.87	9.00	BZ\$106.83	\$53.42	site visit to retrieve a manatee tag that came off
02/03/2013	V-Power Gas	11.87	9.00	BZ\$107.37	\$53.69	retrieve dead manatee
19/03/2013	V-Power Gas	12.2	9.00	BZ\$109.80	\$54.90	retrieve dead manatee
26/03/2013	V-Power Gas	12.2	10.00	BZ\$122.00	\$61.00	retrieve dead manatee
09/04/2013	V-Power Gas	12.15	10.00	BZ\$121.50	\$60.75	retrieve dead manatee
15/04/2013	V-Power Gas	12.15	8.00	BZ\$97.20	\$48.60	retrieve dead manatee
22/04/2013	V-Power Gas	12.15	12.00	BZ\$145.80	\$72.90	manatee rescue
22/04/2013	regular gas	11.75	10.00	BZ\$117.50	\$58.75	retrieve dead manatee
08/05/2013	V-Power Gas	12.15	8.23	BZ\$100.00	\$50.00	site visit
27/05/2013	V-Power Gas			BZ\$50.00	\$25.00	Fuel to track a manatee by road that travelled into the sibune river
02/06/2013	Lube	12.22	3.00	BZ\$45.25	\$22.63	to mix fuel for a 2 stroke engine
10/08/2013	Regular Gas	9.8	9.06	BZ\$100.00	\$50.00	site visit
				<b>BZ\$5,869.90</b>	<b>\$2,934.95</b>	



## Lodging

**Table 6: Table showing the breakdown of the lodging budget**

Receipt number	Date	Description	Unit costs	Quantity	Total price in local currency	Total price, US \$	why is this bought?
0939-21	28/02/2013	one night hotel	100.28	1	BZ\$128.28	\$64.14	Shooting of the awareness commercial first site visit
	30/03/2013	3 nights lodging @ tom's Inn	305	1	BZ\$305.00	\$152.50	lodging for awareness commercial crew
				<b>TOTAL</b>	<b>BZ\$433.28</b>	<b>\$216.64</b>	

## Food

**Table 7: Table showing breakdown of food budget**

Date	Description	Unit costs	Quantity	Total price in local currency	Total price, US \$	why is this bought?
08/01/2013	fry chicken	5.75	3	BZ\$17.25	\$8.63	Lunch for the team to take out on the water
	3 Juice	0.5	3	BZ\$1.50	\$0.75	
17/01/2013	chicken fingers	12.48	3	BZ\$37.44	\$18.72	lunch for the team while working on the road
	Chicken Quesida	9.95	1	BZ\$9.95	\$4.98	
	water melon juice	4.29	1	BZ\$4.29	\$2.15	
	orange juice	2.99	1	BZ\$2.99	\$	

					<b>1.50</b>	
	Sm water melon juice	3.29	1	BZ\$3.29	<b>\$ 1.65</b>	
	Drink	3.56	1	BZ\$3.56	<b>\$ 1.78</b>	
	water melon juice	4.29	1	BZ\$4.29	<b>\$ 2.15</b>	
	12.5% tax	8.23	1	BZ\$8.23	<b>\$ 4.12</b>	
19/02/2013	3 plates of food	6	3	BZ\$18.00	<b>\$ 9.00</b>	Lunch for the team while working on awareness commercial
20/02/2013	Drinks	5	4	BZ\$20.00	<b>\$ 10.00</b>	Lunch for the team while working on awareness commercial
	waters	2	3	BZ\$6.00	<b>\$ 3.00</b>	
	chicken fingers	12	2	BZ\$24.00	<b>\$ 12.00</b>	
	grilled chicken burger	12	1	BZ\$12.00	<b>\$ 6.00</b>	
	tax	4.5		BZ\$4.50	<b>\$ 2.25</b>	
21/02/2013	2 bags of water	7	2	BZ\$14.00	<b>\$ 7.00</b>	water to carry into the field for the team
22/02/2013	lunch	7	9	BZ\$63.00	<b>\$ 31.50</b>	meal for the team while working on awareness commercial
28/02/2013	maxi shrimp	17	1	BZ\$17.00	<b>\$ 8.50</b>	Lunch for the team while in the field
	B. style fish	15	1	BZ\$15.00	<b>\$ 7.50</b>	
	drink	5	2	BZ\$10.00	<b>\$ 5.00</b>	
	orange juice	5	1	BZ\$5.00	<b>\$ 2.50</b>	
	tax	5.87		BZ\$5.87	<b>\$ 2.94</b>	
28/02/20	Ice, soda,	23.1	1	BZ\$23.1	<b>\$</b>	Lunch for awareness

