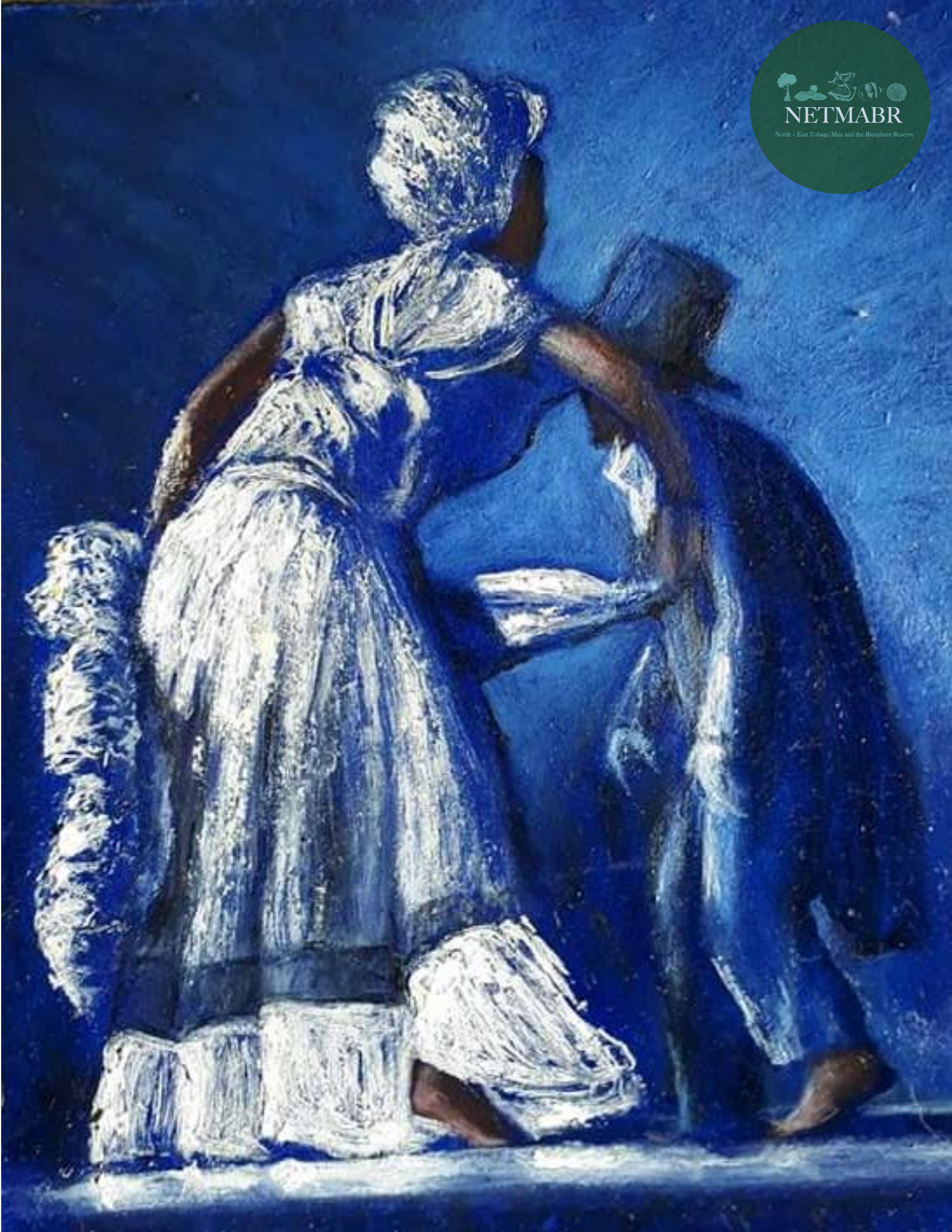
NETMABR

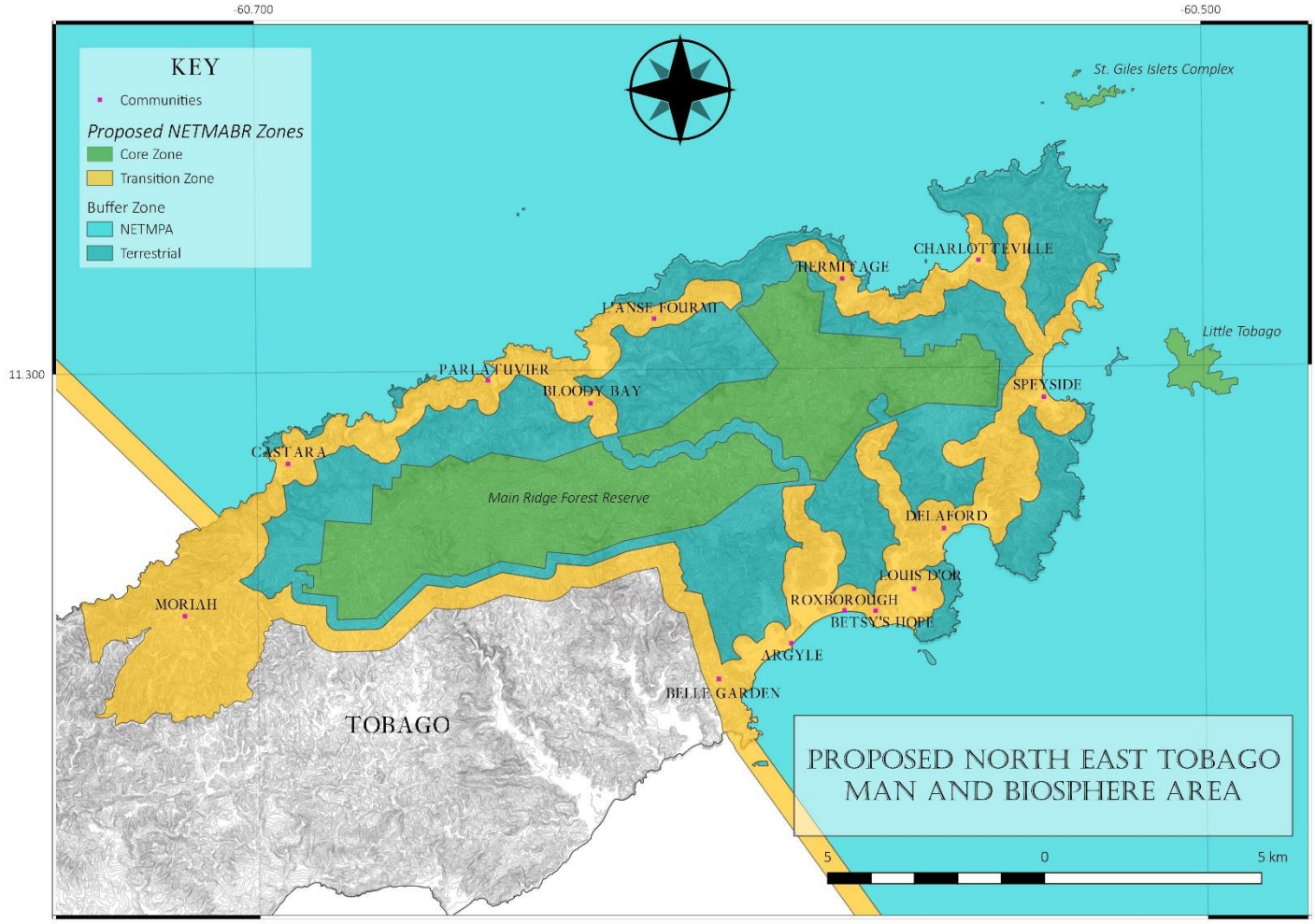
North – East Tobago Man and the Biosphere Reserve

NORTH - EAST TOBAGO

BIOSPHERE RESERVE NOMINATION FORM


NETMABR
North – East Tobago Man and the Biosphere Reserve

PROPOSED NORTH - EAST TOBAGO MAN AND THE BIOSPHERE RESERVE



MESSAGE FROM THE OFFICE OF THE CHIEF SECRETARY, TOBAGO HOUSE OF ASSEMBLY

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September 12, 2019

MESSAGE FROM THE CHIEF SECRETARY, TOBAGO HOUSE OF ASSEMBLY

An idyllic island like Tobago, where abundant natural beauty meets a vibrant and well-preserved heritage, necessitates development in a sustainable manner that improves human livelihoods and the safeguarding of our ecosystems.

North-East Tobago, with its secluded stretches of coastline, colorful marine life, authentic traditions and the oldest, legally protected tropical forest in the world, has great potential for such development. The relationships between people and their environment is of particular importance when looking to improve the quality of life and the preservation of natural heritage.

The Tobago House of Assembly has therefore mandated sustainability, academic, research and community-based experts to compose an application to UNESCO for North-East Tobago to be designated as a biosphere reserve.

A significant number of projects and programmes related to conservation, sustainable development, cultural heritage, education, training and research have been implemented over the past five years. Such projects increasingly used the combined strength of government, civil society and the private sector.
The designation as a Man and the Biosphere reserve would be a key factor in unlocking the potential of North-East Tobago for economic development that is socially and culturally appropriate, and environmentally sustainable.

Although unique in many characteristics, North-East Tobago can serve as a great example and motivation for other rural areas, as it shares similar environmental, socio-economic and cultural conditions with many communities in the insular Caribbean. Additionally, North-East Tobago will also be able to provide mutual benefits to the World Network of Islands and Coastal Biosphere Reserves and the Ibero MaB Network.

We are therefore proud to have taken on the challenge of this nomination and would like to express our gratitude towards all involved stakeholders for their contribution, commitment and participation with this difficult task, which will allow North-East Tobago to conserve and enhance its authentic cultural and natural heritage, landscapes and biodiversity.

The Honourable Kelvin Charles
Chief Secretary and
Secretary of Education, Innovation and Energy

MESSAGE FROM THE DIVISION OF INFRASTRUCTURE, QUARRIES AND THE ENVIRONMENT

ENDORSEMENT

Tobago's pursuit of the United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and the Biosphere (MAB) Acclaim

by

Councillor Kwesi Des Vignes,

Secretary of Infrastructure, Quarries and the Environment

Historically, the island, Tobago, has been revered as a land of delight; where the unimagined and undiscovered secrets shock even the natives who call the place home. The mantra ***'She Becomes More Beautiful'*** in essence is the epitome of a place and a people, while maturing is forever pregnant with fresh experiences and expectations.

This makes ***Tobago, an Ageless Beauty,*** lush with a cultural and colonial heritage that rivals many in the world, and a people distinguished from others, despite its small size but not at all lowly status.

Profoundly, the generational esteem shown to the environment and culture is noteworthy. The guardian of the past and some in present times understood that it was and is the earth which gives life to industry, to community and to the biosphere.

It was my grandfather, Edward Hernandez who captured Tobago in the female image of the Heritage Festival; the celebration of Tobago runs within my veins. Our predominant heritage married with European influences has continued throughout the generation and it is spectacularly re-enacted for seasons. It, however, lives sublimely in many secluded and sheltered parts of north-eastern Tobago.

For us in Tobago, ***North-East Tobago is the pearl of our paradise***. It presents exploration for immense opportunities in business and industry; exploration of a way of life that celebrates traditions; and of experiences with nature that either refresh or take your breath away. It is therefore no surprise that Tobago aspires and is considered worthy enough to attract the attention of the world.

The pursuit for the United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and the Biosphere (MAB) acclaim is laudable, particularly from a small nation with a fierce spirit. This movement presents potential for the enhancement and growth of Tobago's intrinsic and tangible value. More importantly, it will awaken a pride among a people, who though mired in struggle continue to overcome and overtake.

Thank you UNESCO MAB Programme for reminding us in Tobago of how great we are and how great we can become having placed the environment at the centre of our existence!

Councillor Kwesi Des Vignes
Secretary

MESSAGE FROM THE DIVISION OF FOOD PRODUCTION, FORESTRY AND FISHERIES

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MESSAGE FROM THE SECRETARY OF FOOD PRODUCTION, FORESTRY & FISHERIES, TOBAGO HOUSE OF ASSEMBLY

In an island that offers numerous attractions including leisurely beach vacations, forest treks and ecological and cultural heritage festivities, the sustainable management of Tobago's resources continues to be the chief mandate of the Division of Food Production, Forestry and Fisheries. The Division recognizes that North-East Tobago possesses a unique and fragile blend of natural resources that must be protected and managed sustainably. Over the years the Division has piloted and supported projects and programmes geared towards this.

Notably, the North-East possesses one of the oldest legally protected Forest Reserve in the Western Hemisphere, the Main Ridge Forest Reserve, which is approximately 3937 hectares. The Reserve itself was formally established on April 13th, 1776 (243 years) by an ordinance which outlines that this was resolutely done for attracting rains upon the island. This was championed at that time by Soame Jenyns, a member of the British parliament who was mainly responsible for plantation and trade. His efforts were supported by the findings of the English Scientist, Stephen Hales who was able to demonstrate a strong correlation between trees and rainfall. The Forest Reserve is a National Heritage Site under the National Trust Act and is considered to be a landmark in Tobago's history in terms of forest conservation and preservation. The Main Ridge Forest Reserve boasts as home to many endemic species to Tobago. Among them are the Ocellated Gecko, White-tailed Sabrewing Hummingbird, Tobago Stream Snake, Tobago Stream Frog, Wild Pine, Blue-crowned Motmot, Bloody Bay Tree Frog and Turpin's Litter Frog.

North-East Tobago is also the home of one of the greatest wonders in the world, i.e. one of the world's largest brain coral colony measuring 10ft (3M) high and 16ft (5.3M) across which can be found in the deep blue waters of Speyside. Fish of all sizes and colours, turtles, stingrays and other marine creatures add to the pool of natural wonders of North-East Tobago.

The Division of Food Production, Forestry and Fisheries is in support of the Tobago House of Assembly's mandate to engage experts to compose an application to UNESCO for North-East Tobago to be designated as a biosphere reserve. The designation as a Man and the Biosphere Reserve, will not only safeguard against the loss of this island's natural resources, but it uses science to improve relationships between people and their resources which is of prime importance for sustainability.

The Division will remain committed as a key stakeholder in this initiative under the Tobago House of Assembly and will continue to work together with other stakeholders to accomplish this challenging task to ensure that North-East Tobago's authentic natural and ecological/cultural heritage and biodiversity is protected and sustainably managed.

Assemblyman Hayden Spencer
Secretary
Division of Food Production, Forestry and Fisheries

MESSAGE FROM THE DIVISION OF TOURISM, CULTURE AND TRANSPORTATION

Division of Tourism, Culture and Transportation
#12 Sangster's Hill, Scarborough, Tobago

MESSAGE FROM THE SECRETARY OF TOURISM, CULTURE AND TRANSPORTATION, TOBAGO HOUSE OF ASSEMBLY

Tobago is a Caribbean gem, strategically poised as an Undiscovered, Untouched and Unspoilt destination that is truly Beyond Ordinary. The island's unique brand strategy and positioning testify to the continuous pursuit of environmental sustainability and cultural preservation while advancing the island's overall tourism product.

Launched in 2018, the "Go to Market" strategy focuses on the four core pillars of the island's appeal: Seas and Beaches; Local Culture, People and Heritage; Eco-Adventure and Nature; and Romance and Weddings.

Tobago's North-East Coast is undoubtedly endowed with rich biodiversity that perfectly aligns with all facets of the Eco-Adventure and Nature cornerstone. One major compelling feature of this region is the multi-award winning Main Ridge Forest Reserve; the oldest protected reserve in the Western Hemisphere. Its diverse ecosystem, alluring coastal features, historical attractions and hospitable people, make it an ideal location for protection, promotion and exploration. Each aspect holds limitless potential and can reach its highest refinement with vision, creativity and the necessary resources.

North-East Tobago can foster an emerging tourism product through the introduction of a natural laboratory for education and scientific research in biodiversity. It can be foreseen that this will attract interest groups the world over for tourism exploration and industry growth - increasing the overall visitor volume on the island.

As we continue to invest in our natural and cultural heritage, the UNESCO Man and the Biosphere reserve will, therefore, aid in positioning North- East Tobago and the rest of the island to become a tourism leader in scientific tourism with ecology and biodiversity at its core.

As the Secretary of Tourism, Culture and Transportation, I am heartened by North East Tobago's nomination for UNESCO's Man and the Biosphere Programme and look forward to the island's sustainable progression as a result of the scientific, socio-economic and educational initiatives.

Councillor Nadine Stewart-Phillips
Secretary
Tourism Culture and Transportation

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NORTH - EAST
TOBAGO

BIOSPHERE RESERVE NOMINATION FORM

PART I SUMMARY

TABLES

FIGURES

Please Note:

The sections of this document are following the format below according to the UNESCO MAB Nomination Form template:

MAIN QUESTIONS

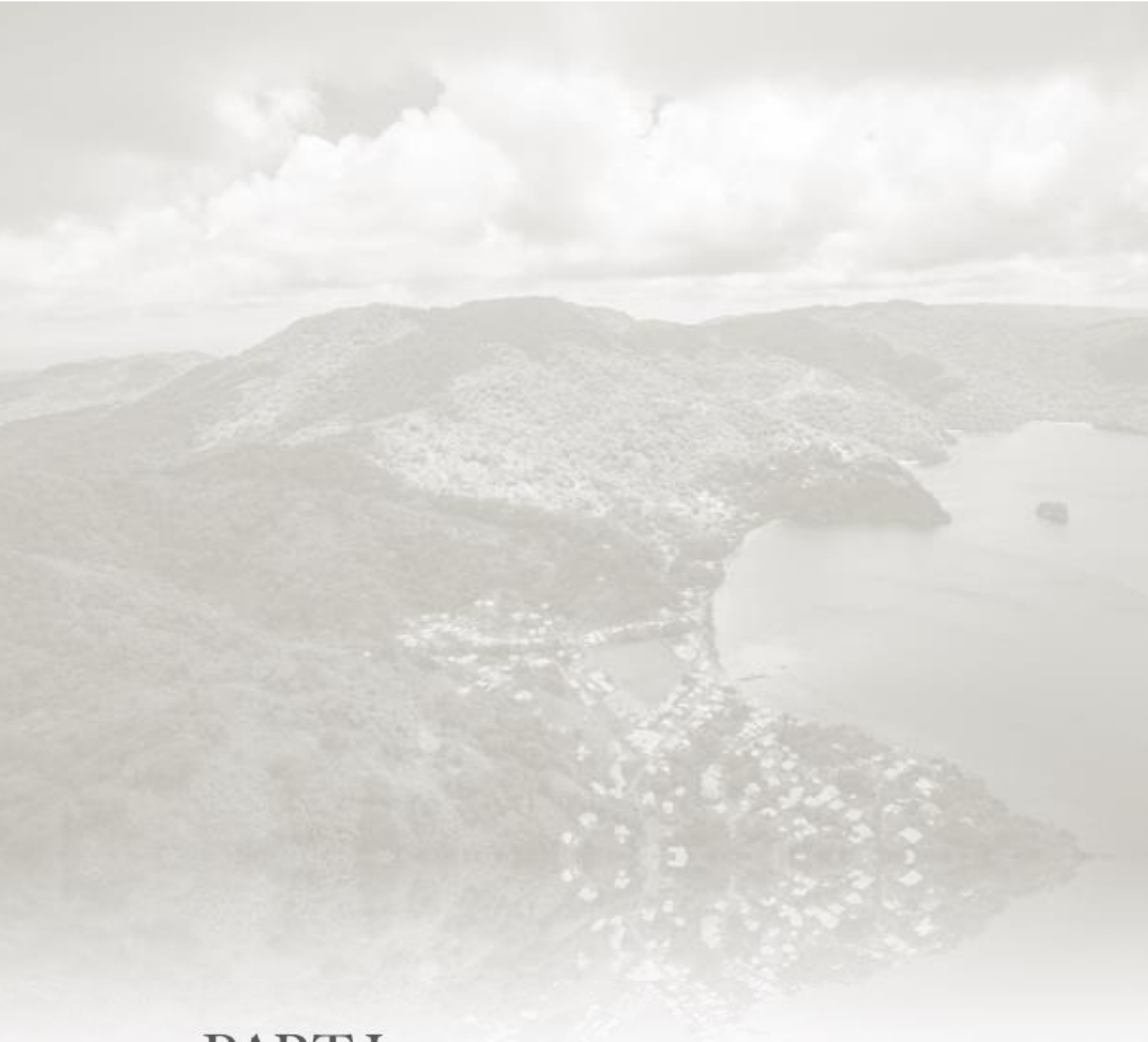
"Explanatory notes provided by UNESCO."

Response to the questions

ABBREVIATIONS

BR	**B**iosphere **R**eserve
CEDP	**C**omprehensive **E**conomic **D**evelopment **P**lan
CITES	**C**onvention on **I**llegal **T**rade of **E**ndangered **S**pecies
CMS	**C**onvention on **M**igratory **S**pecies
CNG	**C**ompressed **N**atural **G**as
CNH	**C**ultural **N**ational **H**eritage
CR	**C**ritically **E**ndangered
CSO	**C**ivil **S**ociety **O**rganisations
DIQE	**D**ivision of **I**nfrastructure, **Q**uarries and the **E**nvironment
DMRF	**D**epartment of **M**arine **R**esources and **F**isheries
DNRF	**D**epartment of **N**atural **R**esources and **F**orestry
DoE	**D**epartment **o**f the **E**nvironment
DoTCT	**D**epartment **o**f **T**ourism, **C**ulture and **T**ransportation
EDGE	**E**volutionary **D**istinct and **G**lobally **E**ndangered
EN	**E**ndangered
ENGO	**E**nvironmental **N**on-**G**overnmental **O**rganisations
EMA	**E**nvironmental **M**anagement **A**uthority
ERIC	**E**nvironmental **R**esearch **I**nstitute **C**harlotteville
ESA	**E**nvironmentally **S**ensitive **A**rea
ESS	**E**nvironmentally **S**ensitive **S**pecies
ET	**E**nvironment **T**obago
FAO	**F**ood and **A**gricultural **O**rganisation of the United Nations
GEF	**G**lobal **E**nvironmental **F**acility
GoRTT	**G**overnment **o**f the **R**epublic of **T**rinidad and **T**obago
IBA	**I**mportant **B**ird and **B**iodiversity **A**rea
IDB	**I**nteramerican **D**evelopment **B**ank
IFPAM	**I**mproved **F**orest and **P**rotected **A**rea **M**anagement
IICA	**I**nteramerican **I**nstitute for **C**ollaboration on **A**griculture
IMA	Trinidad and Tobago's **I**nstitute of **M**arine **A**ffairs
IUCN	**I**nternational **U**nion for **C**onservation of **N**ature
LME	**L**arge **M**arine **E**coregion
MAB	UNESCO **M**an **a**nd the **B**iosphere Reserve
MEA	**M**illenium **E**cosystem **A**ssessment
MPA	**M**arine **P**rotected **A**rea
MRFR	**M**ain **R**idge **F**orest **R**eserve
NE Tobago	**N**orth-**E**ast **T**obago
NETMABR	**N**orth-**E**ast **T**obago **M**an **a**nd the **B**iosphere **R**eserve

NETMP	**N**orth-**E**ast **T**obago **M**anagement **P**lan
NETMPA	**NE T**obago **M**arine **P**rotected **A**rea
NETPAMT	**N**orth-**E**ast **T**obago **P**rotected **A**rea **M**anagement **T**rust
NGO	**N**on-**G**overnmental **O**rganisation
NNH	**N**atural **N**ational **H**eritage
NOAA	**N**ational **O**ceanic and **A**tmospheric **A**dministration
NPASP	**N**ational **P**rotected **A**reas **S**ystems **P**lan
NT	**N**ear **T**hreatened
NTTT	**N**ational **Tr**ust of **T**rinidad and **T**obago
PAMP	**P**rotected **A**rea **M**anagement **P**lan
PPA	**P**ilot **P**rotected **A**rea
SIDS	**S**mall **I**sland **D**eveloping **S**tates
SDG	**S**ustainable **D**evelopment **G**oal
THA	**T**obago **H**ouse of **A**ssembly
TTAL	**T**obago **T**ourism **A**gency **L**imited
TVT	**T**urtle **V**illage **T**rust
UWI	The **U**niversity of the **W**est **I**ndies
UTT	**U**niversity of **T**rinidad and **T**obago
VU	**V**ulnerable
WNBR	**W**orld **N**etwork of **B**iosphere **R**eserve
WWF	**W**orld **W**ildlife **F**und



PART I

SUMMARY

EXECUTIVE SUMMARY

On 21 June 2019, the Government of the Republic of Trinidad and Tobago (GoRTT), through the Minister of Planning and Development, expressed its interest to nominate parts of North-East (NE) Tobago as an UNESCO Man and the Biosphere Reserve (MAB) and appointed the Department of the Environment (DoE) within the Division of Infrastructure, Quarries and the Environment (DIQE) of the Tobago House of Assembly (THA) as the Focal Point for the nomination process. Through the Tobago House of Assembly Act, the THA is responsible for and manages Tobago's internal affairs including a six nautical miles wide marine zone around the island. Considering multi-stakeholder technical advice and in-depth evaluation, the THA decided in late 2018 to draft the nomination form required to apply for MAB Status for NE Tobago.

The nominated site is labelled as "North-East Tobago Man and the Biosphere Reserve" (NETMABR). Covering over 835km^2; it encompasses three protected areas, one of which is the oldest protected tropical forest reserve in the world, a large planned Marine Protected Area (MPA) and 15 communities which are home to approximately 10,000 residents with a rich historical and cultural heritage. The area's rare and largely intact Caribbean Island Ridge-to-Ocean eco- and human-systems are well equipped to fulfil the three functions of a UNESCO Biosphere Reserve (BR): its biodiversity, range of ecosystems, and special-interest species are important on a regional and global scale (Conservation); the cultural heritage is a living example for the region's deeply rooted, historical, socio-economic and spiritual relationship between communities and natural resources (Development); and decades of regionally outstanding educational, research and networking activities.

The close linkage between ecosystem services and natural resource use, active community groups, successful sustainable development projects, governmental initiatives and its closeness to Trinidad's resources provide the area with the prerequisites to successfully implement a BR and share lessons learnt with its Caribbean neighbours while serving as a regional role model. Being a hotspot for conservation related research for decades and having a track record of environmental education, capacity building and monitoring are well established cornerstones for providing and further increasing logistical support.

The legal, policy and institutional framework to manage a MAB area exist; current projects and programmes as well as those in the national and local development pipeline, and improved collaboration between government, civil society and private sector are demonstrably supportive of this BR nomination initiative. On varying levels, NE Tobago is already close to meeting the key conservation objectives of a successful BR as mentioned in the Seville MAB Strategy.

Coordinating future sustainable development efforts under a MAB umbrella and the inclusion of all relevant sectors of the society will significantly improve conservation and livelihoods through responsible use of our natural and cultural heritage which is the central goal of Tobago's guideline policy document, the Comprehensive Economic Development Plan.

1. PROPOSED NAME OF THE BIOSPHERE RESERVE

Official Name: North - East Tobago Man and the Biosphere Reserve

Local Name: North-East Tobago Man and the Biosphere Area (NETMABA)
Justification: The term “Reserve” is locally understood as a place set aside for the protection of wildlife and associated with strict regulations and very limited human – ecosystem interaction; it is perceived as highly regulating and top-down management. Therefore, local understanding of “reserve” does not align with the purpose and intent of a BR. As such, we would prefer to be able to use the term “area” for local and outreach activities.

Figure 1: Proposed NETMABR logo draft

2. NAME OF THE COUNTRY

Republic of Trinidad and Tobago

Figure 2 Caribbean coastline of the proposed NETMABR (Jacob Bock)

3. FULFILLMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES

"Article 3 of the Statutory Framework presents the three functions of conservation, development and logistic support. Explain in general terms how the area fulfils these functions."

3.1 CONSERVATION

CONTRIBUTE TO THE CONSERVATION OF LANDSCAPES, ECOSYSTEMS, SPECIES AND GENETIC VARIATION

"Stress the importance of the site for conservation of biological and cultural diversity at the regional or global scales."

NE Tobago is Trinidad & Tobago's most iconic conservation landscape. It is a rare and largely intact Caribbean Island Ridge-to-Ocean ecosystem that includes the world's oldest tropical rainforest reserve, three candidate Natural National Heritage (NNH) Sites, a multitude of proposed Cultural National Heritage (CNH) Sites, a planned MPA of coral reefs and open ocean, and three Important Bird and Biodiversity Areas (IBA). It crosses five conservation areas, and various ecosystems with 19 distinct habitat types and is home to globally unique and endangered plants and animals including 83 IUCN red list species, 41 endemic species, 13 EDGE criteria species, 48 international migratory (CMS) criteria species and 120 CITES criteria species. Overall, 1,774 species are scientifically recorded and the number is counting.

The establishment of a BR and the associated objective to increasingly harmonise livelihood needs with natural and cultural conservation, would significantly support the stability of this fragile and remarkable human and natural landscape.

Table 1 Summary of NE Tobago's ecosystems.

Conservation Area	Area [*ha*]	#	Ecosystems
"Ridges"	~7,900	1	Lower montane forest
		2	Elfin woodlands
		3	Lowland Rain Forest
		4	Dry broadleaf forest
		5	Evergreen formation forest
"Rivers"	<75	6	Riparian
		7	Riverine

Conservation Area	Area [*ha*]	#	Ecosystems
		8	Estuarian
		9	Mangrove
"Reefs"	~300	10	Sandy beaches
		11	Rocky intertidal shores
		12	Coral reefs
		13	Sand and silt substrates
		14	Seagrass beds
"Islets"	~150	4	Dry broadleaf forest
"Ocean"	~62,000	15	Epipelagic
		16	Mesopelagic
		17	Mesobenthos
		18	Bathyal pelagic
		19	Bathyal bentic

Further, outstanding conservation characteristics within the planned NETMABR are:

- the influence of adjacent biogeographic regions is resulting in a regionally and globally unique combination of biodiversity and ecosystems associated primarily with:
  - ecoregions present in the Lesser Antillean (insular) and Venezuelan Coastal Andes (continental);
  - the Caribbean Large Marine Ecoregion (LME) and North Brazil Shelf LME influencing marine ecosystems;
- the ecological and human interactions within a rare combination of several conservation areas from ridges to open ocean;
- the 3,958ha Main Ridge Forest Reserve (MRFR), declared in 1776, an IBA, with 31 endemic species across various taxa;
- small, but healthy and protected patches of dry tropical forest, which is a rare and threatened ecosystem in the Caribbean;
- the St Giles Island Complex (also an IBA), one of the most important seabird breeding colonies in the Caribbean, especially for Magnificent Frigate Birds;
- Little Tobago, (also an IBA), an important breeding site for Audubon's Shearwater, Red-billed Tropicbird and Brown Noddies and several other sea-bird species;
- the relatively intact and astonishingly resilient coral-sponge co-dominated reefs including iconic brain coral colonies;
- the regionally significant nesting beaches for critically endangered sea-turtles;
- the characterisation as a regionally important "bright spot" and "refuge" for endangered shark species;
- a great potential to serve as a demonstration site for:

- colonial and slavery related history and its cultural and socio-economic influences to date, and
- post-colonial socio-cultural and economical history typical for the southern Antilles;

- a culturally, deeply rooted socio-economic and spiritual relationship between communities and natural resources signified by artisanal fishing, former (now largely abandoned) cocoa estates, a range of important ecosystem services, and traditional ceremonies;
- an equally important spiritual relationship between people and natural resources demonstrated by many folk stories and traditional medicines and ceremonies;
- annual community-based cultural festivals such as the Blue Food Festival focusing on the traditional culinary uses of dasheen (taro, *Colocasia esculenta*);
- traditional music and dances like "*heel and toe";*
- the annual Charlotteville Natural Treasures Day; and the
- Tobago Heritage Festival activities, especially Moriah Ole Time Wedding, showcasing traditional wedding ceremonies accompanied by sounds of characteristic Tambrin music.

Figure 3 Main Ridge Forest Reserve (Jacob Bock)

*The **Tobago Main Ridge Forest Reserve** depicts a milestone in the history of conservation as the oldest legally protected tropical forest globally. Therefore, it serves as a valuable addition to the Ibero MAB network and the SIDS MAB network. The MRFR has been established for conservation purposes and has been described by the Caribbean Journal as "a living example of the power of conservation, and one whose continued stewardship sends a daily message to the rest of the region". Its variety of forest types and micro-climates provides an abundance of ecological niches that are occupied by specialist plants and animals and traversed by ecological generalist species. It was established on April 13th, 1776 by an ordinance which states in part, that the reserve is "for the purpose of attracting frequent showers of rain upon which the fertility of lands in these climates doth entirely depend." The passage of the ordinance is attributed to Soame Jenyns, a member of the British parliament whose main responsibilities were trade and plantation. He was influenced by the ideas of the English scientist Stephen Hales who was able to show the correlation between trees and rainfall. It took Jenyns eleven years to convince the parliament that this was indeed a valid endeavour. Scientific American has commented: "...the protection of Tobago's forest was the first act in the modern environmental movement". This can be considered a landmark in the history of conservation and preservation of the environment. The living testimony is the survival of the Forest Reserve itself.*

THE VALUE OF THE WHOLE LANDSCAPE

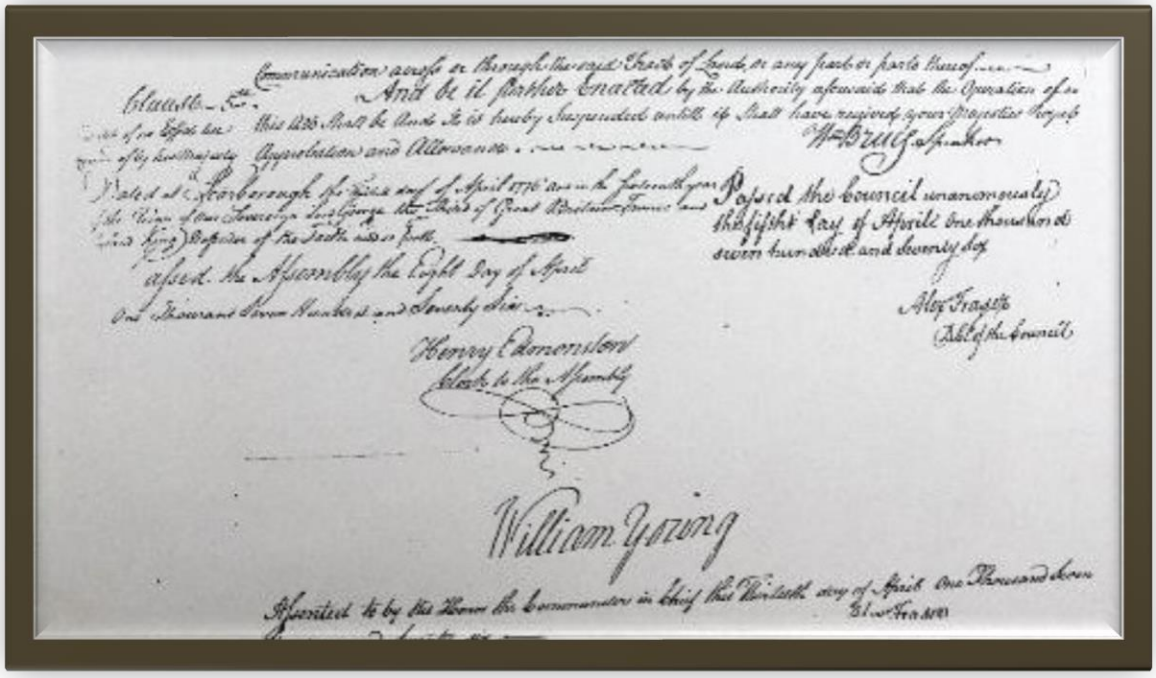


Figure 4 Original declaration of the legal protection of the MRFR.

NE Tobago is a regionally outstanding example for Caribbean islands that are distinct systems characterised by temporal social and ecological isolation as well as a strong interaction between marine and terrestrial environments. Although each ecosystem/habitat described above has value in terms of ecosystem processes and services, it is their proximity and interaction that makes the entire landscape a valuable conservation target.

For example, coral reefs require clear water and a low nutrient environment. Healthy forests, estuaries and mangroves reduce soil run-off, which minimise the nutrient content, pollution, sedimentation and siltation that coastal coral reefs are exposed to. Similarly, healthy offshore island and coral reef ecosystems reduce the impact of storm events on coastal beaches and communities.

Communities simultaneously interact with terrestrial and marine ecosystems which fosters opportunities using educational experiences to provide insights to the importance of ecosystem connectivity for school children and adult users alike. Threats to natural and cultural heritage are still limited, providing room for timely interventions with relatively low potential of conflict. The cultural, even spiritual bond between people and the environment is getting weaker; however, it is far from being broken and in need of protection to ensure future generations gain the understanding of culture and maintain it. Many opportunities exist for strengthening this important bond and the proposed BR designation will be an important tool to do so.

Figure 5 Bloody Bay River and Bay (Jacob Bock)

3.2 DEVELOPMENT

FOSTER ECONOMIC AND HUMAN DEVELOPMENT WHICH IS SOCIO-CULTURALLY AND ECOLOGICALLY SUSTAINABLE

"Indicate current activities and the potential of the proposed biosphere reserve in fulfilling the objective of fostering sustainable economic and socio-cultural development, including by securing flows of ecosystem services from the biosphere reserve."

The proposed NETMABR provides a wide suite of essential ecosystem services to the communities in the Transition Zone and Tobago in general.

Forests offer regulating services such as watershed protection, carbon sequestration and land stabilisation on steep slopes. Provisioning services include timber, game for hunting, citrus and cocoa. Their primary cultural services are aesthetic beauty and recreational attractions which draw local, regional and international tourists and carry equally important heritage and spiritual values. An important supporting service is their role as a repository of pollinator biodiversity. Fortunately, on a very small scale, forest exploitation is largely informal and unregulated.

Figure 6 Forest ecosystems in NE Tobago MRFR (ERIC)

River dams and wells are the main sources of freshwater for agriculture and potable water supply. Wetlands are essential for coastal protection, soil and sediment regulation and the retention of nutrients and solid waste. Terrestrial aquatic systems also support eco-tourism activities in NE Tobago.

Estimating from a 2007 study by the World Resources Institute for the entire island of Tobago, coral reef services for tourism, recreation, fishing and shoreline protection would place a value of roughly US$55 million annually for NE Tobago's reefs. This assessment did not evaluate supporting services such as nutrient cycling.

The small islets are important for cultural services such as eco-tourism for birding and for provisioning services including the unregulated and illegal hunting of iguanas and seabirds.

The open ocean similarly provides critical services, notably provisioning for artisanal fishing, as well as cultural services for sport fishing and yachting tourism. It further provides regulating (e.g.

water purification and carbon sequestration) and supporting services (e.g. nutrient cycling especially from annual Orinoco plumes).
Communities (approximately 10,000 people in 15 villages) in the planned NETMABR are economically dependent on the above described ecosystem services and on governmental employment (~ 60%) in the administrative, public service or unemployment relief sectors.
The main economic activities depending on ecosystem services are artisanal fishing and small-scale, community-based tourism, followed by a very limited agricultural and agroforestry sector.

The proposed NETMABR will be able to significantly benefit from ongoing efforts by the governmental, private and civil society sectors to align economic activities with locally relevant global sustainable development goals.

Highlights of such efforts are:

- Since 2014, the Food and Agricultural Organisation of the United Nations (FAO) has been implementing a Global Environmental Facility (GEF)-funded "*Improved Forest and Protected Area Management*" (IFPAM) Project (FAO/GEF, 2013-2020), which includes the Tobago MRFR and a planned MPA around NE Tobago. This project has made significant strides regarding stakeholder participation, capacity building, biodiversity assessments, livelihood assessments and draft Protected Area Management Plans (PAMP).
- A new, Draft National Fisheries Act, also developed with the help of the FAO, points clearly in a more sustainable direction.
- Civil society and the local Department of Marine Resources and Fisheries (DMRF) are working on a Sustainable Shark and Ray Fisheries Management Plan for the area.
- Civil society organisations are actively developing tourism products based on sustainable, science-, eco-, yachting- and community-based tourism.
- The hydrocarbon-based energy sector (marine, adjacent of the proposed NETMABR) provides significant support to civil society regarding the development of sustainable livelihoods and socio-cultural development.
- A Trinidad and Tobago-specific "Green Fund" enables civil society organisations in NE Tobago to access substantial funding to implement projects related to conservation and sustainable economic development.
- The potential for the sustainable development and revitalisation of the historic cocoa production has been demonstrated and invites expansion.
- The Tobago Tourism Agency's Strategic Vision Statement reads: "To enhance the quality of life of the people and residents of Tobago by building a prosperous, inclusive tourism industry founded on the principles of sustainable tourism development". It further identifies in its 2017-2020 roadmap culture-, diving-, birding- and eco-tourism as strategic

niche markets and stresses on the importance of international eco-label certifications such as Blue Flag and Green Key.

Noteworthy, enabling socio-cultural aspects are:

- the presence of vibrant civil society organisations such as Environmental Non-Governmental Organisations (ENGOs), business associations, police youth clubs, sport clubs, village councils, and churches. While facing the usual challenges, these Civil Society Organisations (CSOs) have a demonstrable history of implementing remarkable projects e.g.
  - long-term sea turtle, reef health, shark population and water quality monitoring,
  - festivals celebrating cultural heritage and identity through art, dance, culinary experiences and music,
  - capacity building/vocational training/education outside of the public system,
  - waste management in communities and schools,
  - community beautification, and
  - establishment of the North East Tobago Climate Change Champions Network
- free primary, secondary and partially free tertiary education; 12 primary and two secondary schools are within the Transition Zone of the proposed NETMABR,
- a history of ongoing conservation, biodiversity and biogeographic scientific research by local and international academic institutions over six decades,
- free public health care,
- current construction and significant improvement of fire service, health and police facilities in the proposed NETMABR,
- governmental programmes regarding youth development, gender affairs, disabilities, children and families etc.,
- a rich cultural diversity including performing arts, painting, music, culinary arts, craft, many of which are related to the natural and cultural heritage of the area.

During stakeholder meetings related to the management of NE Tobago's natural and cultural heritage and the nomination on the NETMABR (2018-2019) the following blue and green economic and socio-cultural development opportunities have been discussed and were welcomed by stakeholders.

For the ***Core***, ***Buffer*** and ***Transition*** Zone:

- coordinated development of sustainable tourism (e.g. science-, community-based, eco-agro-, dive-, yacht-, boutique resort-, nature-, birding-, educational-);
- improving opportunities for the youth to find sustainable employment related to natural and cultural heritage within the proposed NETMABR;

- pairing NE Tobago with another, complimentary BR; and
- reducing government employment through initialising, facilitating and strengthening sustainable private and civil society enterprises.

For the ***Buffer*** and ***Transition*** Zone:

- sustainable agriculture and agroforestry (e.g. tea, honey, cocoa, timber, heritage fruits, usage of invasive bamboo);
- development of the significant number of terrestrial and marine archaeological sites mostly related to colonial history and slave trade.

For the ***Buffer*** Zone:

- sustainable mariculture (e.g. shellfish, algae); and
- using the national effort to increase the usage of Compressed Natural Gas (CNG, which is a significant national resource) to switching artisanal fishing propulsion to environmentally friendly and cost-effective use of CNG;

For the ***Transition*** Zone:

- community based waste management;
- renewable energy (e.g. solar water heating, wind, photovoltaic, and biogas);
- establishment of tertiary educational facilities related to applicable blue and green economy in Small Island Developing States (SIDS) in conjunction with an internationally accredited University; and
- improving the authenticity and visibility of local culture especially festivals, and arts.

Most importantly, the guideline policy document for the development of Tobago is the Comprehensive Economic Development Plan (2006, updated 2012) which puts sustainability at the centre of its development goals and desired key policy outcomes.

Figure 7: Development goals *(green)* and key outcomes *(blue)* of Tobago according to the Comprehensive Economic Development Plan for Tobago.

Once diligently managed, the designation as a BR will be the most appropriate tool to unlock the substantial potential of NE Tobago for improved sustainable development, while at the same time ensuring that the above described existing flow of ecosystem services is maintained and, if possible, significantly improved.

While unique in some characteristics, NE Tobago resembles in many aspects the environmental, socio-economic and cultural conditions in many rural communities of Caribbean SIDS sharing similar challenges and opportunities.

As such, the NETMABR has the significant potential of sharing its experiences on coordinated, sustainable development by promoting natural and cultural heritage with the nation and the entire Caribbean region.

Furthermore, the planned designation of three Natural National Heritage Sites, several Cultural National Heritage Sites, and of a significant MPA, as well as the recently established, participatory

and equitable North-East Tobago Protected Area Management Trust (NETPAMT) are important enabling and supporting elements for the success of the NETMABR.

Figure 8 Ridge to reef ecosystems of NE Tobago (Jacob Bock)

3.3 LOGISTIC SUPPORT

SUPPORT FOR DEMONSTRATION PROJECTS, ENVIRONMENTAL EDUCATION AND TRAINING, RESEARCH AND MONITORING RELATED TO LOCAL, REGIONAL, NATIONAL AND GLOBAL ISSUES OF CONSERVATION AND SUSTAINABLE DEVELOPMENT

"Please indicate current and planned activities."

In 1944, J.S. Beard's "The Natural Vegetation of the Island of Tobago" established a milestone for scientific research in NE Tobago that is still of significant influence. Since the 1960s, the proposed NETMABR has been frequently and repeatedly visited by scientists and student groups not only from the University of the West Indies (UWI), the University of Trinidad and Tobago (UTT), and Trinidad and Tobago's Institute of Marine Affairs (IMA), but also from an, especially recently, increasing number of international institutions, see Table 2. This has led to the area's reputation as a national science-tourism hotspot and continuous support regarding conservation research and education.

Table 2: Academic and research institutions conducting research or education programmes in North-East Tobago.

From	To	Academic Institution	Country	Research	Education
1960s	ongoing	UWI	Trinidad and Tobago	x	x
1960s	2004	Smithsonian Institution	USA	x	
1980s	ongoing	IMA	Trinidad and Tobago	x	
1995	ongoing	Cardiff University	UK	x	x
2005	ongoing	Pacific Lutheran University	USA		x
2005	2005	Kleve Tourism School	Germany	x	
2007	ongoing	Hogeschool Van Hall Larenstein	Netherlands	x	
2014	ongoing	University of Glasgow	UK	x	
2014	ongoing	Adam Mickiewicz University	Poland	x	
2015	ongoing	UTT	Trinidad and Tobago	x	x
2016	ongoing	Austin College	USA		x
2016	ongoing	Florida International University	USA	x	
2017	ongoing	Trinity College	USA		x
2018	ongoing	Texas A&M University	USA		x
2018	ongoing	Northwood College	USA		x
2019	ongoing	Ohio State University	USA		x
2019	ongoing	New York State University	USA		x

Past and present research programmes address herpetofauna, avifauna, coral reefs, tropical forest biodiversity, climate change as well as studies related to research methods, sustainable tourism, MABR design, resource use, policy planning, ecosystem services evaluation, archaeological sites as well as cultural expressions.

In April 2014, the Environmental Research Institute Charlotteville (ERIC), an ENGO, established the first permanent research facility, including resident scientists, in the proposed NETMABR and conducts ongoing ecological monitoring, facilitates international researchers and student groups from almost all of the above-mentioned institutions, implements projects related to climate change and linking community livelihoods to conservation. ERIC has a demonstrable working relationship with the relevant natural resource management authorities for the area, namely the Department of the Environment (DoE), the Department of Marine Resources and Fisheries (DMRF), and the Department of Natural Resources and Forestry (DNRF).

Figure 9 ERIC's sustainability scientists collecting Reef Check data (Max Smith)

The key factors for an enabling environment supporting demonstration projects, environmental education and training, research and monitoring etc. are as follows:

- rich biodiversity, ecosystem diversity and connectivity as well as cultural and archaeological heritage in a relatively small area allow for reaching all points of interest within short distance and time;

- most communities have been exposed to visiting researchers, students and environmental / cultural education and training and are commonly welcoming such activities (once results are shared);
- governmental bodies, schools (two secondary and 12 primary), and CSO's have a demonstrable track record of (co-) implementing demonstration projects, environmental education and training, as well as research and monitoring;
- private and public landowners as well as management authorities are generally well-disposed of collaborating on demonstration projects and potentially grant access to implementation sites;
- funding and technical support: the connection to its sister isle Trinidad allows for relatively easy access to:
    - national academic and research institutions such as the UWI, UTT and IMA;
    - national environmental training and educational programmes;
    - national incentives and grants (e.g. Green Fund see above);
    - a strong private sector (especially the hydrocarbon extracting companies) with well-developed corporate social responsibility programmes and a long-standing track record of supporting demonstration projects, environmental education and training, research and monitoring;
    - multilateral agencies (e.g. UN-agencies, the Inter-American Institute for Collaboration on Agriculture (IICA), the Inter- American Development Bank (IDB), as well as national and regional diplomatic missions that can provide networking, PR support and access to funding;
- NE Tobago is easily accessible: currently there are weekly direct connections to the USA, Germany and England; the short airbridge to Trinidad allows for daily international travel to the region, middle America, Northern America and Europe. The NETMABR is 1-hour drive from the Tobago international airport on well developed country roads;
- researchers and student groups can easily find affordable long term and short-term accommodation;
- NE Tobago can be considered a safe and secure environment for visitors;
- publicly accessible community centres, school classrooms and CSO facilities for educational and training programmes; and
- required equipment and materials are relatively easily available due to proximity to Trinidad with its international airport and seaports.

In this highly conducive environment, activities related to local, national, regional, and global issues of conservation and sustainable development are carried out by governmental and non-governmental organisations (NGO's), private citizens and local as well as foreign academic institutions.

Current and planned activities related to the management of the proposed NETMABR are described in detail in Section 16.

In summary, governmental agencies, CSOs, national and international academic and research institutions have a demonstrable track record of implementing projects and programmes related to:

- biological and ecological baseline monitoring,
- collecting data related to fisheries and tourism,
- climate change monitoring,
- capacity building, environmental, cultural and natural heritage education, and
- socio-cultural and economic activities related to sustainable development.

Many of these activities address issues shared with the region (e.g. turtle conservation, archaeological research) and globally (e.g. climate change, shark population monitoring; reef health monitoring).

Currently, some of these activities are conducted in silos, information is unreliably stored and complicated to access. Therefore, it will be an important mandate of the future NETMABR management organisation to consolidate activities, define future research, outreach and implementation agendas, stimulate cooperation between stakeholders, and provide link-ups with other BRs to support research exchanges (e.g. through IberoMAB or the Island and Coastal BR Network).

4. CRITERIA FOR DESIGNATION AS A BIOSPHERE RESERVE

"Article 4 of the Statutory Framework presents seven general criteria for an area to be qualified for designation as a biosphere reserve which are given in order below."

4.1 ENCOMPASS A MOSAIC OF ECOLOGICAL SYSTEMS REPRESENTATIVE OF MAJOR BIOGEOGRAPHIC REGIONS, INCLUDING A GRADATION OF HUMAN INTERVENTIONS

"(The term "major biogeographic region" is not strictly defined but it would be useful to refer to the Udvardy classification system (http://www.unep-wcmc.org/udvardys-biogeographical-provinces-1975_745.html))."

According to Udvardy's Biogeographic Classification System, NE Tobago's terrestrial biodiversity is classified as follows:

Realm: Neotropical
Biome: Mixed Island System
Province: Lesser Antillean

While the Udvardy (1975) classification is useful, the World Wildlife Fund (WWF) classification is used in this instance since it was felt that it has a higher resolution and also includes the marine environment, providing a more comparable definition of its biogeographic divisions.

NE Tobago's terrestrial biomes (Figure 10) are classified as predominantly Tropical and Subtropical Moist Broadleaf Forests (also found in mainland South America, primarily the Cordillera de la Costa in Venezuela, Eastern Venezuela, Guyana, and Suriname), with its most northern end being Tropical and Subtropical Dry Broadleaf Forest (associated with several islands in the Lesser Antilles).
Each biome is further subdivided into ecoregions, based on its geography (including geology, local climate, hydrology, etc) and, community assemblage and interactions. NE Tobago has a combination of Trinidad and Tobago Moist Forests and Lesser Antillean Dry Forests.
The term "Bioregion" is an additional category sometimes used to define ecoregions sharing historically similar biogeography. Trinidad and Tobago is classified into the Orinoco Bioregion and is the only Caribbean country found in this relatively small grouping.

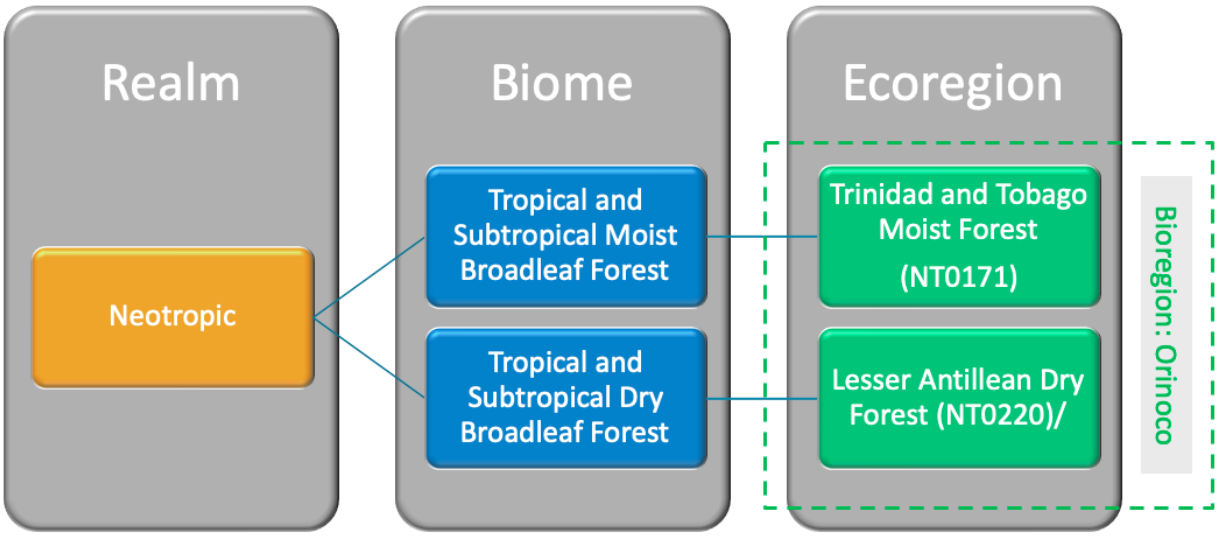


Figure 10 Terrestrial biogeographic classification.

