

TOLEDO INSTITUTE FOR DEVELOPMENT AND ENVIRONMENT

ANNUAL REPORT

2020





2020 seemed very promising for the Toledo Institute for Development and Environment (TIDE) as our financial projections from 2019 indicated that we would have adequately covered our program and operational costs. The first quarter of the year was busier than ever with project implementation and hosting of student groups through TIDE Tours. Group reviews were positive and there was commitment for repeated travel to southern Belize. This positive outlook changed unexpectedly with the rapid spread and negative impact of Covid-19 worldwide. Numerous groups who had already booked with TIDE Tours, cancelled travel. For a couple months, we were hopeful that Covid-19 would go away, but by mid-year, we were confident that we could no longer rely on income from tourism.

We felt that protected areas managers, would soon be impacted by Covid-19 so we were prudent in revising our annual work plans, budgets and secured income to be able to make prudent decisions. We knew for sure that we would prioritize resource protection and quickly learned to be innovative in planning outreach activities in order to maintain communication with key stakeholders, while abiding by Belize’s Covid-19 restrictions. Our management staff rapidly adjusted to working virtually, and the field staff maintained full presence in the protected areas even during the country’s ‘lock down’ period. I believe that Belize’s public education on the pandemic along with TIDE’s Covid-19 preparedness and response plan, intended to guide our team to respond to the pandemic, proved useful as none of our staff got Covid-19.

2020 is behind us and despite the pandemic, I am confident that we maintained resource protection, carried out monitoring of commercial species, invested in community outreach and development and prepared adequately to be able to respond to the Covid-19 pandemic. We are grateful for the ongoing financial support from donors, leadership of our board of directors, dedication of the staff, support from the Forest and Fisheries Departments, and stewardship displayed by resource users.

Celia Mahung
Executive Director

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VISION

Toledo’s healthy ecosystems support biodiversity, communities and sustainable development.

MISSION

To engage stakeholders in the sustainable management of natural resources within the Maya Mountain Marine Corridor of southern Belize for the benefit of all.



2020 Highlights

There were 1388 patrols within the three protected areas; PCNP conducted 310, PHMR conducted 678 and TPPL with 400 patrols.



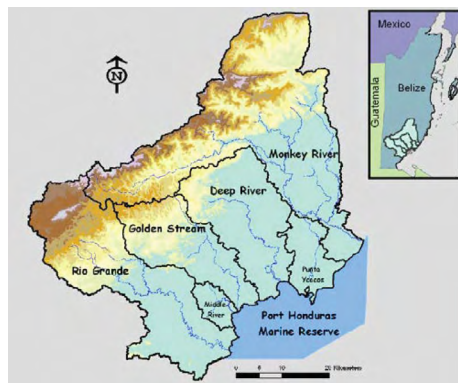
Prescribed burns were conducted in Deep River Forest Reserve (DRFR) and Payne's Creek National Park (PCNP) whereby 7500 acres was burnt to meet specific objectives.

About TIDE

TIDE is safeguarding biodiversity and natural capital in one of the most pristine parts of the Mesoamerican Biodiversity Hotspot, the Maya Mountain Marine Corridor of southern Belize. Recognizing the interdependent nature of this landscape and its people, TIDE works with stakeholders to implement holistic landscape-level strategies to preserve the natural processes and habitats that sustain biodiversity and people.

- Natural Resource Management
- Research and Monitoring
- Environmental Education
- Sustainable Development

Within the Maya Mountain Marine Corridor, TIDE manages three protected areas: Port Honduras Marine Reserve (TPPL), Payne's Creek National Park (PCNP), and the TIDE Private Protected Lands (PCNP). These areas protect at least 39 species of international concern, including jaguars, yellow-headed parrots, howler monkeys, tapirs, West Indian manatees, hawksbill turtles, and great hammerhead sharks. With a strong commitment to building local capacity for sustainable natural resource management TIDE allows for effective and inclusive community participation in all four of our program areas:



The Maya Mountain Marine Corridor is an 830,000 acre ridge-to-reef landscape that connects the Maya Mountains with the coastal waters and coral reefs of the Gulf of Honduras.