13	cups, water			0	<b>11.55</b>	campaign crew
31/03/2013	Garlic batter fish fillet	22	2	BZ\$44.00	\$ <b>22.00</b>	
	B style fish	18	1	BZ\$18.00	\$ <b>9.00</b>	
	Drinks	5	1	BZ\$5.00	\$ <b>2.50</b>	
	water	3	2	BZ\$6.00	\$ <b>3.00</b>	
13/06/2013	Chicken	10	1	BZ\$10.00	\$ 5.00	Lunch for team after school presentations
	Fish Fillet	18	1	BZ\$18.00	\$ 9.00	
	Juices	4	1	BZ\$4.00	\$ 2.00	
	Juices	2	1	BZ\$2.00	\$ 1.00	
05/09/2013	Fettucine Alfredo con shrimp	20.5	1	BZ\$20.50	\$ 10.25	Dinner while out on awareness campaign
	chicken fingers	17	1	BZ\$17.00	\$ 8.50	
	drink	13	1	BZ\$13.00	\$ 6.50	
	drink	5	1	BZ\$5.00	\$ 2.50	
	tax	6.93	1	BZ\$6.39	\$ 3.20	
			<b>TOTAL</b>	<b>BZ\$499.15</b>	<b>\$ 249.58</b>	

## Transportation

**Table 8: Table showing breakdown of Transportation budget**

<b>Receipt number</b>	<b>Date</b>	<b>Description</b>	<b>Unit costs</b>	<b>Quantity</b>	<b>Total price in local currency</b>	<b>Total price, US \$</b>	<b>why is this bought?</b>
Receipt	08/02/2013	volunteer transportation to and from workshop	46	1	BZ\$46.00	\$23.00	Reimbursement for travel to workshop for volunteer
invoice	18/02/2013	transportation food and expense for workshop presenter	115.5	1	BZ\$115.50	\$57.75	Reimbursement to presenter who traveled from out of town
cash voucher	21/02/2013	fuel donation	50	1	BZ\$50.00	\$25.00	Fuel donation to get the kids on site for awareness commercial
	28/02/2013	2 round trip ticket to caye caulker	30	2	BZ\$60.00	\$30.00	Water taxi trip to promote manatee awareness
						\$-	
					<b>BZ\$110.00</b>	<b>\$55.00</b>	

## Customs

**Table 9: Table showing breakdown of Customs budget**

<b>Receipt number</b>	<b>Date</b>	<b>Description</b>	<b>Unit costs</b>	<b>Quantity</b>	<b>Total price in local currency</b>	<b>Total price, US \$</b>	<b>why is this bought?</b>
-----------------------	-------------	--------------------	-------------------	-----------------	--------------------------------------	---------------------------	----------------------------

5QMT	08/17/2012	Equipment shipping to Belize	105	1	BZ\$210.00	\$ 105.00	Shipping of equipment from the U.S to Belize
				<b>TOTAL</b>	<b>BZ\$210.00</b>	<b>\$ 105.00</b>	

## Outreach

**Table 10: Table showing breakdown of budget for Outreach**

Receipt number	Date	Description	Unit costs	Quantity	Total price in local currency	Total price, US \$	why is this bought?
2400-9440-5602-4004	29/01/2013	Reimbursement for QR-Code payment	99	1	BZ \$198.00	\$ 99.00	to put on posters brochures etc for people to scan at airports , public places to link to our work etc
143647	13/03/2013	decal 6' manatee per 500	780	1	BZ \$780.68	\$ 390.34	Protect our manatees Belize boat decal
		Die Cut 4 colors 6' manatee inv	140	4	BZ \$560.00	\$ 280.00	
		Decal 4' manatee per 1000 Cle INV	459	3	BZ \$1,379.70	\$ 689.85	
		Die Cut 5 colors INV	87.5	5	BZ \$437.50	\$ 218.75	

					7.50		
		GST 12.5% Tax			BZ \$394.74	\$ 197.37	
373	19/02/2013	manatee signs	225	1	BZ \$225.00	\$ 112.50	Manatee no wake sign for the Belize River
S2S-2013-09	31/05/2013	Commercial		1	BZ \$3,000.00	\$1,500.00	One of the biggest part of our awareness effort. To have something to share to the public why they should help
486	11/04/2013	Manatee "No wake Signs"	225	5	BZ \$1,125.00	\$ 562.50	To replace damaged signs due to the storm we had s well as to add a few more to key areas
	30/08/2013	manatee t-shirts, caps and polo's		72	BZ \$1,836.73	\$ 918.37	To continue with our awareness drive as well as to share with or rehabilitation team so we all look uniformed in the field
				<b>TOTAL</b>	<b>BZ \$9,937.35</b>	<b>\$4,968.68</b>	

## Workshop

Table 11: Table showing breakdown of Budget for Workshops

Receipt number	Date	Description	Unit	Quantity	Total price in	Total price, US \$	why is this bought?