According to the National Oceanic and Atmospheric Administration's (NOAA's) LME classification, Tobago is situated in the Caribbean Large Marine Ecosystem (LME), and in proximity to the North Brazil Shelf LME. The WWF broadly divides the marine ecosystems into provinces, in which Tobago is classified as Tropical North-western Atlantic.

With further subdivision, Tobago is one of the few Caribbean islands categorised into the Southern Caribbean ecoregion influenced by the juxtaposed Eastern Caribbean and Guianan ecoregions.

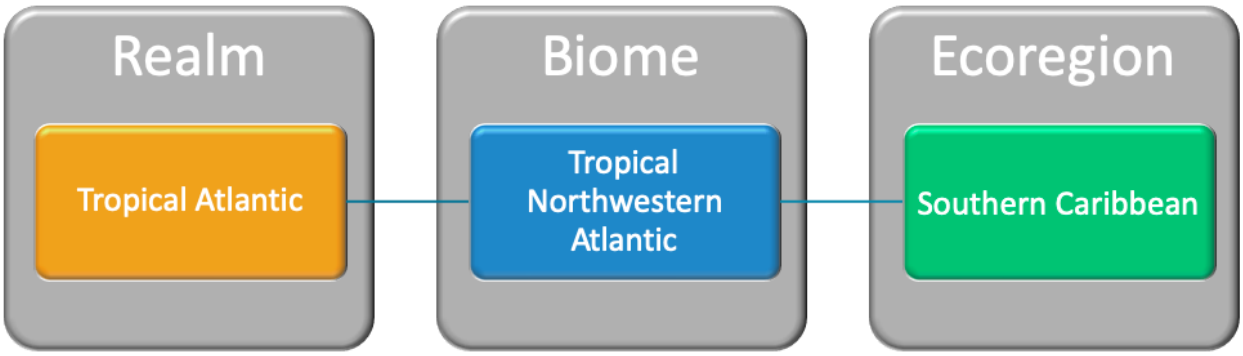


Figure 11 Marine biogeographic classification.

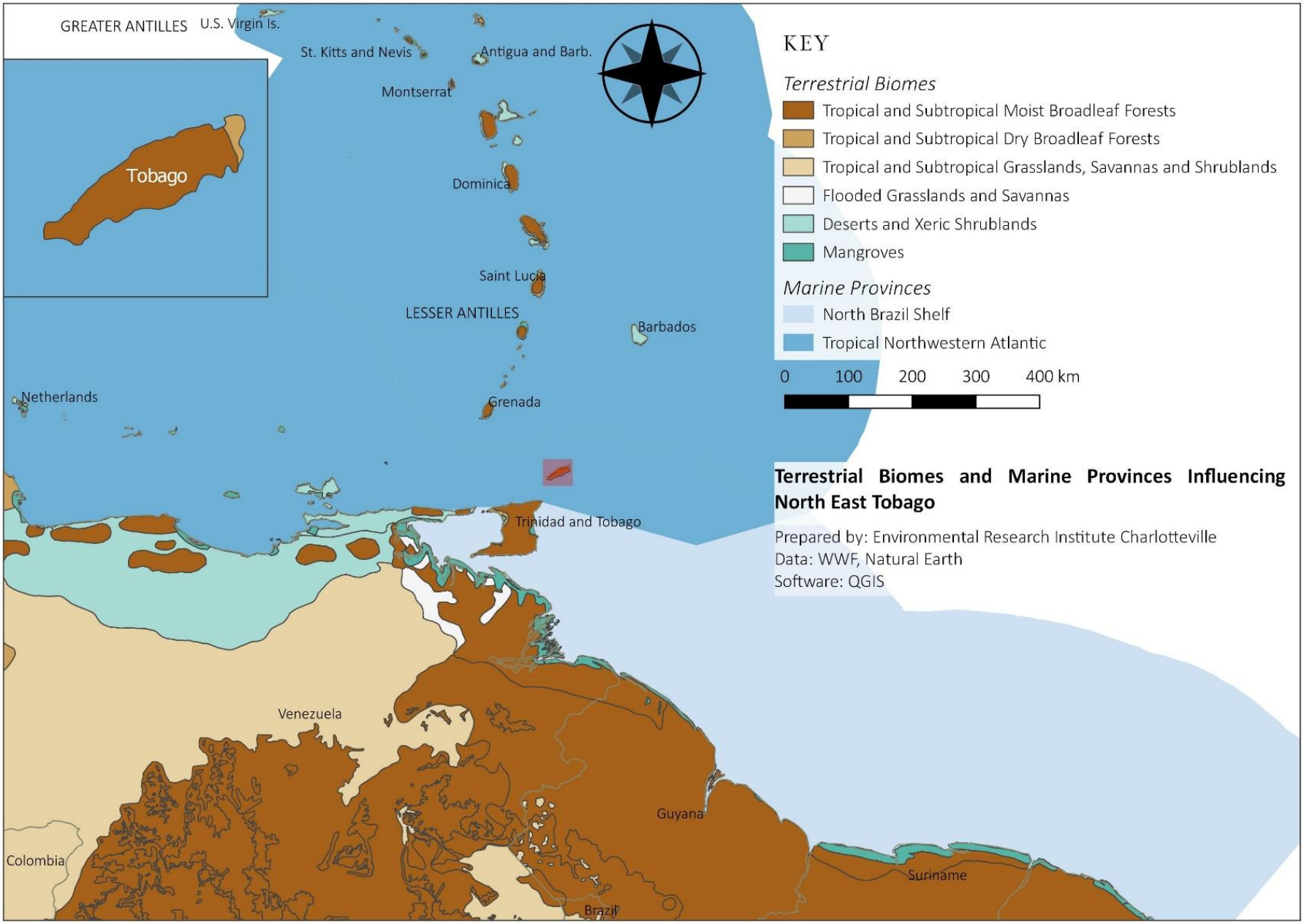
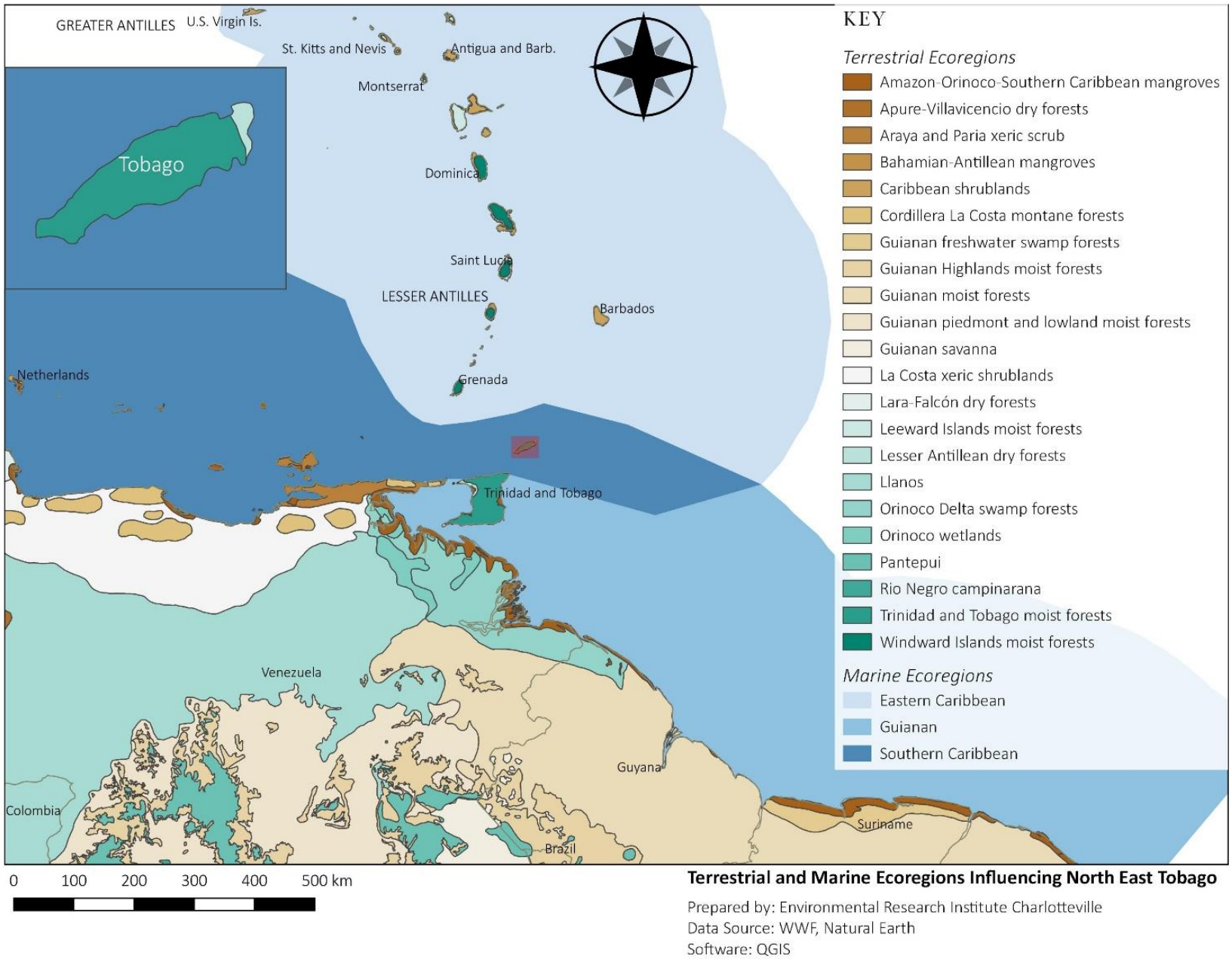


Figure 12 Terrestrial biomes and marine provinces in the Lesser Antilles and South America, with focus on Tobago (inset), according to WWF classification.



Terrestrial and Marine Ecoregions Influencing North East Tobago

Prepared by: Environmental Research Institute Charlotteville
Data Source: WWF, Natural Earth
Software: QGIS

Figure 13 Terrestrial and marine ecoregions in the Lesser Antilles and South America, with focus on Tobago (inset), according to WWF classification.

Due to the relatively low population density, its remoteness and the absence of major economic interests, the human interventions on the ecosystems are limited and the vast majority of the area is relatively pristine.

Table 3: Types and degree of human interventions on ecoregions in the planned NETMABR.

	Eco Region	Eco System	Human Intervention
Terrestrial	Trinidad and Tobago Moist Forests	Lower montane forest	hunting, timber extraction, small scale agriculture
		Elfin woodlands	hunting, timber extraction
		Evergreen formation forest	hunting, timber extraction
	Lesser Antillean Dry Forest	Dry broadleaf forest	poaching (sea birds)
Marine	Southern Caribbean	Sandy beaches	recreation, poaching (turtles)
		Rocky intertidal shores	artisanal fishing
		Coral reefs	recreation, artisanal fishing, liquid and solid waste
		Mangroves	small scale agriculture, liquid and solid waste
		Sand and silt substrates	artisanal fishing
		Seagrass beds	artisanal fishing
		Epipelagic	recreation, artisanal fishing, solid waste
		Mesopelagic	fishing
		Meso benthic	fishing
		Bathyal pelagic	n/a
		Bathyal benthic	n/a
		Human Intervention Key	very low
			low
			medium
			high
			very high

4.2 BE OF SIGNIFICANCE FOR BIOLOGICAL DIVERSITY CONSERVATION

"This should refer not only to the numbers of endemic or rare species, but may also refer to species on the IUCN Red List or CITES appendices, at the local, regional or global levels, and also to species of global importance, rare habitat types or habitats with unique land use practices (for example traditional grazing or artisanal fishing) favouring the conservation of biological diversity."

NE Tobago harbours globally valuable biodiversity in terms of 'at-risk' species, endemic species, migratory species, iconic species and commercial species. The value of NE Tobago's biodiversity comes from the diversity of the area's ecosystems and their relative intactness. The NETMABR will include open ocean species such as manta ray and hawksbill sea turtle, minute, florescent marine molluscs on the coral reef, iridescent hummingbirds, glass frogs, and extraordinary plant diversity in the Tropical Moist Broad Leaf Forests and regionally rare Tropical Dry Broad Leaf Forests. The terrestrial part of the planned NETMABR has historically been used extensively for sugar, coconut and cocoa-based agriculture, which is indicated by many colonial ruins and, in the case of cocoa, still within living memory. In fact, the need for an ecosystem service namely consistent and sufficient water supply for the sugar industry was the main reason for the declaration of the MRFR in 1776.

In 1963, Hurricane Flora caused massive forest devastation and the subsequent change from an agricultural-based to a hydrocarbon-based economy in the early 1970s led to an almost total decline in agriculture and the abandonment of vast areas with larger estates and smaller farms. Today, the MRFR, a future Core Zone, is mainly ecologically intact and the surrounding private and public properties (a future Buffer Zone), are barely economically used. This is mainly due to the deterioration of agricultural access roads and predominant steep slopes which are making the area difficult to access and mechanisation impractical; however, this condition also provides a certain level of protection from intrusion.

The planned MPA, a future Buffer Zone, is only used for artisanal fishing and recreational activities. There are no commercial ports or major shipping routes within its boundaries. However, it should be mentioned that this marine Buffer Zone is bordered by large areas earmarked for extraction of natural gas. Two islets (St. Giles and Little Tobago) are IBAs and protected by national legislation.

This landscape, with a low population density, lack of large infrastructure, and the absence of major economic interests are an ideal prerequisite for the long-term conservation of the natural diversity of NE Tobago.

Figure 14 Critically endangered hawksbill sea turtle hatchlings at Man-o-War Bay, NE Tobago (ERIC)

Most outstanding is the presence of critically endangered (CR) Hawksbill Sea Turtles (*Eretmochelys imbricate*), Staghorn and Elkhorn Corals (*Acropora*), endangered (EN) Leatherback Sea Turtles (*Dermochelys coriacea*), Green Sea Turtles (*Chelonia mydas*), Loggerhead Sea Turtles (*Caretta caretta*), hammerhead sharks (*Sphyrna*), star corals (*Montastraea*), vulnerable (VU) Olive Ridley Sea Turtles (*Lepidochelys olivacea*), snappers (*Heteropriacanthus*), Manta rays (*Manta birostris*), Bloody Bay Poison Frogs (*Mannophryne olmonae*), Eastern Glass Frogs (*Hyalinobatrachium orientale tobagoense*) and Bloody Bay Litter Frogs (*Pristimantis*). The latter three species are endemic. Near threatened (NT) species include the Rainbow Parrotfish (*Scarus guacamaia*), Blacktip Shark (*Carcharhinus limbatus*), Caribbean Reef Shark (*Carcharhinus perezii)*, Bull Shark (*Carcharhinus leucas*), Lemon Shark (*Negaprion brevirostris*) and the White-Tailed Sabrewing (*Campylopterus ensipennis*). The conservation status of eight endemic species remains unknown; these include the Tobago Greenlet (*Hylophilus insularis*), Attenborough's Myotis (bat)(*Myotis attenboroughi*), Charlotteville Robber Frog (*Pristimantis charlottevillensis*), Hailey's Parrot Snake (*Leptophis coeruleodorsus*), Tobago False Coral Snake (*Erythrolamprus ocellatus*), Tobago Coral Brotula (*Ogilbichthys tobagoensis*), Tawny Blenny (*Starksia rava*) and the Darksaddle Blenny (*Starksia sella*).

Biodiversity experts expect that further research will likely yield more endemic species, especially of plants, reptiles and amphibians.

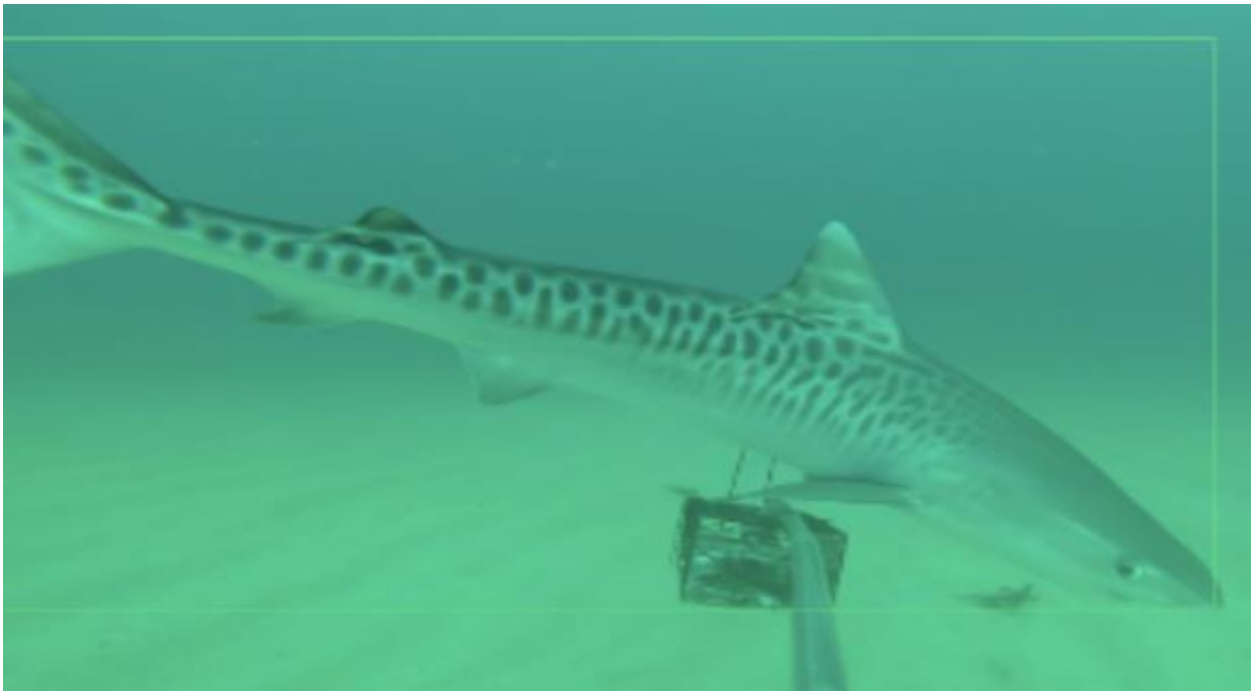


Figure 15 Juvenile tiger shark recorded on baited underwater camera in NE Tobago (ERIC)

Table 4: Summary of IUCN at-risk species, endemic species, EDGE species, CMS species and CITES species occurring in the planned NETMABR.

Category		Number	
IUCN RED LIST species	Critically Endangered	11	**83**
	Endangered	13	
	Vulnerable	34	
	Near Threatened	25	
ENDEMIC species			**41**
EDGE species			**13**
CMS species			**48**
CITES species			**120**

In 2019, the first complete list of all documented, macroscopic species was compiled as a by-product of the MAB application (see Annex) and indicates NE Tobago's species richness as follows:

Table 5: NE Tobago species richness.

Species Group	Number of Species
Freshwater Invertebrates	26
Marine Invertebrates	252
Terrestrial Invertebrates	207
Marine Fish	204
Freshwater Fish	13
Amphibians	15
Reptiles	45
Birds	160
Marine Mammals	19
Terrestrial Mammals	39
Vascular Plants	800
Non-Vascular Plants	16
Total	**1796**

Please note, this is work in progress and additional species are expected especially regarding terrestrial and marine invertebrates.
Please also note that the total species count is 1,774. In some instances, species in Table 5 were counted twice if they are found in marine and terrestrial habitats.

4.3 PROVIDE AN OPPORTUNITY TO EXPLORE AND DEMONSTRATE APPROACHES TO SUSTAINABLE DEVELOPMENT ON A REGIONAL SCALE

"Describe in general terms the potential of the area to serve as a site of excellence for promoting the sustainable development of its region (or eco-region). "

Regarding human development-related aspects NE Tobago is very similar to many coastal, rural areas in the insular Caribbean; this includes, but is not limited to the following factors:

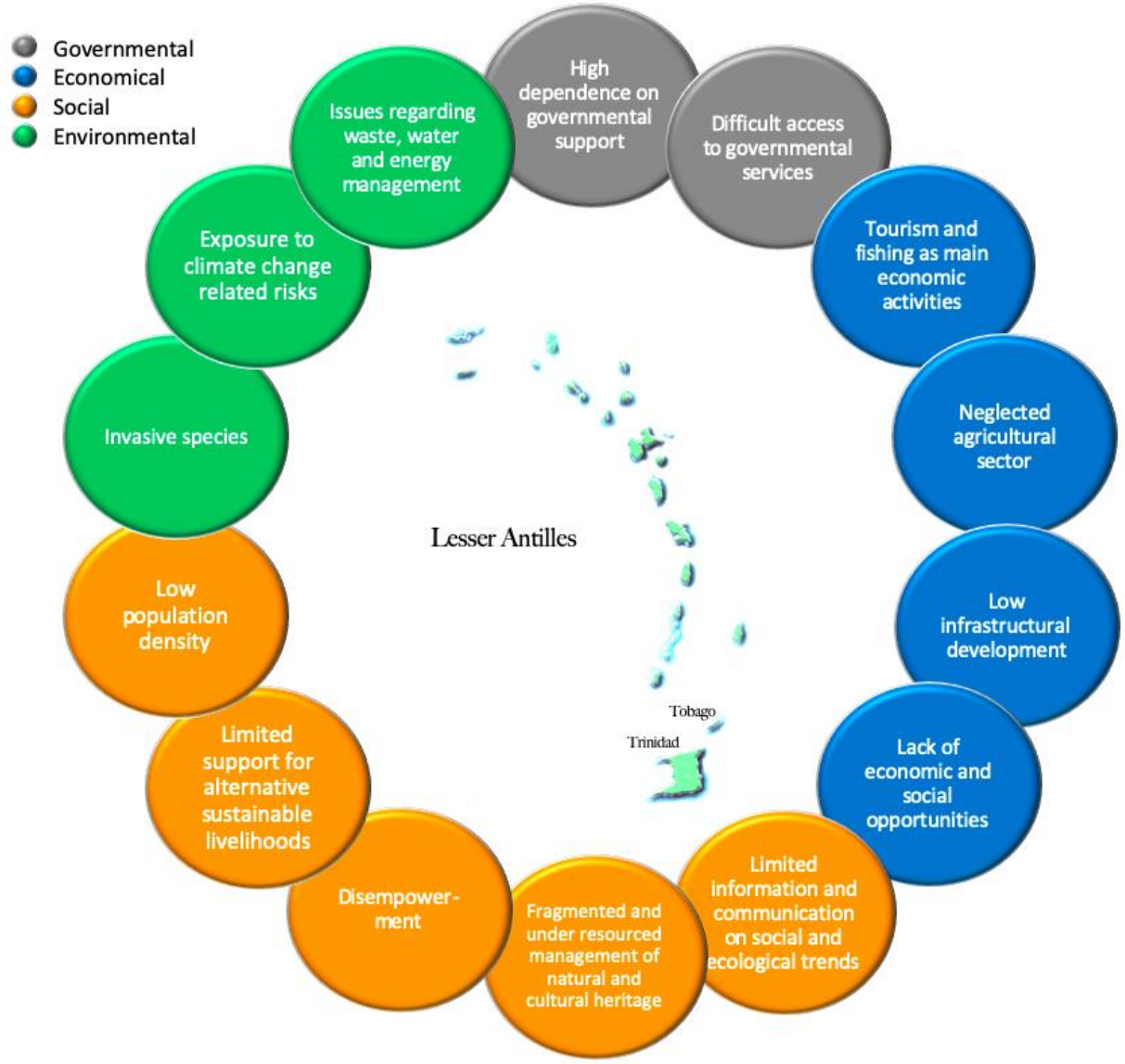


Figure 16 Selected human development issues that Tobago shares with its region.

These similarities will allow for the meaningful exchange of experiences and lessons learnt from the implementation of NETMABR regarding approaches to sustainable development between Tobago and the region.

Additionally, the planned NETMABR is exposed to a multitude of windows of opportunity to address these shared issues and provide examples and inspiration for sustainable development to the insular Caribbean.

These opportunities include:

Current land tenure situation: Private land tenure in NE Tobago is dominated by a series of large estates. These estates are currently forested, undeveloped and encompass land of high conservation value. Notably, some of this land maintains critical ecosystem connectivity between the MRFR and the forested North-East tip of the island. Several landowners have expressed interest in conservation easements and conservation-relevant development.

There are viable and already budding opportunities for sustainable, conservation-relevant natural and cultural resource use throughout the area. Examples include a variety of sustainable tourism sub-categories such as eco-, agro-, nature -, science-, community-based -, and culture-tourism, agroforestry such as cocoa, tea, heritage fruits, timber and honey, annual heritage festivals, shellfish and algae mariculture etc.

The central and local government's intention to consolidate and improve the conservation status of ecologically high value areas in NE Tobago is demonstrated through the presence of three already protected areas, the intention to declare a significant MPA and three NNH Sites, acceptance of the new National Protected Areas Systems Plan (NPASP; 2019), implementing the national IFPAM Project in the MRFR and the planned MPA, establishing a participatory NETPAMT and applying for MAB designation. The government's willingness to engage in exploring sustainable, alternative livelihood opportunities for the area is driven by a recent slow-down of the (mainly hydrocarbon-based) national economy.

NE Tobago has several active Community Based Organisations (CBO's) with environmental and cultural mandates. These organisations currently pursuing natural and cultural conservation-relevant activities and have demonstrated a willingness to engage with sustainable development activities. While currently having limited capacity, they have demonstrated, through several projects, the ability to improve with experience.

Mainly, due to its relationship with its sister isle Trinidad, and to an existing international network of funders and researchers, Tobago enjoys relative accessibility to technical and funding support for pilot, and demonstration projects and programmes exploring sustainable development. Many funders are specifically interested in the regional replicability of such activities.

During the stakeholder consultations for the MAB nomination process (2018-2019) it became clear that one of the cross-sectoral, primary objectives of the application for BR status is to

establish an area to promote sustainable development activities related to natural and cultural heritage, that is adapted to local conditions.

The above-mentioned opportunities and the additional impetus of a MAB designation will allow NE Tobago to take a strategic sustainable development advantage, to coordinate and catalyse all these features, which will promote, create and diversify livelihood opportunities as an example for the region.

Figure 17 Access road to Argyle Waterfall (Jacob Bock)

4.4 HAVE AN APPROPRIATE SIZE TO SERVE THE THREE FUNCTIONS OF BIOSPHERE RESERVES

"This refers more particularly to (a) the surface area required to meet the long-term conservation objectives of the core area(s) and the buffer zone(s) and (b) the availability of areas suitable for working with local communities in testing and demonstrating sustainable uses of natural resources. "

The proposed NETMABR encompasses 834.88 km^2 which is subdivided as follows:

Table 6: Area of NETMABR and its three zones.

NETMABA Zones	Area [km2]	%
Total Core Zones	*39.38*	*4.7*
Terrestrial Buffer Zone	*57.51*	*6.9*
Marine Buffer Zone	672.49	*80.5*
Total Buffer	*730.00*	*87.4*
Terrestrial Transition Zone	54.15	*6.5*
Marine Transition Zone	11.35	*17.3*
Total Transition Zone	*65.50*	*7.8*
Total	**834.88**	**100.0**

CONSERVATION

The Core Zones were defined based on their already, legally established, protected area status, low levels of human threats, and relatively successful conservation management in the past.

The Buffer Zone was established based on the low likeliness of increasing human intrusion and destructive economic interest (terrestrial) as well as the planned MPA (marine).

Both zones have demonstrably sufficient size to maintain the integrity of their interconnected landscapes, ecosystems, biodiversity and genetic variation which is signified by their relatively high intactness under the current circumstances significantly improving the declaration of a BR in the future.

Furthermore, it is the intent of governmental and non-governmental stakeholders to increase the protection level of Core and Buffer Zone by declaring additional NNH and CNH Sites in the future (some of which will then switch from the Buffer Zone to the Core Zone), implementing the recently cabinet approved NPASP, (which also will switch some Buffer Areas to the Core Area) and implementing the NE Tobago Marine Protected Area (NETMPA) through national legislation and/or local regulations in the near future.

Local community groups have also a long-standing track record of working on conservation issues especially beach turtle patrols and clean ups. These activities have always either been tolerated, endorsed, or actively supported by private and public landowners as well as governmental agencies.

All three zones of the NETMABR entail significant areas for local communities to engage in conservation activities with the goodwill of stakeholders.

DEVELOPMENT

The terrestrial Core Zone (MRFR) is one of the most important eco-tourism destinations in Tobago, used solely for nature trails. There are several trails along the only road traversing the forest reserve; the current usage is limited and does not impact on the integrity of the MRFR. The two islets within the Core Zone are also used for bird watching and reef snorkelling tours, again without crossing the limits of acceptable change. The usage of the large marine Buffer Zone by local artisanal fishermen and for water-sport activities currently does not hinder the conservation objectives; however, the implementation of the MPA and the designation of a BR are very likely to initiate a shift from the current relatively unregulated situation to a more ecologically sustainable development. In the Core Zone, areas to develop demonstration projects for sustainable development will continue to be very limited in the future and be restricted to low impact day visits. However, the terrestrial and marine Buffer Zone entail large areas in which community-based entrepreneurs and organisations can engage in sustainable resource use especially regarding agroforestry, mariculture, and various forms of responsible tourism.

The Transition Zone is the main area for the further development and fostering of cultural heritage activities, art and craft which are already showing signs of shifting towards a lower environmental footprint and increased cultural authenticity. With its approximately 10,000 people, 15 communities, many archaeological sites, and supporting facilities, the area clearly has the space as well as other opportunities required to fulfil the development function of a BR.

LOGISTIC SUPPORT

The relatively high intactness, variety, accessibility and size of the Core and Buffer Zone make this area an ideal location for research, environmental education and demonstration projects without the risk of overcrowding or unsustainable levels of usage. As described above, such activities started in the 1960s with the Smithsonian Institution and have recently seen a significant increase with the operation of the ERIC in NE Tobago. Current research activities go far beyond the biological realm, reaching into the Transition Zone and include social, cultural and economic topics, most of them with a connection to applied sustainable development.

Increasingly, local stakeholders insist on their right to be involved in research and get informed about the results. While there is still much work to be done, a significant change happened in this regard over the past five years. Especially, in relation to the IFPAM project that involved numerous key civil society stakeholders on its local steering committee.

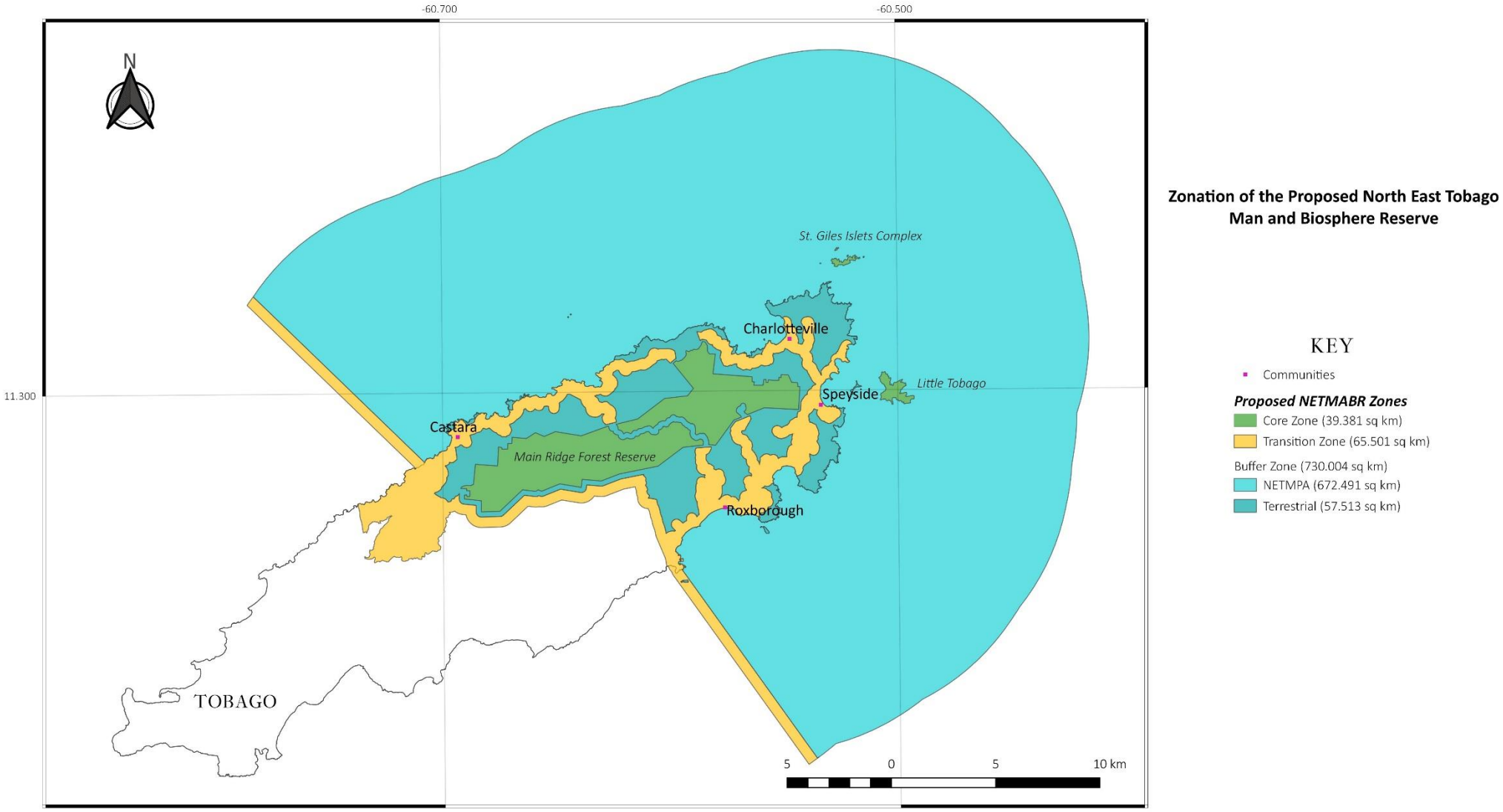


Figure 18 Proposed NETMABR zones.

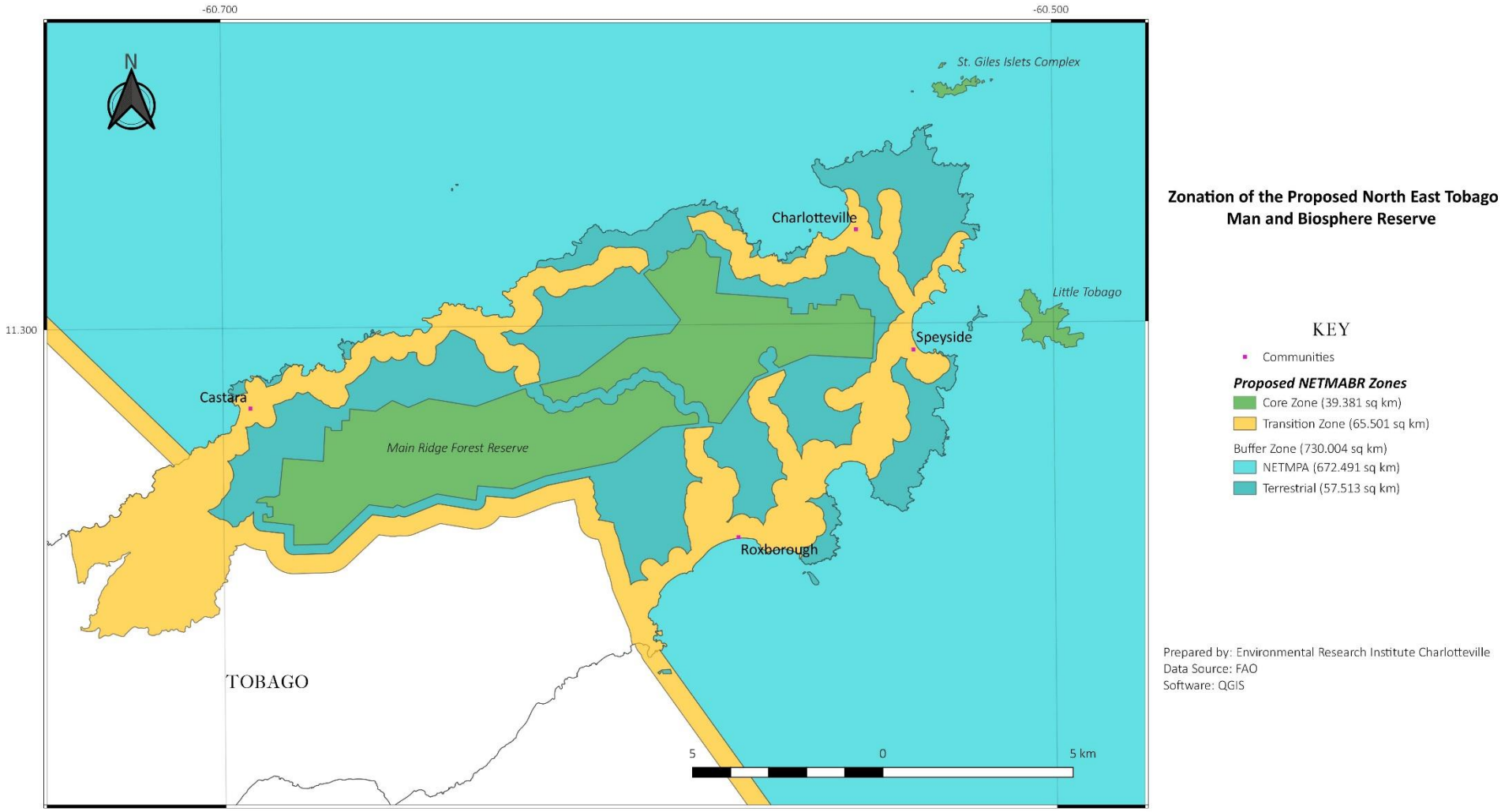


Figure 19 Enlargement of proposed NETMABR zones.

4.5 THROUGH APPROPRIATE ZONATION

(A) A LEGALLY CONSTITUTED CORE AREA OR AREAS DEVOTED TO LONG TERM PROTECTION, ACCORDING TO THE CONSERVATION OBJECTIVES OF THE BIOSPHERE RESERVE, AND OF SUFFICIENT SIZE TO MEET THESE OBJECTIVES.

"Describe the core area(s) briefly, indicating their legal status, their size, the main conservation objectives. "

The Core Zone of the proposed NETMABR consists of three legally protected areas: the MRFR, Little Tobago and the St Giles Islet Complex, all of which are terrestrial.

It should be noted that, at the moment the Core Zone does not include any marine areas, due to lack of protective legislation and regulations; however, work has started to designate high conservation value reefs as NNH Sites (which is the fastest way of to achieve legal protection) in 2020, and the NPASP was approved by Cabinet, which hopefully will result in the designation of the overall NETMPA with some special, IUCN 1a category areas. Once these marine areas receive legal protection, they can later on switch from Buffer to Core Zone status within the BR.

The main and most distinguishing Core Area of the NETMABR will be the MRFR. The MRFR stretches from south-west to north-east on both sides of the centre mountainous ridge in NE Tobago, 17km long and two to six km wide, covering 39.56km^2, reaching elevations up to 630m and representing roughly 13 percent of the terrestrial area of Tobago. It is characterised by forest cover consisting of lower montane forest, evergreen formation forest and some elfin woodland and stretches across eleven watersheds.

Geologically, the Main Ridge shifted from the Pacific along northern South America and across the Caribbean Tectonic Plate to its present location in the Atlantic. On its way, it connected several times with Trinidad and Southern America, facilitating the exchange of species. The MRFR and the entire NE Tobago are part of the North Coast Schist Group (NCSG) consisting mainly of metavolcanics and metasedimentary rock. Much of the soil in the MRFR is loamy clay which loses its elasticity quickly during heavy rainfall. Therefore, landslides are common during the wet season.

The MRFR is home to 22 non-poisonous snake-, 37 mammal-, 16 lizard-, 128 bird-, 15 fish, 662 plant and numerous invertebrate species of which 31 are endemic. It is the most important terrestrial location in Tobago for ecotourism and was voted the "World's Leading Eco-Tourism Destination" by the World Travel Awards each year from 2003 to 2006; and the "World's Leading Green Destination" in 2007 and 2009. The MRFR is an internationally IBA and is further nominated as a NNH Site and as a Queens Commonwealth Canopy Site.

The area was declared a forest reserve in 1776 by the British colonial authorities making it the oldest legally protected tropical forest reserve in the world.

The management of the MRFR and associated biodiversity is carried out by the DNRF by virtue of various pieces of legislation governing the management of forests, forest products and wildlife. There are several key primary legislation and policies pertaining to the MRFR:

- Tobago House of Assembly Act Chap. 25:03, Act 40 of 1996 amended by 17 of 2006; which notably provides THA with the capacity to legislate for the protection of biodiversity and natural areas locally,
- Forest Act Chap. 66:01, Act 42 of 1915 amended by 23 of 1999,
- Conservation of Wildlife Act Chap. 67:01, Act 16 of 1958 amended by 31 of 1980,
- Sawmills Act Chap. 66:02, Act 35 of 1943 amended by 24 of 1999,
- Conservation of Wildlife Act Chap. 67:01, Act 16 of 1958 amended by 31 of 1980,
- The Environmental Management Act Chap. 35:05, Act 3 of 2000,
- Environmentally Sensitive Species Rules, 2001,
- State Lands Act Chap. 57:01, Act 32 of 1918 amended by 25 of 2006,
- National Protected Areas Policy (2011: provides the main policy framework for the NPASP),
- National Forest Policy (2011), and
- National Wildlife Policy (2013).

Stakeholder consultations regarding the drafting of a Management Plan for the MRFR (2018) agreed on the following Draft Vision, Mission and Main Objective for the management of the MRFR:

Draft Vision: *"A conserved Tobago rainforest for generations".*

Draft Mission: *"To encourage the sustainable management of the MRFR through collaborative linkages with various stakeholders driven by research, results-based management, training, awareness and the need for livelihoods."*

Draft Main Conservation Objective: "*To maintain the viability of the oldest protected forest reserve in the western hemisphere*."

The other two, much smaller Core Areas are the islet of Little Tobago and the St Giles Islets Complex, both located at the north-eastern end of Tobago.

Little Tobago is hilly with steep slopes, cross-shaped, ~ 2km long and 1.3 km wide, covering ~ 121ha. St Giles, also hilly with steep slopes, is elongated, ~2km long and maximum 300m wide covering 41ha. Both share their geology with the MRFR; however, are dominated by, regionally rare, Dry Broadleaf Forest and listed as internationally IBA (Magnificent Frigate Birds, Brown and Red Footed Boobys, Audubon Shearwaters, Tropic Birds, Terns, Noddies etc.); it is the intention to also list these islets and their surrounding coral reefs as NNH Sites. Both islets are famous for excellent diving and bird watching.

Figure 20 Large male iguana on Little Tobago, threatened by hunting (ERIC)

They are managed by the DNRF and are listed as Prohibited Areas and Game Sanctuaries according to Forest Act Chap. 66:01 of 1915 amended by 23 of 1999.
Stakeholder consultations regarding the drafting of a Management Plan for the planned NETMPA (2018) in which these two Core Areas fall, agreed on the following Draft Vision, Mission and Main Conservation Objective for their management:

Draft Vision: "*A collaboratively-managed MPA for sustainable livelihoods and conservation in NE Tobago"*.
Draft Mission: "*Conserving natural resources for sustainable use in the NETMPA through scientific research, collaboration and empowerment*".
Draft Main Conservation Objective: "*to maintain ecological processes of the marine ecosystem (i.e., coral reefs, mangrove forests and marshes, seagrass beds, etc.) inclusive of the offshore islands and up to the 5m contour line on the main island, in NE Tobago and/while supporting sustainable livelihood [and other] activities."*

It should be mentioned that the above statements were formulated with the entire, planned NETMPA in mind (of which these islets are only a minute part) as such it is understood that the only types of sustainable resource use on the islets should be carefully regulated eco-tourism, education and research.

As seen from the above-mentioned legislation, the three Core Areas have been managed for quite a long time as protected areas and demonstrably kept their ecological and biodiversity integrity relatively intact. As such it can be stated that the Core Zone is of sufficient size to achieve the local and BR conservation objectives (see table 7 below).

(B) A BUFFER ZONE OR ZONES CLEARLY IDENTIFIED AND SURROUNDING OR CONTIGUOUS TO THE CORE AREA OR AREAS, WHERE ONLY ACTIVITIES COMPATIBLE WITH THE CONSERVATION OBJECTIVES CAN TAKE PLACE.

"Describe briefly the buffer zones, their legal status, their size, and the activities which are ongoing and planned there. "

The Buffer Zone for NETMABR was defined as:

- all lands between the Transition Zone and the MRFR Core Zone,
- a 125m belt on both sides of roads within the Core Zone (combining to a width of 250m)
- a 250m belt along the boundary between the Core Zone and the south-western area outside of the NETMABR,
- coastal areas between the boundaries of the NETMPA and the Transition Zone, and
- the entire marine realm of the proposed NETMPA.

As mentioned in the section above, some marine Buffer Zones might change to Core Zone as soon as legal protection will be provided. Therefore, the terrestrial, coastal Buffer Zones are crucial to protect sensitive marine ecosystems.

The terrestrial Buffer Zone covers 57.51km^2, the marine Buffer Zone covers 672.49km^2, adding up to a total area of 730.00km^2.

The overall management of the terrestrial Buffer Zone is vested in the THA via the Tobago House of Assembly Act, 1996. Other pieces of noteworthy legislation and policies are:

- Forest Act Chap. 66:01, Act 42 of 1915 amended by 23 of 1999,
- Conservation of Wildlife Act Chap. 67:01, Act 16 of 1958 amended by 31 of 1980,
- The Environmental Management Act Chap. 35:05, Act 3 of 2000,
- Environmentally Sensitive Species Rules, 2001,
- State Lands Act Chap. 57:01, Act 32 of 1918 amended by 25 of 2006,
- National Protected Areas Policy (2011: provides the main policy framework for the NPASP),
- National Forest Policy (2011),

- National Wildlife Policy (2013), and
- the Comprehensive Economic Development Plan (CEDP) 2.0, which is the local policy document that focuses on sustainable development in Tobago and at the heart of CEDP 2.0 is diversification of the economy, preservation of the environment and a better standard of living for its people.

The terrestrial Buffer Zone is characterised by forested private and public lands on mostly abandoned larger estates as well as smaller properties. Human activity is currently limited to sparsely scattered micro-farming, legal and illegal hunting, small scale timber extraction, and low-level of nature-, and eco-tourism.
During consultations regarding the nomination of the NETMABR, stakeholders expressed interest to engage in sustainable (organic) agro-forestry (especially cocoa and heritage fruits), eco-, agro-, science-, sport- (biking, hiking,) tourism, honey- and tea production, use of invasive bamboo, and research.

The marine Buffer Zone, by far the largest of all zones, comprises of a 11.1km seawards belt around NE Tobago and was defined by using the boundaries of the planned NETMPA; the 11.1km boundary is also the seaward boundary of the area vested in the THA for internal self-governance. The DMRF is the responsible management authority within the THA.
Key, primary legislations and policies regarding the marine Buffer Zone are:

- Tobago House of Assembly Act Chap. 25:03, Act 40 of 1996 amended by 17 of 2006,
- Fisheries Act Chap. 67:51, Act 39 of 1916 amended by 23 of 1975,
- Marine Preservation and Enhancement Act Chap. 37:02, Act 1 of 1970 amended by 37 of 1996,
- Territorial Sea Act Chap. 1:51, Act 38 of 1969 amended by 22 of 1986,
- Continental Shelf Act Chap. 1:52, Act 43 of 1969 amended by 23 of 1986,
- Conservation of Wildlife Act Chap. 67:01, Act 16 of 1958 amended by 31 of 1980,
- The Environmental Management Act Chap. 35:05, Act 3 of 2000, and
- Environmentally Sensitive Species Rules, 2001.

The coast consists of mainly rocky shores and cliffs as well as sandy beaches. The epibenthic is characterised by coral and coral-sponge co-dominated reefs and sandy to clayish flats which are mainly in bays.
The well-lit area from the coast to a 50m depth contour covers roughly 400ha.
The beaches of NE Tobago are predominantly narrow bands of sand at the base of steep valleys. Many are isolated from easy landward access. The cumulative length of all beaches is approximately 10km across 35 beaches. The coastal area is also the habitat for five of the world's

seven species of sea turtles, including, regionally important rookeries for leatherback and hawksbill turtles.
Further seawards, the seafloor drops relatively steeply and in the north-east to a maximum of 1,000m.
The pelagic area is at the border between the Caribbean Sea and the Atlantic and strongly influenced by the Guiana Current which brings nutrient rich water with reduced salinity especially during the rainy season. The waters are frequented by a diversity of marine mammals, sharks, rays and commercially valuable fish species such as various mackerel species, mahi mahi, snappers, etc.
Human activities are artisanal fishing (mainly pelagic fish) and coastal recreational activities including diving, yachting, birdwatching and bathing.

The beaches are also used for religious rituals (e.g. Shouter Baptists), cultural festivals (e.g. Fisherman Festival) and for medicinal purposes (sea bathing is used in therapy sessions for various ailments by both locals and visitors to the villages).
During consultations regarding the nomination of the NETMABR, stakeholders expressed interest to engage in sustainable fisheries including mariculture, eco-, science-, water-sport tourism, and research. These activities are envisaged at a scale and footprint that will not interfere with the conservation objectives for the marine and terrestrial Buffer Zones.
Stakeholder consultations regarding the drafting of a Management Plan for the planned NETMPA, which is the same area as the marine Buffer Zone for the NETMABR, agreed on the following Draft Vision, Mission and Main Conservation Objective for their management:
Draft Vision: "*A collaboratively-managed MPA for sustainable livelihoods and conservation in NE Tobago"*.
Draft Mission: "*Conserving natural resources for sustainable use in the NETMPA through scientific research, collaboration and empowerment*".
Draft Main Conservation Objective: "*to maintain ecological processes of the marine ecosystem (i.e., coral reefs, mangrove forests and marshes, seagrass beds, etc.) inclusive of the offshore islands and up to the 5m contour line on the main island, in NE Tobago and/while supporting sustainable livelihood [and other] activities."*
There is stakeholder consensus that the establishment of the NETMABR is beneficial for both, the communities and conservation and that all future activities should be of a type, scale and footprint that will not interfere with the conservation objectives for the marine and terrestrial Buffer Zones.

(C) AN OUTER TRANSITION AREA WHERE SUSTAINABLE RESOURCE MANAGEMENT PRACTICES ARE PROMOTED AND DEVELOPED.

"The Seville Strategy gave increased emphasis to the transition area since this is the area where the key issues on environment and development of a given region are to be addressed. Describe briefly the transition area(s), the types of questions to be addressed there in the near and the longer terms. The Madrid Action Plan states that the outer boundary should be defined through stakeholder consultation. "

The planned Transition Zone was defined as all lands that are located within a 250m belt on both sides of all roads within the overall boundaries of the NETMABR; this includes all communities, and economical activities in the NETMABR (except for some micro-scale subsistence farming and hunting in the Buffer Zone). The terrestrial Transition Zone covers 54.15km^2; the marine Transition Zone, a 500m belt on the south-western boundaries of the NETMPA, covers 11.35km^2. These boundaries were suggested by the DoE and the Department of Land Management and presented at various stakeholder meetings without objections being raised.

The result of this definition is a Transition Zone band, sandwiched between the terrestrial and marine Buffer Zones on which it has significant influence.

There are 15 rural communities with approximately 10,000 residents. The government is the main employer especially through unemployment relief programmes as well as administrative and governmental services.

Other relevant economic activities are fishing, vending, construction, repair services, gastronomy, agriculture, and tourism, all on a relatively small scale.

There are three gas stations, three police stations, two health centres, two secondary and 12 primary schools, two libraries, one fire station, a newly constructed administrative complex and seven community centres/multipurpose facilities.

Civil society organisations are relatively active including sport clubs, cultural heritage organisations, churches, village councils, business associations, and ENGOs.

Collaboration between government and civil society addressing key environmental issues such as solid and liquid waste management, illegal dumping, poaching, natural resource management is steadily increasing as indicated by annually implemented projects and programmes. In 2019 alone, the first, cross sectoral, Environmental Partnership Conference was facilitated by the THA and local ENGOs, a drive to reduce the use of Styrofoam initiated, one community-based tourism organisation successfully implemented a replicable, community-based waste reduction project and a collaborative project to replant 2,500 trees for coastal protection has started.

Stakeholders agreed during consultations regarding the nomination of the planned NETMABR that future activities need to focus on waste management, implementation of existing environmental laws, awareness and capacity building, providing sustainable livelihoods

opportunities (especially for the youth), revitalisation of viable and sustainable agricultural and fisheries sectors as well as promoting cultural heritage and ensuring authenticity.
Civil society in the area is clearly interested in increased co-management of natural and cultural heritage/resources as equal partners of government and funding agencies.

(D) PLEASE PROVIDE SOME ADDITIONAL INFORMATION ABOUT THE INTERACTION BETWEEN THE THREE AREAS.

Ecologically, the entire BR area is an excellent example for regional ridge to open ocean connectivity with water courses acting as blood vessels for species, sediments and nutrients.
Provisioning, regulating, supporting and cultural ecosystem services from the Core and Buffer Zones are of significant importance for the communities in the Transitions Zone which directly depends on the health of the natural areas.
While fishing is still very important, the agricultural sector significantly declined over the last 50 years. People residing within the planned NETMABR have a strong connection to the area and were historically using natural resources (agriculture and fisheries) as the main income generating activity. This connection is reflected in many cultural, spiritual and artistic expressions, such as the Tobago Heritage Festival, which is an annual celebration of the heritage of Tobago in every village including dance, song, music and cuisine, first staged in 1987.
While within communities and along roads human impact on the terrestrial and marine Buffer Zone can be observed, the overall size of the Buffer and Core Zones compared to the relatively low population and a low interest for industrial development from outside of the area are important reasons why the proposed NETMABR is still relatively intact and pristine.

