



**GEF-6 PROJECT IDENTIFICATION FORM (PIF)**

**PROJECT TYPE: Full-sized Project**

**TYPE OF TRUST FUND: GEF Trust Fund**

For more information about GEF, visit [TheGEF.org](http://TheGEF.org)

**PART I: Project Information**

Project Title:	Meeting the Challenge of 2020 in The Bahamas		
Country(ies):	The Bahamas	GEF Project ID:	9791
GEF Agency(ies):	UNEP	GEF Agency Project ID:	01569
Other Executing Partner(s):	BEST Commission, Department of Marine Resources (DMR), Bahamas National Trust (BNT), The Nature Conservancy (TNC), Department of Agriculture	Resubmission Date:	June 12, 2017
GEF Focal Area(s):	Multi-focal Area	Project Duration (Months)	60 months
Integrated Approach Pilot	IAP-Cities <input type="checkbox"/> IAP-Commodities <input type="checkbox"/> IAP-Food Security <input type="checkbox"/>	Corporate Program: SGP	<input type="checkbox"/>
Name of parent program:		Agency Fee (\$)	593,085

**A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES**

Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs)	Trust Fund	(in \$)	
		GEF Project Financing	Co-financing
<b>BD 1 – Program 1, 4 and 9</b>	GEFTF	4,587,958	9,811,322
<b>CC 1-Program 1</b>	GEFTF	1,655,046	2,151,678
<b>Total Project Cost</b>		<b>6,243,004</b>	<b>11,963,000</b>

**B. INDICATIVE PROJECT DESCRIPTION SUMMARY**

**Project Objective:** Management of Marine Protected Areas (MPAs) in The Bahamas strengthened and integrated into broader landscape planning in order to reduce pressures on ecosystem services and biodiversity from competing resource uses

Project Components	Financing Type	Project Outcomes	Project Outputs	Trust Fund	(in \$)	
					GEF Project Financing	Co-financing
1. Integrated Natural Resource Management systems for marine protected areas and adjacent land / seascapes	TA	<p>1.1 Better effective planning for conservation and sustainable development in areas encompassing MPAs obtained through information on ecosystem conditions and services <i>Indicator: Increase in score of capacity development scorecard [to be developed during PPG] focusing on capacities to generate, access and use information and knowledge, and capacities for strategy, policy and legislation development.</i></p> <p>1.2. Integrated natural resource management (INRM) framework supports the reduction of pressures on biodiversity from competing land uses in the wider landscape <i>Indicator: Increase in hectares on application of biodiversity-friendly practices in the wider landscapes</i></p>	<p>1.1.1: Spatially-based decision support systems for INRM are available for use in cross-sectoral landscape planning &amp; management and in policy and regulatory development</p> <p>1.2.1: Ecosystem-wide Zoning Plans developed and approved for areas encompassing 5 target MPAs</p>	GEFTF	1,200,000	1,000,000
2. Effective Protected Area Management	TA	2.1. Improved PA management effectiveness at 5 MPA sites: Joulter Cays, Lucayan, Exuma Cays, Andros West Side, and	2.1.1: PA Management Advisory Boards for recently established MPAs (Joulter Cays National Park and Lucayan National Park) established and provided with operational	GEFTF	4,075,915	8,500,000

		<p>Conception Island (covering 723,631 ha) <i>Indicator: 15% increase in PA Management Effectiveness Tracking Tool (METT) scores in each of the five sites over project period</i></p> <p>2.2. Increased financial sustainability of the Joulter Cays and Lucayan National Parks <i>Indicator: Continual reduction in annual financing gap for basic management scenario as evidenced through regular application of the Financial Sustainability Scorecard applied to Joulter Cays and Lucayan National Parks</i></p> <p>2.3. Stable population numbers of the Northern Rock Iguana in the Andros West Side National Park and Exuma Cays Land and Seas Park <i>Indicator: Number of Northern Rock Iguana in the Andros West Side National Park and Exuma Cays Land and Seas Park</i></p> <p>2.4. 2,105,539<sup>1</sup> tCO<sub>2</sub>-eq emissions from buildings in protected areas are reduced (indirect and direct impacts) <i>Indicator: Quantity of carbon emissions reduced over the project period in Exuma Cays Land and Seas Park, Andros West Side National Park and Bonefish Pond National Park.</i></p>	<p>capacity</p> <p>2.1.2: Management Plans developed / updated and under implementation at 5 MPA sites</p> <p>2.1.3: Infrastructure established and staff deployed and capacitated at 5 MPA sites</p> <p>2.2.1: Business Plans developed and under implementation for Joulter Cays and Lucayan NPs</p> <p>2.3.1: Species Conservation and Monitoring Plans developed and priority actions (e.g. monitoring) under implementation for priority species at 5 MPA sites</p> <p>2.4.1: Up to 5 carbon neutral Marine Protected Area facilities (photovoltaic substitute for diesel generators (minimum 1,052,769.6 tCO<sub>2</sub>-equivalent direct emission reduction over 15 years): -Exuma park's visitors center -Andros West's fee collection booth -Bonefish Pond's visitors center -2 more facilities to be determined during PPG</p>				
3. MPA management integrated with sustainable development in the broader land / seascape	TA	<p>3.1 Enhanced provision and appreciation of community of services from ecosystems in MPAs and surrounding areas as a result of:</p> <ol style="list-style-type: none"> <li>1) rehabilitation of degraded land</li> <li>2) changes in production sector practices leading to both development and conservation objectives</li> <li>3) long-term custodianship of communities of the ecosystems</li> </ol> <p><i>Indicator: Increased appreciation of the services provided by and attitude towards MPAs measured through KAP<sup>2</sup> surveys on selected stakeholders</i></p>	<p>3.1.1: Reduced impacts from adjacent areas on MPAs through Invasive Alien Species (IAS) management and ecosystem restoration ( at least 100 ha)</p> <p>3.1.2: Reduced use of agricultural chemicals in areas containing sensitive biodiversity and crucial water resources</p> <p>3.1.3: Pilot communities and/or schools are supporting management of two MPAs (“adoption schemes”)</p>	GEF TF	669,808	1,893,333	
<b>Subtotal</b>					<b>5,945,723</b>	<b>11,393,333</b>	
Project Management Cost (PMC)					GEFTF	297,281	569,667
Total Project Cost						6,243,004	11,963,000

<sup>1</sup> Estimate – to be confirmed during PPG

<sup>2</sup> Knowledge, Attitudes and Practices

**C. INDICATIVE SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE, IF AVAILABLE**

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount (\$)
Recipient Government	Ministry of Housing and Environment, Ministry of Agriculture, Prime Minister's Office/SIDS DOCK	Grants	\$2,500,000
Recipient Government	Ministry of Housing and Environment, Ministry of Agriculture, Prime Minister's Office/SIDS DOCK	In-kind	\$4,000,000
Others	Caribbean Biodiversity Fund (CBF)	Grants	\$1,025,000
Others	Inter-American Development Bank (IDB)	Grants	\$398,000
CSO	The Nature Conservancy (TNC)	Grants	\$1,500,000
CSO	The Nature Conservancy (TNC)	In-kind	\$500,000
CSO	Bahamas National Trust (BNT)	Grants	\$590,000
CSO	Bahamas National Trust (BNT)	In-kind	\$1,450,000
<b>Total Co-financing</b>			<b>\$11,963,000</b>

**D. INDICATIVE TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS**

GEF Agency	Trust Fund	Country/Regional/Global	Focal Area	Programming of Funds	(in \$)		
					GEF Project Financing (a)	Agency Fee (b) <sup>b)</sup>	Total (c)=a+b
UNEP	GEFTF	The Bahamas	Biodiversity		4,587,958	435,856	5,023,814
UNEP	GEFTF	The Bahamas	Climate Change		1,655,046	157,229	1,812,275
<b>Total GEF Resources</b>					<b>6,243,004</b>	<b>593,085</b>	<b>6,836,089</b>

**E. PROJECT PREPARATION GRANT (PPG)**

Is Project Preparation Grant requested? Yes  No  If no, skip item E.

**PPG AMOUNT REQUESTED BY AGENCY(IES), TRUST FUND, COUNTRY(IES) AND THE PROGRAMMING OF FUNDS**

Project Preparation Grant amount requested: \$182,648					PPG Agency Fee: \$17,352		
GEF Agency	Trust Fund	Country/Regional/Global	Focal Area	Programming of Funds	(in \$)		
					PPG (a)	Agency Fee (b)	Total c = a + b
UNEP	GEF TF	The Bahamas	Biodiversity		134,188	12,748	146,936
UNEP	GEF TF	The Bahamas	Climate Change		48,460	4,604	53,064
<b>Total PPG Amount</b>					<b>182,648</b>	<b>17,352</b>	<b>200,000</b>

**F. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS**

Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society	Improved management of landscapes and seascapes covering 300 million hectares	723,631 Hectares
2.		
3. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO2 mitigated (include both direct and indirect)	2,105,539 tons of CO2-eq <sup>3</sup>

**PART II: PROJECT JUSTIFICATION**

*Project Description.* Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, GEF focal area strategies, with a brief description of expected outcomes and components of the project, 4)

<sup>3</sup> Estimate – to be confirmed during PPG

[incremental/additional cost reasoning](#) and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and [co-financing](#); 5) [global environmental benefits](#) (GEFTF) and/or [adaptation benefits](#) (LDCF/SCCF); and 6) innovation, sustainability and potential for scaling up.

*1) Global environmental problem, root causes and barriers that need to be addressed*

The Bahamas, known officially as the Commonwealth of the Bahamas, is an archipelagic state consisting of more than 700 islands, cays, and islets in the Atlantic Ocean; the country is located north of Cuba and Hispaniola (Haiti and the Dominican Republic), northwest of the Turks and Caicos Islands; southeast of the US State of Florida and east of the Florida Keys. As the largest small island archipelago in the tropical Atlantic with 3,542 kilometres of coastline, The Bahamas covers an expansive land and marine area of approximately 233,000 km<sup>2</sup> (within the 12 nautical mile territorial sea). Of this area, only 13,940 km<sup>2</sup>, or about 5% is land and 116,500 km<sup>2</sup>, or 50%, is relatively shallow bank. The remainder of about 102,500 km<sup>2</sup>, or 44%, is deep water, either in the three major marine canyons that separate the banks or in the outside depths adjacent to the islands' flanking reef systems. The Bahamas is a coastal country, with the entire population of almost 400,000 persons living within the coastal zone. The low latitude and low elevation of the Bahamas, combined with the warm tropical Gulf Stream, give the country a warm and winterless climate. Rain falls throughout the year, with summers (June – October) being the wettest months, but the country is sunny and dry for long periods of time, and averages more than 3,000 hours or 340 days of sunlight annually<sup>4</sup>.

In terms of gross domestic product per capita, The Bahamas is one of the richest countries in the Americas (following the United States and Canada), with an economy based on tourism and finance. Marine environments provide jobs, food and recreational services; each year thousands of visitors frequent the shores of The Bahamas to dive and fish on the reefs, or cruise the beautiful waters of the archipelago. As a result, tourism employs more than half the workforce and accounts for more than 50% of the total GDP. Agriculture and fisheries make up 5% of the GDP and about 5% employment. Approximately 90% of the available agricultural land is owned by the government and leased to farmers. Of the 95,000 ha of arable land in the country, only 7,650 ha is under cultivation, with two very distinct systems of agricultural production: mechanized methods in the northern islands that receive more rainfall and have large underground freshwater reserves; and shifting cultivation in the central and southern islands that are characterized by subsistence farming. More than 5,000 acres of agricultural land in The Bahamas are used for citrus production. Major crops for export are grapefruit, limes, avocados, papaya, okras and pineapples. The soils in the country are generally poor in terms of nutrient availability and water holding capacity, so farmers rely on heavy inputs of chemical fertilizer. In addition, farmers need to supplement rainfall through irrigation, relying on subsurface freshwater lenses that sit in the limestone aquifer. Many farmers see these aquifers as an inexhaustible resource, but they also supply municipal water needs and population growth and increased visitation could potentially overwhelm water supplies.

