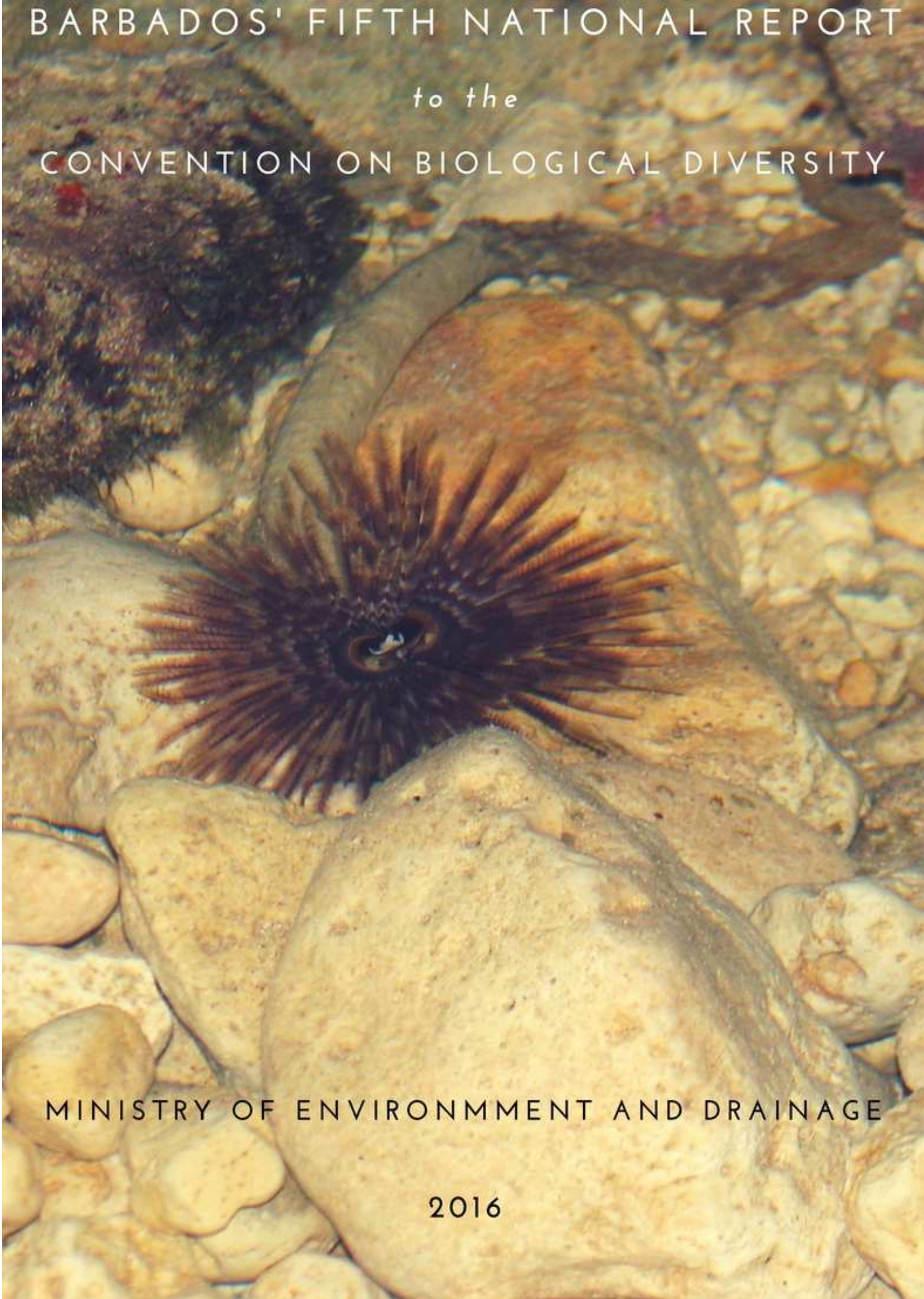
BARBADOS' FIFTH NATIONAL REPORT

to the

CONVENTION ON BIOLOGICAL DIVERSITY



MINISTRY OF ENVIRONMMENT AND DRAINAGE

2016

Photograph Credit
Sea anemone at the Animal Flower Cave

EXECUTIVE SUMMARY

To date Barbados has submitted four national reports to the Convention on Biological Diversity; the fourth national report being submitted in 2011. This current fifth report has three main components:

1. An update on biodiversity status, trends, and threats and implications for human well-being.
2. The national biodiversity strategy and action plan (NBSAP), its implementation, and the mainstreaming of biodiversity
3. Progress towards the 2015 and 2020 Aichi Biodiversity Targets and contributions to the relevant 2015 Targets of the Millennium Development Goals

Part I of the report provides an update on biodiversity initiatives and trends since the Fourth Report was submitted. Updated information is provided in the following areas:

Trends in terrestrial biodiversity: (i) natural fibres conservation and utilisation; (ii) important bird areas; (iii) Barbados Leaf-toed Gecko. Initiatives to manage biodiversity in Barbados are presented in the following case studies:

- Case study 1 highlights work undertaken to transform the Walkers Sand Quarry to a natural reserve
- Case study 2 looks at the sustainable utilisation of natural fibres
- Case study 3 presents the initiatives undertaken by the Barbados Wildfowlers Association to change the perceptions among shorebird hunters toward biodiversity shorebird conservation and management to encourage better management of shooting swamps as natural reserves.
- Case study 4 presents the case of co-existence of farmers and the green monkey population.
- Case study 5 provides an overview of the Barbados Sea Turtle Project and the results of an economic valuation of marine turtle conservation in Barbados
- Case study 6 outlines management strategies being implemented for Sargassum influxes in Barbados
- Case study 7 provides insight into how stakeholders are managing Barbados' coastal zone

Part II of the report focuses on the status of the implementation of the National Biodiversity Strategy and Action Plan (NBSAP).

Part III provides details on Barbados' progress towards implementing the 2020 Aichi Biodiversity Targets.

There are two annexes included in this report: (i) Annex 1 provides information on some of the biodiversity-related projects completed and underway since Barbados' last reporting period; and (ii) Annex 2 provides corrected data and information provided in the Fourth report.

Contents

LIST OF ACRONYMS

MOA	Ministry of Agriculture, Food, Fisheries and Water Resource Management
FMP	Fisheries Management Plan
TMP	Tourism Master Plan
FAO	Food and Agriculture Organisation
UNEP	United Nations Environmental Programme
GESS	Green Economy Scoping Study
MED	Ministry of the Environment
BWFA	Barbados Wildfowlers Association
NGO	Non-Governmental Organisation
IBAs	Important Bird Areas
GEF SGP	Global Environmental Facility Small Grants Programme
NBSAP	National Biodiversity Strategy and Action Plan
CBD	Convention on Biological Diversity

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1. BACKGROUND

To date Barbados has submitted four national reports to the Convention on Biological Diversity (CBD); the fourth national report being submitted in 2011. The reports submitted provide a mechanism to collect, collate and analyse key information and data for a review at the national level of the implementation of the strategic plans for biodiversity management and to inform decision makers of issues related to implementation.

Previous national reports submitted by Barbados can be found on the CBD website https://www.cbd.int. The fifth report as presented, has three main components:

1. An update on biodiversity status, trends, and threats and implications for human well-being.
2. The National Biodiversity Strategy and Action Plan (NBSAP), its implementation, and the mainstreaming of biodiversity
3. Progress towards the 2015 and 2020 Aichi Biodiversity Targets and contributions to the relevant 2015 Targets of the Millennium Development Goals

2. BARBADOS COUNTRY PROFILE

Barbados is the most easterly island of the Eastern Caribbean island chain. The island is 34 kilometres (km) long and 23 km wide and has a total land area of approximately 432 square km or 166 square miles. The Exclusive Economic Zone (EEZ) of the country is 167,000 square km.

Approximately eighty six percent of the island is comprised of a karst topography, rising in a series of limestone terraces towards the centre of the island. A series of deep gullies which facilitate the movement of water during heavy rainfall also radiate from the centre of the island. There are no permanent rivers in Barbados. The remaining fourteen percent of the land area which is in the northeast of the island is called the Scotland District and is comprised of sedimentary deposits (sands, shales and clays). These layers are highly folded and faulted and result in land slippage being common in the area. The East coast of the island is a high wave energy coastline that is characterized by high cliffs and headlands that are battered by strong surf, while the West and South coasts represent low wave energy coastlines characterized by sandy beaches and calmer waters.

Barbados has a population of approximately 277,821[1]. Most of the country's population is settled along the south-east, south and west coasts of the island. The available land is utilised for agriculture production (32.6%); forest cover (19.4%) and other uses including for housing (48%).

[1] Source: http://www.barstats.gov.bb/files/documents/PHC_2010_Census_Volume_1.pdf

3. PART I BIODIVERSITY OF BARBADOS – AN UPDATE

3.1 LAND COVER

The fourth report presented information on Barbados' forest land cover. Table 1 below presents a more detailed and updated presentation of the data presented in that report.

Table 1: Land Cover – Forest and other wooded land based on the Global Forest Resources Assessment for Barbados, 2010		
Land –cover or forest formation – FRA[2]	**original data Hectares (ha)**	**Calibrated[3] area (ha)**
Urban or built up land		
High-Medium Density Urban or Built-up Land	3,840	3,801.980
Low Density Built-up Land (Rural or Residential)	5,231	5,179.208
Herbaceous Agriculture		
Sugar cane	11,518	11,403.960
Minor crops	1,609	1,593.069
Mixed and woody agriculture		
Coconut palm-pasture	248	245.545
Pasture and rangeland		
Pasture, Hay or inactive Agriculture (e.g. abandoned sugar cane)	8,658	8,572.227
Pasture, Hay or other Grassy Areas	2,459	2,434.654
Golf course	308	304.951
Drought Deciduous Woodland	1,081	1,070.297
Drought deciduous and semi-deciduous forest, lowland or submontane		
Deciduous, Evergreen Coastal and Mixed Forest or Shrub land, with or without Succulents, or Limestone or other substrates[4]	2,913	2,884.158
Drought Deciduous Forest/Shrub	263	260.396
Semi-deciduous and drought deciduous forest on limestone (including semi-evergreen forest)	2,864	2,835.644
Semi-deciduous forest (includes semi-evergreen forest)	277	274.257
Seasonal evergreen and evergreen forest, lowland or submontane		
Seasonal evergreen forest	34	33.663
Wetlands		
Mangrove	6.9	6.832
Emergent wetlands	4	3.960
No Vegetation		
Quarries	201	199.009
Coastal sand, rock and bare soil	172	170.297
Bare soil	1,078	1,067.327
Water – permanent	50	49.505
Cloud cover areas in final map	615	608.911
TOTAL	**43,430[5]**	**42,999.90**

[2] Global Forest Assessment 2010. Country Report, Barbados. Forest Department, Food and Agriculture organization of the United Nations. FRA2010/018. Rome, 2010.