MEETING BR MAIN CONSERVATION OBJECTIVES

When comparing the Main Conservation Objectives of BRs, as stated in the Seville Strategy with the attributes and intentions regarding the proposed NETMABR, it can be stated that NE Tobago has significant potential to fulfil these objectives.

Table 7: Seville Strategy key conservation objectives related to NETMABR.

Goals	Key Conservation Objectives	NETMABR
I: Use biosphere reserves to conserve natural and cultural diversity	I.1: Improve the coverage of natural and cultural biodiversity by means of the World Network of BRs	Significantly increases coverage in the southern Caribbean
	I.2: Integrate biosphere reserves into conservation planning	Is intended to be the main tool for participatory and coherent conservation planning in NE Tobago
II: Utilize biosphere reserves as models of	II.1: Secure the support and involvement of local people	All stakeholder consultations indicate cross-sectoral buy-in.

Goals	Key Conservation Objectives	NETMABR
land management and of approaches to sustainable development	II.2: Ensure better harmonization and interaction among the different biosphere reserve zones	Stakeholders expressed interest in knowledge and experience exchange with similar BR as well as pairing with international BR
	II.3: Integrate biosphere reserves into regional planning	
III: Use biosphere reserves for research, monitoring, education, and training	III.1: Improve knowledge of the interactions between humans and the biosphere	Demonstrable track record of monitoring, educational, public awareness, research and training activities that have significant potential to be built on and increased
	III.2: Improve monitoring activities	
	III.3: Improve education, public awareness and involvement	
	III.4: Improve training for specialists and managers	
IV: Implement the biosphere reserve concept	IV.1: Integrate the functions of biosphere reserves	Demonstrably, NETMABR possesses all key prerequisites to integrate conservation, sustainable development and logistics support.
	IV.2: Strengthen the World Network of Biosphere Reserves	Stakeholders indicated interest in actively participating in World Network of Biosphere Reserves (WNBR) activities.

4.6 ORGANIZATIONAL ARRANGEMENTS SHOULD BE PROVIDED FOR THE INVOLVEMENT AND PARTICIPATION OF A SUITABLE RANGE OF INTER ALIA PUBLIC AUTHRORITIES, LOCAL COMMUNITIES AND PRIVATE INTERESTS IN THE DESIGN AND THE CARRYING OUT OF THE FUNCTIONS OF A BIOSPHERE RESERVE

4.6.1 DESCRIBE ARRANGEMENTS IN PLACE OR FORESEEN

"Describe involvement of public and/or private stakeholders in support of the activities of the biosphere reserve in core, buffer and transition areas (such as agreements, protocols, letters of intent, protected area(s) plans). "

Over the past five years, private and/or public stakeholders implemented a significant amount of projects and programmes related to conservation, sustainable development, cultural heritage, education, training and research within the proposed NETMABR.

While these activities were not explicitly linked to the planning and establishment of a BR, they laid important foundations that currently support the nomination and will assist in the implementation of the NETMABR activities.

Such activities included public awareness campaigns, citizen science projects, ecosystem, biodiversity and climate change monitoring, clean-up and waste reduction campaigns, cultural workshops and festivals, natural resource user workshops, etc. Most significantly, the IFPAM project (2013-2019), which targeted directly the MRFR and the planned NETMPA, was managed under a steering committee consisting of governmental agencies, academic institutions and civil society organisations from the area. The IFPAM project executed Knowledge Attitude and Practise assessments, livelihood assessments, biodiversity studies, communication and outreach activities, drafting of conservation objectives and PAMPs for the MRFR and the NETMPA.

During the first half year of 2019, the intent to nominate NE Tobago as a BR was presented at over 20 meetings and discussed with around 160 public and private stakeholders, the vast majority welcoming the nomination and requesting to be informed and involved in the future; no significant objections were raised.

In 2018, the NETPAMT was incorporated through a local government initiative. The Trust is envisaged to be the key organisational arrangement to directly manage the protected areas (Core Zones) as well as implement BR activities in Buffer and Transition Zone. The THA intends to legally vest all protected areas into the Trust which will be constituted of 60% governmental and 40% civil society representation.

Currently the THA is engaging to secure technical support to establish a solid governance structure, 5-year business plan, HR structure and organisational policies for the Trust.

4.6.2 HAVE ANY CULTURAL AND SOCIAL IMPACT ASSESSMENTS BEEN CONDUCTED, OR SIMILAR TOOLS AND GUIDELINES BEEN USED?

No cultural or social impact assessments in relationship with the nomination of NE Tobago as a BR have been conducted. However, several environmental and social impact assessments have been conducted by the hydrocarbon extracting industries that have commercial interests outside of the marine Buffer Zone. Such assessments are publicly accessible and could be used to support future planning activities.

It should be noted that there are no indigenous people in the area.

4.7 MECHANISMS FOR IMPLEMENTATION

DOES THE PROPOSED BIOSPHERE RESERVE HAVE:

(A) MECHANISMS TO MANAGE HUMAN USE AND ACTIVITIES IN THE BUFFER ZONE OR ZONES?

"If yes, describe. If not, describe what is planned "

The existing mechanisms to manage human use in the three BR zones are national legislation and local regulations.

Currently the DMRF, the DNRF and the DoE are the key local government agencies to manage the Core and Buffer Zone with the help of the Police Department and the Coast Guard.

These agencies will also collaborate with the NETPAMT, once fully operational.

The main pieces of legislation regarding Core and Buffer Zone were listed in 4.5

Buffer Zone and Transition Zone are also managed under national legislation and local regulations with the involvement of all Divisions and their Departments of the THA and statutory bodies such as the Environmental Management Authority (EMA), the Waste and Sewerage Authority, and others.

(B) A MANAGEMENT POLICY OR PLAN FOR THE AREA AS A BIOSPHERE RESERVE?

"If yes, describe. If not, state how such a plan or policy will be developed, and the timeframe. (If the proposed area coincides with one or more existing protected natural area(s), describe how the management plan of the proposed biosphere reserve will be complementary to the management plan of the protected areas) "

There is no specific management policy or plan for the NETMABR in place.

The most recent applicable documents are the Draft PAMP for the MRFR and the Draft PAMP for the NETMPA (both 2018) and the CEDP (2012) policy for Tobago.

Additionally, there is the North-East Tobago Management Plan (NETMP; 2003, funded by the EU and adopted by the THA and the GoRTT), which covers the Core Zone and 80% of the Buffer and Transition Zones of the planned NETMABR; this document has been the principle management reference for the area since 2003. The Plan recommends the development of sustainable tourism, fisheries, small business, agriculture and conservation of the natural environment.

These four documents will be the corner stones for and complimentary to the development of a specific management plan for the NETMABR, which should be finalised within 24 months after designation and allow for extensive stakeholder consultation and active participation.

(C) A DESIGNATED AUTHORITY OR MECHANISM TO IMPLEMETN THIS POLICY OR PLAN?

The overarching authority to implement a BR management plan for NE Tobago is the THA, represented by the Office of the Chief Administrator; from this office responsibilities are delegated to the various Divisions and their Departments.

The DoE within the DIQE is currently the MAB Focal Point for Trinidad and Tobago and will also be the responsible entity to implement the NETMABR management plan until such time this responsibility can be handed over to the NETPAMT.

(D) PROGRAMMES FOR RESEARCH, MONITORING, EDUCATION AND TRAINING?

"If yes, describe. If not, describe what is planned."

The following programmes are currently ongoing:

Table 8: Overview of research, monitoring and education in the future NETMABR.

	Time Frame	Title	Main Implementer	Description
Natural Heritage Related	June to August 2012-2019	Distribution Surveys of Endemic Frog Species	Glasgow University	Surveying 7 sites around northeast Tobago for frog calls and observations
	2012-Current	Turtle Conservation	NEST	Turtle tagging, capacity building, technical training
	2013-Current	Sea Turtle Egg Development Research	Glasgow University	Taking egg temperature of turtles using infrared laser thermometer
	2014-2019	National Sea Turtle Conservation Project	NEST	Recording turtle nest temperatures, satellite tracking
	June (Annually)	Beach Clean Up	Castara Youth Centre	Cleaning community and beach area
	June (Annually)	I tour, I learn	Belle Garden Police Youth Club	Learning about the MRFR
	May (Annually)	Speyside Beach Clean Up	SEMPR	Cleaning community and beach area
	June (Annually)	Beach Clean Up	Moriah Police Youth Club	Cleaning community and beach area
	September (Annually)	Beach Clean Up	Belle Garden Police Youth Club	Cleaning community and beach area
	2015 - Present	Reef Check NE Tobago	ERIC	Rapid reef health assessments in 12 sites across NE Tobago and contributing to a global assessment.

	Time Frame	Title	Main Implementer	Description
	2004 - ongoing	Clean School Programme	Environment Tobago (ET)	Annual Tobago wide school competition related to waste management and change of behaviours.
	2014-2015	MPA Co-Management Capacity Building in NE Tobago	ERIC	Capacity-building of selected community members to contribute to MPA co-management.
	2015	MPA Monitoring and Co-management Capacity Building	ERIC	Continued training of community members in Reef Check
	2016 - 2019	Establishment of a Network of Community Climate Change Champions	ERIC	Creating the NoE Tobago Climate Change Champions Network to advocate for climate change adaptation and action
	2016 - 2018	The Global FinPrint Project	ERIC	Survey of reef elasmobranchs abundance and diversity in NE Tobago
	2017 - 2019	Supporting NE Tobago Natural Resource Management: Eco- and Human System Mapping, Livelihood Benefits and Meaningful Participation	ERIC	Creating coastal resource use and environmental threats maps in NE Tobago
	2019	Drafting Sustainable Shark and Ray Management Regulations	ERIC	Drafting of management regulations to conserve NE Tobago's elasmobranch populations, supported by continued monitoring in NE Tobago using BRUVs and shark ID training for fisheries' data collectors and fisher folk.
	2016 - Present	Diver Observations of Elasmobranchs in Tobago	ERIC	Established database of elasmobranch sightings during recreational or spear diving and preliminary assessment of data.
	2017 / 2019	Sea Turtle Offshore Monitoring Project - Dive Component	ERIC	Underwater assessment of marine turtles' diversity, abundance and behaviour during the nesting season at 8 reefs.
	2016-2019	Charlotteville Coral Garden - Development of a Community-based Conservation, Education and Eco-Tourism	ERIC	Design and implementation of a pilot coral garden in Man O War Bay for assessment of feasibility as a long-term project for coral

	Time Frame	Title	Main Implementer	Description
		Programme as a Mitigation Tool Against Climate Change		reef restoration and science-tourism.
	2017 - Present	Forest Check Tobago	ERIC	Citizen-science based assessment of climate change in the MRFR, using indicator species during forest tours.
Cultural Heritage Related	April (Annually)	I tour, I learn	Belle Garden Police Youth Club	Learning the history of Forts in Tobago
	April (Annually)	Easter Summer Camp	Castara Youth Centre	Teaching programs to encourage sustainable livelihoods and learn culture
	May, Annually	Changing the Game for Sustainable Living and Environment Awareness	LEVE Foundation	Art competition on the beach for secondary school students using discarded items found on the beach
	June (Annually)	Heritage: Tobago Ole Time Weddings	THA	Perform traditional dances and re-enact the weddings from long ago
	July (Annually)	Heritage: Tobago Ole Time Harvest	THA	Re-enact traditions of Tobago Culture
	July (Annually)	Heritage: National Treasure Day	THA	Re-enact traditions of Tobago Culture. Cocoa dancing, baking in dirt oven, squeezing cane
	July (Annually)	Heritage: Bele Dance Festival	THA	Re-enact traditions of Tobago Culture. Traditional dances
	August (Annually)	Summer Youth Awareness	Division of Tourism and Transportation	Learning about ecosystems, history and culture of Tobago
	2017-2019	Documentation of Historical Sites	National Trust of Trinidad and Tobago (NTTT) and Private Citizens	Documenting forgotten historical sites and buildings

Additionally, primary and secondary schools have implemented sections related to natural and cultural heritage into their curricula.

The following programmes were recommended at stakeholder meetings and are planned (with or without successful BR designation):

- continued monitoring of
  - biodiversity,
  - ecosystem health,

- climate change impacts, and
- species of specific interest,

  through a collaborative effort of governmental, non-governmental and private sector actors, especially including citizen and volunteer-based science approaches,
- documentation of tangible and intangible authentic cultural sites and expressions of art,
- establishment and increased support of new and existing demonstration projects related to the sustainable use of natural and cultural heritage and resources (e.g. organic agriculture, control of invasive species, promoting and marketing of art and craft, nature and culture-based sustainable tourism),
- designation of new cultural and natural NH Sites,
- forest- and reef restoration,
- coastal protection programmes,
- implementing the recently approved NPASP,
- enforcing of existing environmental laws and regulations,
- formulating of NETMABR specific regulations to protect natural and cultural heritage and improve overall environmental management esp. waste management, and
- the intention of the Government of Trinidad and Tobago to apply to the Global Environmental Facility for funding a 4-year, FAO implemented project related to the improvement of sustainable livelihoods and agriculture around selected protected areas including those within the NETMABR.

5. ENDORSEMENTS

The signatories hereby endorse the nomination of North-East Tobago as an UNESCO Man and the Biosphere Reserve, which is in accordance with all relevant policies and management plans for the area.

The relevant authorities are committed to implementing this programme and align management activities, projects and resources for its successful implementation through meaningful participation and sharing of responsibilities with civil society and private sector partners.

5.1 Signed by the authority/authorities in charge of the overall management of the planned NETMABR OFFICE OF THE CHIEF SECRETARY

Full name and title: *Chief Administrator* BERNADETTE SOLOMON-KORONA

Date: 18th SEPTEMBER 2019

Address, email, phone number: CALDER HALL, TOBAGO. oca.secretary@tha.gov.tt. 660-7511

Bernadette Solomon-Korona
CHIEF ADMINISTRATOR
Tobago House of Assembly

5.2 Signed by the authority/authorities in charge of the management of marine, forested and protected areas of the planned NETMABR DIVISION OF FOOD PRODUCTION FORESTRY AND FISHERIES

Full name and title: Administrator DFFF WENDELL BERNARD

ADMINISTRATOR
DIVISION OF FOOD PRODUCTION, FORESTRY AND FISHERIES
TOBAGO HOUSE OF ASSEMBLY

Date: 18th SEPTEMBER 2019

Address, email, phone number: GLEN ROAD, BRANCH TRACE #2, SCARBOROUGH TOBAGO dammne_administrator@gov.tt 639-2234, 639-1966

5.3 Signed by the authority/authorities in charge of charged with the protection, preservation and enhancement of Tobago's environment DIVISION OF INFRASTRUCTURE, QUARRIES & THE ENVIRONMENT

Full name and title: Administrator DIQE RITCHIE TAPPIN

Date: 18TH SEPTEMBER 2019

Address, email, phone number: SHAW PARK TOBAGO, Ritchie.Tappin@tha.gov.tt; 639-1087

ADMINISTRATOR
Division of Infrastructure, Quarries and the Environment

5.4 Signed by, elected representative of the communities located in the transition area(s).

Full name and title: Farley Augustine, FARLEY CHAVEZ AUGUSTINE AREA REPRESENTATIVE - PARLIAMENT/L'ANSE FOURMI/SPEYSIDE

Date: 18th ~~August~~ September 2019

Address, email, phone number: #26 Lucayade Road, Speyside, Tobago, farleyaugustine@gmail.com 1-868-492-6157

5.5 Signed on behalf of the MAB National Committee or Focal Point:

Full name and title: Director DoE DEPARTMENT OF THE ENVIRONMENT LINFORD BECKLES Director Department of the Environment Division of Infrastructure, Quarries and the Environment

Date: 18th SEPTEMBER 2019

Address, email, phone number: SHAW PARK TOBAGO, linfordbeckles@yahoo.com 639-1284; 735-4350

Explanatory Note: All terrestrial and marine areas of the planned NETMABR are managed by the Tobago House of Assembly. There is no difference in management authority for core, buffer, and transition zone.

The Tobago House of Assembly Act grants the Tobago House of Assembly internal self-government within the twin-island state of Trinidad and Tobago.

The Tobago House of Assembly consists of 10 Divisions, each with various departments, led by the Office of the Chief Secretary.

Each Division is headed by a political appointee addressed as Secretary. The highest public servant of each division holds the title of Administrator.

The highest public servant is the Chief Administrator.

The most relevant Divisions for the management of the area are the Division of Food Production, Forestry and Fisheries and the Division of Infrastructure, Quarries and the Environment. The latter houses the Department of the Environment, which is the appointed Focal Point for the UNESCO Man and the Biosphere Programme for Trinidad and Tobago.

Civil Society Endorsements

ENDORSEMENT
for the Establishment of the
North-East Tobago Man and the Biosphere Area

The signatories hereby endorse the nomination of North-East Tobago as an UNESCO Man and the Biosphere Reserve, which is aligned with our visions for the sustainable development of North-East Tobago by creating sustainable livelihoods through the protection and enhancement of our remarkable natural and cultural heritage.
We are committed to implementing this programme and align our organisations' activities, projects and resources for its successful implementation through meaningful participation and sharing of responsibilities with government and private sector partners.

Full name and title: BERTRAND BHIKARRY (PRESIDENT)
Organisation(s): ENVIRONMENT TOBAGO
Date: 4.9.2019
Address: #11 Cuyler St. Scarborough, Tobago
Email: Office@environmenttobago.net
Phone number: 660-7467

ENDORSEMENT
for the Establishment of the
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Full name and title: DARLINGTON CHANCE
Organisation(s): MAIN RIDGE TOURGUIDE ASS AND P.V-F.F. ASS.
Date: 5.9.2019
Address: BLOODY-BAY. TGO
Email: Darlington@Chance-Mother-Nature.com
Phone number: 318-8034

ENDORSEMENT
for the Establishment of the
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Full name and title: Aljoscha Wothke
Organisation: Environmental Research Institute Charlotteville
Date: 13 September 2019
Address: Man o War Bay Cottages, Charlotteville, Tobago
Email: info@eric-tobago.org
Phone number: 1-868-788-3550

ENDORSEMENT
for the Establishment of the
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Full name and title: CHARLENE SAMAROO - LEADER
Organisation(s): MORIAH POLICE YOUTH CLUB
Date: 6th September 2019
Address: 126 North Side Road Moriah Tobago
Email: spicydougla25@gmail.com
Phone number: 1-868-399-3829

ENDORSEMENT

for the Establishment of the

North-East Tobago Man and the Biosphere Area

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Full name and title: Dr. Faith B.Yisrael, Parent Body Member

Organisation(s): Belle Garden Police Youth Club

Date: 6th September 2019

Address: Windward Road, Belle Garden, Tobago

Email: faith.brebnor@gmail.com / bellegardenpyc@gmail.com

Phone number: 1 (868) 494-8827 / 309-9292

ENDORSEMENT

for the Establishment of the

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Full name and title: CAMELIA BLAKE

Organisation(s): BLOODY BAY UNITED RAIDERS

Date: 11th September, 2019

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Email: MAIN ROAD, BLOODY BAY, TOBAGO

Phone number: 333-1044

ENDORSEMENT

for the Establishment of the

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Full name and title: Mr. Stephen Felgate

Organisation(s): Castara Retreats Eco Resort

Date: 2 September 2019

Address: Northside Road, Castara, Tobago

Email: steve@castararetreats.com

Phone number: +44 7908 526036

S. Felgate

ENDORSEMENT

for the Establishment of the

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Full name and title: BERTIL TAYLOR

Organisation(s): CTDA - CASTARA TOURISM DEVELOPMENT ASSOCIATIO

Date: 06 SEPTEMBER - 2019

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Email: Castaractda@gmail.com

Phone number: 666 7957

NETMABA

ENDORSEMENT

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Full name and title: Len Carrington

Organisation(s): Parlatuvier Village Council

Date: 5/10/19

Address: Parlatuvier, Tgo

Email: Parlatuvier Village Council at g.mail

Phone number: 3034557

NETMABA

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Full name and title: PERCIVAL MELVILLE - PRESIDENT

Organisation(s): ROXBOROUGH POLICE YOUTH CLUB

Date: THURSDAY 14th SEPTEMBER 2019

Address: #24 BLOODY BAY ROAD ROXBOROUGH TOBAGO

Email: roxboroughyouthclub@gmail.com

Phone number: 660-5357 | 660-6630

NETMABA

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Full name and title: SUSAN SUCHIT

Organisation(s): SEMPR

Date: 05-09-2019

Address: MAIN ROAD SPEYSIDE TOBAGO

Email: Susan.a.Suchit@gmail.com

Phone number: 768-7987 - 660-5156

NETMABA

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Full name and title: Sean Robinson - Owner.

Organisation(s): Tobago Dive Experience Aca.
Speciality Dive Ltd

Date: 5-9-2019.

Address: 195 Windward Rd, Speyside Tobago

Email: Sean.robinson63@me.com.

Phone number: 1-868-688-5071 or 660-5268

ENDORSEMENT

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Full name and title: Patricia A. McGaw, Secretary

Organisation(s): Council of Presidents of the Environment

Date: 2019/09/20

Address: PO Box 1381, 22-24 St. Vincent Street, Port of Spain, Trinidad and Tobago

Email: copett2011@gmail.com

Phone number: 1-868-753-5177

Member Organisation of COPE supporting this initiative are as follows:

Aquaculture Association of Trinidad and Tobago
Asa Wright Nature Centre
Environmental Research Institute Charlotteville
Environment Tobago
Caribbean Youth Environmental Network Trinidad and Tobago
Fishermen and Friends of the Sea
Fondes Amandes Community Reforestation Project
Friends of Botanic Gardens of Trinidad and Tobago
Pointe-a-Pierre Wild Fowl Trust
Trinidad & Tobago Field Naturalists' Club
Trinidad & Tobago Orchid Society
UWI Biological Society
Wildlife Orphanage and Rescue Centre
Wildlife and Environmental Protection of Trinidad and Tobago

P.A. McGaw

Patricia A. McGaw
Hon. Secretary
Council of Presidents of the Environment

PART II
DESCRIPTION

6. LOCATION (COORDINATES AND MAPS)

6.1 PROVIDE THE BIOSPHERE RESERVE'S STANDARD GEOGRAPHICAL COORDINATES (all projected under WGS 84):

Table 9 Biogeographical coordinates of the proposed NETMABR.

Points	dd.dddd	dd mm.mmmm	dd mm ss.ss	UTM
Centroid	11.3139, -60.5683	11°18.8340', -60°34.0980'	11°18'50.04", -60°34'05.88"	20P 765437mE 1251793mN
Cardinal North	11.4399, -60.5672	11°26.3940', -60°34.0320'	11°26'23.64", -60°34'01.92"	20P 765440mE 1265738mN
Cardinal East	11.3126, -60.4161	11°18.7560', -60°24.9660'	11°18'45.36", -60°24'57.96"	20P 782062mE 1251792mN
Cardinal South	11.1864, -60.5693	11°11.1840', -60°34.1580'	11°11'11.04", -60°34'09.48"	20P 765444mE 1237682mN
Cardinal West	11.4472, -60.5259	11°18.9180', -60°45.2880'	11°18'55.08", -60°45'17.28"	20P 745068mE 1251785mN
Northern extent	11.3153, -60.7549	11°26.8320', -60°31.5540'	11°26'49.92", -60°31'33.24"	20P 769942mE 1266584mN
Eastern extent	11.3126, -60.4161	11°18.7560', -60°24.9660'	11°18'45.36", -60°24'57.96"	20P 782062mE 1251792mN
Southern extent	11.1403, -60.5362	11°08.4180', -60°32.1720'	11°08'25.08", -60°32'10.32"	20P 769104mE 1232610mN
Western extent	11.7831, -60.3428	11°46.9860', -60°20.5680'	11°46'59.16", -60°20'34.08"	20P 789585mE 1303941mN

6.2 PROVIDE A MAP ON A TOPOGRAPHIC LAYER OF THE PRECISE LOCATION AND DELIMINATION OF THE THREE ZONES OF THE BIOSPHERE RESERVE

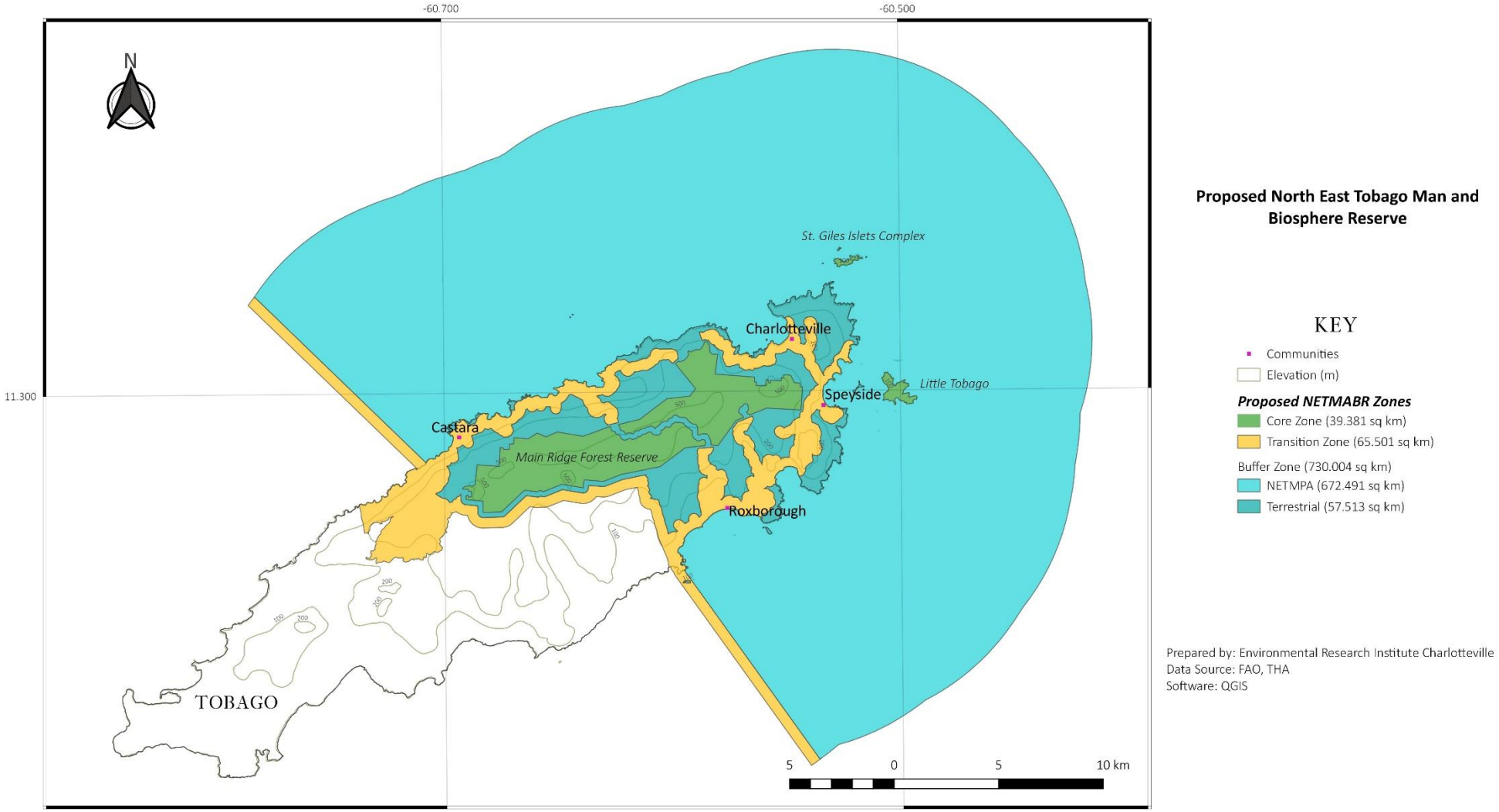


Figure 21 Topographic map of the proposed NETMABR (100m, 200m, 500m).

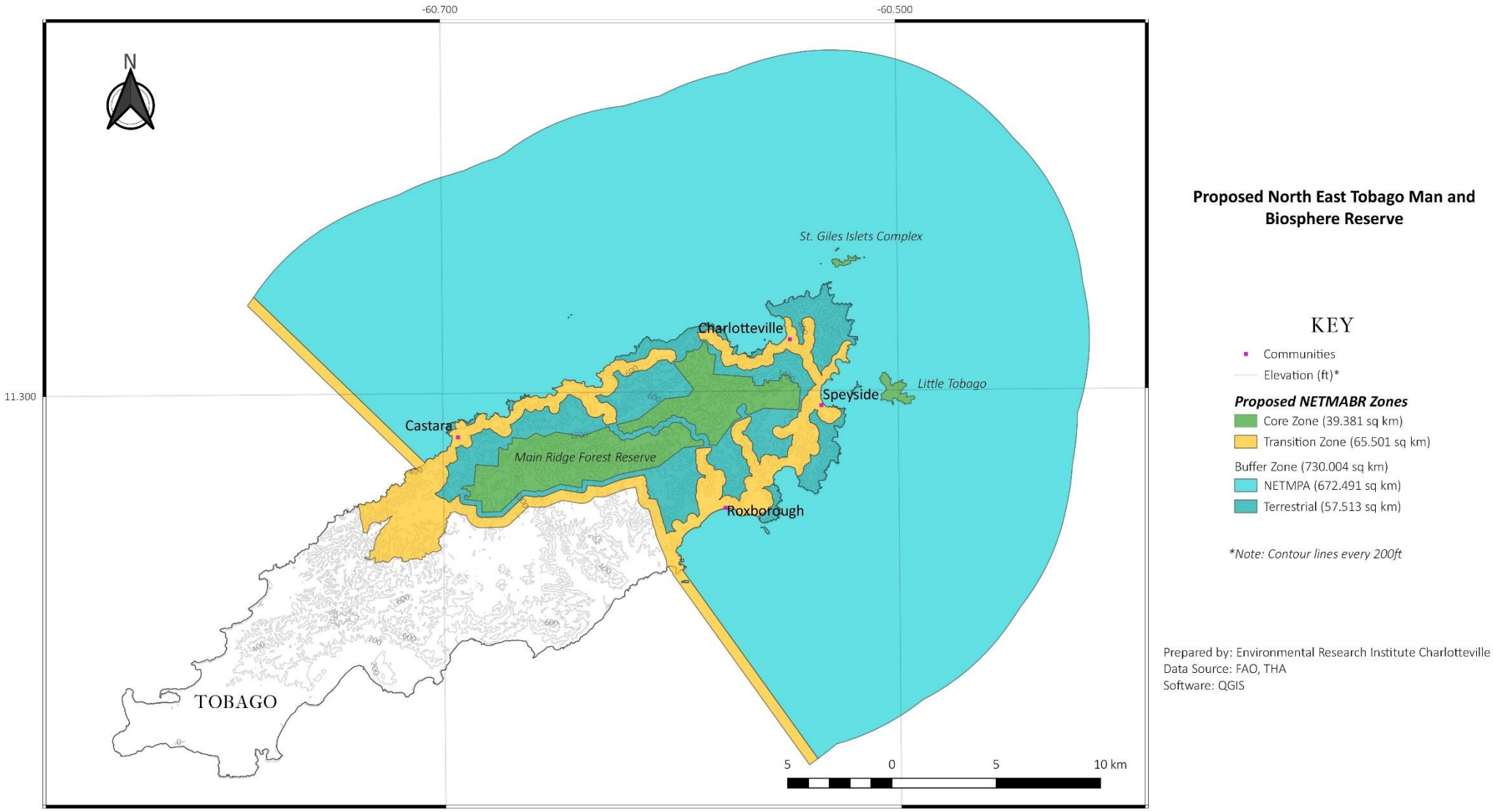


Figure 22 Topographic map of the planned NETMABR (200ft / 60.96m intervals).

7. AREA

Table 10 Area of NETMABR zones.

	Terrestrial	Marine	Total
7.1 Area of Core Area(s):	39,38km^2	0	39.38km^2
mk7.2 Area of Buffer Zone(s):	57.51km^2	672,49km^2	730.00km^2
7.3 Area of Transition Area(s):	54.15km^2	11.35km^2	65.50km^2
TOTAL:	**151.04km^2**	683.84 km^2	**834.88km^2**

7.4 BRIEF RATIONALE OF THIS ZONATION IN TERMS OF THE RESPECTIVE FUNCTIONS OF THE BIOSPHERE RESERVE

"If a different type of zonation also exists indicate how it can coexist with the requirements of the biosphere reserve zonation.
(e.g., if national criteria exist for the definition of the area or zones, please provide brief information about these)."

The ***Core Zone*** was determined based on existing legal protection of the three core sites: MRFR, Little Tobago Bird Sanctuary and St Giles Wildlife Sanctuary; these sites also enjoy a generally high regard by residents, are seen as national icons and poaching happens only on relatively low levels. Based on their *high conservation value*, all three sites are internationally acknowledged as IBA and nominated as NNH Sites. Minimal impact eco-, and science tourism is occurring and has the potential to be responsibly expanded to contribute to local livelihoods and *sustainable development*. The same applies regarding, environmental and sustainable development education, training, research, and monitoring thus *fulfilling the logistic support* function.

The ***Buffer Zone*** was determined as:

a. lands between Transition- and Core Zone unlikely to be used for commercial or residential purposes, vastly consisting of abandoned private and public properties, with limited agriculture and agroforestry, and
b. the proposed NETMPA, which will be a sustainably managed, multi-user site, extending from the shore to the 6 nautical mile (11.1km) boundary which demarcates the marine area managed by the THA (please note that no Transition Zone was designated outside this 11.1km seaward

boundary, since it would not fall under THA authority; an outer Transition Zone band around the NETMPA and within the 11.1km was not designated because different zoning in this outer area would create highly impractical management conditions of the MPA in the future).

c. a 100m band on both sides of roads that touched or traversed the terrestrial Core Zone.

The *conservation value* of the terrestrial part of the Buffer Zone is almost similar to that of the Core Zone since many ecosystems, habitats and species are shared. The marine area is home to many IUCN, EDGE, CMS, CITES species and hosts relatively intact coral – sponge co-dominated reefs. Low impact small scale agriculture (very limited) as well as eco-, nature-, adventure-, and science tourism are occurring and have the potential to be responsibly and significantly expanded to contribute to local livelihoods and *sustainable development*; this applies especially to soft water sport activities. The area has a multitude of opportunities for demonstration projects and sustainable business development research (e.g. agroforestry, cocoa, honey, tea, sustainable fisheries, citizen-science mari- and aquaculture), including related multi-stakeholder capacity building and as such is more than *equipped to fulfil the logistic support function.*

The terrestrial ***Transition Zone*** was determined as the area within 250m on each side of any road. In the exceptional cases were a road touched or traversed a Core Zone, a 100m band on both sides of this road was designated as Buffer Zone. This area is already used or with the potential being used for residential, commercial, public and other infrastructure and activities; it includes all housing areas and agricultural access roads. Its *conservation value* is focused on cultural heritage and activities from Amerindian to contemporary and including culinary, art, craft, dance, music, etc. The area also includes the mangrove and grassy wetlands close to communities. The Transition Zone provides the economic base for the NETMABR residents including tourism, service sector, vending, and construction which are the dominant activities. As already demonstrated in some communities, there is great potential and a legal as well as regulatory base to reducing the environmental footprint of human activities in the Transition Zone, and at the same time *support sustainable development*. Most communities have been exposed to research and monitoring activities, all to capacity building initiatives regarding cultural and natural heritage. Required facilities and facilitating community-based organisations exist throughout the Transition Zone and provide all prerequisites to *fulfil the logistic function*.

A 500m band of marine Transition Zone on the south-western Caribbean and Atlantic boundary of the NETMPA was designated. Purposefully, no marine Transition Zone was designated outside of the 11.1km boundary of the NETMPA (justification provided in above paragraph).

A different, but by no means contradictory, zonation regarding protected areas in the planned NETMABR is described in the NPASP, which was approved by Cabinet in early 2019. The NPASP lists one Terrestrial Scientific Reserve, one Terrestrial Special Conservation Reserve, one Terrestrial National Park, one Terrestrial Natural Landmark, five Terrestrial Natural Habitat or Species Management Reserves, two Coastal and Marine National Parks, eight Coastal and Marine Habitat or

Species Management Reserves, and one Coastal and Marine Seascapes within the proposed NETMABR.

Only four of the above-mentioned areas are already legally protected: South- and North MRFR, Little Tobago and St Giles Islet Complex, all of which are in the NETMABR Core Zone.

While cabinet-approved, the other listed areas are not legally protected as yet and mainly situated in the Buffer Zone. Once they achieve legal protection, shifting them into the Core Zone might be considered.

The NPASP is supporting the NETMABR zoning and conflicts are not foreseen.

Table 11 Proposed conservation status of protected areas in NE Tobago (NPASP).

Type	Name	IUCN Equivalent	Comment
Terrestrial Scientific Reserve	Southern MRFR	Ia Strict Nature Reserve	NETMABR Core Zone
Terrestrial Special Conservation Reserve	Goldsborough Watershed	Ib Wilderness Area	Adjacent to Core and Buffer Zone
Terrestrial National Park	Northern MRFR	II National Park	NETMABR Core Zone
Terrestrial Natural Landmark / Monument	Flagstaff Hill	III Natural Monument or Feature	NETMABR Buffer Zone
Terrestrial Natural Habitat or Species Management Reserve	L'Anse Fourmi Habitat Management Reserve	IV Habitat or Species Management Area	NETMABR Transition and Buffer Zone
	Merchiston Habitat Management Reserve	IV Habitat or Species Management Area	NETMABR Transition and Buffer Zone
	Starwood Habitat Management Reserve	IV Habitat or Species Management Area	NETMABR Transition and Buffer Zone
	Louis D'or Conservation Area	IV Habitat or Species Management Area	NETMABR Transition and Buffer Zone
	Hillsborough Dam Watershed	IV Habitat or Species Management Area	Adjacent to Core and Buffer Zone
Coastal and Marine National Parks (Marine Protected Areas)	Englishman's Bay	II National Park	Buffer Zone
	Charlotteville MPA	II National Park	Buffer Zone
Coastal and Marine Habitat or Species Management Reserves	Little Tobago and Goat Island	IV Habitat or Species Management Area	Core and Buffer Zone
	Lucy Vale	IV Habitat or Species Management Area	Buffer Zone

Type	Name	IUCN Equivalent	Comment
	Queens Island	IV Habitat or Species Management Area	Buffer Zone
	Richmond Island	IV Habitat or Species Management Area	Buffer Zone
	Sisters Rocks	IV Habitat or Species Management Area	Buffer Zone
	St Giles Islet Complex	IV Habitat or Species Management Area	Core Zone
	L'Anse Fourmi Bay	IV Habitat or Species Management Area	Buffer Zone
	Hermitage Bay	IV Habitat or Species Management Area	Buffer Zone
Coastal and Marine Seascapes	NETMPA	V Protected Seascape	Buffer Zone

8. BIOGEOGRAPHICAL REGION

"[Indicate the generally accepted name of the biogeographical region in which the proposed biosphere reserve is located.]
(The term "major biogeographic region" is not strictly defined but you may wish to refer to the Udvardy classification system (http://www.unep-wcmc.org/udvardys-biogeographical-provinces-1975_745.html))."

According to Udvardy's Biogeographic Classification System, NE Tobago's terrestrial biodiversity is classified as follows:

Realm: Neotropical
Biome: Mixed Island System
Province: Lesser Antillean

Also see chapter 4.1.

9. LANDUSE

9.1 HISTORICAL

"If known, give a brief summary of past/historical land use(s), resource uses and landscape dynamics of each zone of the proposed biosphere reserve)."

The communities within the Transition Zone developed out of slave and colonist settlements within several, large estates. Land use has been extremely dominated by, now severely declined, agriculture and agroforestry, while the ocean was, and still is increasingly, used for artisanal fishing.
Therefore, the historical land use of the Core, Buffer and Transition Zone is tightly linked and could be best described in combination:
Tobago was originally inhabited by three early Amerindian cultures. The Ciboney were the first followed by the Arawaks and the Caribs who used the island for hunting expeditions and spiritual ceremonies. Most of the Amerindian relicts are found in south-west Tobago and there are no records of permanent Amerindian settlements in the NETMABR area.
With little regard for the original occupants, Tobago is said to have changed hands over thirty times gaining notoriety as battlefield fuelled by aspirations of conquest by European powers like the British, French, Dutch and Courlanders. The island was divided into large agricultural estates, producing tobacco, indigo, cotton and by 1770 the first shipment of sugar left Tobago. Most of the island was deforested and the estate owners realised that increasing deforestation reduced the availability to irrigate crops

and ability to power the waterwheels used to crush sugarcane. Therefore, in 1776 NE Tobago set a globally historic milestone: the MRFR was established. Composed by the Council and the THA and signed by Major William Young, the Act for rendering a certain tract of land proper for attracting "Rains Inalienable" entered into force. This made Trinidad and Tobago the location of the first legally protected rain forest reserve globally.

Finally, in 1814 the island was rested in the hands of the British through the Treaty of Paris.

For decades, Tobago, at the hands of African slaves, was a model sugar producer. However, competition from larger and more fertile colonies like Brazil and Cuba, persistent neglect and use of outdated technology, and the abolition of the slave trade and slavery attributed to the island's loss of profitability in the sugar trade. Cocoa was well established on Tobago by 1908 and coconut palms were beginning to replace sugar cane.

1927, the first Cocoa Fermenting Cooperative was started in Pembroke and in 1931 a Lime Growers Cooperative was formed. Sugar cane had now been almost totally replaced.

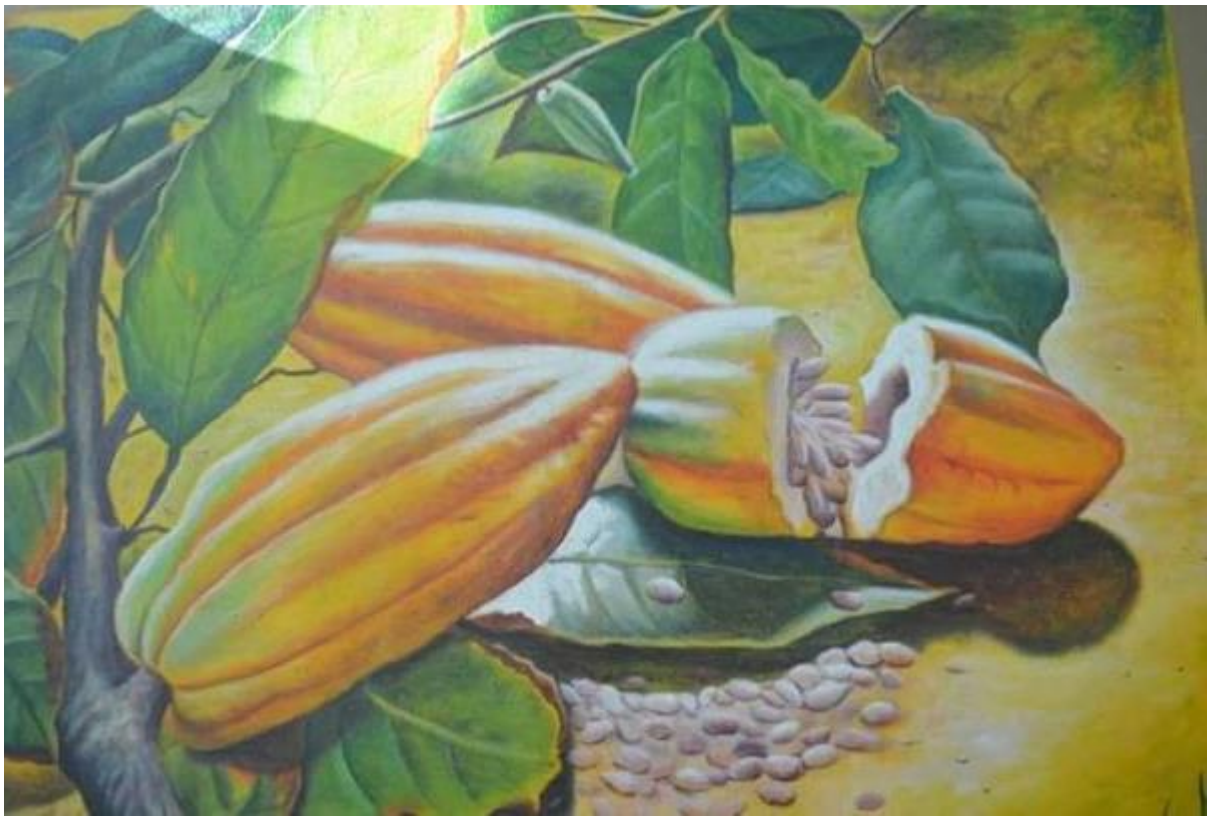


Figure 23 Cacao pods (Jason Nedd)

In 1963, Hurricane Flora destroyed many houses, estates and large parts of the rain forest, with a total loss of 17 lives. The destruction by the hurricane, the rising oil price and some other factors caused a collapse of the agricultural sector by the 1970's; most estates and smaller farms were increasingly abandoned and are now under secondary forest cover (mainly in the Buffer Zone).

In 1983, a shelterwood system, initiated in 1964 to enhance the rejuvenation of the forests, was concluded. The shelterwood system included clearing debris, removing unwanted vines and other plants after Hurricane Flora and planting Caribbean Pine in the MRFR.

Figure 24 Waterwheel and sugar factory ruins in Speyside (Camille Fitz-Worme & Gabriele De Gaetano)

Tourism started to increase from the mid 80's onwards. By 1984, five nature trails within the MRFR were established and mapped. Small scale, community-based tourism developed around forest tours, birding, diving, snorkelling and remote beach tourism. After a tourism boom in the late 90' and early 00', the sector declined, mostly due to factors external to NETMABR, and is currently on a relatively small scale. Hunting within the planned NETMABR as mostly been a recreational activity for residents; however, with economic decline, the high price of wild meat starts to attract persons hunting for commercial reasons.

9.2 WHO ARE THE MAIN USERS OF THE BIOSPHERE?

"For each zone, and main resources used. If applicable, describe the level of involvement of indigenous people taking into account the "United Nations Declaration on the Rights of Indigenous Peoples". (http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf)."

The main users can be broadly classified as residents and visitors.

Residents use natural resources mainly for provision of water, fishing, agriculture, agroforestry and recreation.

Figure 25 Fishermen and fishing boats, Man-o-War Bay (Janina Ewals)

Visitors use resources mainly for recreational purposes.
The overall resource use is very low to low; however, there are coastal and terrestrial areas, mainly next to communities, where resources (e.g. snapper, grouper, lobster, conch, certain game species) are heavily used and stocks are declining.
There are no indigenous people in Tobago.

Table 12 Main users, types of usage, and resources.

Zone	User	Type	Resource
Core Zone	Residents	hunting, legal and illegal	game species
		Poaching	songbirds
		collecting medicinal herbs	herbs
		conducting spiritual rituals	trees
		clay mining (seasonal)	soil
		illegal logging	trees
		spring water collection	water

Zone	User	Type	Resource
	Visitors	recreation, guided forest tours	forest
Buffer Zone	**Residents**	small scale agriculture	soils, plants
		logging, legal and illegal	trees
		hunting, legal and illegal	game species
		Fishing	fish pelagics
		Fishing	costal fish and shellfish
		provision of water sport related services	ocean, reefs
		illegal marihuana cultivation	herbs
	Visitors	guided hiking tours	forests
		diving, snorkelling	reefs
		Swimming	ocean
		Yachting	ocean, wind
		Angling	fish
		bird watching	birds
		illegal fishing by non-nationals	fish
		sight seeing	natural heritage
Transition Zone	**Residents**	small scale agriculture	soils, plants, livestock
		hunting, legal and illegal	game species
		drinking water	water
		illegal dumping	land
		transporting wastewater (grey)	water (courses), bays
		illegal sand, gravel mining	sand, gravel at rivers and beaches
		construction, residential, commercial, public	land
		recreation beach and river visits	water, beaches
		nature tours	trails, forest
	Visitors	recreation beach and river visits, nature tours	water, beaches
		nature tours	trails, forest
		accommodation	room stock
level of usage	very low		
	low		

Zone	User	Type	Resource
	medium		
	heavy		
	very heavy		

9.3 WHAT ARE THE RULES (INCLUDING CUSTOMARY OR TRADITIONAL) OF LAND USE IN AND ACCESS TO EACH ZONE OF THE BIOSPHERE RESERVE?

Core Zone:

- the MRFR is protected since 1776. The land is owned by the state, extractive usage, agriculture, commercial activities and any type of structures are not permitted; an exemption is hunting of game species (Nine-banded Armadillo, Green Iguana, Cryptic Golden Tegu, Red-rumped Agouti) during the day and within the open season (01 October to last day of February every year). Traditionally and customary, plants for medicinal and spiritual uses are extracted in very limited way. There are several trails (associated with the only traversing road) that are used by tour-guides for nature and eco-tourism tours; this activity is also irregular and quite limited.
- Little Tobago is also protected, and access should be controlled by the Forestry Department. However, the legislation is not enforced, and boats can access the islet to carry visitors mainly for bird watching; again, this is a very limited, irregular activity carried out by three small glass-bottom boats. Overall, the protected status is respected, and extractive use is almost non-existent. The only exemption is the very rare poaching of sea birds especially for harvest festivals.
- St Giles is also legally protected, and access is difficult due the terrain. Limited poaching of sea bird chickens occurs around harvest festivals. Otherwise, the natural resources on the islet are untouched.

Buffer Zone:

- Terrestrial: the terrestrial parts of the Buffer Zone are either state lands or privately owned. Land use and access rules are governed by the laws of Trinidad and Tobago. There are customary and traditional trails (mostly used by hunters) that cross private and state property.

- Marine: The use and access rules of the marine Buffer Zone are governed by the laws of Trinidad and Tobago, especially the Fisheries Act. However, traditionally and customarily fisher folk access resources relatively freely.

Transition Zone:

The majority of Transition Zone is privately owned except for state properties for public services and buildings. Land use and access rules are governed by the laws of Trinidad and Tobago.

9.4 DESCRIBE WOMEN'S AND MEN'S DIFFERENT LEVELS OF ACCESS TO AND CONTROL OVER RESOURCES

"Do men and women use the same resources differently (e.g., for subsistence, market, religious/ritual purposes), or use different resources?"

The access and control over resources is very similar for all genders.

However, men use natural resources to a much further extent than women. This applies specifically to the fisheries and agricultural sectors, but also to hunting. This imbalance is traditionally caused by men's greater physical abilities and willingness to take higher risks of survival at sea and women's role as housekeepers and mothers. Over the past 30 years the educational level of women rose significantly and most business, service, administrative, vending, tourism, and academia related jobs are occupied by women, resulting in a relative low level of interest in using natural resources for income earning activities.

Resources (e.g. herbs, trees, springs etc) used for religious/ritual purposes are accessed and used by men and women similarly.

10. HUMAN POPULATION OF PROPOSED BIOSPHERE RESERVE

"Approximate number of people living within the proposed biosphere reserve."

	Number of permanent residents in NETMABR (approx.)
10.1 Core Area(s)	0
10.2 Buffer Area(s)	50
10.3 Transition Area(s)	10,080
Total:	**10,130**

10.4 BRIEF DESCRIPTION OF LOCAL COMMUNITIES LIVING WITHIN OR NEAR THE PROPOSED BIOSPHERE RESERVE

"Indicate ethnic origin and composition, minorities etc., main economic activities (e.g. pastoralism, tourism) and the location of their main areas of concentration, with reference to the map (section 6.2))."

Unfortunately, the available population data for the planned NETMABR seem not very reliable, therefore the statements below should be seen as approximates.

The vast majority (over 90%) of residents are of African descent, the remainder are of European and East Indian origins and a very small minority of other groups. There is a slight majority of women and a relatively high percentage of children and youth.

Most persons live in their own homes. Most persons, especially the younger generation, attend a secondary school. The ratio of residents with a higher education is low, mainly due to the lack of employment possibilities. The unemployment rate is approximately 8%; however, recent data are missing. Many persons are employed with various state-sponsored unemployment relief programmes, working in the morning hours, some starting a second income earning activity in the late morning hours.

Tobago is a government-dominated economy where the state is by far the most important employer. The most important business sectors are wholesale and retail, construction and tourism. The agricultural output remains at a low 2% of Tobago's economy.

The economy is mainly focussed on, but by far not satisfying, local needs. Main economic activities are small scale fishing, tourism, construction, vending and government services. The only noteworthy export is unprocessed fish and tourism. Castara, Charlotteville and Speyside are the villages with most tourism activities.

Every village is connected by a ring-road surrounding NE Tobago along the coastline. Most villages are small (<1,000 residents) and only Roxborough, which is almost a small town with government facilities,

has a larger population size. The only road traversing NE Tobago and the MRFR Core Zone starts in Roxborough on the Atlantic side and ends in Bloody Bay on the Caribbean side of the island.

There are three gas stations, three police stations, two health centres, two secondary and 12 primary schools, two libraries, one fire station, a newly constructed administrative complex and seven community centres/multipurpose facilities in the planned NETMABR.

The religious composition is dominated by Christian belief systems such as Pentecostal, Methodist, Seven Day Adventists, Catholics, and Anglicans. The population density is between 59 – 123 persons/km^2. The average household size consists of three (3) persons. Approximately 66% of heads of households are male.

All utilities are available at relatively low rates; however, reliability remains an issue. Roads are generally in an acceptable condition; however, large, heavy transport vehicles cannot access all villages. There is a pressing need for sustainable development based on informed and participatory decision making while respecting heritage, culture and the environment. Such development will create opportunities for NE Tobago communities to meaningfully capitalise on their resources while also addressing the needs of future generations.

Figure 26 Roxborough street view (Jacob Bock)

Figure 27 Map of NE Tobago villages and tourism attractions.