			st	y	local			
			s		curr			
					ency			
3037 23	26/ 02/ 20 13	Pad legal White	1	10 0	BZ\$ \$	100. 50.00	00	To hand out to participants of the workshop
		Box pencil yellow	18	1	BZ\$ \$	18.0 9.00	0	To hand out to participants of the workshop
		Paper linen 1 pack	17	1	BZ\$ \$	17.0 8.50	0	To hand out to participants of the workshop
		Port Twin Pocket folder.	0. 6	10 0	BZ\$ \$	60.0 30.00	0	
		GST 12.5% Tax			BZ\$ \$	22.1 11.07	3	
1649 2	07/ 02/ 20 13	Snacks packs for for workshop	2. 75	10 0	BZ\$ \$	275. 137.50	00	Provide a snack for the participants of the workshop
7184 54	07/ 02/ 20 13	dinner for workshop volunteers	10	3	BZ\$ \$	30.0 15.00	0	Volunteers worked late preparing for the second day so we provided them dinner
		drinks	4	8	BZ\$ \$	24.0 12.00	0	Volunteers worked late preparing for the second day so we provided them dinner
5218 9	08/ 02/ 20 13	food for workshop	8	10 0	BZ\$ \$	800. 400.00	00	Lunch for the workshop since it was a full day
4785	11/ 02/ 20	t-shirts	12 .5	20 0	BZ\$ \$	2,50 1,250.00	0.00	T-shirts for workshop volunteers participants, steak

	13						holders and for prizes on school visit	
		Set up fee	115	1	BZ\$ 115.00	\$ 57.50		
		Sales tax (12.5%)			BZ\$ 326.88	\$ 163.44		
374	19/02/2013	Awareness effort ( consultancy and videography, workshop set up)	500	1	BZ\$ 500.00	\$ 250.00	consultancy and assistance with "Protect our manatee project and videography	
111-0288 920-1271 436	22/05/2013	LCD projector and Screen	599.22	1	BZ\$ 1,198.44	\$ 599.22	For our on the road awareness efforts	
				<b>T O T A L</b>	<b>5986.45</b>	<b>2993.225</b>		

<b>Recie pt number</b>	<b>Date</b>	<b>Description</b>	<b>Unit costs</b>	<b>Quantity</b>	<b>Total price in local currency</b>	<b>Total price, US \$</b>	<b>why is this bought?</b>
259	24/06/2	trailer wheel	130.		130.61	\$	This was



	013		61			65.31	bought to replace trailer wheel that was broken during boat transporting
939544	25/06/2013	research permit	200	1	BZ\$200.00	\$100.00	To pay for the permits required for us to carry out our research
	01/06/2012	repair trim and tilt switch on manatee capture boat	80	1	80	40	replace a faulty tilt switch
		Servicing of manatee capture boat			180	\$90.00	This is done every year to the engine
	18/10/2013	Boat trailer wheel (second hand)	100	1	100	\$50.00	replacing the trailer wheel on the manatee rescue boat trailer
						\$-	
						\$-	

				<b>TOTAL</b>	<b>BZ\$690.61</b>	<b>\$ 345.31</b>	
--	--	--	--	--------------	-------------------	------------------	--

## Administrative

Table 12: Table showing breakdown of budget for Administrative Expenses

Receipt number	Date	Description	Unit costs	Quantity	Total price in local currency	Total price, US \$	why is this bought?
	06/15/2013	Administration	300	1	BZ\$600.00	\$ 300.00	for administrative services
						\$ -	
						\$ -	
						\$ -	
						\$ -	
						\$ -	
						\$ -	
<b>TOTAL</b>				<b>TOTAL</b>	<b>BZ\$600.00</b>	<b>\$ 300.00</b>	

## Incidentals

**Table 13: Table showing breakdown of budget for incidentals.**

<b>Receipt number</b>	<b>Date</b>	<b>Description</b>	<b>Unit costs</b>	<b>Quantity</b>	<b>Total price in local currency</b>	<b>Total price, US \$</b>	<b>why is this bought?</b>
103-3069648-6181062	08/01/2021	Columbia Men's Watertight Jacket	19.95	1	BZ\$39.90	\$ 19.95	to balance the over spending in camping equipment
		photographic equipment	79.92	1	BZ\$159.84	\$ 79.92	to balance the over spending in photographic equipment
				<b>TOTAL</b>	BZ\$199.74	\$ 99.87	

## Publicity

[Home](#) » [Environment, People & Places](#) » Jamal Galves wins regional awards because of his love of conservation

May 4, 2012

Jamal Galves wins regional awards because of his love of conservation



A local conservationist is the recipient of two regional awards. Jamal Galves, whom we call manatee boy because of his love of nature and the endangered species, is in Antigua on a training exercise. His colleague, Nicole Auil Gomez told News five that one of the awards will actually provide funds for further developing management strategies to keep the specie alive.

Nicole Auil Gomez, National Consultant, CZMAI



**NICOLE AUIL GOMEZ**

*“Mister Jamal Galves; he received two awards this year. Right now he’s in Antigua attending a workshop. It’s a regional award so it is for the Caribbean and twelve recipients got this award throughout the Caribbean. This is the first year they are doing it for the Caribbean and he got it for his work with manatees. It is a training course as well*

*where he is learning things in terms of how to implement better management strategies and he is going to be doing a two year project with other awardees after the training course which ended today. He'll be back in country on Monday. He is also the recipient for a conservation leadership program award in which he was granted thirty thousand Belize dollars to implement a program for manatee conservation. And the program is looking at threats that affect manatees in the Belize River area. So he and a team of three others—Chantalle Clarke and Samir Rosado from the Coastal Zone Management Authority institute as well as Mister Andre Reneau of Friends of Swallow Caye are going to be doing a project on how they can implement strategies to protect the animals around Belize River working with tour guides, tour operators, boat operators. It is an effort that they are going to be working also with different agencies: Coastal Zone, the Belize Port Authority, Friends of Swallow Caye as well as Sea to Shore Alliance*  
Be Sociable, Share!

