Our seventh year was filled with exciting findings, continued support to and communication with our many collaborators and partners. The Coastal Resilience Program continued long-term monitoring of important fisheries, spawning aggregations and ecosystems at the Turneffe Atoll Marine Reserve; they also took first steps at rearing coral to assess its viability for future restoration efforts.

The Sustainable Landscapes Program expanded long-term monitoring for vegetation, birds and wildlife to cover protected areas from north to south. A highlight this year was the publication of 14 years of monitoring work in the Cockscomb Basin Wildlife Sanctuary. Over 100 individual jaguars were identified with a record maximum age of 14 years for one of them.

Our capacity building efforts continued through our student volunteer/intern program, teaching in the Natural Resources Management Program, training of practitioners through the National Training Program for Protected Areas Management and other efforts.

We also informed policy and decision-making for natural resources the national level. This all was made possible through our hard-working staff and the support of the University and its Board of Trustees, our Steering Committee, and our numerous partners and donors.

We hope you enjoy this year’s report and welcome your comments and support always.

Dr. Elma Kay
Administrative Director
I was very pleased to be a part of the activities of the UB ERI during my first year at UB as I am in sharing some perspectives on its 2017 Report.

The UB ERI is still a young and the only research institute of our National University, which celebrated its 20th Anniversary this year. When the UB ERI succeeds, it helps to fulfill the mission of the University, which is about teaching, research and outreach. As you read this report you can appreciate the ERI’s impact on our teaching, especially in our flagship Natural Resource Management program, and of its research and outreach that impact our better understanding on the protection and conservation of our marine and terrestrial Belizean environment. Belize’s natural environment is one which the world is waiting to see and experience, from its barrier reef and the magnificence of its corals and rich marine life to its majestic and prized forests, home to exotic wildlife like its prized Jaguar and birds. So the work which the UB ERI and by extension the UB produces, is of prime importance to Belize’s own sustainable future, growth and prosperity as it is to preserving the world’s heritage for generations to come. I applaud this work without reservation and commend the research faculty and staff of the institute for their efforts.

As President of UB, I cannot but thank the many Project sponsors and donors who support the work of our ERI - the OAK Foundation, Panthera, the Belize Audubon Society and the many other international universities and local organizations together with the private sector whose contributions make the work happen at the UB ERI. Your steadfast support including that of the Government and people of Belize is crucial for the UB ERI to deliver on its mandate, one that is contributing so significantly to saving this small but extremely beautiful Belizean part of our tropical planet, for generations to come.

My congrats to the UB ERI on its 2017 Report.

Prof Clem Sankat, PhD, CEng.
President
University of Belize
The University of Belize Environmental Research Institute (UB ERI), inaugurated in January 2010, was created primarily to address the large gap in local capacity for research and monitoring that exists within Belize.

MISSION:
The University of Belize Environmental Research Institute continuously builds national scientific capacity for the effective management, sustainable use and conservation of Belize’s natural resources.

VISION:
As the premiere environmental research institute in Belize and highly respected in the region, UB ERI provides sound science and creates a culture of evidence-based decision-making in the public and private sector in areas relevant to Belize’s sustainable development.

OBJECTIVES:

- To provide a mechanism for research that meets the natural resource management needs of Belize as identified in national plans and policies;

- To undertake teaching and training in environmental-related fields at the undergraduate, post-graduate and professional levels to build local capacity;

- To provide for the coordination and integration of environmental research to inform and influence decision-making regarding formulation of national policies, plans and laws;

- To engage in national, regional and international collaborations for research, training and implementation of management and conservation initiatives; and,

- To develop the appropriate mechanisms to enable self-sustainability including the provision of technical services to public and private entities engaged in the use and management of natural resources.
Coastal ecosystems provide important goods and services to our country that support our economy and livelihoods and contribute to human well-being.
Belize’s marine resources provide fishery products that form an economically important export fishery for queen conch and spiny lobster, with annual revenues of BZ$14 million. Besides this export fishery, the local fish trade is also sustained by the coral reef, mangrove and seagrass ecosystems, which ensure the necessary habitats for fish production. Besides fisheries, our marine resources also support our thriving tourism industry.