The 15 communities within target area are of similar demographic and social structure. Since the 2011 government census there have been no major changes in population density.
Following the coastline along the southern Atlantic coast around to the northern Caribbean coast are among other the following villages:

Roxborough

Roxborough is the largest settlement in the area with approximately 2,000 residents. It was once a thriving agricultural centre and the second capital of Tobago. Services include primary schools, a secondary school, a fire station, a police station, a health centre, two gas stations, the island's only dive decompression chamber, several government offices, small vendors, a fishing depot and several church groups. Tourism activities and industrial activities are notably absent. The Roxborough Police Youth Club is one of the strongest CBOs in Tobago and is engaged in social and environmental activities funded by a variety of local and multilateral organisations. Roxborough falls just outside the draft boundaries of the NE Tobago MPA, however it needs to be addressed by the project due to its potential impacts on conservation success in NE Tobago.

Betsy's Hope

Betsy's Hope is a small community of approximately 500 persons, a primary school, catering business and mechanic shops. The village has no port or any notable industry or business activities.

Louis D'or

Louis D'or is a settlement with approximately 900 persons. It is characterised by a government agricultural demonstration station and tree nursery. There are no notable services or industries. There is one primary school.

Speyside

Situated at the eastern tip of Tobago, and in close proximity to world famous birding and diving areas, this village is characterised by its small-scale tourism industry including guesthouses, restaurants, four dive operators, three small hotels, and two glass bottom boat operators. Services are provided by a primary school, a secondary school, church groups, a police station and an emergency response unit. Speyside is populated by approximately 900 persons. The village is also home to the Speyside Eco Marine Park Rangers (SEMPR), a CBO with a conservation-oriented mission in operation since 2009.

Charlotteville / Campbellton

Charlotteville / Campbellton is adjacent to the large Man-o-War Bay which provides protection to the port and the beachfront. The village is the largest fishing port in NE Tobago. Tourism activities include a yacht harbour, diving, snorkelling, recreational fishing, guest houses and

sightseeing. Charlotteville is a point of immigration for Trinidad and Tobago. There are a police station, a health centre, two primary schools and a gas station. ERIC an expert-based NGO, works towards sustainability for the people and ecosystems of NE Tobago, taking an integrated ecosystem- and communities-based ridge-to-reef management approach. The CBO North East Sea Turtles is focusing on sea turtle conservation and has been successful in maintaining a strong presence in the area over the past years. Approximately 1,000 persons live in Charlotteville.

Hermitage

Hermitage is a very small settlement with no more than 30 inhabitants. There is no connection to public water supply and most activities happen outside of this purely residential community. However, the proximity and impacts on Hermitage Bay with its important sea turtle nesting site, small wetland and mainly intact forest ecosystem is of importance for conservation efforts in NE Tobago. The owners of Hermitage Estate are open to the possibility of conservation activities on their lands.

L'Anse Fourmi

This village of approximately 300 persons has no port and a mainly agricultural background. Notable are a local painter with an international reputation and one of the most active community-based women's groups in NE Tobago.

Bloody Bay

Around 300 people reside in Bloody Bay, which is the northern access point to the road crossing the MRFR towards Roxborough. There are no notable services or industries; however, Bloody Bay is home to most of the nature trail tour guides for the MRFR and the most up-to date, yet underused, beach facility in NE Tobago. The nearby Bloody Bay Estate is state owned. The Bloody Bay River is the largest river in NE Tobago that maintains an important wetland.

Parlatuvier

Parlatuvier is a fishing village with approximately 400 residents, a primary school and several small guest houses. The village was once the centre for indigo production in the southern Caribbean and a small artisan community is attempting to revive the production of and dyeing with indigo. The village council is interested in conservation activities, however, needs capacity building support.

Castara

Castara with approximately 1,000 residents is characterised by its high-end villa and guest house, community-based tourism industry. Castara Bay is a natural fishing port that facilitates some yachts, a dive operator and snorkelling activities. The village was selected as a demonstration site for community-based sustainable tourism practises in Tobago.

Delaford

This community of roughly 500 residents has a small, quite sheltered fishing port within the large King's Bay which facilitates the largest mangrove ecosystem in NE Tobago. There are no notable services or industries. There is one primary school.

Figure 28 Delaford Bay (Jacob Bock)

10.5 NAME(S) OF THE MAJOR SETTLEMENT(S) WITHIN THE PROPOSED BIOSPHERE RESERVE WITH REFERENCE TO THE MAP (SECTION 6.2)

Table 13 Settlements within the NETMABR.

	Village Name	Approximate Population
1	Moriah	900
2	Castara	1,000
3	Parlatuvier	400
4	Bloody Bay	300
5	L'Anse Fourmi	300
6	Hermitage	30
7	Charlotteville	1,000
8	Speyside	900
9	Delaford	500
10	Louis D'or	900
11	Betsy's Hope	500
12	Roxborough	2,000
13	Argyle	400
14	Kendall	400
15	Belle Garden	600
	Total	**10,130**

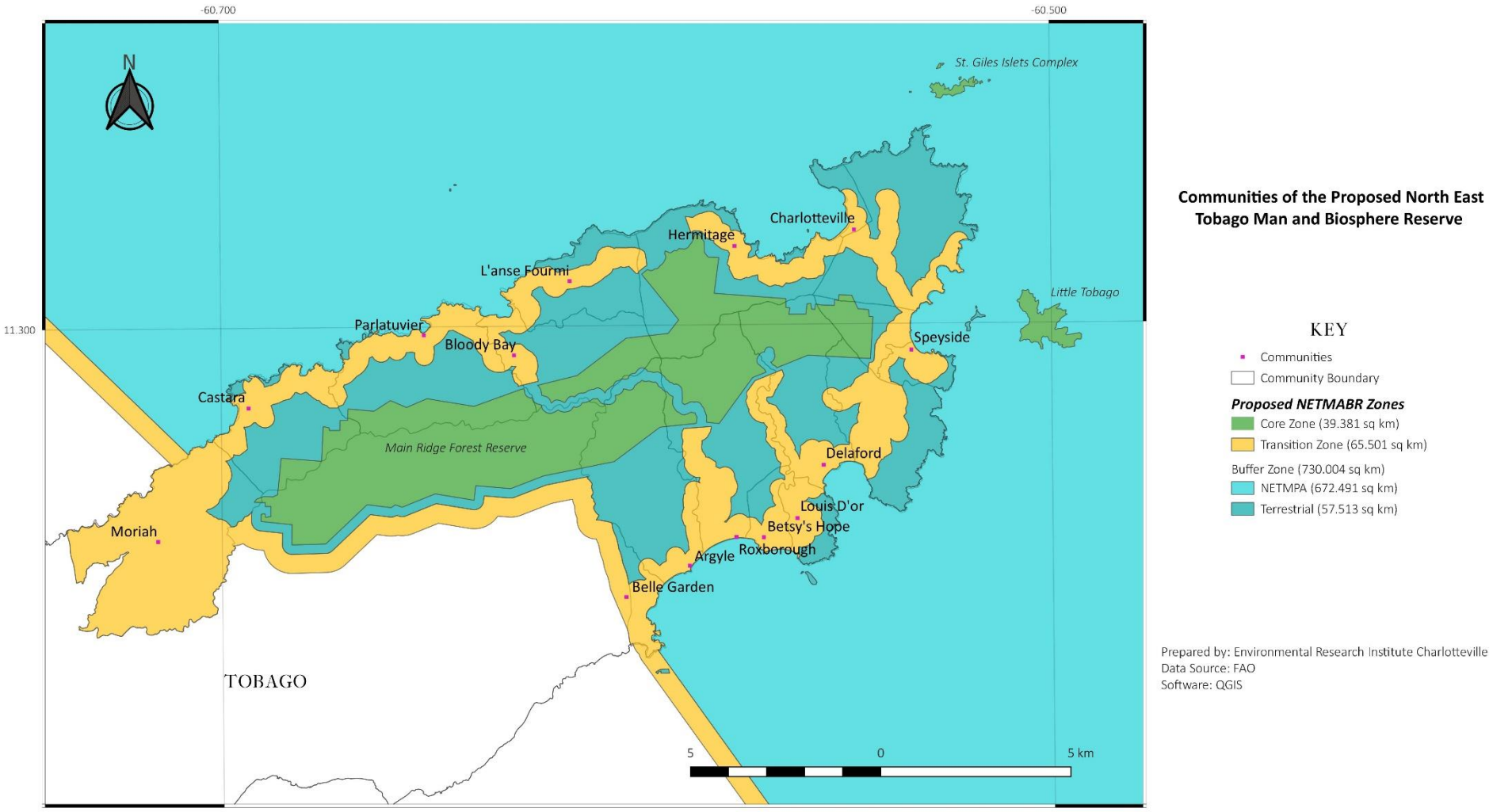


Figure 29 Communities of the proposed NETMABR.

10.6 CULTURAL SIGNIFICANCE

"Briefly describe the proposed biosphere reserve's importance in terms of past and current cultural values (religious, historical, political, social, ethnological) and others, if possible, with distinction between material and intangible heritage."

NE Tobago's cultural values are indeed primarily based on land use and strongly linked to its "agri-cultural" history.

Prior to the 1498 arrival of Christopher Columbus the island of Tobago, or Aloubaéra as it was known, was inhabited by Ariwakan and Kalinago peoples. These peoples, relative to the natives found on the Orinoco Basin, persisted on the island undisturbed for centuries and did so even after Columbus's sighting of the island. In fact, though records are sketchy, historians suggest that they were present on the island until Dutch settlements were set up here in 1632. It is believed that the natives survived here, though in declining numbers, until 1810 when there were only twenty left in the north coast of the island, all coming from one family. Contrary to other Caribbean Islands, the former Amerindian presence has left only very limited traces in NE Tobago's cultural values.

Tobago's history from the almost forgotten lives of the natives, to its struggles with conquest, African slavery and forging a new identity with Trinidad saw the island going through a process of indigenisation and creolisation making Tobago an isle described by historians as a "sui generis society" with characteristics of its own.

While aspects of the culture have been eroded through evolution, acculturation and inadequate transmission, today NE Tobago represents the island's centre of cultural conservation. It is important to note that given Tobago's small size, cultural practices and traditions are fairly homogeneous with little to no distinctions between villages in the planned NETMABR. Ancient structures deteriorating in the periphery of everyday life serve as a reminder of the island's colonial past. The water wheel in Speyside, nestled at the base of the foreboding hills to Charlotteville, hides secrets of sugar plantations past. This water wheel immortalised in countless photographs and paintings is one of the best preserved. Time-worn cocoa houses, guarded by idle cocoa trees, serve as pictorial evidence of fond memories shared by the venerable in society, never failing to remind the youth of a taller time when cocoa was Queen. Even former Estate Great Houses in places like Kings Bay and Richmond, though threatened by the elements still stand in firm rebellion; reminiscent of the temperament of the slaves that built them. These structures buttress the society in the past and provide reinforcement for the intangible culture of Tobagonians today.

Perhaps one of the most distinguishing and often intangible features of the people is their spirituality. Christianity, a legacy imparted by European colonisers by far attracts the most patrons, undoubtedly due to the Europeans quelling of African practices. African slaves who were brought to the island were stripped of their identity; their psyche was dismembered and discarded, replaced by a Eurocentric identity. African traditional worship was rooted in animism with the idea of ancestral worship and possession was prevalent, essentially accessibility to the spirit world formed the ethos of their practices. However, slaves were forbidden from practicing their religion therefore Christianity took hold. Major Christian denominations forming part of the Tobagonians religious heritage include Moravian, Anglican, Seven Day Adventists, Pentecostals, and Methodists. Their legacy can be seen with the numerous churches dotting the area from the 89-year-old Methodist church in Roxborough to the peculiar round Anglican church in Bloody Bay.

Figure 30 Tobago Heritage Festival (THA)

Though the colonisers made violent attempts to chafe away the slaves Africanness they resisted and so continued to practice elements of their religion in secret. This led to the development of syncretic practices evident in the Orisha and Spiritual Baptist traditions. Not only that, but the practice of Obeah (system of spiritual and healing practices developed among enslaved West Africans) and ancestral veneration today form part of the African continuity. Obeah stems from

the belief that some persons are ordained with supernatural abilities and as such is an intercessor between man and the spirit world. It is believed that those who practice are gifted with third sight, healing powers and the ability to sway events in their favour. An historical example of Obeah is demonstrated in the legend of Betsy, a slave master's wife on the Queens Bay estate. It is said that the slaves were engaged in the practice of Obeah and whenever they were beaten Betsey felt their pain. It is told that it was Betsy, a woman averse to slavery hope that slavery would be abolished thus the village's name of Betsy's hope. Even to this day, despite Obeah practices being shrouded in mystery, branded as devil worship and eliciting fear and discontent in the majority, it is still an underground practice as a means of problem solving.

Figure 31 Moriah Ole Time Wedding (THA)

The nature of socialisation within the area also exhibit cultural authenticity. In West African, tradition respect for elders forms part of the moral complex of the people, this inclination has been transposed and preserved in the Tobago context. In NE Tobago, it is quite common for the young to refer to elders as Ma/moms, uncle or tantie. In past years it was also expected that indiscipline portrayed by children outside of the homes and witnessed by elders to be reprimanded without repercussions from blood relatives. Furthermore, passing strangers on the street without extending a timely greeting is frowned upon. These strong social bonds within the community give life to the frequently touted adage that it takes a village to raise a child.

Rituals surrounding death epitomise the unique sense of community responsibility embedded in the people. From the time of death villagers would gather at the home of the deceased to mourn with the family. This practice culminates in a formal wake the night before the funeral and continuing possibly up to nine nights beyond. This funeral tradition involves almost all in the village where men would cut wood for dirt oven fires and women would gather to bake bread and sweet bread, prepare salt fish and fry fish and make chocolate tea for the wake night proceedings. Typically, the male present at the baking would be bestowed the task of "manning the oven". During the night, a wake and bongo is kept. This ritual typically involves the reciting of prayers as well as the singing of Christian hymns with African influences. These would range from lively chanting, passionate shouting and almost involuntary dancing to the hypnotic beats of African drums, shak shaks and other instruments. Moreover, the bongo would include limbo and other hyper-sexual dances. Another common sight would be men gathered playing card games. The wake proceedings may take on a life of their own, as though the spirit of the dead possesses those present, casting dominion over all; leaving them devoid of will and subject to the volition of the activity itself. While the wake is still practiced the bongo is scarcely seen.

Figure 32 Children at Roxborough Carnival (ERIC)

The harvest celebration held on various Sundays around the island is another divergent characteristic of Tobago and is closely linked to the Christian churches. The peasant communities had a day to celebrate the farming prosperity of the past year at church. On the day of the village celebration, persons would bring produce as an offering to the church where it was expected to be sold. It was not uncommon to see stacks of plantains and bananas, yams, cocoa, cane and coconuts lining the perimeter of the church where prayers and hymns would be sung in adoration of God, thanking him for fertility. In the afternoon, cantata was held which was one of the most anticipated recreational activities. At the cantata the church choir decked in white uniforms and matching bonnet would perform harvest anthems; other villagers would also offer their talent whether it is through instrumentals, skits and monologues. All in all, it was a grand exciting affair. Today harvest celebrations have withstood time but not secularisation. Very few attend church services and fewer cantatas. Some villages such as Roxborough retain the original structure of morning service and afternoon cantata whereas others like Delaford and Belle Garden have been forced to merge affairs having both cantata and service in one. Further changes have been seen where individuals stay at home and prepare boastful meals and drinks for friends and strangers alike. In many instances the feast spills over into Monday replacing the harvest dance. Despite the evolution of the harvest beyond the church, the underpinnings of thanksgiving and generosity remain.

Similarly, the fisherman festivals held to celebrate St Peter, the patron saint of fishermen, once a Christian tradition has been retained as semblance of its former self. This celebration was isolated to Charlotteville where priests would bless the boats of the fishermen and a re-enactment of St Peter coming to shore was hosted. Eventually, the celebration morphed into an all weekend affair complete with street parties, jouvert and sports day and spreading to communities like Speyside, Castara and even Delaford.

Figure 33 Fishermen hauling in the catch of the day (Jason Nedd)

The cultural practices of NE Tobagonians represent a society that is perched in the balance, resting in the threshold of so-called modernity and a heritage fashioned from a tumultuous past.

Much of the intangible cultural heritage can be experienced in tangible for at sites listed by in the National Heritage Register. The National Trust of Trinidad and Tobago listed 24 such CNH and NNH Sites. These sites are in various stages of the process to be nominated as NNH Sites.
A document with most historic cultural heritage sites can be found in the Annex.

Table 14 NE Tobago Sites listed in the National Heritage Register.

	Name	Location	Type
1	Coastal Steamer Boat House	Bloody Bay	Cultural Heritage
2	Doctor's Quarters	Belle Garden	Cultural Heritage
3	Estate House	Charlotteville	Cultural Heritage
4	Estate House	Kings Bay	Cultural Heritage
5	Estate Sugar, Cocoa and Copra House	Roxborough	Cultural Heritage
6	Trois Rivieres Estate Ruins	Speyside	Cultural Heritage
7	Fort and Battery	Betsy's Hope	Cultural Heritage
8	Fort Campbellton	Charlotteville	Cultural Heritage
9	Hermitage Estate House and Ruins	Hermitage	Cultural Heritage
10	Indigo Pitts	Parlatuvier	Cultural Heritage
11	Lovers' Retreat	Speyside	Cultural Heritage
12	Methodist Church, School and Manse	Charlotteville	Cultural Heritage
13	Old Sugar Works	Roxborough	Cultural Heritage
14	Pigeon Hill	Charlotteville	Cultural Heritage
15	Police Station	Roxborough	Cultural Heritage
16	Post Office, Warden Office, Court House	Roxborough	Cultural Heritage
17	Roman Catholic Church	Delaford	Cultural Heritage
18	Roxborough to Parlatuvier Roald Old Houses and Buildings		Cultural Heritage
19	Speyside Estate Ruins and Waterwheel	Speyside	Cultural Heritage
20	Speyside Lookout Point	Speyside	Natural Heritage
21	Main Ridge Forest Reserve	Main Ridge	Natural Heritage
22	Flagstaff Hill	Charlotteville	Natural Heritage
23	Little Tobago	Little Tobago	Natural Heritage
24	Man o War Hill	Speyside	Natural Heritage

10.7 SPECIFY THE NUMBER OF SPOKEN AND WRITTEN LANGUAGES (INCLUDING ETHNIC, MINORITY AND ENDANGERED LANGUAGES) IN THE BIOSPHERE RESERVE

"Refer, for instance, to the UNESCO Atlas of Endangered languages (http://www.unesco.org/culture/languages-atlas/index.php)."

There are two spoken languages on Tobago; Standard and nonstandard English. Nonstandard English is mostly spoken within the communities. It was formed in slavery times using a mixture of mainly English but also African and French expressions, most of which are hardly in use anymore.

The written language in NE Tobago is Trinidad and Tobago English or United Kingdom English. There are no used languages described in the UNESCO Atlas of Endangered languages.

Figure 34 Fishing boats in Man-o-War Bay by sunset (Janina Ewals)

11. BIOPHYSICAL CHARACTERISTICS

11.1 GENERAL DESCRIPTION OF SITE CHARACTERISTICS AND TOPOGRAPHY OF AREA

"Briefly describe the major topographic features (wetlands, marshes, mountain ranges, dunes etc.) which most typically characterize the landscape of the area."

The terrestrial area is mainly characterised by the Main Ridge which has a length of 17km, a width of two to six kilometres and a maximum height of 573m. Its steep slopes drop often directly to sea level and are only interrupted by some low lying, coastal valleys cut by rivers.
These valleys harbour villages and the small remains of wetlands such as marshes and grass lands.
The coast consists mostly of rocky shores, interrupted by some sandy beaches.
Most of the rocky nearshore marine area is covered by reefs; within bays the substrate consists of a sand / clay mixture to various degrees. The seafloor towards the Caribbean (north) drops to about 500m, while it drops to about 1,000m towards the Atlantic in the north east.

Figure 35 Roxborough Bay (Jacob Bock)

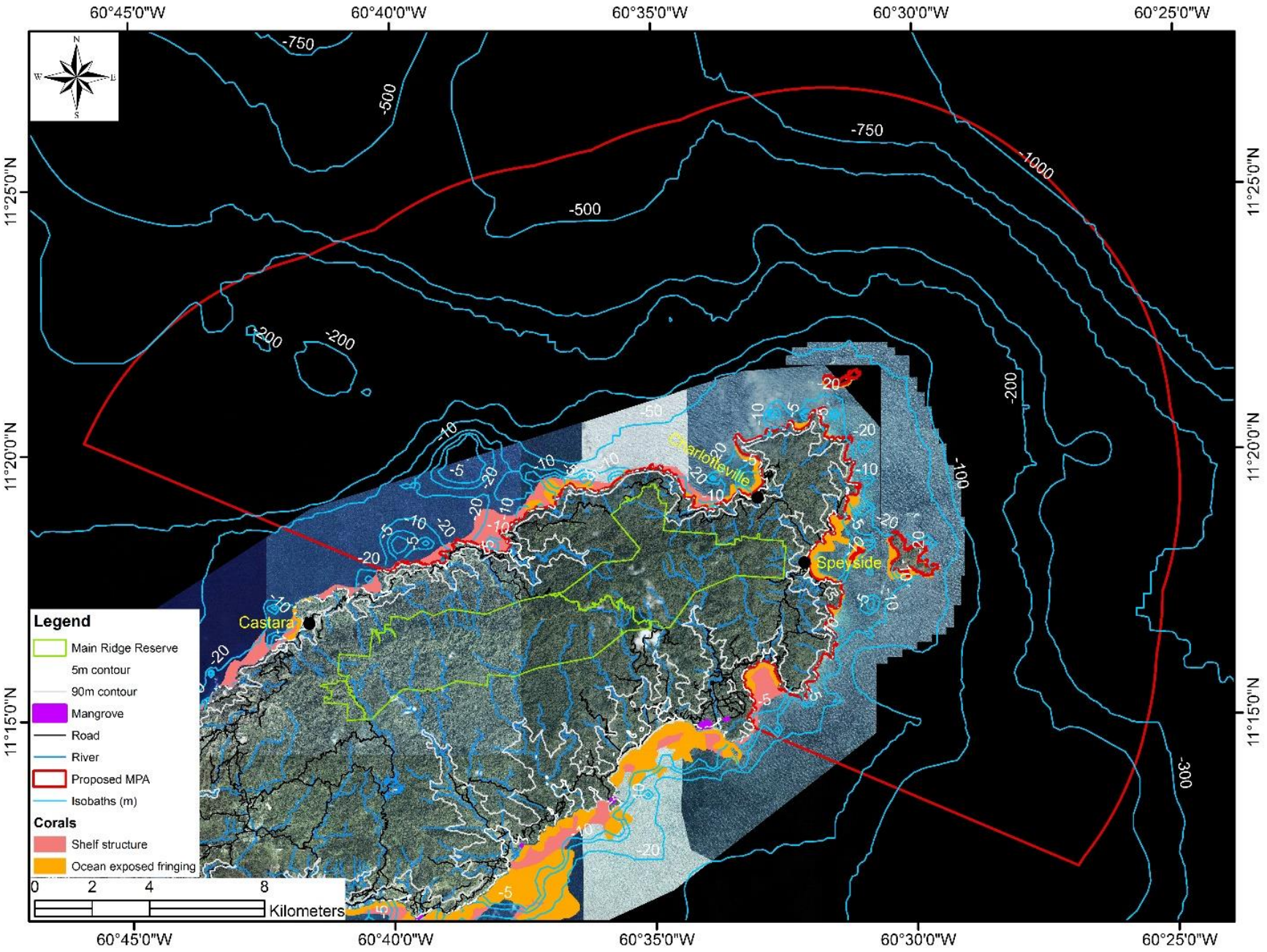


Figure 36 Bathymetry of the proposed NETMPA.

11.2 ALTITUDINAL RANGE

11.2.1 HIGHEST ELEVATION ABOVE SEA LEVEL:

573m

11.2.2 LOWEST ELEVATION ABOVE SEA LEVEL:

0m

11.2.3 FOR COASTAL/MARINE AREAS, MAXIMUM DEPTH BELOW MEAN SEA LEVEL:

~1,000m

11.3 CLIMATE

"Briefly describe the climate of the area, you may wish to use the regional climate classification by Köppen as suggested by WMO (http://www.wmo.int/pages/themes/climate/understanding_climate.php)."

Using the Köppen climate classification, the area can be classified as **Aw** (winter dry season) indicating a Tropical Wet-Dry climate which is controlled mainly by seasonal fluctuations of the trade winds and the Intertropical Convergence Zone (ITCZ) with precipitation in the driest month being less than 60mm. The terms winter and summer have little meaning, but in many locations annual rhythm is provided by the occurrence of wet and dry seasons.

11.3.1 AVERAGE TEMPERATURE OF THE WARMEST MONTH:

Average temperature of the warmest month (July) is 27.3°C

11.3.2 AVERAGE TEMPERATURE OF THE COLDEST MONTH:

Average temperature of the coldest month (February) is 25.6°C

11.3.3 MEAN ANNUAL PRECIPITATION:

Tobago's mean annual precipitation is 2,519.3 mm, recorded at a known elevation of 4.0m
The average rainfall ranges from 3,800 mm in the Main Ridge to less than 1,250 mm in the south-western lowlands.

11.3.4 IS THERE A METEOROLOGICAL STATION IN OR NEAR THE PROPOSED BIOSPHERE RESERVE? IF SO, WHAT IS ITS NAME AND LOCATION AND HOW LONG HAS IT BEEN OPERATING?

There is no meteorological station within or near to the NETMABR.
The Crown Point Meteorological Services operates a Campbell Scientific Automated Weather Station in the Louis D'or area in the North East called the Louis D'or AWS which is within the proposed biosphere reserve and has been actively recording data since 13 December 2007.

11.4 GEOLOGY, GEOMORPHOLOGY, SOILS

"Briefly describe important formations and conditions, including bedrock geology, sedimentary deposits, and important soil types."

Tobago is located south east of the Caribbean Plate and the Lesser Antilles, 40km north-east of the Venezuelan coast of South America. The north eastern part of Tobago, in which the NETMABR falls, consists of cretaceous metavolcanic and the centre consists of unmetamorphosed cretaceous volcanic and plutonic rocks. The MRFR forms the easternmost allochthonous fragment of the Caribbean mountain system. It is situated in the geological metamorphic province NCSG. This is considered to constitute the oldest rocks on Tobago embracing the Main Ridge namely the Parlatuvier and Mount Dillon Formations see Figure 37. The NCSG contains a succession of low-to-medium grade regionally metamorphosed rocks originated from the Lower Cretaceous. These heavily deformed metavolcanics and metasedimentary rocks underwent penetrative plastic deformation during greenschist facies metamorphism. The Main Ridge part contains phyllitic, serictic schists that grade upwards into the Parlatuvier Formation, a series of metavolcanics rocks which show a yellowish-brown or buff colour and pale green colour at fresh exposures due to abundance of chlorite, epidote and amphibole. In this formation, mica, chlorite, granular quartz and epidote compose a fine-grained schistose matrix which encloses porphyroclasts of plagioclase feldspar, amphibole and clinopyroxene.
The significant movement of the oceanic island Tobago over the past 10 million years has brought it from the west in the Pacific, which lead to a direct joint to Venezuela at least once, before it migrated eastwards to the present location. About 11,000 years ago the last separation from the continental mainland took place. Meanwhile it became attached several times to the South American continent and was joined to Trinidad through a land bridge during periods of low sea level as for instance in the past ice age. These events enabled movement of flora and fauna species from Trinidad and explain species like the Tobago Glass Frog which is closely related to a Venezuelan species but not a separate species.

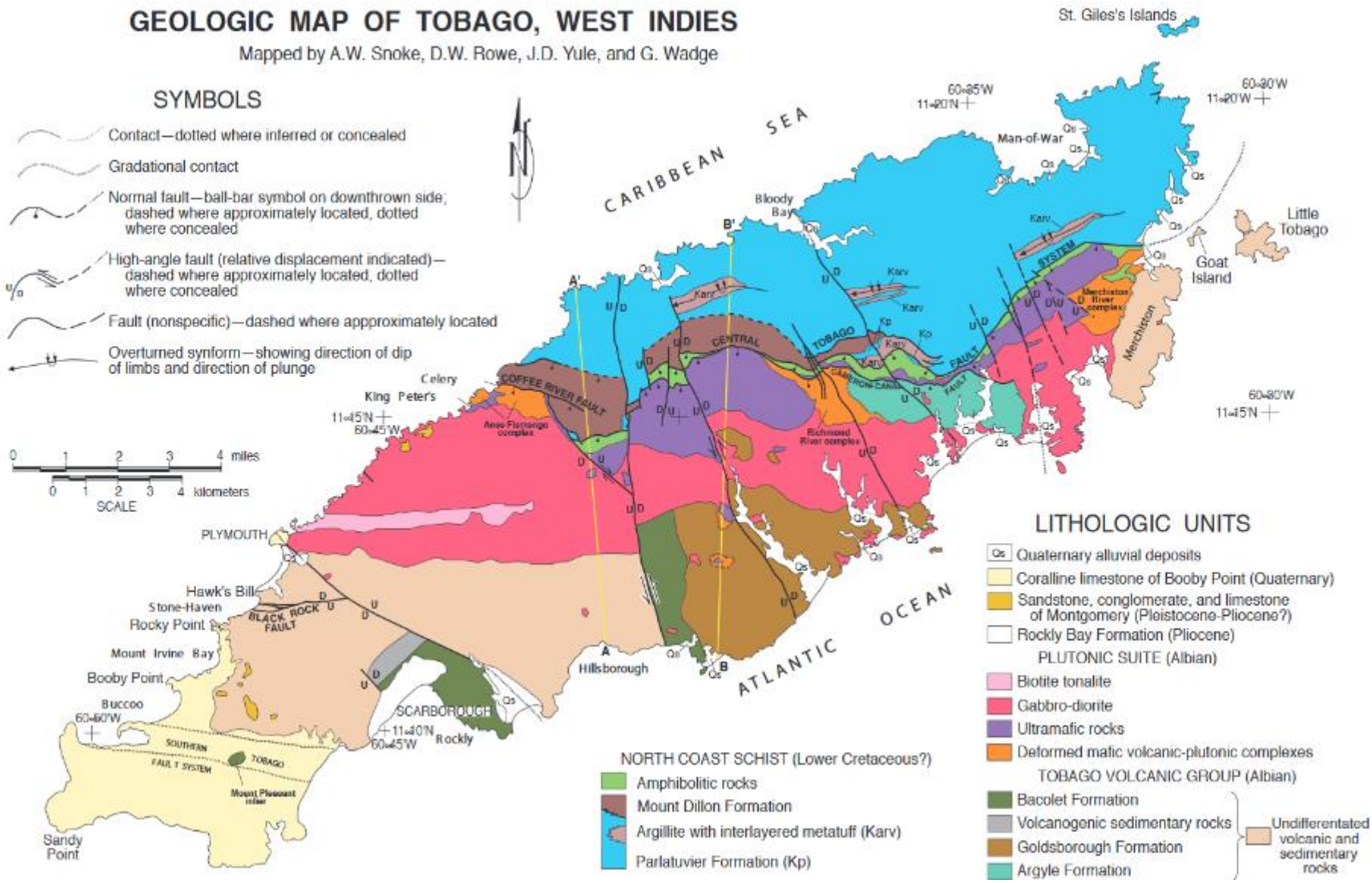


Figure 37 Geological map of Tobago.

11.5 BIOCLIMATIC ZONE

"Indicate the bioclimatic region in which the proposed biosphere reserve is located, refer to the table below and tick the appropriate box for each area of the biosphere reserve."

Areas	Average annual rainfall/mm	Aridity index		Core Area(S)	Buffer Zone(S)	Transition Area(S)
		Penman	(UNEP index)			
Hyper-arid	P<100	<0.05	<0.05			
Arid	100-400	0.05-0.28	0.05-0.20			
Semi-arid	400-600	0.28-0.43	0.21-0.50			
Dry Sub-humid	600-800	0.43-0.60	0.51-0.65			
Moist Sub-humid	800-1200	0.60-0.90	>0.65			
Per-humid	P>1200	>0.90		x	x	x

Table 15: Aridity index resulting from the use of P/ETP

*Mean annual **precipitation (P)/**mean annual potential evapotranspiration (**ETP**)*

11.6 BIOLOGICAL CHARACTERISTICS

"List main habitat types (e.g. tropical evergreen forest, savanna woodland, alpine tundra, coral reef, kelp beds) and land cover types (e.g. residential areas, agricultural land, pastoral land, cultivated areas, rangeland). For each type, indicate:
- REGIONAL if the habitat or land cover type is widely distributed within the biogeographical region within which the proposed biosphere reserve is located, to assess the habitat's or land cover type's representativeness; - LOCAL if the habitat or land cover type is of limited distribution within the proposed biosphere reserve, to assess the habitat's or land cover type's uniqueness. For each habitat or land cover type, list characteristic species and describe important natural processes (e.g. tides, sedimentation, glacial retreat, natural fire) or human impacts (e.g. grazing, selective cutting, agricultural practices) affecting the system. As appropriate, refer to the vegetation or land cover map provided as supporting documentation."

The proposed biosphere reserve can be divided into:

- three major ecosystem types (terrestrial, fresh and brackish water, marine), which can be subdivided into

- five conservation areas (ridges, rivers, reefs, islets, ocean), within which
- 18 main habitat types can be identified.

All of these habitats are representative of the region; non is unique to NE Tobago. However, the dry broadleaf forest is an endangered habitat throughout the Caribbean and the uniqueness of the coral-sponge co-dominated reefs needs to be further, scientifically investigated.

Table 16 Summary of the BR's habitats and their distribution.

Major Ecosystem Type	Conservation Area	Habitat Type	Distribution
Terrestrial	Ridges	Lower montane forest	Regional
		Elfin woodlands	Regional
		Evergreen formation forest	Regional
		Lowland rain forest	Regional
		Dry broadleaf forest	Regional
	Islets	Dry broadleaf forest	Regional
Fresh and Brackish water	Rivers	Riparian	Regional
		Riverine	Regional
		Estuarian	Regional
		Mangrove	Regional
Marine	Reefs	Sandy beaches	Regional
		Rocky intertidal shores	Regional
		Coral reefs	Regional
		Sand and silt substrate	Regional
		Seagrass beds	Regional
	Ocean	Epipelagic	Regional
		Mesopelagic	Regional
		Meso benthic	Regional
		Bathyal pelagic	Regional
		Bathyal benthic	Regional

TERRESTRIAL ECOSYSTEMS

All of the proposed BR's terrestrial ecosystems fall within the *Ridges* and *Islets* Conservation Area.

Habitat and Land-Cover Types, and Distribution

The MRFR, which is the largest Core Zone in the proposed biosphere reserve, includes at least three forest types: lower montane rain forest, small pockets of evergreen formation forest and elfin woodland.

Surrounding the MRFR, in the Buffer and Transition Zone, are lowland rain forests which extend towards the coastline, except at the northern end of Tobago. These forests are impacted, even though to a limited extend, as they cleared for agriculture (livestock, subsistence and commercial crops) urbanisation and new land development.
These four forest types (lower montane, evergreen formation, elfin woodland and lowland rainforest) make up the tropical moist broadleaf forest dominant in NE Tobago.
The vegetation in the northern end of NE Tobago and the islets is tropical dry broadleaf forest. Its small, local distribution within the proposed biosphere and limited distribution in the neotropics makes this ecosystem endangered by IUCN.

Characteristic species

While there are well over 800 vascular plant species present within the terrestrial ecosystems, each forest type is usually associated with certain abundant species of vegetation.

In the lower montane forests, the characteristic species are considered to be wild cocoa (*Licania heteromorpha*) and serrette (*Byrsonima spicata*), while for the lowland rain forests are crappo (*Carapa guianensis*) and manac (*Euterpe precatoria*). There are also large swathes of secondary forests interspersed among the lowland rain forests which are characterised by the presence of the invasive common bamboo (*Bambusa vulgaris*).

Within the dry broadleaf forests, naked indian (*Bursera simaruba*) and Tobago fan palm (*Coccothrinax barbadensis*) are often found while Little Tobago's understory is dominated by the aroid *Anthurium jenmanii*.


Figure 38 *Left:* Turpin Frog (Renoir Auguste); *Right*: Agnosia Glasswing (ERIC)

Other commonly found flora within the biosphere reserve include hog plum (*Spondias mombin*), black poui (*Tabebuia chrysantha*), yellow poui (*Tabebuia serratifolia*), wild immortelle (*Erythrina*

corallodendrum), box tree (*Hura crepitans*), balata (*Manilkara bidentata*), blue copper (*Guettarda scabra),* bois cannon (*Cecropia peltata*), and common cherry (*Cordia collococca*). Additionally, there are 12 endemic plant species on Tobago and an additional six can also be found in Trinidad and Tobago.

Of all the faunal taxonomic groups found within the terrestrial ecosystem, the avifauna is the most distinct. In fact, the proposed Core Areas are designated as IBAs according to Bird Life International and are frequently visited by bird enthusiasts and ornithologists to observe several resident and migratory species. The island's national bird rufous vented chacalaca (*Ortalis ruficauda*) is found widespread within the proposed biosphere reserve. Iconic species within in MRFR include white-tailed sabrewing (*Campylopterus ensipennis*), blue-backed manakin (*Chiroxiphia pareola atlantica*), and collared trogon (*Trogon collaris*). Important birds of prey also present in NE Tobago are great black hawk (*Buteogallus urubitinga urubitinga*) and broad-winged hawk (*Buteo platypterus antillarum*). There are two species of endemic birds, one of which is shared with Trinidad - the charismatic Trinidad motmot (*Momotus bahamensis*) and the less conspicuous Tobago greenlet (*Hylophilus insularis*).

Several species of seabirds either reside as breeding populations on the islets or are seasonal migrants. The St. Giles Islets Complex is believed to be one of the largest breeding populations of magnificent frigatebird (*Fregata magnificens*) in the Caribbean. Also breeding on the islets are red-footed booby (*Sula sula*), brown booby (*Sula leucogaster leucogaster*), brown noddy (*Anous stolidus stolidus*), red-billed tropicbird (*Phaethon aethereus aethereus*), and Audubon's shearwater (*Puffinus lherminieri lherminieri*).

There are more species of volent mammals than any other mammalian species in NE Tobago, accounting for 68% of the taxon. Among these is the endemic Sir David Attenborough's myotis (*Myotis attenboroughi*) which has a very limited distribution range. The largest mammal on the island is crab-eating raccoon (*Procyon cancrivorus*).

The highest faunal endemism is found among the herpetofauna (three snakes, one lizard and four frogs). All the endemic herpetofauna, apart from the ocellated gecko (*Gonatodes ocellatus*) are only documented in NE Tobago, to date.

Natural Processes

The MRFR was designated a forest reserve in 1776 with the increasing recognition of the close relationship between forests and rainfall production, at a time when sugarcane production was steadily growing. This relationship is still important as water is trapped, recharging rivers and groundwater. The moist broadleaf forests are especially important for local climate regulation as its closed canopy traps moisture and increases humidity to support several vascular and non-

vascular plant species, and fauna. This is especially critical for the dry forest habitat in the islets where there are no rivers.

The forests also act as a, small, yet important carbon sink by trapping atmospheric carbon. It releases small amounts of this carbon along with nutrients with decomposition, to continue the natural carbon and nitrogen cycles. With this, the vegetation plays an important role in the food cycle as producers, by supporting herbivory. The terrestrial ecosystem is an important habitat for pollinators which are critical for food crops and flowering trees.

On the rocky islets, natural weathering processes as well as droppings from resident seabirds contribute to the production of soil matter which supports vegetation. The proximity of the islets to the main island also supports movement of birds, reptiles, and organic and inorganic matter, to support colonisation.

Human impacts

The major, however very limited, anthropogenic impact to the terrestrial ecosystems is land clearing especially along roads and populated areas. Land is cleared primarily for subsistence agriculture and land development. Illegal logging, mainly occurring in the Transition Zone on abandoned lands, is also quite limited and scars the forest landscape next to access roads.

Seabirds such as the magnificent frigatebird and red-footed booby are poached from the islets. While this activity has not seemingly caused any significant impact to their populations, it could be detrimental in future, if left unchecked.

While there is regular waste collection, some indiscriminate waste disposal (mainly construction) and derelict vehicles along the roadways creates an aesthetic impact. Some waste (mainly individual plastic bags, wrappers) also falls into ravines and nearby waterways, which eventually flows out to sea. Animals may consume the wastes which can be detrimental to their health. Breakdown on plastics into microplastics can have an effect on the quality of the environment.

Climate change is anthropogenic in nature. With higher temperatures changing climatic patterns, it can alter forest types, changing dominance to other floral species. A change in flowering, fruiting and leaf dropping cycles has been observed over the past years and citizen-science based monitoring programmes (e.g. Forest Check) are implemented to monitor changes.

AQUATIC ECOSYSTEMS

The *Rivers Conservation Area* encompasses all of NE Tobago's aquatic (non-marine) ecosystems. This includes freshwater and brackish water systems. It is found in all three BR zones with the majority located within the Buffer Zone.

Habitat and land-use types, and distribution

An extensive river network is distributed regionally throughout NE Tobago's proposed BR and constitutes two freshwater habitat types - riverine and riparian. Riverine ecosystems include the riverbed and the water environment, whilst riparian habitat refers to the transitory environment between riverine and terrestrial habitats.

Figure 39 Bloody Bay River (Jacob Bock)

The rivers are clearwater systems with changes in its profiles influenced by topography. In the upper reaches, the steeper gradient results in narrow channels of fast-flowing water over rocky substrate. As the gradient gradually flattens, the channel widens while its substrate contains more rubble, sand and silt. This dynamism presents several micro-habitats to support a diversity of invertebrates. The riparian habitat lines either side of the rivers supporting the sides of the river channels, forming a very intimate relationship with the river.

The lower reaches of most of the rivers widen at the mouth and are influenced by the tide as salinity levels increase, giving rise to brackish water habitats - estuarine and mangrove. Brackish water conditions shift temporally with the tide, influencing faunal movements. While estuarine conditions are found at every river mouth, its distribution is local and therefore limited, when compared to riverine and riparian habitat distribution. Its environment may differ with location, varying from silted environments with dense riparian vegetation to wetlands dominated by

marsh vegetation. There are several, very small mangrove habitats remaining making it a critical ecosystem within the proposed biosphere reserve.

Residential housing and agriculture are the main land use of the aquatic ecosystem. Riparian and wetland vegetation are cleared for construction and agriculture, which may result in either filling or re-routing of waterways. This is mostly confined to the lower and flatter reaches and is fairly local in its distribution.

Characteristic species

The characteristic species of the *Rivers Conservation Area* are crayfishes. At upper reaches of the river, jonga (*Atya scabra*), *Potimirim glabra*, and *Xiphocaris elongata* are found along the riparian edges. Descending to the middle river sites, adult big claw river shrimp (*Macrobrachium carcinus*) and *Macrobrachium crenulatum* begin to dominate, staying close to rocks in the riverbed, while their juveniles hide along the riparian edge. At the river mouths where riverine habitats begin to transit to brackish water, breeding *Macrobrachium carcinus* and *Macrobrachium crenulatum* are present.

The aquatic fish diversity is low with 11 freshwater and four brackish water species. Some of these species include Hart's rivulus (*Anablepsoides hartii*), mountain mullet *(Agonostomus monticola*), giant goby (*Gobiomorus dormitor*) and marbled swamp eel (*Synbranchus marmoratus*). Two species of crabs are also frequently caught - manicou crab (*Eudaniela garmani*) and blue crab (*Callinectes sapidus*). Guppy (*Poecilia reticulata*) which is used in evolutionary, genetic and ecological research in NE Tobago are also present in a few streams.

The catadromous American eel (*Anguilla rostrata)*, which as elvers grow to sexual maturity in rivers before migrating to the Sargasso Sea to breed, are present in both freshwater and brackish water habitats. Some fish species complete part of their life cycle within the estuarine and mangrove habitats before migrating to marine habitats. These include grey snapper (*Lutjanus griseus*), dog snapper (*Lutjanus jocu*) and Hospe mullet (*Mugil hospes*).

Several species of gastropods and bivalves are found in the river habitats of the proposed BR. In the mangrove habitat, they frequently populate the prop roots of red mangrove (*Rhizophorus mangle*) and include species such as *Crassostrea* sp., *Echinolittorina* sp. and *Brachiodontes* sp. In riverbeds and close to riparian habitat are gastropods *Neritina* sp. and two invasive species of snails are abundant: *Melanoides tuberculata* and *Tarebia granifera.*

Several species of birds live among the riparian and mangrove vegetation and can include night heron (*Nycticorax nycticorax hoactli*), tricolour heron (*Egretta tricolor*), common pootoo (*Nyctibius griseus*), and copper-rumped hummingbird (*Amazilia tobaci erythronotus*).

Among mammals, various bats and rodent species, crab-eating raccoon (*Procyon cancrivorus*) and red-tailed squirrel (*Sciurus granatensis*) are found.

The riparian habitat within secondary forests are characterised by the presence of common bamboo (*Bambusa vulgaris*), lining the rivers.

Natural processes

Rivers are important transport systems of nutrients and organic matter, plant material, fauna, sediment and freshwater. The movement of water is important for shaping the landscape around it through erosion and deposition, creating micro-habitats best suited for different fauna. During the wet season or periods of heavy rainfall, seasonal or ephemeral channels are formed, transporting excess water and nutrients into areas of the terrestrial ecosystem that otherwise would not receive during the dry season. They also transport useful material to the river mouths for use in other processes or by other organisms. For example, the deposition of empty snail shells at the mouths near rocky shores, replenish the supply of shell for the marine hermit crabs *Clibanarius tricolor* and *Clibanarius vittatus.*

Riparian vegetation along the river embankment provides organic matter to the river with shedding and decaying of leaves. They also play a role in climate regulation, providing shade over the rivers to prevent excess evaporation, and otherwise maintaining cool temperatures.

The freshwater and brackish water ecosystems play a role in the life cycle of some animal species as seasonal changes in conductivity and salinity levels act as reproductive cues such as for the American eel, mountain mullet and *Macrobrachium* sp. Mangroves. Estuaries are also important nurseries for marine fishes such as *Lutjanus* sp.

Human impacts

The largest impact to the river conservation area is the grey water discharge from communities. This results, especially during the dry season, in eutrophication and, in some instances, anoxic conditions in small drains.

Pesticides and fertilisers are used in agriculture; however, due to the fact that agriculture is very limited, only impacts in less than a handful of very localised sites.

Some persons prefer to wash their vehicles at rivers introducing chemicals into the aquatic ecosystem. In some areas cars are driven into the rivers, for either car washing or access to agricultural plots, resulting in physical damage to both riparian and riverine habitats.

Bamboo is an invasive plant species introduced for riverbank stabilisation. However, their fast growth overwhelms native riparian flora, resulting in extensive dominance of bamboo stands.

Figure 40 Sting ray (Max Smith)

The onset of climate change will exacerbate many of the above impacts. Higher temperatures alter rainfall patterns, in which overall precipitation levels are anticipated to decrease. This will affect groundwater and surface water recharge, resulting in some tributaries converting to ephemeral channels. This in turn will have a downstream effect on the *rivers* natural processes.

MARINE ECOSYSTEMS

The marine ecosystem forms the largest area in the proposed biosphere reserve. This area covering 85% of the reserve is the proposed NETMPA and forms the marine Buffer Zone. The marine ecosystem is consisting of two conservation areas - *reefs* and *oceans*.

Figure 41 shows a map with all marine ecosystems within the proposed NETMABR.

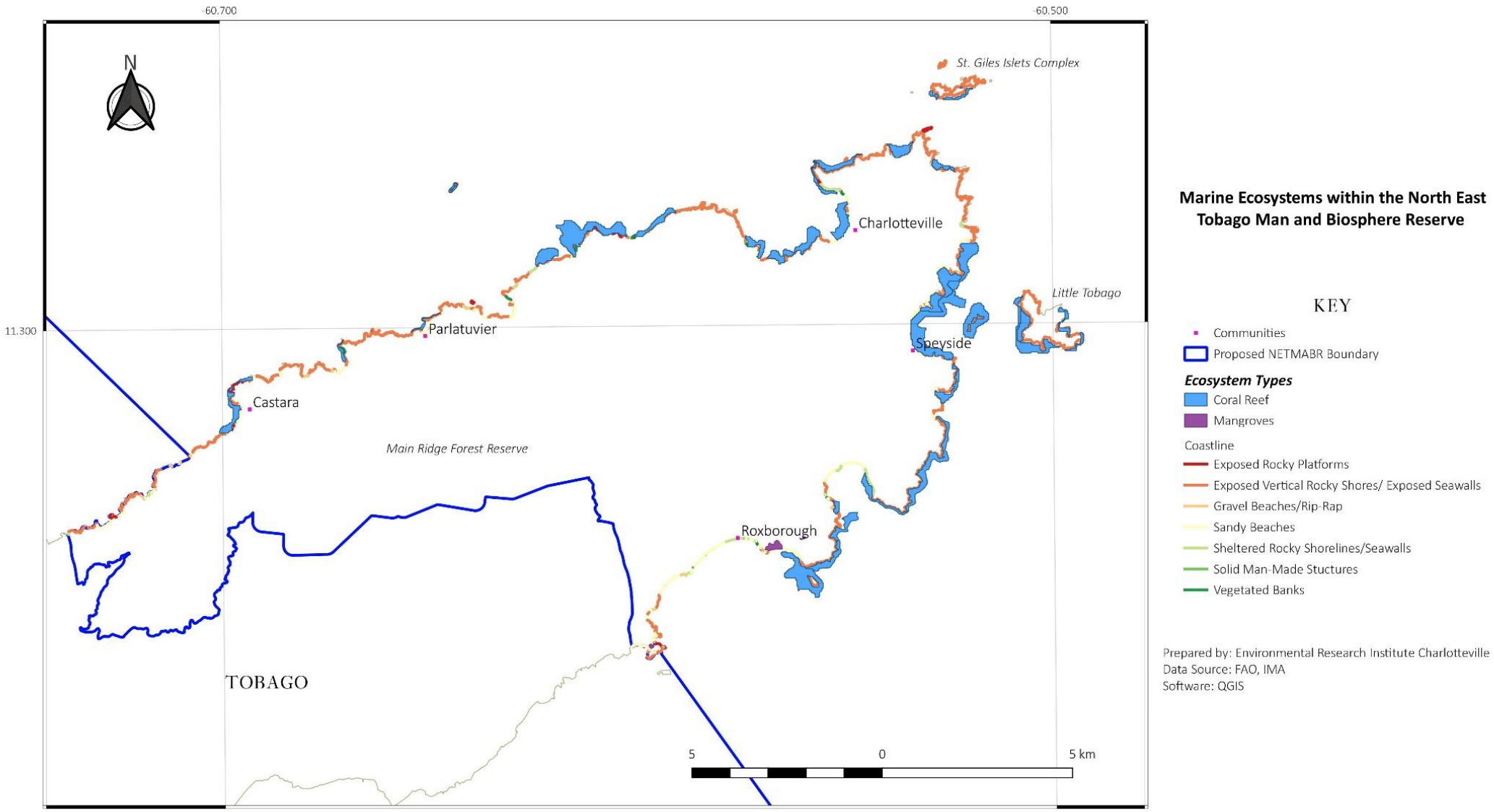


Figure 41 Marine Ecosystems within the proposed NETMABR.

Habitat types and distribution

The conservation area designated as "reef" covers habitats found on the coast and sublittoral zone. This includes sandy and rocky shore ecosystems, coral reefs, sand and silt substrate, and seagrass beds.

Sandy shore ecosystems constitute many of the bays and beaches in NE Tobago where its size and profile are influenced primarily by wave energy and sediment type, making it one of the most dynamic ecosystems in the proposed BR. A few of these beaches are marine sea turtles nesting sites, for namely hawksbill turtle (*Eretmochelys imbricata*), Leatherback turtle (*Dermochelys coriacea*) and green turtle (*Chelonia mydas*) also visit for nesting. Various bird species are found along the coastline such as semipalmated sandpipers (*Calidris pusilla*) and southern lapwing (*Vanellus chilensis cayennensis*). During the months of March to October, a large breeding population of laughing gulls (*Leucophaeus atricilla*) flock the coastline, particularly in Charlotteville. Buried within the sand are various species of polychaetes and crustaceans such as amphipods, isopods and small crabs. Common vegetation found on the coast include sea grape (*Coccoloba uvifera*) and West Indian almond (*Terminalia catappa*) along with the very poisonous manchineel (*Hippomane mancinella*) at some beaches.

The rocky shore ecosystem is limited to Charlotteville, Speyside and Little Englishman's Bay in northeast Tobago, resulting in a local distribution. It is an intertidal ecosystem covered, during high tide and exposed at low tide, exposing its associated fauna to extreme environmental conditions. Echinoderms such as rock-boring urchins (*Echinometra lucunter*), blunt-spined brittle star (*Ophiocoma echinata*) and sea cucumbers are often found. Juvenile chain moray (*Echidna catenata*) and other reef fish species are also present while knobby zoanthid (*Palythoa mammillosa*) mats and small elkhorn coral (*Acropora palmata*) colonies are exposed by the low tides. In Charlotteville, a large colony of tiny blue-legged hermit crab (*Clibanarius tricolor*) and thinstripe hermit crab (*Clibanarius vittatus*) aggregate among the rocks along with marbled chitons (*Chiton marmoratus*), eight-ribbed limpet (*Hemitoma octoradiata*), zebra periwinkle (*Echinolittorina ziczac*) and several other gastropods.

Fringing coral reefs hug the coastline of the main island of Tobago and its associated islets. The reefs are vastly populated by various gorgonians, hard corals and sponges. Depending on the conditions faced by the reefs, the living substrata can vary from gorgonian-dominated to sponge-hard coral co-dominated to hard coral-dominated. Small colonies of the critically endangered staghorn coral (*Acropora cervicornis*) can be found at depths up to 10m at a few reef sites, whilst its equally critically endangered relative the elkhorn coral (*Acropora palmata*) is more widespread, at similar depths. Other species of hard corals commonly found include various common brain coral (*Diploria labyrinthiformes*), knobby brain coral (*Pseudodiploria clivosa*), symmetrical brain coral (*Pseudodiploria strigosa*), and massive starlet coral (*Siderastrea siderea*).