The Bahamas is part of the Caribbean Islands Biodiversity Hotspot, an archipelago of habitat-rich tropical and semi-tropical islands encompassing 30 nations and territories and stretching across nearly 4 million km<sup>2</sup> of ocean. The geography and climate of the Caribbean islands hotspot have resulted in an amazing diversity of habitats and ecosystems, which in turn support high levels of species richness and species found nowhere else. The hotspot supports a wealth of biodiversity within its terrestrial ecosystems, including forests, rivers, streams, lakes, wetlands, and underground karst networks, with a high proportion of species that are endemic or unique to the hotspot. The hotspot includes about 11,000 plant species, of which 72% are endemic. For vertebrates, high proportions of endemic species characterize the herpetofauna (100% of 189 amphibian species and 95% of 520 reptile species), and to a lesser extent, birds (26% of 564 species) and mammals (74% of 69 species, most of which are bats). The hotspot is the heart of marine diversity in the Atlantic Ocean; roughly 8 -35% of species within the major marine taxa found globally are endemic to the hotspot. Overall, species endemic to the hotspot represent 2.6% of the world's plant species, and 3.5% of the world's vertebrate species.

The islands and adjacent marine waters of The Bahamas encompass a unique confluence of landform types, including saline and freshwater wetlands, blue holes, creek systems, shallow water banks, deep ocean trenches and marine estuaries that host a range of terrestrial and marine resources important to the country, the Caribbean region and beyond. For example, it is thought that the west coast of Andros may serve as the greatest marine estuary for the entire Western Atlantic<sup>5</sup>. On a global scale, the coral reefs of the Bahamas comprise about 5% of the world's total coral reef systems, surpassing even that of Australia's Great Barrier Reef. The relative insularity of Bahamian waters and an extensive shelf with productive coral reefs and other habitats augmented by a large area of coastal wetlands and mangrove forests, contribute to the considerable abundance and diversity of fish in the country, and The Bahamas has greater biodiversity abundance and diversity than the entire insular Caribbean<sup>6</sup>. Correll (1982) reported that nearly 9% (121 taxa) of plant species found in The Bahamas are endemic. Over 1,350 species of flowering plants and ferns have been described, representing approximately 660 genera and 144 families. Rare, critically

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<sup>4</sup> [www.caribbeanislands.org/the-bahamas](http://www.caribbeanislands.org/the-bahamas)

<sup>5</sup> Proposal for the Expansion of Peterson Cay National Park Grand Bahama Island, The Bahamas. Henwood and Nolan, May 2013.

<sup>6</sup> UNEP-GEF, 2010.

endangered, and endemic species can also be found in The Bahamas, including the Bahamas parrot (*Amazona leucocephala bahamensis*), several species of Rock iguana (*Cyclura sp.*), Kirtland's warbler (*Setophaga kirtlandii*), West Indian flamingo (*Phoenicopterus ruber*), Bahamian Hutia (*Geocapromys ingrahami*), Queen conch (*Lobatus gigas*), and Loggerhead (*Caretta caretta*), Hawksbill (*Eretmochelys imbricate*), and Green turtles (*Chelonia mydas*).

### Policy & Legal Context

The Ministry of the Environment (MoE) has overall responsibility for coordination of environmental management activities in The Bahamas. Within MoE, The Bahamas Environment Science and Technology (BEST) Commission is responsible for protection, conservation and management of the environment and manages relations with national and international organizations on matters relating to the Environment. The BEST Commission also oversees several sub-committees that bring together experts from relevant agencies, namely sub-committees on National Implementation Support Partnership (NISP), Biodiversity, Climate Change, Science and Technology and Wetlands. The NISP Committee, which includes the BEST Commission, DMR, BNT and TNC, is charged with implementing the Programme of Work on Protected Areas. Other departments within MoE include the Department of Physical Planning that is responsible for land use planning and review of environmental impact assessments, the Port Department that is responsible for maritime affairs, and the Department of Environmental Health Services (DEHS) that is responsible for scientific research and environmental control. Land and resource planning and management in The Bahamas are largely governed by two pieces of enabling legislation. The *Conservation and Protection of the Physical Landscape of The Bahamas Act, 1997* authorizes the Department of Physical Planning within MoE to protect the physical landscape from environmental degradation (e.g. regulate filling of wetlands, drainage basins or ponds; prohibit digging or removing sand from beaches and sand dunes); to regulate excavation, landfill, quarry / mine operations and indiscriminate land clearing and issuance of permits; to manage protected trees; and to levy fines for illegal movement of sand, trees, vegetation and excavation. The *Planning and Subdivision Bill, 2010* authorizes the same department to ensure appropriate and sustainable use of all land; provide for the orderly sub-division of land; protect and conserve the natural and cultural heritage of The Bahamas; and oversee the preparation of land-use plans for each island, the preparation of physical plans, development control and regulation, environmental impact assessments, etc.

Several other government, ministries, departments, statutory organizations and NGOs have varying responsibilities for different aspects of biodiversity conservation and resource management. One of the most significant is the Bahamas National Trust, a non-governmental, non-profit, membership organization that was established in 1959 to manage the country's system of parks and protected areas, as well as places and buildings of historic interest. In 2010, the legislation was updated to formalize the BNT as an official advisor to government and the private sector on development, conservation and biodiversity issues and policies. The BNT is governed by an independent council that includes representatives from the public and private sectors, as well as from international scientific institutions. The Department of Marine Resources (DMR) continues to work with the BNT to implement the "Master Plan for The Bahamas National Protected Area System", and both organizations also work with The Nature Conservancy (TNC) to help the country meet the requirements of "The Caribbean Challenge" and the UN CBD. The DMR, which is part of the Ministry of Agriculture & Marine Resources & Local Government, also is responsible for granting permits for commercial fishing and for the importation of fishing vessels and fishing gear, development of aqua-culture, sea-food processing, and the inspection and certification of fishery products. Within this same ministry, the Department of Agriculture oversees veterinary services, animal slaughter, food technology, food standards, land clearing, the issuing of sanitary and phyto-sanitary permits, the administration of the Convention of International Trade on Endangered Species (CITES), farmer registration, and import licensing for fruits, vegetables, plants and flowers, cats, dogs, and other plant and animal species. Farming and agriculture are also under the purview of the Department of Cooperatives within the same ministry, which oversees Credit Unions, Agricultural Cooperatives, and Farmers Associations.

### Overview of Project Sites

The project will focus primarily on six marine protected areas in The Bahamas, of which five are designated Key Biodiversity Areas (KBAs). These five MPAs are: (i) Joulter Cays National Park; (ii) Lucayan National Park; (iii) Conception Island National Park; (iv) Exuma Cays Land and Seas Park; and (v) Andros West Side National Park. Additional details on the five MPA sites, including data related to their designations as KBAs, is provided in Annex 1. In addition, the project will carry out some LD-related activities at (vi) Bonefish Pond National Park.

*Joulter Cays National Park:* The boundaries of the recently established Joulter Cays National Park (46,134 ha) extend east and west from the cays, to offshore reefs encompassing the IBA, a portion of the Andros Barrier Reef, deeper waters incorporating habitats of pelagic species, and various coastal habitats. Located just north of Andros Island, the NP is well known for its: 1) impressive bonefish populations that contribute to a sustainable vibrant recreational fly-fishing industry in Andros; 2) extensive banks of unique oolitic sand; 3) sand flats that provide habitat for thousands of shorebirds, including the largest congregation of Piping Plover outside of the United States; 4) mangroves and tidal creeks that provide nursery areas for sharks and

commercially important reef fish species; 5) seagrass meadows that sustain nursery habitats for lobsters, conch and sea cucumbers, and feeding grounds for marine turtles; 6) areas of coppice that support breeding populations of White Crowned Pigeon; and 7) intact healthy coral reefs that provide shoreline protection and enhances productivity. The primary users of the Joulter Cays are sports fishermen who target bonefish and permit, commercial fishermen that harvest demersal fish (grouper, snapper, grunts, etc.), lobster and stone crabs, and commercial harvesters of sponge and conch. Fishermen that use the Joulter Cays are concerned by the increased fishing pressure on the flats, and the declining state of the reefs. Other threats to this area include poor handling of bonefish, vessel groundings that destroy reef sites, discarded fishing gear, and other marine debris.

Lucayan National Park: The Lucayan National Park was recently expanded and now encompasses 1,092 ha. Lucayan NP is situated on Grand Bahama island, which is now the second most populous island in The Bahamas and its major city, Freeport, is regarded as the nation's second city. Grand Bahama island is low lying and consists of extensive flatlands. Within the NP, a section of Gold Rock Creek, a tidal creek that passes through mangrove wetlands, connects to an underwater cave system and provides plankton-filled seawater that supports a variety of species found in the cave environment, including lobster, crabs, shrimp, sea stars, sea cucumbers, cowries, and species of fish and crustaceans that live both near the cave entrances and deep in the totally dark interior of the caves. Numerous species that have adapted to this dark environment (troglobites) are found in the underwater caves within and surrounding the Park, and the caves hold species found nowhere else in the world and often new to science. Lucayan NP is the most heavily visited property managed by the Bahamas National Trust (BNT); its beach is the most popular attraction but visitors also enjoy walking the interpretive trails, and the park represents an important economic component to the area's tourist-based economy. Adjacent to the park, the Grand Bahama Southern Shore Important Bird Area (44 ha) runs along the southern coastline; shorebirds such as Piping Clowers, as well as herons and egrets, can be found here during the winter, while landbirds are present in the coppice and pinewoods behind the beach. Also nearby is the Peterson Cay (National Park) IBA (434 ha), a windswept and sparsely vegetated limestone island.

Conception Island National Park: Conception Island NP (12,244 ha) was established in 1964 and encompasses an uninhabited island surrounded by its own shallow bank just north of Rum Cay. The main island, Booby Cays, and South Rocks are home to an extraordinary number of wildlife species, many of which are threatened or endangered. The island was one of the first landfalls of Columbus in the New World and is an important sanctuary for migratory birds as well as a breeding / nesting site for a variety of seabirds, including long tail tropic birds, sooty terns, oyster catchers, and osprey. The centre of the island is a large mangrove and creek habitat and an important nursery for fish, sharks, conch, and crawfish. Green turtles forage in the creek, off the southwestern shore, and in the northern bay, while the coral reefs and grass flats in the surrounding sea are unusually healthy and home to an abundance of sea life, which attracts many dive boats and research vessels.

Exuma Cays Land and Seas Park: The ECLSP (45,584 ha) is The Bahamas' oldest park, established in 1959. The terrestrial ecosystems within the park are a vital refuge for a small mammal called the hutia (*Geocapromys ingrahami*, the only native terrestrial mammal in The Bahamas), several rare and endangered iguana species (including the Northern Rock Iguana *Cyclura cyclura*), and marine birds such as terns and the long-tailed tropicbird that nest high in the bluffs. The waters of Exuma Cays have been managed as a no-take marine fishery reserve since the 1986, allowing populations of commercially important species such as queen conch, Nassau grouper and spiny lobster to thrive. Warderick Well, an island within the Park, functions as the park headquarters and sees many visitors. Mooring sites are located throughout the park.

Andros West Side National Park: Andros West Side NP (618,577 ha) encompasses a vast area on Andros island of coastal mangrove habitat that is an important nursery area for conch, lobster and fish, and provides habitat for the endangered Andros Rock Iguana (*Cyclura cyclura*, IUCN Category VU) and many bird species, including the West Indian Flamingo. The island features the second largest coral barrier reef in the Western hemisphere and a complex web of tunnels connecting land and sea, including blue holes, which provide ideal habitat for an assortment of rare and poorly understood species, including a recently discovered new class of crustaceans, and allow the filtering of freshwater through a sheet of porous limestone that produces clean, potable water. Andros remains largely undeveloped; commercial fishing, including crabbing and sponging, is the most important source of income for local residents, comprising almost half of the island's economy. Tourism and guided recreational fishing account for approximately 30% of the economy, while agriculture represents only 1% and is primarily for subsistence<sup>7</sup>. Tidal creeks and flats within the park are key to Andros Island's multi-million dollar bonefish industry, which attracts sports-fishermen from around the world.

Bonefish Pond National Park: Bonefish Pond NP (499 ha) is situated on New Providence island and composed primarily of coastal mangrove habitat. Despite its small size (210 km<sup>2</sup>), New Providence island is the most populous in The Bahamas, containing more than 70% of the country's total population, the capital city of Nassau, and hotels and a port that account for more than two thirds of the four million-plus tourists who visit The Bahamas annually. The park safeguards one of the largest remaining intact areas of nearshore marine ecosystems on New Providence, and is critical in the juvenile and adult life of many

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<sup>7</sup> Hargraeves-Allen, 2010. The Economic Valuation of Natural Resources of Andros. Conservation.

ecologically, economically and culturally important fish and invertebrate species, including groupers, majorra, snappers, grunts, bonefish, barracuda, crabs, crawfish, queen conch and many species of shore birds. Since its establishment as a national park in 2002, a number of restoration projects have been conducted in the park to improve its effectiveness as a fish nursery habitat. These projects have helped return the area to a more pristine condition through improving tidal flows that were previously obstructed, removing invasive plants, and increasing suitable fish habitat. The programs have also been a valuable way to increase public awareness about coastal ecosystems among visitors, neighbouring residents, and potential users to the area.