[3] Calibration: Total land area according to FAOSTAT – 43,000 ha. Calibration factor (43,430/43000) – 1.01

[4] On Barbados, the class Deciduous, Evergreen Coastal and Mixed Forest or Shrub land, with or without Succulents, or Limestone or other substrates, includes a mosaic of deciduous and seasonal evergreen forest/shrub northeast of Mt. Hillaby.

[5] Table 3 Helmer, E. *et. al.* 2007. Distribution of land cover and forest formations for St. Kitts, Nevis, St. Eustatius, Grenada and Barbados from satellite imagery.

Figure 1 shows satellite imagery of Barbados' land cover[6].

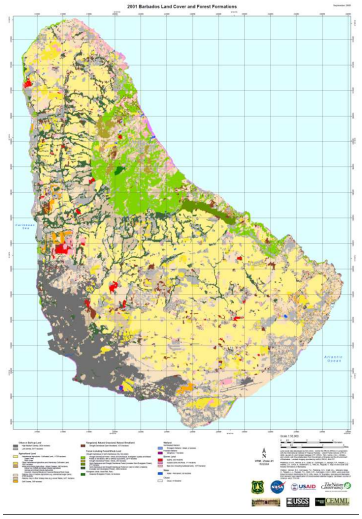

Figure 1 Barbados Land cover and Forest Formation Map

3.2 TRENDS IN TERRESTRIAL BIODIVERSITY

The 4th report presented detailed information and data of Barbados' terrestrial biodiversity categorised under Flora and Fauna. This 5th report provides new information obtained since the 4th report was submitted.

3.2.1 NATURAL FIBRES AND SEEDS

The Barbados Natural Fibres project funded by the Global Environmental Facility (GEF) Small Grants Programme (SGP) in 2015 identified the following natural fibres and seeds as having economic value for the national crafts sector. See Table 2.

The project sought to identify and to map these fibres and seeds both from a conservation and sustainable use perspective and to provide information to craft artisans as to the location and relative quantities of available traditional and non-traditional fibres in Barbados.

[6] Helmer, E.H., Kennaway, T.A., Pedrero, D.H., Clark, M.L., Marcano-Vega, H., Tieszen, L.L., Ruzycki, T.R., Scheill, S.R., and Carrington, C.M.S. 2008. Land Cover and Forest Formation Distribution for St. Kitts, Nevis, St. Eustatius, Grenada and Barbados from Decision Tree Classification of Cloud-Cleared Satellite Imagery. Caribbean Journal of Science, Vol. 44, No. 2, 175-198

Table 2 List of Fibres of Economic Importance to the Crafts Sector in Barbados	
COMMON NAME	**SCIENTIFIC NAME**
Aloe	*Aloe barbadensis*
balsam, cliff balsam, gully balsam, Rock balsam	*Clusia plukenetii Urban*
Bamboo	*Bambusa schrebex*
Banana/Plantain	*Musa spp*
Black sage	*Varronia curassavica/ Cordia curassavica*
Bread & Cheese (shrub)	*Pithecellobium unguis-cati*
Bread & Cheese (vine)	*Paullinia cururu*
Bulrush / rush	*Juncaceae Spp*
Cabbage Palm/Royal palm	*Roystonea Oleracea*
Calabash	*Crescentia cujete – Bigoniaceae*)
Clusia	*Clusia Grandiflora* and *Clusia Palmicida*
Coconut	*Cocus Nucifera*)
Cotton	*Gossipyum barbadense*
Elephant Grass/Napier Grass/ Miscanthus	*Pennisetum purpureum*
Ficus/Banyan	*Ficus citrifolia*
Fountaingrass	*Pennisetum alopecuroides*
Ginger Root	*Zingiber officinale*
Guava	*Psidium guajava*
Hemp	*Cannabis sativa*
Indigo	*Indigo tincturia*
Khus-Khus	*Vetiveria zizanoides*
Loofah	*Luffa aegyptiaca or Luffa acutangula*
Okra	*Abelmoschus esculentus*
Pampas grass	*Cortaderia jubata*
Pandanus	*Pandanus utilis*
Purple Fountaingrass	*Pennisetum setaceum Purpureum*
Razor Grass	Scleria secans (L.) Urb
River Tamarind	*Leucaena leucocephala*
Sanseveria	*Sansevieria trifasciata*
scratch wiss, skipping rope, snake vine	*Cissus verticillata (L.)*
Silk Cotton / Kapok	*Ceiba pentandra*
Sisal	*Agave Rigida Var. Sisalana*)
Sorrel	*Hibiscus sabdariffa*
Sugar Cane & Cane Arrows	*Saccharum officinarum L.*
Tamarind	*Tamarindus indica*
White Hoop	*Trichostigma octandrum*
Wild Cane	*Gynerium sagittatum*
Yucca/Spanish bayonet	*Yucca aloifolia*
List of Seeds of Economic Importance to the Crafts Sector in Barbados	
Black Pearl, Velvet Seed (Mgambo Tree)	*Majidea zanguebarica*
Circassian seeds or Jumbie Beans/ Red Sandalwood	*Adenanthera Pavonina*
Crab Eye, Rosary pea	*Abrus precatorius*
Horse Nickers/Nickernuts	*Caesalpinia Bonduc*
Job's Tears	*Coix Lacryma Jobi*
Mahogany pod	*Sweitenia mahogany*
Mile tree/ Casuarina	*Casuarina equisetifolia*
Palm seeds	*Arecaceae*
Sandbox seed	*Hura crepitans*
Shak-Shak Seed (Royal Poinciana tree)	*Delonix regia*
Tamarind	*Tamarindus indica*

Field trips to various locations across Barbados revealed areas of concentration of specific plants, for example, the parish of St. Lucy was noted to contain larger numbers of pandanus, while the parishes of St. Andrew, St. Joseph and St. John and parts of St. Philip bordering St. John contained larger numbers of banana and other Musa species. Noteworthy were the limited number of Job's Tears which were once abundantly harvested in areas of St. Andrew and St. Thomas. Further research is required to determine the status of this species.

Job's Tears (*Coix Lacryma Jobi*) no longer found in abundance in Barbados. The Barbados Natural Fibres Network has initiated a programme of providing their members with seeds to plant to conserve this plant species and to increase the quantity of seeds available to crafts-persons

Figure 2 shows the distribution within Barbados of some of the listed fibres.

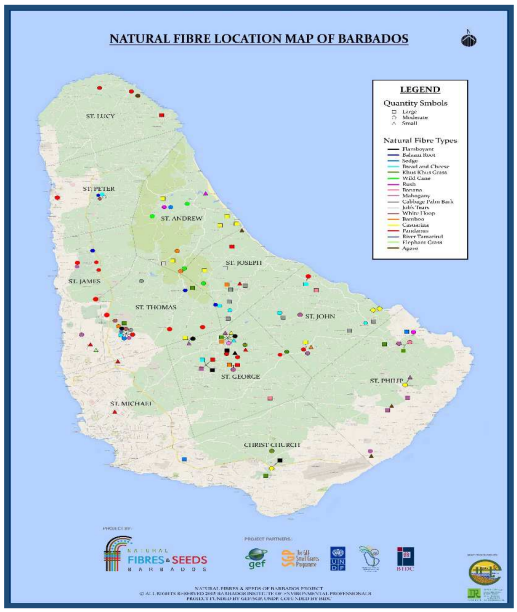

Figure 2 Natural Fibres Location Map of Barbados

3.2.2 IMPORTANT BIRD AREAS

The following section presents an update to the information presented in the 4th National Report.

Barbados has seven Important Bird Areas (IBAs) which cover approximately 185 ha (0.1% of total land area) including marine areas. The IBAs have been identified based on 11 key bird species found on the island and which meet international IBA criteria.[7] The national IBAs are wetlands which serve as an essential network of sites for native and migratory water bird species. See Table 3 and Figure 3[8].

Table 3 Important Bird Areas in Barbados

Table 1. Key bird species at Important Bird Areas in Barbados.

Key bird species	Criteria	National population	Criteria	Barbados IBAs BB001	BB002	BB003	BB004	BB005	BB006	BB007
Masked Duck *Nomonyx dominicus*	■	30	■							30
Audubon's Shearwater *Puffinus lherminieri*	■	150–300	■	150						
Little Egret *Egretta garzetta*	■	24	■			24	21	✓		
American Golden Plover *Pluvialis dominica*	■	10,000–25,000	■		4,050–9,000				4,050–9,000	
Greater Yellowlegs *Tringa melanoleuca*	■	1,000–5,000	■		2,550				2,550	
Lesser Yellowlegs *Tringa flavipes*	■	25,000–100,000	■		13,200				13,200	
Pectoral Sandpiper *Calidris melanotos*	■	10,000–25,000	■		6,600				6,600	
Green-throated Carib *Eulampis holosericeus*	■		■		✓	✓	✓	✓	✓	✓
Antillean Crested Hummingbird *Orthorhyncus cristatus*	■		■		✓	✓	✓	✓	✓	✓
Caribbean Elaenia *Elaenia martinica*	■		■			✓				
Barbados Bullfinch *Loxigilla barbadensis*	■		■		✓	✓	✓	✓	✓	✓

All population figures = numbers of individuals.
Restricted-range birds ■. Congregatory birds ■.

[7] Wayne Burke. Important Bird Areas of the Caribbean – Barbados. www.birdlife.org (29/05/2016)
[8] Wayne Burke. Important Bird Areas of the Caribbean – Barbados. www.birdlife.org

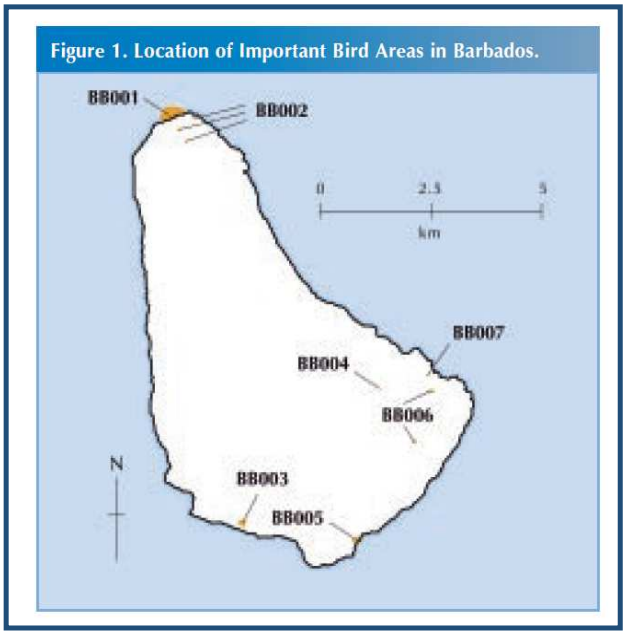

Figure 3 Location of IBAs – Barbados

Within the context of biodiversity conservation, it is important to continually monitor these IBAs for new and dwindling water bird species as their population are in continual flux. An example would be the recently established Near Threatened Caribbean Coot *Fulica caribaea* which should be monitored as it grows.