The evolutionary distinct, globally endangered (EDGE) species boulder star coral (*Orbicella franksi*), lobed star coral (*Orbicella annularis*), and mountainous star coral (*Orbicella faveolata*) are also found at many reef sites throughout NE Tobago, whilst pillar coral (*Dendrogyra cylindrus*) has a seemingly limited distribution. Among the soft corals, extensive mats of white encrusting zoanthid (*Palythoa caribaeorum*) is a common sight at all reefs along with gorgonians bipinnate sea plume (*Antillogorgia bipinnata*), corky sea finger (*Briareum asbestinum*), and porous sea rod (*Pseudoplexaura porosa*). Giant barrel sponge (*Xestospongia muta*) and vase sponges (*Callyspongia* sp.) create impressive fields at sponge co-dominated reef sites.

Other invertebrates commonly found are Caribbean spiny lobster (*Panulirus argus*), spotted spiny lobster (*Panulirus guttatus*), flamingo tongue (*Cyphoma gibbosum*), various cleaner shrimps such as banded coral shrimp (*Stenopus hispidus*), and echinoderms such as black long-spined sea urchin (*Diadema antillarum*) and donkey dung sea cucumber (*Holothuria mexicana*).

There is a fair diversity of fish present, with impressive inter-species schools of creole wrasse (*Clepticus parrae*), chromis (*Chromis* sp.) and other small reef fish. Herbivorous fishes include brightly coloured parrotfish (*Scarus* sp.) and angelfishes (*Holocanthus* sp. And *Pomacanthus* sp.).

The reefs are seasonally visited by mantas (*Mobula birostris*) for feeding and possibly mating. Shark species found within the proposed NETMPA include the endangered great hammerhead (*Sphyrna mokarran*), scalloped hammerhead (*Sphryna lewini*), Caribbean reef shark (*Carcharhinus perezii*), nurse shark (*Ginglymostoma cirratum*), tiger shark (*Galeocerdo cuvier*). Southern sting ray (*Hypanus americanus*) and spotted eagle ray (*Aetobatus narinari*) are frequent visitors.

Much of NE Tobago's seagrass beds are lost, leaving small isolated patches of the pioneering species Caribbean seagrass (*Halophila decipiens*) in sand and silt substrate. These are often visited by red cushion sea star (*Oreaster reticulatus*), queen conch (*Lobatus gigas*), and other small fishes and crustaceans. Sand and silt substrate are home to often cryptic, well-camouflaged species such as lesser electric ray (*Narcine bancroftii*), and maculated flounder (*Bothus maculiferus*).

Figure 42 Coral-sponge co-dominated reef in NE Tobago (Max Smith)

The *ocean* conservation area, which makes up a large proportion of the proposed NETMPA, is still largely unexplored. However, several commercially important pelagic and demersal fishes are caught in these waters such as blackfin tuna (*Thunnus atlanticus*), dolphinfish/mahi mahi (*Coryphaena hippurus*), four-winged flying fish (*Hirundichthys affinis*), red snapper (*Lutjanus purpureus*), plumhead snapper (*Rhomboplites aurorubens*), yellowedge grouper (*Epinephelus flavolimbatus*), and several jack and mackerel species.

Cetaceans often sighted within the vicinity of the proposed NETMPA for either feeding, or simply visiting. Common species are common bottlenose dolphin (*Tursiops truncatus*) and melon-headed whale (*Peponocephala electra*).

Natural processes

Weathering and erosion play a major role in shaping the coastline of NE Tobago and its associated islets. Beaches undergo a natural cycle of erosion and deposition dictated by the waves. The material that builds the beach is dependent on mechanical abrasion of the surrounding geological formations, dead corals, and shells as well as mastication of corals by parrotfishes. This movement also maintains a constant exchange of oxygen, nutrients, and organic and inorganic materials between the intertidal and subtidal zones, supporting a diversity of small organisms such as juvenile fishes and macroinvertebrates.

Enrichment from the island's rivers and the Orinoco plume support the production of phytoplankton in NE Tobago's waters. This forms the base of an efficient nutrient cycle. It is essential for coral reef growth which turn supports the marine environment's biodiversity. Consequently, it encourages the visitation and residence of charismatic megafauna such as turtles, sharks, mantas, and cetaceans and the production of commercial fish species.

The marine environment, similar to forests, also acts as a natural sink for carbon dioxide. It is an important element in photosynthesis by phytoplankton and algae, particularly the symbiotic zooxanthellae in corals which produces as much as 80% of the energy needed by their hosts. It is also essential for the production of calcium carbonate which is absorbed by shellfish (molluscs and crustaceans) and corals for growth.

Human impacts

Runoff from land consisting of solid and liquid wastes has always been an issue, especially associated with communities. Eroded sediments from construction activities have caused siltation in some bays which can smother corals and other sessile organisms. Liquid waste, mainly grey water, enriches the waters within the nearshore environment, providing enabling conditions from algal growth.

Illicit sand mining degrades certain beaches and destabilises its immediate environment. If extraction outweighs sediment deposition, the beach retreats which results in loss of habitat and fertility for its associated biodiversity and loss of nesting sites for marine turtles. It also increases the turbidity of the water which will impact on nearby reef habitats.

Though protected by law and despite continued efforts of community-based conservation organisations, nesting sea turtles are still poached. They are also captured as a result of entanglement in gill nets which can also capture sharks and other non-target species. Unmonitored gill nets set nearshore in proximity to coral reefs, can shift with swells or strong currents. This can result in entanglement on coral substrate, causing substantial damage. Similarly, fishing lines caught on substrate are cut loose by fishermen and entangles in the reef. Ghost fishing is also an issue as abandoned gill nets and fish pots continue to 'fish'.

Overfishing is another issue whereby fishermen can unscrupulously capture significant quantities of immature, breeding and endangered fish. With limited management in place to adequately assess maximum sustainable yield and total allowable catch of fish stocks and to recommend and enforce individual fishing quotas, monitoring potential overfishing is difficult. International long liners targeting sharks deplete populations. Fishermen also face competition from illegal, unreported and unregulated fishing from foreign fishing vessels. Many large predators, with the exception of sharks, are targeted by local fishermen. Some reefs show a shift from top predators

to meso-predator dominance where populations of groupers, snappers and sharks are very low, while grunts dominate.

Climate change affects the marine environment with warming sea surface temperatures (two bleaching events in 2015 and 2010), sea level rise and ocean acidification. A change of the seasonality of plankton blooms and fish migrations has been observed in the past years.

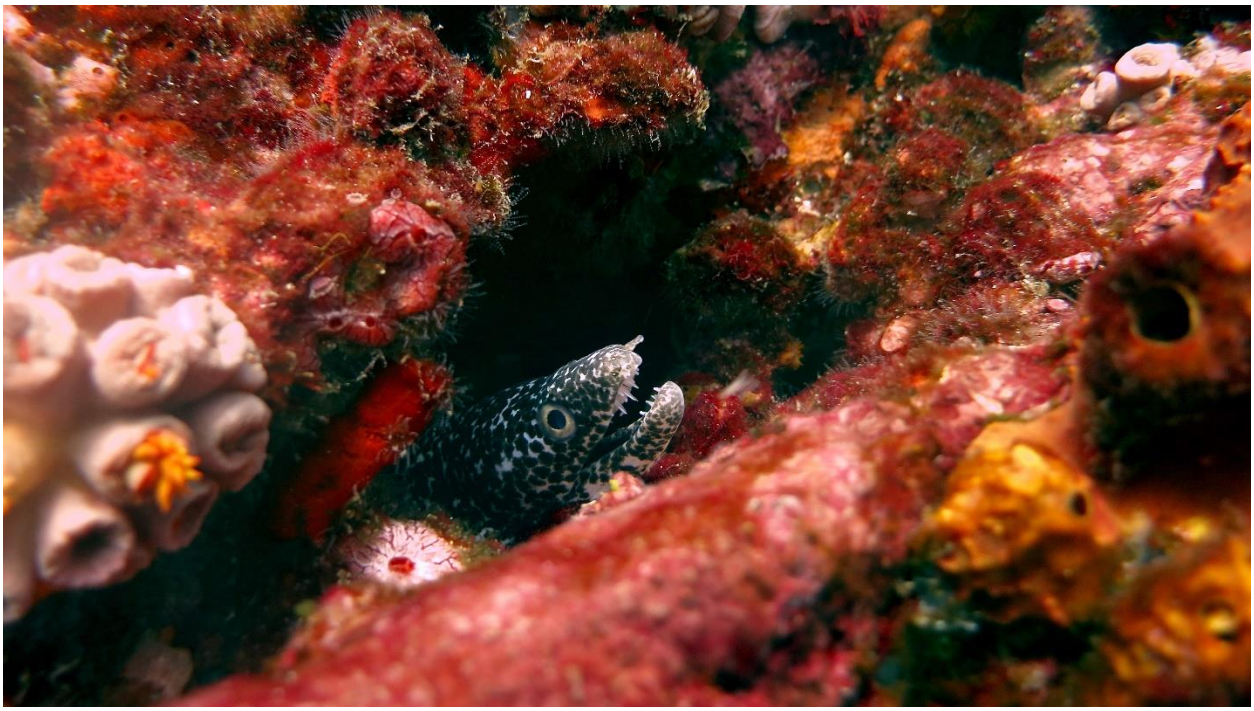


Figure 43 Spotted moray (ERIC)

12. ECOSYSTEM SERVICES

12.1 IF POSSIBLE, IDENTIFY THE ECOSYSTEM SERVICES PROVIDED BY EACH ECOSYSTEM OF THE BIOSPHERE RESERVE AND THE BENEFICIARIES OF THESE SERVICES

"Please refer to the Millennium Ecosystem Assessment Framework and The Economics of Ecosystems and Biodiversity (TEEB) Framework (http://millenniumassessment.org/en/Framework.html and http://www.teebweb.org/publications/teeb-study-reports/foundations/)."

As defined by the Millenium Ecosystem Assessment (MEA): "A well-defined ecosystem has strong interactions among its components and weak interactions across its boundaries". This is the case for NE Tobago where the ecosystems within the landscape are tightly interlinked but buffered from other social and ecological systems. To seaward, this buffer is the Caribbean Sea and the Atlantic Ocean. Landwards, the buffer is the topography and conservation status of the MRFR which has restricted extensive human development to the south-western end of the island. What is captured in between is a landscape that encompasses, in a small area, a wide range of ecosystem processes, services and biodiversity including two of the world's most biodiverse ecosystems, tropical rainforest and coral reefs.

For descriptive purposes, ecosystem service value is expressed in terms of five broader ecological areas that together constitute the landscape of NE Tobago: Ridges, Rivers, Reefs, Islands, Ocean. Each area includes one or more related ecosystems.

Ecosystems are often valued for the services they provide to people. The MEA uses four categories of: provisioning (e.g. artisanal fishery, small-scale agriculture, hunting), regulating (e.g. erosion control, coastal protection, water purification), cultural (e.g. aesthetic beauty that supports eco-tourism) and supporting (e.g. nutrient cycling). Ecosystem value is assessed here in these terms.

The diagram below illustrates the various ecosystem services of the five broader ecological areas:

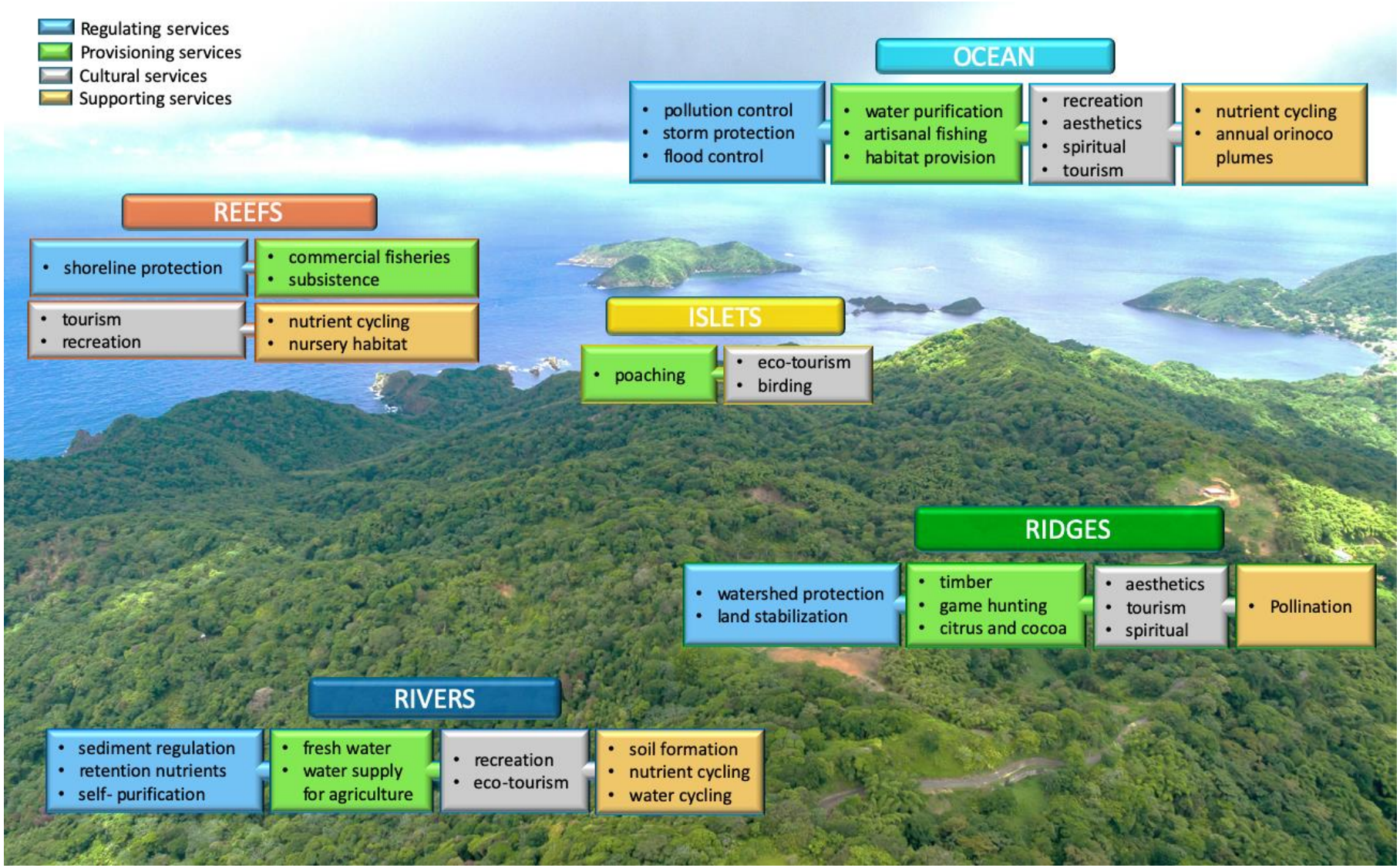


Figure 44 Summary of ecosystem service types provided by the conservation areas in the planned NETMABR.

The beneficiaries of the ecosystem services are primarily residents within the Transition Zone of the NETMABR. Residents of South-West Tobago and tourists benefit from water supply, aesthetics, tourism, recreation, and supply of nutrients in form of fisheries and agricultural products.

12.2 SPECIFY WHETHER INDICATORS OF ECOSYSTEM SERVICES ARE USED TO EVALUATE THE THREE FUNCTIONS (CONSERVATION, DEVELOPMENT AND LOGISTIC) OF BIOSPHERE RESERVES. IF YES, WHICH ONES AND GIVE DETAILS

Indicators of ecosystem services are currently not used to evaluate the three functions of the future BR.

12.3 DESCRIBE BIODIVERSITY INVOLVED IN THE PROVISION OF ECOSYSTEMS SERVICES IN THE BIOSPHERE RESERVE (E.G. SPECIES OR GROUPS OF SPECIES INVOLVED)

The list below only refers to ecosystem services that are related to specific species or groups of species. Ecosystem services that are mainly a product of abiotic factors are omitted.
The list is to be understood as representative and not exhaustive.

Table 17 Ecosystems, services and associated key species

Ecosystems	Services	Example	Associated Key Species
Tropical Forests	Provisioning	timber extraction	e.g. Cedar (*Ocotea lucoxylon*), Cypre (*Cordia alliodora*), Crapo (*Carapa guianinsis*), Mahogany (*Swietenia spp*)
		hunting	e.g. Agouti (*Dasyprocta leporina*), Iguana (Iguana iguana), Armadillo (*Dasypus novemcinctus*)
		medicinal plants	e.g. Naked Boy Tree (*Bursera simaruba*), Bois Canot (*Cecropio peltata*), Zebapique (*Neurolaena lobate)*
	Regulating	carbon sequestration	all plants

Ecosystems	Services	Example	Associated Key Species
		pollination	bees (e.g. *Apis mellifera*), bats (e.g. *Glossophaga longirostris*), butterflies/moths (e.g. *Caligo tucer*)
		moderation of extreme events, erosion control	trees (various species), bamboo (*Babusa vulgaris*)
	Cultural	tourism - birdwatching	e.g. White-tailed Sabrewing (*Campylopterus ensipennis*), Collared Trogon (*Trogon collaris*), Stripe-breasted Spinetail (*Synallaxis cinnamomea*)
		spiritual rituals	e.g. Silk Cotton Tree (*Ceiba pentandra*)
Fresh & Brackish Water (riparian, riverine, estuary and mangrove)	Provisioning	trapping	e.g. Blue Crab (*Callinectes sapidus*), Crayfish (*Macrobrachium carcinus*)
	Regulating	Waste-water treatment	e.g. mangroves (*Rhicophorus mangle*), reeds (various species)
	Cultural	tourism - bird watching	e.g. Black Crowned Night Heron (*Nycticorax nycticorax*), Belted Kingfisher (*Megaceryle alcyon*)
		inspiration for art	plants associated with rivers and estuaries
	Supporting	provision of habitat	e.g. mangroves (*Rhicophorus mangle*), reeds (various species)
Coastal Marine (coastal beaches, coral reefs, seagrass beds)	Provisioning	fishing	e.g. Conch (*Lobatus gigas*), Lobster (*Panuliarus argus*), Snappers (*Lutjanus spp*), Grouper (*Epinephalsus spp*), Parrotfishes (*Sparisoma*), Sea Grape (*Coccoloba ubifera*), Sea Almond (*Terminalia cattapa*), Coconut (*Cocos nucifera*)
	Regulating	erosion control	e.g. Sea Grape (Coccoloba ubifera), Sea Almond (Terminalia cattapa), Coconut (Cocos nucifera), corals (Scleractinians)
	Cultural	tourism - snorkelling, diving	corals (Scleractinians), other sea creatures

Ecosystems	Services	Example	Associated Key Species
		inspiration for art	plants and animals associated with the ecosystems
	Supporting	provision of habitat	e.g. Sea Grape (Coccoloba ubifera), Sea Almond (*Terminalia cattapa*), Coconut (Cocos nucifera), corals (Scleractinians)
Offshore Islands	Provisioning	poaching	e.g. Magnificent Frigate Bird (*Fregata magnificens*), Red Footed Booby (*Sula sula*)
	Cultural	tourism - bird watching	e.g. Red-billed Tropic Bird (*Phaethon aethereus*), Briddeled Tern (*Onychoprion anaethetus)*
Marine Pelagic	Provisioning	fishing	Mahi Mahi (*Coryphaena hippurus*), Tuna (Thunnus spp), Mackerels (Scomberomorus spp)
	Cultural	tourism - sport fishing	e.g. Tuna (Thunnus spp), Marlin (*Makaira nigricans*)

Figure 45 Ecosystem services use of water resources (Jacob Bock)

12.4 SPECIFY WHETHER ANY ECOSYSTEM SERVICES ASSESSMENT HAS BEEN DONE FOR THE PROPOSED BIOSPHERE RESERVE. IF YES, IS THIS ASSESSMENT USED TO DEVELOP THE MANAGEMENT PLAN?

Unfortunately, not.

13. MAIN OBJECTIVES FOR THE BIOSPHERE RESERVE'S DESIGNATION

13.1 DESCRIBE THE MAIN OBJECTIVES OF THE PROPOSED BIOSPHERE RESERVE, INTEGRATING THE THREE FUNCTIONS

"Conservation, development and logistic, presented below (sections 14 to 16), including components of biological and cultural diversity. Please specify the indirect pressures and/or organizational issues."

The planned NETMABR is subject to a series of interconnected, indirect pressures and human and environmental threats that can be addressed by implementing objectives aligned with the three MAB functions. Other objectives of the proposed BR will address direct pressures that were described in Section 11.

It is important to note that the below described objectives are based on a) conservation objectives developed by stakeholders for the drafting of the MRFR Management Plan and the NETMPA Management Plan, and b) by the technical writing team for this nomination form. These objectives are therefore in a draft format, to be further discussed and refined when the overall management plan for the planned NETMABR will be drafted.

INDIRECT PRESSURES AND ORGANISATIONAL ISSUES

In 2013, the IFPAM Project document identified the main barriers to successful conservation in NE Tobago as follows:

- outdated legal and regulatory framework for establishing and managing protected areas,
- fragmented responsibilities and capacity of protected area staff,
- inadequate funding,
- lack of technical capacity to identify conservation gaps,
- minimal capacity on the ground with respect to practical approaches to effective biodiversity management,
- and minimal experience with income-generating opportunities in protected areas.

Local residents and stakeholders are not regularly inspired to undertake conservation-relevant practices. This is partly because intelligible, adequate and continuous environmental education still requires improvement. While knowledge often exists, it is not successfully translated into a positive attitude and practise. This in turn is partially due to perceived and actual lack of ownership and empowerment on the part of residents in NE Tobago. Similarly, residents facing environmental challenges, such as developers violating laws by dumping waste illegally, are often not informed enough to take appropriate actions against those perpetrating the violations (e.g. seek assistance from the Environmental Police and/or the Environmental Commission of Trinidad and Tobago). Additionally, the lack of coherent and consistent conservation co-management

often undermines good efforts in some areas by neglect in others. For example, efforts of CSOs to protect nesting sea turtles are undermined by a lack of law-enforcement regarding the use of turtle nets and turtle meat consumption.
The principle barrier to addressing direct threats to the ecosystems of NE Tobago is fragmented management and use. The NPAP policy, the IFPAM Project, and ERIC's assessments have all identified and prioritised this barrier for NE Tobago. Regulations and roles are unclear and consequently there is limited "enforcement / implementation of regulations concerning natural resource use" as stated in the NETMP. Fragmented formal and informal public and private land management and use create an environment where it is nearly impossible for a single stakeholder to meaningfully influence the direct threats that are degrading NE Tobago's ecosystems.

Although fragmented management is the principal barrier to conservation in NE Tobago, another critical barrier is a lack of monitoring and communication. This issue captures two hindrances to biodiversity conservation regionally as identified by the Caribbean Islands Biodiversity Hotspot assessment: limited technical and scientific knowledge and poor availability of information needed for effective decision-making, and lack of awareness of importance of biodiversity and ecosystem services. Limited information and communication mean that it is difficult to: quantify conservation threats, foster informed discussions, prioritise management actions, measure the success of interventions, and inspire stakeholders to take action. This barrier will be specifically targeted by strengthening of the logistic function of the planned BR.

In order to address the above and in Section 11 described challenges through strengthening the functions of a BR, the technical team proposes the following main objective for the management of the NETMABR:

To successfully consolidate and co-manage activities, projects and programmes related to conservation, sustainable development, research, capacity building, education and networking on landscape and eco-system levels for the benefit of NE Tobago's cultural and natural heritage and people.

The following sub-objectives might be considered for the drafting of the management plan.

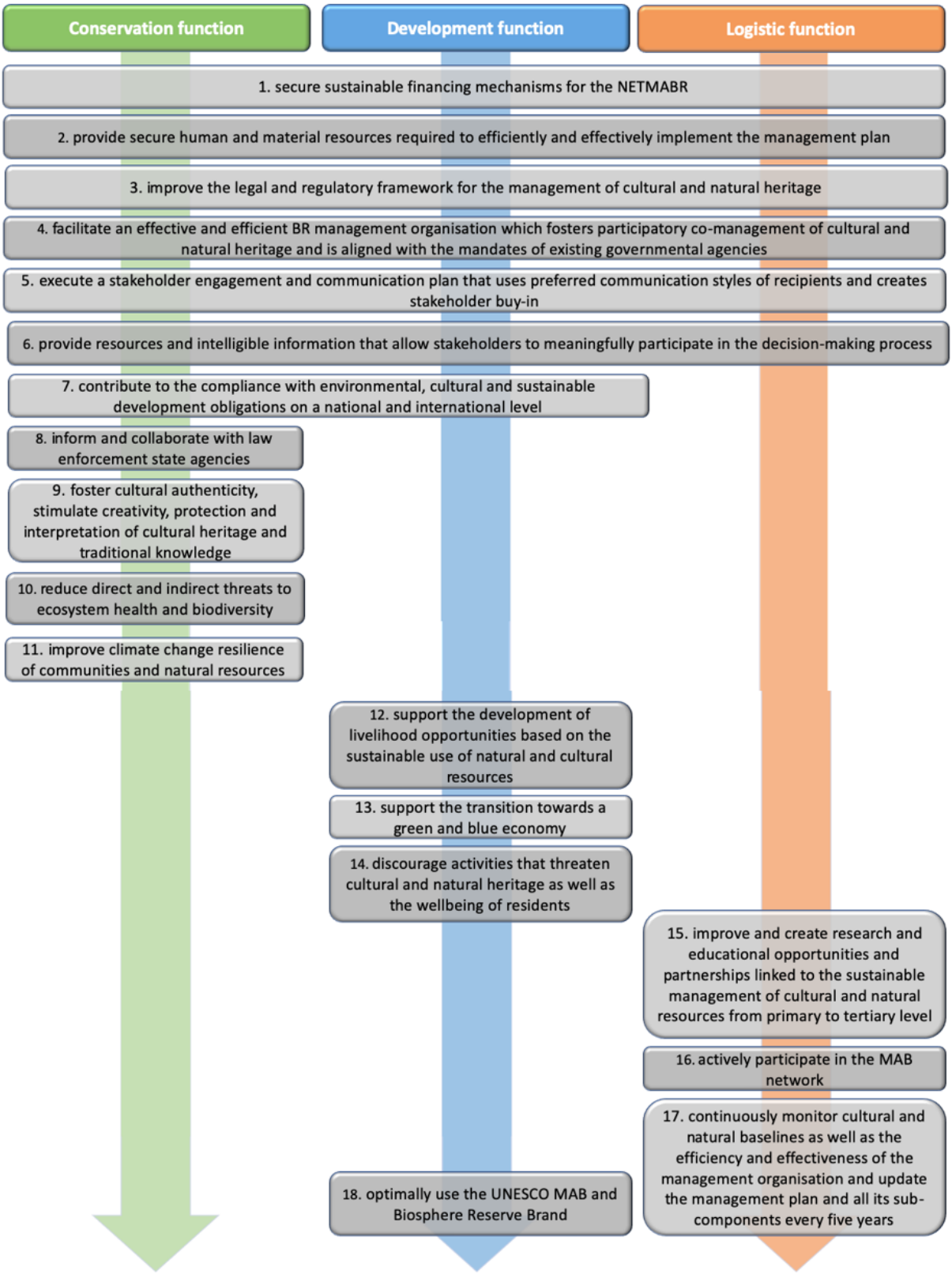


Figure 46 Proposed sub-objectives for the BR management plan

The following draft conservation objective was formulated during several stakeholder meetings under the IFPAM Project for the drafting of the NETMPA Management Plan.
"To maintain ecological processes of the marine ecosystem (i.e., coral reefs, mangrove forests and marshes, seagrass beds, etc.) inclusive of the offshore islands and up to the 5m contour line on the main island, in NE Tobago and/while supporting sustainable livelihood activities".

Seven, draft sub-objectives were detailed:

1. support enhancement of the near shore, marine, water quality (for example by promoting soil conservation measures and reducing other sources of pollution from sewage and grey water);
2. drive initiatives to prevent the further destruction of marine ecosystems and promoting the regeneration of the marine ecosystems;
3. support initiatives for sustainable harvesting of commercial marine species and environmental conscious practices of the supporting industries;
4. support initiatives to improve the enforcement of laws prohibiting the harvesting of nationally protected or IUCN listed endangered species for example seabirds, marine turtles and corals;
5. promote education, nature appreciation (through recreation and tourism opportunities) and scientific research in the protected area;
6. promote active participation of resource users in management; and
7. monitor indicator species.

The following draft, main conservation objective was formulated during several stakeholder meetings under the IFPAM Project for the drafting of the MRFR Management Plan (2018).
"*To maintain the viability of the oldest protected forest reserve in the western hemisphere*."

Six, draft, sub-objectives were detailed:

1. Maintaining a minimum of 5,179.57 ha under natural forest, including the present MRFR of 3,955.97 ha plus the proposed extension of the Pilot Protected Area (PPA) by 1,223.6 ha;
2. Decreasing the impacts of forest fragmentation and edge effects by supporting infrastructure development only in instances deemed necessary, for example, scientific research within the MRFR, by advising on the implementation of a long-term infrastructure development plan for the entire protected area;
3. Maintaining the ecological services provided by the PPA, in particular the provision of clean water, inclusive of the development of a repository of data on the hydrological cycle, with an emphasis on identifying sustainable levels of water extraction;

4. Maintaining the ecological connectivity of the PPA with the marine environment through ensuring the ecological integrity of all water courses emanating from the PPA and reducing land-based sources of pollution;
5. Supporting the development of sustainable livelihoods from the use of natural resources in/from the PPA by further developing the site as a model product for ecotourism and heritage tourism (inclusive of capacity building initiatives in areas such as marketing, certification, emergency response, data collection); and
6. Monitoring indicator species of the baseline survey to contribute toward advising effective ecosystem management.

13.2 DESCRIBE THE SUSTAINABLE DEVELOPMENT OBJECTIVES OF THE BIOSPHERE RESERVE

"If appropriate, please refer to Agenda 21, Rio+20 and SDG post 2015."

In referring to Sustainable Development Goals (SDG) of the 2030 Agenda the following objectives are proposed for applicable goals for further discussion and integration into the NETMABR Management Plan. These objectives are based on the above-mentioned main objectives and aligned to each SDG.

Goal 1. End poverty in all its forms everywhere.
Comment: There is no extreme poverty in Tobago.
Objective: To diminish poverty through applied research, education, capacity building, facilitating demonstration projects, lowering entrepreneurial risks, and fostering innovation and transition to a sustainable green and blue economy.

Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
Comment: There is no extreme hunger in Tobago. Food security is threatened to by dependency on imports, there is access to health nutrition.
Objective: To increase food security and improve access to high nutrition value goods through the promotion of sustainable agriculture and fisheries with the context of a green and blue economy.

Goal 3. Ensure healthy lives and promote well-being for all at all ages.
Comment: None

Objective: To provide education regarding the connection between ecosystem and human health and discourage activities that threaten cultural and natural heritage as well as the wellbeing of residents.

Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
Comment: Primary and secondary education are mandatory (up to the age of 14) free and easily accessible to all.
Objective: Improve and create research and educational opportunities and partnerships linked to the sustainable management of cultural and natural resources from primary to tertiary level.

Goal 5. Achieve gender equality and empower all women and girls.
Comment: Women and girls are equally empowered to men and boys. Young boys are a higher risk group than girls. Gender equality requires improvement for LGBT+ persons.
Objective: Provide opportunities to all persons without preference of gender or sexual orientation.

Goal 6. Ensure availability and sustainable management of water and sanitation for all.
Comment: Access and sanitation are available to every household
Objective: Protect vegetation and specifically forest cover within the BR, reduce pollution of waterways and encourage sustainable use.

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all.
Comment: Access to affordable, relatively reliable and cheap energy is provided.
Objective: Support the transition towards a green economy including usage of decentralised alternative energy sources.

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
Comment: There is a high level of employment due to governmental unemployment relief programmes. Wages are decent.
Objective: Support the development of livelihood opportunities based on the sustainable use of natural and cultural resources.

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

Comment: Infrastructure is relatively resilient; NE Tobago has a more natural resource based than and industry-based economy, which is in line with the preferred lifestyle of residents. Innovation is needed to develop a green and blue economy.
Objective: Improve resilience of communities and infrastructure by supporting resilient ecosystems and innovative approaches to sustainable development.

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable.
Comment: Human settlements in the proposed NETMABR are relatively safe and inclusive.
Objective: To improve community resilience, especially against climate change, through innovation and knowledge exchange and promote sustainable blue and green economies.

Goal 12. Ensure sustainable consumption and production patterns.
Comment: This applies specifically to over-harvesting of natural resources and the ab-, and mis-usage of synthetic pesticides and herbicides.
Objective: Support the transition towards a green and blue economy; discourage activities that threaten cultural and natural heritage as well as the wellbeing of residents.

Goal 13. Take urgent action to combat climate change and its impacts.
Comment: None
Objective: Monitor the effects of climate change, exchange knowledge through networks and improve climate change resilience of communities and natural resources.

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
Comment: None
Objective: Support the transition towards a sustainable blue economy.

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
Comment: Desertification is currently not a threat in NE Tobago.
Objective: Reduce direct and indirect threats to ecosystem health and biodiversity.

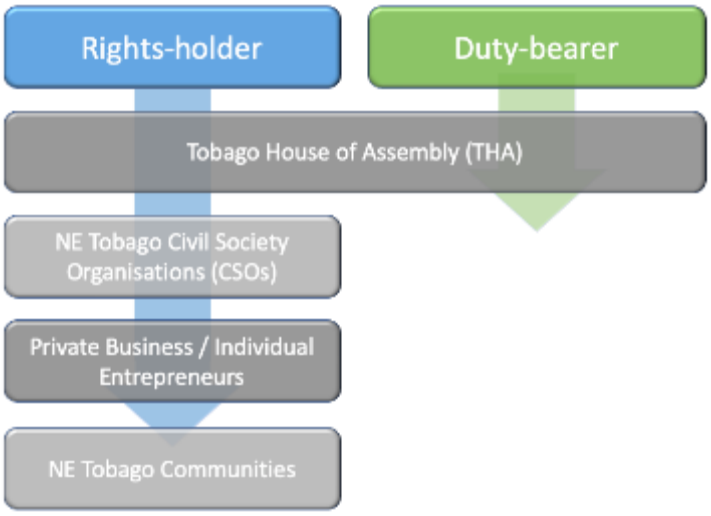
Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.
Comment: None
Objective: Actively participate in the MAB network.

13.3 INDICATE THE MAIN STAKEHOLDERS INVOLVED IN THE MANAGEMENT OF THE BIOSPHERE RESERVE

Currently, all areas of the planned NETMABR are managed by Divisions of the THA (see section 17 for details).
Over the past five years, civil society and private business stakeholders got increasingly involved, mainly on the Steering Committee of the IFPAM Project, but also in smaller, community-based activities.
It is envisaged that the overall area of future BR will still mainly be manged by the THA; however, the included protected areas, NNH Sites in their entirety and MAB specific activities, projects and programmes in the Buffer and Transition Zones will be managed by the NETPAMT.

Current and future main stakeholders involved in the management of the BR have been assessed and mapped using categories. For this purpose, "power" is the level of influence of a stakeholder in successfully concluding the nomination process, "interest" is the level at which the livelihood or fulfilment of the mandate of a stakeholder is influenced by the nomination process or its outcome.
Additionally, two different categories of actors were considered as follows:

- **Rights-holders**, are socially endowed with legal or customary rights with respect to land water and natural resources
- **Duty-bearers**, are actually conducting the business or undertaking the nomination process, including their responsibility to secure the human rights of the least powerful.



See figure 47.

Figure 47 Right-holders and duty-bearers at two different categories to be considered.

The key stakeholders / stakeholder groups, their respective interest and power for this nomination process are shown in figure 48.

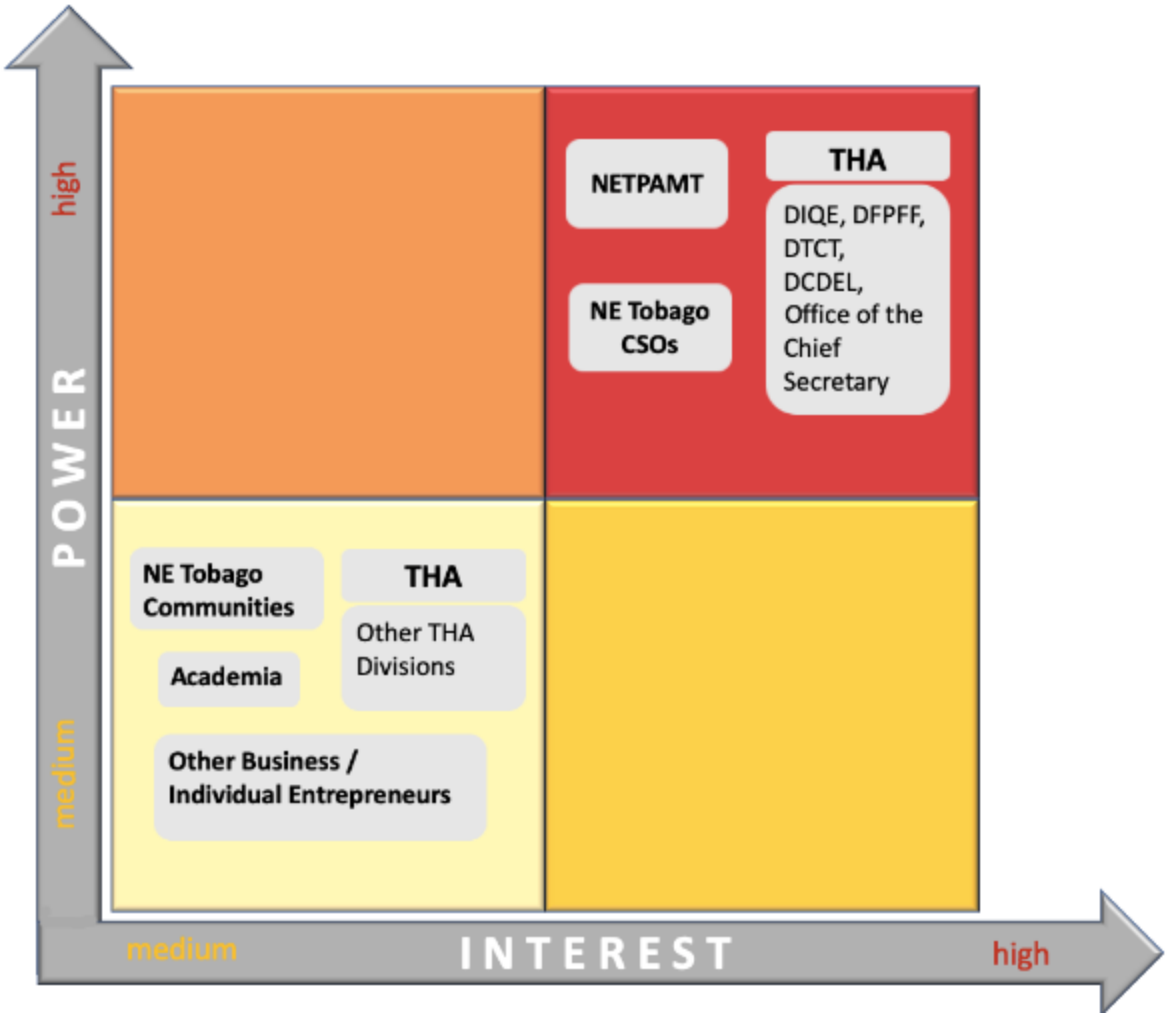


Figure 48 Power/Interest Matrix of different NETMABR stakeholders.

TOBAGO HOUSE OF ASSEMBLY

The THA is the current nomination process owner, which is demonstrated via an Executive Council note and the engagement of the Technical Writing Team.

The THA is a category of stakeholders comprising government departments and individuals in positions of authority. The THA has a great deal of influence in Tobago, both formal and informal. Formal influence is by means of policies and funding. Informal influence is by means of its dominance of the Tobago economy. Power in the THA is highly centralised around individuals in prominent positions. This means that influence is often politically-driven.

All terrestrial and marine areas under consideration for nomination are currently vested in the Tobago House of Assembly under the Tobago House of Assembly Act (1980).

However, once the establishment of the NE Tobago Protected Area Management Trust (NETPAMT) is successful, it is the THA's intention (outlined in an Executive Council Note) to transfer protected areas in NE Tobago, including the NETMABR, from the THA to the NETPAMT.

Of the ten Divisions of the THA the following will be the main project-relevant ones: the Division of Infrastructure, Quarries and the Environment (DIQE), the Division of Food Production, Forestry and Fisheries (DFPFF), the Division of Tourism, Culture and Transportation (DTCT), the Division of Community Development, Enterprise and Labour (DCDEL), the Office of the Chief Secretary, and the Division of Education, Innovation and Energy.

The DIQE, the DFPFF, the DTCT, the DCDEL, and the Office of the Chief Secretary have high interest and power in the nomination process; interest and power of other Divisions (and their representatives) varies considerably and should be deemed on average as medium.

As per the Tobago House of Assembly Act, the THA is also the most powerful rights-holder; as the entity initiating the Nomination process and ultimately responsible for the upholding of human rights, the THA is also the most important duty-bearer.

NE TOBAGO CIVIL SOCIETY ORGANISATIONS

A series of civil society organisations with conservation-relevant mandates influence NE Tobago. These include, but are not limited to: ET, the Speyside Eco-Marine Park Rangers, the ERIC, North East Sea Turtles Tobago, the Roxborough Police Youth Club, the Main Ridge Tour Guide Association, the Anse Fromager Ecological and Environmental Protection Organisation, the Delaford Eco-Tourism Association, the Castara Tourism Development Association, the NE Tobago Climate Change Champions Network, village councils, fishermen associations, sports clubs, churches, and parent / teacher associations. Based on their participation in projects to date and their responses to previous stakeholder consultations, these organisations are largely supportive of the principles of the nomination process. Civil society is also a key beneficiary of the IFPAM Project. Some organisations are represented on the Tobago Subcommittee of IFPAM, which is envisaged as the precursor of the first full NETPAMT Board. CSOs in NE Tobago (especially those with a conservation mission) and their members will be key partners for the nomination process and therefore have a high level of interest and power. Organised and un-organised fisherfolk are important customary rightsholders in marine areas; hunters also claim customary rights which is a specifically important issue regarding the future management of the MRFR.

PRIVATE BUSINESS / INDIVIDUAL ENTREPRENEURS

The project-relevant private sector in NE Tobago relates to uses of the natural environment such as tourism, agriculture, fisheries and, just outside of the target area, the oil and gas extracting industry. The micro and small business sector does not have strong representation through associations or a business chamber. However, the number of persons involved in agriculture, fisheries and tourism makes them a political factor that gains attention in election periods.

Most natural resource users are largely supportive of the guiding principles which take traditional knowledge and cultural customs into account. Furthermore, this sector is an important beneficiary of the nomination process. The future management of the UNESCO property and

heritage sites will be designed to support sustainable business and aims directly at the creation of sustainable livelihoods connected to conservation and threat reduction in the target area.
Private business (especially estates, which might act as Buffer Zones) and individual entrepreneurs in NE Tobago will be key partners for the future management of any protected site and will, ideally, work very closely with the NETPAMT. For the nomination process, their power is on a medium level, their interest is currently at a medium level (which might rapidly change during the nomination process).
Some private enterprises have legal rights to terrestrial and marine resources in NE Tobago and are as such important rights-holders.

NE TOBAGO COMMUNITIES

NE Tobago residents who are not members of the previously mentioned stakeholder groups, such as government workers, youth, housewives, the elderly, and the unemployed, form an important pool of persons who influence and are affected by the nomination process. Their knowledge, attitudes and practise directly influence the state of the surrounding environment, which at the same time influences their livelihoods and wellbeing.
Increasing outreach and conservation activities will raise the level of awareness and interest with this stakeholder group. However, the power level remains quite low for this unorganised and highly diverse group of people.
Communities in NE Tobago have (partially perceived) customary rights over natural resources in the area and are as such to be regarded as right-holders.

NETPAMT

The NETPAMT will be the THA's / DIQE's successor as nomination process ownership.
As a co-management organisation, comprising of civil society and governmental stakeholders, the NETPAMT is envisioned to be the managing organisation for all protected areas in NE Tobago. As such, the NETPAMT will have a high level of power and interest once fully established. Furthermore, it will be the successor of the THA as most important duty-bearer and rightsholder. The composition governance of the new Board is envisaged to follow participatory co-management principles, which could be reflected in the representation of governmental agencies (60%) and CSOs (40%).

ACADEMIA

National and international universities have, for decades, conducted research in NE Tobago and their interest is increasing with the availability of ERIC as a research facility. The interest of academic institutions will rise with increasing project scope while their power to influence the project will be on a medium to low level. It is expected that representatives of national academic

and research institutions will play a strong advisory role and have a seat on the future NETMABR management Board.

13.4 WHAT CONSULTATION PROCEDURE WAS USED FOR DESIGNING THE BIOSPHERE RESERVE?

Over a period of nine months meetings, related the design of the NETMABR, were held with governmental and non-governmental organisations and representatives. These meetings were facilitated by the technical writing team for this nomination form.
Initially, the idea and concept of a BR for NE Tobago was discussed with staff and heads of the following THA Divisions and Departments:

- Division of Infrastructure, Quarries and the Environment, specifically
  - Department of the Environment (MAB Focal Point)
- Division of Food Production, Forestry and Fisheries, specifically
  - Department of Natural Resources and Forestry
  - Department of Fisheries
  - Department of Agriculture
- Division of Tourism, Culture and Transportation, specifically
  - Department of Culture
- Office of the Chief Secretary
  - Department of Land Management

  and representatives of the
- Tourism Development Company of Trinidad and Tobago (now dissolved, discussions started in 2016);
- Trinidad and Tobago National Commission for UNESCO (discussions started in 2016);
- Tobago Tourism Agency Limited;
- NTTT.

Recommendations and ideas from these initial meetings were used to prepare the first concept for the NETMABR which was then presented to and discussed with the following civil society organisations:

Again, recommendations were incorporated into the concept and discussed again with the lead THA Departments.
A final version was presented and discussed during a public meeting involving governmental and non-governmental stakeholders at a central location within the NETMABR area on 12 September 2019. Based on this meeting final changes were made to the application form.

It is important to note, that all stakeholders agreed that the consultation process is ongoing and a continued interaction between government and non-governmental organisations is vital for the in-depth design and implementation of the MAB programme in NE Tobago, this is specifically the case for the design of the BR Management Plan.

13.5 HOW WILL STAKEHOLDER INVOLVEMENT IN IMPLEMENTING AND MANAGING THE BIOSPHERE RESERVE BE FOSTERED?

There are two potential stakeholder involvement scenarios for the implementing and managing of the NETMABR:

1. The current situation: the area will be managed by THA Divisions and Departments. Once the NETMABR is established a stakeholder advisory board (possibly the NETPAMT) which will consist of governmental and non-governmental stakeholders will provide guidance the THA authorities. This scenario would be in place as long as the NETPAMT is not fully empowered and has not received the mandate from the THA to manage the protected areas, NNH Sites and BR related activities.
2. Once the NETPAMT is fully empowered, its governance structure and operational procedures established and financing secured, a governing board will be established that consists of local governmental and non-governmental key, expert stakeholders (envisaged is a 60/40 ratio). Additionally, an Advisory Committee should be formed, which would consist of a wider range of stakeholders; representation on this Committee might also fluctuate according to topics to be discussed.
   This scenario will allow for all sectors of the society to participate in the decision-making process regarding the management of the BR.

13.6 WHAT ARE THE EXPECTED MAIN SOURCES OF RESOURCES (FINANCIAL, MATERIAL AND HUMAN) TO IMPLEMENT THE OBJECTIVES OF THE BIOSPHERE RESERVE AND PROJECTS WITHIN IT?

"Please provide formal commitments and engagements."

Material and human resources will be sourced according to procurement and human resource policies and in a concentric manner around the proposed BR once quality and price are similar; which means that resources from within the NETMABR will be preferred over those from Tobago,

which will be preferred over those from Trinidad, which will be preferred over those sources internationally.

Human and material resources will be sourced via financial resources. Donations of material or volunteer time of management experts are not foreseen to play a major role.

A budget and financial plan for the NETMABR has not been developed as yet and will be part of the overall management plan.

However, in 2019, a report was prepared under the IFPAM Project titled: "Sustainable Financing for a System of Protected Areas in Trinidad and Tobago", which includes highly relevant recommendations and will be used as a baseline to develop the budget and financing plan for the NETMABR.

Sources of financing (all of which have already been applied) will include but are not limited to:

- annual budget allocations to the relevant THA Divisions and Departments,
- annual budget allocations to the NETPAMT (once fully operational),
- private sector (e.g. hydrocarbon extracting industry),
- multilateral donors (e.g. UNEP, UNDP, IDB, OAS)
- diplomatic missions (e.g. Embassies),
- international natural and cultural conservation organisations (e.g. CI, IUCN),
- private donors, and
- user and access fees

As part of Trinidad and Tobago, NE Tobago has a regionally unique combination of access to funding.

- Notably, in 2000, the Government of Trinidad and Tobago established the Green Fund, a National Environmental Fund. It is capitalised by a 0.3% Green Fund Levy on gross sales or receipts on every dollar spent in Trinidad & Tobago (ad infinitum). Funds are kept separate from other taxes but represented in national accounts. The Green Fund is used for conservation of the environment, remediation and restoration activities, (e.g. reforestation as well as for environmental education and public awareness of environmental issues). It is administered by the Ministry of Planning; statutory bodies, NGOs and CBOs can apply for funding and NETPAMT would be eligible. The funds' financial resources are significant and could finance the transition phase for PA management in NE Tobago; ad infinitum funding is not possible.
- Global hydrocarbon mining / energy companies are operating in Trinidad and Tobago, some of which have sustained interest in the exploitation of NE Tobago offshore hydrocarbon (mainly gas) resources. Historically, these companies are an important funding partner for the entire civil society sector in Trinidad and Tobago and have already demonstrated their interest to support conservation and sustainable livelihoods in NE Tobago.

- Contrary to many other global places of high natural and cultural heritage value, NE Tobago's natural, social, cultural, and security environment provides significant opportunities for well-designed responsible tourism entrepreneurship, adding to income stream generation, supporting conservation activities and livelihoods.

Due to the very similar question, the above information is repeated in Section 17.4.11.

14. CONSERVATION FUNCTION

14.1. AT THE LEVEL OF LANDSCAPES AND ECOSYSTEMS (INCLUDING SOILS, WATER AND CLIMATE)

14.1.1 DESCRIBE AND GIVE THE LOCATION OF ECOSYSTEMS AND/OR LAND COVER TYPES OF THE BIOSPHERE RESERVE

LOCATION AND DESCRIPTION

The biosphere reserve is located on Tobago, the smaller of the twin-island Caribbean Republic of Trinidad and Tobago, forming the southernmost end of the Lesser Antilles. Although the island is small, the north-eastern end (and proposed BR) is relatively isolated, approximately half the size of the entire island and home to a little less than quarter of the island's population.

The MEA defines an ecosystem as one that has "strong interactions among its component and weak interactions across its boundaries". In NE Tobago, the ecosystems within the landscape are tightly interlinked but buffered from other social and ecological systems. The Caribbean Sea and the Atlantic Ocean buffer the marine boundary, whilst the terrestrial environment is buffered by the island's topography and the MRFR, both of which has restricted extensive community development to the south-western end of Tobago. What is therefore captured by the proposed BR, is a land- and sea- scape that encompasses in a small area, a wide range of ecosystem processes, services, and biodiversity, including two of the world's most biodiverse ecosystems: tropical rainforest and coral reefs.

ECOSYSTEM DESCRIPTIONS

Tropical Forest Ecosystem

The mainland terrestrial area of the proposed BR is predominantly a tropical forest ecosystem, covering approximately 150km^2. The topography ranges from sea level to a maximum elevation of 573 m. The main forest types within the proposed BR are lower montane forest with very small pockets of elfin woodland and evergreen formation forests, lowland rain forest and dry broadleaf forest. Interspersed between the communities in the lower elevations are a variety of other forest types such as young secondary forest and forested wetlands.

NE Tobago's forests constitute a mix of northern South American and Antillean species, creating a unique diversity in contrast to the other islands of the Antilles. It is a critical avian habitat, with the MRFR designated as an IBA. The dry tropical forest is a rare ecosystem in Trinidad and Tobago and is poorly protected. While this forest type is often favoured for clearing for human habitation, its topography, exposure, and inaccessibility in NE Tobago leaves it relatively undisturbed, making the forests regionally valuable for conservation.

Fresh and Brackish Water Ecosystem

Riverine and riparian ecosystems are the freshwater ecosystems creating critical links within the landscape, whilst estuarine and mangrove ecosystems form the interface between freshwater and marine ecosystems. They provide corridors for animal and nutrient movement from the ridges to the ocean. Although there are four largely permanent rivers in the area, most watercourses are seasonal between the dry and rainy seasons. The proposed BR contains estuaries at every river mouth, which includes at King's Bay and Bloody Bay, as well as a wetland at Speyside. Two, small patches of mangrove are located in King's Bay and Louis D'or, making this a very critical habitat.

Coastal Marine Ecosystem

The coastal marine ecosystem includes all marine ecosystems from beaches and cliffs, through the littoral zone, to a 50m depth contour and covers roughly 400 ha of the proposed area. The beaches of NE Tobago are predominantly narrow bands of sand at the base of steep valleys. Many are isolated from easy landward access. The cumulative length of all beaches is approximately 10km across 35 beaches. Although a limited area, these beaches host an active rookery of critically endangered hawksbill sea turtles. The coastal marine environment harbours relatively healthy and robust Caribbean coral reef complexes.

Offshore Islands Ecosystem

The offshore islets of the area include Little Tobago, the St. Giles complex, Goat Island, Sister's Rocks, Brother's Rocks and Booby Island. These small islets, although terrestrial, are dominated by the marine environment. Vegetation on the largest three (Little Tobago, the St. Giles Complex, and Goat Island) is young secondary bush and remains a relatively undisturbed example of dry tropical forest reflecting both Antillean and north South American influences and are protected as sanctuaries. The islets are also critical for avian reproduction, reflected in the status of St. Giles Islands and Little Tobago Island as IBAs for supporting principally seabirds.