35 sea turtle nest sites with confirmed laying events with a total of 2694 hatchlings.

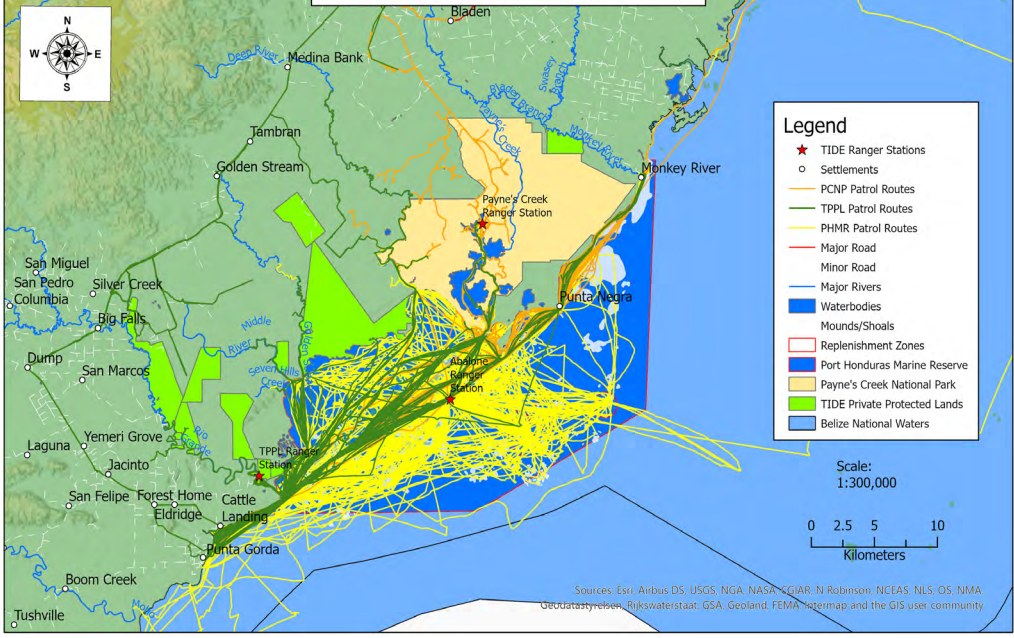


19 schools from buffer communities around TIDE's protected areas assisted with Covid-19 relief supplies and engaged in conservation related initiatives in their communities.

108 Civil Society Organizations and Civil Servants engaged in capacity building workshops to strengthen their management skills for efficient and effective service delivery, to promote transparency and accountability and to develop network based partnerships.



TIDE Enforcement Team Patrols for 2020



Sources: Esri, Airbus-DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Utdatavstyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap, and the GIS user community

European Union Project
 "Restoring Fisheries in the Mesoamerican Barrier Reef System"

The European Union project, "Restoring Fisheries in the Mesoamerican Barrier Reef System," has provided a significant boost in laying the groundwork for a bright future in Managed Access nationally. This was done through a significant contribution towards MPA enforcement, MPA capacity building, scientific studies of commercial species and community development of communities who rely directly on the fishing industry.

Major accomplishments for 2020, the final year of the project included hosting of a national fishing forum which was held in Hopkins with participation from fishers in Area 7, Area 5, Area 4 and Area 3. A total of 150 fishers were in attendance along with conservation partners from TIDE, BAS, SEA and the Belize Fisheries Department which brought the total persons present to over 225. The main objectives of the forum were to: (1) update fishers on the management of protected areas within areas 3, 4, 5 and 7, (2) discuss aspects of the EU project and (3) provide an overview of the new Fisheries Resources Act.



A total of 150 fishers were in attendance along with conservation partners from TIDE, BAS, SEA and the Belize Fisheries Department which brought the total persons present to over 225.