## Threats

Ecosystem Degradation and Fragmentation: Many Bahamian ecosystems and habitats are already degraded and /or under threat of further degradation, notably including coral reefs, mangrove forests and pinelands. As noted in the country's NAP, economic development has led to a significant increase in the demand for land, and large tracts of land have been cleared for tourism and urban development projects. Other economic sectors such as agriculture and construction have also increased the pressures on coastal lands. In the Exuma Cays Land and Seas Park, private development of vacation homes and booming tourism threaten to destroy native vegetation and lead to increased channelling/dredging and pollution. In addition, increased boat traffic and diving activity can cause irreparable damage to coral reefs. In Lucayan NP, there is the possibility of resort and residential development adjacent to the Park, particularly along the nearly pristine shoreline, as well as the potential for pollutants and siltation to cause serious environmental damage to the mangrove wetlands and to the fragile cave ecosystem. The system of caves and anchialine holes in the park is the habitat of the Bahama Cavefish (*Lucifuga spelaeotes*, VU); these habitats have very low levels of oxygen and the species is very sensitive to solar insolation, water flow velocities and organic matter input, so that even slight changes in cave water quality can negatively affect the fish. Activities such as rock removal and siltation, hydrological manipulations caused by water removal, and environmental pollution are a direct threat to the cavefish. In Andros West Side NP, both the coral reefs and the blue holes are highly vulnerable to development impacts. The impacts of development and poor land management on ecosystem functioning can be seen clearly in Bonefish Pond NP, where mangrove forests have been destroyed by dredging for marinas and other development and by extensive pollution (areas of the park have been used as a dump and a copper burning site).

Unsustainable Resource Uses and Practices: Many valuable natural resources in The Bahamas are fast becoming depleted, including a number of species of commercial fish and valuable coppice forest species. Overharvesting of fish and other marine species in particular is a threat even within MPA boundaries. Agricultural activities in areas bordering MPAs are responsible for negative impacts on ecosystem services in the productive landscape as well as the neighbouring protected land / seascape. For example, heavy reliance on fertilizer in some areas, and the use of pesticides and other agricultural chemicals, has impacted mangrove ecosystems and degraded ground water supplies. Water is scarce throughout the Bahamas, and the fresh water lenses not far below the surface can easily be contaminated due to the porous nature of the bedrock. In addition, over-abstraction from these lenses, including for agricultural production, leads to saltwater intrusions that can contaminate freshwater supply and lead to an increase in salinity.

Invasive Alien Species: Invasive species have been identified as a key threat to biodiversity in The Bahamas, and invasive species that pose threats to native biodiversity were identified in the 2003 and 2013 National Invasive Species Strategy. Notable examples include invasive plants such as the Australian Pine (*Casuarina equisetifolia*) and Ground Orchid (*Eulophia graminea*), and animals such as the Red lionfish (*Pterois volitans*). The population of lionfish, which first appeared in the country 2006, is now estimated in the tens of thousands and impact not only native biodiversity but also fisheries productivity; researchers have confirmed that lionfish feeds on commercially important juvenile and adult fish species such as the Nassau grouper (*Epinephelus striatus*), and it is feared that they are impacting other species as well as coral reefs through their predation of herbivores that keep the reefs free of algae. In Lucayan NP, two invasive species are of particular concern: the Paperbark Tree (*Melaleuca quidqernervia*), which is spreading in the freshwater wetlands, and the Australian Pine, which has spread along the entire length of the dune area. Destabilization of the dune by the Australian Pine increases the chances of salt water intrusion into the forest habitat behind the dunes; the only noticeable loss of habitat for the Bahama Swallow (*Tachycineta cyaneoviridis*) in Andros and Great Bahama has been from saltwater intrusion associated with large storms following hurricanes.

Climate Change: The potential impacts of climate change are considered to be one of the most important threats to biodiversity in The Bahamas. Some 80% of The Bahamas' landmass is within 1.5 meters (5 ft.) of sea level, and 90% of the country's freshwater lenses are within 1.5 meters (5 ft.) of the land surface, making the groundwater resource fragile and highly vulnerable to contamination from seawater intrusion and storm surge inundations that are projected to become more severe with sea level rise. In a 2007 World Bank study, The Bahamas was ranked the country most in danger (out of ten countries) from losses in coastal population and declines in Gross Domestic Product that might result from storm surge intensification; the country was also listed as one of the top three countries most vulnerable to the climate change impacts of coral bleaching, increasingly powerful tropical hurricanes and rising sea level. Some of the greatest negative impacts being experienced along

coastal areas are due to storms and hurricanes. Increased rainfall has led to massive soil erosion in inland upland areas, dislodging solid waste and the leaching of biological and chemical materials into streams and rivers. As a consequence, reefs and other coastal areas become inundated with sediment, plastics, bacterial, industrial and agro-chemical pollutants. As noted in The Bahamas' National Climate Change policy, a single extreme climate event can have huge economic costs, such as Hurricane Joaquin. In addition, SIDS are highly dependent on fossil fuel imports. Given the geographical settings of SIDS, transportation is proving to be one of the fastest consumers of petroleum. This brings various threats such as risks associated to fuel spills, inability to cover basic needs of population and institutional services due to risks associated with the efficient delivery of fuel in remote locations (i.e many of the family islands in the Bahamas). The principal uses of energy within family islands and in particular in relation to PA management and operations are: lighting, water heating, cooling and ventilation. Inability to replenish fuel in those islands and PA operation booths (i.e due to hurricanes, accidents, lack of coordination, etc) will automatically impact the provision of basic services. Although renewable energy sources such as solar, biomass and wind are already being used in several SIDS and in a number of sectors, these need to be further developed to ensure a more sustainable approach to energy generation and use in SIDS. In this respect, the Draft outcome document of the third International Conference on Small Island Developing States (A/CONF.223/3, para. 47) recognizes this dependence on fossil fuel imports as a major source of SIDS vulnerabilities and highlights the efforts of SIDS to advance sustainable energy, including through the Barbados Declaration on Achieving Sustainable Energy for All in Small Island Developing States. Regional and International Development Banks, the United Nations system, the International Renewable Energy Agency and development partners are urged to intensify funding, capacity building and technology support to SIDS in advancing sustainable energy objectives.

#### Barrier Analysis

**Barrier 1: Lack of framework for promoting sustainable development at site level in The Bahamas islands:** A key barrier for ensuring the sustainability of current and future developments and the protection of ecosystems in the Bahamas islands is the lack of an integrated natural resource management framework among the key responsible agents at site level. Planning and implementation of development, SLM and conservation measures are carried out on a piecemeal basis. It does not consider the ecological sensitivity of certain habitats and the need to find solutions benefitting development as well as ecosystem resilience, climate change and conservation of biodiversity, resulting in sustainable actions 'on the ground'. With few exceptions, the different authorities, with authority over development and natural resources decisions, have limited capacity and information to integrate biodiversity and SLM into their work. Also, while the development of the islands can and should capitalise from the capacity of these different entities, the lack of an overarching framework for consultation on the use of land, seascapes and associated resources at a local level contributes to the accelerated simplification, fragmentation and degradation of various ecosystems.

**Barrier 2: Lack of successful models of individual MPAs that overcome financial and capacity constraints through targeted investment & insufficient knowledge of what Renewable Energy (RE) can offer for MPA management effectiveness:** With the past and continual expansion of the protected area system in The Bahamas, supported by the concluded GEF Marine Protected Areas project and the ongoing The Nature Conservancy (TNC) project "Realizing the 2020 Goal", there is a need to ensure that expansion of the protected area estate will be accompanied by strengthened operational management of new protected areas. Without addressing this aspect, there is a legitimate concern that an expanded protected area system will be made up primarily of 'paper parks' – with no improvement in management and therefore continued loss of threatened species and ecosystem services to local communities even after the establishment of MPAs. For example, BNT currently manages all protected areas, and it wishes to involve the general public and local communities as much as possible in the management of these PAs. However, financial constraints mean that such participation is limited to irregular/impromptu meetings, even though the dire need for constructive joint planning between BNT and stakeholders in managing these PAs is widely recognized, and long-term planning and buy-in are considered cost-effective measures for which dividends are paid in the long term. Further, BNT is constrained, both financially and in terms of human resources, in managing the PAs of The Bahamas. This capacity constraint was/is amplified with the number of new protected areas. There is therefore a need to showcase how selected protected areas, through upfront infrastructure investment (i.e renewable energies on PA infrastructures that will reduce the dependency of fossil fuels) and capacity building, can become effectively managed and in the long-term be financially sustainable. Issues such as dependency on fossil fuel for energy production, lack of pioneering projects in RE, lack of knowledge on the benefits of RE and lack of investment in RE, are factors limiting the country's transition to greener solutions (renewable energies and energy efficient measures). In the particular case of MPAs, energy needs are only partially met and by diesel fueled generators mainly. The retrofitting with renewable energies of selected facilities in protected areas is expected to add to the financial sustainability of the parks and serve as a model for future interventions towards a more effective and innovative management of protected areas. On the latter point, BNT and TNC, through the establishment of the Caribbean Biodiversity Fund and the Bahamas Protected Area Fund (BPAF), are addressing financing from an external funding perspective, however, there is also the need to address the MPA's financial sustainability in terms of income generation and cost management at the site level, within the framework of formal PA business planning processes for newly created MPA sites. In this way, the project approach will deliver a package of revenues and of cost savings that will increase the financial sustainability of MPAs and provide a model for the PA system nationally.

**Barrier 3: Lack of capacity and inadequate experience in INRM at the local site level:** The Bahamas does not have operational “on-the-ground” examples of integrated natural resource management at the local level. Where they do exist, resource management systems are labelled under protected area management or as agricultural efficiencies, delinking the intervention to the knowledge of providing a particular service to humans by the ecosystem in question. Without access to know-how, proven through demonstration, government decision-makers and resource users do not have the tools and knowledge to necessary address land degradation and make the important connections between degradation and numerous social, economic and environmental impacts and costs. There is a critical unmet need to infuse new management approaches into the management system – focusing on the sectors and stakeholders that are driving land degradation. This need includes three aspects: i) showcasing the rehabilitation of degraded land and establishing cost efficiencies for such rehabilitation; ii) showcasing that particular changes to production sector practices (e.g. use of chemicals) that can have beneficial outcomes both for the production sector (development) and to other land uses (conservation); and iii) involving communities and schools in INRM to promote education and custodianship of wider coastal landscapes. This approach has significant potential in the context of marine protected areas, as improved management of agricultural and other productive lands in areas adjoining or upstream of MPAs can have enormous benefits for preserving ecosystem services and biodiversity within the MPAs themselves.

## **2) Baseline scenario and any associated baseline projects**

Notwithstanding declarations, only a well-managed network of MPAs will guarantee long-lasting, tangible conservation results in The Bahamas. At present, although 51 protected areas have been declared in the country, only four have formalized management plans that outline goals, conservation actions and measures toward effective management (another dozen or so protected areas have draft management plans). Fortunately, in the past few years several large initiatives have been launched to address not only PA coverage but also PA management capacity and financing in The Bahamas. For instance, the Nature Conservancy (TNC) in partnership with the Bahamas National Trust (BNT) have developed the management plans for Andros (2012-2012) and Exuma (2004-2005) parks, and have started their implementation. The cost of this intervention was estimated in approximately 160,000 USD. In addition, two other management plans for San Salvador and Moriah Harbour Cay are currently being developed.

Under the Caribbean Challenge Initiative (CCI), visionary leaders of Caribbean governments have come together with responsible business leaders to take collaborative action to protect and sustainably manage their marine and coastal environment. Eleven participating CCI countries and territories, including The Bahamas, have committed to: i) conserve at least 20% of their nearshore marine and coastal environments by 2020—effectively tripling marine protected area coverage in the region; and ii) ensure that these conserved areas are effectively managed into the future through a reliable, long-term finance structure—including the creation of National Conservation Trust Funds, funded by sustainable revenue sources and dedicated solely to conserved area management and on-the-ground conservation efforts. As a signatory to the CCI and the associated Caribbean Biodiversity Fund (CBF), The Bahamas, through BPAF, is poised to receive annual payments in perpetuity from the regional trust fund, which will contribute to the reduction of the funding gap and sustainable financing required. The CBF, with help from The Nature Conservancy (TNC), has to date raised over \$42 million dollars to assist Caribbean governments in conserving at least 20% of their marine environment by 2020. A figure of \$5 million has been set aside for drawdowns from The Bahamas as soon as the draft agreement is signed; the country will then have a further two years to establish new financial mechanisms as part of the agreement.