Marine Pelagic Ecosystem

The marine pelagic ecosystem starts beyond a depth contour of 50m, extending to the edge of the planned NETMPA. This is largely a marine pelagic ecosystem encompassing waters of both the Caribbean Sea and the Atlantic Ocean, and the interaction of the Guiana Current and the Caribbean System. This ecosystem and the coastal 'Reef' ecosystems are seasonally enriched by a nutrient pulse from the Orinoco River. Both conservation targets are also habitat for five of the world's seven species of sea turtles, including breeding habitat for leatherbacks and hawksbills. A diversity of marine mammals, sharks, rays, and commercially valuable fish species frequent the waters.

14.1.2 DESCRIBE THE STATE AND TRENDS OF THE ECOSYSTEMS AND/OR LAND COVER TYPES DESCRIBED ABOVE AND THE NATURAL AND HUMAN DRIVERS OF THE TRENDS

In the MEA, islands are treated as distinct systems. They are characterised by social and ecological isolation as well as a strong interaction between marine and terrestrial environments. Although each ecosystem described so far has value in terms of ecosystem processes and services, it is their proximity and interaction that makes the entire landscape a valuable conservation target. For example, coral reefs require clear water and a low nutrient environment. Healthy forests, estuaries and mangroves reduce soil run-off, and therefore minimise the nutrient, pollution, sedimentation, and siltation that coastal coral reefs are exposed to. Similarly, healthy offshore island and coral reef ecosystems reduce the impact of storm events on coastal beaches and communities. Yet it is this complex interaction among social and ecological components that also increases the overall system's vulnerability to climate change, threatening the long-term value of each component as well as the landscape as a whole. For example, continued deforestation in upland watersheds, coupled with climate change-driven increases in precipitation intensity, will likely lead to increased soil erosion, increased peak run-off, and resulting increases in sedimentation of the coral reefs.

Most recently, the IFPAM Project document states that the terrestrial ecosystems of NE Tobago are considered regionally threatened and host biodiversity of global significance. Specifically listed are threats to the existing terrestrial and proposed MPAs in NE Tobago: hunting / overfishing, potential of un-managed levels of tourism, wildfire, alien invasive species, climate change, unregulated coastal development, and pollution.

The MRFR is the most intact forest region in Tobago, with much of it considered to be virgin forest, however, the passage of Hurricane Flora in 1963 damaged sections of the reserve. Since then, there has been substantial recovery of its vegetation. The MRFR's condition is largely due to its protection by legislation, which has staved off encroachment and substantial logging. However, its boundaries and other forested regions are threatened by uncontrolled fires, which are set deliberately set for small-scale agriculture or hunting during the dry season. This practice likely leads to increasing areas of young secondary forest, including areas of introduced bamboo and ecosystem fragmentation, making it a conservation concern.

Road development, uncontrolled construction activities, and partition of larger estates also increasingly contribute to the fragmentation of ecosystems and associated ecological processes. Abandoned agricultural estates are taken over by young secondary forests which includes valuable timber species, which are targeted by illegal logging. Such logging activities are not commercial but instead are mostly small scale and could be considered praedial larceny.

Construction activities associated with private (e.g. house renovations) and public (e.g. road works) infrastructure projects are a major concern. The majority do not adhere to good

environmental practises such as waste management or mitigation of erosion of construction material and disturbed soil. This also destroys or diverges main and ephemeral river channels. Most of NE Tobago's wetlands have been destroyed and developed into commercial and residential areas, leaving small, isolated patches. The remaining coastal wetlands are threatened by encroachment from land development and high nutrient and pollution intake from agriculture and household discharges.

The coral reef complexes in the coastal marine environment are relatively healthy and robust. These have been declining in recent years in response to a combination of threats including land- and marine-based pollution, increased incidence of coral disease, invasive alien species, and a severe 2010 bleaching event. In the last four years, large drifting mats of *Sargassum* has emerged as a new threat to NE Tobago's coral reefs, with its potential to block sunlight and smother coral substrate and its associated benthic communities.

Figure 49 Sargassum (Jacob Bock)

14.1.3 WHAT KIND OF PROTECTION REGIMES (INCLUDING CUSTOMARY AND TRADITIONAL) EXIST FOR THE CORE AREA(S) AND THE BUFFER ZONE(S)?

There are no generally respected ad used customary or traditional protection regimes in the Core Area and Buffer Zone. However, it needs to be mentioned that many persons respect cultural

and natural heritage due to traditional and sometimes spiritual relationship with places and nature.

The formal, legal protection regimes are based on the laws of Trinidad and Tobago.

Table 18 BR relevant key legislation and policies

Protection Regimes	BR Core Zones	BR Buffer Zones
Agricultural Fires Act (Chap 63:02)		X
Biodiversity Strategy and Action Plan for Trinidad and Tobago (2001)	X	X
Certificate of Environmental Clearance (2001)	X	X
Comprehensive Economic Development Plan for Tobago: Clean, Green, Safe and Serene	X	X
Conservation of Wildlife Act Chap. 67:01, Act 16 of 1958 amended by 31 of 1980	X	X
Continental Shelf Act (Chap. 1:52)	X	X
Disaster Measures Act (Chap 16:50)	X	X
Draft National Wildlife Policy	X	X
Draft Waste Management Rules, 2008	X	X
Fisheries Act (Chap. 67:51)	X	X
Forest (Prohibited Areas) Order	X	
Forests Act (Chap 66:01)	X	x
Land Acquisition Act (Chap 58:01)		X
Marine Preservation and Enhancement Act (Chap. 37:02);	X	X
Minerals ACT (2000)	X	X
National Action Programme to Combat Land Degradation in Trinidad and Tobago 2006-2020 (2006)	X	X
National Climate Change Policy, 2011	X	X
National Environmental Policy, 2006	X	X
National Forest Policy (2011)	X	X
National Integrated Water Resources Management Policy, 2005	X	X
National Oil Spill Contingency Plan	X	X
National Policy and Programmes on Wetland Conservation for Trinidad and Tobago, 2002		X
National Protected Areas Policy (2011)	X	X
National Tourism Policy (2010)	X	X

Protection Regimes	BR Core Zones	BR Buffer Zones
North East Tobago Management Plan	X	X
Petroleum Act (Chap 62:01)	X	X
Plant Protection Act (Chap 63:56)	X	X
Sawmills Act (Chap. 66:02)	X	X
Standards Act (1997)	X	X
State Land (Regularisation and Tenure) (Chap 57:05)		X
State Lands Act Chap. (57:01)	X	X
Territorial Sea Act (Chap. 1:51)	X	X
The Environmental Commission Rules and Practice and Procedure, 2011	X	X
The Environmental Management Act (Chap. 35:05)	X	X
Three Chains (Tobago) Act (Chap 57:04)	X	X
Tobago House of Assembly Act (Chap 25:03)	X	X
Town and Country Planning Act (Chap 35:01)	X	X
Trinidad and Tobago National Programme of Action for the Protection of the Coastal and Marine Environment from Land-based Sources and Activities 2008-2013	X	X
Trinidad and Tobago Tourism Master Plan (1995)	X	X
Water and Sewerage Act (Chap 54:02)	X	X
Water Pollution Rules, 2006	X	X

Unfortunately, the enforcement for the above legal protection requires improvement due to a multitude of reasons including corruption, nepotism, and lucre.

The training of police officers is more geared towards serious crime, and enforcing environmental legislation is not seen as a priority. Understanding this issue, police officers within the planned NETMABR site were trained by the IFPAM Project regarding environmental laws e.g. hunting, Environmentally Sensitive Species (ESS) and Environmentally Sensitive Areas (ESA).

14.1.4 WHICH INDICATORS OR DATA ARE USED TO ASSESS THE EFFICIENCY OF THE ACTIONS/STRATEGY USED?

Presently, there are no known indicators for assessing the efficacy of enforcing prescribed policies, regulations, and legislations. This is a critical consideration for future reviews and amendments.

14.2 AT THE LEVEL OF SPECIES AND ECOSYSTEM DIVERSITY

14.2.1 IDENTIFY MAIN GROUPS OF SPECIES OR SPECIES OF PARTICULAR INTEREST FOR THE CONSERVATION OBJECTIVES, ESPECIALLY THOSE THAT ARE ENDEMIC TO THIS BIOSPHERE RESERVE, AND PROVIDE A BRIEF DESCRIPTION OF THE COMMUNITIES IN WHICH THEY OCCUR

The proposed BR crosses 18 natural habitat types, including two of the world's most biodiverse: coral reefs and tropical rainforests and thus captures significant biodiversity for a small island. As a result, few other protected areas can invoke such biodiversity from ridge to ocean.

AT-RISK & ENDEMIC SPECIES

The site harbours 83 IUCN red list species, 41 endemic species, 13 EDGE criteria species and several iconic species. A summary is provided in the table below.

Table 19 Most outstanding at-risk, endemic and EDGE fauna.

IUCN Conservation Status	Taxon	Species	EDGE*/ Endemic	Habitat Type
Critically Endangered	Reptile	Hawksbill Sea Turtle (*Eretmochelys imbricata*)		Marine pelagic, Coral reef
	Coral	Staghorn Coral (*Acropora cervicornis*)		Coral reef
	Coral	Elkhorn Coral (*Acropora palmata*)		Coral reef
	Plant	*Maxillaria broadwayi*	Endemic	Lower montane forest
Endangered	Reptile	Leatherback Sea Turtle (*Dermochelys coriacea)*		Marine pelagic
	Reptile	Green Sea Turtle (*Chelonia mydas*)		Coral reef
	Fish	Scalloped Hammerhead Shark (*Sphyrna lewinii*)		Marine pelagic
	Fish	Great Hammerhead Shark (*Sphyrna mokarran*)		Marine pelagic

IUCN Conservation Status	Taxon	Species	EDGE*/ Endemic	Habitat Type
	Coral	Mountainous Star Coral (*Orbicella faveolata*)	EDGE	Coral reef
	Plant	*Macrolobium trinitense*	Endemic	Lower montane forest
	Fish	*Anguilla rostrata* (American eel)		Riverine
Vulnerable	Fish	Canteen Snapper (*Lutjanus cyanopterus*)		Marine pelagic, Coral reef
	Fish	Mutton Snapper (*Lutjanus analis*)		Marine pelagic, Coral reef
	Fish	Giant Manta Ray (*Mobula birostris*)		Marine pelagic, Coral reef
	Amphibian	Bloody Bay Poison Frog (*Mannophryne olmonae*)	Endemic	Riparian
	Amphibian	Tobago Glass Frog (*Hyalinobatrachium orientale tobagoense*)	Endemic	Riparian
	Amphibian	Turpin's Litter Frog (*Pristimantis turpinorum*)	Endemic	Lowland rain forest
	Coral	Pillar Coral (*Dendrogyra cylindrus*)	EDGE	Coral reef
	Plant	*Pilea tobagensis*	Endemic	Lower montane forest, Dry broadleaf forest
Near Threatened	Fish	Rainbow Parrotfish (*Scarus guacamala*)		Coral reef
	Fish	Black tip Shark (*Carcharhinus limbatus*)		Coral reef
	Fish	Caribbean Reef Shark (*Carcharhinus perezii*)		Coral reef
	Fish	Bull Shark (*Carcharhinus leucas*)		Marine pelagic
	Fish	Lemon Shark (*Negaprion brevirostris*)		Coral reef

IUCN Conservation Status	Taxon	Species	EDGE*/ Endemic	Habitat Type
	Bird	White-tailed Sabrewing Humming Bird (*Campylopterus ensipennis*)		Lower montane forest
Data Deficient/ Not Evaluated	Mammal	Sir David Attenborough's Myotis (*Myotis attenboroughi*)	Endemic	Lowland rain forest
	Reptile	Tobago Stream Snake (*Erythrolamprus pseudoreginae*)	Endemic	Lower montane forest
	Fish	Tobago Brotula (*Ogilbicthyes tobagoensis*)	Endemic	Coral reef
	Fish	Darksaddle Blenny (*Starksia sella*)	Endemic	Coral reef
	Insect	Stonefly (*Anacroneuria isleta)*	Endemic	Riverine

*EDGE – Evolutionarily Distinct Globally Endangered

Biodiversity experts expect that further research will likely yield more endemic species, especially of plants, reptiles, and amphibians.

Migratory Species

Trinidad and Tobago became a signatory to the CMS on 1 December 2018. It is considered a Range State for many migratory species including sharks. NE Tobago hosts 18 species, marine and avian, that are listed in the Convention. These notably include broad-winged hawks (*Buteo platypterus*), great black hawks (*Buteogallus urubitinga*), roseate terns (*Sterna dougallii*) and hawksbill (*Eretmochelys imbricata*) and leatherback sea turtles (*Dermochelys coriacea*), all which nest in the area. Giant manta rays (*Manta birostris*) are also an iconic migrant species that frequent NE Tobago waters.

Iconic Species

Many species are globally valuable for the recognition they receive in either public or scholarly spheres.

The Speyside Brain Coral (Colpophyllia natans)

One of the most notable natural icons is the Speyside Brain Coral colony. This colony is the largest reported in the Western hemisphere and one of the larger brain coral colonies in the world, measuring 3m high by 5.3m wide. The colony is estimated at 2000 years old. The Speyside Brain Coral is a living monument to both the enduring power of living systems, such as coral reefs, and

their fragility in modern times. Despite its extreme robustness and age, the colony suffered from both bleaching and subsequent disease during the 2010 Coral Reef Bleaching Event in Tobago, a reminder that in face of global climate change, even the most enduring natural icons are at risk.

The Hawksbill Sea Turtle (*Eretmochelys imbricata*)

The Hawksbill sea turtle is an iconic, endangered species that is a living embodiment of the interdependence of terrestrial and marine environments that the small island system represents. Like coral reefs, sea turtles represent an ancient evolutionary strategy that is at imminent risk from both global and local threats. Hawksbill sea turtles depend on a healthy ocean, safe coastal waters, and viable beaches for their lifecycle. Although Trinidad and Tobago are recognised internationally for Leatherback sea turtle nesting, recent evidence suggests that NE Tobago's small, isolated beaches host a regionally significant rookery for this globally critically endangered species. While Leatherback sea turtles are Red Listed as vulnerable, Hawksbill sea turtles are critically endangered. Limited monitoring, combined with a local tradition of consumption, local abundance and the publicity given nationally to Leatherbacks have led to the iconic value of NE Tobago's Hawksbill's being dramatically undervalued. There is significant scope to expand the profile of this iconic species in the conservation area.

Figure 50 Hawksbill sea turtle (ERIC)

Iconic Birds and Marine Life

The area attracts international dive tourism for manta rays, and formerly for shark species, which may recover if fishing pressure is reduced. NE Tobago also includes three of Trinidad and

Tobago's seven IBAs, which attract international tourists. Notable is the hummingbird diversity, the largest magnificent frigate bird (*Fregata magnificens*) colony in the Caribbean on St. Giles

Figure 51: Hummingbird (Newton George)

Island and the extraordinary variety of seabirds on Little Tobago documented by Sir David Attenborough.

14.2.2 WHAT ARE THE PRESSURES ON KEY SPECIES?

"In other words: what are the threats (example unsustainable management of forest), their immediate causes (drivers of change like forest change or habitat change), their underlying causes (example overgrazing, fire, pollution), and the main driving forces (example: economic, political, social, external, etc.) and the area(s) concerned?"

Infrastructure Development

Construction of private and public infrastructure driven by population growth and economics, are a major concern to at-risk species. Poor adherence to good environmental practises and mitigation of erosion of construction material and disturbed soil, cause considerable damage to habitats. Heavy sediment loading blocks river mouths, preventing movement of the American eel (*Anguilla rostrata)* between the river and the sea. More impactful is sedimentation on reefs,

affecting critical coral species and their associated communities. Infrastructure development is an active sector of the economy governed by inadequate legislation and limited enforcement.

Over-Exploitation

Unsustainable resource use including hunting, logging, and overfishing, threatens NE Tobago ecosystems. Despite a two (2) year national hunting ban from 2014 to 2015, hunting remains a threat and is a socially accepted activity. Sea turtle slaughter and egg poaching are still practised, despite 2012 legislation rendering the practice illegal. However, long term efforts by local conservation groups are beginning to show positive effects and sea turtle consumption is becoming increasingly unpopular. Illegal logging happens mostly on abolished estates. The damage caused by heavy equipment access just to extract several trees is extensive. Such logging activities are not commercial but instead are mostly small scale and could be considered praedial larceny. This threat extends regionally to other Caribbean islands. While good fishing practices and monitoring are not strictly adhered to, overfishing in nearshore is primarily restricted to baitfish. Over-exploitation of NE Tobago's fish stocks are attributed to illegal, unreported, and unregulated fishing from foreign fishing boats, and unregulated fishing from foreign long liners, targeting sharks.

Pollution

Pollution by solid waste, liquid waste and agricultural run-off is a significant issue in NE Tobago. Liquid waste, including grey and black water, and solid waste enters the rivers and ocean via communal drainage. Septic tanks are often not maintained or pumped leading to high levels of faecal coliform in waters adjacent to urban areas. These impact water quality in reefs and exposes hard corals, gorgonians and fish to disease-inducing bacteria. Enriching the water to support algal growth applies additional pressure on at-risk hard corals, competing for space. Plastic packaging material is the main solid waste found alongside roads and in waterways associated with limited solid waste pickup schedules, littering, and unrestricted illegal dumping at roadside sites. This has become a major issue for NE Tobago's marine wildlife such as sea turtles and seabirds, who consume plastics mistakenly.

Climate Change

The effects of climate change, manifest through changing and unpredictable weather patterns, are a significant threat to NE Tobago's species of interest in every habitat. Related consequences include wildfires, landslides, coastal erosion and disrupted animal and plant life cycles. The dissolution of distinct wet and dry seasons over the past half century poses a major challenge for organisms to adapt their life, and especially reproductive, cycles. A good example is when increased rainfall in traditionally 'dry' seasons destroys the flowers of flowering plants that flower

during dry conditions. This in turn affects nectar-seeking pollinators and consequently fruit seeking animals some months later.

Long dry seasons increase the vulnerability of the various forest ecosystems to wildfires which are sometimes accidental, sometimes set on purpose for soil fertilisation or land clearing. Wildfires can in turn lead to colonisation of the area by invasive bamboo and other secondary bush. Subsequent landslides in the rainy season are often a result of wildfires which destroy the plant cover that was previously stabilising the soil.

Increasing sea surface temperatures especially during the months of August to October increases the likelihood of bleaching events with the reefs, which if prolonged, can result in significant coral mortality and have downstream effects on several natural processes. With coral reef loss, supported fauna is also lost, including endemic fish species.

Local Disempowerment

Residents and stakeholders are only rarely inspired to undertake conservation-relevant practices. This is partly because intelligible, adequate, and continuous environmental education is still in its infancy. While knowledge often exists, it is not successfully translated into a positive attitude and practise. This in turn is partially due to perceived and actual lack of ownership and empowerment on the part of residents in NE Tobago. Similarly, residents facing environmental challenges, such as developers violating laws by dumping waste illegally, are often not informed enough to take appropriate actions against those perpetrating the violations. Additionally, the lack of coherent and consistent conservation co-management often undermines good efforts in some areas by neglect in others. For example, efforts of CSOs to protect nesting sea turtles are undermined by a lack of law-enforcement regarding the use of turtle nets and turtle meat consumption.

Ecosystem Fragmentation

Road development, uncontrolled construction activities, partition of larger estates, and land clearing for small-scale agriculture driven by population growth, the economy and the need for increased and improved development and services, increasingly contribute to the fragmentation of forest, riverine and riparian ecosystems and their associated ecological processes.

Invasive Species

Alien invasive species currently pose a significant threat to NE Tobago ecosystems. As global ecosystem connectivity increases, this issue is likely to be an increasing challenge in the future. *Lionfish* are the most obvious invasive species in NE Tobago and are posing a significant threat to resident fish species including the endemic species, due to their high fertility rate and enormous appetite. Local predators have not yet adapted to take advantage of this easily hunt-able fish. A less noticeable alien invasive species is the amphibian chytrid fungus, which poses a significant risk to the endemic amphibians of NE Tobago. A third category of invasive alien species that have

a significant impact on local ecosystems are feral pets and unrestrained livestock such as feral cats, roaming dogs, and unrestrained yard fowl, which compete with native for resources, kill opportunistically or disrupt natural behaviours, such as sea turtle nesting.

14.2.3 WHAT KIND OF MEASURES AND INDICATORS ARE CURRENTLY USED, OR PLANNED TO BE USED TO ASSESS BOTH SPECIES GROUPS AND THE PRESSURES ON THEM? WHO UNDERTAKES THIS WORK, OR WILL DO SO IN THE FUTURE?

Monitoring surveys are conducted by state agencies including the EMA, IMA, and various departments under the THA including the DoE, DNRF, and DMRF. They are responsible for monitoring the ecosystem health under their mandate. Indicators and measures will include indicator species abundance, fisheries catch landings, and environmental quality testing. ENGOs such as ERIC also conduct surveys of various species groups as part of their monitoring programmes.

With the intention to establish a national protected areas system, a baseline assessment of potential indicator species under the IFPAM Project was conducted for the proposed BR core areas and the proposed NETMPA. Based on these findings and consultations with stakeholders, development of monitoring protocols to support draft management plans for the MRFR and the NETMPA are ongoing. These monitoring protocols are intended to be administered by both designated government agencies, trained community members and CSOs.

14.2.4 WHAT ACTIONS ARE CURRENTLY UNDERTAKEN TO REDUCE THESE PRESSURES?

There are several pieces of legislation (see 14.1.3) which contain regulations and associates schedule listings that protect at-risk species from the various pressures directly impacting individuals or their environment. Breach of these regulations is punishable either through fines or imprisonment. However, severely neglected, or under-represented in these protection regimes are marine species, except for the sea turtles which are currently considered ESS. Ongoing amendment of the country's Fisheries Act will attempt to rectify this.

ENGOs and THA Departments (e.g. Fisheries, Forestry, Environment, Education) are implementing ongoing environmental awareness and education programmes over the past decades. Most notable, under the recent IFPAM Project a Knowledge, Attitude and Practise assessment was conducted in NE Tobago outreach activities developed and implemented such as radio and TV talks, community walk abouts, banners, leaflets, meetings and training with resource user groups, sensitisation of political figure heads and training of law enforcement

officers. The potential designation of NE Tobago as a BR and start of implementation of management activities in June 2020 would be a brilliant move for succession to the IFPAM Project which ends in May 2020 to continue the outreach programmes amongst many other benefits.

14.2.5 WHAT ACTIONS DO YOU INTEND TO TAKE TO REDUCE THESE PRESSURES?

Over the past years, avenues for threat reduction were discussed within and outside the IFPAM Project amongst stakeholders. These include, but are not limited to:

- using the results of the 2017 and 2019 environmental Knowledge, Attitude and Practice assessments to design and implement a medium term communication plan informing residents and visitors about the vital linkages between eco- and human-system health, ecosystem services, national, regional and global importance of natural and cultural heritage, as well as the legal and regulatory framework; this will include messaging about the BR as a brand and indication of place value;
- consolidate the CSO and governmental educational efforts regarding cultural and natural heritage for children and adults;
- engaging community members, especially resource users, in monitoring of environmental health and as well as participating in shared positive experiences regarding our cultural and natural heritage;
- using (BR) networks to exchange experiences with similar sites on best practices to reduce pressures;
- supporting transitions from conventional to sustainable livelihoods through green and blue economic approaches;
- facilitating the enactment of the NPASP and designation of NNH Sites in NE Tobago to improve legal protected status;
- facilitating the approval and implementation of additional NE Tobago specific conservation regulations by the THA;
- improving the enforcement of existing and future legislation and regulations, including the ongoing training of law enforcement officers.

14.3. AT THE LEVEL OF GENETIC DIVERSITY

14.3.1 INDICATE SPECIES OR VARIETIES THAT ARE OF IMPORTANCE (E.G. FOR CONSERVATION, MEDICINE, FOOD PRODUCTION, AGROBIODIVERSITY, CULTURAL PRACTICES ETC)

While NE Tobago is quite biodiverse as demonstrated in earlier sections, partly due to the variety and interconnectedness of terrestrial, aquatic, and marine ecosystems, some species stand out as being genetically important. However, apart from the identification of its endemic species, genetic taxonomy is a still relatively young field in biological classification for Trinidad and Tobago.

The genetics of American eel (*Anguilla rostrata*) is still uncertain due to its migration to the Sargasso Sea for breeding, where it encounters its relative, European eel (*Anguilla anguilla*) which is heavily exploited in the North American and European fisheries sector. Tobago's eel subpopulation spends its development years in the rivers and estuaries of NE Tobago and is therefore an important contributor to the global genetic pool.

Some species live in very isolated populations, that can be easily extirpated with a single catastrophic event. Small populations of the hermit crabs thinstripe hermit crab (*Clibanarius vittatus*) and blue-legged hermit crab (*Clibanarius tricolor*) are only found in the intertidal rocky shores of NE Tobago. They are important detritivores, scavenging on dead plant and animal matter.

Pillar coral (*Dendrogyra cylindrus*) is evolutionarily distinct as it is the only species within its genus. They are an iconic reef species with colonies forming impressive columns reaching as high as 2m and are one of the few coral species whose polyps feed during the day. Their population in NE Tobago is quite low with perhaps no more than 10 colonies distributed throughout the reefs. As important reef builders within their communities, they are an important conservation species.

The St. Giles Islets Complex is reputed to host one of the largest breeding populations in the Caribbean Region of magnificent frigatebird (*Fregata magnificens*) the largest species of frigatebird. While stray individuals may roost on other offshore islets around NE Tobago, St. Giles is its main breeding ground.

Some beaches of NE Tobago, particularly Hermitage Beach, act as an important rookery for hawksbill turtles (*Eretmochelys imbricata*) while using the nearshore coral reef environment for breeding and foraging. As a critically endangered species, local protection of the NE Tobago's sub-population is important since recovery of hawksbill turtles rely on their migration and connectivity with other regional subpopulations.

The dry broadleaf forests of NE Tobago represent a very small, vulnerable forest ecosystem. The forest in Little Tobago, with its isolation from the mainland and protection status, is an important repository of dry forest plant diversity, as its assemblage is representative of the southern Antilles and northern South America. This makes the ecosystem an important reference for plant species composition for dry forest restoration on the main island or elsewhere in with similar assemblages. The islet community can also be a potential source of propagules for restoration.


Figure 52 *Left:* Cocrico; *Right:* White -tailed sabrewing (Newton George)

14.3.2 WHAT ECOLOGICAL, ECONOMIC OR SOCIAL PRESSURES OR CHANGES MAY THREATEN THESE SPECIES OR VARIETIES?

Impacts to the species are not always exclusively ecological, economic or social in nature, as one pressure can create or exacerbate the pressure of another.

Reproduction and recruitment of American eel (*Anguilla rostrata)* is closely tied to the river's connection to the sea as a blocked river mouth prevents migration of sexually mature eels out to sea and juveniles into the river. Blockages are seasonal, occurring during the dry season. Decreasing rainfall levels and longer dry spells confines adults to the rivers and riparian edges, while elvers remain vulnerable at the estuary's entrance. Blocked mouths are exacerbated by increased sediment loading resulting from land slippages.

Frigate bird chicks and hawksbill turtles and their eggs are both poached by locals specifically for harvest celebrations. While the market value of seabird is unknown, there is usually a high price attached to turtle meat. The fines for harming any sea turtle are high (up to 15,000 USD) and eggs, meat from frigate birds or turtles is not available on markets but consumed as a "secret, special treat" by few persons. The frigate-bird population is not seemingly impacted by the current poaching levels. However, left unchecked and coupled with the onset of potential climate change impacts such as shifts in fish migration patterns, which is crucial during the breeding season, the population can plummet. Hawksbill turtles have a slow growth rate, taking several years before reaching sexual maturity. Unsustainable, illegal harvesting of sexually mature adults have serious consequences to its population and is one of the reasons they are critically

endangered. Additionally, traditional rookeries are threatened by illegal sand mining, *Sargassum* landfalls, and sea level rise, resulting in loss of ideal nesting sites.

Isolating pillar corals even further, apart from its rarity in NE Tobago, is its dioecious biology, in which a colony is either male or female, resulting in very low recruitment and survival of larvae. Land and marine-based pollution along with increasing sea surface temperatures make these corals further susceptible to disease and coral bleaching.

Dry broadleaf forests are usually targeted for housing and land development. They are also very vulnerable to uncontrolled fires, which are set by farmers to clear land. While the forests may not be directly targeted, fires that are not. While the trees are adapted to low rainfall levels, increasing frequencies of dry spells can impact on the natural processes of the vegetation and their associated biotic communities.

14.3.3 WHAT INDICATORS, AT THE LEVEL OF THE SPECIES, ARE USED, OR WILL BE USED, TO ASSESS THE EVOLUTION OF POPULATION STATUS AND ASSOCIATED USE?

Morphological differences are the most plausible indicators to assess population status at present since genetic studies are limited. However, collaboration with universities and researchers (local and international) will provide better indicators for improved assessments.

14.3.4 WHAT MEASURES WILL BE USED TO CONSERVE GENETIC DIVERSITY AND PRACTICES ASSOCIATED WITH THEIR CONSERVATION?

Protecting NE Tobago's genetic diversity requires mitigation measures against the spread of potential invasive species that can displace vulnerable natives. Research, awareness and understanding of invasive species are steadily growing and will be taken into consideration with review and amendments of regulations and monitoring protocols.

Areas of unique biodiversity and habitats of at-risk and special interest species will be considered in management and monitoring. For example, areas of coral reefs with pillar corals may be designated as zones of limited activities, to mitigate unnecessary or additional potential stressors that impact the species, its habitat's and associated community's health.

15. DEVELOPMENT FUNCTION

15.1. POTENTIAL FOR FOSTERING ECONOMIC AND HUMAN DEVELOPMENT WHICH IS SOCIO-CULTURALLY AND ECOLOGICALLY SUSTAINABLE

15.1.1 DESCRIBE HOW AND WHY THE AREA HAS POTENTIAL TO SERVE AS A SITE OF EXCELLENCE/MODEL REGION FOR PROMOTING SUSTAINABLE DEVELOPMENT

The importance of serving as a role model is the ability to transfer lessons learnt, knowledge and hands on experiences to others; for this to be possible a place should share similar features with others in the region, in other words be representative. Successful sustainable development is closely linked to the three functions of a BR and the section below structured accordingly.

NE Tobago, shares a multitude of features with many rural, coastal areas in Caribbean SIDS:

- a human history starting with Amerindian settlements, followed by violent colonisation, slavery, struggle for independence and self-governance;
- an agricultural history regarding the cultivation of sugar, coconut, cotton, and cocoa for export followed by the breakdown of agricultural estates during the last century and the dependence on agricultural imports over the past decades;
- a political structure that is still influenced by the former way of colonial administration and has neglected the importance of civil society inclusion for the most part of the last 50 years;
- an economy that requires governmental subventions, and is mainly supported by micro businesses, artisanal fisheries and the tourism sector; medium and large scale industries are mostly absent;
- a civil society sector that is engaged; however, mostly lacks the capacity to develop strong organisations with adequate governance structures, financial security and long-term strategies;
- limited educational options for youth and very limited employment opportunities for higher educated persons that would like to assist in the development of their place of origin;
- a multitude of opportunities to develop sustainable green and blue economies and at the same time lack of support regarding research, knowledge exchange, meaningful capacity building, and bridging of risks during start up phases; and
- relatively intact ecosystems and biodiversity worthy of protection and conservation.

On the other hand, there are some differences that are actually supporting NE Tobago's potential to successfully demonstrate and share conservation, sustainable development and research / education and networking activities, project and programmes; some of which are:

- a landscape that comprises of a the successfully protected MRFR, a band of coastal communities with low population density and a future MPA with several levels of protection, resulting in a "sandwich" situation with protected areas on top and bottom and a band of communities in the middle. This situation allows to meaningfully communicate and discuss with communities their influence on the overall ridge to reef ecosystem (Conservation);
- a significant increase in conservation related activities and CSO involvement over the past five years (Conservation);
- the current intent to significantly increase the protection level for ecosystems and biodiversity through the NPASP and NNH Sites (Conservation);
- a local funding environment that facilitates further research and the implementation of demonstration projects, especially those gathered toward green and blue economy (Development);
- fast easy and cheap access to Trinidad, which is a regional innovation, financial, conference and technological hub (Development and Logistic);
- over 70 years of research and collaboration with international academic institutions resulted in a network that can be used to expand sustainable science research and education (Logistic); and
- presence of strong national and local academia and research institutions (Logistic).

How Tobago can serve as a sustainable role model is mostly linked to the potential to share lessons learnt, knowledge and experiences with its regional counterparts. There are various communication tools and channels that can be employed (some of which are already practised):

- the relatively strong presence of academia is resulting in an increasing list of conservation, sustainable development, and culture related publications that share scientific information with other experts locally, regionally and globally;
- success stories are already shared on social media, accessible to any interested person in the region; while this information is currently published by individual organisations, it can be consolidated under one access point once the BR is established; and
- most importantly, the existing, community-based tourism and townhall infrastructure perfectly facilitates the hosting of peer to peer knowledge exchange, "learning journeys" and shared experiences for interested visitors from other Caribbean islands while keeping the cost affordable and contributing to village economy.

15.1.2 HOW DO YOU ASSESS CHANGES AND SUCCESSES (WHICH OBJECTIVES AND BY WHICH INDICATOR)?

Currently, there is no monitoring scheme to assess changes and successes regarding sustainable development in NE Tobago.
Future Monitoring & Evaluation and relevant indicators will be described once the goal, objectives, outcomes and outputs are described in the NETMABR Management Plan.
In lieu of the final NETMABR Management Plan and as a base for future discourse, reference can be made to some of the preliminarily formulated objectives related to SDGs mentioned in section 13.2.

Objective: to diminish poverty through applied research, education, capacity building, facilitating demonstration projects, lowering entrepreneurial risks, and fostering innovation and transition to a sustainable green and blue economy.
Indicator: number households that fall under a minimum amount of income needed to cover basic needs (to be done in collaboration with governmental social services).

Objective: to increase food security and improve access to high nutrition value goods through the promotion of sustainable agriculture and fisheries with the context of a green and blue economy.
Indicators: prevalence of undernourishment; % of sustainable agricultural and fisheries practices; prices for high nutrition value goods.

Objective: to provide education regarding the connection between ecosystem and human health and discourage activities that threaten cultural and natural heritage as well as the wellbeing of residents.
Indicators: knowledge, attitude and practise regarding cultural and natural heritage.

Objective: improve and create research and educational opportunities and partnerships linked to the sustainable management of cultural and natural resources from primary to tertiary level.
Indicator: number of local participants in research and educational programmes.

Objective: protect vegetation and specifically forest cover within the BR, reduce pollution of waterways and encourage sustainable use.
Indicator: number of households with sufficient access to clean water and sanitation.

Objective: support the transition towards a green economy including usage of decentralised alternative energy sources.

Indicator: % of alternative energy in overall energy consumption.

Objective: support the development of livelihood opportunities based on the sustainable use of natural and cultural resources.
Indicators: unemployment rate, % of persons involved in sustainable economic activities.

Objective: improve resilience of communities and infrastructure by supporting resilient ecosystems and innovative approaches to sustainable development.
Indicators: level of knowledge, attitude and practise regarding risks of climate change and natural disasters, health of ecosystems.

Objective: support the transition towards a green and blue economy; discourage activities that threaten cultural and natural heritage as well as the wellbeing of residents.
Indicator: number of sustainable green and blue economy enterprises.

Objective: monitor the effects of climate change, exchange knowledge through networks and improve climate change resilience of communities and natural resources.
Indicator: change of seasonal biological patterns, number of participants in networking activities.

Objective: reduce direct and indirect threats to ecosystem health and biodiversity.
Indicator: ecosystem health and biodiversity.

15.2. IF TOURISM IS A MAJOR ACTIVITY

15.2.1 DESCRIBE THE TYPE(S) OF TOURISM AND THE TOURISTIC FACILITIES AVAILABLE

"Summarize the main touristic attractions in the proposed biosphere reserve and their location(s)."

The attractions within the proposed NETMABR appealing to international travellers are mostly nature-based, ranging from beautiful beaches, ridge to reef scenery, forest and marine biodiversity in combination with the experience of life in small Caribbean fishing villages.
Other attractions, such as cultural festivals and sport events, are targeting a more local and national clientele.
The main accommodation providers are small guest houses, privately-owned villas and three small hotels with up to 25 rooms; three villages are the focal points for tourism:

- **Castara**: famous for its community-based tourism product and sustainability efforts;

- **Charlotteville**: the environmental science tourism hotspot in Trinidad and Tobago; and
- **Speyside**: internationally renowned for diving at Goat Island and Little Tobago.

Table 20 Tourism attractions, location, activities and targets.

Focus	Attraction	Location	Frequency	Activity	Main Target
Cultural	Heritage Festival	Various villages	Annually in several villages	Participation in the re-enactment of old traditions, dances, rituals	mixed
	Blue Food Festival	Bloody Bay	Annually	Celebration of root tuber vegetables	local
	Fishermen Fete	Various villages	Annually	Fisherfolk harvest	local
	Speyside Jazz	Speyside	Annually	Music festival with regional artists	national
	Harvest	All villages	Annually in each village	Originally agriculture related, now general thanksgiving for the year	local
	Carnival	Roxborough	Annually	Music, dance, masquerading	local
	Village living	Castara, Parlatuvier, Charlotteville, Speyside	Permanent	Enjoying Caribbean village life	international
Sport	Boat Racing	Roxborough	Annually	Spectating	local
	Game Fishing Tournament	Charlotteville	Annually	Angling	international
	Marathon	Main Ridge Forest Reserve	Annually	Running	local
Natural	Beach aesthetics	Castara, Englishman's Bay, Bloody Bay, Charlotteville, Kings Bay	Permanent	Liming	mixed
	Marine biodiversity	Castara, Englishman's Bay, Bloody Bay,	Permanent	Snorkelling	international

Focus	Attraction	Location	Frequency	Activity	Main Target
		Charlotteville, Kings Bay			
	Marine biodiversity	Along the entire coast	Permanent	Diving	international
	Bird diversity	Main Ridge Forest Reserve, trails in buffer zone, islets	Permanent	Birding	international
	Ecosystem and biodiversity	Charlotteville	Permanent	Science tourism	international

Table 21 List of visitor accommodations, bedrooms and type within the planned NETMABR.

	PROPERTY NAME	CATEGORY	LOCATION	# OF ROOMS
1	**Blue Waters Inn**	Hotel	Speyside, Tobago.	38
2	**Nabuccoo Resort Dive**	Hotel	Speyside	18
3	**Angel Retreat**	Self-Catering Apartments	Castara	10
4	**Bay Watch Apartments**	Self-Catering Apartments	Castara	4
5	**Bay Watch Inn**	Self-Catering Apartments	Castara	2
6	**Bella Vista Cottage**	Self-Catering Apartments	Charlotteville	2
7	**Belle Aire Inn**	Self-Catering Apartments	Charlotteville	5
8	**Blue Mango Cottage**	Self-Catering Apartments	Castara	7
9	**Man-o-War Bay Cottages**	Self-Catering Cottages	Charlotteville	25
10	**Sharon and Phebs**	Self-Catering Apartment	Charlotteville	10
11	**Boatview**	Self-Catering Apartments	Castara	4
12	**Carpe Diem Villa**	Self-Catering Apartments	Castara	4
13	**Castara Bliss**	Self-Catering Apartments	Castara	3
14	**Castara Cottage**	Self-Catering Apartments		
15	**Castara Retreats**	Boutique Resort	Castara	20
16	**Castara Roundhouse**	Self-Catering Apartments	Castara	2
17	**Castara Villas**	Self-Catering Apartments	Castara	5

	PROPERTY NAME	CATEGORY	LOCATION	# OF ROOMS
18	**C&K Apartments**	Self-Catering Facilities	Castara	2
19	**Charlottevilla**	Self-Catering Facilities	Charlotteville	4
20	**Chacalaca Villa**	Villa	Charlotteville	3
21	**Cholson Chalet**	Self-Catering Apartments	Charlotteville	12
22	**Coffee House**	Self-Catering Apartments	Castara	2
23	**Cottage Mango**	Self-Catering Apartments	Castara	3
24	**Golden Apple**	Self-Catering Facility	Castara	2
25	**Grand View**	Self-Catering Facility	Speyside	3
26	**Davies Atlantic View**	Self-Catering Facility	Speyside	4
27	**Divers and Nature Lovers Drea,**	Self-Catering Facility	Speyside	2
28	**Erasmus Cove Cottages**	Self-Catering Facility	Parlatuvier	4
29	**Essex Cottage**	Self-Catering Facility	Parlatuvier	2
30	**Glouchester Place**	Bed and Breakfast	Parlatuvier	4
31	**Green Valley Apt**	Self-Catering	Castara	1
32	**Hidden Cottage**	Self-Catering	Castara	4
33	**Humming Bird Haven**	Self-Catering	Castara	2
34	**Lilibeths**	Self-Catering Apartments	Castara	4
35	**Little House on the Hill**	Self-Catering Apartments	Castara	2
36	**Mango Inn**	Self-Catering Apartments	Speyside	3
37	**Mot Mot**	Villa	Castara	4
38	**Naturalist Beach Resort**	Self-Catering Apartments	Castara	16
39	**Nature Retreat**	Self-Catering Apartments	Parlatuvier	6
40	**Nature View Apartment**	Self-Catering Apartments	Castara	2
41	**Nature View Apartment**	Self-Catering Apartments	Speyside	1
42	**Nico Vile**	Self-Catering Apartments	Charlotteville	5
43	**Ocean View**	Self-Catering Apartments	Charlotteville	3
44	**Ocean View**	Self-Catering Apartments	Castara	1
45	**Ocean View Cottage**	Self-Catering Apartments	Delaford	8

	PROPERTY NAME	CATEGORY	LOCATION	# OF ROOMS
46	**Parrot Estate Villa**	Villa	English man's Bay	2
47	**Riverside Cottage**	Self-Catering Apartments	Castara	4
48	**Samahdi**	Self-Catering Apartments	English man's Bay	4
49	**Sea Garden Guesthouse**	Self-Catering Apartments	Delaford	3
50	**Sea Level Guest House**	Self-Catering Apartments	Castara	8
51	**Seascape**	Self-Catering Apartments	Castara	3
52	**Silk Cotton Valley**	Self-Catering Apartments	Castara	2
53	**Sunset Valley Estate**	Villa	English man's Bay	3
54	**Tamarind House**	Self-Catering	Parlatuvier	4
55	**Tanager Ridge**	Villa	English man's Bay	5
56	**Ten Cent Cottage**	Self-Catering Apartments	Speyside	2
57	**Tekeya Place**	Self-Catering	Castara	2
58	**Tony's Offgrid Cabin Getaway**	Self-Catering	Speyside	1
59	**Top Ranking**	Self-Catering Apartments	Speyside	5
60	**Top River Perl**	Self-Catering Apartments	Charlotteville	6
61	**Ali Baba Sea Breeze**	Self-Catering Apartments	Castara	4
62	**Villa Di Sorrisi**	Villa	Parlatuvier	2
	Additional non-listed rooms			70
			TOTAL	**398**

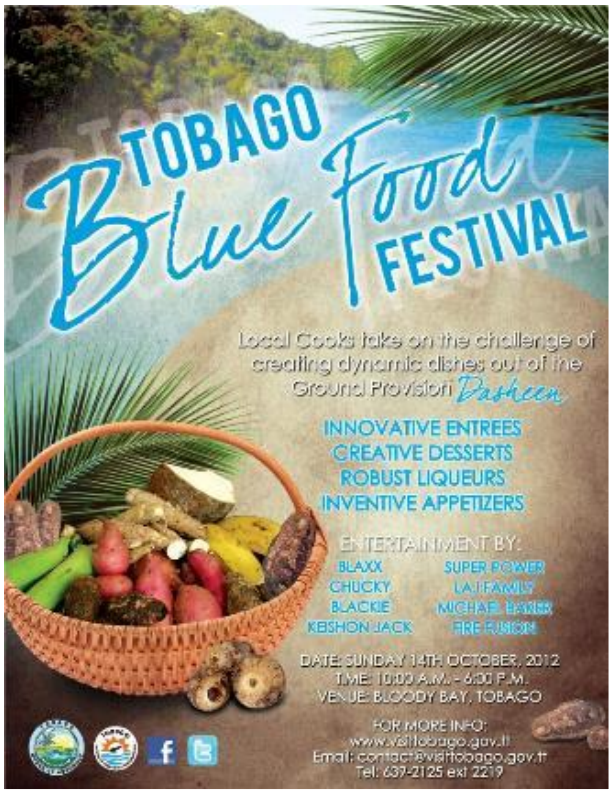


Figure 54 Tobago Blue Food Festival poster.

Figure 55 Charlotteville Fishing Tournament poster.

Figure 53 Tobago Heritage Festival poster.

15.2.2 HOW MANY VISITORS COME TO THE PROPOSED BIOSPHERE RESERVE EACH YEAR?

"Distinguish between single-day visitors and overnight guests, visitors only visiting the proposed biosphere reserve or only passing on the way to another place). Is there an upward or downward trend, or a particular target?"

Unfortunately, there are no data regarding visitation numbers specifically for the proposed NETMABR.

The main, domestic tourism market for Tobago is in Trinidad; however, the vast majority of domestic tourists are staying in the south-western side of the island which is more geared towards entertainment and night life-based tourism. Those local tourists that visit the proposed NETMABR area are single day visitors on a road trip through the island and spending money on mainly catering.

The annual cruise ship arrivals in Tobago fluctuate significantly (e.g. in 2017-2018 at 82,000; in 2016-2017 at 23,821). Tours to the MRFR and Little Tobago are offered and booked; however, there are no data on actual visitor numbers to the NETMABR; it can be stated that the economic, social and environmental impact of cruise ship tourist in NE Tobago is relatively low.

Annual, international arrivals in Tobago via airlift are around 26,000; however, this does not account for those international travellers that arrive at the much larger international airport in Trinidad (Piarco Airport, POS), and then take a short (20 min) domestic flight to Tobago.

Most of the international visitors are staying overnight in the south-western part of Tobago; it can be assumed that at least 50% will choose to take a one-day trip around the island and possibly book a tour to Little Tobago or in the MRFR. The main international markets are the UK, Germany and Northern America.

The number of overnight stays, staying within NE Tobago can only be estimated at a rough order of magnitude scale. The room stock in NE Tobago is estimated at approximately 400 rooms with an average booking of 40% resulting in roughly 160 daily overnight stays. The average cost per room is 60 USD, resulting in income from accommodation of roughly 9,600 USD/day for the entire NETMABR area. Further income, by guess of similar value, is generated via car rentals, taxi services, catering, supermarket spending, guided tours, and diving.

Despite the generally low visitation level for entire Tobago, the efforts to establish sustainable community-based and science tourism products in NE Tobago have led to a relatively significant increase in bookings over the past five years, especially in Castara and Charlotteville.

15.2.3 HOW ARE TOURISM ACTIVITIES CURRENTLY MANAGED?

The management of tourism activities is facilitated by the:

- Division of Tourism, Culture and Transportation which is charged with the responsibility of establishing, standardising and sustaining the island's tourism product in a manner consistent with the repositioning strategy for Tobago as a tourist destination; and the
- The Tobago Tourism Agency Limited (TTAL), a state enterprise established in 2017. TTAL has oversight for the strategic marketing of the destination, product development and innovation, as well as cruise and airlift. The core mandate of the TTAL is to lead the (re)development of the island's tourism product and the marketing and (re)positioning of Tobago as a premier island destination founded on the principles of sustainable development.

  This includes the establishment of quality standards, training of industry workers, research on the impacts and contribution of tourism, the development of quality products and services, and the facilitation of investment into the island's tourism industry. In order to fulfil its mandate, the TTAL is working with and through public and private sector stakeholders and partners in the aviation, cruise and hospitality sub-sectors.

Noteworthy private sector organisations are:

- Association of Tobago Dive Operators,
- Castara Tourism Development Association, and
- Tobago Hotel and Tourism Association.

15.2.4 INDICATE POSSIBLE POSITIVE AND/OR NEGATIVE IMPACTS OF TOURISM AT PRESENT OR FORESEEN AND HOW THEY WILL BE ASSESSED (LINKED TO SECTION 14)

Due to the relatively low number of visitors, the negative impacts of tourism are currently limited. Neither reefs nor forests are visited beyond the limits of acceptable change. The pressure on resources e.g. water, fish, fruits, vegetables, and other commodities is also limited given that the average visitor number is less than 3% of the total population at one given time; the same applies to the very limited increase of waste produced by overnight visitors, which are often environmentally conscious.

Spearfishing tourism (mainly by Trinidadian divers) has led to a decrease in meso-predators at specific reefs; however, a new Fisheries Act, already drafted with FAO assistance, will include stiff penalties for mixing SCUBA and spearfishing gear on any vessel.

Events and festivals produce a larger amount of waste which is managed by the THA or private event managers. Only recently, the THA started to encourage event organisers to reduce their environmental footprint, especially regarding solid waste.
Land prices at scenic locations are relatively high, which can be a negative or positive tourism impact depending on the point of view.
Both, the CEDP and NETMP suggest the expansion of responsible tourism as a viable and appropriate economic activity for NE Tobago. One of the main drivers for the nomination process, on the governmental, non-governmental and private sector sides, is the expectation that once properly managed and marketed, the UNESCO MAB brand will assist in increasing income from tourism in NE Tobago. However, this will require upgrading of visitor facilities, trails, improved waste management, customer service training, and certifications according to international standards (e.g. Blue Flag for beaches, which is currently in the making).
The future NETMABR Management Plan will need to include the monitoring of visitor impacts and setting of visitation rules, limits and seasons for certain areas (e.g. turtle beaches).
The most obvious positive impact of the anticipated increase in tourism is an increase in direct and indirect income for NETMABR residents and Tobago as a whole. Additionally, and once properly managed, increased science tourism can lead to increased scientific research, knowledge exchange, scholarships and publications relevant to sustainable development and management of cultural and natural resources. Since 2015, tourists are already paying for participating in ecosystem health monitoring through Reef Check and Forest Check and as such contributing to conservation efforts. As more persons understand that their income directly depends on a healthy and aesthetically pleasing environment as more likely is it that they protect their cultural and natural heritage attractions and assets.
Most tourist that are attracted to a destination like NE Tobago have relatively high environmental standards. Increased visitation will therefore put additional pressure on tourism operators to satisfy customer preferences and reduce their environmental footprint.

15.2.5 HOW WILL THESE IMPACTS BE MANAGED, AND BY WHOM?

The above described positive and negative impacts need to be anticipated in the NETMABR Management Plan and proactively managed by preparing sites and establishing regulations and setting limits of acceptable change.
The future management organisation of the NETMABR will have the mandate to coordinate its own (BR focused) management activities with those of the THA Divisions responsible for the various aspects of reduction and mitigation of impact risks.
Therefore, it is of utmost importance that the relationship between the NETMABR management organisations and other management authorities is clearly defined and does not allow room for

uncertainties regarding responsibilities and mandates; this does not only relate to the management of impacts but also to the overall relationship between these organisations.

15.3. AGRICULTURAL (INCLUDING GRAZING) AND OTHER ACTIVITIES (INCLUDING TRADITIONAL AND CUSTOMARY)

15.3.1 DESCRIBE THE TYPE OF AGRICULTURAL (INCLUDING GRAZING) AND OTHER ACTIVITIES, AREA CONCERNED AND PEOPLE INVOLVED (INCLUDING MEN AND WOMEN)

Detailed baseline data regarding agricultural activities are unfortunately not available.
However, it can be stated that agricultural activities in the proposed NETMABR are on a very small scale, almost exclusively situated within the proposed Transition Area, and can be described as follows:

- the two largest farms (at Lois D'or and Kendall) are state farms, operated by the Department of Agriculture, each covering between 15 to 20ha;
- there is one operational, 100% organic certified (from the US Department of Agriculture), cocoa estate in Roxborough with approximately 10 ha under crop;
- small holdings between 0.5 to 5ha cover a total of 25 – 40ha spread throughout the area;
- 400 to 500 sheep and goats are reared in groups of 5 – 10 by single owners, mainly tied in the open at the side of roads;
- 75 – 100 cattle are reared in small groups, mainly tied in the open in the vicinity of roads;
- some individual households rear chicken for personal use;
- there are between 10 – 15 small pig farms with 5 – 10 pigs each;
- less than 5 small bee – keepers;
- the main short crops are corn, starchy root tubers, tomatoes, aubergine, ochro, peas, pak choi;
- long term and tree crops include various types of bananas, citrus (in orchards) as well as mango, avocado, breadfruit and plums which are planted in residential areas or home gardens for private use and rarely on the market.

Agriculture is perceived by many persons as an unattractive, hard labour occupation and is not able to attract youth or a larger scale.
There is strong competition with produce imported from Trinidad where production costs are lower and many persons prefer internationally imported fruits such as apples, grapes, pears and even bananas are imported from other Caribbean islands.
All of the above contributes to the situation, that the few remaining farmers are mostly male and above 50 years of age.

15.3.2 INDICATE THE POSSIBLE POSITIVE AND/OR NEGATIVE IMPACTS OF THESE ACTIVITIES ON BIOSPHERE RESERVE OBJECTIVES (SECTION 14)

The negative impacts of agriculture on BR objectives relate mainly to the quality of waterbodies (rivers, estuaries, reefs) next to farms. Fertilisers and pesticides are often used above recommended application amounts and mixed indiscriminately. Seasonal eutrophication, depending on the amount of rainfall, can be observed at the Bloody Bay River mouth, mainly caused by a 1ha farm, and at Louis D'or River wetland, caused by a mixtures of farm effluent and village grey water. These negative impacts are relatively small when taken the entire area into consideration.
It should be a part of the BR Management Plan to shift the larger governmental farms to sustainable agricultural practises and use them for demonstration and training purposes.