The major threats to IBAs include pressure from development and bird shooting which remains a sporting activity in Barbados. Other threats would include prolonged periods of drought especially for those IBAs not managed as part of sporting activities.

Source: Ministry of Environment

3.2.3 BARBADOS LEAF-TOED GECKO

The Barbados Leaf-Toed Gecko *Phyllodactylus pulcher* is one of the few remaining endemics vertebrate species in Barbados. Previously thought extinct, the gecko was rediscovered on Culpepper Island in 2011. In 2013, other colonies have subsequently been found in rocky coastal areas in St. Philip. Surveys undertaken in both these locations estimate that fewer than 250 mature individuals remain. Further field surveys are currently underway to locate other colonies and to ascertain the size of the population. Based on data collected and analysed to date it is believed that the Barbados Leaf-toed Gecko qualifies as globally threatened on the IUCN Red List of Threatened Species. Notification and confirmation in this regard has not yet been made.

Efforts at conservation include the hosting of a national workshop in 2013 to review the status of the Barbados Leaf-Toed Gecko, discuss recent actions to study and conserve this species, and begin designing a species recovery plan. Recommended conservation measures to be employed include: (i) Establishing an ex-situ captive breeding colony of Barbados Leaf-Toed Geckos overseas and/or in Barbados; (ii) Alleviate the pressure on Barbados Leaf-Toed Geckos from invasive alien species – in this regard efforts have been made to eradicate rats from Culpepper Island; (iii) Boosting gecko carrying capacity in selected areas through habitat enhancement techniques; and (iv) the enactment and enforcement of legislation to protect the Barbados Leaf-Toed Gecko and critical habitats.

Participants at the 2013 workshop identified threats to the Barbados Leaf-Toed Gecko's populations to include invasive alien species, habitat loss and degradation, and collection. Resort development and agricultural activities were identified as major drivers of habitat loss and the spread of invasive alien species.

Leaftoed Gecko[9]

[9] Source: https://www.bajanreporter.com/2011/10/once-presumed-extinct-barbados-leaf-toed-gecko-phyllodactylus-pulcher-re-discovered-in-barbados/

3.2.4 BATS of BARBADOS

Bats of Barbados

The chiropteran fauna of Barbados is represented by four families:[10]

1. Noctilionidae,
2. Phyllostomidae,
3. Vespertilionidae,
4. Molossidae

These families collectively include the following species:

- 1 piscivore (*Noctilio leporinus*)
- 1 omnivore (*Brachyphylla cavernarum*)
- 1 pollenivore/nectarivore (*Monophyllus plethodon*)
- 1 frugivore (*Artibeus jamaicensis*)
- 2 insectivorous species (*Myotis nyctor* and *Molossus molossus*)

3.3 TRENDS IN BIODIVERSITY – UPDATE

Marine Biodiversity

- Appearance of the Lionfish and development of a Lionfish invasion response plan[11]
- Sargassum seaweed appearance in significant quantities to warrant concern regarding survival rates of young turtles moving from the beach to the ocean after hatching
- Continued research and data collection on coral bleaching events in Barbados[12]. See timeline below.

Freshwater Biodiversity

- General reduction in the number of inland water catchment areas on the island
- Protracted drought periods

Agricultural Biodiversity

- Trend towards germplasm conservation – work has commenced to establish a seed bank of plants of agronomic importance at the Ministry of Agriculture, Food, Fisheries & Water Resource Management, Graeme Hall.

[10] Genoways, Hugh H.; Larsen, Roxanne J.; Pedersen, Scott C.; Kwiecinski, Gary G.; and Larsen, Peter A., "Bats of Barbados" (2012). Mammalogy Papers: University of Nebraska State Museum. 158. http://digitalcommons.unl.edu/museummammalogy/158

[11] Biodiversity Working Group (2011). Lionfish invasion response plan for Barbados. Natural Heritage Department, Sturges, St Thomas, Barbados, 22pp.

[12] Hazel A. Oxenford and Henri Vallès. 2016.Transient turbid water mass reduces temperature-induced coral bleaching and mortality in Barbados. Centre for Resource Management and Environmental Studies, University of the West Indies, Cave Hill, Barbados and Department of Biological and Chemical Sciences, University of the West Indies, Cave Hill, Barbados; Respectively

The following shows a timeline of major events impacting Barbados' coral reefs[13]

Timeline

1640s:	Clearing of land for sugarcane cultivation resulted in the removal of forests and massive amounts of erosion and sedimentation. Resulted in final demise of *Acropora* reefs on the SE Coast
1950s:	Expansion of the fishing fleet
1955:	Hurricane Janet (Category 5)
1950s-60s:	Tourism boom begins
1960:	Bellairs Research Institute, a field station for McGill University was established, and some of the earliest records of reef health recorded.
1960:	Lewis categorizes platforms at Six Mens Bay on the west coast of Barbados
1974:	Cave Hill Campus of the University of the West Indies established and stimulates reef research
Early 1980s:	Acroporid mass mortality from White Band Disease
1982:	Coastal Zone Project Unit established and starts the National Coral Reef Monitoring Programme, with local and international scientists; First documentation of a eutrophication gradient on the west coast of the island (Tomascik & Sander 1985); Establishment of the Bridgetown Sewage Treatment Plant
1983:	*Diadema antillarum* mass mortality
1987:	Second monitoring event for the National Coral Reef Monitoring Programme
1992:	Third monitoring event for the National Coral Reef Monitoring Programme
1997:	Fourth monitoring event for the National Coral Reef Monitoring Programme
1998:	Bleaching event
2001-2002:	First coral disease survey carried out, low but pervasive levels recorded
2002:	Establishment of the South Coast Sewerage Project, largely as a result of proving that corals deteriorated along a eutrophication gradient on the west coast; Fifth monitoring event for the National Coral Reef Monitoring Programme
2003 – present:	Sporadic outbreaks of yellow band disease and black band disease observed, while white plague disease, dark spot disease and Aspergillosis remain at low levels.
2005:	Most severe mass bleaching event recorded, with an average of 70.6% corals bleached in October, and high bleaching associated mortality over the following year resulting in a loss of 25.9% live coral cover
2007:	Sixth monitoring event for the National Coral Reef Monitoring Programme
2010:	Mass bleaching, not as severe as in 2005 with an average of 37.3% corals bleached in October, and bleaching associated mortality resulting in the loss of around 8% coral cover within the following year
2011:	First lionfish observed
2012:	Seventh monitoring event for the National Coral Reef Monitoring Programme

[13] Jackson JBC, Donovan MK, Cramer KL, Lam VV (editors). (2014) Status and Trends of Caribbean Coral Reefs: 1970-2012. Global Coral Reef Monitoring Network, IUCN, Gland, Switzerland. Barbados specific information: Coauthors: Caroline Bissada-Gooding, Angelique Brathwaite, Hazel Oxenford, Nicholas Polunin, Richard Suckoo, Ivor Williams, CARICOMP and Reef Check

3.3 MANAGEMENT OF BIODIVERSITY – SELECT CASE STUDIES

3.3.1 NATURAL RESOURCE EXTRACTION

Resource extraction (quarrying and sand mining) is generally regarded as a national economic necessity in the context of the island's relatively scarce terrestrial natural resource supply. In this regard, these operations need to be continuously monitored and strictly managed to ensure that potential negative impacts such as soil erosion, flooding in coastal areas and the degradation of terrestrial and marine habitats are minimized.

CASE STUDY 1: WALKER'S QUARRY TRANSFORMATION TO A NATURAL RESERVE[14]

This case study provides an example of how the private sector is working to manage and conserve natural resources and to create new habitats.

Walker's Reserve

Walker's Quarry has been in operation in Barbados for over 50 years. The silica sand found in abundance in the quarry is primarily used in making concrete for the building and construction sector. As the lifespan of the quarry is coming to an end the owners have focused their attention on transforming the area into Walker's Reserve with the aim of restoring Biodiverse health and climatological resilience" to the land in the area. The key objectives of the reserve include:

- *Returning extracted areas of the quarry to ecological health*
- *Cultivating a mixed-use permaculture site providing food, fibre, medicine and livelihood*
- *Mitigating, by design, potential ongoing environmental impacts that might have otherwise been caused by the extraction operation such as soil erosion, landslides, and further ecological degradation*
- *Providing habitat to threatened and endangered migratory birds and endemic species to the Lesser Antilles*
- *Protecting the endangered leatherback turtle habitat*
- *Inspiring ecological and agricultural tourism for the Scotland District of Barbados.*
- *Providing meaningful livelihood opportunities for St. Andrew's and neighbouring parish residents*
- *Striving to help stabilize the climate through reforestation and regenerative land use.*
- *Providing a gene bank for the island of Barbados of rare and useful plants*

Walker's Reserve uses a Permaculture design to restore the natural ecological functions of the quarry by introducing different "perennial food systems". The project started implementation in 2015 and is expected to run over a 5-year period and will result in the planting of 100 different species in 12 different planting patterns with approximately 52 different planting plots. Revegetation will be mainly of native species, especially those known to grow in the area. To date, through the project, several plant species have been established including: fat pork (Chrysobalanus icaco); Cashew (Anacardium occidentale); Khus-Khus grass (Vetiveria zizanoides); Agave (Agave Rigida Var. Sisalana/ Agave barbadensis); various legumes; coconut (Cocus Nucifera); almond (Terminalia catappa) and Loofah (Luffa aegyptiaca or Luffa acutangula).

[14] Source: walkersreserve.com and https://www.facebook.com/WalkersReserveBarbados/

Photograph shows planting of Khus Khus grass and food crops on the slopes of an excavated sand dune at Walker's Reserve

CASE STUDY 2: SUSTAINABLE USE OF NATURAL FIBRES

This case study showcases how a Non-Governmental Organisation (NGO) is working with communities across Barbados to revive the production of traditional crafts which rely on craftspersons harvesting biodiversity from the wild. The focus is on education, biodiversity use and conservation to create social and economic value.