**Viewers please note: This Internet newscast is a verbatim transcript of our evening television newscast. Where speakers use Kriol, we attempt to faithfully reproduce the quotes using a standard spelling system.**



[Click here to print](#)

## **Belize's Manatees Numbers Improving**

**Thu, May 3, 2012**

**An aerial survey of Belize's coastline conducted a month ago has confirmed that Belize's manatee population is on the increase.**

**A total of 507 manatees were sighted; 10% of them were calves. According to a release from the Coastal Zone Management Authority & Institute, "this is the highest count recorded for Belize, still known globally to have the greatest number of the endangered Antillean manatee." The Southern Lagoon at Gales Point had an impressive 52 manatee.**

**An aerial survey was also conducted for dolphins and whales in mid April. They searched an area between 17 and 50 miles from the coast, looking for rough-tooth dolphins, killer whales, pilot whales, and sperm whales which have been sighted in Belize's waters. The observers made two rare sightings of sperm whale sightings at the southern end of the barrier reef, swimming southward towards Honduras. Other species spotted during the surveys were 33 dolphins, 11 turtles, and four crocodiles.**

**In other, related news, Manatee Researcher Jamal Galves has been recognized for his work with manatees in Belize. Galves was selected for the inaugural 2012-2013 class of "Caribbean Emerging Wildlife Conservation Leaders." He now gets to participate in a two-year training programme.**

**And that's not all, the talented Galves received an award of \$30,000 Belize dollars from the Conservation Leadership Programme for a project called "Ameliorating Threats to the Manatee in the Heart of Belize."**

**The project will see a threat assessment carried out in the Belize River mouth area, where most of the manatee deaths and injuries are observed**

Belize Channel 5 News Story

Posted on [March 28, 2013](#) by [admin](#) Posted in [Blog](#)

<http://edition.channel5belize.com/archives/83582>

**Rehabilitated manatee released into wild**



Throughout the year, manatees are injured or killed at sea by water traffic. The rehabilitation of injured manatee falls largely on the shoulders of a conservation group that treats them to be released back into the wild. It could be a long process but it is certainly costly. The center is located up north and it is manned mostly by volunteers. On a recent visit, News Five's Joe Sanchez met Twiggy, a calf that had been rescued and treated.

**Jose Sanchez, Reporting**

On the outskirts of Sarteneja, in Corozal Town, is the home to Wildtracks, a conservation organization dedicated to the rescue and rehabilitation of manatees. The photo shows a tiny calf in the hand of Jamal Galves a Manatee Associate who along with another conservationist rescued the calf called Twiggy over three years ago.



**Jamal Galves, Manatee Research Associate, Sea to Shore Alliance/CZMAI**

*“She was found around Heusner Caye. They called us and said that there is this young manatee swimming along the Caye alone for some hours and usually a mother wouldn't leave a calf for such a long time. So once we got there and monitored the situation, we*

*realized that she was alone and we caught her and on her face she had scars; maybe had gotten hit by a small boat or something.”*



**Paul Walker, Director, Wildtracks**

*“Twiggy was rescued with the coastal zone group three and a half years ago and very emaciated, dehydrated condition; a lot of cuts on her. She was an orphan; her mother had been separated from her at least several days from how dehydrated and emaciated she was. The cuts in her face and flippers and tail probably resulted from attacks from barracudas—I guess you can say that she looked like she had passed through a cheese grater. She was a real struggle from the beginning and we actually called her Twiggy after the skinny British Model who wanted to keep skinny because it seems like Twiggy just didn’t want to put on weight.”*

Injuries and deaths caused by mariners are common problems for manatees. Galves has regularly examined the carcasses of dead manatees.



**Jamal Galves**

*“2012 has been the worse year up to date; we had twenty-two deaths last year—fourteen of which were the result of water craft collision. Many were undetermined due to decomposition state and many go unreported and unseen so the twenty-two is still not the exact amount. So as it is twenty-two is a lot of money for us to have dead. With the population that we do have, it is a high population in this side of the world, but that number isn’t a stable number.”*



Rehabilitating a manatee is expensive work. To fund the project, Wildtracks does consulting work and receives donations from a Manatee Club in the US, Sea to Shore Alliance and a group called “help we supply the milk”.



Paul Walker

**Paul Walker**

*“Milk is our biggest single cost and a manatee consumes a huge amount of milk; several gallon of milk a day, very concentrated milk, so that is our biggest single expense. We run fundraiser when we have to build new facilities like the big concrete pools.”*

**Jose Sanchez**

“What would be approximate cost for example a year for Twiggy?”



**Paul Walker**

*“Just in terms of food, it’s about seven thousand Belize dollars a year roughly for one manatee. It varies from one to another depending on the size, the amount they consume, but it is roughly seven thousand Belize dollars and that is more than available in a country like Belize which is why we have to have international partners. We can’t raise that amount of funding for an endangered species within country; so we are totally dependent on foreign input.”*

The three years of Twiggy’s rehabilitation took place in several tanks on the Wildtracks compound.