The potential and positive impact of sustainable agriculture in the planned Transition and Buffer Zone of the NETMABR is still to be unlocked. The revitalisation of high-end cocoa production (as already successfully demonstrated within the area) can create conservation opportunities for pollinators and birds of prey (as deterrents to pests); income from agroforestry, agro-tourism, and specialised products such as honey and teas can significantly contribute to sustainable development; and governmental research and training facilities have the potential to be used for knowledge sharing and as role models for other small island states. However, this will require political will, initial investments and a shift from the current, uncompetitive crops, to high value crops.
It should be noted that as long as consumers prefer imported agricultural products and the production cost in Tobago are higher than those for the imports, food security will always have to be subsidised by the state.

15.3.3 WHICH INDICATORS ARE, OR WILL BE USED TO ASSESS THE STATE AND ITS TRENDS?

The future NETMABR management organisation would collaborate with the Division of Food Production, Forestry and Fisheries, ERIC and the UWI to determine monitoring indicators and frequency.
The following indicators are preliminarily suggested as a minimum:

- water quality in rivers, wetlands and reefs close to agricultural activities;
- number and area under regular agriculture and sustainable agriculture;
- number of persons employed in agriculture; and
- amount and types of sustainably produced crops.

15.3.4 WHAT ACTIONS ARE CURRENTLY UNDERTAKEN, AND WHICH MEASURES WILL BE APPLIED TO STRENGTHEN POSITIVE IMPACTS OR REDUCE NEGATIVE IMPACTS ON THE BIOSPHERE RESERVE OBJECTIVES?

The current measures to reduce negative and strengthen positive impacts are:

- efforts of the Department of Agriculture to increase the usage of sustainable agricultural practises and correct usage of synthetic chemicals through its training and agricultural extension programmes;
- medium to large scale agricultural activities, especially livestock related, require a Certificate of Environmental Clearance from the EMA and are not present;
- the DNRF ensures that medium to large scale logging is not practised. It should be noted that the forest cover in NE Tobago remained practically the same over the past decades; land clearing normally only occurs for small scale agriculture (less than 0.5 ha) or individual residential construction, which is at a slow pace.

Recommendations for future actions would include, but are not limited to:

- incentives supporting sustainable agricultural practises through the Department of Agriculture, the Agricultural Development Bank of Trinidad and Tobago and other related governmental institutions;
- disincentivise agricultural activities that pose environmental and health threats;
- improve marketing of sustainably produced agricultural products including the use of the BR brand;
- facilitating knowledge exchange with other BRs regarding the promotion of sustainable agricultural practises;
- specifically, revitalisation of cocoa production, processing, chocolate making, and export associated with agro-tourism and organic honey production; and
- strengthening the individual and organisational capacities of farmers.

15.4 OTHER TYPES OF ACTIVITIES POSITIVELY OR NEGATIVELY CONTRIBUTING TO LOCAL SUSTAINABLE DEVELOPMENT, INCLUDING IMPACT/INFLUENCE OF THE BIOSPHERE RESERVE OUTSIDE ITS BOUNDARIES

15.4.1 DESCRIBE THE TYPE OF ACTIVITIES, AREA CONCERNED AND PEOPLE INVOLVED (INCLUDING MEN AND WOMEN)

The most important activity related to sustainable development in NE Tobago is fishing.
The vast majority of fishing activities within a 11.1 (6nm) radius (Buffer Zone) around NE Tobago (which is the area managed by the DMRF (THA)), can be described as follows:

- artisanal fishing carried out by one-engine, 5m to 8m pirogues. On rare occasions small long-line fishing vessels (up to 15m) would visit the shore to collect ice and bait, they would start fishing within the future Buffer Zone on their way to the open ocean. Their home ports are in south-west Tobago (2 vessels) or Trinidad;
- there are seven fish landing sites with 170 – 200 individually owned and operated boats;
- main targeted fish species include tunas, mackerels, mahi mahi, snappers, barracudas, and groupers. Sharks, rays and marine mammals are not targeted. Lobster and (to a much lesser extent) queen conch are the only targeted invertebrates;
- due to over-exploitation of near shore reefs over the past decades, most fishing is conducted further out at sea (1km to 30km) either by pulling a single hook hand line or banking;
- the main near shore fishing is pot-fishing;
- net fishing is rare and only used for bait, beach seining and when larger schools of mackerels reach the shore once or twice a year to spawn;
- less than five fishermen using fillet nets tied on shore; monofilament nets are illegal. Fishing with dynamite or poison is not practised; and
- artisanal fishing in NE Tobago can be seen as a high-risk activity, many boats only have one engine, many fisherfolk are not able to swim and do not take professional care in preparation of emergency situations; it is an activity open to females, but mainly carried out by men.

Outside of the planned NETMABR, mainly in the Atlantic Ocean to the east, larger, international long-line vessels are fishing legally and illegally. It is highly likely that these activities have led to a significant reduction of the shark population over the last 20 years. Catches from such vessels are off-loaded in Trinidad or other international ports.

Unsustainable fishing practises occur mainly due to the lack of gear-, size-, seasonal- or area-restrictions. Such practises include the few fillet nets, pot-fishing with a too small mesh diameter and pot ghost fishing, and SCUBA spear fishing (mainly by tourists from Trinidad and on an irregular small scale). Over the past 10 years the extraction of parrotfishes by free-dive spear-fishers has increased. While significant amounts of lobster have been exported in the 90ties, lobster is now relatively rare, expensive and export has fully collapsed.

The establishment of the BR, in conjunction with the establishment of the planned NETMPA with its several layers of protection and the establishment on NNH Sites around Little Tobago, St. Giles and at other important reef structures can be expected to have a positive, fish biomass spill over effect for the south western part of Tobago.
Once the regulatory and legal framework of the planned MPA, the marine NNH Sites, and the NETMABR are established in collaboration with all stakeholders, it can be expected that a sustainable fisheries sector will develop.

The seaward boundaries of the future BR and planned NETMPA are close to natural gas fields (currently licensed to Shell Trinidad and Tobago and BHP Billiton Trinidad and Tobago); extraction has not started as yet but is expected soon to happen. All technical, material support and human resources for these activities are coming from Trinidad.

15.4.2 INDICATE THE POSSIBLE POSITIVE AND/OR NEGATIVE IMPACTS OF THESE ACTIVITIES ON BIOSPHERE RESERVE OBJECTIVES (SECTION 14). HAVE SOME RESULTS ALREADY BEEN ACHIEVED?

Unsustainable fishing practises especially related to non-selective gear, size-, area-, and seasonal restrictions have a significant potential to negatively influence the objectives of the BR regarding the maintenance of healthy marine ecosystems. Specifically, the loss of top predators such as sharks, large groupers and snappers will lead to an overall change in reef fish assemblage which will negatively impact on resilience and recovery from climate change related threats such as coral bleaching.
A shift to sustainable fishing practises, is likely to maintain or restore fish biomass, secure healthy fish stocks for future generations and as such support the fisheries sector in NE Tobago, without which the area's economy and livelihoods would decline dramatically.

Regarding the hydrocarbon activities, it can be stated that a major accident would mainly result in the release of gas and some associated oil; models indicate that an impact on NE Tobago is unlikely because currents would transport contaminants in a more northerly direction.
All past and current operators of these offshore blocks have contributed to the sustainable development in Trinidad and Tobago in general via the Green Fund Levy, taxes and direct corporate social responsibility related funding. Both above mentioned companies, have financed social and environmental projects in NE Tobago over the past five years, such as:

- the installation of yacht mooring systems in sensitive reef areas associated with a community-based social enterprise;
- an in-depth feasibility study regarding the possibility to establish a long-term conservation trust; and

- financial support for the Tobago Environmental Partnership Conference in 2019.

15.4.3 WHAT INDICATORS ARE, OR WILL BE USED TO ASSESS THE STATE AND ITS TRENDS?

The future NETMABR management organisation would collaborate with the DMRF, the IMA, the ERIC and the UWI, to determine monitoring indicators and frequency.
The following indicators are preliminarily suggested as a minimum:

- fish catch: sizes, species, amount, health,
- number of active fisherfolk and number of vessels,
- number of fisherfolk using sustainable fishing methods,
- local prices for local fish and shellfish,
- reef health, fish biodiversity and biomass, and
- ecosystem health of seagrass beds and estuaries.

In mid-2019, the IMA has been contracted under the IFPAM Project by the FAO office in Trinidad to develop a reef health monitoring protocol in NE Tobago; consultations are on-going, and the results are expected at the end of 2019.

15.4.4 WHAT ACTIONS ARE CURRENTLY UNDERTAKEN, AND WHICH MEASURES WILL BE APPLIED TO STRENGTHEN POSITIVE IMPACTS OR REDUCING NEGATIVE ONES ON THE BIOSPHERE RESERVE OBJECTIVES?

The current measures to reduce negative and strengthen positive impacts are:

- a new, national Fisheries Act has been drafted with technical assistance from the FAO, containing significant changes towards sustainable fisheries and stiff penalties for illegal fishing activities;
- the local ERIC and the DMRF are collaborating in training fisheries officers in the identification of sharks and rays and collecting data at fish landing sites; continue the shark monitoring programme in collaboration with Global Fin Print (Florida International University) and develop a sustainable shark and ray management plan for the planned MPA and NETMABR Buffer Zone.

Recommendations for future actions would include, but are not limited to:

- incentives supporting sustainable fisheries practises through the DMRF, the Agricultural Development Bank of Trinidad and Tobago and other related governmental institutions;
- seizure of illegal fishing gear and vessels;

- exploration of environmentally sensitive mari-culture such as shellfish and algae;
- facilitating knowledge exchange with other BRs regarding the promotion of sustainable agricultural practises; and
- strengthening or individual and organisational capacity of fisherfolk.

15.5 BENEFITS OF ECONOMIC ACTIVITIES TO LOCAL PEOPLE

15.5.1 FOR THE ACTIVITIES DESCRIBED ABOVE, WHAT INCOME OR BENEFITS DO LOCAL COMMUNITIES (INCLUDING MEN AND WOMEN) DERIVE DIRECTLY FROM THE SITE PROPOSED AS A BIOSPHERE RESERVE AND HOW?

Unfortunately, there are no data available regarding income for local communities from the above activities.
However, in order to understand the scale of the following, rough order of magnitude (ROM-25%/+75%), estimates can be made:
Income from tourism, based on the above-mentioned room stock and average daily spending of visitors, ~ 3,600,000 USD / year.
Income from fishing, based on an average fisherman/boat income of 1,800 USD / month and 180 active boats: ~ 3,900.000 USD / year.
Similar estimates for the agricultural sector cannot be made since the activities are too diverse.

An additional benefit deriving from the fisheries sector is food security (e.g. when the ferry link to Trinidad breaks down) and simultaneous access to a healthy protein source. While fish is more expensive than commercially raised farm chicken from Trinidad, fish is still shared with family members without compensation and a preferred protein source for fisherfolk households.
The benefits deriving from the adjacent hydrocarbon extracting industry have been described above.

15.5.2 WHAT INDICATORS ARE USED TO MEASURE SUCH INCOME OR OTHER BENEFITS?

There is no systematic collection of economic indicators in NE Tobago. The assumptions made to derive at the income estimates were mentioned above.

15.6 SPIRITUAL AND CULTURAL VALUES AND CUSTOMARY PRACTICES

"Provide an overview of values and practices, including cultural diversity."

15.6.1 DESCRIBE ANY CULTURAL AND SPIRITUAL VALUES AND CUSTOMARY PRACTICES INCLUDING LANGUAGES, RITUALS, AND TRADITIONAL LIVELIHOODS. ARE ANY OF THESE ENDANGERED OR DECLINING?

Folk practice associated with religion

The bible was always opened at psalm 23 or 91, scissors were opened to form a cross and were placed alongside the bible.

Folk medicine and cures

Olive Bush: Leaf tea for weakness of the bladder, for womb cleaning, menstrual pains, leaves together with silk fig leaves for high pressure, diabetes, hypertension, cough, colds and heart.

Parvu: Wonder of the world, for earache: warm and squeeze into the ear. Use for sprains, bruises, ulcers, swellings, arthritis, tay- tay worms, bladder cleansing.

Pigeon Peas: The leaves are boiled and applied to wounds, skin infections and ulcers. A decoction of the leaves is drunk and also used as a gargle for infected gums and toothache. A cup of tea made from three leaves is taken by children in case of bed wetting. Leaf baths are used for stroke and bewitchment.

Ditay Payee Fregosa

The leaf tea is used as a febrifuge, and also to treat the gripping effects accompanying the purgative action of castor oil. Either the leaf juices or the extracts of the leaves are used as an eyewash. "Leaf tea or dew on the leaf is eyewash for ophthalmia. Herb tea for flu, fever, dysmenorrhoea, heat, vomiting, measles, as postpartum depurates."

Bird Pepper

Use to make a tea for palpitation. Use for asthma, cough, cold in the chest, consumption; Fruits: for indigestion, in gargle for sore throat.

Papi – Pap Paw

The fruit is cut and rubbed into ring worm affected areas on the skin until they bleed. Half a green paw paw fruit is boiled in water to make a strong decoction, salt is added, and this is taken to produce sterility in woman. Green and yellow fruit is crushed and mixed with sour orange juice and taken as required to treat high blood pressure.
Young fruits for flu, hypertension: infusions of roots of male plant is good for venereal diseases, constipation, heat, flu, and used as rubs for scorpion stings.

Tarantan (French Guava, Taran Tan, Wild Senna)
Used on the skin to treat "Lohtah," as a cooling, and to purify the blood. The tea is also used for intestinal worms. Leaf tea for diarrhoea, worms. Tea of flower and leaf for constipation as purgative.

Avocado (Zaboca, Pear)
A leaf decoction is taken for high blood pressure. The leaves are also used in baths for pain and fever. The grated seed may be used to treat jigger worms in the feet.

Gully Root
For early arthritis, boil the whole plant in water and to the aqueous extract, add some urine and a little Epsom salts and apply luke warm in a cloth bandage to the area.

Seed Under Leaf
Herbal infusion is taken for oliguria. Special precautions should be taken in its use as it is generally believed to be abortifacient.

Candles Bush
Used for bathing hunting dogs to stimulate their senses. The tea is used for high blood pressure.

Plantain
This leaf is used as an eye drop. A leaf is placed over the mouth of a clean cup, a hot iron is placed on it and the juice is collected.

Castor Oil
The seed oil is used is used as a purgative. The leaf is rubbed in a little soft candle, warmed over a fire and then tied on the forehead for headaches. Leaf is a poultice for stomach-ache, flu, inflammation of the womb. Seed oil is consumed during pregnancy and postpartum period. Ricin is a toxic glycoprotein in the seed of this plant and it is currently under study in the chemotherapy of the cancer.

Bois Bande

An infusion made of a thumb size piece of the bark of the bois bande in a pot of hot water is taken as the effects are said to last for three days or more depending on the dosage for sexual potency.

The Role of the Reel Dance in the Tobago Folk Practices

Tobago Reel

It is said that when danced, the Tobago Reel can reach such great intensity that it creates an atmosphere for spirit possession. Before marriage, a Reel Dance is held in honour of the ancestors so that they can bless the couple and offer spiritual guidance. At wakes, the Reel is performed to guide the soul of the deceased and to summon the ancestors to assist in this rite of passage. The Reel dance was also performed on other village occasions. It is a couple's dance with bent knees, leaning forward in a sort of stamp and shuffle movement. The costumes are very colourful skirts and blouses, complete with neck scarves and head ties. Men wear simple trousers and shirts with the occasional use of a jacket or with tailcoat and top hat.

15.6.2 INDICATE ACTIVITIES AIMED AT IDENTIFYING, SAFEGUARDING, PROMOTING AND/OR REVITALISING SUCH VALUES AND PRACTICES

Preservation of the Folk Culture

In earlier times folk music was not written down. Over the last two centuries historians have spent time listening to all kinds of folk music. Research took them over mountains, to merchant ships, to shanty towns, even in prison in search of folk melodies with their multi-versed tales of life, ways of life and the village. Folk songs were song by slaves encouraging each other; sea shanties kept precise timing for workers at sea.

Tobago Harvest Festival

- The Tobago Harvest Festival originated as a religious festival of thanksgiving that took place in the church. There were usually two parts to the day's activities, a harvest thanksgiving service in the morning and a cantata in the evening.

- The church was "dress" by members of the congregation who cleaned, scrubbed, painted and decorated well into the night in preparation for the special day. All villagers were encouraged to attend as it was a village activity and not merely a religious one, so no one was left out. Those who could not attend were visited by churchgoers later in the day and brought food.

- Tobago folk music is no different and these songs all speak about many life stories in the village: the mystery of jumbie and spirits, the issue of marriage and elderly advice, the influence of neighbours and the obeah man, the charisma of village icons and characters, the wonder of nature, the magic of the ocean and general beliefs of Tobago that have been passed on from one generation to the another and preserved.

- Tobago folk songs carry the beat of call and response chants, slave songs, jigs, reels, heels and toes, brush backs, paseos and quadrille.

- The Tambrin was originally a distorted drum made by the slaves because it was easier to hide from the massa. Tambrin music is very popular at folk festivals, weddings, wakes, and other community activities. Folk music is sometimes accompanied by tambrin bands with a fiddler. A typical tambrin band comprises the low drum called the “Boom”, the middle range drums called the “Rollers” and the high snare-like drums called the “cutter”. The band which also features a triangle and a fiddler or violinist.

Local Tobago Saying and Proverbs

This small of old and new proverbs seeks to place on record a part of our history which scant attention has been paid. Our linguistic past is full of colour, drama and phenomenal flight of imagination.

These saying, almost all of them over three centuries old, are par excellence, a vivid illustration of the way our ancestor provided his own means of communication in a language incomprehensible to his slave master, this was his own language.

These proverbs are for the most past inventions of our African ancestors to whom abstract thought could best be express by means of concrete situation familiar to them.

“Doan sit down ah river rock stone and talk river-Hungry dog cat raw cornflour “Mout open story jump out” are all expression of a way of life-a philosophy which was handed down from one generation to another by means of this sayings.

Activities aimed at identifying, safeguarding, promoting and or revitalizing such values and practices are:

- The Tobago Heritage Festival activities that is celebrated in the specific area e.g. the Moriah Wedding historical re-enactment
- Natural Treasures day which celebrate both our Tangible and intangible heritage
- Blue Food Festival
- The various Fisherman Festivals
- Bonfire Festival

15.6.3 HOW SHOULD CULTURAL VALUES BE INTEGRATED IN THE DEVELOPMENT PROCESS

"…elements of identity, traditional knowledge, social organizations, etc.?"

The definition of culture that is most appropriate when speaking of the Man and the Biosphere is that of E.B Taylor and Raymond Williams for the philosophy behind these theorist definition embrace man and his survival through customs and beliefs in his natural habitant it forms the nucleus to which indigenous and traditional Knowledge passed on orally from generation to generation therefore structures can be put into place integrate our rituals, agricultural practices, Traditional food preparation methods, traditional medicines, education etc. into our developmental process, notwithstanding it is difficult for one to place monetary value on our Tangible and intangible cultural heritage however since it is what defines us as a people and therefore should be a part of the developmental process of Tobago

15.6.4 SPECIFY WHETHER ANY INDICATORS ARE USED TO EVALUATE THESE ACTIVITIES. IF YES, WHICH ONES AND GIVE DETAILS

"Examples of indicators: presence and number of formal and non-formal education programmes that transmit these values and practices, number of revitalization programmes in place, number of speakers of an endangered or minority language".

Formal and informal education programmes exist at all secondary and primary schools across the island. These are facilitated in the first instance through the written/formal curriculum. At the primary level environmental issues of resource management and sustainability are integrated into the Social Studies, Agricultural Science and Health & Family Life Education (H.F.L.E) curricula. Specific indicators of the implementation would be based on both formative and summative assessment of student learning outcomes. These assessments include project-based assessment as well as summative quizzes and tests given to students.

At the secondary level, there is explicit attention to fundamental ecological principles, human population and the environment, sustainable use of natural resources, agriculture and the environment, energy and the environment and pollution of the environment. These are covered at the lower secondary level in the Social Sciences curriculum and at the upper secondary level in the Social Studies, Geography and Environmental Science curricula.

Assessment of students' learning outcomes in these instances, are assessed through standardised tests. At the lower secondary level, there is the National Certificate of Secondary Education (N.C.S.E) assessment. At the upper secondary level, the Caribbean Examination Council (CXC) is the formal examining body which assesses students' proficiency. CSEC stands for Caribbean Secondary Education Certificate (CSEC) examinations are normally written by candidates who have completed two years of the syllabus at the secondary level. Caribbean Advanced Proficiency Examination (CAPE) examinations are normally written by candidates who have completed one or two years of post-secondary level education usually within the formal context of our secondary schools.

Figure 56 No Man's Land beach clean-up (ERIC)

16. LOGISTIC SUPPORT FUNCTION

16.1 RESEARCH AND MONITORING

16.1.1 DESCRIBE PAST, EXISTING AND PLANNED RESEARCH PROGRAMMES

"And projects as well as monitoring activities and the area(s) in which they are (will be) undertaken in order to address specific questions related to biosphere reserve management and for the implementation of the management plan (please refer to variables in Annex I)."

The historical, substantial research track record and linkages to national, regional and international academic and research institutions has been described in Section 3.3.

Consistent monitoring of ecological indicators significantly increased over the past five years (and complimented ongoing governmental monitoring programmes) due to the implementation of the IFPAM Project and the activities carried out by ERIC in collaboration with various THA Departments.

Activities that are aligned with the proposed objectives of the future NETMABR Management Plan and relate to the three functions of a BR, are already conducted throughout the site by various actors.

The table below indicates general categories of current activities. However, some very recent projects are worth highlighting:

- establishment of marine, terrestrial and reef biodiversity baselines; establishment of biodiversity monitoring protocols (the UWI, IFPAM, 2017);
- reef health monitoring programmes (ERIC, biannual, since 2015, IMA ongoing);
- Forest Check (award-winning), climate change impact monitoring programme in collaboration with tour- guides (ERIC, since 2017);
- sea turtle monitoring and tagging programme (Turtle Village Trust (TVT), various NGOs in NE Tobago, ongoing since 2004);
- cataloguing archaeological sites in NE Tobago (Team Museum, 2019);
- seabird population monitoring (in collaboration with Bird Life International);
- ongoing turtle, frog, and bat research (University of Glasgow in collaboration with local researchers);
- Coral Reef Early Warning System (CREWS, IMA in collaboration with NOAA);
- beach profiling (IMA, annually, since 1990s).

As stated above, some of these research and monitoring activities are conducted in silos, unreliably stored, or hard to access. In order to address this situation, the IFPAM Project contracted the UWI in mid-2019 to establish a fully comprehensive and accessible data base containing information regarding research, monitoring, legal-, regulatory-, and policy issues, maps, stakeholders, etc. This important database is expected to be finalised before the end of 2019.

Table 22 Current activities related to conservation and sustainable development, implementing agencies and relevance.

		Relevance		
General Activity Category	**Implementing Agencies**	**Local**	**Regional**	**Global**
Biodiversity and Ecological Baseline Research	The UWI, IMA, ERIC, THA Departments, foreign academic Institutions	x	x	x
Fisheries Landing Monitoring	DMRF	x	x	
Tourism-Related Data Collection	Department of Tourism, Culture and Transportation (DoTCT), TTAL	x		
Continuous Terrestrial and Marine Ecological and Climate Change Impact Monitoring	IMA, ERIC, DNRF, TVT, Meteorological Office	x	x	x
Capacity Building and Training Related to Conservation and Sustainable Livelihoods	ET, ERIC, IFPAM, Churches	x		
Education regarding waste reduction, alternative energy, sustainable lifestyles	ET, CDTA, THA Departments, Police Youth Clubs, Village Councils	x		
Sea Turtle Nesting Patrols	various ENGOs	x	x	
Natural and Cultural Heritage Education	various NGOs, THA Departments, Police Youth Clubs, Village Councils	x		
Documentation of Archaeological Sites	NTTT, private citizens	x	x	
Socio-cultural and economic activities related to sustainable development	THA Departments, various NGOs, Police Youth Clubs, Village Councils	x		

Stakeholder discussions in relation to the planned NETMABR indicated significant interest in a list of activity categories for the future. It is generally agreed that due to limited resources these activities should be implemented through a collaborative effort of governmental, non-governmental and private sector actors (especially including citizen and volunteer-based science approaches).

Such discussed activities included, but were not limited to:

- continued monitoring of
  - biodiversity,
  - ecosystem health,
  - climate change impacts,
  - species of specific interest, and
  - socio-economic (agricultural, tourism, fisheries) and wellbeing indicators
- documentation of deep see biodiversity and ecosystems,
- documentation of authentic cultural sites, as well tangible and intangible expressions of art,
- establishment and increased support of new and existing demonstration projects related to the sustainable use of natural and cultural heritage and resources (e.g. organic agriculture, control of invasive species, promoting and marketing of art and craft, nature and culture-based sustainable tourism),
- designation of new cultural and natural NH Sites,
- forest- and reef restoration,
- coastal protection programmes,
- implementing the recently approved NPASP,
- enforcing of existing environmental laws and regulations,
- formulating of NETMABA specific regulations to protect natural and cultural heritage and improving overall environmental management esp. waste management.

Figure 57: Tobago dancers, Jason Nedd.

The variables considered in past (PA), ongoing (ON) and planned (PL) research and monitoring projects and programmes related to the implementation of the future NETMABR Management Plan and its proposed objectives are indicated in the table below.
Please note that ON (ongoing) includes intermittent and regular activities, the level/scope of the research or monitoring activity and the availability of data is not indicated.

Table 23 Research and monitoring variables.

Biodiversity	Implementer	Area	PA, ON, PL
Afforestation/Reforestation	DNRF	all terrestrial areas	ON
Algae	IMA	near shore	ON
Alien and/or invasive species	IMA, ERIC, UWI, lionfish, brittle stars	near shore	ON
Amphibians	UWI, Glasgow	all terrestrial areas	ON
Arid and semi-arid systems	NA		
Autoecology	none		
Beach/soft bottom systems	IMA, beach profiles	all beaches	ON
Benthos	IMA	near shore	ON
Biodiversity aspects	UWI, IMA, ERIC visiting researchers	all terrestrial and marine areas	ON
Biogeography	UWI	all terrestrial and marine areas	PA
Biology	UWI, IMA, ERIC, DoE, DMRF, DNRF visting researchers	all terrestrial and marine areas	ON
Biotechnology	none		
Birds	UWI, Trinidad and Tobago Field Naturalist Club	all terrestrial and marine	ON
Boreal forest systems	NA		

Breeding	none		
Coastal/marine systems	IMA, ERIC, UWI	coastal marine	ON
Community studies	ERIC, visiting researchers	all terrestrial	ON
Conservation	UWI, IMA, ERIC visting researchers	all terrestrial and marine	ON
Coral reefs	UWI, IMA, ERIC visting researchers	coastal marine	ON
Degraded areas	none		
Desertification	NA		
Dune systems	NA		
Ecology	UWI, IMA, ERIC, DoE, DMRF, DNRF visiting researchers	all terrestrial and marine areas	ON
Ecosystem assessment		all terrestrial and marine areas	PL
Ecosystem functioning/structure	UWI, IMA, ERIC, visiting researchers	all terrestrial and marine areas	ON
Ecosystem services	UWI, ERIC	all terrestrial and marine areas	ON
Ecotones		all terrestrial and marine areas	PL
Endemic species	UWI, ERIC	all terrestrial and marine areas	ON
Ethology	visiting researchers	all terrestrial and marine areas	ON
Evapotranspiration	none		
Evolutionary studies/Palaeoecology	none		
Fauna	UWI, IMA, ERIC, DMRF, DNRF, visiting researchers	all terrestrial and marine areas	ON
Fires/fire ecology	none		
Fishes	UWI, IMA, ERIC, visiting researchers	freshwater and marine systems	ON
Flora	UWI, DNRF, visiting researchers	all terrestrial areas	ON
Forest systems	UWI, DNRF, visiting researchers	all terrestrial areas	ON
Freshwater systems	UWI	all terrestrial areas	ON
Fungi			PL
Genetic resources			PL
Genetically modified organisms	NA		
Home gardens	none		
Indicators	?		
Invertebrates	UWI, IMA, ERIC, visiting researchers	all terrestrial and marine areas	ON
Island systems/studies			PL
Lagoon systems	NA		
Lichens	UWI Herbarium	all terrestrial areas	PA
Mammals	UWI	all terrestrial areas	ON
Mangrove systems	IMA	wetlands	ON
Mediterranean type systems	NA		
Microorganisms			PL
Migrating populations			PL
Modeling			PL
Monitoring/methodologies	?		
Mountain and highland systems	NA		

Natural and other resources	UWI, IMA, ERIC, DoE, DNRF, DMRF, visiting researchers	all terrestrial and marine areas	ON
Natural medicinal products	local and traditional researchers	all terrestrial areas	ON
Perturbations and resilience			PL
Pests/Diseases			PL
Phenology			PL
Phytosociology/Succession	none		
Plankton	UWI, IMA	all marine areas	ON
Plants	UWI Herbarium, DMRF	all terrestrial and marine areas	ON
Polar systems	NA		
Pollination			PL
Population genetics/dynamics	UWI		PL
Productivity			PL
Rare/Endangered species	UWI, IMA, ERIC, DoE, DNRF, DMRF, visiting researchers		ON
Reptiles	UWI, visiting researchers	all terrestrial and marine areas	ON
Restoration/Rehabilitation	DMRF, ERIC	forests and reefs	ON
Species (re) introduction	none		
Species inventorying	UWI, IMA, ERIC, DoE, DNRF, DMRF, visiting researchers	all terrestrial and marine areas	ON
Sub-tropical and temperate rainforest systems	UWI Herbarium, ERIC, DMRF	forests	ON
Taxonomy	UWI, IMA, visiting researchers	all terrestrial and marine areas	ON
Temperate forest systems	NA		
Temperate grassland systems	NA		
Tropical dry forest systems	UWI Herbarium	dry forest	PA
Tropical grassland and savannah systems	NA		
Tropical humid forest systems	UWI Herbarium	forests	ON
Tundra systems	NA		
Vegetation studies	UWI, DNRF, visiting researchers	all terrestrial areas	ON
Volcanic/Geothermal systems	NA		
Wetland systems	IMA, UWI, ERIC, visiting researchers	wetlands	ON
Wildlife	UWI, IMA, ERIC, DMRF, DNRF, visiting researchers	all terrestrial and marine areas	ON
Abiotic	**Implementer**	**Area**	**PA, ON, PL**
Abiotic factors	IMA, Met Office, temperature, salinity, pH, connectivity, conductivity	terrestrial and marine monitoring station, 1 each	ON
Acidic deposition/Atmospheric factors	Met Office	Louis D'or Monitoring Station	ON
Air quality	none		
Air temperature	Met Office	Louis D'or Monitoring Station	ON
Climate, climatology	Met Office	Louis D'or Monitoring Station	ON
Contaminants	DoE, IMA	beaches	ON
Drought	Met Office	Louis D'or Monitoring Station	ON

Erosion	none		
Geology			PA
Geomorphology			PA
Geophysics			PA
Glaciology	NA		
Global change	?		
Groundwater	WASA	terrestrial areas	ON
Habitat issues	UWI, IMA, ERIC, DMRF, DNRF, visiting researchers	all terrestrial and marine areas	ON
Heavy metals	visiting researchers	in cocoa	PA + PL
Hydrology	WASA	terrestrial	PA
Indicators	?		
Meteorology	Met Office	Louis D'or Monitoring Station	ON
Modelling	none		
Monitoring/methodologies	UWI, IMA, ERIC, DMRF, DNRF, visiting researchers	all terrestrial and marine areas	ON
Nutrients	IMA	marine areas	ON
Physical oceanography	IMA	marine areas	ON
Pollution, pollutants	IMA, DoE	beaches	ON
Siltation/sedimentation			PL
Soil			PA
Speleology	NA		
Topography	Land and Surveys Division, Oil and Gas Industry	terrestrial and marine	ON
Toxicology	none		
UV radiation	none		
Socio-economic	**Implementer**	**Area**	**PA/ON/PL**
Agriculture/Other production systems	Department of Agriculture, UWI	all terrestrial areas in buffer and transition zone	PL
Agroforestry	DMRF	all terrestrial areas in buffer and transition zone	ON
Anthropological studies	UWI	all terrestrial areas	PA
Aquaculture			PL
Archaeology	Museum Group	all terrestrial areas in buffer and transition zone	ON
Bioprospecting	UWI	all terrestrial areas	ON
Capacity building	ERIC	all terrestrial areas	ON
Cottage (home-based) industry	THA, various divisions	all terrestrial areas	ON
Cultural aspects	THA, various divisions	all terrestrial areas	ON
Demography	CSO	all terrestrial areas	ON
Economic studies	UWI	all terrestrial areas	ON
Economically important species			PL
Energy production systems			PL
Ethnology/traditional practices/knowledge	visiting researchers	all terrestrial areas	ON

Firewood cutting	NA		
Fishery	DMRF, ERIC	all marine areas	ON
Forestry	DNRF	all terrestrial areas	ON
Human health	Tobago Regional Health Authority	all terrestrial areas	ON
Human migration	none		
Hunting	DMRF	all terrestrial areas	ON
Indicators	?		
Indicators of sustainability			PL
Indigenous people's issues	NA		
Industry	NA		
Livelihood measures	ERIC	terrestrial and marine areas	ON
Livestock and related impacts	THA Department of Agriculture	terrestrial buffer and transition zone	ON
Local participation	ERIC	all terrestrial areas	ON
Micro-credits	THA Division of Finance		ON
Mining	NA		
Modelling			PL
Monitoring/methodologies	UWI, IMA, ERIC, visiting researchers	all terrestrial and marine areas	ON
Natural hazards	Tobago Emergency Management Authority	terrestrial transition zone	ON
Non-timber forest products	Department of Agriculture, UWI	terrestrial buffer and transition zone	ON
Pastoralism	none		
People-Nature relations	ERIC	all terrestrial and marine areas	ON
Poverty	THA, various Departments	terrestrial buffer and transition zone	ON
Quality economies/marketing			PL
Recreation	DoTCT, TTAL	all terrestrial and marine areas	ON
Resource use	DoE, DNRF, ERIC, DMRF	all terrestrial and marine areas	ON
Role of women	THA, various Departments, NGOs	all terrestrial areas	ON
Sacred sites			PL
Small business initiatives	THA, various Departments	terrestrial and marine buffer and transition zone	ON
Social/Socio-economic aspects	THA, various Departments, UWI	terrestrial areas	ON
Stakeholders' interests	DoE, DMRF, DNRF, ERIC	all terrestrial and marine areas	ON
Tourism	DoTCT, TTAL, ERIC, ADTO, THAT	all terrestrial and marine areas	ON
Transports	DoTCT, DMRF	all terrestrial and marine areas	ON
Integrated monitoring	**Implementer**	**Area**	**PA, ON, PL**
Biogeochemical studies	none		
Carrying capacity	UWI, ERIC, DoE, DMRF, DNRF	all terrestrial and marine areas	ON
Climate change	UWI, IMA, ERIC, DoE, DMRF, DNRF	all terrestrial and marine areas	ON
Conflict analysis/resolution			PL
Ecosystem approach			PL
Education and public awareness	THA, various Departments, ERIC, ET	all terrestrial areas	ON

Environmental changes	UWI, IMA, ERIC, DoE, DMRF, DNRF	all terrestrial and marine areas	ON
Geographic Information System (GIS)	ERIC, THA UWI Geomathics. THA Department of Land Management	all terrestrial and marine areas	ON
Impact and risk studies	ERIC, Tobago Emergency Management Authority	all terrestrial and marine areas	PA
Indicators	?		
Indicators of environmental quality	UWI, IMA, ERIC, DoE, DMRF, DNRF	all terrestrial and marine areas	ON
Infrastructure development	DIQE	all terrestrial and coastal marine areas	ON
Institutional and legal aspects	THA, various Departments	all terrestrial and marine areas	ON
Integrated studies		all terrestrial and marine areas	PL
Interdisciplinary studies		all terrestrial and marine areas	PL
Land tenure	THA, Department of Land Management	all terrestrial areas	ON
Land use/Land cover	THA, Department of Land Management	all terrestrial areas	ON
Landscape inventorying/monitoring		all terrestrial and marine areas	PL
Management issues		all terrestrial and marine areas	PL
Mapping	THA, Department of Land Management, ERIC, IFPAM, IMA, DoE, DMRF, DNRF	all terrestrial and marine areas	ON
Planning and zoning measures	THA, Department of Land Management, ERIC, IFPAM	all terrestrial and marine areas	
Policy issues			PL
Remote sensing			PL
Rural systems			PL
Sustainable development/use	THA various Departments, ERIC	all terrestrial and marine areas	
Transboundary issues/measures	Central Government	all marine areas	ON
Urban systems	NA		
Watershed studies/monitoring	WASA	all terrestrial areas in buffer and transition zone	ON

16.1.2 INDICATE WHAT RESEARCH INFRASTRUCTURE IS AVAILABLE IN THE PROPOSED BIOSPHERE RESERVE, AND WHAT ROLE THE BIOSPHERE RESERVE WILL PLAY IN SUPPORTING SUCH INFRASTRUCTURE

The only research infrastructure available within the proposes BR is the ERIC, established in 2014. As the only environmental resources, research and sustainability science organisation in Tobago and with three, permanent academic staff, it conducts projects and programmes related to baseline monitoring, capacity building, sustainable livelihoods throughout NE Tobago and provides technical expertise to governmental and non-governmental stakeholders. The ERIC houses a meeting facility, research equipment and a SCUBA dive centre.

Figure 58 Environmental Research Institute Charlotteville (ERIC)

Once the NETMABR is established, it can be reasonably assumed that the BR brand and designation will assist the ERIC in expanding its research, sustainable development and conservation activities and facilities. At the same time, the ERIC, as a key stakeholder, will play a significant role in the management of the site. As mentioned above, stakeholders suggested during discussions about the proposed NETMABR, that a BR designation should also help

Figure 59 Reception area ERIC (ERIC)

developing new research infrastructure in the long term, e.g. the establishment of a small academic campus in collaboration with an internationally accredited university.

16.2 EDUCATION FOR SUSTAINABLE DEVELOPMENT AND PUBLIC AWARENESS

16.2.1 DESCRIBE EXISTING AND PLANNED ACTIVITIES, INDICATING THE TARGET GROUP(S) AND NUMBERS OF PEOPLE INVOLVED (AS "TEACHERS" AND "STUDENTS") AND THE AREA CONCERNED

Further to the above-mentioned governmental activities there are environmental clubs facilitated by the Social Science Department in several of the secondary schools across the island. Students are encouraged and supported in applying the concepts highlighted in the formal curriculum to solving problems in their schools and communities. Students engage in activities such as tree planting, beach clean-ups and recycling.

Figure 60 Students at Charlotteville Seven Day Adventist Primary School (ERIC)

In addition to cultural and natural education programmes at schools, civil society organisations are delivering environmental and cultural awareness, training and education programmes to students and adults on a regular basis.

Time Frame	Title	Main Implementer	Description	# of "Teachers" est.	# of "Students" est.
2012-Current	Turtle Conservation	NEST	School outreach	2	100
June (Annually)	I tour, I learn	Belle Garden Police Youth Club	Learning about the Main Ridge Forest Reserve	5	60
May (Annually)	Speyside Beach Clean Up and Education	SEMPR	Cleaning community and beach area	2	20
June (Annually)	Beach Clean Up and Education	Moriah Police Youth Club	Cleaning community and beach area	4	50
2017 - ongoing	Beach Clean Up	Belle Garden Police Youth Club	Cleaning community and beach area	5	60
2016 - ongoing	Environmental School Outreach	ERIC	Shark, coral and turtle conservation presentations	1	50
2004 - ongoing	Clean School Programme	ET	Annual Tobago wide school competition related to waste management and change of behaviours.	2	1600
2014-2015	MPA Co-Management Capacity Building in NE Tobago	ERIC	Capacity-building of selected community members to contribute to MPA co-management.	2	6
2015	MPA Monitoring and Co-management Capacity Building	ERIC	Continued training of community members in Reef Check	2	6
2016 - 2019	Establishment of a Network of Community Climate Change Champions	ERIC	Capacity Building and Creating the NE Tobago Climate Change Champions Network to advocate for climate change	1	14

	Time Frame	Title	Main Implementer	Description	# of "Teachers" est.	# of "Students" est.
				adaptation and action		
Cultural Heritage Related	April (Annually)	I tour, I learn	Belle Garden Police Youth Club	Learning the history of Forts in Tobago	5	60
	April (Annually)	Easter Summer Camp	Castara Youth Centre	Teaching programs to encourage sustainable livelihoods and learn culture	2	25
	August (Annually)	Summer Youth Awareness	Division of Tourism and Transportation	Learning about ecosystems, history and culture of Tobago	4	100

16.2.2 WHAT FACILITIES AND FINANCIAL RESOURCES ARE (OR WILL BE) AVAILABLE FOR THESE ACTIVITIES?

There are 12 primary (totalling on average 800 students and 50 teachers) and 2 secondary (totalling on average 1,000 students) schools in within the proposed BR site.

Funded through the Division of Education, Innovation and Energy or privately, all schools are relatively well equipped and staffed.

Environmental activities implemented by CSOs are delivered partly on a voluntary basis, partly funded by a multitude of donor organisations or the private sector.

One of the tasks of the future NETMABR Management Organisation will be to consolidate the environmental and cultural educational programmes and support CSOs to access funding to conduct outreach activities which are complimentary to the schools curricula.

Figure 61 Roxborough Secondary High School (ERIC)

16.3 CONTRIBUTION TO THE WORLD NETWORK OF BIOSPHERE RESERVES

16.3.1 HOW WILL THE PROPOSED BIOSPHERE RESERVE CONTRIBUTE TO THE WORLD NETWORK OF BIOSPHERE RESERVES, ITS REGIONAL AND THEMATIC NETWORKS?

The NETMABR, as the second UNESCO BR in the English-speaking Caribbean, will be an invaluable addition to the WNBR for the promotion of the MAB Programme in the region. It serves as a great example how even small-scale nature areas, as is the case for many islands, can have an immense impact on its people and nature for sustainable development, if the two are being integrated in a harmonious way. Since the beginning of its development, the NETMABR has prioritised the integration and cooperation of all stakeholders involved, therefore demonstrating, for example, the positive influence communities can have when involved in the planning and conservation of our cultural and natural heritage. Thus, motivating other coastal, rural areas in the insular Caribbean, who share similar development issues with NE Tobago, to acknowledge their potential and to dare stepping up to join the MAB Programme for the good of the people and their environment.

The inclusion of Tobago's MRFR in the WNBR will bring the historical legacy of the oldest protected tropical forest into the WNBR fold.

16.3.2 WHAT ARE THE EXPECTED BENEFITS OF INTERNATIONAL COOPERATION FOR THE BIOSPHERE RESERVE?

The NETMABR stakeholders recognise international cooperation not only as a key element to the BRs' success itself but also as an essential component for the capacity building of the WNBR. The international sharing of knowledge, exchanging experiences and promoting best practices will have an immeasurable impact on conservation on a global scale, accelerating the speed of problem-solving, overcoming challenges and reaching goals that are connected to the management of BR. NETMABR is exposed to many potential opportunities adressing internationally shared issues, for example how to cope with arising challenges caused by climate change. Finally, benefits are expected through sharing experiences based on personal interaction and communication, especially for those stakeholders, whose preferred learning styles are personalised interaction instead of exchanging technical documents.

16.4 INTERNAL AND EXTERNAL COMMUNICATION CHANNELS AND MEDIA USED BY THE BIOSPHERE RESERVE

16.4.1 IS (WILL) THERE (BE) A BIOSPHERE RESERVE WEBSITE? IF YES, WHAT IS ITS URL?

There will be a NETMABR website.

16.4.2 IS (WILL) THERE (BE) AN ELECTRONIC NEWSLETTER? IF YES, HOW OFTEN WILL IT BE PUBLISHED?

An electronic newsletter will be published twice per year.

16.4.3 DOES (WILL) THE BIOSPHERE RESERVE BELONG TO A SOCIAL NETWORK (FACEBOOK, TWITTER, ETC.)?

NETMABR will belong to social networks.

17. GOVERNANCE, BIOSPHERE RESERVE MANAGEMENT AND COORDINATION

The information in this section represents the situation as at September 2019:

- There is no specific management or coordination structure, management plan, budget or financing plan for the planned NETMABR as yet.
- Currently, all areas/zones within the planned NETMABR are managed by various Divisions and Departments of the THA. The THA has significant independence regarding Tobago's internal affairs within the twin island state of Trinidad and Tobago.
- The foundations for a NETPAMT, composed of 60% government representation and 40% CSO representation, have been laid in 2017. It is envisaged that the NETPAMT will implement the future NETMABR management plan and consolidate ongoing conservation, sustainable development and research/educational within the area.

17.1 MANAGEMENT AND COORDINATION STRUCTURE

17.1.1 WHAT IS THE LEGAL STATUS OF THE BIOSPHERE RESERVE?

There is no legal status that refers specifically to the nominated area.

17.1.2 WHAT IS THE LEGAL STATUS OF THE CORE AREA(S) AND THE BUFFER ZONE(S)?

The following key legislation applies to all three zones:

- Tobago House of Assembly Act Chap. 25:03, Act 40 of 1996 amended by 17 of 2006; which notably provides THA with the capacity to legislate for the protection of biodiversity and natural areas locally;
- Forest Act Chap. 66:01, Act 42 of 1915 amended by 23 of 1999;
- Conservation of Wildlife Act Chap. 67:01, Act 16 of 1958 amended by 31 of 1980;
- Sawmills Act Chap. 66:02, Act 35 of 1943 amended by 24 of 1999;
- The Environmental Management Act Chap. 35:05, Act 3 of 2000;
- Environmentally Sensitive Species Rules, 2001
- State Lands Act Chap. 57:01, Act 32 of 1918 amended by 25 of 2006;
- Fisheries Act Chap. 67:51, Act 39 of 1916 amended by 23 of 1975;
- Marine Preservation and Enhancement Act Chap. 37:02, Act 1 of 1970 amended by 37 of 1996;
- Territorial Sea Act Chap. 1:51, Act 38 of 1969 amended by 22 of 1986;
- Continental Shelf Act Chap. 1:52, Act 43 of 1969 amended by 23 of 1986;

The MRFR, Little Tobago and St Giles are protected areas under the Conservation of Wildlife Act (Chap. 67:01), the Forest Act (Chap. 66:01), the National Forest Policy (2011) and the Forest (Prohibited Areas) Order. The management of these three PAs is also supported by the State Lands Act (Chap. 57:01).

CEDP 2.0 for Tobago is a guiding policy document that promotes the diversification of the economy, preservation of the environment and a better standard of living for its people.

The Buffer and Transition Zones consist of public and private lands that are, in addition to the above-mentioned laws, governed by the laws of the Republic of Trinidad and Tobago such as Environmental Legislation, Summary Offences Legislation (Criminal), Fisheries Legislation etc.

17.1.3 WHICH ADMINISTRATIVE AUTHORITIES HAVE COMPETENCE FOR EACH ZONE OF THE BIOSPHERE RESERVE (CORE AREA(S), BUFFER ZONE(S), TRANSITION AREA(S))?

The Tobago House of Assembly Act grants the THA significant autonomy in the management of its internal affairs within the twin-island state of Trinidad and Tobago, including the management authority over the terrestrial and marine parts of the planned NETMABR.
There is no difference in the overall management authority for Core, Buffer, and Transition Zone.
The THA consists of 10 Divisions, each with various departments. The presiding Division is called: "Office of the Chief Secretary".
Each Division is headed by a political appointee addressed as Secretary. The highest public servant of each division holds the title of Administrator.
The highest public servant is the Chief Administrator who operates out of the Office of the Chief Secretary and supervises all Administrators in the THA.
The most relevant Divisions with specific management authority over the terrestrial and marine areas of the planned NETMABR are:

- the Division of Food Production, Forestry and Fisheries, and
- the Division of Infrastructure, Quarries and the Environment which houses the Department of the Environment, which is the appointed Focal Point for MAB for Trinidad and Tobago.

Divisions with a high interest in the planned NETMABR are:

- Division of Tourism, Culture and Transportation
- Division of Community Development, Enterprise Development and Labour

Other Divisions, mostly relevant to the Transition Zone are:

- Division of Education, Innovation and Energy
- Division of Sports and Youth Affairs
- Division of Settlements, Urban Renewal and Settlements
- Division of Health, Wellness and Family Development, and the
- Division of Finance and the Economy.

17.1.4. CLARIFY THE RESPECTIVE COMPETENCE OF EACH OF THESE AUTHORITIES. MAKE A DISTINCTION BETWEEN EACH ZONE IF NECESSARY AND MENTION ANY DECENTRALIZED AUTHORITY

The THA is a decentralised authority with far reaching competencies for the management of Tobago's internal affairs (including the NETMABR site) within the Republic of Trinidad and Tobago.

In order to answer this question, it must be noted that "competence" was interpreted as "mandate". Information provided by the Divisions and selected, relevant Departments within these Divisions, was used to describe the various mandates.

DIVISION OFFICE OF THE CHIEF SECRETARY

Departments:

Management Services Unit

The Management Services Unit is responsible for providing management consultancy services to all Divisions of the Assembly.

Information Department

The Department of Information is the publicity hub of the Assembly. Its main function is to keep the public informed about matters concerning the Assembly. The information is presented through television, radio, and the press.

Tobago Emergency Management Agency

The Tobago Emergency Management Agency is responsible for management of a comprehensive disaster management plan, which includes prevention, preparation for, and mitigation against disasters, as well as emergency response rehabilitation and recovery from such events

DIVISION OF INFRASTRUCTURE, QUARRIES AND THE ENVIRONMENT

The DIQE manages the policy and planning for the sustainable development of Tobago's infrastructural network, natural resources and space. Its foci therefore are to ensure the delivery

of infrastructure and systems that are safe, robust, intelligently designed and environmentally sensitive; to respond to local needs and enhance economic and social growth in Tobago and to promote the sustainable use and preserve the quality of air, land and water resources.

DIQEs core responsibilities are as follows: construction, development and maintenance of the road network and drainage systems; construction and maintenance of public buildings and facilities and environmental management and protection.

In the local context, DIQE acts for and on behalf of the EMA of Trinidad and Tobago in the execution of its regulatory function.

Department:

Department of the Environment

The DoE is charged with implementation of the Environmental Management Act and its Rules. This includes the ESS and ESA rules, which potentially can directly affect Protected National Area management on Tobago.

The DoE is also charged with the protection, preservation and Enhancement of Tobago's environment. Moreover, the Department promotes the sustainable use and management of our air, land and water for the benefit of current and future generations.

Services of the Department include:

Processing of environmental permits pursuant to the Environmental Management Act of 2000 including Certificates of Environmental Clearance , Noise Variations, Water Pollution Permits, Air Pollution Permits; Environmental Education; General environmental monitoring – noise levels, air quality, water quality and wetland health.; Coastal zone monitoring; Investigation of environmental complaints; Provision of technical assistance to various THA Divisions and stakeholders regarding the adoption of sector specific environmental management systems and best practices.

The DoE is the Focal Point for MAB in Trinidad and Tobago.

DIVISION OF FOOD PRODUCTION, FORESTRY AND FISHERIES

Mission: To affect the sustainable management of all our natural resources, the skilled development of our human resources and increased use of relevant technology to facilitate trade and a dynamic agro-business sector.

Vision: A Division with the capacity and determination to stimulate every sub- sector served by it to achieve the goal of maximising optimum output and grasping opportunities thereby contributing to a more vibrant Tobago Economy.

Departments:

Natural Resources and Forestry Department

Implements the Forest Act and Conservation of Wildlife Act, and has been administratively a separate Conservancy from Trinidad, administered by an Assistant Conservator of Forests who nominally reports to the Conservator or Forests in Trinidad, but who administratively reports to the Administrator of the Division of Food Production, Forestry and Fisheries of the THA.

Department of Agriculture

This Department is subdivided into two units:

Food Crop Production:

This Unit promotes agriculture as a viable business in order to increase the number of committed commercial and private agro-producers and improve agricultural production in Tobago through improvement of services and facilities extended to the farming community. In response to the changing demands for food on the island, food security has emerged as one priority of this unit. As a result of this, much attention has been directed towards the revitalisation and promotion of sustainable agriculture systems geared towards making Tobago self-sufficient in food crop production.

Livestock Production:

The activities of the Department of Livestock are carried out by three units namely: The Government Stock (Hope) Farm, Blenheim Sheep Project, Animal Health and Livestock Extension.

Together these units: Maintain an on-station genetic pool of the various breeds of livestock used in animal production in Tobago, the multiplication and sale of breeding stock (sheep, cattle, goats, rabbits, pigs and poultry) to farmers on the island, serve as a practical classroom for the training of students and farmers through the demonstration of the various aspects of animal husbandry and farm management involved in the rearing of the various classes of livestock. This includes housing, pasture management, feeds and nutrition, sanitation, breed selection and breeding. Operate disease control and prevention programs geared towards the maintenance of the health of the livestock population in Tobago through the Veterinary Section which offers, ambulatory, laboratory and regulatory services. Assist farmers in expanding their units through the provision of artificial insemination services.

Department of Marine Affairs and Fisheries

This Department is responsible for the sustainable Management of Tobago's Marine Resources from the coastline to a distance of 6 nautical miles offshore and implements the Marine Preservation and Enhancement Act Chap 37:02. The Department is subdivided into two Units:

Fisheries and Aquaculture Unit:

The Fisheries and Aquaculture Unit is responsible for the development and management of the fishing industry in Tobago. Its duties involve resolving conflicts in the Fishing Industry, training fishers, processors, vendors, and other stakeholders in the industry, in new equipment and techniques in fishing and fish marketing and safety measures and monitoring the fish resources surrounding the island.

Marine Areas Unit:

The Marine Areas Unit has responsibility for the marine and coastal resources around Tobago. Some of the duties include developing an integrated coastal zone management plan that would involve methods of including the community members in the management of the marine resources and researching ways and means of reducing pollution and the degradation of the reefs, mangroves, and sea grass beds.

