

2022

Annual Report

Port Honduras Marine Reserve



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Manager's Overview

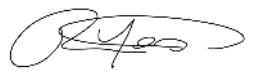
It is with great pleasure that I present the Port Honduras Marine Reserve (PHMR) annual enforcement report for 2022. This report summarizes the main activities that occurred throughout the year January 2022 - December 2022 and includes aspects of enforcement, community development, education and outreach, research and monitoring, communications, governance, and stakeholder use within the reserve. The reserve enforcement staff have remained committed to our determination in ensuring the successful management of the area by meeting conservation targets.

The team conducted a total of 568 patrols within the period, a reduction in comparison to the previous years. As a result, 13 infractions were recorded with 9 verbal warnings distributed, 4 gill nets and 1 lobster trap were removed from within the reserve. There were 2 instances of vessel groundings within the reserve although none were near the Snake Cayes or any coral habitat. Within the nearby Rio Grande, there was an instance of theft of a vessel and engine which the team promptly responded to along with the Belize Coast Guard and it was later retrieved due to the quick response of the team. The ranger team also gave some support to the other enforcement teams at TIDE by conducting joint patrols. Working relationships with government agencies in 2022 such as the Belize Coast Guard, Belize Fisheries Department, Belize Police Department, Department of Environment, Coastal Zone Management Authority and Institute, Belize Port Authority, and the Belize Forest Department have continued to be improved upon.

We would like to express our sincere gratitude to the many donors who continue to contribute towards TIDE's sound management practices and enforcement of sustainable extraction and use of marine resources by stakeholders. TIDE is grateful for their continued financial contribution, technical assistance, and commitment throughout the 25 years of TIDE's history.

I must make a special mention to PHMR's rangers, Edwin Cabrera, Aaron Garbutt, Byron Usher and Ezri Mangar for their continued dedicated support and hard work to the conservation and protection of PHMR's natural ecosystems and its marine life. Thanks to all our resource users who have continued to be great stewards of the reserve. A special thank you to the Belize Coast Guard for their tremendous support throughout 2022 in aiding the enforcement of rules and regulations of the reserve and the security they provided for our staff and resource users. It has been a privilege and a great experience to have worked with you all for 2022 and I look forward to 2023 with great expectations.

Sincerely,



Ryan A. Moore

Protected Areas Manager

Toledo Institute for Development and Environment

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0.0 List of Abbreviations

PHMR	-	-	-	-	Port Honduras Marine Reserve
TIDE	-	-	-	-	Toledo Institute for Development and Environment
BFD	-	-	-	-	Belize Fisheries Department
BCG	-	-	-	-	Belize Coast Guard
SMART	-	-	-	-	Spatial Monitoring and Reporting Tool
MPA	-	-	-	-	Marine Protected Area
GIS	-	-	-	-	Geographic Information Systems
MMMC	-	-	-	-	Maya Mountain Marine Corridor
SI	-	-	-	-	Statutory Instrument
RZ	-	-	-	-	Replenishment Zone
MA	-	-	-	-	Managed Access
FWC	-	-	-	-	Fresh Water Cup
PACT	-	-	-	-	Protected Areas Conservation Trust
TEC	-	-	-	-	TIDE Environmental Club

1.0 Administration

1.1 Staffing for PHMR

No.	Names	Position
1	Ryan Moore	Marine Manager
2	Edwin Cabrera	Head Ranger
3	Aaron Garbutt	Ranger
4	Byron Usher	Ranger
5	Evander Paquiul	Temporary Ranger
6	Olivero Garcia	Temporary Ranger
7	Raphael Chee	Temporary Ranger

Table 1: Showing PHMR Enforcement Staff

No.	Names	Position
1	Anthony Rash	Marine Biologist

Table 2: Showing PHMR Research and Monitoring Staff

2.0 Background of the Port Honduras Marine Reserve

2.1 Introduction

The PHMR was declared by the Government of Belize on the 25th of January 2000. It is actively co-managed by TIDE with the governing authority being the Fisheries Department. PHMR is a semi-estuarine system that covers approximately 160 square miles and is an integral part of the MMMC in southern Belize. The reserve is located just off the coast of Punta Gorda and extends north up to Monkey River Village. PHMR comprises coastal wetlands, seabed, mangroves, lagoons, savannahs of Payne's Creek National Park and national lands within the area known as Port Honduras. The general boundaries of the reserve are the Rio Grande in the south, Monkey River in the north, the Snake Cayes in the east and the coastal wetlands in the west. Two buffer communities are located adjacent to the reserve which are Monkey River Village and Punta Negra Village with Punta Gorda Town lying just outside.

The reserve is rich in biodiversity, containing approximately 138 small mangrove cayes, which provide essential habitat and nursery for juvenile aquatic species. Other critical habitats include seagrass beds, hard bottom communities of coral and/or rubble, and soft bottom communities. A large portion of the reserve is covered by seagrass, which also provides essential habitat and food for juvenile fish species, sea turtles and manatees. Also, within the reserve are fringing reefs, coral patches and coral heads which provide refuge and food for marine animals.

Residents who directly depend on the reserve for their livelihood engage as commercial fishers, tour guides and as fly-fishing guides. Of the number of fresh produces extracted from the reserve, it is quite common to advertise the product originating from Punta Gorda to as far as Corozal in the north. The most popular species include groupers, snappers, grunts, and the barracuda. Many Belizeans from Punta Gorda frequent the reserve with the most popular activities being recreational fishing, snorkeling, and swimming. The reserve hosts over 500 vessels in and around the reserve annually engaging in numerous activities. It is also quite frequent for sailing vessels from Guatemala to stop in and enjoy a safe harbor in the New Haven Lagoon or the Snake Cayes on their way to and from Placencia.

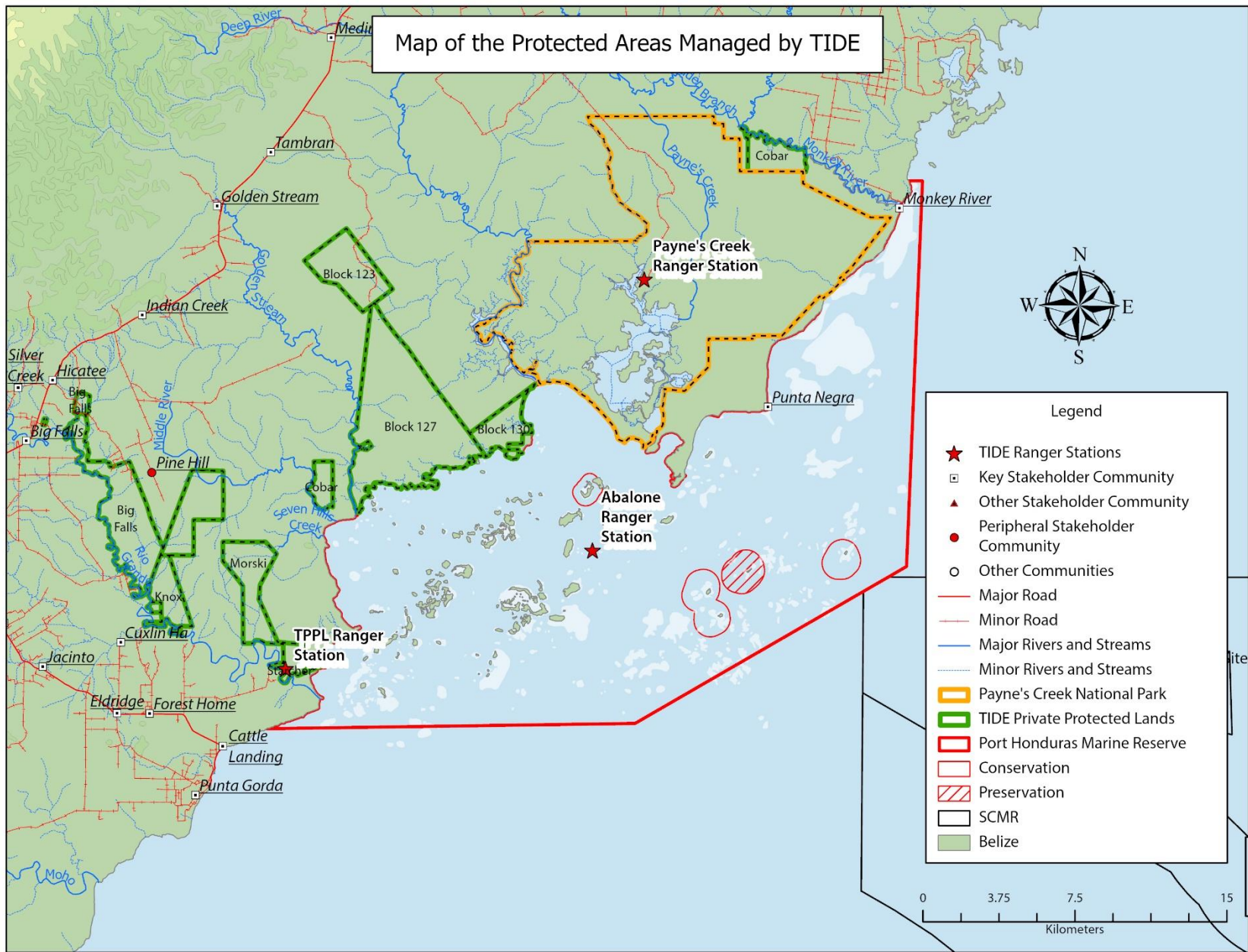


Figure 1: Map of the protected areas managed by the Toledo Instituted for Development and Environment