The backbone of the Belize Tourism Industry is the Belize Barrier Reef and its associated mangrove and seagrass ecosystems. Without these resources, our tourism product would collapse. The coral reef, seagrass and mangrove ecosystems also provide crucial shoreline protection services that help protect our coastal towns and villages from hurricanes and coastal erosion. Removal of mangroves and seagrass increases the loss of shoreline through erosion and reduces the ability for our coast to buffer the effects of storms. There are many other biodiversity and regulatory services such as water quality and recreation that these ecosystems provide.

The continued provision of these ecosystem goods and services are threatened however by unsustainable development, overfishing and global climate change.

We need to maintain the health of these ecosystems to make them resilient to localized anthropogenic disturbances, and especially to climate change where we have already seen large-scale impacts of elevated sea surface temperatures. Given the various anthropogenic threats facing Belize’s marine ecosystems and the global impacts of climate change, the focus of UB ERI efforts is placed on exploring strategies to build and maintain coastal resilience, this includes resilience of coral reefs, mangroves and sea grass to ensure that these systems are able to remain healthy and functional.

The goal of the Coastal Resilience Program is to maintain healthy and functional marine ecosystems so that they continue to provide the goods and services to support human well-being and Belize’s economy.
Objectives:

1. Enhance the resilience of coral reef, seagrass and mangrove areas within the Turneffe Atoll Marine Reserve through research that informs management interventions.
2. Develop a climate resilience index for Turneffe’s coral reefs, seagrasses and mangroves using appropriate indicators, for use by managers.
3. Determine the impacts of unsustainable land use practices on the resilience of marine ecosystems within the offshore atolls.
4. Promote sustainable fishing practices and develop fish stock rehabilitation programs for Turneffe Atoll, and at the national level.
5. Develop and implement tourism and fisheries management strategies to build resilience of coral reefs, seagrasses and mangroves, including regional guidelines, compliance requirements and best practices for developers.
6. Develop alternative aquaculture programs and projects along with relevant sectors.
7. Build collaborative partnerships with the fishing and tourism industries to effect positive change to enhance coastal resilience.
8. Develop and implement communication strategies focusing on policy and decision makers, resource users and private sector for biodiversity conservation, climate change adaptation, ecosystem services.

CONCH AND LOBSTER SURVEY RESULTS RELEASED

In 2016 and 2017, surveys were conducted, through the Long-term Atoll Monitoring Program Protocol (LAMP), to assess important fishery species such as the Caribbean Spiny Lobster, Panulirus argus, and Queen Conch, Strombus gigas, to determine the trends of their populations within the TAMR.

QUEEN CONCH

During the closed season (July 1st to September 30th) there has been insufficient recovery of the species during its breeding season. Both years showed that the population consisted mostly of sexually immature juveniles.

Most importantly, density of sexually mature individuals was well below what has been recorded as the critical number of individuals per hectare for successful reproduction.

CARIBBEAN SPINY LOBSTER

Caribbean Spiny Lobster, on the other hand, showed an increase in relative abundance during the 2017 closed season (February 15th to June 14th) suggesting that the closed season, which prohibits extraction of the species, is allowing some recovery.

Overall, for both conch and lobster, there has been no significant difference between the general use and conservation zones.
SPAWNING AND AGGREGATIONS - SNAPPERS AND GROUPERS MONITORING

Groupers and Snappers are the primary economic and cultural species in Belize. These species have been fished in the region for decades, with the only regulation being closed fishing areas and season during their spawning months, and size limits for Nassau Grouper, Epinephelus striatus.