DIVISION OF TOURISM, CULTURE AND TRANSPORTATION

The Division is charged with the responsibility of establishing, standardising and sustaining the island's tourism product in a manner consistent with the repositioning strategy for Tobago as a tourist destination.

DIVISION OF COMMUNITY DEVELOPMENT, ENTERPRISE DEVELOPMENT AND LABOUR

The Division of Community Development, Enterprise Development and Labour is geared essentially towards the promotion and preservation of our cultural heritage.

Vision: Building Families, Sustaining Culture, Preserving Communities, Changing Lives.

Mission: Transforming the quality of lives of all Tobagonians by mobilising and empowering communities, promoting and showing respect to our culture for the benefit of our people.

DIVISION OF EDUCATION, INNOVATION AND ENERGY

The Division of Education, Innovation and Energy is mandated to provide access to educational institutions and programmes in Tobago, including quality early childhood, primary and secondary education, to achieve the holistic development of the child. The Division is also responsible for providing efficient service and support systems for Tobago's youth, through social education and holistic development so as to empower and maximise potential. The provision and maintenance of sporting facilities, as well as the development of sporting programmes and support to sporting organisations is also under the remit of the Division.

VISION: An effective and professional organization committed to the optimal intellectual, physical and social development of its clientele.

MISSION: To provide an environment that promotes and supports holistic development and lifelong learning through relevant, innovative and well-conceived educational, sporting and youth-oriented programmes, thus enabling all persons to achieve their full potential as productive citizens.

DIVISION OF SETTLEMENTS, URBAN RENEWAL AND SETTLEMENTS

The Department of Settlements is the arm of the THA responsible for providing affordable housing for Tobagonians and the administration of home improvement grant and subsidy programmes.

DIVISION OF SPORTS AND YOUTH AFFAIRS

The Division is mandated to provide and maintain sporting facilities across Tobago, as well as the development of sporting programmes and support to sporting organisations. It is also responsible for providing efficient service and support systems for Tobago's youth, through social education and holistic development so as to empower and maximise potential.

DIVISION OF HEALTH, WELLNESS AND FAMILY DEVELOPMENT

The Division of Health, Wellness and Family Development is committed to the delivery of professional services and leadership on environmental matters through health promotion and education / enforcement of regulations and advice.

Mission: To provide a service for the maintenance and enhancement of personal and community health, through the application of sound environmental health principles of disease prevention, health promotion and protection.

DIVISION OF FINANCE AND THE ECONOMY

The Division is committed to ensuring that the financial business of the Assembly is conducted with professional integrity and responsibility, and that the public funds of the THA, are properly safeguarded and are applied only for the purposes intended by Parliament and properly reflected in the Accounts of the THA.

Departments:

Finance Department

The Finance Department can be further subdivided into the Units including the Budgets Section which is responsible for disbursing funds allocated and released by the Ministry of Finance to the THA; Customs and Excise which facilitates trade, collects revenue to the State and combats smuggling; Inland Revenue which collects revenue and taxes on behalf of the Assembly; District Revenue Services collects Land and Building Taxes; Internal Audit which conducts independent appraisal of existing systems and controls within the various Divisions of the THA; Data Processing which provides Payroll services to all Departments of the THA; and the Accounting Unit.

Enterprise Department

The Enterprise Department is an amalgamation of the Cooperative Unit, the Consumer Affairs Unit and the Business Development Unit. Its mission is "fostering successful business activity in Tobago". This is being achieved through, expansion and efficiency in the growth of the small and micro enterprise sectors, the strengthening of the cooperative Credit Union sector and the development of Consumer awareness among residents of Tobago.

Mission: To manage and safeguard all finances of the THA, through effective and efficient planning, implementation, auditing and enforcement functions in accordance with existing legislation to the benefit of the THA and all residents of Tobago.

Vision: To achieve excellence in financial activities, entrepreneurial development and enforce the law with regards to revenue collection.

17.1.5 INDICATE THE MAIN LAND TENURE (OWNERSHIP) FOR EACH ZONE

Core Zone: All lands in the Core Zone are owned by the state.

Buffer Zone: The entire marine area of NETMABR belongs to the state; the vast majority of the terrestrial area is privately owned.

Transition Zone: Almost all of the Transition Zone is privately owned.

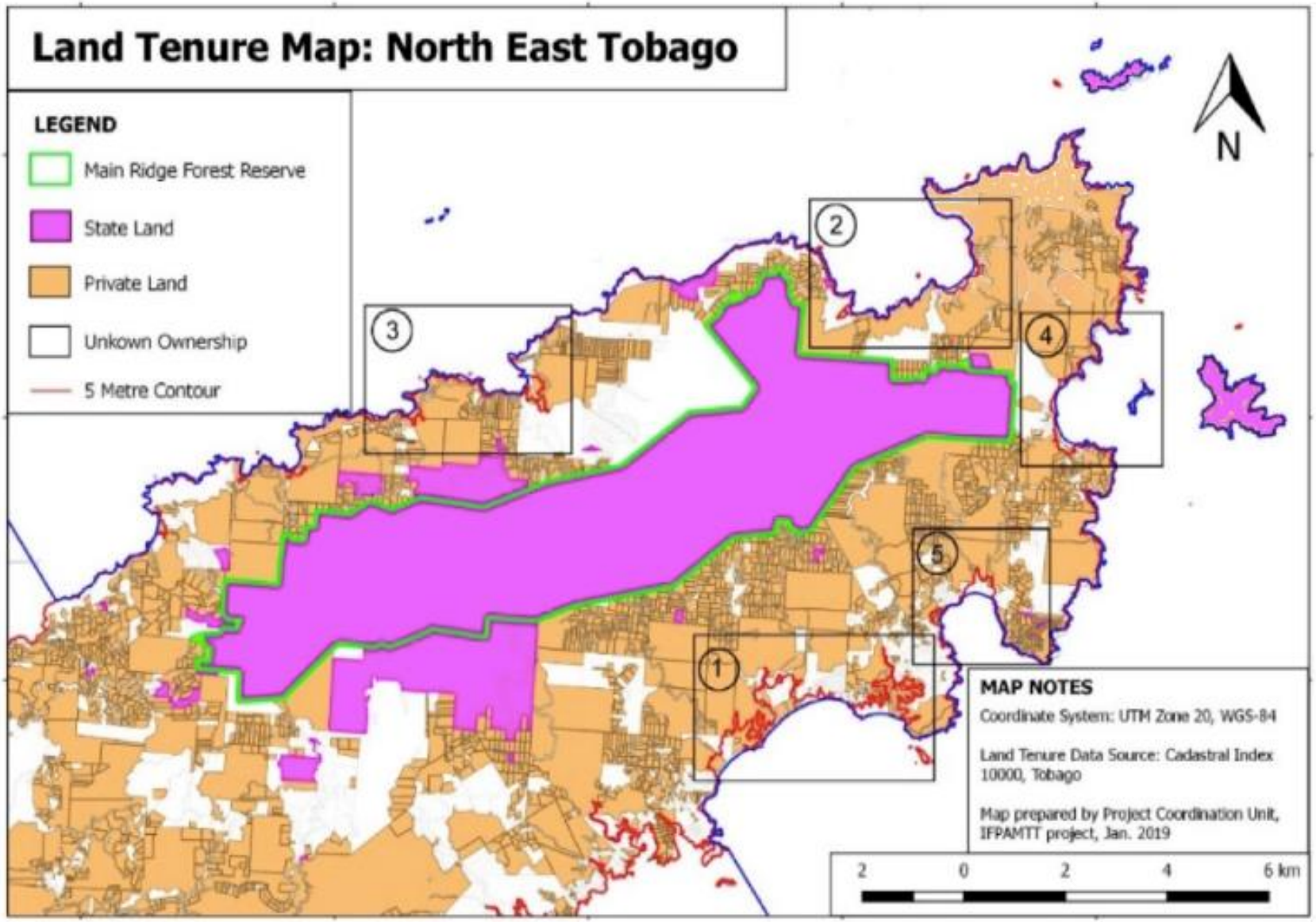


Figure 62 Land tenure in NE Tobago.

Please note that there might be minor inaccuracies on figure 62 regarding land tenure of “Unknow Ownership”.

17.1.6 IS THERE A SINGLE MANAGER/COORDINATOR OF THE BIOSPHERE RESERVE OR ARE SEVERAL PEOPLE IN CHARGE OF MANAGING IT?

"If one manager/coordinator, who designates and employs him/her (national authorities, environmental administrative agency, local authorities)?"

The planned NETMABR is not yet a functional unit and as such does not have a designated authority and associate staff as yet.

As described above, there are several Divisions, Departments and persons in charge of managing the different aspects of the area.

17.1.7 ARE THERE CONSULTATIVE ADVISORY OR DECISION-MAKING BODIES (E.G., SCIENTIFIC COUNCIL, GENERAL ASSEMBLY OF INHABITANTS OF THE RESERVE) FOR EACH ZONE OR FOR THE WHOLE BIOSPHERE RESERVE?

"If yes, describe their composition, role and competence, and the frequency of their meetings."

There are no specific consultative advisory or decision-making bodies for any of the zones or for the whole BR.

However, from 2013 to 2020, the above-mentioned IFPAM Project, which implemented conservation related projects within the area of the proposed NETMABR, was advised by a steering committee comprising of approximately 20 representatives from governmental, non-governmental and academic sectors. Its regular meetings facilitated, for the first time in the conservation history of NE Tobago, a collaborative effort leading towards improved relationships between the sectors and co-implemented activities.

Table 24 IFPAM NE Tobago Stakeholders represented on the local Steering Committee.

Governmental Organisations	Non-Governmental Organisations
Department of Natural Resources and Forestry (THA)	Bloody Bay Main Ridge Nature Explorers
Department of Environment (THA)	Bloody Bay Fisher Folk

Governmental Organisations	Non-Governmental Organisations
Division of Finance and Enterprise (THA)	Castara Tourism Development Association
Department of Marine Resources and Fisheries (THA)	ERIC
EMA	ET
Institute of Marine Affairs	L'Anse Fourmi Village Council
	Parlatuvier Village Council
	Speyside Eco Marine Park Rangers
	UWI
	Tobago Hotel and Tourism Association
	Tobago Hunters Group
	University of the Southern Caribbean

The IFPAM Project ends in May 2020; however, members of the steering committee have agreed to continue meetings to coordinate conservation efforts leading to improved participatory co-management of the area.

17.1.8 HAS A COORDINATION STRUCTURE BEEN ESTABLISHED SPECIFICALLY FOR THE BIOSPHERE RESERVE?

"If yes, describe in detail its functioning, composition and the relative proportion of each group in this structure, its role and competence.

Is this coordination structure autonomous or is it under the authority of local or central government, or of the manager/coordinator of the biosphere reserve?"

There is no specific coordination structure for the NETMABR.

However, in light of the conclusion of the IFPAM Project and the intention to nominate NE Tobago as a BR, governmental and civil society stakeholders approached the THA in 2017 with the concept of establishing a NETPAMT.

In September 2017, the Executive Council of the THA accepted the proposal as expressed in an Executive Council Note. An Interim Board of the Trust was established and the Trust legally registered in 2019.

Currently the DIQE is seeking support from the IDB to secure technical expertise for designing the governance and operational structure of the Trust as well as develop corporative policies, budgets and Monitoring & Evaluation protocols.

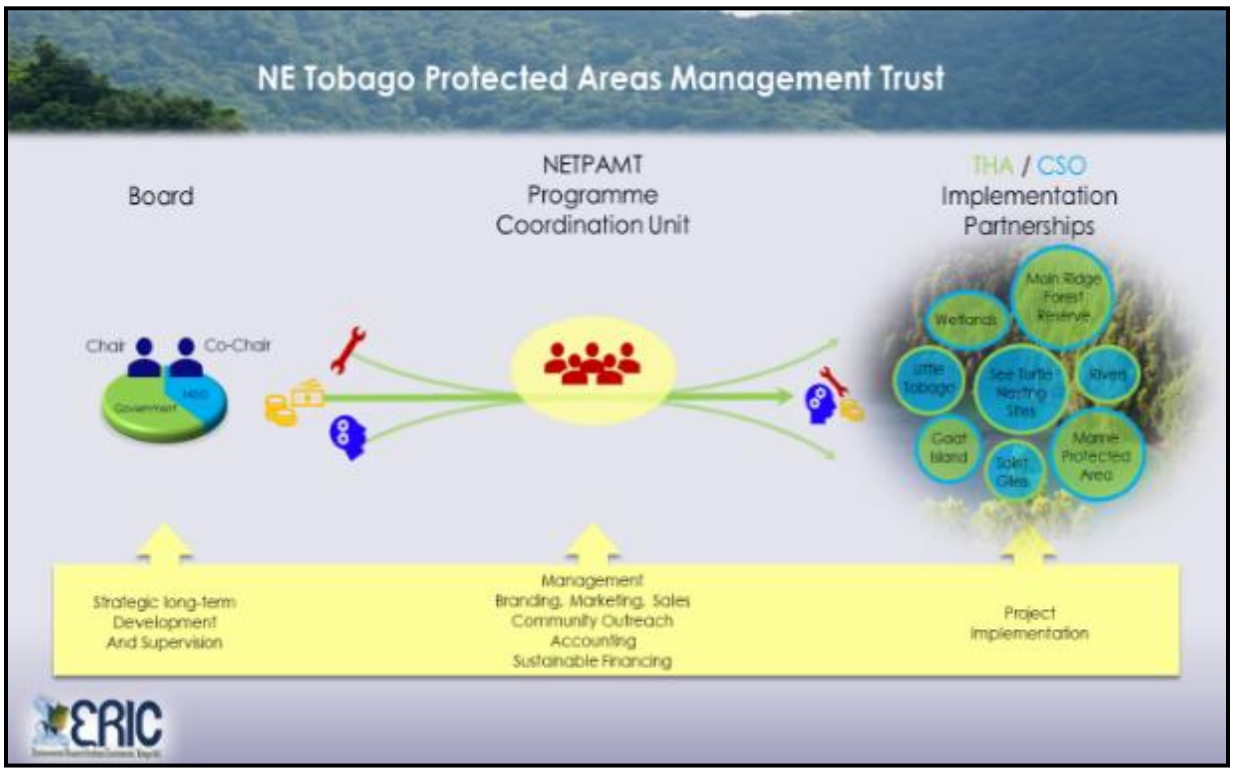


Figure 63 Potential Structure for NE Tobago Protected Areas Management Trust.

This approved concept proposes to improve management of NE Tobago's protected area ecosystems and uplift associated sustainable livelihoods in adjacent communities. The THA would vest in the Trust management responsibility for current and future protected areas in NE Tobago including NNH Sites and the potential UNESCO BR.
Board Members would be selected amongst governmental and non-governmental stakeholders.

Representation required on Board of the Trust

Key stakeholders from:

- THA
- NGOs with a related mandate in NE Tobago.
- Communities/villages surrounding the MRFR
- Resource users (tour guides, taxi operators, hotels and guest house operators etc.)
- Private sector
- Academia

Skill set required for the Board of the Trust

- Sustainable/ responsible entrepreneurship initiation and promotion
- Environmental management
- Stakeholder capacity building

- Participatory management
- Rural community development
- Product development and marketing

ROLE OF THE NETPAMT

- assume responsibility for PAMPs developed under IFPAM;
- implement projects and programmes that support the integrity, viability, sustainability of the ecosystems vested in the Trust (*such as the NETMABR*);
- secure other funding sources outside of THA subventions and collectable fees;
- develop, implement and monitor plans, projects and programmes relating to the management of protected areas according to PAMPs. This will include the submission of bi-annual reports specifying progress or setbacks in accomplishing goals;
- develop an annual operational plan prior to October of each year informed by PAMPs. This plan will be formulated in a participatory manner with stakeholders and contain a detailed budget identifying sources of funding;
- promote public awareness of the ecological systems and natural resources of NE Tobago Protected Areas and their importance in sustaining livelihoods on the island;
- promote and support sustainable livelihoods of community members in and around NE Tobago Protected Areas through aggressively pursuing synergies with established initiatives and utilising innovative approaches;
- drive the development and promotion of NE Tobago Protected Areas as lead ecotourism product;
- maintain in good order and repair all infrastructure in collaboration with the THA;
- contribute to the establishment and maintenance of a database to guide decision-making. This would include conducting visitor surveys and compiling information from study visits of researchers; and
- collect on behalf of the THA in a manner agreed upon, any fees payable by users of NE Tobago Protected Areas and use those fees as unrestricted funds according to its mandate

Reporting relationships

The following diagram illustrates the proposed reporting relationship of the Trust to the Executive Council of the THA.

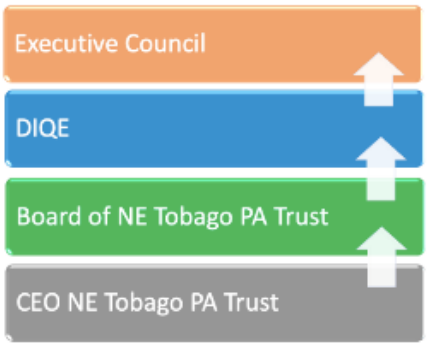


Figure 64 Proposed reporting relationship of the Trust to the Executive Council of the THA

ROLE OF THE THA

- transfer management power over the entrusted sites / areas to the Trust including enforcement powers;
- nominate THA representatives to the Trust board;
- provide relevant information in a timely manner to the Trust to effectively perform the role of the custodian;
- monitor the progress of the implementation of the PAMPs for the sites / areas;
- authorise the Trust to collect on its behalf, in a manner agreed upon, any fees payable by users and to use such fees as unrestricted income within the boundaries of its mission and mandate;
- identify and assign a representative of the THA who shall be the official liaison between the Trust and the THA, and
- provide yearly subventions to the Trust to effectively manage the sites / areas.

Safeguards for accountability and transparency

The following are measures included to contribute to accountability and transparency:

- annual technical reports and independent financial audits presented to the THA Chamber and available to the public;
- documentation of decisions made at meetings of the Board of the Trust;
- compliance with articles on incorporation under the Companies Act Chap. 81:01; and
- abiding by bylaws to govern the operations of the Trust particularly with reference to procurement

17.1.9 HOW IS THE MANAGEMENT/COORDINATION ADAPTED TO THE LOCAL SITUATION?

The current management of the area is fully adapted to the local situation and has not significantly changed over the past decades.

17.1.10 IS THERE A PROCEDURE FOR EVALUATING AND MONITORING THE EFFECTIVENESS OF THE MANAGEMENT?

Not currently; however, Monitoring & Evaluation protocols will be included in the future NETMABR management plan.

17.2 CONFLICTS WITHIN THE BIOSPHERE RESERVE

17.2.1 DESCRIBE ANY IMPORTANT CONFLICTS REGARDING THE ACCESS OR THE USE OF NATURAL RESOURCES IN THE AREA CONSIDERED (AND PRECISE PERIOD IF ACCURATE)

"If the biosphere reserve has contributed to preventing or resolving some of these conflicts, explain what has been resolved or prevented, and how this was achieved for each zone."

There are no major conflicts amongst stakeholder groups regarding the access or use of natural resources.

Minor, irregular conflicts relate mostly to breaching of laws/regulations and include:

- fishing by non-national vessels (e.g. from Barbados and Venezuela) within the planned NETMPA,
- hunting during off – season,
- poaching of seabirds,
- use of monofilament fishing gear,
- illegal logging,
- catching of protected songbirds, and
- harvesting of fully protected sea turtles/turtle eggs.

17.2.2 IF THERE ARE ANY CONFLICTS IN COMPETENCE AMONG THE DIFFERENT ADMINISTRATIVE AUTHORITIES IN THE MANAGEMENT OF THE BIOSPHERE RESERVE, DESCRIBE THESE

While there are no direct conflicts of competence or mandate between the different Divisions and Departments, there are grey areas of overlapping responsibilities which lead to uncertainties and sometimes delayed action, or inaction regarding violations of laws or regulations.

17.2.3 EXPLAIN THE MEANS USED TO RESOLVE THESE CONFLICTS, AND THEIR EFFECTIVENESS

Currently conflicts related to the use or management of natural resources are solved either based on personal relationships or through stakeholder meetings.

Especially since 2013, the regular meetings of the IFPAM Steering Committee for Tobago provided a platform on which governmental and non-governmental stakeholders were able to identify, discuss and recommend solutions for conflicts.

Furthermore, the Draft Management Plans (2019) for the MRFR and the planned MPA in NE Tobago were developed through in-depth stakeholder consultations, identifying issues and providing strategies to resolve those.

The practised approach to conflict resolution has created a situation where conflicts are temporary and more on an individual level than involving entire stakeholder groups.

It is expected that the establishment of the NETMABR and the associated formation and regular meetings of stakeholder groups will allow for improved conflict resolution.

17.3 REPRESENTATION, PARTICIPATION AND CONSULTATION OF LOCAL COMMUNITIES

17.3.1 AT WHAT STAGES IN THE EXISTENCE OF A BIOSPHERE RESERVE HAVE LOCAL PEOPLE BEEN INVOLVED

"Design of the biosphere reserve, drawing up of the management/cooperation plan, implementation of the plan, day to day management of the biosphere reserve? Give some specific examples."

The planned NETMABR is currently in its primary design stage which is characterised by compiling information relevant to this nomination form and supporting documentation.

All persons directly involved in Tobago are "local people" due to the size of the island, the size of the planned NETMABR and its potential impact on all residents in Tobago.

This further implies that all governmental (THA) representatives involved in this nomination stage are "local people" as well, including the director and staff of the UNESCO MAB Focal Point organisation (DoE, THA).

For the preparation of this document over 20 meetings with around 160 attendees (50% men, 50% women) have been held (Table 25 and 26) informing stakeholders about the nomination process, purpose, progress and content. Comments and recommendations were recorded and used to refine the nomination form at hand. Participants were asked to endorse the nomination. The meetings included Village Councils, Police Youth Clubs, ENGOs, schools, representatives of political parties, Directors and staff of THA Departments, and the Executive Council of the THA (consisting of Secretaries of all Divisions).

Table 25 Key Stakeholder Meetings

Date & Location	Group	Comments, Suggestions, Actions
18th January 2019 at ERIC	Farley Augustine (NE Tobago area representative)	
4th April 2019 at DIQE	THA Divisions: Division of Sport and Youth Affairs, Division of Tourism, Culture and Transportation, DMRF, Division of Finance and the Economy, DoE, Division of Education, Innovation and Energy	**C:** Concerns were raised about who is responsible for the maintenance of the UNESCO MAB status after designation, ways to engage groups socially and enforcing regulations and restrictions in environmentally sensitive areas. **S:** Reach out to church groups and heads of Division. **A:** The presentation was sent to all Divisions who attended and did not attend. The respective Departments received information packets to answer questions needed for the nomination file.
9th April 2019 at DNRF	Forestry Division	
10th April 2019 at Parlatuvier Community Centre	Main Stakeholders: DNRF, Speyside High School, ET, DoE, Castara Tourism Development Agency, DMRF, Speyside Eco-Marine Park Rangers, Main Ridge Tour Guide Association, Parlatuvier Village Council, Bloody Bay Fisherfolk, NETPAMT, Tobago Dive Experience	**C:** Concern was expressed over the boundaries of zones, means of funding to do projects, the lack of jobs for young people and the brain drain. Hopes were that with attaining MAB status there would be more jobs available. **S:** The entire island of Tobago should be included but it was later decided that the process would start with NE Tobago and the rest gradually added. **A:** The audience was informed the boundaries of zones are not fixed and can be adjusted on a map. The adjustments were noted.
15th April 2019 at DNRF	Forestry Division	
16th May 2019	NTTT	
17th May 2019 at Ministry of	UNESCO Representative; Acting Secretary General	

Education, Trinidad		
25th July 2019	UNESCO Representative; Secretary General	
28th August 2019	UNESCO MaB Consultation	

Table 26 Community Meetings

Date & Location	Group	Comments, Suggestions, Actions
24th April 2019 at Parlatuvier Community Centre	Parlatuvier Community	**C:** There was no turn out at this meeting. **A:** A meeting was rescheduled for the following week.
25th April 2019 at Belle Garden Facility	Belle Garden Community	There was no turn out at this meeting. **A:** It was decided to target smaller groups within the area.
30th April 2019 at Parlatuvier Community Centre	Parlatuvier Community	**C:** Individuals asked about the process to apply for nomination and what level of commitment is needed from villages, whether or not THA backed the project, the limit in jobs in Tobago and brain drain.
1st May 2019 at Speyside High School	Speyside Community	**C:** Questions were asked about how difficult the process will be to get villagers to change their ways and live more sustainably but it was explained that it will happen over time and not overnight. Opportunities for tour operators were raised, zones and what is allowed and not allowed, ways in which MAB would affect the protection of the reefs and how, the importance of everyone working together as a village to make a difference rather than individually, enforcement of regulations and conservation and location of the protected zones and unprotected areas. **S:** Restrict overfishing and regulate size of catch. Meetings should be held in a more open area rather than in the school.

2nd May 2019 Castara Community Centre	Castara Community	**C:** One person from the youth division attended. **S:** Smaller groups should be targeted.
3rd May 2019 at Bloody Bay	Bloody Bay Community	**C:** There was no turn out at this meeting.
4th May 2019 at Parlatuvier Community Centre	Parlatuvier Community	**C:** There was no turn out at this meeting.
5th May 2019 in L'Anse Fourmi	L'Anse Fourmi Community	**C:** The meeting was cancelled.
7th May 2019 at Charlotteville Library	Charlotteville Community	
13th May 2019 at Speyside High School	Speyside High Students	**C:** Students discussed issues that affected them.
1st June 2019 at Roxborough Police Youth Club	Roxborough Police Youth Club	**C:** Just met with Collis Hazel
16th June 2019 at Belle Garden Facility	Belle Garden Youth Club	**A:** A youth day is being planned for the club members where UNESCO MAB will be discussed.
18th July 2019 in Moriah	Moriah Police Youth Club	**C:** Topics like the need for projects and jobs for young people in Moriah was discussed. Members asked about protected areas and if there would be limitations to activities. They discussed ways in which the group can get involved. **A:** The group will come up with programmes and ways in which they can utilise the UNESCO MAB.
20th July 2019 in Bloody Bay	Bloody Bay United Raiders	**C:** Discussed how they can communicate and participate. The was particularly interested in agriculture.
24th July 2019 in L'Anse Fourmi	Main Ridge Nature Explorers	**C:** Like ideas of limitations and restrictions. Expressed concern over culture being less and less authentic.

		Talked about how their fishing areas are now further out. They wanted to find out how they can contribute.
5th August 2019 at Roxborough Police Youth Club	Roxborough Police Youth Club	**C:** Particular interest expressed in preserving culture. The idea of the programme was liked and well received. **S:** More should be done via social media. A greater emphasis should be placed on communicating with church groups.

All meeting attendance sheets can be found in the Annex.

17.3.2 DESCRIBE HOW THE LOCAL PEOPLE (INCLUDING WOMEN AND INDIGENOUS COMMUNITIES) HAVE BEEN, AND/OR ARE REPRESENTED IN THE PLANNING AND MANAGEMENT OF THE BIOSPHERE RESERVE

As stated above, all persons involved (except the UNESCO Secretary General for Trinidad and Tobago and the National Commission for UNESCO of Trinidad and Tobago, which provided comments on the draft document) are local people.
As documented by the attendance sheets, women were well represented at all stakeholders levels and consultations, which also reflects the prominent role women play in public discourse.
There are no indigenous people in Tobago.

17.3.3 DESCRIBE THE SPECIFIC SITUATION OF YOUNG PEOPLE IN THE PROPOSED BIOSPHERE RESERVE

"E.g., potential impacts of the biosphere reserve on youth, consideration of their interests and needs, incentives to encourage them to participate actively in the governance system of the biosphere reserve."

Opportunities for young persons in NE Tobago are quite limited. Extracurricular educational and recreational activities are very intermittent and public transportation to reach events often difficult. This results in a serious "brain-drain" situation caused by young adults seeking education and entertainment in south west Tobago, Trinidad and, if affordable, outside of the country. For those having received higher education, finding employment opportunities can be challenging and accordingly there is not much incentive to return home and contribute to sustainable

development. Currently young people engage mainly in police Youth Clubs, sports, church related activities, and arts (largely dance).

During stakeholder consultations, MAB related projects and programmes were discussed that would specifically address the interests and needs of young persons, this included, but was not limited to:

- facilitating youth communication and exchange programmes within the IBERO MAB Network and the World Network of Island and Coastal Biosphere Reserves,
- twinning of the planned NETMABR with another BR preferably in Europe or North America facilitating youth communication and exchange programmes related to sports, culture/arts, religion, education etc;
- establishment of a campus for sustainable development and natural resource management in SIDS in collaboration with an accredited international university; and
- actively incorporating young persons in all aspects of the implementation of the planned NETMABR including curricular additions, implementation of projects regarding cultural and natural heritage, and representation on advisory councils to the future NETMABR management structure.

17.3.4 WHAT FORM DOES THIS REPRESENTATION TAKE

Currently, there two principal forms of representation in NE Tobago:

Political:

- Tobago East is one of two constituencies in Tobago regarding national elections. The Tobago East parliamentary representative is elected mainly in the planned NETMABR.
- Four of the 12 electoral districts for the THA elections are either fully or partly within the planned NETMABR.

Those representatives have either been participating in consultation meetings regarding the NETMABR or relevant documents were shared.

Civil Society Organisations:

- ENGOs
- Business Associations (fisherfolk, farmer, tourism, dive, tour-guide associations)
- Village Councils
- Cultural Heritage Groups
- Police Youth Clubs
- Church Groups
- Sport Groups

Over the past five years representatives of ENGOs, business associations, village councils have been actively participating in the implementation of the IFPAM Project in NE Tobago and have been represented on its steering committee. The outreach regarding the intention to nominate the NETMABR engaged approximately 70% of these organisations.

The NETPAMT is expected to consist of a Board with a 60% government and 40% CSO representation. The Board will be consulting with a NE Tobago advisory panel that will be open to any functional civil society organisation from NE Tobago that is not represented on the Board.

17.3.5 ARE THERE PROCEDURES FOR INTEGRATING THE REPRESENTATIVE BODY OF LOCAL COMMUNITIES

There has never been a functioning, representative body of local communities in Tobago, except representation by political parties.

It is important to note that all stakeholders, even the representatives of political parties, recommended to de-politicise the MAB application and future operation. This is a similar recommendation as for other conservation activities or projects based on the experience that the impression of political bias may hinder the process; which is unfortunately often the case in small island states.

Communities in NE Tobago are often, partially represented by heads of village councils or heads of other, prominent community-based organisations.

A meeting of such representatives was held on 10 April 2019 to establish buy-in for the MAB Nomination process and included representatives of:

- Speyside High School
- ET
- Tobago Dive Experience / Association of Tobago Dive Operators
- Castara Tourism Development Association
- Speyside Eco Marine Park Rangers
- Main Ridge Nature Explorers
- Bloody Bay Fisher Folk Association
- NETPAMT
- Parlatuvier Village Council
- DMRF
- DoE
- DNRF

All present organisations agreed to continue the process and to be included and publicly mentioned as promoters of the MAB nomination for NE Tobago.

Figure 65 Initial NE Tobago MAB nomination key stakeholder consultation meeting (ERIC)

17.3.6 HOW LONG-LIVED ARE CONSULTATION MECHANISMS (PERMANENT ASSEMBLY, CONSULTATION ON SPECIFIC PROJECTS)?

Consultation mechanisms regarding natural and cultural heritage in NE Tobago are project specific and last, depending on the scope of a project, from several weeks to years.
Annual heritage events are planned in collaboration just some weeks before the actual event, while the consultations for the IFPAM Project started in 2013 and are expected to continue until 2020.

17.3.7 WHAT CONSULTATION MECHANISMS HAVE BEEN USED, AND WHO HAS BEEN INVOLVED? ARE THEY FOR SPECIFIC PURPOSES OR LONG-TERM?

"What impacts have they had on decision-making processes (decisional, consultative or merely to inform the population)?"

The consultation mechanisms are project specific and the degree of consultation varies significantly.
Some natural and cultural heritage projects are mainly driven by community groups and governmental stakeholders are not participating or invited as observers, mentors, facilitators of funders; this applies for example to the planning and execution of the Tobago Heritage events.
Governmentally and private sector driven projects are normally presented to the communities, as required under the Environmental and Social Impact Assessment Rules regarding issuing of a Certificate of Environmental Clearance. The level of consultation depends on the facilitator and stretches from informing to decision making.

In case of the recent IFPAM Project, governmental and non-governmental stakeholders formed a steering committee with decision making power regarding the implementation of the project over a period of seven years. This has been the first time in the history of protected area conservation and management in Tobago that civil society organisations were treated as equal partners.

17.3.8 DO WOMEN PARTICIPATE IN COMMUNITY ORGANIZATIONS AND DECISION-MAKING PROCESSES? ARE THEIR INTERESTS AND NEEDS GIVEN EQUAL CONSIDERATION?

"What incentives or programmes are in place to encourage their representation and participation (e.g.: was(were) a "gender impact assessment(s)" carried out)?"

Most persons engaged in community organisations are women and it can be stated that they are demonstrably capable to express their interests and needs.

17.4. THE MANAGEMENT/COOPERATION PLAN/POLICY

17.4.1 IS THERE A MANAGEMENT/COOPERATION PLAN/POLICY FOR THE BIOSPHERE RESERVE AS A WHOLE?

There is no specific Management Plan for the planned NETMABR at this point.

The NETMP is still the guiding document for the development of the area, but does not refer to the plans to nominate a BR.
Once approved, a management plan will be developed within 24 months in a participatory manger.
However, in 2019, two draft management plans were developed for parts of the planned NETMABR under the FAO led IFPAM Project.

- For the MRFR Core Area: "Management Plan for the Main Ridge Forest Reserve Protected Area 2019-2029"
- For the Marine Buffer Zone: "Management Plan for the North-East Tobago Marine Protected Area 2019-2029; both plans are currently under review and approval can be expected by the end of 2019.
- The 2018 Cabinet approved NPASP also recommends the designation of 20 protected areas within the NETMABR.

- A report drafted by an MPA Specialist Team in 2013, also done under the IFPAM Project, contains recommendations regarding ecosystem-based management, monitoring and conservation strategies for the planned MPA.

The above-mentioned documents, all of which included in-depth stakeholder consultations, provide an excellent foundation for the development of an encompassing management plan for the NETMABR area.

17.4.2 WHICH ACTORS ARE INVOLVED IN PREPARING THE MANAGEMENT/COOPERATION PLAN? HOW ARE THEY INVOLVED?

As for the documents mentioned above, the management plan for NETMABR will be developed by a technical expert team in close consultation with and reviewed by governmental agencies and civil society organisations within the NETMABR.
The board of the future NETPAMT and the Office of the Chief Secretary would be the final authorities to approve the management plan.

17.4.3 DO LOCAL AUTHORITIES FORMALLY ADOPT THE MANAGEMENT/COOPERATION PLAN? ARE LOCAL AUTHORITIES MAKING REFERENCE TO IT IN OTHER POLICIES AND/OR PLANS? IF SO, PLEASE PROVIDE DETAILS

The NETMP, developed in 2003, has been approved by local authorities, is still the guiding document for development in NE Tobago and is mentioned in the other policies and plans mentioned above.
The NPASP has been approved by the Cabinet of Trinidad and Tobago (2019) and relevant aspects presented to the Executive Council of the THA. The latter applies also to the two management plans for the MRFR and NETMPA.

17.4.4 WHAT IS THE DURATION OF THE MANAGEMENT/COOPERATION PLAN? HOW OFTEN IS IT REVISED OR RENEGOTIATED?

The NETMP, is still in use, but has not been revised since then.
The two, draft management plans for the MRFR and NETMPA have a duration of ten years with a recommended revision after five years.
It is recommended that the future NETMABR Management Plan should also have a twenty-year duration with revisions every five years.

17.4.5 DESCRIBE THE CONTENTS OF THE MANAGEMENT/COOPERATION PLAN

"Does it consist of detailed measures or detailed guidelines? Give some examples of measures or guidelines advocated by the plan? (Enclose a copy)."

The Management Plan for the NETMABR should include, but not be necessarily limited to, aspects that were used in the drafting of the two management plans for the MRFR and the NETMPA. As an example, the table of contents of the MRFR management plan is as follows:

1. Executive Summary
2. Introduction
    a. Background and Context
    b. Purpose and Scope
    c. Management Planning Process
3. Description of the PA
    a. Significance and Role
    b. Management Framework
    c. Land Tenure and Rights
    d. Physical Features
    e. Ecology
    f. Biodiversity
    g. Cultural and Historical Context
4. SWOT Analysis
    a. Biodiversity Conservation
    b. Livelihoods and Socio-Economic Development
    c. Limits of Acceptable Change
5. Management Vision and Objectives
    a. Vision
    b. Mission
    c. Objectives
6. Management Arrangement and Strategies for Implementations
    a. Roles for Participatory Management
    b. Management Agreements
    c. Strategies and Actions
    d. Management Constraints
7. Zoning

8. Stakeholder Roles and Responsibilities
9. Stakeholder Engagement and Communication Plan
10. Grievance Mechanisms
11. Budget
12. Financing
13. Work Plan
14. Monitoring and Evaluation

17.4.6 INDICATE HOW THIS MANAGEMENT/COOPERATION ADDRESSES THE OBJECTIVES OF THE PROPOSED BIOSPHERE RESERVE (AS DESCRIBED IN SECTION 13.1)

The management objectives, described in 13.1, as well as those described in the two management plans for MRFR and NETMPA and the NETMP will be the baseline to develop specific objectives for the NETMABR. The organisational structure and operative strategies of the plan must address and align with these objectives.

17.4.7 IS THE PLAN BINDING? IS IT BASED ON A CONSENSUS?

The NETMABR Management Plan will be based on consensus of all key stakeholders. It will be the principal guiding document for the management of the NETMABR and the basis for Monitoring & Evaluation of the management organisation(s).
While it would be desirable, it is currently unlikely that the plan will be legally binding.

17.4.8 WHICH AUTHORITIES ARE IN CHARGE OF THE IMPLEMENTATION OF THE PLAN, ESPECIALLY IN THE BUFFER ZONE(S) AND THE TRANSITION AREA(S)? PLEASE PROVIDE EVIDENCE OF THE ROLE OF THESE AUTHORITIES

The principal authority in charge of the implementation of the plan will be the THA through its various Divisions and Departments as explained above.
Specifically, this will be the DoE, the DNRF, the DMRF and the Division of Tourism, Culture and Transportation.
However, it is the intention to operationalise the NETPAMT in the near future, which will then have responsibilities specifically regarding the implementation of the plan in relation to natural and cultural heritage.

17.4.9 WHICH FACTORS IMPEDE OR HELP ITS IMPLEMENTATION (E.G.: RELUCTANCE OF LOCAL PEOPLE, CONFLICTS BETWEEN DIFFERENT LEVELS OF DECISION-MAKING)

Key factors with the potential to impede the implementation of a management plan are:

- the NETMABR will be the first BR in Trinidad and Tobago; as such stakeholders will require time to gain additional experience and skills needed for successful implementation;
- while access to funding seems to be highly likely (see below), start-up funding must come directly from government to finance a first year of down-scaled operations, drafting of the management plan and applications for funding;
- once funding is secured or highly likely it will have significant impact on an area with just 11,000 residents; this might cause conflicts over positions of influence and spending allocations.

Key factors that will help with the implementation of the management plan are:

- bipartisan political support;
- alignment with all relevant local and national development plans and policies;
- the existing capacity of CSOs in the area;
- the NPASP includes explicit requirements for co-management of public protected areas; and
- the shared experiences of key stakeholders related the IFPAM Project from 2013-2020.

17.4.10 IS THE BIOSPHERE RESERVE INTEGRATED IN REGIONAL/NATIONAL STRATEGIES? VICE VERSA, HOW ARE THE LOCAL/MUNICIPAL PLANS INTEGRATED IN THE PLANNING OF THE BIOSPHERE RESERVE?

This nomination document is so aligned, and the future management plan will be aligned with the NETMP, the CEDP for Tobago, the NPASP, and the "Vision 2030: The National Development Strategy of Trinidad and Tobago 2016-2030".

17.4.11 INDICATE THE MAIN SOURCE OF THE FUNDING AND THE ESTIMATED YEARLY BUDGET

A budget and financial plan for the NETMABR has not been developed as yet and will be part of the overall management plan.

However, in 2019, a report was prepared under the IFPAM Project titled: "Sustainable Financing for a System of Protected Areas in Trinidad and Tobago", which includes highly relevant

recommendations and will be used as a baseline to develop the budget and financing plan for the NETMABR.

Sources of financing (all of which have already been applied) will include but are not limited to:

- annual budget allocations to the relevant THA Divisions and Departments
- annual budget allocations to the NETPAMT (once fully operational)
- private sector (e.g. hydrocarbon extracting industry)
- multilateral donors (e.g. UNEP, UNDP, IDB, OAS)
- diplomatic missions (e.g. Embassies)
- international natural and cultural conservation organisations (e.g. CI, IUCN)
- private donors
- user and access fees

As part of Trinidad and Tobago, NE Tobago has access to a regionally unique combination of access to funding.

- Notably, in 2000, the GoRTT established the Green Fund, a National Environmental Fund. It is capitalised by a 0.3% Green Fund Levy on gross sales or receipts on every dollar spent in Trinidad & Tobago (ad infinitum). Funds are kept separate from other taxes but represented in National accounts. The Green Fund is used for conservation of the environment, remediation and restoration activities, (e.g. reforestation as well as for environmental education and public awareness of environmental issues). It is administered by the Ministry of Planning; statutory bodies, NGOs and CBOs can apply for funding and NETPAMT would be eligible. The funds' financial resources are significant and could finance the transition phase for PA management in NE Tobago; ad infinitum funding is not possible.
- Global hydrocarbon mining / energy companies are operating in Trinidad and Tobago, some of which have sustained interest in the exploitation of NE Tobago offshore hydrocarbon (mainly gas) resources. Historically, these companies are an important funding partner for the entire civil society sector in Trinidad and Tobago and have already demonstrated their interest to support conservation and sustainable livelihoods in NE Tobago.
- Contrary to many other global places of high natural and cultural heritage value, NE Tobago's natural, social, cultural, and security environment provides significant opportunities for well-designed responsible tourism entrepreneurship, adding to income stream generation, supporting conservation activities and livelihoods.

17.5 CONCLUSIONS

17.5.1 IN YOUR OPINION, WHAT WILL ENSURE THAT BOTH THE FUNCTIONING OF THE BIOSPHERE RESERVE AND THE STRUCTURES IN PLACE WILL BE SATISFACTORY?

"Explain why and how, especially regarding the fulfilment of the three functions of biosphere reserves (conservation, development, logistic) and the participation of local communities."

It can be stated that NE Tobago has a demonstrable history of already fulfilling the three functions of a BR to a remarkable extent, the establishment of a BR will significantly improve this capability.

CONSERVATION:

- there is existing legislation regarding the protection of the Core Zone as well as ESS and ESA in Buffer and Transition Zones. Additional, legal protection is currently in the making by nominating NNH and Cultural National Heritage Sites and implementing the already cabinet approved NPASP, which will provide varying levels of additional protection to 20 sites within the future BR. People generally respect the existing protected areas and see them as national icons;
- local, national and international academia organisations, local ENGOs and community groups have demonstrated their interest and implementation capacities regarding conservation of cultural and natural heritage for decades;
- over the past five years the collaboration between government and CSOs has made significant positive steps towards participatory decision-making regarding conservation action and co-management of natural resources.

Figure 66 Top river waterfall Parlatuvier (Jacob Bock)

DEVELOPMENT:

- NE Tobago's history as an agricultural-, fishing-, and tourism-based economy as well as a track record of increasingly sustainable approaches to develop these sectors are a solid foundation for improvement through the MAB programme;
- an increasing number of conservation activities is now actively linked to also achieving socio-economic goals and wellbeing of residents;
- community-based, nature, eco-tourism clients (which are dominant in NE Tobago) are requesting increased sustainability and decreased environmental footprint and acknowledge the efforts made by conscious tourism-oriented businesses, thus providing positive emotional and financial feedback.

Figure 67 Castara Beach Facility (Jacob Bock)

LOGISTIC:

Monitoring, research, educational and networking activities have also a track record over decades; however, there is a significant increase since 2013, partially due to the IFPAM Project, partially through the activities of CSOs. It can be expected that these activities will be sustained in the future and a MAB programme would be ideal to consolidate these efforts under one roof.

Figure 68 Bio Blitz (ERIC)

Existing Structures

The area is currently managed by the THA through its, admittingly under-resourced, Divisions and Departments. However, these Departments have been able to manage natural and cultural heritage in a way that prevented major losses and established a relatively high-level status quo. Numerous awards and international acclaim are indicators for these efforts. NGOs and CBOs are increasingly working with governmental institutions and are receiving positive feedback, since governmental managers are progressively realizing the potential and benefits of meaningful collaboration. The first Environmental Partnership Conference, specifically targeting Tobago's environmental stakeholders, was held in May 2019, designed, financed and implemented by government and CSOs and targeted specifically future collaboration between the different sectors of society.

Even if the NETPAMT takes longer to get operational, the existing structures are well capable of implementing a MAB Programme.

Future Structures

The establishment of the NETPAMT has already started and is a milestone in participatory co-management of natural and cultural heritage in Trinidad and Tobago and has the potential to be a model for other island states in the Caribbean. While there are admittingly teething issues, the DIQE of the THA continues to be dedicated to lay the foundations for a sound governance and operational structure with the assistance of international and local experts.

The NETPAMT will be the ideal vessel to implement the MAB programme in NE Tobago providing social inclusion and opportunities for shared conservation, development and logistic experiences.

18. SPECIAL DESIGNATIONS

Designation Name:

( ) UNESCO World Heritage Site
( ) RAMSAR Wetland Convention Site
( ) Other international/regional conservation conventions/directives (specify)
( ) Long term monitoring site (specify)
( ) Long Term Ecological Research (LTER site)
(X) Other (specify)

There are no regional or international special designations/directives/conventions that are legally binding or are signed/ratified by the GoRTT or the THA.

However, it is noteworthy that the importance of the current Core Area in carrying out the functions of conservation, monitoring, experimental research, and environmental education is recognised as follows:

- the MRFR and the two wildlife sanctuaries: Little Tobago and St. Giles Island, are protected under the Conservation of Wildlife Act (Chap. 67:01), the Forestry Act (Chap. 66:01) and the Forest (Prohibited Areas) Order, the management is empowered by the State Lands Act (Chap. 57:01);
- all three sites are also nominated as NNH Sites, it is expected that they will be designated in 2020 and, as such enjoy, additional protection under the National Trust Act, 1991
- they are further listed as IBA by Birdlife International according to the following classification criteria:
  - ✓ A1: Globally threatened species occur in the area
  - ✓ A2: Restricted-range species
  - ✓ A3: Biome-restricted species
  - ✓ A4: Congregations ≥1% of global population

Table 27 IBA Classification for NETMABR Core Area.

Name IBA	A1	A2	A3	A4
Main Ridge TT005	✓	✓	✓	
St. Giles TT006				✓
Little Tobago TT007				✓

- the MRFR was nominated as a Queen Commonwealth Canopy site in early 2018.

19. SUPPORTING DOCUMENTS

19.1 LOCATION AND ZONATION MAP

[Provide the biosphere reserve's standard geographical coordinates (all projected under WGS 84).
Provide a map on a topographic layer of the precise location and delimitation of the three zones of the biosphere reserve (Map(s) shall be provided in both paper and electronic copies). Shapefiles (also in WGS 84 projection system) used to produce the map must also be attached to the electronic copy of the form. If applicable, also provide a link to access this map on the internet (e.g. Google map, website).]

The location and zonation maps with coordinates can be found in the Annex.

19.2 VEGETATION MAP OR LAND COVER MAP

A vegetation map as well as a land cover map can be found in the Annex.

19.3 LIST OF LEGAL DOCUMENTS

The following list includes all key legal documents referring to the proposed NETMABR. A copy of all listed documents can be found in the Annex.

- **Agricultural Fires Act** Chap. 63:02, Act 20 of 1965;
- **Animal (Diseases and Importation) Act** Chap. 67:02, Act 19 of 1954 amended by 17 of 1997 (some pages authorised in 2006);
- **Comprehensive Economic Development Plan** (CEDP) 2.0, which is the local policy document that focuses on sustainable development in Tobago and at the heart of CEDP 2.0 is diversification of the economy, preservation of the environment and a better standard of living for its people;
- **Conservation of Wildlife Act** Chap. 67:01, Act 16 of 1958 amended by 31 of 1980; an Act to make better provision for the Conservation of Wild Animal Life in Trinidad and Tobago;
- **Continental Shelf Act** Chap. 1:52, Act 43 of 1969 amended by 23 of 19; An Act to make provision as to the exploration and exploitation of the Continental Shelf; to enable effect to be given to certain provisions of the Conventions on the High Seas done in Geneva on 29th April 1958; and for matters connected with those purposes;
- **Environmental Management Act** Chap. 35:05, Act 3 of 2000; The EMA Act is legislation with the goal of ensuring the protection, conservation, enhancement and wise use of the environment of Trinidad and Tobago. The EM Act established the Environmental

Management Authority (EMA) and provided for its composition, administration, financing and role; includes among other the **Environmentally Sensitive Species Rules** (2001);

- **Fisheries Act** Chap. 67:51, Act 39 of 1916 amended by 23 of 1975; an Act to regulate fishing in the waters around Trinidad and Tobago;
- **Forest Act** Chap. 66:01, Act 42 of 1915 amended by 23 of 1999; an Act related to Forests and Forest Produce;
- **Land Acquisition Act** Chap. 58:01, Act 28 of 1994 amended by 73 of 2000;
- **Litter Act** Chap. 30:52, Act 27 of 1973 amended by 4 of 2014;
- **Marine Preservation and Enhancement Act** Chap. 37:02, Act 1 of 1970 amended by 37 of 1996; An Act respecting the Marine Areas of Trinidad and Tobago;
- **National Forest Policy** (2011); This National Forest Policy is not an isolated statement, and it builds on the existing policy framework for forest management and it supplements and enhances other public policies and plans;
- **National Protected Areas Policy** (2011); provides the main policy framework for the NPASP;
- **National Trust of Trinidad and Tobago Act** Chap. 40:53, Act 11 of 1991 amended by 6 of 2015;
- **National Wildlife Policy** (2013) Draft; Despite the diversity and importance of wild organisms to the culture, recreation and sustainable livelihoods of the people of Trinidad and Tobago, there has never been a standalone National Wildlife Policy. To date, formal policy statements that address the management of the country's wildlife resources have been integrated into the National Environment Policy (NEP), the National Wetland Policy (NWP) and the National Forest Policy (NFP) and National Protected Areas Policy (NPAP). This policy framework has also been rapidly evolving to reflect the changes in the status of wild animals and plants nationally, changes of attitudes of the society towards wildlife use and value, and obligations under global international agreements on wildlife to which the country is a Party;
- **Planning and Facilitation of Development Act**, Act 10 of 2014; An Act relating to the planning and development of land and to repeal and replace the Town and Country Planning Act, Chap. 35:01;
- **Sawmills Act** Chap. 66:02, Act 35 of 1943 amended by 24 of 1999;
- **State Lands Act** Chap. 57:01, Act 32 of 1918 amended by 25 of 2006;
- **Summary Offences Act** Chap. 11:02, Act 31 of 1921 amended by 85 of 2000; An Act relating to offences punishable on summary conviction;
- **Territorial Sea Act** Chap. 1:51, Act 38 of 1969 amended by 22 of 1986; an Act to make provision with respect to the Territorial Sea of Trinidad and Tobago;

- **Tobago House of Assembly Act** Chap. 25:03, Act 40 of 1996 amended by 17 of 2006; which notably provides THA with the capacity to legislate for the protection of biodiversity and natural areas locally;
- **Tourism Development Act** Chap. 87:22, Act 9 of 2000 amended by 16 of 2006;
- **Water and Sewerage Act** Chap. 54:40, Act 16 of 1965 amended by 28 of 1994 and through the Prevention of Water Pollution (Courland Water Works) Byelaws, 1980; an Act to provide for the development and control of water supply and sewerage facilities in Trinidad and Tobago and matters of sanitation incidental thereto; the promotion of the conservation and proper use of water resources; and for the establishment of an Authority to administer the several purposes aforesaid and matters connected therewith.

19.4 LIST OF LAND USE AND MANAGEMENT/COOPERATION PLANS

[List existing land use and management/cooperation plans (with dates and reference numbers) for the administrative area(s) included within the proposed biosphere reserve. Provide a copy of these documents. It is recommended to produce English, French or Spanish synthesis of its contents and a translation of its most relevant provisions]

The currently, relevant policies and draft management plans are:

- The Comprehensive Economic Development Plan for Tobago
- the North East Tobago Management Plan
- the Draft Management Plan for the Main Ridge Forest Reserve, and
- the Draft Management Plan for the Proposed North East Tobago Marine Protected Area

All these documents can be found in the Annex.

19.5 SPECIES LIST

A complete list of documented species can be found in the Annex.

19.6 LIST OF MAIN BIBLIOGRAPHIC REFERENCES

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19.7 ORIGINAL ENDORSEMENT LETTERS

Copies of all original endorsement letters can be found in the Annex.

19.8 FURTHER SUPPORTING DOCUMENTS

Moreover, several documents have been established as by-product of the NE Tobago MAB nomination process:

- **NE Tobago Communications Plan**. ERIC, February 2019.
- **NE Tobago Stakeholder Engagement Plan**. ERIC, March 2019.
- **Evaluation of Viability for UNESCO Recognition of Natural Heritage in NE Tobago**. ERIC, November 2018.
- **Technical Dossier Nomination of the Tobago MRFR as a Natural National Heritage Site of Trinidad and Tobago**. ERIC, May 2019.
- **Booklet "The Tobago Main Ridge Forest Reserve – A National Heritage Site".** The National Trust of Trinidad and Tobago, ERIC, May 2019.
- **Complete List of Documented Species**, ERIC, September 2019.

These and other supporting documents can be found in the Annex.

20. ADDRESSES

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