2.2 PHMR's Strategic Plan and Goals

The PHMR management strategy is based on five major goals:

1. To protect the physical and biological resources of the Port Honduras Marine Reserve
2. To provide education and research
3. To preserve the value of the area for fisheries and other important genetic resources
4. To develop recreational and tourism services that will enhance the economic and social benefits of the area without causing environmental damage.
5. To strive for sustainable financing

2.3 Zoning Plan and Regulations

Three zones were established for the purpose of the regulation and control of the reserve:

1. General Use Zone (95% of the Reserve)

Established to provide opportunities for uses and activities (e.g. fishing for conch, lobster, and finfish) under a stringent monitoring scheme.

2. Conservation Zone (4% of the Reserve)

Established to provide an area free from commercial fishing to prevent overexploitation of fishery stock, provide an undisturbed area for recruitment of species, and enhance the value of the area for recreational and tourism activities. These areas are located 0.805-kilometers (half a mile) radius around Wildcane Caye and 0.805-kilometers (half a mile) radius around East, West, and South Snake Cayes.

3. Preservation Zone (1% of the Reserve)

Established to provide an area within the marine reserve that is preserved in an entirely natural state and to protect areas of particularly fragile habitat or with threatened or rare species. Neither fishing nor recreation is permitted in this area. This area is located 0.805-kilometers (half a mile) radius around Middle Snake Caye.

3.0 PHMR Activities Accomplished in 2022

3.1 Patrols and Surveillance

A total of 568 patrols were conducted for the period January 2022 to December 2022 (*Appendix 1: Patrol Routes in 2022*). The rangers travelled ~17,585km and averaged ~km per month. This totaled ~1269 hrs. at sea patrolling with an average of ~106 hrs. per month. This was done by consuming ~2957 gallons which was ~610 gallons less than the previous year. During this reporting period due to the international situation, the price per gallon of fuel significantly increased for a large portion of the year which significantly impacted available resources to conduct patrols.



Figure 2: Showing the Enforcement Team interacting with a canoe in the reserve

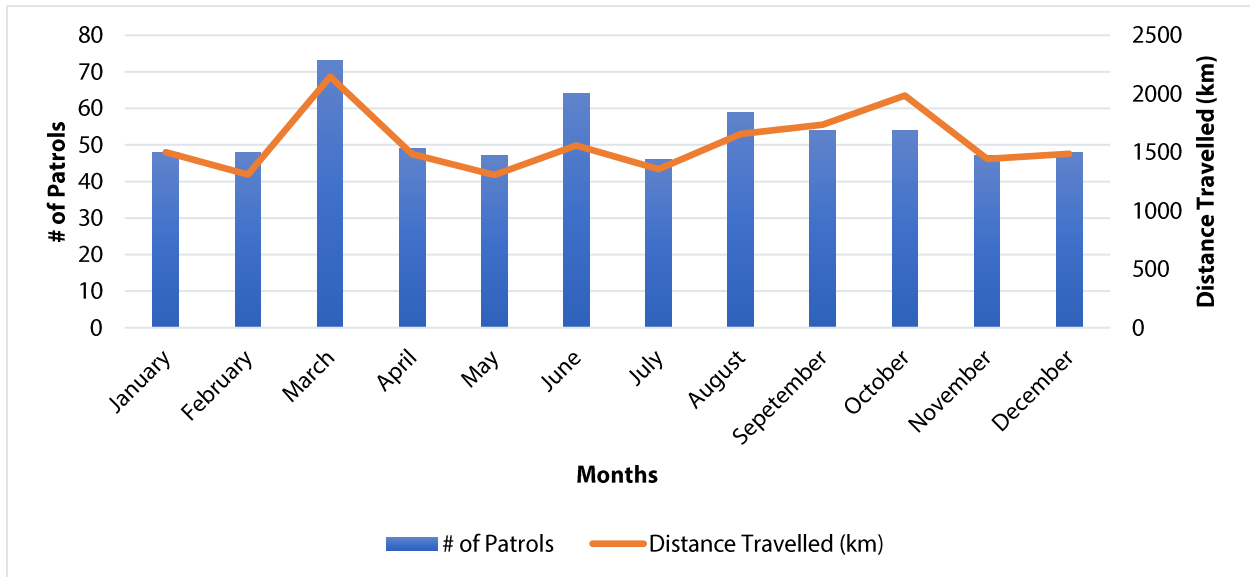


Figure 3: Showing the number of patrols and distance travelled (km) by month in 2022

An average of ~47 patrols were conducted each month focusing on the conservation and preservation zones around the Snake Cayes and the most eastern islands which are the primary habitats for conch and lobster. This

number was a reduction in comparison to the previous year. Other priority areas included the coastline leading up to Monkey River Village, the river mouths which empty into PHMR and the conservation zone around Wildcane Caye. A few extra patrols were done around the Sapodilla Cayes Marine Reserve and the village of Barranco to the south of Punta Gorda Town.



Figure 4: Showing the Enforcement Team on patrol and utilizing a drone

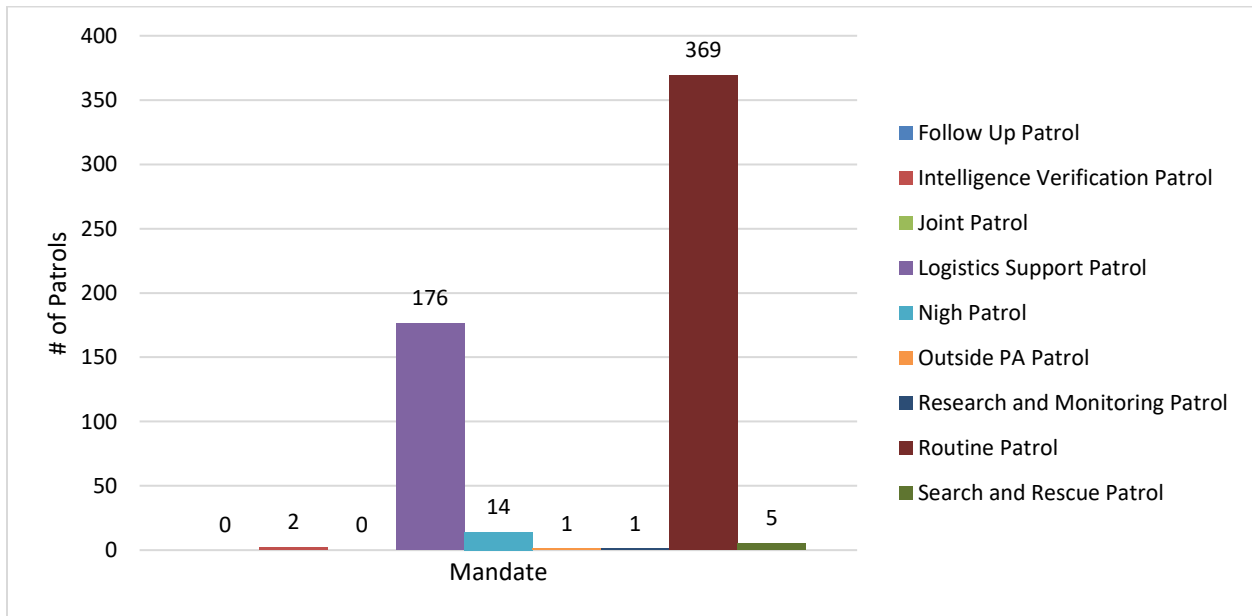


Figure 5: Showing patrols by mandate for 2022

The ranger team will continue to prioritize night patrols of the PHMR to reduce illegal transboundary infractions by Guatemalans and Hondurans as well as to target local gill net users in and around the reserve. Continuing into the coming year the PHMR enforcement team will engage in developing an enforcement strategy and an enforcement plan to guide activities within the reserve and surrounding areas.