Sustainable use of Natural Fibres

Traditionally, the crafts sector in Barbados relied on the extraction of raw materials from the island's abundant biodiversity of natural fibres and seeds such as Pandanus (Pandanus utilis), cabbage palm (Roystonea Oleracea), Khus Khus grass (Vetiveria zizanoides) and agave (Agave Rigida Var. Sisalana). These natural fibres were used to make functional products for use in the home (e.g. baskets, bags and mats) and for use in agriculture (e.g. the traditional dung basket). With the development of Barbados' tourist sector, these items were also produced for a growing tourist market.

Today, the story is different, as very few craftspersons produce these traditional crafts products. Additionally, over the years there has been a decline in the abundance of raw materials as habitats are lost due to land clearing for housing development, burning of pasture land and general debushing activities.

To reverse this trend, since 2015 the Barbados Natural Fibres Network has been executing its model one week intensive "Beyond the Bush™" – Making Money from Natural Fibres" workshops in communities throughout Barbados to (i) educate persons of the importance of natural fibres and seeds as a valuable source of raw materials to make marketable products; (ii) facilitate knowledge transfer related to natural fibres product development using traditional techniques taught by master artisans (iii) sustainably harvest and process natural fibres and seeds from their natural habitats; and (iv) grow their own raw materials, with an initial focus on the least abundant resources such as Job's tears (Coix Lacryma Jobi).

Participants attending a "Beyond the Bush™" workshop being taught by Master Artisan Frank Watson (brown hat) how to make a traditional Lace-stitched placemat. On the table are chairs made from bulrush harvested from Bawden's St. Andrew

Further information can be obtained from: naturalfibresbarbados@gmail.com

CASE STUDY 3: CHANGING PERCEPTION TO CONSERVATION THROUGH KNOWLEDGE TRANSFER: THE CASE OF THE BARBADOS WILDFOWLERS ASSOCIATION[15]

Shorebird hunting in Barbados is a long tradition going back to the mid-1600s. The sport has evolved to one which is structured with several shooting swamps being developed and managed. Hunting activities are governed by the Barbados Wild Birds Protection Act.[16] The Barbados Wildfowlers Association provides guidance to its members in relation to conservation of important and endangered shorebird species and encourages members to better manage their swamp shooting facilities not only for sporting activities but also to provide important wetlands for several bird species.

Barbados Wildfowlers Association

The Barbados Wildfowlers Association (BWFA) was established in 1981 and of 2014 consisted of 80 members. In 2008 the BWFA collaborated with the Birdlife International, Canadian Wildlife Services and the U.S. Fish and Wildlife Service on an initiative to ensure sustainable harvesting and management of shorebirds in Barbados. The focus of the initiative has been on changing the evolution of the tradition of bird hunting rather than elimination of such practices. Additionally, the initiative sought to change hunters' attitude toward shorebird hunting through a programme of education and awareness regarding endangered bird species, to promulgate the benefits of sustainable maintenance of shooting swamps as important wetlands, and to collect data on the sector.

Greater Yellowlegs (*Tringa elanoleuca*) at Woodbourne Shorebird Refuge

Based on the information collected during the initiative, the BWFA has passed several resolutions at its annual general meetings to limit the harvest of some shorebird species and to control the use of certain hunting methods. Members have committed to the following actions:

- *Limiting the gross annual harvest on the island to 22,500 shorebirds;*
- *Allowing no more than 2,500 shorebirds to be shot per swamp each year;*
- *Shooting no more than 300 birds in each day per swamp;*

[15] Information extracted from: David C. Wege (Birdlife International), Wayne Burke (Shorebird Conservation Trust), and Eric T. Reed (Canadian Wildlife Service). 2014. Migratory Shorebirds in Barbados: Hunting, Management and Conservation. [Project funded by U.S. Fish and Wildlife Service; Department of the Interior]

[16] EVALUATION OF THE BARBADOS SHOREBIRD HARVEST BETWEEN 1988 AND 2010. Report prepared by Eric T. Reed (Migratory Birds Population Analyst) of Canadian Wildlife Service in collaboration with the Barbados Wildfowlers Association and Birdlife International

- *Limiting the Lesser Yellowlegs harvest per swamp to 1,250 birds annually; and*
- *Restricting the shooting of American Golden Plovers to 100 birds in any swamp on any given day.*
- *No use of speakers to lure shorebirds;*
- *No use of shotgun extension magazines; and*
- *Restricting the number of hunters such that no more than thee hunters present arms in each swamp at one time.*

Several of the listed measures have been implemented to date. The work undertaken by the BWFA has shown that using soft approaches, engaging stakeholders, and providing accurate data can result in changes to traditional practices deemed detrimental to biodiversity. This model has gained the attention of other Caribbean countries which are looking to implement a similar project nationally.

CASE STUDY 4: CO-EXISTENCE OF FARMERS AND WILD PRIMATES (MONKEYS) IN BARBADOS: A NEED FOR A MANAGEMENT PLAN

Farmers – Green Monkey Co-existence: Need for a Management Plan

The Barbados green monkey, Chlorocebus sabaeus, was introduced during the 17th century and is now generally considered an agricultural pest in Barbados. Farmers repeatedly complain of reduced revenues from growing food crops as a direct result of damage to crops caused by monkeys. Over the past three decades, data has been collected on the crop damage caused by monkeys and the estimated economic impact of these losses.

A 2010 survey was undertaken using methodologies consistent with previous studies undertaken in 1980 and 1994 to be able to make direct comparisons and analysis in changes in monkey crop damage and estimation of population size. In the 2010 survey 100 farmers (10 from each parish) were interviewed and responses obtained using a standard survey. The study showed that the preference for specific crops remain constant since the initial survey was undertaken in 1980. Annual crop losses due to monkey damage varied from parish to parish averaging US$ 2,000.00 per farmer. The study suggests that the monkey population may be stable although the instances of crop damage has increased. This observation may be a result of declining cultivated acreage and the concomitant reduction of food available for monkeys. The result is a change in distribution of monkeys as they seek areas where there is accessible food and adjacent forest cover.

The size of the monkey population in the 1980 and 1994 surveys was estimated at 14,000 – 15,000 individuals. While exact figures were not presented in the 2010 survey, it is estimated that the population of resident monkeys has remained constant.

There is a clear need to understand the movement and distribution patterns of monkeys in Barbados and to accurately access their numbers, distribution and their economic impact on the agricultural sector to develop a management plan which conserves the monkey population and reduces crop losses due to their activities.

Barbados Green Monkey at Wildlife Reserve

CASE STUDY 5 ECONOMIC VALUE OF MARINE TURTLE CONSERVATION

Marine turtles have provided sustenance to coastal communities for centuries mainly through their direct use for eggs, meat, shell, oil, leather or other products.[17] *In recent decades, however, their populations have drastically declined due to several factors including*[18]*: (i) Being harvested for consumptive use: eggs, meat, shell, and skin; (ii) Their slow growth rate and late maturity make them vulnerable to exploitation for a longer period of time than most marine animals; (iii) Fisheries by-catch is a major threat: Turtles are largely affected by fish nets, fish pots, and longlines; (iv) Hatchlings and adults are disoriented by coastal lighting, which makes it difficult for nesting females to lay eggs and for hatchlings to find the ocean; (v) Growth, reproduction, and sex ratios may be affected by warming sea temperatures as sea turtles are ectotherms; and (vi) Habitat destruction.*

An analysis of the economic aspects of marine turtle use and conservation considers both consumptive and non-consumptive use (the use of marine turtles as a tourism attraction, either on land when turtles come to nest or bask, or in-water; the production and sale of items with marine turtle motifs associated with conservation projects, and the provision of board and lodging services to scientists and volunteers may also be considered non-consumptive use.)[19].

It is estimated that the gross revenue from consumptive use of marine turtle meat, eggs, shell, leather and bone can range from US$158 to US$1,701,328 per annum per country dependent on such use with an average of US$581,815 per annum. Direct beneficiaries from consumptive use vary from a few to several hundred value chain stakeholders including fishermen and egg collectors. Gross revenue generated from non-consumptive use of marine turtles, such as tourism, range from US$41,147 to US$6,714,483 per annum per country with an average of US$1,659,250 per year. Non-consumptive use generates more revenue, has greater economic multiplying effects, greater potential for economic growth, creates more support for management, and generates proportionally more jobs, social development and employment opportunities for women than consumptive use.

The Barbados Sea Turtle Project (BSTP)[20]

Barbados is currently home to the second-largest hawksbill turtle nesting population in the Wider Caribbean, with up to 500 females nesting on the island per annum. Sea turtle management in Barbados not only has an ecological focus but also an economic one as 'swimming with turtles' has become a major tourist attraction for visitors to the island. There are three main species of sea turtles found in Barbados: (i) hawksbill (Eretmochelys imbricata), (ii) green (Chelonia mydas), and (iii) leatherback sea turtles (Dermochelys coriacea). Hawksbills and leatherbacks have a status of critically endangered, and green sea turtles are endangered (WWF 2016).[21]

The Barbados Sea Turtle Project (BSTP), which is based at the University of the West Indies (Cave Hill Campus), is involved in several aspects of conservation of the endangered marine turtle species that forage around and nest on Barbados. This objective is achieved through research, education and public outreach as well as monitoring of nesting females, juveniles and hatchlings. The BSTP provides a range of services and activities related to conservation of marine turtles in Barbados including:

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[17] Troëng, S. and Drews C. (2004). Money Talks: Economic Aspects of Marine Turtle Use and Conservation, WWF-International, Gland, Switzerland www.panda.org

[18] Barbados' Hidden Treasure An Economic Valuation of Sea Turtles the Snorkelling Tour Industry& Written By: Jake Gutman, Rebecca Lavery & Helena Reinfels In Association with Bellairs Research Institute, McGill University, and Barbados Blue November 22, 2016

[19] Troëng, S. and Drews C. (2004). Money Talks: Economic Aspects of Marine Turtle Use and Conservation, WWF-International, Gland, Switzerland www.panda.org

[20] Source: www.barbadosseaturtles.org *and* https://www.facebook.com/thebstp

[21] Barbados' Hidden Treasure An Economic Valuation of Sea Turtles the Snorkelling Tour Industry& Written By: Jake Gutman, Rebecca Lavery & Helena Reinfels In Association with Bellairs Research Institute, McGill University, and Barbados Blue November 22, 2016

- *Operating a 24 hour "Sea Turtle Hotline" to monitor sea turtle sightings and address sea turtle "emergencies"*
- *Monitoring the national index nesting beach nightly for 4 months during the nesting season (June-September),*
- *Operating mobile patrol groups that survey 15 other nesting beaches*
- *Monitoring of juvenile hawksbills on the island's west coast bank reef*
- *Producing guidelines and developing printed materials to inform visitors on how to minimize any potential negative impacts of their visits on the turtles at the "Swim with the Turtles" sites*
- *Facilitating productions of sea turtle documentaries for the Caribbean Broadcasting Corporation, Canadian Broadcasting Company, BBC, the Discovery Channel, and various internet TV sites*

These activities and their links to sustainable tourism have resulted in the BSTP being listed in Islands Magazine's Blue List as one of the top 100 sustainable tourism activities on islands anywhere in the world.