A recently concluded GEF-financed *Marine Protected Areas* project concluded with the successful establishment of the Bahamas Protected Areas Fund (BPAF), strengthening and substantially expanding the country’s MPA network (including through pilot demonstration projects) and developing an effective monitoring and evaluation regime. The project ultimately gazetted 3 million hectares of new protected areas and marine reserves, exceeding the target of 10% (2.5 million hectares) coverage of the marine environment. The project also established a monitoring and evaluation protocol in consultation with international scientist networks. Monitoring capacity was substantively increased through the training of 5 Reef Check local instructors, and a total of 53 persons trained under the project with 75 total Eco Divers in The Bahamas. The Atlantic Gulf Rapid Reef Assessment (AGRRRA) has 3 local instructors and 27 trained individuals. The following new gazettements of marine protected areas and reserves were effected under this project:

- **In Abaco:** The Marls of Abaco National Park; East Abaco Creeks National Park ; Cross Harbour National Park South Abaco Blue Holes National Park; East Abaco Creeks-The Bight; East Abaco Creek – Snake Cays; East Abaco Creek – Cherokee; and South Abaco Blue Holes National Park
- **In Crooked Island / Acklins:** Southeast Bahamas Marine Managed Area; Bight of Acklins National Park
- **In Andros:** Andros Green Cay National Park; The Joulter Cays National Park; and The Cay Sal Marine Managed Area
- **In Grand Bahama:** The North Shore - The Gap National Park; East Grand Bahamas National Park; Hogsty Reef Protected Area; Lucayan National Park Expansion; and Peterson Cay National Park expansion (All Grand Bahama Parks exclude Grand Bahama Development Company holdings)

- In Mayaguana: Booby Cay National Park
- In New Providence: Southwest New Providence Marine Managed Area; and Perpall Tract National Park
- In Great Exuma: Moriah Harbour Cay National Park expansion.

The Government of the Bahamas is launching “Bahamas Solar PV and Battery Hybrid System Project” which prioritizes the deployment of photovoltaic systems across the family islands with a view towards replacing diesel generators with 17MW of solar PV and associated battery storage. The project estimated cost is \$50 million for Engineering, Procurement and Construction (EPC) contracts on a prioritized subset of islands which were chosen on the basis of several factors including population size, demand and load factors, and is expected to commence in 2017.

In June 2016, the Ministry of the Environment and Housing announced the establishment of the **Youth Environmental Corps**, which will provide apprenticeship and training to Bahamian youth in the development of green and blue economies. Approximately 1,200 jobs will be created to work with the Bahamas National Trust (BNT) and the Bahamas Public Parks and Public Beaches Authority and Forestry Unit of the Department of the Environment.

In addition, while international and regional transport connectivity is important for all SIDS, interisland domestic transport is of equal importance, not only to reach outer islands that are spread across vast distances, but also to service productive sectors such as tourism, operations related to protected areas management and fisheries. For example, domestic interisland shipping services in many countries are infrequent and unreliable. This has a negative impact on the livelihoods and on services. These conditions limit access to education, health, and business development services; and the ability of public agencies to deliver programmes and develop social infrastructure in the outer islands. They also increase the prices of essential goods. This project will try to address this by piloting RE and EE models to support the operation of PAs on various islands.

### **3) Proposed alternative scenario with a brief description of expected outcomes and components of the project**

**Project Objective:** Management of Marine Protected Areas (MPAs) in The Bahamas strengthened and integrated into broader landscape planning in order to reduce pressures on ecosystem services and biodiversity from competing resource uses

#### **Component 1: Integrated Natural Resource Management systems for marine protected areas and adjacent land / seascapes**

Output 1.1.1 - Spatially-based decision support systems for INRM are available for use in cross-sectoral landscape planning & management and in policy and regulatory development: The project will address a key barrier related to the fragmented approach to natural resource management on the islands of The Bahamas through the development of a framework within which the management of MPAs becomes integrated into broader sea/land planning. First and foremost, support to INRM will be strengthened by collating key data and information on the targeted sites in a central information system managed by BEST Commission and/or Department of Physical Planning. The system’s host institution will be selected during PPG based on its possibility to continue sponsoring the operation of the system after the project life, to ensure its sustainability. The possibility of having an open access, spatially based ‘decision support systems’ will be investigated during the PPG. The information system will provide useful information for the management of MPAs and surrounding areas, including the location of critical habitats, the distribution of endangered species, thresholds for the use of natural resources (e.g. land, freshwater, etc.), ecosystem resilience, and the impacts of climate change. In addition, any planner or developer will be able to determine where critical habitats are, which threats these habitats are suffering, whether a given site has a PA status, and what the predominant land and seascape uses are; and the systems will create an enabling environment within which legislation pertaining to the sustainable development of the islands can be enacted, and EIA procedures and due diligence can be enforced.

Output 1.2.1 – Ecosystem-wide Zoning Plans developed and approved for areas encompassing 5 target MPAs: Based on the information generated by the decision support systems, the project will promote a participatory exercise to create Ecosystem-wide Zoning Plans for the areas of the 5 target MPAs and surrounding areas. This exercise will include consultations on which areas should be dedicated to different land uses, including conservation, development (including what kind of development), restoration / rehabilitation, sustainable uses, etc. The exercise also will look at trade-offs and approaches to infrastructure and tourism on the islands and the control of alien invasive associated with increased marine traffic. It is expected that the plans will be adopted because the lack of an overarching framework for consultation on the use of land, seascapes and associated resources contributes to the accelerated fragmentation and degradation of various ecosystems; which is one of the major issues that the local authorities are trying to address. However the lack of information in relation to suitable land uses, critical habitats, thresholds for the use of natural resources, among others have hindering informed decision-making and coordinated actions in this respect.

## Component 2: Effective Protected Area Management

Output 2.1.1 – PA Management Advisory Boards for recently established MPAs (Joulter Cays National Park and Lucayan National Park) established and provided with operational capacity: In partnership with the Bahamas National Trust (BNT), which is responsible for the operation of these two sites, the project will assist in establishing a participatory PA Management Advisory Board for each of the two new MPAs, which will include representatives from local stakeholder groups, and will provide technical support and capacity building for board members to enable them to guide the management planning process and to define and achieve long-term park management goals. The project also will develop and implement a community awareness and education campaign, which combined with community participation in decision-making through the PA Management Advisory Board, will strengthen community involvement and build a sense of ownership for improving park management capacity.

Output 2.1.2 – Management Plans developed / updated and under implementation at 5 MPA sites: Building on the information and planning / zoning priorities established under Component 1, the project will work with BNT and local communities to develop consultative PA management plans for Lucayan National Park and Joulter Cays National Park, and to update existing PA management plans for Exuma Cays Land and Seas Park, Andros West Side National Park and Conception Island National Park. PA management plans will include: 1) institutional arrangements for collaboration and conflict resolution and mechanisms for surveillance and enforcement; 2) clear biodiversity conservation objectives, targets, management strategies and monitoring programmes; and 3) strategies for energy conservation and renewable energy. As part of the process for developing PA management plans, the project will help to consolidate the findings from research and published scientific papers to support management and zoning plan development. A particular priority for updating the existing management plans at these sites is to take account of evolving threats from within the MPAs as well as those coming from adjacent areas. The management plans will also define a strategy for the protected areas to become carbon-neutral – it is believed that the sites are very good locations to influence communities and tourists views on renewable energy sources. In terms of financial implications for PA management associated with carbon neutrality, the management plans will consider financial aspects that will include the conversion to RE and EE for each site. An example would be the replacement of diesel fuel (brought by ships into the various islands) by renewable energy options. The business plans will also include whenever possible aspects associated to this.

Output 2.1.3 - Infrastructure established and staff deployed and capacitated at 5 MPA sites: The project will support the establishment of critical MPA infrastructure, including offices, staff quarters, visitor facilities, and docking facilities, with a preference for installing “green infrastructure” with low environmental impacts and carbon neutrality. The project also will support the hiring, training and equipping of MPA staff as needed to carry out day-to-day protected area operations. To support effective monitoring and enforcement of MPAs, staff will be provided with radios, boats and other equipment, and will be trained in patrolling strategies, boat use, mooring systems, etc. MPA staff also will be trained in general park administrative and operational activities in order to ensure sufficient capacity is in place for resource protection, visitor services, fee collection and outreach, and in working with key partners (i.e. fly fishing guides, lodge owners) to jointly manage visitation to the MPAs and protection of their resources.

Output 2.2.1 - Business Plans developed and under implementation for Joulter Cays and Lucayan NPs: To support the sustainable operations of the new Joulter Cays NP and the expanded Lucayan NP, the project will undertake a complete cost analysis for the operations of these newly designated MPAs; conduct a feasibility assessment for the potential use of new user fees at the sites, and develop MPA business plans for operating the two MPAs. The business plan will focus on 1) increasing existing financial resources; 2) identifying and implementing cost-saving activities (e.g. renewable energy and energy efficiency; see Output 1.8), including through coordination and sharing of resources with other PA sites and conservation partners; and 3) finding and securing new sources of PA financing (including through partnerships with private operators to increase tourism visitation and generation of associated fees). Lucayan National Park, which was recently expanded under the GEF FSP to include significant additional coastal / marine area, will provide opportunities to increase revenue streams by implementing new user fees and tourism concession related to visitation to the marine part of the park. A feasibility study will be completed to determine the types of services and amenities that need to be developed for LNP in order to take advantage of the projected influx of visitors (more than 20,000/year) that are expected to visit the park.

Output 2.3.1 - Species Conservation and Monitoring Plans developed and priority actions (e.g. monitoring) under implementation for priority species at 5 MPA sites: Building on the information established under Component 1, the project will develop a species conservation and monitoring plan for populations of the Northern Rock Iguana (*Cyclura cychlura*; VU) in Andros West Side NP and Exuma Cays Land and Sea Park, including surveys and life history studies, a threat assessment including analysis of the effects of the existing commercial trade in this species, a public education program, and a monitoring program. During the PPG phase, the urgency and potential for developing species conservation and monitoring plans for other species will also be investigated, possibly including the Bahama Swallow (*Tachycineta cyaneoviridis*, EN) in Lucayan National Park, the Bahaman Hutia (*Geocapromys ingrahami*, VU) in the ECSLP, and the Red lionfish (*Pterois volitans*) at all

MPA sites. In addition, the project will support monitoring of key species at each of the 5 MPA sites (to be confirmed during the PPG phase): 1) Conception: populations of resident and migratory bird species; 2) Lucayan: populations of resident and migratory bird species, especially the Bahama Swallow (*Tachycineta cyaneoviridis*), and of the Bahama Cavefish (*Lucifuga spelaotes*); 3) ECLSP: populations of migratory bird species, and of the Bahama Swallow; 4) Andros West Side: populations of Cat Island Freshwater Turtle (*Trachemys terrapen*); and 5) Joulter Cays: populations of resident bird species and diverse marine species (Bonefish, Lemon Shark, Green Sea Turtle, Loggerhead Sea Turtle, Sawfish).

Output 2.4.1-Up to 5 carbon neutral Marine Protected Area facilities (photovoltaic substitute for diesel generators (photovoltaic substitute for diesel generators (minimum 1,052,769.6 tCO<sub>2</sub>-equivalent direct emission reduction over 15 years): The project will seek to demonstrate the social, environmental and economic feasibility of climate change mitigation through implementing innovative carbon neutral solutions that will contribute to the effective management of marine protected areas and to reduce risks associated to the use of diesel such as “pollution / storage” since diesel fuel requires storage of bulk fuels on the islands and the transfer of fuel from bulk storage to monthly storage for daily use. This storage and transfer increases the risk of a spill into the water or ground resources of the park. A set of technological options will be considered, including solar PV systems, energy efficient lighting (LED-based), improved windows and insulation, green roofing, and use of vegetation for cooling. The pilots will serve as a model of what can be a sustainable/greener option to combat climate change and improve financial sustainability of the parks; which can be eventually scaled up to more facilities within protected areas and in the country. Cost efficiencies for various options of renewable energy and energy efficiency methods will be developed in order to make the case of upscaling due to cheaper options. The proposed interventions are: (i) Visitors Centre for Warderick Wells (ECLSP), (ii) West Andros Fee collection booth, (iii) Bonefish Pond high visibility demo pilot. Proposed activities include: (i) Transform Warderick Wells to renewable energy sources, to include connecting existing buildings to solar power and outfitting with energy efficient appliances and lighting; (ii) Carbon neutral renewable energy powers basic park infrastructure at West Andros; (iii) Demo Renewable Energy Pilot (New Providence – high visitation area) for Bonefish Pond. Bonefish Pond is a park located in New Providence island, where Nassau the capital it. This is the highest populated island and therefore a pilot in this park would be strategic for: 1) large visibility, schools also go there for field-educational trips 2) large number of Bahamians visit, 3) the Government recently paved a road to the park; and (iv) Up to two additional pilots, based on GHG emission reduction and visibility/visitation criteria and co-finance challenge funds. To be determined during PPG.