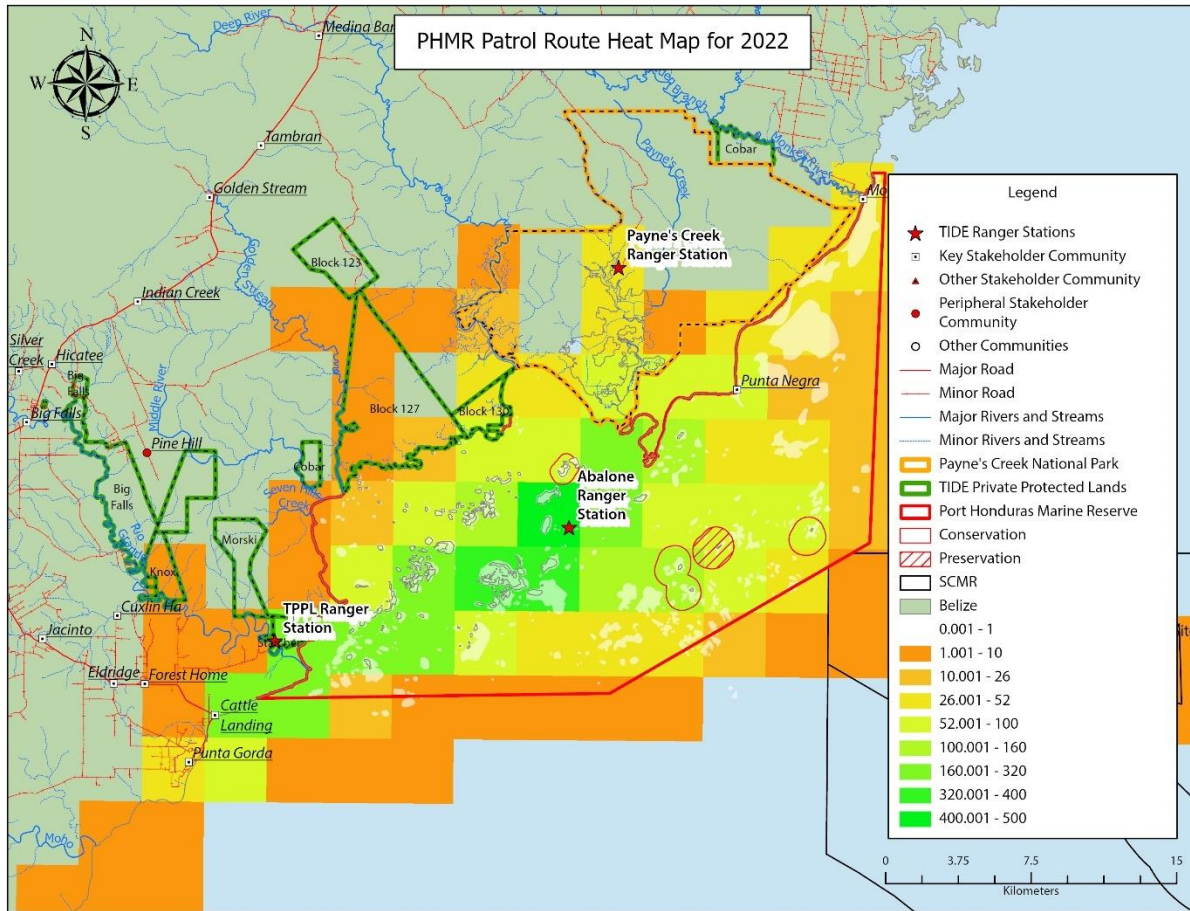


Figure 6: Showing a Patrol Heat Map showing where patrols were focused in 2022

3.2 Patrol Infractions for 2022

The patrols in PHMR yielded 9 verbal warnings, 6 gill nets and 1 out of season Lobster Trap removed from within the reserve. Nets were handed over to the Fisheries Department to be destroyed.

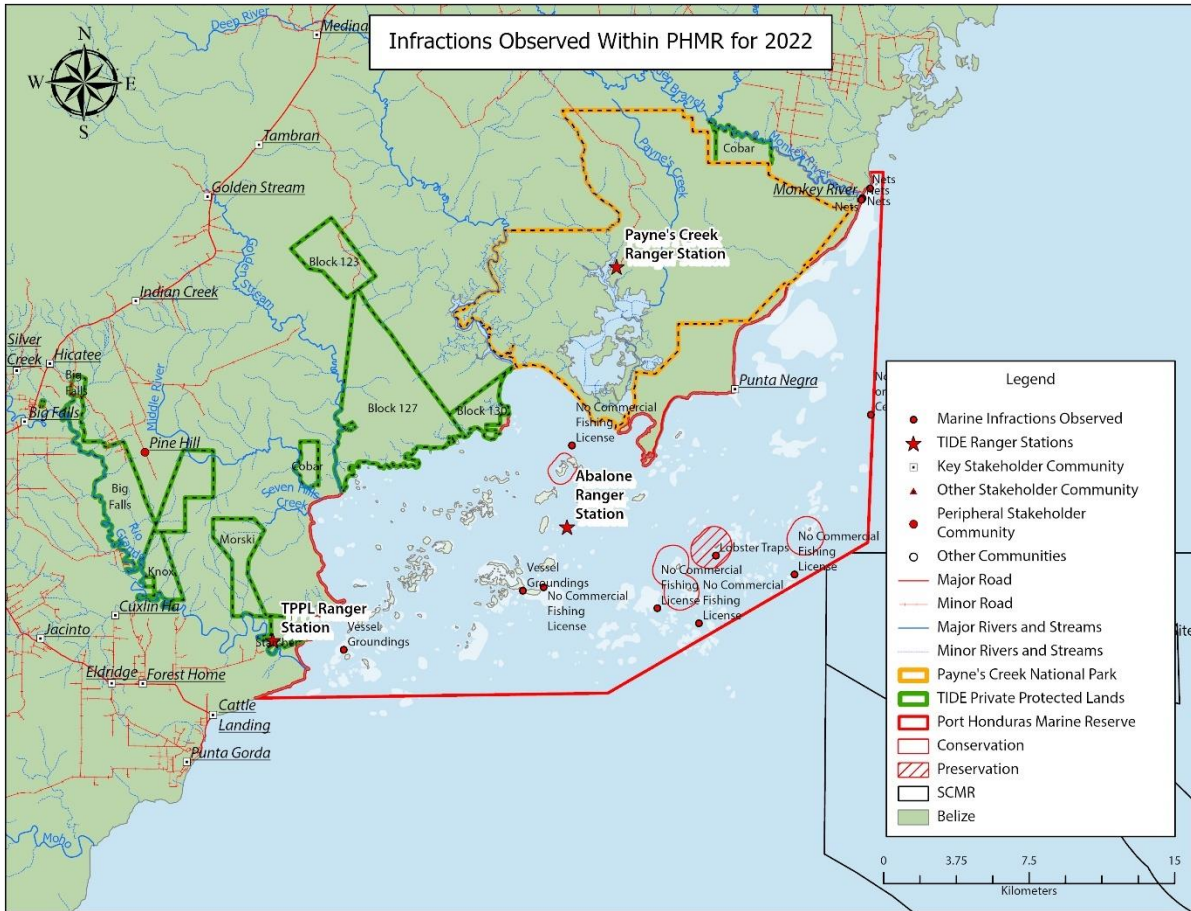


Figure 7: Showing infractions within PHMR for 2022

3.3 Advisory Committee Meetings

For 2022 there was one Advisory Council Meeting held which was successful and fruitful in the discussions held. On August 25, 2022, the meeting was held with the attendance of some members virtually. The primary objective of the meeting was to elect 2 new board members. For the Port Honduras Marine Reserve, Mr. Alex Leonardo was selected and for the Payne's Creek National Park, Ms. Eloydia Cuevas was selected. Caroline Oliver gave brief updates on the community development work and Anthony Rash TIDE's Biologist gave a presentation on the Stony Coral Tissue Loss response plan being implemented by TIDE for this region.

3.4 Maintenance of Patrol Equipment

The upkeep of the patrol equipment such as the regular cleaning of the patrol vessel, and regular servicing of the outboard engine (engine oil, oil filter change, gear oil change, freshwater wash, and re-greasing) were done by rangers; major repairs and any technical problems were done by a mechanic in Punta Gorda Town. To improve the capacity of rangers a session was held with the mechanic which also standardized practices.