Through fishery-independent data collection, the UB ERI team conducts Spawning Aggregation monitoring (SPAGs) at two of the few remaining SPAGs sites in Belize; the Mauger Caye SPAG site for Groupers and the Caye Bokel Multispecies SPAG site for Snappers. Both sites are located at the Turneffe Atoll Marine Reserve (TAMR).

The UB ERI works in tandem with the co-managers, the Turneffe Atoll Sustainability Association (TASA), for science-based management, therefore acting as an important partner towards a sustainably managed marine reserve.

The 2017 season, January to May, was met with challenge.

The team discovered that the aggregations were seemingly moving away from historically recorded locations, moving to greater depths. Illegal fishing activities at these sites was also found.

*Results Revealed:*

**GROUPERS**

Mean size of the Nassau Grouper was recorded at 651mm using a laser and video sizing system adopted to capture accurate size estimation, and a mean maximum count of 373 individuals was recorded.

Black, Tiger, Yellowmouth and Yellowfin groupers were also observed at the Mauger Caye SPAG site in small numbers (<20). While aggregation and other spawning behaviors were observed, no actual spawning was witnessed.

**SNAPPERS**

The Snapper aggregation observed at the Caye Bokel Multispecies SPAG site was a mixed school of Dog, Cubera, Gray and Mutton Snappers with fish located at greater depth than recreational divers are allowed and therefore no accurate size estimation using the laser and video sizing system could be obtained.

A mean maximum count of 808 snappers were recorded in the 2017 spawning season.
RESTORING BELIZE'S CORAL REEFS

In the summer of 2016, the UB ERI Coastal Resilience Team conducted their annual ecosystem health & status monitoring. In October, the team also started piloting sexual coral restoration at Turneffe as a tool to enhance the health and resilience of the reefs in the atoll.

Results Revealed:

From these surveys, we saw a fair amount of coral cover. Fair in this case is an intermediate state of reef condition. It is neither good nor poor, but it is in a position of vulnerability.

Looking at the species composition of the coral that dominate our reefs, the large reef builders that provide opportune habitat for fish, lobster, urchins, etc., are not in the abundance that they once were. This is notable from large coral skeletons of branching and boulder corals at many Turneffe reef sites.

These massive coral species that form massive coral colonies are incredibly slow growing, and they live for hundreds and some even thousands of years. It is alarming to see recent death of such old coral.

With declined coral populations and the onset of threats such as those associated with climate change, the future of coral reefs is in question.

The application of reproductive intervention techniques for coral have been utilized nationally, regionally, and globally to attempt to increase the resilience of coral reefs.

Our Marine staff and volunteers, through training, collaboration, and partnership with the laboratory of Dr. Anastazia Banazhak of the Universidad Nacional Autónoma de Mexico – Instituto de Ciencias del Mar y Limnologia, conducted, a pilot effort to rear recruits of Orbicella faveolata, “mountainous star coral,” near Calabash Caye to assess the viability of this technique for future reef restoration within Turneffe.
Coral reefs are in decline globally due to a range of anthropogenic factors and global climate change.

In Belize, our reefs have declined from over 40% cover in the early 1990s to an average of 10-15% cover in 2015 across most sites. This decline has resulted primarily from bleaching, disease, loss of grazers, nutrient pollution, overfishing, unsustainable land use practices, uncontrolled and unsustainable tourism, and climate change.

These impacts affect the natural balance of processes on coral reefs that maintain good reef health and reef resilience such as coral recruitment and growth, grazing, high live coral cover, low macroalgal cover, accretion and bioerosion.

The increase in health and resilience of a coral reef therefore involves ensuring the right balance among these various factors.

The UB ERI focuses its efforts on monitoring these.

O. faveolata, "mountainous star coral"
Forests free the atmosphere of millions of tons of carbon annually storing it in the soil as well as their roots, stems, and leaves.