### **Component 3: MPA management integrated with sustainable development in the broader land / seascape**

Output 3.1.1 – Reduced impacts from adjacent areas on MPAs through Invasive Alien Species (IAS) management and ecosystem restoration: The project will support restoration of critical areas for ecosystem services and biodiversity habitat in areas adjacent to MPAs, in particular areas where land and sea interface and with a focus on strengthening ecosystem resiliency. Working in creek systems (Millars Creek and Coral Harbour Creek) adjacent to Bonefish Pond National Park, the project will undertake restoration of at least 60 ha of mangroves, including restoring water flows and hydrological connectivity; grading of the shoreline and replacement of hard substrata with sediments more suitable for mangrove growth; planting of mangroves to enhance or supplement natural mangrove recruitment; removal of debris and trash from the area; and removal of invasive Australian Pine (*Casuarina equisetifolia*) and Brazilian Pepper (*Schinus terebinthifolius*). In areas around Lucayan National Park and along the coastline to the west (within the IBA), the project will complete a feasibility study for restoring degraded coastline and wetland habitats and for the management and control of the invasive Paperbark Tree (*Melaleuca quidqernervia*). Other possible interventions, including IAS management and habitat restoration activities at Conception Island, will be assessed during the PPG phase. All of the interventions under this output will contribute to establishing cost coefficients for ecosystem restoration and the removal of IAS for land areas on other islands in the country. To ensure sustainability of these actions (IAS management and ecosystem restoration) the project will be addressing the main causes leading to this problem. For instance the community based “adoption pilots” will be used to disseminate information about the importance of reducing impacts on adjacent areas on MPAs. During the PPG the exact conformation of stakeholders that would be involved in the “adoption schemes” will be confirmed, but it is expected that key actors with prominent roles in both education and PA management will be involved. This will add to the sustainability since communities and youth groups will be exposed to the potential problems, and how to avoid additional degradation, giving them thus an opportunity to engage with the cause beyond the project life.

Output 3.1.2 – Reduce impacts of agriculture and pollution in productive landscapes on ecosystem services and biodiversity in MPAs: Important coastal and marine habitats within MPAs, including underwater caves and blue holes (e.g. at Andros West Side) are highly vulnerable to changes in the chemical composition of their water, which frequently result from sedimentation and the use of pesticides, fertilizer and other chemical inputs on agricultural land. Working with the Department of Agriculture, which plans to train farmers in “Good Agricultural Practices” (GAP; as defined by FAO), the project will support the adoption of practices to improve the organic matter content of soil, minimize erosion, and maintain soil coverage, including composting, mulching, crop rotation, collecting of livestock manure for fertilizer, planting of nitrogen-fixing crops, etc. The project also will work with farmers to minimize fertilizer and chemical inputs; implement regular groundwater testing to measure agricultural runoff for chemicals and fertilizer; seek to place limits on the use of agricultural chemicals (i.e. limitations on the amount of or

areas in which certain chemicals can be used); and carry out workshops to explain the human and environmental health effects of chemical pesticides and herbicides, train farmers in appropriate usage and application of chemicals, and demonstrate alternative methods of pest management such as use of natural oils (e.g. neem oil), crop rotation, inter-cropping of different plants, etc.

Output 3.1.3 - Pilot communities and/or schools are supporting management of two MPAs (“adoption schemes”): In collaboration with MPA staff, the project will establish community support groups and youth environmental programmes in schools nearby the Andros West Side and Bonefish Pond MPA sites, and will provide training to these stakeholder groups (with the approach train the trainer) to assist in species and habitat monitoring and in ecosystem restoration techniques, which will strengthen the long-term management capacity of these MPAs and help to integrate their management into broader land / seascape management systems. The involvement of the Department of Cooperatives and setting up cooperative to manage certain ‘business units’ within the protected area and surrounding areas will be investigated during the PPG. The training will be originally financed by the project, but it is expected to continue beyond the life of the project due to aspects such as: -training of trainers methodology, -including in the programme aspects that will remark the importance of the natural resources that these communities and groups will be trying to protect, such that the value of this protection will serve as an incentive for future actions; and -through engaging local stakeholders as trainees and participants of the whole “adoption schemes”, which will ensure ownership of the programme and its continuity. Local stakeholders, and key partner organisations such as the Bahamas National Trust, TNC and the University of the Bahamas could also play a key role in the scaling up of the results of this output. During PPG the possible role of each of the actors will be further defined, with the objective to ensure that the “adoption schemes” could be used in other protected areas (i.e which are managed by BNT) and to which the same approach could be brought. Lessons from this initial experience will be documented and serve as important instruments in the scaling-up of community adoption schemes.

#### Summary of Activities at Targeted Project Sites

Project Sites	Component 1	Component 2	Component 3
Joulter Cays NP	1.2.1 Ecosystem-wide zoning plan	2.1.1 PA Management Board 2.1.2 PA Management Plan 2.1.3 Infrastructure & Staff 2.2.1 Business Plan 2.3.1 Species Conservation & Monitoring	
Lucayan NP (with expansion)	1.2.1 Ecosystem-wide zoning plan	2.1.1 PA Management Board 2.1.2 PA Management Plan 2.1.3 Infrastructure & Staff 2.2.1 Business Plan 2.3.1 Species Conservation & Monitoring	3.1.1 IAS Management & Ecosystem Restoration
Conception Island NP	1.2.1 Ecosystem-wide zoning plan	2.1.2 PA Management Plan 2.1.3 Infrastructure & Staff 2.3.1 Ecological Monitoring	3.1.1 IAS Management & Ecosystem Restoration
Andros West Side NP	1.2.1 Ecosystem-wide zoning plan	2.1.2 PA Management Plan 2.1.3 Infrastructure & Staff 2.3.1 Species Conservation & Monitoring 2.4.1 Renewable energy pilot	3.1.2 Reduced Agriculture Impacts 3.1.3 Community MPA adoption schemes
Exuma Cays Lands and Seas Park	1.2.1 Ecosystem-wide zoning plan	2.1.2 PA Management Plan 2.1.3 Infrastructure & Staff 2.3.1 Species Conservation & Monitoring 2.4.1 Renewable energy pilot	
Bonefish Pond NP		2.4.1 Renewable energy pilot	3.1.1 IAS Management & Ecosystem Restoration 3.1.3 Community MPA adoption schemes

The project will also support fulfilment of The Bahamas’s commitment to the Aichi Targets adopted at the 10th Conference of the Parties of the CBD particularly: Global environmental benefits will be quantified and monitored using the 2013 Aichi Passport indicators. The project aligns with the following Aichi Biodiversity Targets:

- Target 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.
- 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.
- Target 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 particular importance for biodiversity and ecosystem services, are 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.

- Target 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, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.
- 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.

**4) Incremental/additional cost reasoning. Proposed Alternative Scenario & Global Environmental Benefits**

CURRENT PRACTICE (BASELINE)	PROJECT ALTERNATIVE (ADDITIONALITY)
<p>In the baseline scenario, monitoring and research will continue as sector-based approaches and will be directed to the sector’s specific needs and goals. Conservation monitoring and research will be targeted at species level without incorporating information from ecosystem services provision to other sectors and their contribution. Agriculture monitoring and research again will be targeted towards increased production and employment statistics. Physical development (urban expansion and business development) will exclude the impact on natural resources and ecosystem services, similar to the agricultural sector. Development decisions will therefore not be based on a balancing of development and conservation needs, and finding the best compromise with dual development and conservation benefits. Management plans of protected areas will continue to be developed as if MPAs are isolated from the wider land/seascapes. Development decisions inside and outside MPAs will continue to be made without the information necessary to triangulate development and conservation possibilities.</p>	<p>A decision-support system will provide relevant information to decision-makers and the Department of Physical Planning in land and sea use planning. This will ensure that land use decisions are made based on the best available information increasing the possibility that decisions will have dual conservation and development impact and that The Bahamas move closer towards developing sustainably. With this information, zoning plans will be developed that will maximise the development and conservation benefits and allocated appropriate land/sea uses to the zones. These plans will inform MPA management plans as well development plans in areas outside MPAs, increasing the possibility of the implementation of such plans.</p>
<p>In the baseline scenario, The Bahamas will continue to have an inadequate regulatory framework and insufficient awareness and capacity to effectively manage protected areas. Limited operational budgets of local institutions will deprive unprotected key species / ecosystems. Currently, most MPAs only exist on paper; and their need for support in the implementation of management plans will persist. Staff have inadequate training and there is not sufficient data to strengthen management plans and/or business plans that could improve the management effectiveness of the various protected areas. The Bahamas is committed with the 2020 challenge of expanding its protected areas; while this process has been occurring in the past years, there is still an urgent need to support that effort with other tools that could actually lead to the preservation of the resources that are hosted in those protected areas. The MPAs will receive funding from donors and from the Caribbean Biodiversity Fund, yet opportunities will be lost to generate on-site income or to implement cost effective PA management.</p>	<p>Additional support to existing local investments and efforts in the form of this GEF project will increase the management effectiveness of MPAs, which are significant for ecosystem services and as biodiversity habitat. In addition, expansion of business planning and the fee system to newly designated protected areas will generate more resources for MPA management, and therefore natural resources under these areas will have a better opportunity to be protected. The retrofitting of buildings and provision of renewable energy sources of selected facilities in protected areas are expected to add to the financial sustainability of the parks and serve as a model for future interventions towards a more effective and innovative management of protected areas.</p>
<p>In the baseline scenario, opportunities to safeguard and sustainably manage ecosystem services will be lost. Opportunities to restore critical areas of habitat and ecosystem resilience, and to generate national capacity and awareness for such activities, will not be realized, and unsustainable land use management practices will continue in areas adjoining or upstream of MPA sites, directly and negatively impacting ecosystem services in those sites. If this situation continues, the negative impacts on ecosystems will affect farming and fishing livelihoods, the tourism industry, and the country’s ability to adapt to climate change and other challenges (such as extreme weather events), to which it is highly vulnerable. In addition, Invasive Alien Species will continue to be a problem at many MPA sites.</p>	<p>The analysis and restoration of productive landscapes interfaced with seascapes will offer the country possibilities to better adapt to challenges such as climate change. In addition, the involvement of communities through demonstration pilots will support the management system of key coastal landscapes found in protected areas. This will serve as a model for future interventions and could be scaled-up.</p>

Between 2004 and 2011, UNDP with funding from the GEF implemented the project “Caribbean Renewable Energy Development Programme”. The project targeted 9 CARICOM member states: Antigua and Barbuda, Bahamas, Barbados, Belize, Cuba, Guyana, St. Kitts and Nevis, Suriname and Trinidad and Tobago. The goal of the project was to remove barriers

to the increased use of renewable energies and reduce implementation cost thus reducing the Caribbean region's dependence on fossil fuels and contributing to the reduction of GHG emissions. The first phase of the project was rated as performing unsatisfactorily. The main reason for this was policy and innovative financing components had failed to move forward. The technical capacity building component showed more satisfactory progress. Changes were made to the project design and the second phase showed some progress and was rated by the final evaluation as satisfactory. Overall, the final evaluation attribute the slow progress to a complex set of issues such as little support at political level in the first phase and passivity of its project management unit. But also, the slow progress can be attributed to flaws in project design. Some lessons learnt in this respect were: (i) Mitigating barriers may take different timeframes: Capacity building and awareness creation events (consisting of a series of workshops, seminars or course participation) can be organized most quickly. However, effecting changes in the mind-sets of policy and decision-makers may need a timeframe longer than a typical GEF mitigation project; (ii) Only if the appropriate policy goals have been formulated and an appropriate regulatory environment for RE investments has been established, commercial investors will be attracted; and (iii) Experiences of renewable energy project implementation in the region has shown that preparation work to produce a bankable proposal takes more time and resources than foreseen during project planning. Other recommendations include (i) Where possible, links should be made with energy efficiency considerations; (ii) Rather than focusing on one-time 4 to 5 years interventions, one option is to allow a more long-term programmatic approach with a country or region, which would consist of several modules (smaller projects) that address specific issues and barriers, of which some would be implemented in parallel and other ones in a consecutive order. All recommendations and lessons learnt have been taken in account during the preparation of the PIF and will be further considered during PPG. The project will not focus on addressing the policy barriers – the retrofitting and provision of renewable energy sources of selected facilities in protected areas will be done within the project period. The project will focus on convincing individuals and hotel groups to uptake mitigation options and not attempt to attract large private sector investment in the provision of mitigation services. The PPG will be used to ensure that all mitigation projects will be implementable during the project period and the link between renewable energy and energy efficiency has been incorporated with all mitigation projects to have a joint approach. The future sequencing of projects will also be discussed with the country during PPG in order to have a clear path leading to future GEF and other donor project proposals.