Figure 8: The mechanic reviewing basic components guiding rangers on best practices

3.5 Infrastructure Maintenance

The upkeep of the ranger station was done by the rangers and personnel from the Belize Coast Guard (BCG) stationed at PHMR. Additionally, the kitchen was refurbished under the guidance of the head ranger. We also hired a contractor to refurbish the bathroom and to tile the floor.



Figure 9: Refurbished kitchen with tile countertop and floor

3.6 Trainings Accomplished by PHMR Enforcement Staff

One staff member, Byron Usher, was given the opportunity to participate in a training at Glovers Reef facilitated by WCS and the Fisheries Department. Additional trainings occurred in September 2022 along with the National Biodiversity Office focusing on Green Laws, Drone Training, SMART, Vessel Handling, Engine Maintenance and Basic Customer Service Principles. Several of the trainings were led by senior staff such as vessel handling, drone training, camera trapping and SMART. Oliver Garay, TIDE Tours Sustainability Manager, provided the basic customer service principles training.



Figure 10: Vessel handling training being conducted by senior ranger Andrew Williams

3.7 Training needs for PHMR enforcement staff

	Needed Trainings	Plans
1.	Engine Maintenance Training	Continuous, occurred in September 2022
2.	SMART Training	Continuous, occurred individually in 2022
3.	Fisheries Regulations Training (continuous)	Follow up training by the Fisheries Department
4.	Vessel Boarding Procedures (practical)	Follow up training by the Belize Coast Guard
5.	Arrest Techniques Training (practical)	Follow up training by the Belize Coast Guard
6.	Case File Preparation Training	Follow up training by the Fisheries Department and Internal training
7.	Special Constable Training	Scheduled for July or August 2023
8.	Underwater Drone Training	First Quarter 2023
9.	Conflict Resolution Training	First Quarter 2023

Table 3: Showing training needs for PHMR Management Staff

3.8 Partnerships

The PHMR staff continue to work with local and partner organizations, these partners include the Fisheries Department, the Belize Coast Guard, the Police Department, the Belize Defense Force, the Belize Audubon Society,

Southern Environmental Association, the University of Belize and the Tour Guide and Fishermen Associations from the buffer communities of the reserve.

This year TIDE assisted the University of Belize with GIS Training. During an Advisory Council Meeting TIDE made commitments to assist students involved in the Natural Resource Management Program. Protected Areas Manager Ryan Moore provided the training to Zenobia Polonio and Jayron Locario over a 2-day period at TIDE and virtually using Microsoft Teams. The students were trained in utilizing freely available software for their phones and computers to collect and process the data and in the end, they were able to produce their first map.



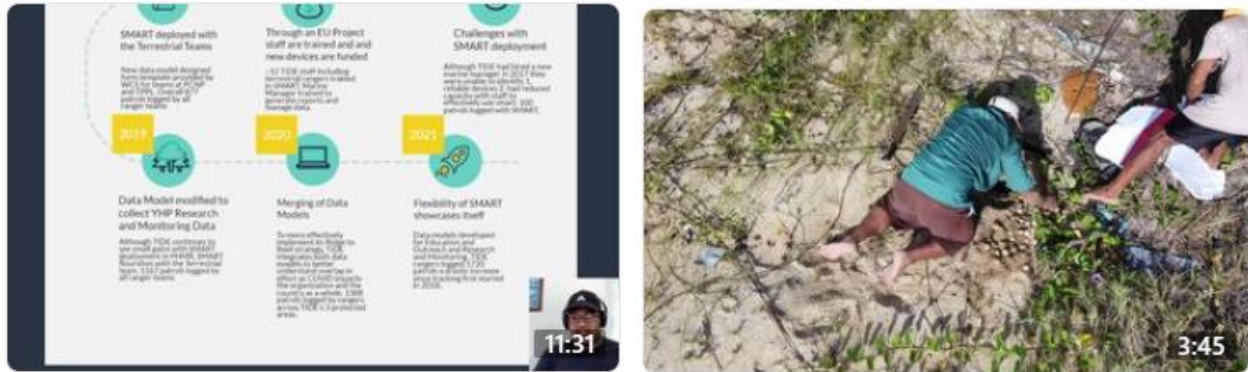
Figure 11: Showing Zenobia and Jayron collecting GPS points with their phone

3.9 Management Effectiveness

TIDE conducted a Management Effectiveness Assessment through the support of the IUCN lead KFW project titled, “Linking the Central American Landscape.” In this exercise, numerous stakeholders were identified who contribute directly or indirectly to the management of the PHMR. The overall score attained was 69.4% which is classified as “Good” on the indicator scale. Throughout the lifetime of this project, TIDE has set the goal of being listed within the internationally renowned Green List. To achieve this TIDE will be engaging in numerous activities funded through this project targeting weaknesses identified through Management Effectiveness Assessments.

4.0 Communications

There were multiple communications produced which aired nationally on television, radio and Facebook covering issues such as Turtle Monitoring, Mangrove Replanting, SMART and the 25th Celebration of TIDE's inception. Videos and posts can be found on TIDE's YouTube and Facebook pages.



TIDE's protected areas manager Ryan Moore giving an overview of TIDE's work with SMART and the...

Over 60 Turtle Nests recovered 2021 there was a notable increase in turtle nesting sites over the...

Figure 12: Showing a few videos produced in 2022 highlighting our work with Turtles and SMART

5.0 Erosion of Abalone Caye

Abalone Caye continues to suffer from erosion brought on by climate change. Unfortunately, no long-term solution has been identified, and in 2022 the idea of a mangrove restoration project was reviewed by community members who attended several training sessions throughout the year. Several sites were tested for the potential for restoration however the underlying issue of erosion must first be addressed due to mangroves requiring a more stable environment.



Figure 13: Community members testing for the potential for mangrove restoration at Abalone Caye

6.0 Community Education and Outreach

6.1 TIDE Environmental Clubs



Figure 14: Showing youth engagement fun sessions and competitions

Youth clubs continue to be the machine on the ground for TIDE's outreach in communities tackling family violence and environmental themes. A total of three hundred eighty-one youth from 19 clubs in buffer communities participated in clean-ups, reef week, summer camp, club games, and environmental and family violence awareness sessions. A total of 120 face-to-face and online meetings were held during 2022 with all active environmental clubs. TIDE collaborated with the Department of Youth Services, Ya'axche Conservation Trust OCEANA, and Humana People to People Belize to provide additional engagement sessions with the youths in the communities.

6.2 Environmental Clean-ups

There were 75 organized clean-ups within 19 communities in 2022. This resulted in a total of 852 bags of trash being removed and disposed of properly at the local landfills while a few clubs repurposed some waste in their communities. Most of the waste was removed by the Rio Grande River Keepers and followed by Laguna Birding and Environmental Club.

6.3 Reef Week



Figure 15: Pictures of the National Banner, Awarding winners for the Football Tournament and the Volleyball game

Twelve environmental clubs and 8 coastal teams of up to 10 participants were engaged this year. The theme "Exemplary Reef Health benefits our Nation's Wealth" through community clean-ups, designing banners, a mixed gender volleyball game and a 7-A-Side football tournament.

A total of 72 females and 72 males participated in a volleyball mixed gender tournament which included 22 stage games and four finalists namely Mafredi, Eldridge, Laguna, and Golden Stream. 70 males and 10 females participated in the football tournament organized by the Toledo Sports Committee. TIDE's Reef Week awareness campaign engaged these youths for three months through sports and banner competitions.

6.4 Summer Camp



Figure 16: Summer Camp engagement sessions in various communities

TIDE focused the Annual Summer Camp around the theme, “A Challenge to Reimagine Conservation” adapted from the theme developed by the International Union for Conservation of Nature. TIDE hosted the camps at 7 communities which buffer our protected areas. Camp activities were planned and executed in the villages of Eldridgeville (17), San Marcos (19), Laguna (21), Big Falls (27), Mafredi (20), Bladen (17), and Trio (35) reaching a total of 156 kids with ages 10-13 for one week. Club leaders facilitated the camps and nutritious snacks were catered by local community members. This year's camp had 24 facilitators who gave their time to ensure that the learning packages were followed by those who registered for the camps. Apart from the fun activities, campers engaged in community clean-ups whereby a total of 26 bags of trash were removed from the environment, upcycled, or disposed of in their community landfill. Camp for 2022 was made possible by Mass Audubon.