**Paul Walker**

*“It took a good six to eight months before she started put on weight. She’s been through the usual very intensive rehabilitation process; over three to three and a half years to get to the size and condition and learn skills that she needs to go back in the wild, so this is her final phase.”*

**Jose Sanchez**

In terms of the actual rehabilitation, I notice you have three tanks; what do you actually do with these mammals?”



**Paul Walker**

*“When they first come in, the small calf goes into intensive care pool; we have them under twenty-four hours observation for the first two to three days recoding respiration rate, buoyancy problems, digestive tract—getting the baseline information after which we monitor their progress over the coming months. They are fed every two hours with a milk formula for the first few minutes and then every three hours and then you start cutting out some of the night foods—a very labor intensive process over the first several months while still little. We gradually move to a larger pool during the day, back to their home pool in the night and then gradually into bigger pool day and night. The middle phase, they go into the lagoon enclosure, which is a fenced area of the lagoon where they have natural water movements, tide, wave action, different types of shades under the mangroves and so forth. Then we take them loose into the lagoon, teach them how to eat*

*sea grass, how to find sea grass. Under supervision for the first few months and then as they get bigger out all day on their own; into the wild population. She has all the skill sets she needs to live within the system here the next phase is just to lead her out through the lagoon out to the coast and then supervise and monitor her movements as she learns the geography of the coastline here and meets the wild population.*

The volunteer crew then corners Twiggy in the water and raise her onto shore with on a tarpon. While one person keeps her moisturized with buckets of water, her measurements such as her weight, and distance between eyes, are taken. The rusted tag is cleaned.



#### **Paul Walker**

*“We’re very fortunate to have support to provide us with a satellite transmitter and the sea to shore has the belt fastened on her and it is an amazing step forward. But also during the first two or three months, we’ll actually have a crew out on the coast physically overseeing her movements as well. So we’ll have on the ground and on the sea information on where she is as well as the satellite information that is coming in that will enable to see how she is using the sea grass beds, how she is interacting with the wild population, how she is using the deep water and the warm water and the fresh water sources which in turn will help inform us about how we go about strengthening the system for the next releases because we have another one that should be released later this year as well.*

And like a proud father, Galvez gives his grown child a pat, but must now allow that child to find its own path in the world.



## **Jamal Galves**

*“It’s always a soothing feeling. It is ironic because it is sad and happy at the same moment. You get so close to these animals after they’ve been with you for such a long time and not wanting them to leave. But it is a positive feeling inside that all the work that you’ve gone through gave you positive results and you are putting back another mammal that can contribute to the population that we have in Belize; that we boast so much of.”*

Twiggy is then lowered back into the water. One of the volunteers raises a gate to let her out, and within moments she’s gone. Later in the year, Wildtracks will release another rehabilitated manatee into sea. Reporting for News Five, Jose Sanchez.

## Sea to Shore Alliance participates in Belize River Challenge

Posted on [March 27, 2013](#) by [admin](#) Posted in [Blog](#)



The Belikin La Ruta Maya Belize River Challenge is a grueling multi-day canoe race traveling a perilous river route across the country of Belize. The route runs West to East along the Macal and Belize Rivers, once the only link between beautiful San Ignacio, in the foothills of the Maya Mountains, and the bustling port of Belize City. This is a race for everyone (not just professional racers)!

The race occurs each year in March, coinciding with Baron Bliss Day. The teams, which race for station prizes along the way, battle for the major cash prizes awarded at the end of the race.

To promote manatee conservation in Belize, Sea to Shore Alliance, along with our partner Bowen & Bowen, took the lead in joining the race to clean the river of the trash left by racers which could cause problems for manatees. Bowen & Bowen provided boat fuel, we donated trash bags and, most importantly, Jamal Galves' time and labor.



[Home](#) » [Environment, People & Places](#) » Teaching guides and mariners to protect manatees

Feb 8, 2013

Teaching guides and mariners to protect manatees



**In some parts of the world, manatees are endangered species. Belize enjoys a healthy manatee population, but mariners who speed along the coast and mangrove regularly come into contact with the mammal. The Sea to Shore Alliance and the Coastal Zone Management Authority and Institute have been recording deaths caused by boat collisions. The organizations have decided to hold a two-day workshop with over eighty tour guides to build awareness on the specie and how to engage the manatee in coastal waters.**

**Jamal Galves, Manatee Research Associate, Sea to Shore Alliance/CZMAI**



Jamal Galves

*“The workshop is to address the increase in mortality rate at the Belize River mouth. The project that I won the conservation award; this is part of the funds on that project. Our*

*key audience was the tour operators that use that area. So we sent out an extended invitation to majority of the tour operators as well as the people that want to learn more on manatee in that area. we had tour operators like Cruise Solutions, Chukka, Ecological Tours—just to name a few. The turnout was surprising; we had eighty-nine people registered in the two days. We had over seventy odd attendants. I was impressed with the attendants and how the people react.”*