It is estimated that a visitor to Barbados has a high likelihood of seeing at least one nesting hawksbill turtle during any 2-week stay at any one of the hotels on the west and south coasts in the nesting season months of May-October. Further, a SCUBA diving visitor can be expected to see at least one hawksbill on the offshore bank reef during any 1-hr dive year-round, and a visitor on a catamaran cruise will likely see several green turtles at the "Swim with the Turtles" sites around the island.

Estimated Economic Value

A recently conducted study estimates that the economic value in terms of annual revenues of the non-consumptive use of the 'swim with the turtle' and snorkelling industries in Barbados is $33.8 million USD. The average revenue annually attributable to each individual green turtle is $1.7 million USD. These estimates are based on the green turtle population. This study provides valuable information for public sector decision making regarding conservation and eco-tourism related to turtle populations around Barbados as well as forming the basis for the private sector businesses based on the 'swim with the turtles' sub-sector to ensure the health and safety of turtles in their habitats.

Logo: Barbados Sea Turtle Project[23]

Photo of Tourist swimming with a turtle. Dive Barbados Blue dive tour[22]

[22] Source: https://www.divebarbadosblue.com/snorkeling-in-barbados/
[23] Source: http://www.barbadosseaturtles.org/pages/about_us/index.html

CASE STUDY 6 MANAGEMENT OF SAGASSUM INFLUXES

Sargassum Management

Since 2011 large quantities of pelagic sargassum have been washing up in recurrent events along the shores of several Caribbean islands and West African countries. In response to this presence and potential threat to marine biodiversity, Caribbean counties, including Barbados, have developed guidelines to enable government officials, coastal managers, beach caretakers and coastal residents to manage sargassum influxes by providing up-to-date information on how best to sustainably manage the seaweed, based on lessons learnt to date.

The immediate issue requiring immediate and urgent attention is that of clean-up as the build-up of sargassum presents several challenges including: increased eutrophication and critically low oxygen levels in nearshore waters; release of toxic hydrogen sulphide; smothering critical habitats. Management response to sargassum (clearing beaches with heavy duty equipment) has also resulted in damage to beaches, beach vegetation and beach fauna as well as potential damage to turtle nesting areas.

Different management approaches can be implemented to address sargassum influx events based on the situation and location, depending on factors such as the biomass of sargassum; accessibility of the affected shoreline, whether the area is ecologically sensitive, important for tourism or fishing, or whether it is adjacent to a coastal community or coastal industry. Generally, the management guidelines take into consideration the following:

A Communication Plan: - An important first step is to ensure coastal users and other stakeholders, including the general public, receive relevant and reliable information about sargassum and the periodic influxes, as well as the on-going management efforts. Various means of communication are implemented based on the target stakeholders and include print and audio-visual media. There is also a regional online forum which has been established by the UNEP-CEP Regional Activity Centre for SPAW for communicating sargassum-related issues (email sargassum.forum@gmail.com).

Letting Nature Take its Course: - adopting a strategy of letting nature take its course is a prudent strategy implemented. If sargassum washes ashore in small quantities or inaccessible, non-tourist or non-critical locations, it is generally preferable to leave the seaweed where it is.

Removal: - When removal of mass sargassum inundations is required it may be collected either onshore using manual or mechanical means; or in the water along the shoreline. The objective is to effect the removal without causing beach erosion which can be caused by heavy construction equipment brought in to clear the seaweed, especially bulldozers with caterpillar tracks and buckets that gouge the beach and remove large quantities of sand with the sargassum

Studies undertaken in relation to Sargassum in Barbados[24]

- *MSc. Research the socio- economic impacts of the Sargassum events on the fishery sector of Barbados*
- *Sargassum sampling to investigate its N15 isotope and determine potential source and nutrification status*
- *Assessment of the occurrence of different phylotypes of E. coli and enterococci, and associated integrons in Sargassum species*
- *Extraction of alginate from Sargassum species for wastewater treatment, membrane separations, drug delivery and antibacterial applications*
- *Impact of the accumulation of Sargassum seaweed on ghost crabs in Barbados*

[24] Source: https://www.sargassum-at-cermes.com/research

- *Investigation of the impacts of Sargassum rafts on nest distribution, incubation, hatchling emergence and sea finding of hawksbill turtles*
- *Development and commercialisation of a beach clean-up/sargassum collection system*
- *The Student Entrepreneurial Empowerment Development (SEED) Program in partnership with the Caribbean Sustainability Collective implemented a project called the "Sargassum Hack", in which researchers, entrepreneurs, students and product developers gathered at the University of the West indies to brainstorm business opportunities and management strategies for the recent Sargassum influx*
- *Research on collection and use of sargassum seaweed and the development of a number of product prototypes ranging from soaps and flour to plywood and biomass pellets*
- *Develop a Small Scale Sargassum Processing Plant*

Sargassum seaweed at River Bay on the north coast of Barbados. Source: Ministry of Environment

CASE STUDY 7 MANAGING BARBADOS' COASTAL ZONE

Coastal Zone Risk Assessment Management Programme[25]

The coastal zone of Barbados supports varied activities ranging from economic (both fisheries and tourism-related); transportation (maritime transport); and leisure (health and wellness and recreational) and is therefore considered a major economic, social and cultural asset. It is therefore critical that measures continue to be implemented to enhance Barbados' coastal zone resilience to marine, coastal and terrestrial hazards such as beach erosion to attain its current and future sustainable development goals.

The Government of Barbados, through the Coastal Zone Management Unit (CZMU), is currently executing the Coastal Risk Assessment and Management Program (CRMP) which is partly funded by the Inter-American Development Bank. The aim of the program is to increase the resilience of Barbados to coastal hazards through the improved conservation and management of the coastal zone. The primary objective of the CRMP is to enhance the capacity of the CZMU in integrated coastal zone management in Barbados while incorporating sound disaster risk reduction and climate change adaptation principles within the development planning process.

The program has three main components:

Component 1: Coastal Risk Assessment, Monitoring and Management

This component focuses data collection and analysis by providing the CZMU updated qualitative and quantitative data on risk in the coastal zone. The main activities of the project fall under the following broad activities:

- *Baseline Studies on Coastal and Oceanographic Processes*
- *Comprehensive Risk Evaluation*
- *National Coastal Risk Information and Planning Platform Development*

Component 2: Coastal Infrastructure

This program component focuses implementing measures to control shoreline erosion; enhance climate-related hazard resilience of coastal infrastructure; improve public access to beaches; and increase the recreational opportunities offered to tourists and residents. Activities within this component include:

- *Holetown Waterfront Improvement Project (HWIP) from Holetown to Heron Bay*
- *Rockley Beach to St. Lawrence Gap Waterfront Improvement Project*
- *Ecosystem-Based Adaptation Pilot Project*

Component 3: Institutional Sustainability for Integrated Coastal Zone Management

The objective of this component is to strengthen the policy, regulatory environment and institutional capacity within Government to enable the CZMU to fulfill its expanded mandate for integrated coastal risk management. This component focuses on the following:

- *DRM and CCA Sensitization and Training Plan for the CZMU and Strategic Partners*
- *Training of Staff of CZMU in Disaster Risk Management (DRM) and Climate Change Adaptation (CCA)*
- *Updating of the Integrated Coastal Zone Management Plan incorporating DRM and CCA*
- *Amendment to the Coastal Zone Management Act and Preparation of Coastal Zone Management Regulations*
- *Preparation of a Strategic Action Plan (SAP) for DRM and CCA in the Coastal Zone*
- *Policy for Information Sharing among the Departments of the Ministry of Environment and Drainage, and with Key Strategic Partners*

[25] Source: http://coastal.gov.bb/?q=content/coastal-risk-assessment-and-management-programme

- *Updated Proposal for Cost Recovery Mechanisms for Coastal Infrastructure*
- *Design and Implementation of a Communications Strategy and Action Plan on DRM, CCA and CZM for CZMU and Strategic Partners*
- *Update of the CZMU Operations Manual*

4. PART II STATUS ON IMPLEMENTATION OF THE NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN

4.1 NBSAP IMPLEMENTATION

Part II of this report provides an update on implementation of the National Biodiversity Strategy and Action Plan (NBSAP) since the submission of the 4th Report.

The current NBSAP has as its guiding principles the following:

- Identification of the current state of knowledge about biodiversity in Barbados;
- Identification of important gaps in the knowledge base and the assessment of further needs and associated costs;
- Identification of current pressures on biodiversity and future trends;
- Assessment of the present and future value to Barbadians of the country's biodiversity;
- Assessment of the costs and benefits of conserving biodiversity in Barbados;
- Identification of the conservation priorities and strategies for conserving biodiversity;
- Identification of appropriate mechanisms or actions to carry out the identified conservation strategies;
- Identification of the institutional requirements to support the implementation of the strategies and actions.

The Ministry of Environment and Drainage is currently working on a project to develop a new NBSAP which has the following key objectives:

- To compile a list of stakeholders on biodiversity matters, who would assist the Government of Barbados in the management of biodiversity
- To prepare a new NBSAP for Barbados based on the guidance provided by the CBD
- To develop the key elements of the NBSAP along with a clear set of strategies, actions, targets and indicators, consistent with national conditions
- To develop a Resource Mobilization Plan and Implementation Plan for the NBSAP
- To develop a Communications Strategy for the implementation of Barbados' NBSAP

The new NBSAP will be completed in 2017.