6.5 25th Anniversary Display Competition

Primary, secondary, and tertiary institutions and youth groups buffering TIDE's three Protected Areas were invited to participate in the 25th Anniversary display competition to win attractive prizes. The display competition focused on the theme, “A Challenge to Re-imagine Conservation” on October 21, 2022, at the Toledo Community College Auditorium from 8 am to 12 noon. Cash Prizes valued at \$1,000 were distributed to 4 winners. Judges visited booths of Jacinto Roots, Big Falls Eco-Warriors and Changing Tides of PG, and Little Flower RC School. At the end of the event, Little Flower RC School was awarded \$400 (1st Place), Jacinto Roots (2nd Place) and Changing Tides of PG and Big Falls Eco-Warriors were each awarded \$150 (3rd place). The Ya'axche Conservation Trust was also present sharing their work in the Maya Golden Landscape. At the event, an estimated 450 students and adults visited with the majority from the Toledo Community College.



Figure 17: Showing 25th Anniversary Environmental Display Competition

6.6 Outreach to Fisherfolks

Port Honduras Marine Reserve stakeholders were reached via two organized boat-to-boat sessions and numerous house visits with 38 Commercial fisherfolks who traditionally use the reserve for their livelihood. The house visits created more one on one discussions with the fisherfolks, and family members present. Discussions centered around regulations of the area and ways to improve the relationship with PHMR staff. Fisherfolks all agree that PHMR staff continue to be respectful and are glad to see rangers patrolling within the area. Many challenges were identified and forwarded to management which included the need for more presence in the reserve, especially at night when they felt illegal activities were occurring.



Figure 18: Showing Outreach with fisherfolks during the opening of the Lobster Season

7.0 Community Development

7.1 Access to Opportunity – PADI Open Water Scuba Training

In collaboration with Access to Opportunity, PADI Open Water SCUBA training was provided to 12 youths from Punta Gorda, and four TIDE Community Researchers also received PADI Advanced Open Water certification. In 2023, the 12 new trainees will be invited to apply for additional methods training and become members of the TIDE Community Researcher team. Over the years, these researchers have gone on to progress in careers in marine biology, tour guiding, and even becoming SCUBA instructors themselves, proving that this program is a steppingstone for youths into future careers that they may not otherwise have access to.

7.2 TIDE's Scholarship Program

TIDE's Scholarship Program continued in 2022 with 37 students who received book scholarships for the school year 2022 – 2023 (15 males and 22 females.) From the previous cohort 12 4th Form students graduated in the school year 2021 – 2022. An overall assessment of the scholarship program is being conducted by Dr. Carolyn Henri, visiting intern from the United States which will look over the entire lifetime of the program. This study should be completed in early 2023 and will be available on the website. A snippet from that study has revealed, "TIDE's scholarship program (TSP) has been operational since 2001, and in that time has assisted 300 high school students in obtaining their secondary education. Over that time TIDE has invested 235,000 BZD in education and students in the Toledo District, originally with full scholarships and now today with book scholarships."

TIDE is grateful to Mass Audubon for their continued support of this program which supports families and youth throughout the Toledo District.

8.0 Research and Monitoring

Research and monitoring continue to be an integral part of the management effectiveness of the Port Honduras Marine Reserve (PHMR). Monitoring for the year 2022 included lobster surveys, conch surveys, sea cucumber surveys, coral health surveys, reef fish surveys, reef benthic habitat surveys and coral bleaching surveys. A detailed analysis of these surveys can be found in PHMR's Biological Report(s) for 2022.

Reintroduced in 2020 was the monitoring of Turtle Nests. This was led in the field by Mario Muschamp and rangers from the PCNP and TPPL teams. They monitored along the Punta Ycacos coastline up to Monkey River where they made frequent checks during routine patrols. For the 2022 turtle nesting season, there were ~8,357 eggs laid at 58 nesting sites. Of those ~5,737 hatchlings emerged successfully or 68.6% of the total. ~1,311 eggs were infertile and ~99 eggs damaged by roots. 6 nest sites were partially inundated with partial success. 6 nest sites were completely predated or ~880 eggs. 5 of the total sites were predated by grey foxes and 1 site by racoons. There were several nests which have not hatched at the end of the year therefore the season has not yet been completed.



Figure 19: Showing a recently processed turtle nest and hawksbill turtle hatchlings making their way to the water

9.0 Commercial Fishing, Recreational Fishing and Tourism in PHMR

9.1 Vessels in PHMR

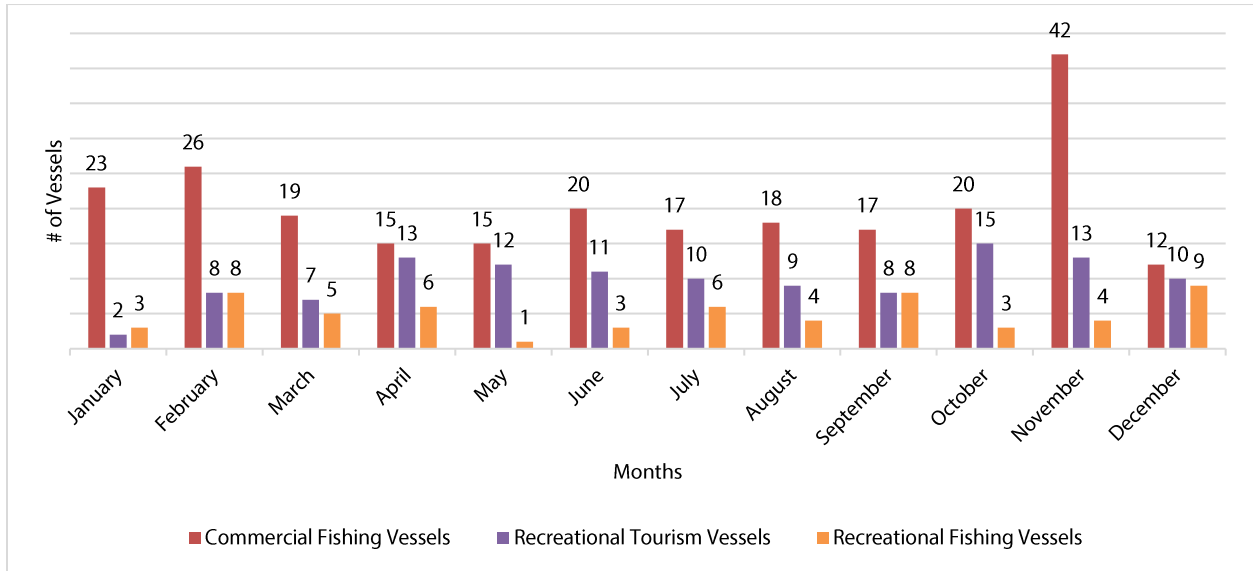


Figure 20: Showing vessels sighted in PHMR for 2022

In 2022 the rangers through the Spatial Monitoring and Reporting Tool (SMART) logged over 422 vessels in the reserve a decrease from the previous year, these numbers were similar in 2019 as individuals have returned to their normal occupation and not as reliant on fishing. Of these vessels 244 were commercial fishing vessels, 126 were recreational tourism vessels and 199 were recreational fishing vessels either transiting the area or conducting other activities.

9.2 Commercial, Recreational and Tourism Users in PHMR

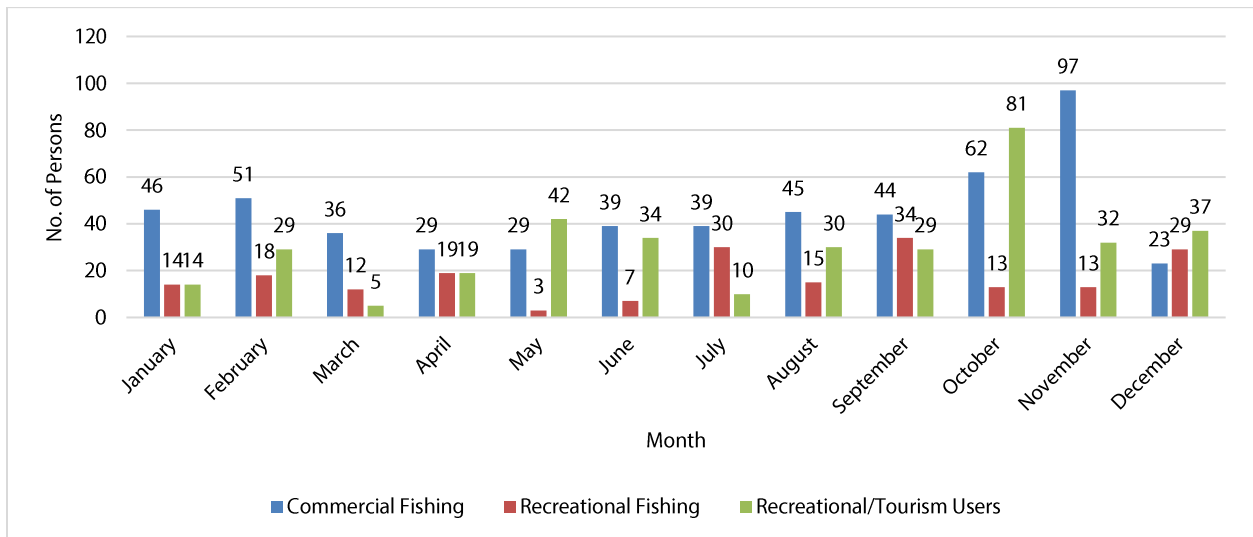


Figure 21: Showing the resource users observed by month for 2022

In 2022 TIDE Port Honduras Marine Reserve enforcement team, through SMART, logged 540 commercial fishers and 207 recreational fishers and 362 tourism users in the reserve not counting the locals on the tourism vessels.