Lisel Alamilla

**Lisel Alamilla, Minister of Forestry, Fishers and Sustainable Development**

*“I think it’s always important to create awareness about what the role of everyone in our society is in ensuring that we protect our manatees and this is one that is being carried out by the Coastal Zone Management Authority and Institute under the responsibility of Jamal Galvez, who won the conservation leadership award that has made this activity possible. It is especially important to create awareness within the tourism sector and especially those at the frontline who are the tour guides on the ground and coming in contact with manatees.”*

**Jamal Galves**

*“From what I’ve seen majority of the tour operators and tour guides and boat captains have assured me that they will try to practice—since they are aware of the situation—try and practice good boating skills noh.”*

**Since the beginning of the year, two manatee deaths have been recorded due to collisions at sea.**



First manatee killing for 2013  
posted on January 24, 2013 in Belize News



Manatee killings do not make headlines, but over twenty of the peaceful creatures were fatally injured by boats in 2012. The first monitored manatee accident for 2013 was recorded on Wednesday by the Dolphin Park in West Landivar. Jamal Galves, a manatee research associate for Sea to Shore Alliance and Coastal Zone Management Authority and Institute says the strategy to save the creature now includes workshops for mariners.

**Jamal Galves, Manatee Research Associate, Sea to Shore Alliance/CZMAI**

*“Upon my arrival I realized that the mammal washed up; a male adult—very fresh animal. It was apparently hit by a boat; from the hull of the boat on the lower section of body. It seems that the animal may have gotten hit but did not die instantly from the body weight; it showed that the animal lost a lot of weight from the penetration of the spinal cord through the skin. So the animal may have been suffering for a long time in the area trying to recover from this injury. We have seen animals have recovered, but the injury he sustained was multiple broken ribs to the lower section and it eventually gave in.”*

**Jose Sanchez**

“I know this is an area where manatees go. There was an exercise to demarcate the different areas. How well has that exercise worked? How often do we see these manatees being killed?”

**Jamal Galves**





Jamal Galves

*“This is the first for the year. It is early into the year, so it is not very great news. With the award that I recently won from the Conservation Leadership Program to ameliorate the threats to manatees in the heart of Belize, at river mouth, it has been going very well. We have had full cooperation of the Port Authorities; we have the Fisheries that has been helping us as well. The Bowen and Bowen Limited is on board as well helping us with this project. We have put together a tour guide training with tour operators that use the area whereby we are going to have a class session that they can use when they go out on their tours. As well as we are going to have go under water to see the area so that all these tour guides are familiar with the areas and the regulations that we are looking at. The Port Authority will be looking out. We are inviting boaters that use the area; we are inviting them to the workshop so that we can address it. So hopefully this year we can see a change in the death so far. Last year was an outstanding year in which we had so much. We had twenty-two deaths in all of 2012; that’s the highest in all the years.”*

**Jose Sanchez**

“In terms of removal of the carcass, what will be done with it.?”

**Jamal Galves**

*“Thankfully we have the fisheries department here offering a boat, they will drag it off to an area where it is safe and not going to be a problem in terms of sanitization.”*

**The tentative dates for the workshop are February seventh and eighth.**

Rotary Provides Cayo Villages Water Filters

Get positioned with GIS

## **Sirenews Newsletter of the IUCN Sirenia Specialist Group**

**April 2012 Funded by the U.S. Marine Mammal Commission Number 57**

### **IN THIS ISSUE**

- 15 MAY DEADLINE FOR SSG MEMBERSHIP NOMINATIONS (pg. 2) □**
- LOCAL NEWS FROM BELIZE, BRAZIL, CUBA, MALAYSIA, MYANMAR, AND NEW CALEDONIA**

### **LOCAL NEWS**

#### **BELIZE**

**Update on manatee conservation efforts in Belize. The Belize Manatee Conservation Project is a joint effort of Sea to Shore Alliance (S2S), the Coastal Zone Management Authority & Institute (CZMAI) together with many national and international partners. The report of strandings along the coastal zone of Belize from 2005-2010, which includes the update on manatees in rehabilitation, is available online at [http://public.sea2shore.org/news\\_room/publications](http://public.sea2shore.org/news_room/publications). The report highlights the increase in mortality over five years, and explains the main causes of death, the most significant being watercraft collisions. As a result of the increase in strandings, the Belize Port Authority (BPA) has been working closely with us to address the high speed boating situation. The area where these deaths have been occurring, the Belize River, has now been approved as a “No Wake Zone” and “Manatee Area”. The BPA has also agreed to assist in the monitoring and enforcement of signage compliance. We are very grateful that Save the Manatee Club has donated signs in this much needed effort.**

**The orphaned calf “Twiggy”, which has been in rehabilitation for almost three years at the Belize Manatee Rehabilitation Centre, is doing very well. She is in “soft release”, the last stage of rehabilitation. She is still supervised and has supplemental feed, but is free to come and go. As her release date isn't finalized, she is brought into the lagoon enclosure (a fenced-off part of the lagoon) each evening and fed a blended mix of banana and water hyacinth leaves, then each morning she is released back out into the lagoon. While she is still provided some supplemental food, she is actually self-reliant and capable of feeding herself. She has been fitted with a VHF tag so we now have a better understanding of how she uses the lagoon, which will help Wildtracks with the rehabilitation of other calves in the future. “Duke”, a juvenile animal found emaciated in a canal near to the Belize River, has been**