Approximately 60% of Belize is covered by forests, but these are under threat.
With approximately 60 percent of its territory still under forest cover, Belize is considered one of the world’s highly forested nations. Forests and other terrestrial ecosystems across the country are responsible for the country’s freshwater and food security, as well as many other ecosystem goods and services responsible for the country’s health and wealth. Water generation, flood control, soil generation, clean air, carbon storage, climate regulation, and biodiversity including pollinators and organisms that control pests, are among the most important of these goods and services. But the pressures on the ecosystems that generate these is mounting, with clear cutting of forests and alteration of wetlands and other habitats for unsustainable uses. Hence, it is critical to balance people’s need with the maintenance of ecosystem functions. As a response to this need, the UB ERI has a program dedicated to the promotion and creation of sustainable landscapes in Belize.

“The goal of the program is to enhance, maintain and/or restore ecosystem services and climate change resilience across landscapes for the well-being of the people of Belize.”

The program aims to achieve this goal through the generation of scientific results and their application to management and decision-making, direct support to stakeholders, and effective communication.

Objectives:

1. Improve our knowledge of ecosystem services and functions, and their contribution to human well-being through targeted research.
2. Reduce the largest threats to ecosystems and their functions though research application that increases acreage under sustainable practices, monitoring/early warning systems, and communication with stakeholders.
3. Increase the resilience of communities, industry and ecosystems to climate change by improving the stakeholder capacity for improved practices, restoration and management, and establishing effective public-private alliances.
4. Improve policy and governance systems for the sustainable management of ecosystem goods and services by providing scientific evidence, increasing public awareness of their importance and building public support for maintaining their integrity.
The UB ERI worked to fill gaps in knowledge through the Sustainable Forestry Project (SUSFOR) and the development of Belize’s National Herbarium (BRH).

*A herbarium can be thought of as a library, but instead of books it is stocked with carefully preserved plants containing detailed information on their taxonomic classification, ecology, habitat and location among other things.*

The SUSFOR Project started in 2014 and supports our understanding of how our forests work to store carbon, and respond to climate change, and the impact of logging, hurricanes and fires. With support from the United Kingdom’s Darwin Initiative, the UB ERI in partnership with the Belize Forest Department (BFD) and the University of Oxford worked in five 1-ha permanent forest plots, including the first established in a pine forest in the Mountain Pine Ridge (MPR). Research assistants and interns assisted the measurement of stem and soil respiration, leaf litter and monthly tree and root growth.

This research is generating data on tree growth and regeneration to support timber management decisions. It also tells us of the carbon storing potential that supports Belize’s commitment to reducing emissions from deforestation and forest degradation.

*Over 600 trees were taxonomically identified* within the plot in the MPR with the assistance of Dr. Steven Brewer and we also worked closely with the BFD and others to develop the BRH as a tool for teaching and research.

*Four volunteers were recruited and two interns assisted in mounting and databasing ~400 specimens* to add to the collection of 11,000+ plants and fungi at BRH.

Additionally, the Epiphytes of Belize Project in collaboration with Marie Selby Botanical Gardens and the Caves Branch Botanical Garden contributed 500 mounted and databased specimens along with another 3000+ that were sorted and organized.

The herbarium collection can educate future plant scientists and support research in areas ranging from plant ecology to medicine.
LONG-TERM BIRD MONITORING FOR IMPROVED NATURAL RESOURCES MANAGEMENT

The UB ERI coordinates a long-term effort to monitor birds in Belize. This started in 2016 in partnership with Black Rock Lodge (BRL) and the Belize Audubon Society (BAS). The effort follows the Monitoring Overwintering Survival protocol (MoSI).

Birds have always played a very important role in the environment through pollination, pest control and nutrient cycling. Bird watching of Belize’s ~600 resident and migrant species, has also become an important tourism activity and income source.