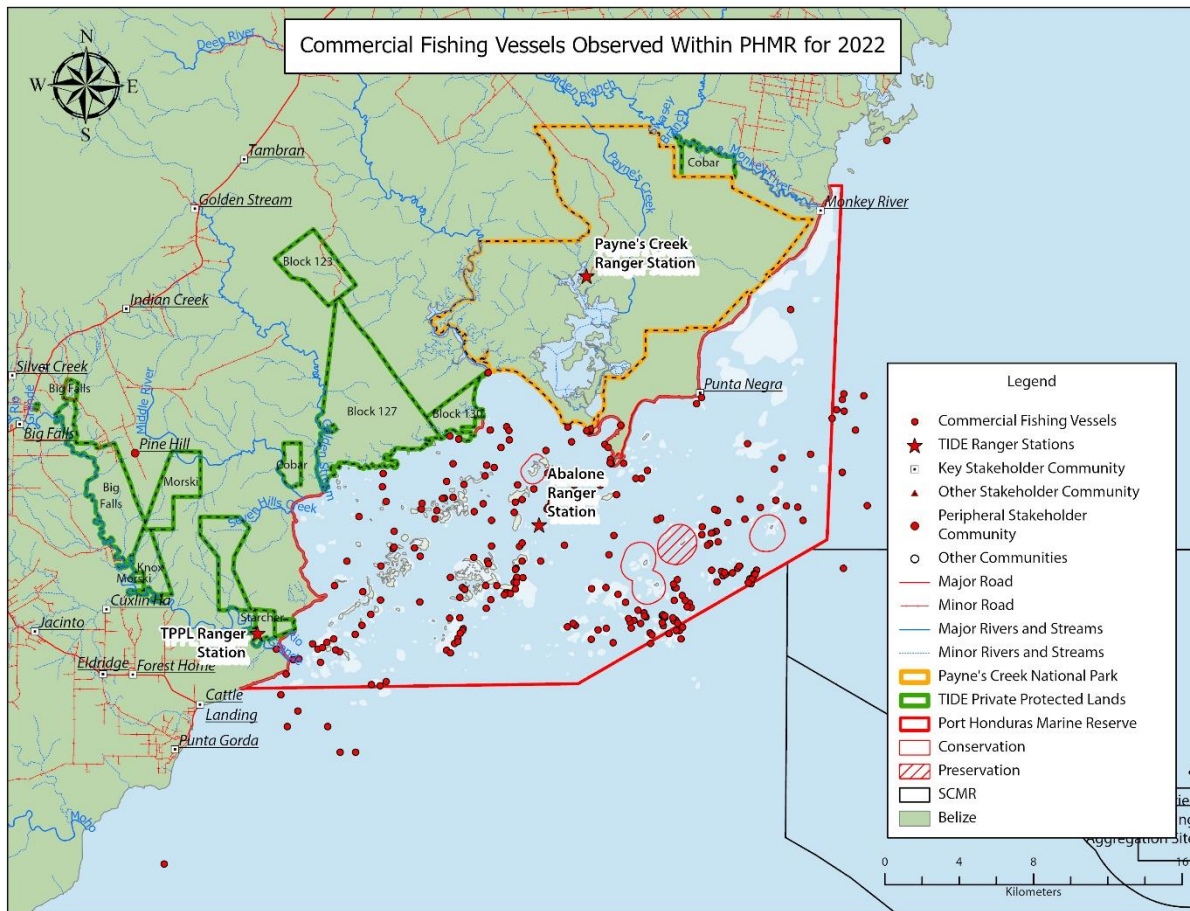


Figure 22: Showing Commercial fishing vessels in PHMR for 2022

The map above shows the approximate location of commercial fishers within PHMR (*The GPS coordinates are taken at the location of the patrol vessel unless the rangers are directly interacting with the commercial fishers*).

Akeem Williams
 Alex Garbutt
 Alonzo Reymundo
 Andy Jones
 Angel Paiz
 Apolonio Westby
 Armando Ramirez
 Avelardo Cuevas
 Bertram Parham
 Brian Cuevas

Byron Paiz
 Canuto Zuniga
 Carlos Bardalez
 Carlos Ramirez
 Darren Castellanos
 David Fuentes
 David Palma
 Dennis Usher
 Dervy Williams
 Eloy Cuevas

Evan Cuevas
 Felix Arzu
 Fidel Audinette
 Frank Jacobs
 George Alford
 George Ramirez
 Harrison Young
 Hilbert Cuevas
 James Mangar
 James Alford

Jason Martinez	Lincoln Garbutt	Ray Jacobs Sr.
Joel Casimero	Lionel Sanchez	Roy Ramirez
Johnathan Alford	Luis Cabrera	Ruben Paiz
Jose Vellos	Milton Garbutt	Victor Cuevas
Joseph Romero	Mynor Perez	Wellington Garbutt Jr
Joash Ramirez	Narciso Martinez	Winsley Cuevas
Kenny Ramirez	Oliver Garbutt Jr	Winston Thompson
Leonel Delcid	Oliver Rojas	Yonardo Cus
Leslie Williams	Ray Arzu	

Table 6: Showing commercial fishers sighted in PHMR for 2022

10.0 Recreational Tourist Visitation to PHMR

Overall, the Port Honduras Marine Reserve saw ~1015 foreign visitors in 2022, this number was derived through ticket sales. The TIDE management team came to the decision to reopen Abalone Station to visitors for 2022. Throughout the year, visitation was not as high as in previous years. However, a reported 106 individuals signed in at Abalone Caye and gave some details on where they originated from after receiving presentations from the rangers.

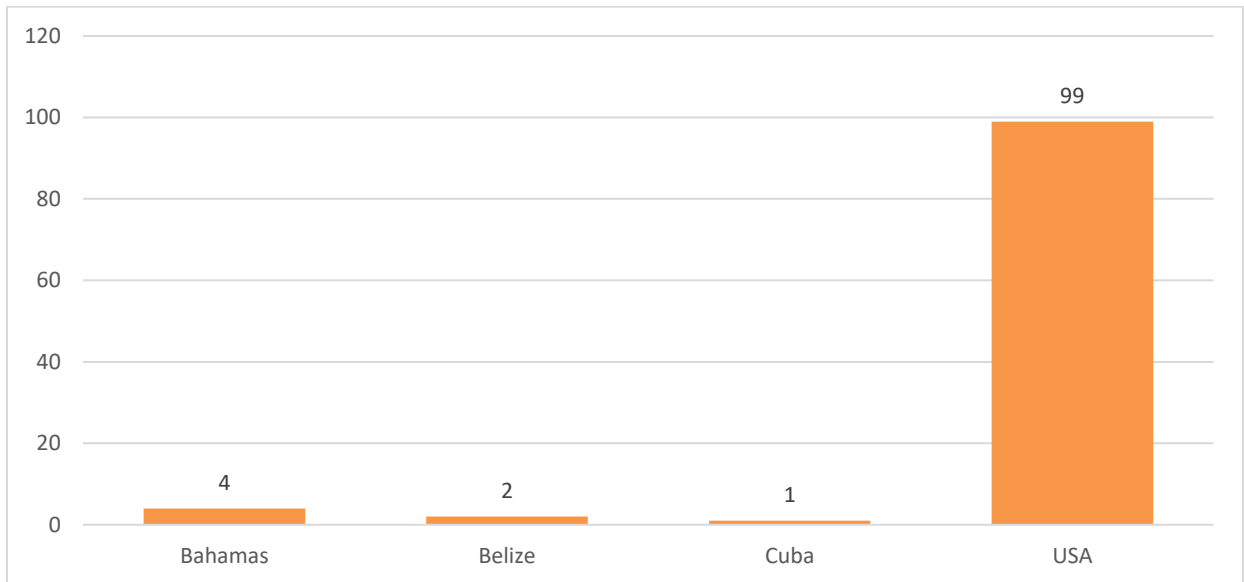


Figure 23: Showing the number and origin of visitors to Abalone Ranger Station

The USA continues to be our largest source of visitors. There are visitors who venture direct to West Snake Caye or Moho Caye and conduct swimming, snorkeling, and sports fishing within the reserve and do not visit the ranger station so a record of their visit is not recorded in the logbook but is captured in the ticket sale record.