#### **5) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCE/SCCF)**

The GEF funding will secure protection of critically important biodiversity in The Bahamas. It will deliver global benefits through the increase of management effectiveness of MPAs identified of global importance (see Annex 1 identifying the selected MPAs as Key Biodiversity Areas), the restoration/rehabilitation and the improved conservation of threatened and endemic species such as *Lucifuga spelaeotes*, *Tachycineata cyaneoviridis*, *Geocapromys ingrahami*, *Trachemys terrrapen* and *Cyclura cyclura* as well as Trigger bird species for Important Bird Areas including *Phaethon lepturus*, *Anous stolidus*, *Onychoprion anaethetus*, *Vireo crassirostris*, *Setophaga ptyophila*, *Sternula antillarum*, *Charadrius melodus* and *Limnodromus griseus*. In particular, extensive mangrove forests, seagrass meadows, broadleaf forests, shrublands, and coral reefs will be conserved and, where possible, rehabilitated. The improved land/seascape management over a large geographical area will safeguard soil and water resources on the islands, increase carbon stocks, reduce GHG emissions, and protect biodiversity. In addition, the expected direct global environmental benefits from the renewable energy demonstrations that will be carried out under the project are in the range of 1,052,769 tCO<sub>2</sub> cumulatively over the lifetime of the applied technologies. The estimated indirect benefits are 2,105,539 tCO<sub>2</sub>-eq.

#### **6) Innovation, sustainability and potential for scaling up**

One goal of this proposed project is that innovative activities developed through the project on Integrated Natural Resource Management, MPA management planning, and piloting of community models for sustainable land management and renewable energies can be scaled up to other islands in The Bahamas. It is worth mentioning that since the Bahamas is in the process of expanding its protected areas as per the 2020 challenge, the lessons learned from the project activities will be of extreme importance as a model to follow. The Bahamas has also set the target to achieve a minimum of 30% renewables in the country's energy mix by 2030. Therefore pioneering carbon neutral activities will be key for the country as an innovative measure towards this goal and will complement other efforts such as the "Bahamas Solar PV and Battery Hybrid System Project". The dependency on fossil fuels on the various islands where protected areas are located makes local operations difficult and makes those who depend on the diesel generators and the shipment of fuel extremely vulnerable. Based on the above mentioned reasons, alternative measures such as renewable energies have a high possibility of replications since they fall within the national priorities, they will tackle a current problem and will deliver global environmental benefits. Further, the project will make the case that if most if not all renewable energy and energy efficient applications there are cost savings influencing both main and remote island inhabitants to make the shift to carbon neutral options. Such financial analyses will also advise the business potential of renewable energy options and energy efficient applications, growing the availability of such solutions and thereby growing the overall sustainability of carbon neutral electricity supply in The Bahamas.

In addition, the project will assist in establishing a participatory PA Management Advisory Board for each of the two new MPAs, which work will definitely contribute to the sustainability of the project results and interventions in the areas (i.e the implementation of the management plans). The project will also develop and implement a community awareness and education campaign, which combined with community participation in decision-making through the PA Management Advisory Board, will strengthen community involvement and build a sense of ownership for improving park management capacity in the future.

Coordinating arrangements for the project will ensure that opportunities for scaling up all facets of the project outcomes are taken up through mechanisms such as the National Implementation Support Partnership, which serves as the Steering Committee for the project. In addition, the BEST Commission as the national environmental agency for The Bahamas works throughout the country and can use its role within government to facilitate scaling up the successes of the project throughout the country. The project also will involve other national agencies such as Department of Marine Resources and the Office of the Prime Minister, as well as NGOs such as the Bahamas National Trust and The Nature Conservancy, which independently and together can facilitate scaling up activities throughout the country. During the project preparation phase, the project management team along with key stakeholders will detail the mechanisms for ensuring that this up-scaling will occur. In relation to sustainability, MPA business plans will be developed during this project for selected sites that will contribute to ensuring that resources are available for their operation and management over the long term. In addition, the expansion of the fee system to newly designated MPAs will add to the sustainability of results by securing additional resources for MPA operations.

2. **Stakeholders.** Will project design include the participation of relevant stakeholders from [civil society organizations](#) (yes  /no ) and [indigenous peoples](#) (yes  /no )? If yes, identify key stakeholders and briefly describe how they will be engaged in project preparation.

A number of stakeholders will be engaged in this project, which will have a strong emphasis on multi-sectoral consultation. Their level of engagement will vary according to expertise and activity; this will be further mapped out during the PPG.

Stakeholder Type	Area of Intervention
Bahamas Environment, Science & Technology (BEST) Commission	The BEST commission is the lead executing agency for the project; it will be part of the project steering committee, and will act as the liaison agency with UNEP and GEF as Operational Focal Point. BEST will provide overall project management on a day-to-day basis, guiding all project interventions
Bahamas National Trust (BNT)	BNT, as the authority in charge of protected areas, will play a key role on the project steering committee and as a technical advisor for the project; and in project implementation as a sub-contracted agency for delivery of some of the project outputs. BNT, which is in charge of implementing PA management plans, has been an active contributor in the development of this proposal.
Bahamas Protected Areas Fund (BPAF)	BPAF is the financing mechanism for enhancement and sustainability of the marine protected areas system and for natural resource management for The Bahamas
Forestry Unit (FU)	FU will participate on the project steering committee, and provide expert advice on forestry matters
Department of Marine Resources (DMR)	DMR, as the responsible authority for marine reserves, will participate on the project steering committee, and provide expert advice on marine related matters, in particular in the identification of priority challenges and operational issues related to marine reserves
The Nature Conservancy (TNC)	As a major partner who also takes a lead role in the implementation of activities related to this project, TNC will be part of the project steering committee. TNC is also foreseen as a possible subcontractor for delivery of some project outputs
Bahamas Reef Environment Educational Foundation (BREEF)	BREEF will act as an executing partner on education and awareness building
Bahamas Sportsfishing and Conservation	Bahamas Sportsfishing and Conservation will act as an executing partner on education and awareness building
Andros Conservancy and Trust (ANCAT)	ANCAT will act as an executing partner on grassroots community management arrangements and sustainable livelihoods
Friends of the Environment (FOE)	FOE will act as an executing partner on grassroots community management arrangements
Nature's Hope for South Andros (NHSA)	NHSA will act as an executing partner on grassroots community management arrangements
Dive & Tour Operators	Dive and tour operators are potential executing partners at the community level
Inter-American Development Bank (IDB)	The IDB will support relevant investments in economy and infrastructure
Food and Agriculture Organisation (FAO)	Linkages will be sought with FAO on sustainable agricultural development and food security
National Implementation	NISP will participate on the project Steering Committee

Support Programme (NISP)	
Office of the Prime Minister (OPM)	The OPM will oversee relevant commitments to investments in economy and infrastructure
Royal Bahamas Police Force (RBPF)	RBPF is responsible for the enforcement of laws relevant to natural resources management and environmental conservation
Royal Bahamas Defense Force (RBDF)	RBDF is responsible for the enforcement of laws relevant to natural resources management and environmental conservation

**3. Gender Equality and Women's Empowerment.** Are issues on [gender equality](#) and women's empowerment taken into account? (yes  /no ). If yes, briefly describe how it will be mainstreamed into project preparation (e.g. gender analysis), taking into account the differences, needs, roles and priorities of women and men.

The project will ensure gender equality. Specifically, the project will include gender disaggregated indicators to measure and report on the gender equitability of participation in project activities, both at the advisory and at the implementation levels. The project preparation phase (PPG) will also seek to ensure the participation of a wide range of organizations, exploring the role that they can play in disseminating information, increasing sensitization and providing feedback on gender-related considerations with regard to specific activities. Gender sensitive perspectives will be incorporated in the final project document, and the PPG will ensure that it has gender-balanced stakeholders providing input on the project design. The PPG also will identify specific areas where gender diversity is key with respect to leadership roles in the implementation process.

**4 Risks.** Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable).

Risk	Rating	Risk Mitigation Measure
Political elections result in changed commitments to the Caribbean Challenge and / or the management of marine protected areas	Low / Medium	The project is designed to involve multiple agencies and sectors in a consultative preparatory phase, so that the project interventions are non-partisan and widely accepted.
Insufficient buy-in from key stakeholders, including senior policy stakeholders and local community members	Low	The project Validation Workshop held in February 2015 was widely supportive of the project parameters, and the PPG phase will build on project consultation and ownership through broad outreach.
Climate change variability: A major natural disaster (such as a hurricane) strikes The Bahamas during the project	Medium	Project components and supporting activities seek to improve climate change resiliency and reduce vulnerability to natural disasters in the MPA system and buffer zones. In the event of a hurricane striking the country, the project will sue part of the M&E funds to check on project sites and identified possible damage that will require adaptive management and or other kind of intervention/actions.
Economic factors and potential social destabilization	Medium	Enhanced financial sustainability of the parks system will result in job creation and economic opportunities for surrounding communities. This will be achieved through revised and new management plans for the protected areas.
Insufficient sources of long-term finance to maintain sustainable management of project interventions	Low	The project will enhance the financial sustainability of the Bahamas Protected Ares Fund (BPAF) and associated drawdown of the Caribbean Biodiversity Fund (CBF), supported in turn by establishment of new financial mechanisms, including a protected areas fee system
Recommendations of the Zoning Plans meet difficulties in being enforced – products are developed but not used	Medium	The Government of The Bahamas fully backs development of the zoning plans, and acknowledges the need to incorporate the use of EIA into zoning plans and consultation processes preceding the allocation of land near MPAs for development purposes. In order to mitigate the risk that zoning plans will not be implemented, a wide consultation process will precede the finalization of the plans.

**5. Coordination.** Outline the coordination with other relevant GEF-financed and other initiatives.

#### GEF Interventions

The UNEP-GEF *Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States (IWEco)* project is a five-year multi-focal area regional project with four components; (1) Development and Implementation of Integrated Targeted Innovative, climate-change resilient approaches in sustainable land management (SLM), integrated water resources management (IWRM) and maintenance of ecosystem services; (2) Strengthening of the SLM, IWRM and ecosystems monitoring, and indicators framework; (3) Strengthening of the policy, legislative and institutional reforms and capacity building for SLM, IWRM and ecosystem services management taking into consideration climate change resilience building and (4) Enhancing knowledge exchange, best practices, replication and stakeholder involvement. The project will be implemented through a network of international, regional and national partners in accordance with their comparative advantage. The Bahamas will be a part of the regional network established under the Regional IWEco project. The Bahamas will also benefit from regionally planned activities and tools to be developed under the regional project. UNEP is also implementing agency of the IWEco project and as such, synergies between both projects will be sought through constant communication between the task managers and when needed through periodic invitations to members of the IWEco project to participate in project meetings.

The UNEP-GEF project *Strengthening Access and Benefit Sharing (ABS) in The Bahamas* is designed to create and apply the enabling conditions for fair and equitable access and effective benefit sharing in the country. Synergies are envisioned with respect to a pilot that will explore the potential for benefit sharing of research being carried out in Blue Holes, some of which fall within the Forest Estate.

The UNEP-GEF project *Bahamas Pine Islands – Forest/Mangrove Innovation and Integration (Grand Bahama, New Providence, Abaco and Andros)* aims to build on recent advances in the forestry sector by integrating biodiversity values, ecosystem services values and precepts of sustainable forest management and land use into enhanced land-use planning in The Bahamas. The project also features a significant conservation component for the forest estate as well as livelihood component to sustainably develop cultivation of native palms and cascarilla.

#### Linkages with Non-GEF interventions:

*IUCN's Biodiversity and Protected Areas Management Programme (BIOPAMA)*, which started implementation in early 2016, is conducting a review of the Bahamas protected areas management categories. Technical personnel from different environmental organizations related to protected areas such as BNT, BEST Commission, TNC, The Forestry Division and Clifton Heritage are participating in this initiative, which aims to standardize the conservation categories of the Forestry Estate by having the entire Forestry estate placed on the IUCN Red List.