*The aim of “bird banding” is to monitor the survival of wintering migrants to determine what affects populations (positively and negatively) and where and when to direct conservation efforts.”*

Birds are safely captured and extracted from fine mesh nets and a small aluminium ring with a unique identifier is placed on their leg. Recaptured birds provide information on the health, preferred habitat and movement/migration patterns. Comparison of data across sites tells us about species distribution and use of specific habitats.

During the 2016-2017 season, the BRL station was expanded and a station was established at Cockscomb Basin Wildlife Sanctuary (CBWS) by the UB ERI’s Avian Biologist, a lead bander from the US, two BRL tour guides and a CBWS ranger. The BFD, Institute for Bird Populations (IBP), and the American Bird Conservancy provided invaluable support for the season’s effort.

To improve the efficiency and use of bird data, the UB ERI successfully obtained funding from the Biodiversity Information Development (BID) program led by the Global Biodiversity Information Facility (GBIF) for mobilization of un-compiled data into eBird and GBIF. Data was contributed by the UB ERI, BAS, Foundation for Wildlife Conservation, Toledo Institute for Development and Environment, and Ya’axche Conservation Trust.

974 birds were banded, comprising a total of 98 species (30 migrants and 68 residents)

27 students from the University of Belize’s Natural Resources Management Program received the birds component of the Field Methods and Assessment course. The students were exposed to both theory and practical aspects of bird research and monitoring.
Belize has an incredible diversity of wildlife that includes five cat species. At the UB ERI, our collaborative wildlife research with Panthera helps us understand the ecology of species of conservation concern and to inform conservation and management decisions.

We use a variety of monitoring and analytical tools to assess wildlife populations. This year we worked with BAS, Corozal Sustainable Future Initiative (CSFI), and a graduate student from the University of Florida on camera trap surveys across six protected areas from Shipstern and Freshwater Creek Forest Reserve in Corozal, St. Herman’s Blue Hole National Park (SHBHNHP) and Ian Anderson’s Caves Branch and Jungle Lodge in Cayo, Cockscambas Basin Wildlife Sanctuary (CBWS) in Stann Creek, to the Golden Stream corridor landscape in Toledo.

CAMERA SURVEYS

Initial comparisons of jaguars from the survey in the northern corridor with our jaguar database indicated a female who has resided in the area for a minimum of ten years. At our long-term jaguar monitoring site in Cockscomb Basin Wildlife Sanctuary, a notable outcome was detection of a female that may be the oldest wild jaguar detected from camera trap surveys! (see more in highlighted story). At SHBHNHP and Caves Branch, several jaguars and ocelots were detected crossing the highway indicating it is not yet a barrier to movement at this location.

JAGUAR - LIVESTOCK CONFLICT RESOLUTION

In addition to camera surveys, we continued work in the Central Belize Corridor with the conflict resolution program.

This year we monitored jaguar visitation rates at farms and tested farm improvements so as to provide information to reduce jaguar-livestock conflict.

NATIONAL SURVEY OF WILDLIFE USE

We also completed a national survey of wildlife use in collaboration the Wildlife Conservation Society to identify the use of wildlife as pets, for consumption, and the use of their teeth and skin for ornamental purposes; 1,500 respondents from across Belize were interviewed. Initial results indicated extensive use of wildlife across the country, including the infancy of a more systematic trade in jaguar teeth that has damaging implications for jaguar conservation.
In 2010, at the inception of the UB ERI, we entered into a partnership with Panthera, an international non-governmental organization dedicated to the conservation of cats in the wild. As part of that partnership, our Wildlife Research Fellow, Dr. Bart Harmsen continued to lead a long-term monitoring program at the CBWS in collaboration with BAS and BFD. This year Dr. Harmsen and co-authors published the results of the 14-year (2002-2015) monitoring program in the open access, peer-reviewed journal Plus One.