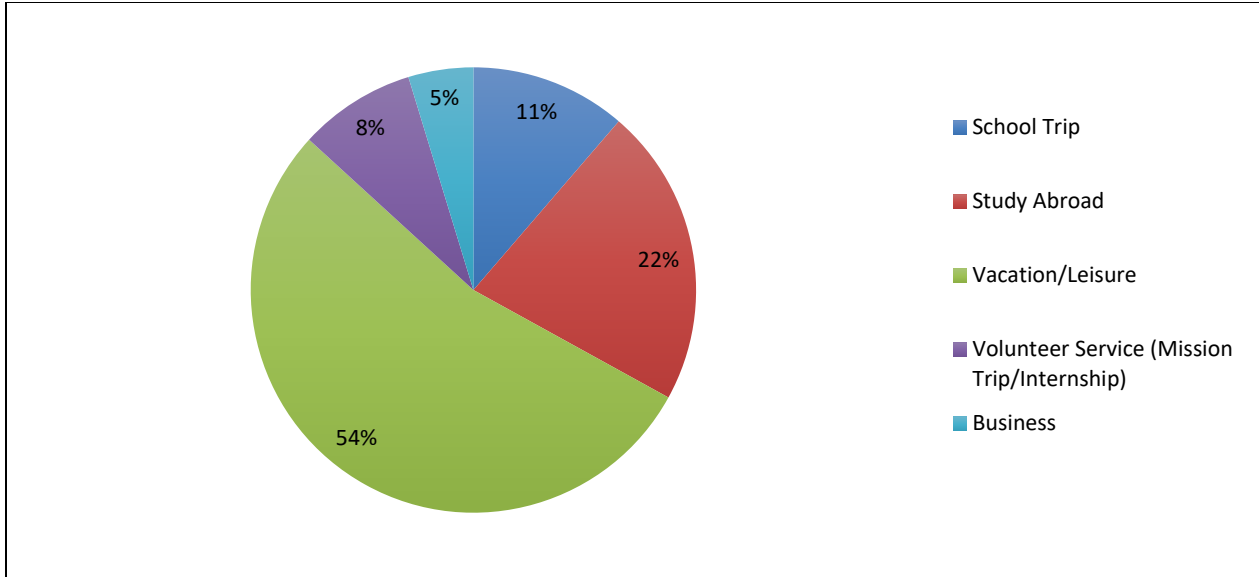


Figure 24: Showing purpose of visit to Belize

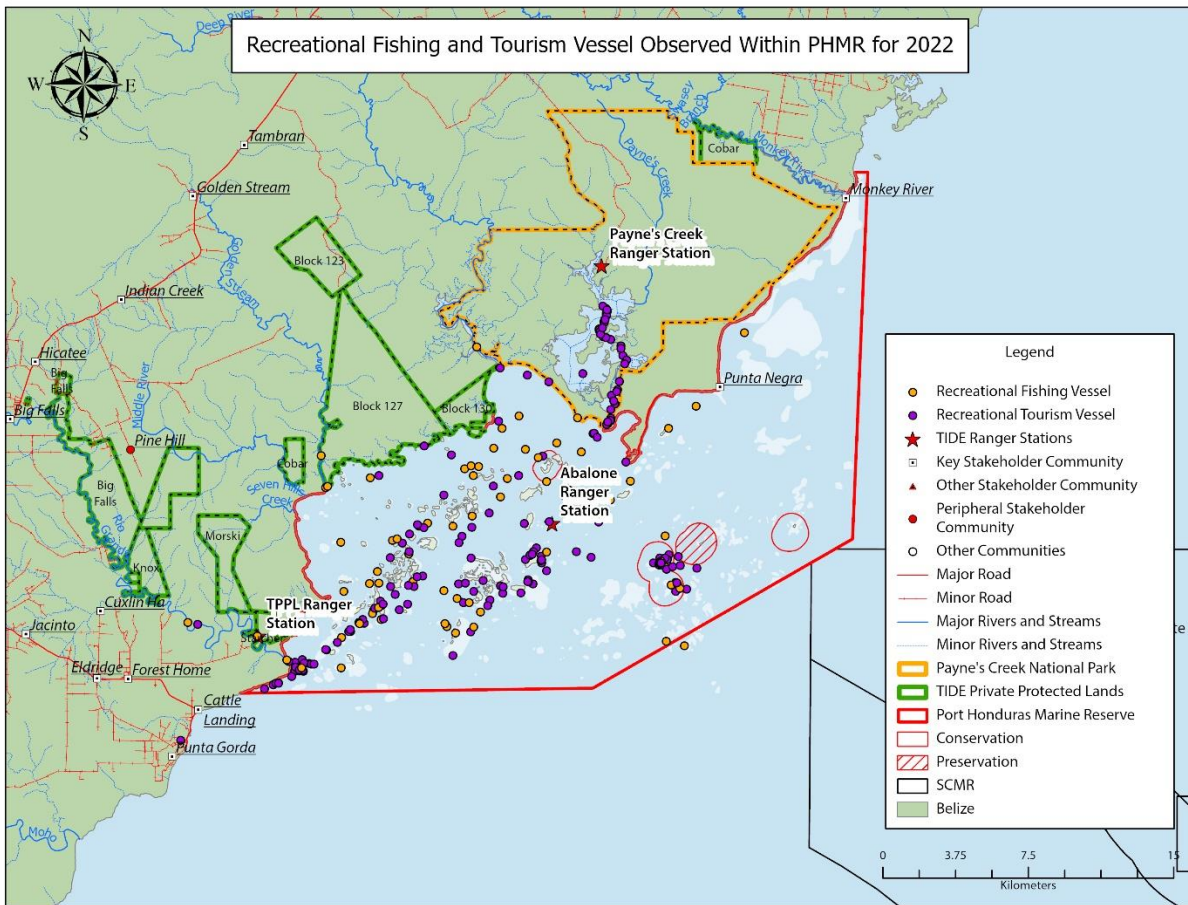


Figure 25: Showing Recreational and Tourism vessels sighted in the reserve by Rangers and logged using SMART

The map above shows that most of the reserve is being used for both recreational fishing and tourism related activities. Areas north of the reserve show little to no activity for these types of vessels although it must be noted that there are fewer patrols in these areas and many of these vessels are coming from PG so it would not be economically feasible to travel that far. From the map, it can be shown that multiple recreational fishing vessels can be seen around the Snake Cayes in the conservation zone although no fishing is allowed. It must be noted that although these vessels are primarily conducting recreational fishing, it is customary for the individuals to also stop by at the cayes to either have lunch, snorkel and/or swim as a part of their daily visit.

11.0 The TIDE Team

11.1 Board of Directors

Mr. Gabriel Roches (Chairman)	Retired Public Officer (Public Health)
Mr. Jeremy Enriquez (Director)	National & International Relations
Ms. Nancy JudyAnn Gomez	Business Representative
Dr. Jay Coombs (Director)	Academia
Mrs. Marie Aleman (Vice-Chair)	Entrepreneur/Community Representative
Ms. Eloydia Cuevas (Director)	PCNP Advisory Council Representative
Mr. Alex Leonardo (Director)	PHMR Advisory Council Representative
Mrs. Celia Mahung (Secretary)	Executive Director (Ex-Officio)

11.2 TIDE Office Staff

11.2.1 Management Staff

Celia Mahung	Executive Director
Leonardo Chavarria	Development Director
Stephene Supaul	Operations Manager
Caroline Oliver	Program Manager
Ryan Moore	Protected Areas Manager
Mario Muschamp	Terrestrial Manager
Federico Caal	Environmental Education Officer/ Community Development Officer
Cecillia Guerrero	Project Manager

11.2.2 Administrative Staff

Darius Avila	Accountant
Kimberly Lawrence	Financial Administrator
Alaine Noralez	Accounts Clerk
Ishiamae Gomez	Front Desk
Paul Etienne	Information Technology Officer