Resource Protection

PHMR Enforcement

TIDE co-manages the Port Honduras Marine Reserve (PHMR) (100,000 acres) with the Fisheries Department and the Payne's Creek National Park (PCNP) (38,000 acres) with the Forest Department. TIDE also manages over 20,000 acres called the TIDE Private Protected Lands (TPPL).

2020 was a successful year for TIDE's three protected areas. There were 1388 patrols within the three protected areas with few illegal activities. The patrols in PHMR yielded 16 infractions which resulted in the following: 4 verbal warnings issued and 10 gill nets and 2 longlines were removed from within the reserve. Other activities undertaken by the rangers included the continuation of the rehabilitation of Abalone Caye to address

Number of Patrols by PA

PCNP:	310 Patrols
PHMR:	678 Patrols
TPPL:	400 Patrols



SMART has continued to be advanced in its use throughout the different program areas of TIDE. Yellow Headed Parrot monitoring and Sea Turtle Nest Monitoring have now been fully incorporated into SMART. Future applications will be identified in order to streamline reporting processes.

The project carried out a training for 50 women in financial management and small business entrepreneurship. Women invited were from the 15 coastal communities under this project. Even though the trainings were for the women primarily, in communities such as Copper Bank, Chunox, Barranco, Temash and Punta Gorda, some men requested to be a part of the training and were granted permission to attend especially since our target of 50 women was not met. In northern communities this was more of a challenge as the male presence and authority seems greater than in any other part of the country. The PMU and consultants visited the homes and engaged the husbands explaining the goals of the project and action. It was felt that with more informed men, more doors for the women will be opened which will allow for more participation and engagement in capacity building trainings. There was presence of some women at public meetings but the numbers were smaller as compared to the southern communities where it was much more common and was seen without any source of discontent. Women fishers were recognized nationally at the Annual Fishers Awards held in March.

Average Increase in Knowledge: Pre and Post
 Marine Protected Areas - 17.8%
 Fisheries Regulations - 15.1%
 Managed Access - 31.4%
 Sustainability - 16.7%

A total of nine (9) community stewards were trained in-person and virtually. 3 Females and 6 males were trained from Barranco, Punta Negra, Monkey River, Seine Bight, Hopkins, Chunox and Copperbank. Pre and Post testing was done to establish the level of knowledge gained from the trainings which was on varying topics related to sustainable fishing and conservation. Participants were trained in marine protected areas, fisheries regulations, managed access, and sustainability which demonstrated an overall increase in knowledge.

PCNP Enforcement

The year 2020 was a productive year for the staff of Payne's Creek National Park despite the challenges brought on by COVID - 19 which included more human pressures brought on to the park. The team conducted a total of 310 patrols in and around the park. Fifteen infractions were recorded in the park and surrounding area. Infractions included three forest fires, 3 detected instances of poaching of game species, three illegal camps which were destroyed and several tracks in areas away from tourism activities leading into the park or neighboring Deep River Forest Reserve..



Tracks observed via the drone during land patrol. In this instance the tracks were observed while on land patrol and the drone was utilized to determine direction and infer intention.

Fire Management "The Good Face of Fire"

The staff conducted some 4000 acres of prescribed burns in Deep River Forest Reserve in February and some 3500 acres in Payne's Creek National Park in November/December - the first burns mimicked a lightning strike fire to meet specific objectives.



Park staff were able to provide basic fire management training for Southern Belize Fire Working Group (SBFWG) member's staff (Forest Department) and other interested partners in the Mountain Pine Ridge Forest Reserve and staff of the Fire Department. Staff also assisted with training for some 16 TNC US based Fire Fighters. Fire fighters were able to enhance fire management skills and obtain various levels of certification. Park staff also via a consultancy conducted prescribed Fire operations for Eco Futures Belize Ltd.

Fire Management Training

TPPL Enforcement

With ~400 patrols in and around the fifteen parcels which comprises the TIDE Private Protected Lands the rangers encountered nine persons and came across evidence of two others. Mostly, people were catching crabs around the boundary line, however three persons were caught conducting illegal fishing activities. Rangers shared information with users about the rules and regulations during patrols, whilst adhering to social distancing regulations.