Table 4: An Update of the Implementation of the Barbados NBSAP

NBSAP Objective	Implementation progress Focusing on Concrete Results Achieved	Obstacles Encountered in Implementation and Lessons Learned
To mobilize adequate financial resources for the management and conservation of Barbados' biodiversity	The Ministry of Agriculture in 2015 established the Green Agricultural Green Product and Green Energy Research Fund (AGPRF), geared toward funding projects with positive environmental impact	The challenge is the limited funding allocation and the fact that the project is time-bound regarding the source of funding and therefore is not expected to run for the long term (over a 5-year period)
To develop the human resource base and strengthen institutional capacity for biodiversity conservation and management	In 2012 the Ministry of Environment undertook a study on Sustainable Land Management with a primary focus of developing a Strategic Plan & Institutional Strengthening of the Soil Conservation Unit (SCU). The strategic plan provides recommendations for various actions which must be implemented for the SCU to effectively undertake its mandate.	The key challenges faced in implementing the strategic plan is the limited availability of both human and financial resources
To conduct essential research to inform the development and implementation of management practices for the sustainable use of biodiversity	The University of the West Indies has been an invaluable source of relevant information. Research on biodiversity is being conducted on an ongoing basis. In addition, the university provides valuable, relevant and timely information to new and emerging threats to biodiversity and work with national public and private sector entities to develop management plans and best practices e.g. research conducted on Lion fish and Sargassum sea weed The impact of the presence of Lionfish in Barbados waters and the development of a lionfish invasion response plan; impact of the presence of Sargassum seaweed on Barbados' seacoast Research commencing in 2015 and ongoing, on the extraction and use of non-traditional natural fibres Research and publication on medicinal plants of Barbados (See Annex 1 for additional programmes and projects related to biodiversity)	The MED needs to develop an environmental knowledge management system to document and make accessible the results of varied R&D efforts
To promote biodiversity conservation and sustainable use through incentives	The 2007 Intellectual Property Strategy for Barbados speaks to providing incentives to farmers who grow indigenous plant varieties Incentives to promote sustainable use of biodiversity are documented in the Ministry of Agriculture Incentive Scheme	The challenge is that most incentive programmes are based on appropriate record keeping and this poses a problem when engaging some private sector entities in a conservation incentive programme based on review of records presented for rebates, income tax concessions etc.
To improve public awareness and	The private sector is also engaged in the national public awareness and education programmes e.g.	There is a need for a well-articulated communication strategy for the NED.

NBSAP Objective	Implementation progress Focusing on Concrete Results Achieved	Obstacles Encountered in Implementation and Lessons Learned
education	• Atlantis Submarine Barbados – educational tours and information • The Barbados Institute of Environmental Professionals • The Barbados Natural Fibres Network • Grantees of various GEF SGP programme • The Barbados Sea Turtle Project	This strategy must include communication to all relevant stakeholders. Lessons learned: collaborating with the private sector to facilitate achieving this NBSAP objective is critical.
To establish effective *in situ* and ex *situ* biodiversity conservation measures	The Ministry of Agriculture in partnership with the Barbados Natural Fibres Network, the Barbados Institute of Environmental Professionals through funding from the GEF SGP is in the initial stages of implementing the first national germplasm/seed bank. The seed bank will in the first phase have a collection of natural fibres and seeds germplasm of economic importance and the second phase will focus on the conservation of seeds of agronomic importance	The challenge observed is the limited human resources available nationally with the knowledge to establish and maintain a national seed bank. Successful implementation and sustainability will rely on collaboration/networking with national and international partners
To ensure equitable biodiversity and Traditional Knowledge access and benefit sharing	The Intellectual Property Office has participated in regional efforts to Establish a Caribbean Framework for the Protection of Traditional Knowledge, Folklore/Traditional Cultural Expressions and Genetic Resources[26]	The challenge is the need to develop a system which guides access to genetic resources and traditional knowledge and benefits to be derived from such access as no coherent mechanism exists.
To establish biosafety regulations in order to safeguard biodiversity	The MED has commenced implementing the National Biosafety Framework. To date there is a draft Biosafety Bill which is undergoing national consultation; the Ministry has also held several training workshops on biosafety. Barbados also has notified the CBD through the BCH of its National roster of Experts	Challenges: lengthy timeframe for the legislative drafting and Cabinet approval as well as for developing regulations
To promote the Conservation and sustainable use of biodiversity in various sectors (agriculture, health, fisheries, tourism)	The Barbados Institute of Environmental Professionals' GEF SGP funded project was instrumental in promoting, through various workshops, the conservation and sustainable use of traditional and non-traditional natural fibres used by the crafts sector Beyond the Bush™ training workshops executed by the Barbados Natural Fibres Network promote the sustainable use and conservation of natural fibres and seeds for use by crafts-persons Ministry of Environment allocation of $ 1 million USD of their STAR resources to GEF SGP for possible use in Biodiversity Conservation Projects	Challenge: sustaining project funding to execute future workshops Lessons learned: collaboration with key partners in the public and private sectors to provide the resources required Engaging key community leaders in the planning process and in execution of workshops within the community to maximise participation

[26] Source: http://www.wipo.int/meetings/en/details.jsp?meeting_id=15485

4.2 MAINSTREAMING OF BIODIVERSITY IN THE NATIONAL POLICY FRAMEWORK

The 4th national report provided detailed information on the mainstreaming of biodiversity in national policy framework as articulated in the following documents:

- National Strategic Plan of Barbados :2006-2025
- National Biodiversity Strategy and Action Plan (NBSAP) 2002:
- Barbados Sustainable Development Policy 2004:
- Physical Development Plan Amended 2003
- Medium Term Development Strategy – Building the Green Economy
- National Park Plan

4.2.1 Barbados' Green Economy Scoping Study

Barbados' Green Economy Scoping Study (GESS)[27] was finalized in 2014 and has as its primary goals:

"….to consider the steps that would be necessary to move towards a greener economy and the resulting net benefits that might accrue". The project focused on five key economic sectors – agriculture, fisheries, building/housing, transportation and tourism and integrated four cross-cutting issues: waste, water, energy and land.

The GESS provided recommendations for the development of a strategic roadmap to Barbados achieving an environmentally advanced green economy[28]:

- Establishment of a set of operational principles as the basis for policy development, education, monitoring and evaluation;
- Granting umbrella responsibility to the Social Partnership for monitoring, reviewing and reporting on Barbados' green economy roadmap, supported by a GETSC and a research secretariat;
- Drafting and enactment of legislation on environmental management, water reuse, groundwater provisions and solid waste management, and the incorporation of 'green policies' in the building code along with strengthening of the policy guidelines in the Physical Development Plan;
- Greater public sector leadership via support for innovative projects and green procurement policies; support for private sector initiatives that advance the country's green economy transition;

[27] Moore, W., Alleyne, F., Alleyne, Y., Blackman, K., Blenman, C., Carter, S., Cashman, A., Cumberbatch, J., Downes, A., Hoyte, H., Mahon, R., Mamingi, N., McConney, P., Pena, M., Roberts, S., Rogers, T., Sealy, S., Sinckler, T. and A. Singh. 2014. Barbados' Green Economy Scoping Study. Government of Barbados, University of West Indies - Cave Hill Campus, United Nations Environment Programme, 244p.

[28] Moore, W., Alleyne ,F., Alleyne, Y., Blackman, K., Blenman, C., Carter, S., Cashman, A., Cumberbatch, J., Downes, A., Hoyte, H., Mahon, R., Mamingi, N., McConney, P., Pena, M., Roberts, S., Rogers, T., Sealy, S., Sinckler, T. and A. Singh. 2014. Barbados' Green Economy Scoping Study. Government of Barbados, University of West Indies - Cave Hill Campus, United Nations Environment Programme, 244p.

- Implementation of a public education campaign that promotes green economy;
- Enhancement of partnerships with stakeholders and international partners (e.g., FAO/UNEP Agri-food Task Force on Sustainable Consumption and Production, Partnership for Clean Fuels, UNEP Global Partnership for Sustainable Tourism, UNEP Sustainable Building and Climate Initiative, Marrakech Task Force on Sustainable Public Procurement, and the Partnership for Education and Research about Responsible Living);

4.3 CROSS-CUTTING NATIONAL PLANS AND STRATEGIES

Tourism Plan:

The Government of Barbados has taken the decision to develop a policy framework, plan and strategy, which will guide and provide specific prescriptions for the future growth and development of the tourism industry in Barbados over the ten (10) year period 2014-2023[29] in the form of a Tourism Master Plan (TMP). The policy and planning framework will ensure that the tourism industry grows in a manner that is economically, socially and environmentally sustainable and thus able to meet the future needs of Barbadians, visitors, investors and other stakeholders.

Agricultural Plan:

The national Fisheries Management Plan (FMP) is currently being updated in line with the development of a new Fisheries Sector Management and Development Policy and new draft Fisheries (Management) Regulations, 2014, under the Fisheries Act. The Fisheries Sector Management and Development Policy considers both international and regional conventions, agreements and treaties to which Barbados is signatory as well as outlining the Guiding Principles for resource sustainability, livelihood sustainability, infra-structural development, legislative reform and the greening of fisheries.

Plant Protection:

The mandate of Plant Protection is the phytosanitary security and conservation of Barbados' agricultural plant biodiversity through the identification of plant pests and diseases and provision of environmentally sound control practices. Barbados also makes provision for the protection of new plants varieties under the *Protection of New Plant Varieties Act, 2001-17* an Act which provides protection for plant breeder's rights and which sets out the procedures for making applications for protection of such rights and for the grant of these rights.[30]

[29] Barbados Tourism Master Plan 2014 – 2023: Report IV: Our Visitors and The Barbados Visitor Economy. Ministry of Tourism and International Transport, Lloyd Erskine Sandiford Centre, Two Mile Hill, St. Michael, Barbados

[30] Source: http://www.caipo.gov.bb/site/index.php/aboutus/legislation

5. PART III PROGRESS TOWARDS IMPLEMENTING THE 2020 AICHI BIODIVERSITY TARGETS

Table 5 Implementing the Aichi Biodiversity Targets in Barbados

The following presents a synopsis of Barbados progress towards implementing the Aichi targets during the reporting period.

No.	Aichi Targets	Relevant indicators	Progress toward implementation during the reporting period
	Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society		
1	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably	• Trends in awareness and attitudes to biodiversity • Trends in public engagement with biodiversity • Trends in communication programmes and actions promoting social corporate responsibility	The MED continues to move forward with its awareness and education programmes on biodiversity conservation and management. The new NBSAP will contain a detailed communication strategy and action plan Training workshops, conferences and seminars have been undertaken in a wide cross section of areas relevant to the environment and obligations under various MEAs Participation in activities marking major environmental days observed globally Outreach programmes to communities and schools to sensitize about environmental issues There is a noticeable trend in the involvement of the private sector in conservation and biodiversity maintenance e.g. the conversion of quarry mines to ecologically balanced spaces.
2	By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	• Trends in incorporating natural resource, biodiversity, and ecosystem service values into national accounting systems • Trends in number of assessments of biodiversity values, in accordance with the Convention	As part of the development of its new NBSAP Barbados is currently undertaking an assessment of biodiversity values While specific studies have not been undertaken to access the value of biodiversity various studies undertaken by the Ministry of Agriculture – Fisheries Division and other

		• Trends in guidelines and applications of economic appraisal tools • Trends in integration of biodiversity and ecosystem service values into sectoral and development policies • Trends in policies considering biodiversity and ecosystem services in environmental impact assessment and strategic environmental assessment	stakeholders and statistical data can be used to assist in determining such values The Green Economy Scoping Study[31] published in 2014 provides tangible linkages between agricultural biodiversity, and economic development The Economic Valuation of Sea Turtles the Snorkelling Tour Industry provides valuable information on the economic value of the marine sea turtle conservation programme executed by the Barbados Sea Turtle Project and its partners One of the challenges faced in determining ecosystem values, especially in non-traditional areas is the lack of statistical data and accessibility of the limited data that is captured by various government departments and within the private sector
3	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, considering national socio-economic conditions.	• Trends in the number and value of incentives, including subsidies, harmful to biodiversity, removed, reformed or phased out. • Trends in identification, assessment and establishment and strengthening of incentives that reward positive contribution to • Biodiversity and ecosystem services and penalize adverse impacts	Data not available to access progress
4	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	• Trends in Ecological Footprint and/or related concepts • Trends in extent to which biodiversity and ecosystem service values are incorporated into organizational accounting and reporting • Trends in biodiversity of cities • Ecological limits assessed in terms of	Much work still needs to be undertaken to achieve this target There is an increasing focus on sustainable utilisation of biodiversity of economic importance as evidenced by the species-specific management plans developed by the Fisheries division (e.g. sea egg); the focus on regenerating old quarries (e.g. Walker's reserve); the conversion of a bird shooting wetland to a conservation area.