The Nature Conservancy (TNC), with funding from Oceans 5, is executing the project *“Realizing The 2020 Goal: Advancing the Expansion and Effective Management of the Marine Protected Areas System in The Bahamas”*, which will; 1) Design a New Set of Marine Protected Areas that will serve as the basis for the Government of the Bahamas to move forward towards the goal of 20 Percent Protection of Marine Habitat; 2) Increase the Effective Management of Protected Areas within The Bahamas Marine Protected Area Network; 3) Increase Sustainable Funding Dedicated to Protected Area Management; and 4) Strengthen Public Awareness and Support for Marine Protected Areas. The project will not however implement any MPA management plans; rather, this proposed new GEF project will support the completion and implementation of MPA management plans that are not targeted by the TNC project.

*Revitalization of the Sponging Industry:* The Inter American Development Bank (IDB) in conjunction with the Bahamas Agriculture and Industrial Corporation (BAIC) is supporting this project whose objective is to increase the income of sponge harvesters in Andros while sustaining the sponge ecosystem and supporting biodiversity. The project will work with the Bahamas Commercial Spongers Association (BCSA) to consolidate sponge processing and to link spongers to markets and buyers, and will increase the area of seafloor in which sponges are being sustainably managed. The sponge project is contributing to the sustainable management of natural resources in Andros, one of the MPA sites targeted by this proposed project.

*Bahamas Solar PV and Battery Hybrid System Project:* which prioritizes the deployment of photovoltaic systems across the family islands with a view towards replacing diesel generators with 17MW of solar PV and associated battery storage. The project estimated cost is \$50 million for Engineering, Procurement and Construction (EPC) contracts on a prioritized subset of islands which were chosen on the basis of several factors including population size, demand and load factors, and is expected to commence in 2017

**6. Consistency with National Priorities.** Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? (yes  /no  ). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.

National strategies and plans or reports and assessments under relevant conventions that are applicable to the Project include: NBSAP, NAP, NAPA, NIP, PRSP, NPDF, among others.

*UN Convention on Biological Diversity (CBD)*: The Bahamas signed the Convention on Biological Diversity (CBD) on the 12th of June, 1992, and ratified it on the 2nd of September, 1993. The Bahamas developed its National Biodiversity Strategy and Action Plan (NBSAP) in 1999. The NBSAP identified the following activities as priorities: a) National Consultative Process to determine the specifics of which species, ecosystems and locations are targeted for conservation activities and to create an awareness among citizens and residents of The Bahamas of the value of biodiversity to the economy and to societal well-being, and of their individual and collective responsibilities under the CBD; b) Preparation of bioregional guidelines, position papers and policy statements with respect to bioregions, major ecosystems, and critical species in The Bahamas and the role of the agriculture, fisheries and forestry sectors in conservation biodiversity; c) Planning for a system of national parks and protected areas; d) Development of monitoring and evaluation methodologies; and e) Protection or rehabilitation of threatened or degraded ecosystems and of threatened species. Over the past 14 years, action has been taken on all of these, but efforts will need to continue as the tasks are significant. Additionally, progress has been made on biodiversity issues not addressed in the NBSAP, inclusive of invasive alien species (IAS) management and sustainable financing for protected areas. The proposed project will contribute to the achievement of key biodiversity conservation objectives outlined in the 4th National Report, including contributing to the following: i) finalize the Caribbean Challenge protected area initiative and establish the funding mechanism for protection and research for designated areas; ii) identify critical areas throughout the Caribbean to serve as focal points for protection and research; iii) provide financial assistance to SIDS countries for mitigation of environmental impacts such as Climate Change; and iv) assist member countries in finding mechanisms to raise funds for conservation methods.

*UN Convention to Combat Land Degradation (UNCCD)*: The National Action Programme (NAP) for Combating Land Degradation was completed in 2006. The overall strategic goal of the NAP is to mitigate, and wherever possible, reverse the effects of land degradation by adopting measures to effectively preserve and manage the limited land resources of The Bahamas through the participation and partnership of the various stakeholders. This goal is to be achieved through a tiered approach involving planning, development and implementation, and evaluation.

*UN Framework Convention for Climate Change (UNFCCC)*. According to The Bahamas 2015 National Communication, electricity generation and the transportation sector are the two most significant sources of greenhouse gas emissions. Whilst The Bahamas' contribution to global greenhouse gas emissions is fairly negligible, its vulnerability to climate change is very high, and increasing. The Bahamas' vulnerabilities are due to and exacerbated by the island's location, topography, limited resources and economic dependence on primary production and the service/tourism industry. Changes in the frequency and intensity of extreme weather and climate events, such as heavy rainfall, strong winds, drought and high sea temperatures and levels have been experienced and documented. These and other events have claimed lives, caused severe damage to infrastructure and other economic assets and adversely impacted livelihoods. These changes and their adverse consequences are projected to escalate in the near and longer terms, with negative impacts on the economy, health and safety, and food and water security. In recognition of the above, The Bahamas has indicated in their Intended Nationally Determined contribution (INDC), communicated to the UNFCCC on November 17, 2015, that the country is expected to adapt to the impacts of climate change while at the same time pursue a low carbon pathway in conformity to growing international and public pressure for environmentally friendly development that reduces their "carbon footprint" and exposure to climate change, while also increasing energy security. Regarding *Adaptation*, the project is aligned to the INDC as adaptation measures for the specific sectors are mentioned as follows: (i) Agriculture, livestock development and fisheries sector: *Formulate and implement strategies and measures which will help to enhance food security and sustainable food production*; (ii) Coastal and Marine Resources and Fisheries sector: *Adopt short-, medium-, and long-term measures to protect coastlines and increase the resilience of coastal ecosystems, enforcement of setbacks, and restoration of coastal wetlands*; and (iii) Energy sector: *Promote the use of less carbon intensive fuels*. Under Mitigation measures, the INDC states the following in line with the project: *"The electricity and transport sectors are the main usage sectors of fossil fuels in the country and the electricity demand is expected to increase in the medium term. Accordingly the Government has defined the policy framework for a low carbon development plan through the National Energy Policy, that sets a target to achieve a minimum of 30% renewables in the country mix by 2030 and will allow for a 10% Residential Energy Self Generation Programme within the year. This comprehensive programme of efficiency improvement and energy diversification will allow The Bahamas to provide high-quality, affordable, environmentally-friendly energy and to reduce the amounts of imported oil that the country uses. Energy diversification will involve moving from a high dependence on petroleum to increase the contribution of other sources such as renewable energy from solar, ocean and wind. Indeed, The Bahamas is well positioned to tap local renewable energy resources such as wind and sun."* and *"Results of a mangrove ecosystem study on one Pine Island (Andros) indicate that approximately 5,661,077 tCO<sub>2</sub>eg may be removed from the atmosphere through the proper management of the ecosystem. Proper management will improve the functionality of our mangrove ecosystems and increase their carbon sink ability."*

As mentioned above, the Bahamas has formalised a National Energy Policy that sets a target to achieve a minimum of 30% renewables in the country’s energy mix by 2030; joining the Carbon War Room “Ten Island Challenge” to deploy 20 MW of utility scale PV installations; amended legislation to promote the use of alternative sources of energy and grid-tie connected systems; expanded the Marine Protected Area network to 10% of nearshore and marine environment; amongst others.

Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region – Cartagena Convention: Of particular relevance to the proposed project is the Protocol Concerning Specially Protected Areas and Wildlife (SPA) in the Wider Caribbean Region, committing to protect, preserve and manage in a sustainable way: 1) areas and ecosystems that require protection to safeguard their special value, 2) threatened or endangered species of flora and fauna and their habitats, and 3) species, with the objective of preventing them from becoming endangered or threatened.

Ramsar Convention: The Ramsar Convention’s mission is “the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world”. The project will support this by increasing awareness and strengthening management of wetlands, particularly those located on private lands.

UNEP’s Ecosystem Management sub-Programme of Work for 2014-2017: The proposed project is consistent with this programme of work, as it specifically addresses UNEP’s expected goals for “use of the ecosystem approach in countries to maintain ecosystem services and sustainable productivity of terrestrial and aquatic systems is increased”, and “services and benefits derived from ecosystems are integrated with development planning and accounting, and the implementation of biodiversity and ecosystem related multilateral agreements”. The project will specifically contribute to output (a) (1) “Methodologies, partnerships and tools to maintain or restore ecosystem services and integrate the ecosystem management approach with the conservation and management of ecosystems”.

The Caribbean Environment Programme Regional Coordinating Unit/Secretariat to the Cartagena Convention: The project will benefit from the recognized expertise of this institution in matters related to the marine and coastal environment and in working in a multi-lingual environment, as well as its expertise in implementing the Cartagena Convention and particularly its SPAW Protocols. CAR RCU's specialized Regional Activity Centre for the Implementation of the Protocols on Specially Protected Areas and Wildlife is located in Guadeloupe; the project will include this specialized technical RAC and the newly established UNEP sub-regional office in Jamaica in its networking and coordination activities, and in stakeholder and partnership arrangements.

**7. Knowledge Management.** Outline the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

The knowledge management approach for this project is a learning-by-doing approach; it is anticipated that project activities, in particular activities on INRM (Component 1) and community support for PA management (Component 3), will provide the various stakeholders (communities, local authorities, MPA staff, etc.) the opportunity to learn about various issues and gain experience in and knowledge of actual resource management approaches. In addition, these activities will serve as “model experiences” which could be replicated in other areas of the country, thereby engaging new communities and stakeholders. Systematization of information and lessons learned will be done throughout the project implementation period. Members of the steering committee and all institutions and organizations with responsibilities relevant to the safeguarding of biodiversity and natural resources in the country will be given reports and key information. Furthermore, the lead executing agency (the BEST commission) will have the support and participation of various organizations (i.e. DMR, BNT and TNC) based on their skills, expertise and areas of work, which will expand opportunities for sharing information to a wider audience and involving organizations that can have a role in scaling-up the results of the project.

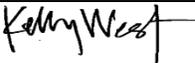
**PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)**

**A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):** (Please attach the [Operational Focal Point endorsement letter](#)(s) with this template. For SGP, use this [SGP OFP endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Ms. Camille F. Johnson	Permanent Secretary	Ministry of the Environment and Housing	10/28/2016

**B. GEF AGENCY(IES) CERTIFICATION**

This request has been prepared in accordance with GEF policies<sup>8</sup> and procedures and meets the GEF criteria for project identification and preparation under GEF-6.

Agency Coordinator, Agency name	Signature	Date (MM/dd/yyyy)	Project Contact Person	Telephone	Email
Kelly West UN Environment/GEF Coordinator Portfolio Manager Corporate Services Division UN Environment		June 12, 2017	Marianela Araya Task Manager	(507) 305-3169	<a href="mailto:marianela.araya@unep.org">marianela.araya@unep.org</a>

**C. ADDITIONAL GEF PROJECT AGENCY CERTIFICATION (APPLICABLE ONLY TO NEWLY ACCREDITED GEF PROJECT AGENCIES)**

For newly accredited GEF Project Agencies, please download and fill up the required [GEF Project Agency Certification of Ceiling Information Template](#) to be attached as an annex to the PIF.

<sup>8</sup> GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, and SCCF

## Annex 1: Key Biodiversity Areas in The Bahamas that are the focus of the project<sup>9</sup>

### Joulter Cays National Park

International [KBA] Name: Joulter Cays

Area: 16,000 ha

Protection Status: 100% of site under protected area status

KBA Criteria<sup>10</sup>: This site has been identified as an Important Bird and Biodiversity Area based on the presence of: 1) Significant populations of one or more bird species at certain times of their lifecycle or seasonal migration.

Site Description: The Joulter Cays (25° 16.00 North 78° 7.00 West) lie on the margins of the Grand Bahama Bank north of Andros Island. It is a large intertidal to shallow subtidal area of stabilized sand flats that covers approximately 160 km<sup>2</sup> (16,000 ha). The sand flats are penetrated partly by tidal channels with grass beds. The flats area fringed on the windward eastern and northeastern borders by mobile sands creating roosting habitats for shorebirds. On the seaward side there is a ridge of vegetated islands up to 6 m above mean sea level. The primary vegetation on the Joulter Cays is Red and Black Mangrove. Other vegetated islands are scattered among the sand flats. The sand bars are primarily made up of Ooid or Oolite sand. This unique spherical grained sand resembling Fish-roe is developed through a chemical process adding concentric layers around a central nucleus. The sands have a large surface area that promotes bacterial growth and are mainly used in the aquarium industry.