Infrastructural Development

Continued investments were made in 2020 on the Starcher Property to facilitate visiting tour groups to the site. These included maintenance of the solar system, furnishing the new kitchen with cabinets and stove, tiling the kitchen floor, installing bathroom ceiling, and building a secure boat shed.



Bird Banding

In order to better monitor the status of resident and migratory bird species in the area, TIDE has established a MoSI monitoring site, and rangers attended several bird banding training opportunities, both within the park and with external partners in Belize. By December, staff were able to fully operate the site without assistance, and conducted their first monthly monitoring "pulse", which takes three to four days per month.





Community Development

CARSI

“Strengthening Civil Society and Civil Servant Capacity in Belize through Partnership.”

108 Civil Society Organizations have received training in the two workshops offered and a total of 79 Civil Servants have received trainings.

University of Florida (UF), in collaboration with the Belize Civil Society Organization (BCSO), Toledo Institute of Development and Environment (TIDE) and the Belize Ministry of Education (BMoE), Youth, Sports and Culture facilitated the project entitled “Strengthening Civil Society and Civil Servant Capacity in Belize through Partnership.” The purpose of this project is three pronged: (1) to enhance the capacities of the civil society sector in Belize through training on organizational management functions, (2) to provide technical support to civil servants to improve existing governance and community engagement practices, and (3) to promote networking between civil society organizations (CSOs) and civil servants to establish collaborative partnerships in public service, especially addressing issues faced by underserved communities. Project activities were implemented in Belmopan, Belize City and Punta Gorda.

108 Civil Society Organizations and 79 Civil Servants have received training in the two workshops offered. There has also been a Community of Practice formed between members which was a direct benefit of the project.

Toledo Institute for Development and Environment

A final meeting took place with members of Punta Negra who felt that the plans captured the priorities highlighted in the 2019 workshop, however identified more emergent community needs in the wake of COVID-19 in 2020. The community identified an interest in producing coconut oil to sell, since they cannot rely on tourism for the foreseeable future. Therefore, an addendum to the plans was created with a new strategy for this activity. Other community plans also saw such changes occurring and with the support of PACT we hope to implement these changes in 2021.

Community Development Plans
 “Punta Gorda, Monkey River, Punta Negra”



For 2020, TIDE community researchers program was able to complete additional trainings for 4 community researchers. Anthony Rash and Eeryn Bowden have now successfully completed their Dive Master training and Nicole Coleman and Aurelia Sho are now Advanced Open Water divers. The program also saw the addition of three new community researchers in Jovann Palacio, Alejandro Choc and Eddison Cal. All trainings were completed by TIDE’s past community researcher, Willie Caal.

Community Researchers

For the 2019 - 2020 school year, 42 students in Secondary School were able to receive assistance. Toledo Community College, Julian Cho Technical Highschool, Providence Highschool and Independence Highschool. 9 students successfully graduated of which 5 were from fishing families.

TIDE is thankful to Joppa Flats (Mass Audubon Society) and Ilda Atkinson who have provided book scholarships to 42 students of the Toledo District.

TIDE Scholarship Program





Research and Monitoring

Lobster

Mean abundance and mean carapace length from 2020 were compared with previous years' data (2017-19) using TIDE's 2019 Port Honduras Marine Reserve Benthic Commercial Species Update Report. Based on trends from over the last four years, spiny lobster abundance showed a gradual decline in all management zones from 2017-2019 and the decline continued in 2020, with CPUE of 1.3-2.0 lobsters hr⁻¹. Mean carapace length however showed a steadier trend and in 2020 was similar to the previous years, ranging from 7.6-9.7 cm.

Overall lobster abundance was very low with most lobsters measuring just above the legal size and in general larger lobster being present at the end of the open season, in February. Whereas in previous years male lobster were the more abundant, in 2020 males were more abundant only at the end of the closed season in May. There were also a lot more mature and reproductively active females in February than May.