**making strides in the right direction and looks much better than when he came in to captivity in January. He is still being tube fed, but occasionally nibbles on vegetation in the pen or pool. He is now spending time in the pen with “Twiggy” where they are separated by a fence but are often seen interacting along the fence.**

**This April, the Coastal Zone Management Authority & Institute completed marine mammal aerial surveys along the entire coast of Belize. Nicole Auil Gomez led manatee surveys on April 3-4 and the Oceanic Society carried out the surveys for the Turneffe Atoll on April 10-11, led by Dr. Holly Edwards. Manatee aerial surveys have been carried out for the coastline of Belize since 1977, and the last national count was done in 2007. The surveys provide information on distribution and relative abundance, which are applied to management strategies, including the national Coastal Zone Management Plan. All rivers, large lagoons, and a large sample of cayes were surveyed using standard**

## **Stranded Manatee Calf Saved**

posted (June 21, 2013)



**On the news last night we told you all about the proposed Cruise Tourism project for Stake Bank Caye and North Drowned Caye – which would erect a causeway across the Swallow Caye Wildlife Sanctuary – which is a manatee reserve.**

**Well, today the issue of manatee safety – or lack of it – was brought into sharp focus – when a stranded manatee calf was found in the waters off Belize City near Marine Farms on the Western Highway.**

**That's far from the proposed site – but close enough to raise the issue of manatee safety. Jules Vasquez went to see the injured calf:...**

### **Jules Vasquez reporting**

This manatee calf is being hand-fed by Jamal Galvez -that's because it was found stranded and listing this morning in a canal off mile 3 on the Western Highway with a wound from a boat propellor. Galvez rescued it and brought it here to the Coastal Zone office

### **Jamal Galvez - Manatee Research Associate – CZMAI**



*"It seems stable but from the way the animal was swimming I could tell that it has some sort of internal injury, probably to the lungs."*

The manatee is still a nursing calf about 6 to 7 months old, add that to its injuries and this aquatic mammal has big problems

### **Jamal Galvez**

*"Without the injury, if he didn't have this injury - it wouldn't survive without the mom and the injury causes more complication to it's chances of survival as it is right now."*

### **Jules Vasquez**

*"If you had to say percentage wise with all these factors - what are it's hopes of survival?"*

**Jamal Galvez**

*"I like to think positively and I'll give it every chance that there is for the chance to survive."*

The manatee will now be taken to WILDTRACKS for rehabilitation

**Jamal Galvez**

*"We have injuries that we have dealt with like this before so I feel that the chances are high and we want to keep our fingers cross and hope that there's no serious complications internally. Actually this is the 20th stranded animal for the year and we are just half way through the year so it's not good news for Manatees."*

**Jules Vasquez**

*"Is that above average?"*

**Jamal Galvez**

*"It's getting there - last year we had 21 the entire year and we're very close to reaching the mark for last year already."*

**Jules Vasquez**

*"Doesn't that underscore the fact that really the problem isn't any cause way that Mr. Finstein wants to build, the problems are the boats."*

**Jamal Galvez**

*"True - Manatees are getting hit in the open waters. But the only place that they have for shelter is Swallow Caye - the once piece of property, the one water way out of all of them"*

*in Belize is there for the Manatees. There's so much problems outside there already, why bring problems into their home - so there's no resting place for these animals, not the open waters nor the place they call home. "*

**This evening the manatee was taken to the Wildtracks Facility in Sarteneja where it is now in a small pool.**

**Galvez put out one call for all boaters to beware when traveling through Manatee occupied waters and to report sightings of distressed animals to the Coastal Zone Management Authority And Institute.**

Sep 24, 2013

Raising awareness on endangered manatees species during manatee month



**The manatee, locally known as the sea cow, is listed as an endangered species in Belize; it is estimated that the population is between seven hundred and nine hundred. Over the years, there have been continuous efforts to protect the local manatee habitat from threats by boaters. In Belize City today, as part of the activities this month to build awareness about the large sea mammal, The Manatee Research Center organized a program for students. Duane Moody reports.**

### **Duane Moody, Reporting**

Youths from across the country have been getting a crash course on the manatee and today at the Coastal Zone Management Authority and Institute Office on Princess Margaret Drive; it was Belize City's turn. Students from various schools in the Old

Capital formed cues as they took turns, in different groups, to get a good grasp on the life of the manatees.



Jamal Galvez

**Jamal Galvez, Manatee Research Associate, CZMAI**

*“We are trying to get communities and the individuals in the communities involved. Manatees, even though Belize has the highest population of this species, we need this help and for change to happen we need this nation, we need the entire country to know and learn about these things and our intention is once we educate people about manatees, they may see the need for them to protect them. It’s basically to teach these children the manatee habitat, the needs, and what are the threats and what they can do. The simple things such as don’t throw garbage in the water because something as simple as a plastic bag can be serious danger for manatee.”*

Belize currently has the largest population of the *Trichechus manatus* or the Antillean manatee. The herbivorous mammal, however, is endangered; the life of the species is being threatened by boaters, polluters as well as mega tourism developments. And according to Manatee Research Associate, Jamal Galvez, he is targeting the youths to try and prevent or even minimize the number of casualties.