The study focused on estimating the life history features and abundance of jaguars in the Cockscomb, where they are protected. During the study over 3,000 photographs of jaguars were “captured” using remote cameras. On average, males were photographed twice as many times as females, likely due to social variation in trail-walking behaviour between the sexes. Through the photographs taken, 105 individual male and female jaguars were identified.

Survival was found to be high and constant for both sexes and a maximum age of 14 years was recorded for one of the individuals; one of the longest records of jaguar survival in the wild. Apart from some transients, the CBWS seems to hold a relatively stable population of resident jaguars. Therefore, the study provides solid evidence that the Sanctuary has been effective in fulfilling the primary purpose for which it was set up: to protect Jaguars. This is thanks to the dedicated efforts of our partners at BAS and their co-management of this protected area with the Government of Belize.
OUTREACH & PUBLIC ENGAGEMENT

STUDENT ENGAGEMENT

From August 2016 to July 2017, we had seven (7) active student volunteers and one (1) international intern. They participated in a number of activities, including the Young Marine Explorers program (YME) that hosted students from primary schools to the Calabash Caye Field Station (CCFS) for hands-on learning activities, involving fisheries surveys of Queen Conch and Spiny Lobster and Spawning Aggregation monitoring at fish spawning sites at Turneffe Atoll Marine Reserve (TAMR). They received training in fish ID for reef health surveys and two of the most outstanding volunteers received SCUBA certification as Rescue Divers.

We had an international intern who assisted with YME, raised awareness on plastic pollution, and collaborated with Turneffe Atoll Sustainability Association (TASA) in identifying lobster trap sites at TAMR. The UB ERI keeps the pulse of the Turneffe Atoll Marine Reserve (TAMR) through yearly monitoring activities. A priority for the UB ERI is accessing the rate of change of important commercial species and their ecosystems within the atoll.

Under the Natural Resources Management Program at the University of Belize, we delivered the Fisheries Management, Coastal Zone Management, Forest Ecology Management, Wildlife Management and Field Methods courses to 54 students in total. This year we also had four long-term interns helping in the wildlife program.
Thirty-five (35) participated in two courses in Conflict Resolution and Negotiation funded by the Oak Foundation as part of a Syracuse University-UB ERI collaboration. The sessions were very interactive and participants shared that they learnt a lot about themselves and how to deal with conflict as it pertains to their work.

Thirteen (13) participated in the Operations Policies and Procedure training for the Scarlet Macaw Bed and Breakfast Group (SMBBG) that was funded by the Belize Audubon Society (BAS).

An Operations Policy and Procedure Manual was also developed for the group to strengthen its overall operations.

Seventeen (17) participated in the Wildlife Monitoring training, funded by the Darwin Initiative and delivered by UB ERI staff members.

The workshop revolved around the process of setting up a monitoring program (camera trapping) for larger to medium-sized terrestrial mammals, and how to collect, process and analyze the data. There was also a one-day field component.

Seven (7) members of the Rio Blanco Mayan Association (RBMA) received training in Governance Strengthening.

The training helped define the board’s roles and responsibilities through facilitated activities. A mission and a vision statement was also created which will serve as a guide for the association to move forward.

https://doi.org/10.1371/journal.pone.0179505


https://doi.org/10.1093/jmammal/gyw179
# FINANCIAL SUMMARY

## UNIVERSITY OF BELIZE (ERI DEPARTMENT)

## STATEMENTS OF FINANCIAL POSITION
YEARS ENDED JULY 31, 2017 AND 2016 (IN BELIZE DOLLARS)

<table>
<thead>
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<th>ASSETS</th>
<th>2017</th>
<th>2016</th>
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<td>CURRENT ASSETS:</td>
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<td>NON-CURRENT ASSETS:</td>
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<tr>
<td>Property, plant and equipment -net</td>
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<td>377,095</td>
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<tr>
<td><strong>Total non-current assets</strong></td>
<td><strong>311,285</strong></td>
<td><strong>377,095</strong></td>
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<tr>
<td><strong>TOTAL ASSETS</strong></td>
<td><strong>1,039,162</strong></td>
<td><strong>841,855</strong></td>
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## LIABILITIES AND EQUITY