11.3 PHMR Advisory Committee

Mr. Alex Leonardo	Association of Tour Guides in Toledo
Mr. Armando Ramirez	Rio Grande Fisherman Cooperative
Hon. Michael Espat	Area Representative
Mrs. Paula Jacobs	Chairperson Punta Negra Village Council
Mr. Roy Polonio	University of Belize-Toledo Campus
Mr. Lyndon Rodney/Victor Vasquez	Fisheries Department-PG
Mr. Charles Selgado	PG Town Council
Mr. Eloydia Cuevas	Monkey River Village Council
Mrs. Celia Mahung	Executive Director
Mr. Mario Muschamp	Terrestrial Manager
Mr. Ryan Moore	Marine Manager

11.4 TIDE Private Protected Lands Staff

Christopher Ical	Ranger
Reymundo Chen	Ranger
James Choc	Ranger
Leonard Teul	Ranger

11.5 Payne's Creek National Park Staff

Mario Muschamp	Terrestrial Manager
Leonard Williams	Head Ranger
Augustin Sho	Ranger
Liberato Pop	Ranger – Resigned in October
Norman A. Williams	Field Officer
Juan Cucul	Ranger – Hired in December

12.0 Conclusion and Recommendations:

2022 was a successful year for PHMR however with the continuation of COVID-19 we had prolonged periods where the team was not as effective due to hiring of new staff at the beginning of the year. Overall, the team was able to accomplish 95% (600) of planned patrols with 568 total patrols. We had a reduction in our numbers from the previous 3 years due primarily to the increase in fuel brought on by external forces for most of the year. The team was able to increase their efficiency by continuing to optimize their fuel consumption using 600 gallons less than the previous year. Coverage of the reserve remains high, with every zone receiving at least 1 patrol per week including areas just outside of the reserve.

Through the continued use of drones, we were able to be more effective in its use through our search and rescue operations, routine patrols, and mapping of islands within the reserve. We also received 2 additional underwater drones and an aerial drone with increased range towards the end of the year with which we hope to continue the removal of fish traps, gill nets and other illegal gear.

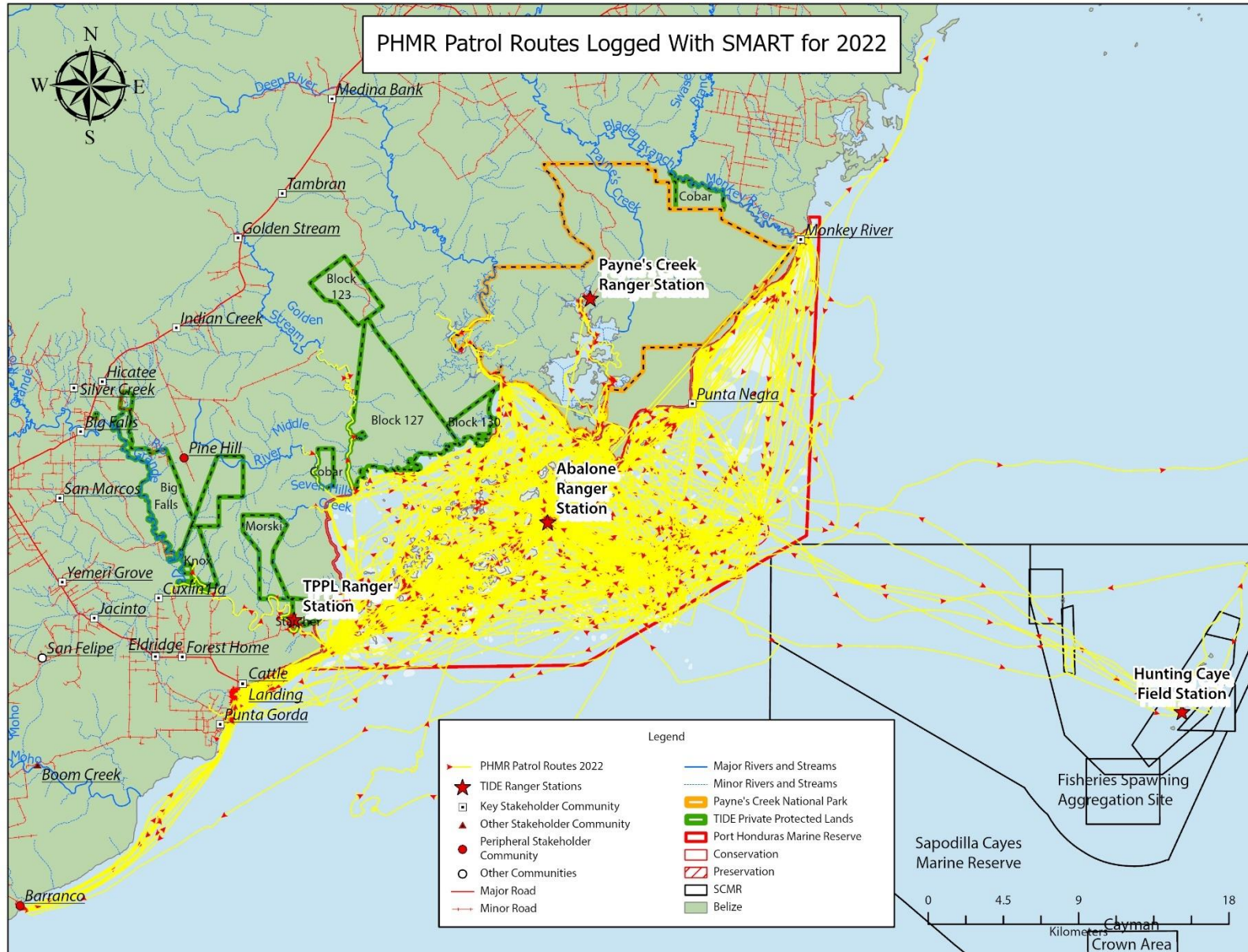
Recommendations

- Develop a 6-month training/orientation plan to rapidly increase the effectiveness of new rangers.
- Develop an Enforcement Strategy and an Enforcement Plan.
- Update the SMART Report to include temporal analysis and the predictive patrol feature of SMART 7.
- Increase Management Effectiveness guided by the gaps identified in the previous assessment.
- Incorporate research and monitoring activities where possible to increase the capacity of rangers.
- Continue to build staff capacity and introduce new technology to be more cost-effective in the management of the protected areas.
- Increase the use of signage around the reserve and produce and distribute a brochure to ensure that stakeholders are knowledgeable of the rules of the park.
- Advocate for the introduction of regulations for recreational fishers.
- Continue the development of Managed Access Implementation at the national scale.

TIDE and the team at Port Honduras Marine Reserve remain committed to ensuring that the ecosystems and the services provided to the numerous stakeholders are maintained for years to come. We would like to express our deepest gratitude to all those who have made the management of PHMR a success in 2022.

13.0 Appendix

Appendix 1: Patrol Routes in 2022



Appendix 2: Financials

Toledo Institute for Development and Environment Port Honduras Marine Reserve Income & Expense Report January through December 2022

Ordinary Income/Expense	
Income	
4001 · Grants	475,000.00
Total Income	<u>475,000.00</u>
Expense	
3001 · Equipment	25,764.87
3005 · Buildings	4,439.95
5001 · Salaries/Wages & Benefits	168,198.09
5002 · Travel & Transportation	647.13
5003 · Cleaning & Sanitation	1,499.57
5004 · Donations	
5005 · Dues & Subscriptions	90.00
5006 · Insurance, Licensing & Permits	7,586.30
5007 · Postage & Delivery	711.20
5008 · Profesional Fees	41,895.14
5009 · Public Awareness & Env. Ed.	27,223.13
5010 · Repairs and Maintenance	24,212.35
5011 · Supplies	5,134.79
5012 · Training	1,906.05
5014 · Board/Advisory Board Expense	789.94
5015 · Utilities	1,076.59
5016 · Telephone, Comm. & Internet	5,039.10
5017 · Bank Charges	1,148.96
5019 · Reserves & Parks Improvement	767.75
5020 · Net Working	8,119.06
5025 · Institutional Strengthening &	4,850.35
5026 · Research & Monitoring	36,209.52
5027 · Recruitment	1,103.69
5029 · TIDE Scholarship program	315.00
5035 · Surveillance, Patrol & Enforce	57,766.15
5036 · Disaster Prepaedness & Management	2,878.90
5037 · Community Development	35,365.19
Total Expense	<u>464,738.77</u>
Net Ordinary Income	<u>10,261.23</u>
Net Suplus(Excess)	<u><u>10,261.23</u></u>