A combination of annual fisheries dependent (catch data), along with fisheries independent (LAMP surveys and other population surveys) will allow TIDE to assess the structure of the harvested portion of the population on a long-term basis. This would then enable more accurate trends on how the fishery may be impacting the population, and thereby better inform adaptive management of the spiny lobster fishery within the PHMR. The establishment of monitoring sites nearby lobster shades will assist in testing theories on whether shades attract lobsters from their natural habitat. Given the fact that lobster abundance and behavior is affected by environmental factors such as temperature among other 16 physical factors should be included in seasonal surveys and regular monitoring. Finally, similar to the queen conch fishery, studies to ascertain lobster spawning and recruitment areas should be conducted as previously recommended.

Conch

Data from 2020 was compared with previous years using TIDE's 2019 Port Honduras Marine Reserve Benthic Commercial Species Update Report. Based on 2019's data, conch was either similar or more abundant in 2020 in all the management zones, with a general upward trend. Shell length and lip thickness however were lower in 2020 than previous years, with mean shell length of between 200-230 cm in the three zones in June 2019, versus 179-197 cm in May 2020; and mean lip thickness of 4-11 mm in June 2019 versus 3.0-5.4 mm in May 2020.

Note that these results were all at the end of the conch fishing season and reflect population trends exposed to exploitation. Since there were no surveys done at the end of the closed season, when some recovery and recruitment into the area is expected, no data was available for comparisons on potential increases in abundance or population structure, in the absence of fishing pressure.

In conclusion, as previous PHMR reports have shown, and other scientific publications within Belize and the region on conch maturity have suggested, the conch regulations should be revised to introduce a management measure for lip thickness that factors in the size relating to 50% maturity. In addition, once data is available on conch landings and catch as outlined above, combined with LAMP data, an annual catch quota for Fishing Area 5 (PHMR) should be developed using population data on abundance, size, biomass and maturity to allow for more sustainable harvests based. Unless these actions are taken, in spite of other existing management regimes, conch populations will continue to decline.

Coral Reef Health

The coral reefs of Port Honduras Marine Reserve are in poor health. While coral cover is fairly healthy fish populations are poor, and declines in health have been identified from previous years. Given the range of anthropogenic impacts to these coral reefs such as land-based runoff including nutrients and pesticides from Belize and the Gulf of Honduras, along with overfishing and the overlying threat of global climate change, evidenced through annual coral bleaching events, there needs to be an expansion of annual coral reef monitoring efforts. Since these reefs are near shore and subject to runoff from land including sedimentation and nutrients, reef health monitoring needs to include water quality parameters, especially at these long-term sites and other strategic areas from shore and across the PHMR. Parameters such as water temperature, dissolved oxygen, turbidity, nutrients, sedimentation and pH should be regularly monitored. In addition, given the ever-present threat of coral bleaching, sea surface temperatures must also be monitored throughout the year using in situ temperature loggers at established coral monitoring sites to detect elevated heating periods. Lastly in order to effectively assess the recovery and resilience of the PHMR coral reefs to coral bleaching, permanent transects including tagged corals must be established on the existing ten monitoring sites to be able to conclusively track the health of the corals.

In terms of management strategies to help improve reef resilience, programs that focus on developing sustainable practices for the use of fertilizers, pesticides and farming techniques should be established with organizations in the area to help reduce land-based runoff and sedimentation, which negatively affect coral health and reduce resilience. Also reducing fishing pressure by ensuring effective enforcement of existing fisheries laws, promoting sustainable fishing practices, setting size limits for commercial species and establishing an effective fishery catch monitoring program to provide comprehensive data on fishing effort to guide management actions, will be important to help reduce fishing pressure and build resilience of these coral reefs.