[31] Moore, W., Alleyne ,F., Alleyne, Y., Blackman, K., Blenman, C., Carter, S., Cashman, A., Cumberbatch, J., Downes, A., Hoyte, H., Mahon, R., Mamingi, N., McConney, P., Pena, M., Roberts, S., Rogers, T., Sealy, S., Sinckler, T. and A. Singh. 2014. Barbados' Green Economy Scoping Study. Government of Barbados, University of West Indies - Cave Hill Campus, United Nations Environment Programme, 244p. (Revised January 2015)

		sustainable production and consumption • Trends in population and extinction risk of utilized species, including species in trade	
	Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use		
5	By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced	• Trends in proportion of degraded/threatened habitats • Trends in extent of selected biomes, ecosystems and habitats • Trends in condition and vulnerability of ecosystems • Trends in fragmentation of natural habitats • Population trends of habitat dependent species in each major habitat type	Loss of habitat in sensitive areas such as the Scotland District Area remains a concern due to land slippage. No assessment has been undertaken to determine the rate of loss of natural habitat. A 2015 study of the natural fibres and seeds of economic importance to the crafts sector has brought to light limited availability of some fibre and seed plants which were present in abundance in specific locales on the island. Grass and pasture fires remain a threat to biodiversity and there is need to undertake baseline studies and to monitor loss of habitat due to this threat The challenge remains the availability of data to make the assessment
6	By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	• Trends in proportion of depleted target and bycatch species with recovery plans • Trends in area, frequency, and/or intensity of destructive fishing practices • Trends in catch per unit effort • Trends in extinction risk of target and bycatch aquatic species • Trends in fishing effort capacity • Trends in population of target and bycatch aquatic species • Trends in proportion of utilized stocks	Several management plans have been developed by the Fisheries Division of the Ministry of Agriculture including an overall fisheries management plan [32][33][34] The Fisheries Management Plan contains 8 fishery-specific management plans for the following: (i) Shallow-shelf reef fishes, e.g. parrotfish, surgeonfish, grunts; (ii) Deep slope fishes, e.g. snappers, groupers; (iii) Coastal pelagics, e.g. herrings, jacks, small tunas; (iv) Large pelagics, e.g. dolphin, tunas, kingfish, swordfish, shark; (v) Flying fish; (vi) Sea urchins, i.e. sea egg; (vii) Turtles, e.g. loggerhead, hawksbill, leatherback; and (viii) Lobsters; e.g. spiny, spotted

[32]. P. McConney, R. Mahon and H. Oxenford. 2003. Barbados Case Study: The Fisheries Advisory Committee. Caribbean Coastal Co-Management Guidelines Project
[33] P. McConney, R. Mahon and C. Parker. 2003. Barbados Case Study: The Sea Egg Fishery. Caribbean Coastal Co-Management Guidelines Project
[34] Patrick McConney. Multi-objective Management of Inshore Fisheries in Barbados: A Biodiversity Perspective

		outside safe biological limits	Section 3(3)) of the 1993 Fisheries Act makes provision for the development of strategies for the sustainable utilisation of fish stock. "*The objective of fisheries management and development shall be to ensure the optimum utilization of the fisheries resources in the waters of Barbados for the benefit of the people of Barbados.*"
7	By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	• Trends in area of forest, agricultural and aquaculture ecosystems under sustainable management • Trends in population of forest and agriculture dependent species in production systems • Trends in production per input • Trends in proportion of products derived from sustainable sources	The Ministry of Agriculture has developed several polices for the sustainable development of the agricultural sector. Policies for the agricultural sector have been articulated within the framework of the National Policy which in addition to other strategies refer to defining a green belt for agriculture.[35] Focus on implementing water storage facilities and rain harvesting facilities on farms; and implementation of water conservation technologies Data will need to be disaggregated to make a full assessment of progress towards the target
8	By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	• Impact of pollution on extinction risk trends • Trend in emission to the environment of pollutants relevant for biodiversity • Trend in levels of contaminants in wildlife • Trends in incidence of hypoxic zones and algal blooms • Trends in nitrogen footprint of consumption activities • Trends in ozone levels in natural ecosystems • Trends in pollution deposition rate	Data not available to access progress

[35] A Review of Agricultural Policies: Case Study Of Barbados. 2005. The CARICOM Regional Transformation Programme For Agriculture

		• Trends in proportion of wastewater discharged after treatment • Trends in sediment transfer rates • Trends in water quality in aquatic ecosystems	
9	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	• Trends in number of invasive alien species • Trends in invasive alien species pathways management • Trends in the impact of invasive alien species on extinction risk trends • Trends in incidence of wildlife diseases caused by invasive alien species • Trends in the economic impacts of selected invasive alien species • Trends in policy responses, legislation and management plans to control and prevent spread of invasive alien species	Studies are being undertaken regarding the Lionfish and Giant African snail about management. More data is required to fully make an assessment on progress to this target
10	By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	• Extinction risk trends of coral and reef fish • Trends in climate change impacts on extinction risk • Trends in climatic impacts on community composition • Trends in climatic impacts on population trends • Trends in coral reef condition • Trends in extent, and rate of shifts of boundaries, of vulnerable ecosystems	Several coral reef studies are being undertaken by the Centre for Resource Management and Environmental Studies (CERMES), Faculty of Science and Technology, The University of the West Indies, Cave Hill Campus, Barbados, including a recent study Mapping the return of acroporid corals on fringing reefs along the west coast of Barbados.[36] Further studies are required to generate data required to make a full assessment on progress towards this target
	Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity		
11	By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of importance for biodiversity and ecosystem services, are	• Trends in extent of marine protected areas, coverage of key biodiversity areas and management effectiveness • Trends in protected area condition and/or	The national system of protect areas management remains under several different government ministries, sometimes with limited coordination of activities. The National Park Development Plan was developed to guide

[36] R. MACLEAN AND H.A. OXENFORD. 2016. Mapping the return of acroporid corals on fringing reefs along the west coast of Barbados. CERMES Technical Report No 80. http://www.cavehill.uwi.edu/cermes

	conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	management effectiveness including more equitable management • Trends in representative coverage of protected areas and other area based approaches, including sites of importance for biodiversity, and of terrestrial, marine and inland water systems • Trends in the connectivity of protected and other area based approaches integrated into land and seascapes • Trends in the delivery of ecosystem services and equitable benefits from protected areas	the development of the Barbados National Park and Natural Heritage Conservation Areas in Barbados. Barbados' system of Parks and Open Spaces is detailed in the Physical Development Plan and comprises 6 categories and specific land use policies for each of the categories. The categories: • OS 1 The Barbados National Park • OS 2 Natural Heritage Conservation Areas • OS 3 Coastal Landscape Zone • OS 4 Public Parks and Open Spaces • OS 5 National Attractions • OS 6 Barbados National Forest Candidate Sites The system of protected areas includes: Folkestone Marine Reserve - Barbados' first marine protected area
12	By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	• Trends in abundance of selected species • Trends in extinction risk of species • Trends in distribution of selected species	Technical workshop in 2013 to discuss the conservation of the Barbados Leaf-Toed Gecko; distribution studies Ongoing work by the Fisheries Division of the Ministry of Agriculture on the abundance and distribution of fish stock of economic importance including invasive species such as the Lionfish.
13	By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	• Trends in genetic diversity of cultivated plants, and farmed and domesticated animals and their wild relatives • Trends in genetic diversity of selected species • Trends in number of effective policy mechanisms implemented to reduce genetic erosion and safeguard genetic diversity • related to plant and animal genetic resources	Mapping of natural fibres and seeds used by the crafts sector (2015) Ministry of Agriculture, collaborating with national Barbados Natural Fibres Network (an NGO) to establish a seed bank for natural fibres and seeds in the first instance and then for crops of agro-importance.

	Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services		
14	By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, considering the needs of women, indigenous and local communities, and the poor and vulnerable.	• Population trends and extinction risk trends of species that provide ecosystem services • Trends in benefits that humans derive from selected ecosystem services • Trends in proportion of the population using improved water services • Trends in proportion of total freshwater resources used	Several studies undertaken by both the private and public sectors on ecosystem services provided by biodiversity. Not enough data available to assess the progress towards this target.
15	By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	• Status and trends in extent and condition of habitats that provide carbon storage • Population trends of forest-dependent species in forests under restoration • Trends in area of degraded ecosystems restored or being restored • Trends in proportion of degraded/threatened habitats • Trends in primary productivity • Trends in proportion of land affected by desertification	Trend towards greater private sector involvement in conservation and restoration with specific focus on restoration of quarry sites and conversion of bird shooting swamps to national reserves. The beautification of Historic Bridgetown focused on the upgrade of Constitution River with an aim toward flood mitigation intervention; landscaping using indigenous plants and the creation of a marine life habitat
16	By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	• Number of Parties to the CBD that have ratified the Protocol • Number of Parties to the Nagoya Protocol that have legislative, administrative or policy measures and institutional • structures in place for implementing the Nagoya Protocol	
	Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building		
17	By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	• Trends in implementation of National Biodiversity Strategies and Action Plans, including development, comprehensiveness, adoption and implementation	Work commenced towards developing new NBSAP targets

18	By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	• Trends in degree to which traditional knowledge and practices are respected through: full integration, participation and • safeguards in national implementation of the Strategic Plan • Trends of linguistic diversity and numbers of speakers of indigenous languages • Trends in land-use change and land tenure in the traditional territories of indigenous and local communities • Trends in the practice of traditional occupations	June designated national cultural heritage month Extraction and documentation of traditional aspects of products and services which have a unique characteristic because of traditional know-how and practices as well as geographical location to be used as a tool for protection of such products under an intellectual property regime
19	By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	• Number of maintained species inventories being used to implement the Convention • Trends in coverage of comprehensive policy-relevant sub-global assessments including related capacity building and knowledge transfer, plus trends in uptake into policy	Greater collaboration with academic institutions such as the University of the West Indies, Barbados Community College, and Bellairs Institute and the private sector regarding biodiversity management issues MOA focus on R&D and innovation to enhance the agricultural sector and train young persons to generate greater interest in agriculture Publication on the medicinal properties of native plant species
20	By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	• In decision X/3 the Conference of the Parties adopted a set of 15 indicators to assess progress in the implementation of the financial resource mobilization strategy and Target 20 of the Strategic Plan.	Traditional funding sources such as the GEF/SGP, CDB and Government financing continue to be significant contributors to supporting related projects An increased number of NGOs focusing on biodiversity conservation projects using indigenous plant species and animal breeds Private sector financing for major restoration and conservation projects

ANNEX 1 NATIONAL PROJECTS AND PROGRAMMES

The following matrix presents a list of national programmes which are currently underway national or are in the planning stages.