### **Jamal Galvez**

*“We wanted to make it interactive so we put a bunch of videos in there that they can relate to with manatees communicating—talking like human beings and talking about their problems. Like for instance you may say that mommy noh wanna buy me a sneakers because it is expensive. Their problems are boats so they are discussing their problems that oh you can’t hang out in this area because the boats are high in this area. So the videos are basically for them to have a very good vision of what manatee life is—what they do every day, what they see every day; what’s the life down under.”*

And so we tested the kids to see if they were able to retain the vast amount of information that was presented. And they were impressive.



Lyon Green

### **Lyon Green, Student**

*“A next name for manatee is the sea cow and they have to come up every thirty seconds to get air to breathe under water and they can breathe for fifteen minutes under water and then dehn go for more air.”*



**Karina Espat, Student**

*“I learnt that they have eyelashes and they have fingernails too. And you should really take care of them and try not to hurt them.”*



Aliyah Azueta

**Aliyah Azueta, Student**

*“I learned that we should protect the manatees and not throw anything in the water.”*

The activity is being held under the theme, “Celebrate and Protect your manatees, Belize.” Duane Moody for News Five.

**A poster competition for the primary school and an essay competition for high school are also being done in celebration of manatee month.**

**Viewers please note: This Internet newscast is a verbatim transcript of our evening television newscast. Where speakers use Kriol, we attempt to faithfully reproduce the quotes using a standard spelling system.**

### **Sea2Shore Alliance:**

Sea to Shore Alliance works worldwide to protect and conserve fragile coastal ecosystems and endangered species, particularly manatees, sea turtles, and right whales. Sea2Shore combines the technical expertise of trained ecologists and biologists with the passion and enthusiasm of citizen volunteers to educate the public, protect endangered species, and conserve our coastal environments for both people and animals.

### **Coastal Zone Management Authority and Institute**

The Coastal Zone Management Institute is the leading marine scientific research organization in Belize. It is headed by a Director with a technical staff to carry out monitoring and research programmes. The Coastal Zone Management Institute carries out the technical functions of coastal management in coordination with the various agencies involved. The Institute's main functions are to conduct marine research, maintain a data centre, provide information as required by the Authority, organize training courses, support other agencies involved in CZM, maintain coastal monitoring programmes, and to assist with preparation of a national CZM plan.

### **Belize Port Authority**

**The Belize Port Authority is a Statutory Body Falling Under the Ministry of Works and Transport. This body is responsible the water-ways of within Belize and the**

vessels that uses these waterways. The Port is also in charge of registering and licenses of all vessels on the Belizean waterway along with the enforcement of water laws and regulations.

### **Belize Forest Department**

The Forest Department, as a public oriented entity, fosters Belize's economic and human development by effectively enforcing relevant policies and regulations for the sustainable management of its natural resources through strategic alliances and efficient coordination with relevant stakeholders. The department is also responsible for the conservation of manatees.

### **Friends of Swallow Caye**

Friends of Swallow Caye (FOSC) is a community based non-profit conservation association focused on the protection of manatees in the Swallow Caye area. The group was organized in 1996 to promote the designation of this area as a Wildlife Sanctuary. Many of the manatees that use the Belize River mouth visits the wildlife sanctuary.

### **Belize Marine Mammal Stranding Network BMMSN)**

The Belize Marine Mammal Stranding Network (BMMSN). The Network formally began April 13, 1999 it was ran by the Coastal Zone institute, and was take over by the Wildlife Trust in 2004 and is headed by the Manatee Researcher of the organization. The four coastal districts are represented on the Network, and each has a main. The District Team is responsible for stranding in their respective District. The Network is responsible for stranding of manatees, Cetaceans and sea turtles (although they are not "mammals").

### **Bibliography**

Auil, N. E. 1998. Belize Manatee Recovery Plan. UNDP/GEF Coastal Zone Management Project. Kingston: Carib-bean Environmen Programme.

Auil, N. E., Powell, J.A., Bonde, R.K., Andrewin, K. Galves, J.(2007). Belize Conservation Programme 10 y year summary to Liz Claiborne Art Ortenberg Foundation, New York; Wildlife Trust.

Galves, J. 2011. Manatee Stranding along the coastal zone of Belize 2005-2010. Belize Marine Mammal Stranding Network.

Miller, M. 1990. Belize Critical Habitat Survey Final Report. Belize Center for Environmental Studies. 168pp

**Distribution list**

1. Department of Fisheries Forestry & Sustainable Development
2. The Belize Port Authority
3. Coastal Zone Management Authority & Institute Library
4. Belize Tourism Board
5. Friends of Swallow Caye Wildlife Sanctuary
6. Sea to Shore Alliance
7. Department of Environment (Belize)