Sea Turtle Nest Monitoring

In 2020 TIDE with the guidance of Linda Searle from ECO-MAR Belize restarted its Sea Turtle Nesting Beaches monitoring program. At TIDE the program was carried out in joint partnership between the Payne's Creek National Park and the Port Honduras Marine Reserve Ranger Team. The PCNP team monitored the Punta Ycacos to Monkey River beach and the PHMR team monitored the snake cayes. Monitoring started in August and concluded November 25 of that year for a total of 17 weeks.

35 nests were recorded throughout the Punta Ycacos beach comprised solely of Hawksbill nests. 18 of those nests were predated by Racoons and Grey Foxes. About 6 nests were damaged by inundation either due to location or hurricanes Eta and Iota which had an impact regionally. Overall the 35 active nests yielded 4,661 eggs and 2,694 hatchlings.



The 2020 monitoring season for the Yellow-headed Parrot (YHPA) in Payne's Creek National Park and the Deep River Forest Reserve (DRFR) included the restoration or replacement of deteriorated nests, initial checks to nests, monitoring of active nests, patrols to deter poachers, extraction of chicks and the re-release of the previous years chicks.

In total, 29 nests were active for 2020 yielding 68 eggs. 51 chicks successfully hatched with 16 who fledged without intervention and 19 chicks were extracted and sent to the Belize Bird Rescue (BBR) for captive rearing and will return in 2021. Additionally, 17 parrots were re-introduced into the wild population. These were chicks that were extracted during the 2019 breeding season and captively reared at BBR. These parrots were brought to PCNP and housed in a soft release enclosure over a few weeks. TIDE staff fed the returned parrots daily and after a few days, the soft release enclosure was opened to allow the first group to exit and slowly integrate into the wild population in PCNP.

Unfortunately 7 nests were predated and 2 nests were poached but overall this concluded a successful YHP nesting season for both the PCNP and DRFR.

Yellow Headed Parrot Monitoring

YHP Monitoring

Total number of nests*	29
Total number of eggs	68
Total number of hatched chicks	51
Total number of fledged chicks	16
Total number of extracted chicks	19
Total number of fledged nests	9
Total number of predated nests	7
Total number of abandoned nests	4



Education and Outreach



Engagement and development of communities buffering TIDE's protected areas is vital in ensuring the long term sustainability of TIDE's work. With children and youth being the most influential group in terms of behavioral change, much of TIDE's Education and Outreach program focuses on youth programs. TIDE also engages communities through development programs, livelihood projects, and capacity building, which seeks to reduce the pressure on natural resources from local communities.

With funds from UNICEF and PACT, TIDE reengaged 19 schools who submitted a letter of interest to be involved in addressing environmental issues in their communities from removing litter, installing bins to making environmental signs in their respective communities. However, due to COVID-19 games were cancelled but nevertheless, all 19 schools were provided with COVID-19 cleaning supplies to continue the fight against the virus before it affected households. These packages were used at the schools when parents visited to collect learning packages for their children.

TIDE Freshwater Cup

19 Schools were engaged, completing their environmental projects and had received COVID-19 cleaning supplies.

As a part of TIDE's Reef Week activities, 19 schools were en-

gaged in poster and book competition. The posters and books illustrated the knowledge of the reef and highlighted major importance of biodiversity and livelihood. Top posters were from St. Peter Claver RC, St. Benedict RC and Indian Creek R. School. Toledo Community College and Julian Cho Technical High School submitted well put together books with illustration on the significance of the reef. Students from the said schools were awarded with boxes of stationaries which were shared among the participants.

Top posters and books were from St. Peter Claver RC, St. Benedict RC, Indian Creek R. School, Toledo Community College and Julian Cho Technical High School.



There were a total of 10 Live events highlighting Reef Week, Fire Management, Watersheds, Freshwater Cup and others. The live events had key messages on COVID-19 and addressed environmental issues in the stakeholder communities.