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<tr>
<th>CURRENT LIABILITIES:</th>
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## EQUITY:

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<th>General fund</th>
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<tr>
<td><strong>TOTAL LIABILITIES AND EQUITY</strong></td>
<td><strong>$1,039,162</strong></td>
<td><strong>$841,855</strong></td>
</tr>
</tbody>
</table>
# UB-ERI Steering Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Title and Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>WILMA WRIGHT, PH.D.</td>
<td>UB Interim Provost - Chairperson</td>
</tr>
<tr>
<td>MARIOT SIMON, PH.D.</td>
<td>UB Vice-President - Chairperson</td>
</tr>
<tr>
<td>ELMA KAY, PH.D.</td>
<td>UB-ERI Administrative Director</td>
</tr>
<tr>
<td>SHERLENE JULIEN</td>
<td>UB Finance Director</td>
</tr>
<tr>
<td>GLEG WATSON</td>
<td>Private Sector Representative</td>
</tr>
<tr>
<td>WILBER SABIDO</td>
<td>Forest Department Representative</td>
</tr>
<tr>
<td>EDGAR CORREA</td>
<td>Forest Department Alternate</td>
</tr>
<tr>
<td>BEVERLY WADE</td>
<td>Fisheries Department Representative</td>
</tr>
<tr>
<td>VANESSA FIGUEROA</td>
<td>Fisheries Department Alternate</td>
</tr>
<tr>
<td>NADIA BOOD</td>
<td>World Wildlife Fund (WWF), Int'l. NGO Representative</td>
</tr>
<tr>
<td>MAURICIO MEJÍA</td>
<td>World Wildlife Fund (WWF), Int'l NGO Alternate</td>
</tr>
<tr>
<td>LIANNE TORRES</td>
<td>Belize Trade and Investment Development Service (BELTRAIDE) Representative</td>
</tr>
<tr>
<td>JOSÉ PEREZ</td>
<td>Association of Protected Area Management Organizations Representative</td>
</tr>
</tbody>
</table>
UB-ERI STAFF

ELMA KAY, PH.D.
Administrative & Science Director (Terrestrial)

LEANDRA CHO-RICKETTS, PH.D.
Science Director (Marine)

IAN SANGSTER
Administrative/Financial Manager

JULISSA LOPEZ
Administrative Assistant

PIA GREGOIRE
Administrative/Marketing Officer

IVANNA WIGHT-CHO
Monitoring Officer

ARLENIE ROGERS, PH.D.
Marine Research Fellow

DENVER CAYETANO
Forest Biologist

GISELLE BORLAND
Training/Communications Officer

JANÉ SALAZAR
Marine Biologist

ALEXANDER NAVARRO
Field Technician

ABIDAS ASH
Avian Biologist

NINON MARTINEZ
Research & Education Officer

BART HARMSSEN, PH.D.
Panthera Jaguar Research Fellow

YAHaira URBINA
Wildlife Biologist

MICHAEL BRAKEMAN
Field Assistant

NICOLE CRAIG
Field Station Manager

JOSHUA MOREY
Boat Captain

ALBERT CHERINGTON
Boat Captain

MELBOURNE YOUNG
Auxiliary Boat Captain

BRANDON JAMES
Boat Hand

ELODIA FLORES
Cook

GEORGIA YOUNG
Cook

LORNA GODOY
Relief Cook

ROSALIND TERRY
Cook

DAYNA SMART
Relief Cook

ELVIS WILLIAMS
Shore Assistant

DEANDRE FLOWERS
Care-taker

KIJEAN GILLET
Care-taker

SIDNEY TRACY
Care-taker

RENE COC
Care-taker
ACKNOWLEDGEMENTS

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