EXISTING/ONGOING BIODIVERSITY-RELATED PROJECTS					
Project	**Description & Key outputs (e.g. Available documents)**	**Budget**	**Duration**	**Funding source**	**Status/ Planned Start**
Sustainable Utilization of Local Natural Fibres and Seeds by Craft Artisans for New Product Development	Sustainable utilization of local natural fibres and seeds by craft artisans for new product development project focuses on the innovative and sustainable utilization of natural fibres and seeds to aid in the development of the local craft industry and the conservation of genetic diversity of these source plants within Barbados. The use of natural fibres for sustainable land management (preventing, controlling, managing soil erosion) within the Scotland District Area of Barbados is indeed ecologically sustainable. This project seeks to identify and document the availability and use of natural fibres biodiversity in Barbados to increase collective knowledge of their use and sustainable management to enhance the capacity of natural fibres product development businesses in Barbados for increased production and competitiveness in traditional and new niche markets. The project makes a genuine effort to evolve several communities across Barbados through training in Community Centres and the involvement of the farming community. Four NGOs are directly involved in the implementation of the project. These organizations include the Barbados Institute of Environmental Professionals, Barbados Crafts Council, Organic Growers and Consumers Association and the 4H Foundation of Barbados. The project provides several opportunities for the development of sustainable livelihoods. These opportunities range from the production of natural fibres to the manufacturing of innovative	50,000.00	December 2013-February 2015	GEF	Completed

EXISTING/ONGOING BIODIVERSITY-RELATED PROJECTS					
Project	**Description & Key outputs (e.g. Available documents)**	**Budget**	**Duration**	**Funding source**	**Status/ Planned Start**
	natural fibre products based on the training provided through this project				
Coastal Conservation Education: Protecting Barbados' Coral Reef	Coral reefs are important to the Barbados fishing industry which partially relies on reef fish. Unfortunately, coral reefs continue to be under threat from marine pollution, unsustainable fishing practices and the introduction of alien/invasive species. This project takes a capacity-building approach to sensitise youth in Barbados on the importance of reefs through the use of educational materials such as publications and game apps. Key stakeholders include teachers, parents and the Coastal Zone Management Unit (CZMU).	50,000.00	June 2014-March 2016	GEF	Completed
Undersea Heritage Museum	The goal of this project is to raise public awareness and appreciation of the marine environment and to encourage marine biodiversity by the creation of an undersea heritage museum, off the South Coast of Barbados to coincide with the 50th anniversary of Barbados' independence. Its objectives include: (i) to provide alternative livelihoods to fisherfolk, (ii) to increase awareness of environmental issues, (iii) to bring local appreciation and respect for the marine environment and (iv) to provide a habitat for marine organisms and new surfaces for coral to attach and grow, with inputs from the Bellairs coral gardening project.	47,197.20	January 2016 – September 2017	GEF	Currently under execution
Capacity Building Workshops for the Junior Coral Reef Ambassadors Programme	This planning grant will seek to build the capacity of members of the Junior Coral Reef Ambassador Programme to support coral reef monitoring at the Folkestone Marine Reserve	5000.00	January 2016- July 2016	GEF	Completed
Barbadian Medicinal Plants: Development of College Land, St. John into a Herbal Health and Wellness Tourism Destination	The planning grant seeks to develop a full grant for a project focused on preserving medicinal plants.	5000.00	February 2016- May 2016	GEF	Currently under execution
Engaging the community and	The project seeks to engage the Barbadian community to foster	4,900.00	June 2016-	GEF	Completed

EXISTING/ONGOING BIODIVERSITY-RELATED PROJECTS					
Project	**Description & Key outputs (e.g. Available documents)**	**Budget**	**Duration**	**Funding source**	**Status/ Planned Start**
building capacity for the Coral Reef Restoration Alliance (CORALL)	conservation and restoration of coral reef ecosystems in Barbados for the well-being of all and to build the capacity of the Secretariat of CORALL.		August 2016		
Participatory Management for the Barbados Marine Management Area (BMMA)	Marine Biodiversity will be improved in the BMMA as a result of the active participation of informed stakeholders in the zonation, management and monitoring of the area. The project objectives are as follows: 1. To develop a zonation map for the BMMA, with input from at least the major marine stakeholders (Fishers, Divers, Swimmers, Catamaran, Jet ski and other pleasure craft operators) by month 4. 2. To establish the Stakeholder Advisory Committee (SAC), with representation from each of the major stakeholder groups, to ensure that a participatory approach is adopted for the development and management of the BMMA by month 3 of the project 3. To establish the BMMA Fisher's Consortium, with membership from the Fishers (minimum of 10) who operate within the Management Area by month 5 of the project. 4. To obtain baseline information on fish biomass via a participatory approach, designed to improve trust and build better relations between Fishers and BMMA operators from month 1 to 6 of the project.	50,000.00	December 2016-2017	GEF	Currently under execution
Protected areas conservation and management programme for young citizen scientists	The goal of the project is to build youth appreciation of Barbados natural heritage through the establishment of a Young Citizen Scientist Programme that facilitates improved protected areas management. The objectives are as follows: 1. To develop a community driven marine/coastal and a terrestrial research based youth programme in two of Barbados's protected areas/natural heritage conservation areas by 2018 2. To explore the feasibility of upgrading the programme to an accredited research programme	50,000.00	December 2016-February 2019	GEF	Currently under execution

EXISTING/ONGOING BIODIVERSITY-RELATED PROJECTS					
Project	**Description & Key outputs (e.g. Available documents)**	**Budget**	**Duration**	**Funding source**	**Status/ Planned Start**
	3. To foster strong partnerships to mobilize resources to support the sustainability of the programme by 2018. 4. To use south to south cooperation as a tool for natural heritage and protected areas conservation				
Engaging the community and building capacity for coral reef restoration (full grant	The Overall Goal is to engage members of the community, in the conservation of biodiversity and environmental stewardship, as they monitor and evaluate the progress of restoration of coral reef ecosystems -- through academic research and citizens science -- at two coastal locations in Barbados. The objectives of the project are to: 1. To engage fifteen hundred members of the community within a period of three years -- through their connection with CORALL -- to monitor and evaluate the progress of restoration of coral reef ecosystems at two feasible coastal locations in Barbados; and, 2. To build the functional and technical capacity of the CORALL secretariat in order to effect community engagement in citizens science, academic research, and awareness pertaining to coral restoration.	49,525.00	January 2017 – January 2020	GEF	Currently under execution
Sargassum Cleanup: Restoration & Upgrade of Beaches (S.C.R.U.B)	The Sargassum Cleanup: Restoration & Upgrade of Beaches (S.C.R.U.B) project which seeks to develop a strategy to remove seaweed from the beaches, process, package and sell it to retail stores as mulch while sensitising the Barbadian society.	2512.50	July 2015-september 2015	GEF	Completed
Plants of the Eastern Caribbean	On-line database with photographs of the flowering plants of the Eastern Caribbean with link to specimens in the Herbarium (BAR) of the University of the West Indies, Cave Hill, Barbados http://ecflora.cavehill.uwi.edu/	0	On-going (started 2006)	UWI staff and technician salary	
PLANNED BIODIVERSITY-RELATED PROJECTS					
The Development of the Apiculture Industry in Barbados through the revival and strengthening of the	The project focuses on developing the apiculture industry in Barbados. Its objectives focuses on (i) developing/enhancing a system for effective project implementation and information dissemination, (ii) drafting a National Policy for the Apiculture	50,000.00	-	GEF	Currently under execution

EXISTING/ONGOING BIODIVERSITY-RELATED PROJECTS					
Project	**Description & Key outputs (e.g. Available documents)**	**Budget**	**Duration**	**Funding source**	**Status/ Planned Start**
Barbados Beekeeping Association	Industry, (iii) building the capacity of the nine members of the Barbados Beekeeping Association and 20 beekeepers, (iv) building/strengthening community support and ensuring women and youth involvement and (v) establishing 11 demonstration sites to initiate an Entrepreneur- Beekeeping Pilot Project and the promotion of a centralised honey processing facility.				
Blackbelly Sheep Project – Mulberry Project	To further develop/improve the Blackbelly Sheep Industry in Barbados by providing high quality forage for small ruminant farmers.	Budget is in the process of finalization.	2017-2019		It is in the Planning Phase which commenced at the end of 2016. The location has been identified and discussions have begun with other government agencies.

ANNEX 2 ERRATA FOR THE FOURTH NATIONAL REPORT

The following are some corrections to data provided in the Fourth National Report

3.2 Trends in Terrestrial Biodiversity

1. Correction on the number of terrestrial mammalian species in Barbados. There is a total of 12 mammalian species: 6 bats, 2 rats, 1 mouse, 1 mongoose, 1 hare, 1 monkey which makes a total of in Barbados. They are currently 11 extant terrestrial reptiles.

2. The species of Thread snake (*Leptotyphlops carlae),* correct to *Leptotyphlos carlae*

5.5.1.7 Natural Hazards/Disasters

3. There has been limited research undertaken examining the impact of natural disasters on coral reefs in Barbados including:

    - Ian G. Macintyre, Peter W. Glynn, and Marguerite A. Toscano. 2007. The destruction of a large *Acropora Palmata* Bank barrier reef and subsequent depletion this reef-building coral off Barbados, Wi. Atoll Research Bulletin No. 545. Issued By National Museum Of Natural History Smithsonian Institution Washington, D.C. U.S.A. December 2007

    - Mah, A.J. and C.W. Stearn, 1986. The effect of Hurricane Allen on the Bellairs fringing reef, Barbados. Coral Reefs 4(3):169-176.

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