Radio and Facebook talk show



Left: Federico Caal, the Education and Outreach Coordinator, August 21, 2020 speaking about biodiversity and highlight mammals. <https://www.facebook.com/351657354900894/videos/320681892416520>

Right: Federico Caal, the Education and Outreach Coordinator, and Ryan Moore, Protected Areas Manager, on November 24, 2020 speaking about the freshwater cup and an introduction to the Port Honduras Marine Reserve. <https://www.facebook.com/351657354900894/videos/1041025016311603>



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Financial Sustainability

TIDE Tours

TIDE's Financial Sustainability program had a busy start to the year with bookings from established partners during the first three months (POD Volunteer, Discover Corps and Ecology Project International). We also welcomed students from Broward Community College in Florida for their first trip to southern Belize. The students worked alongside woodworking students from Toledo Community College to build new picnic benches for the cafeteria at St. Benedict's School in Punta Gorda, as well as screening the dining area and painting signs for the school.

Unfortunately, the COVID-19 pandemic meant that no tours took place during the remaining months of the year. TIDE Tours staff were retained for a short time until it was no longer feasible. During the remaining months of the year, communication was maintained with partners to stay abreast of travel programs for 2021 and beyond. Following the launch of the Belize Tourism Board's new COVID-19 safety standards, TIDE Tours achieved the new Gold Standard Certification in December, which included developing safety guidelines and operational procedures to prevent the spread of the virus during tours, purchasing PPE and cleaning and sanitation supplies, adding signage to vehicles, offices and tour sites, and conducting training with staff. Despite the challenges faced in 2020, engagement with partners has been very positive, with most planning to travel again as soon as possible.



Governance

Victor Jacobs - Newly elected member to represent PHMR Advisory Council

Leonardo Castro - Newly elected member to represent PCNP Advisory Council

TIDE is governed by a Board of Directors that works closely with the executive director to achieve the organization’s mission and goals.

One way of involving local community at the governance level is to include a representative of the advisory councils on the Board of Directors. This year, Victor Jacobs was elected to represent the Port Honduras Marine Reserve Advisory Council and Leonardo Castro, to represent the Payne’s Creek National Park Advisory Council on the Board of Directors. These individuals who are both fisher-folks and tour guides, possess a wealth of local knowledge which is needed to inform the management of the protected areas.

Despite Covid-19, the Board of Directors remained active and met several times to discuss important matters of the organization. Some board members were introduced to using virtual platforms and quickly adopted to using them for regular meetings.

We regret to inform of the passing of Alexander ‘Sonny’ Garbutt – one of the community representatives who had served on the board of directors for a number of years.

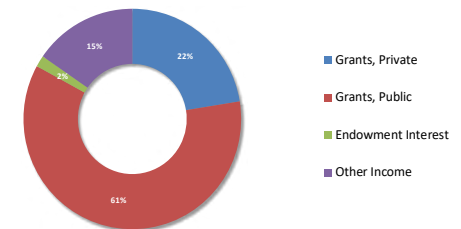


Finances

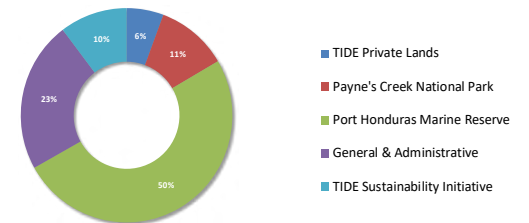
The total 2020 income was US\$ \$1,095,205 from various sources. From private grants (22%), public grants (61%), endowment interest (2%), and other income (15%). We are extremely grateful for the support of all our 2020 main funders, including the European Union, Protected Areas Conservation Trust, Government of Belize through the Tropical Forest Conservation Agreement, Mass Audubon, Oak Foundation, MAR FUND, Overbrook Foundation, World Environment Center, Summit Foundation, and WWF.

2020 expenses were US\$ 990,556 comprised of Port Honduras Marine Reserve (50%), Payne’s Creek National Park (11%), TIDE Private Protected Lands (6%), TIDE Sustainability Initiative (10%) and General & Administrative at (23%).

2020 Income (USD)



2020 Expense (USD)





TIDE

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