Key biodiversity<sup>11</sup>: Non-bird biodiversity: Bonefish, Lemon Shark, Green Sea Turtle, Loggerhead Sea Turtle, Sawfish

Populations of IBA trigger species<sup>12</sup>:

- *Species:* Piping Plover *Charadrius melodus*; IUCN Red-list Category: NT
- *Species:* Short-billed Dowitcher *Limnodromus griseus*; IUCN Red-list Category: LC

### Lucayan National Park

International [KBA] Name: Lucayan National Park

Area: 1,092 ha (with recent expansion)

Protection Status: 100% of site under protected area status

KBA Criteria<sup>13</sup>: The site has been identified as an Important Bird and Biodiversity Area and Key Biodiversity Area based on the presence of: 1) Significant population of globally threatened species; and 2) Significant populations of endemic species known only to be found in a limited area

Site Description<sup>14</sup>: Lucayan National Park is located about 25 miles east of Freeport, Grand Bahama. This park encompasses the longest known underwater cave system in the world with over six miles of caves and tunnels already charted. Above ground it exhibits every vegetative zone found in the Bahamas.

Key biodiversity<sup>15</sup>: The north side of the highway contains coppice and pinewoods where La Sagra's Flycatchers, Cuban Emeralds, Thick-billed Vireos, Red-legged Thrushes and Greater Antillean Bullfinches can be seen. Zenaida Doves, Cuban Pewees, Hairy Woodpeckers, Pine and Olive-capped Warblers can be found in the pinewoods. Bahama Swallows frequently feed over the park in summer. The south side of the highway includes a boardwalk through the mangrove swamp, in winter one can find Snowy Egrets, Blue-winged Teal, American Coots, Common Moorhens, Soras and Virginia Rails. Green Herons, Red-winged Blackbirds and Clapper Rails are here year round. Along the beach one can find shorebirds and scan Gold Rock Creek offshore for roosting terns.

*Non-bird biodiversity:* Buffy Flower Bats roost and raise their young in Ben's Cave during June and July. Blind Cave Fish, (*Lucifuga spalaeotes*) and the Lucayan Oar-foot, (*Spelionectes lucayensis*) are found deep in the caves.

Populations of IBA trigger species<sup>16</sup>:

- *Species:* Thick-billed Vireo *Vireo crassirostris*; IUCN Red-list Category: LC; Season: Breeding; Population Est.: <50 individuals
- *Species:* Bahama Swallow *Tachycineta cyaneoviridis*; IUCN Red-list Category: EN; Season: Resident; Population Est.: 50-249 individuals
- *Species:* Olive-capped Warbler *Setophaga pityophila*; IUCN Red-list Category: LC; Season: Breeding; Population Est.: 50-249 individuals

Information on Globally Threatened Species found in the KBA:

*Scientific Name:* *Lucifuga spalaeotes*<sup>17</sup>

- *Common Names:* Bahama Cavefish, New Providence Cusk-eel
- *Red-list Category:* Vulnerable
- *Range Description:* The distribution of *Lucifuga* spp. are highly patchy, as they are only found in inland karst caves located near coastal margins. *Lucifuga spalaeotes* has been collected or reported from 12 marine blue holes, inland caves, and deep fracture oriented chasms on eight different islands throughout the Little and Great Bahama Bank Islands from 0-28 m depth. Moller et al. (2006) identify localities as: Grand Bahama Island: Lucayan Caverns and Zodiac Caverns, Abaco Island: Inland sink hole, Berry

<sup>9</sup> Information mostly from [www.ibat-alliance.org/ibat-conservation](http://www.ibat-alliance.org/ibat-conservation)

<sup>10</sup> BirdLife International (2017) Important Bird Areas factsheet: Joulter Cays. Downloaded from <http://www.birdlife.org> on 30/01/2017.

<sup>11</sup> BirdLife International (2017) Important Bird Areas factsheet: Joulter Cays. Downloaded from <http://www.birdlife.org> on 30/01/2017.

<sup>12</sup> <https://www.ibat-alliance.org/ibat-conservation/kbafactsheet/m30039>

<sup>13</sup> <https://www.ibat-alliance.org>

<sup>14</sup> BirdLife International (2017) Important Bird Areas factsheet: Lucayan National Park. Downloaded from <http://www.birdlife.org> on 28/01/2017.

<sup>15</sup> BirdLife International (2017) Important Bird Areas factsheet: Lucayan National Park. Downloaded from <http://www.birdlife.org> on 28/01/2017.

<sup>16</sup> BirdLife International (2017) Important Bird Areas factsheet: Lucayan National Park. Downloaded from <http://www.birdlife.org> on 28/01/2017..

<sup>17</sup> <http://www.iucnredlist.org/details/12398/0>

Islands, Andros Island: ocean blue holes / Uncle Charlie's Blue Hole, New Providence Island: Mermaid's Pool and R.M. Bailey School Cave, Eleuthera Island: Nixon's Blue Hole and Sink Hole, Great Exuma Island: Angelfish Blue Hole, and Long Island.

- Countries occurrence: Native – Bahamas
- *Population*: Cave-diving expeditions can be logistically challenging and dangerous to undertake therefore, population data for *Lucifuga spelaeortes* is limited.
- *Habitat and Ecology*: *Lucifuga spelaeortes* is a small, eel-like fish with reduced eyes that shies away from direct light. It is found in at least eight islands and 12 different anchialine holes/caves in the Bahamas, where the top layer of water is fresh and the bottom is salty due to a subterranean connection to the sea. This species has been collected and observed from both the fresh layer and salty layer, indicating that it is euryhaline in nature. Due to the already harsh nature of its environment, even slight changes in cave water quality can negatively affect troglobitic organisms, which have already adapted with very low metabolic rates and small size so as to efficiently use energy when oxygen and food supply are lacking. Food availability is a significant limiting factor for the cave fish. Gonzalez *et al.* (2011) reported that food webs in these caves might be dependent on bacterial primary production. Populations of *Lucifuga* spp. seem to remain stable throughout the year, but populations of the invertebrates that constitute their diet fluctuate significantly. *Lucifuga* spp. primarily prey on troglobitic amphipods and mysids, but will also eat crustaceans and shrimps. Populations of *Lucifuga* spp. are significantly more abundant in caves also inhabited by bats, as their guano fertilizes the water and promotes growth of food sources for the fish.
- *Major threats*: *Lucifuga specaeotes* may be experiencing direct threats from habitat degradation and introduced alien species. Proudlove (2001) described five main threats to cave-dwelling species: habitat degradation through rock removal and siltation, hydrological manipulations caused by water removal; environmental pollution, overexploitation and the introduction of alien species. On multiple occasions, people have reported evidence of trash, sewage, industrial pollution, and competition from introduced species in caves throughout the range of Caribbean *Lucifuga* spp. The level of impact and rate of occurrence of these disturbances correlates to the location of the cave/hole in relation to human population density. There is a concern that caves that are proximal to dense human populations could be exposed to insecticide spraying.

**Scientific Name:** *Tachycineata cyaneoviridis*<sup>18</sup>

- *Common Name*: Bahama Swallow
- Red-list Category: Endangered
- *Range Description*: *Tachycineata cyaneoviridis* breeds on Grand Bahama, Great Abaco and Andros in the northern Bahamas. It may be extinct as a breeding bird on New Providence, but a few birds are seen each breeding season suggesting the presence of a relict but severely threatened population. The winter distribution is poorly defined, but there are a number of records from the southern Bahamas and eastern Cuba, and small numbers appear to be resident on the breeding islands. On migration, it occurs irregularly in the lower Florida Keys and through southern Florida, USA. The area of breeding habitat is c. 2,000 km<sup>2</sup>, and a population of 2,400 pairs was crudely estimated in the late 1990s. There are no empirical data to confirm population trends, but anecdotal reports suggest that the species declined considerably in numbers, and is now a scarce species even in suitable habitat.
- *Countries occurrence*: Native – Bahamas, Cuba, United States
- *Population*: Smith and Smith (1989) estimated a global population of 2,400 pairs, i.e. 4,800 mature individuals. Anecdotal evidence suggests that the population has declined substantially since then, and available survey data suggests the species occurs at low densities, even in apparently suitable habitat; consequently the current population is estimated at 1,500 – 4,000 individuals. Current Population Trend: Decreasing
- *Habitat and Ecology*: It nests in natural cavities and old woodpecker holes in pines *Pinus caribaea* woodlands. It also occurs locally in towns and around human habitation, where it nests in artificial cavities and other human structures. It tends to feed in open areas such as clearings in woodlands, marshes, fields and along coastlines. Breeding takes place in April – July. Movements are poorly known, but some birds undertake small-scale migrations during winter.
- *Major Threats*: Logging of pines in the northern Bahamas has probably had a major impact. Logging was terminated in the early 1970s, but much of the secondary forest is now approaching maturity and there are opportunities for renewed logging. Planned housing developments could eliminate 8% of remaining breeding habitat and there is potential for considerable future building developments on Grand Bahama. There is competition for nest-sites with introduced cavity-nesters such as *Passer domesticus* and *Sturnus vulgaris*. The small area of remaining habitat exacerbates the risk of hurricane-induced habitat loss, the only notable habitat loss in recent years has resulted from saltwater intrusion associated with large storm surges following hurricanes. The frequency of hurricanes within the species' range may increase in coming years as a consequence of global climate change. Fire management may be important for the species as fire suppression may render areas of forest unsuitable over time.

**Conception Island National Park**

International [KBA] Name: Conception Island

Area: 2,905 ha

Protection Status: 100% of site under protected area status

KBA Criteria<sup>19</sup>: This site has been identified as an Important Bird and Biodiversity Area based on the presence of: 1) Significant populations of one or more bird species at certain times of their lifecycle or seasonal migration.

Site Description: Conception Island is a national park under the protection of the Bahamas National Trust, approximately 3 by 1.5

<sup>18</sup> BirdLife International. 2016. *Tachycinetta cyaneoviridis*. The IUCN Red List of Threatened Species 2016: e.T22712080A94318203. <http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T22712080A94318203.en>. Downloaded on 28 January 2017.

<sup>19</sup> <https://www.ibat-alliance.org>

miles, located 25 miles west-southwest of San Salvador. It is uninhabited and its pristine reefs and beaches make it an attractive destination for yachts. Booby Cay and South Rocks and the surrounding shallow water are not included in the protected area<sup>20</sup>. Key biodiversity<sup>21</sup>: During spring and summer White-tailed Tropicbird, Audubon's Shearwaters, Bridled Terns, Sooty Terns and Brown Noddies nest on the island and its offshore rocks. Conception Island is believed to have the largest concentration of nesting Tropicbirds in the Bahamas, and Booby Cay, which lies off the northeast corner, has one of the largest nesting colonies of Sooty Terns and Brown Noddies. Landbirds such as Bahama Mockingbirds, Bahama Woodstar, Bananaquits, Black-faced Grassquits, White-crowned Pigeons, Common Ground Doves, Yellow Warblers and Ospreys can be found year round. In summer Gray Kingbirds and Antillean Nighthawks are common. Ducks, herons and shorebirds are common in the interior lagoon. Non-bird biodiversity includes Green Turtles and Hawksbill Turtles

Populations of IBA trigger species<sup>22</sup>:

- Species: White-tailed Tropicbird *Phaethon lepturus*; IUCN Red-list Category: LC; Season: Breeding; Population Est.: 250 – 999 breeding pairs
- Species: Brown Noddy *Anous stolidus*; IUCN Red-list Category: LC; Season: Breeding; Population Est.: 250 – 999 individuals
- Species: Bridled Tern *Onychoprion anaethetus*; IUCN Red-list Category: LC; Season: Breeding; Population Est.: 50 – 249 individuals

### **Exuma Cays Land and Sea Park**

International [KBA] Name: Exuma Cays Land and Sea Park

Area: 60,827 ha

Protection Status: 75% of site under protected area status

KBA Criteria<sup>23</sup>: The site has been identified as an Important Bird and Biodiversity Area and Key Biodiversity Area based on the presence of: 1) Significant population of globally threatened species; and 2) Significant congregations of one or more bird species at certain times in their lifecycle or seasonal migration.

Site Description<sup>24</sup>: The Exuma Cays Land and Sea Park is the first of its kind in the world. It covers 176 square miles beginning at Wax Cay Cut in the north and stretching some 22 miles southward to Conch Cut and extending out approximately four nautical miles on either side of the cays. It is a no-take zone by both land and sea - nothing living or dead, can be removed from the park. The headquarters building and visitors centre is located on Warderick Wells and several moorings sites are situated throughout the park.

Key biodiversity<sup>25</sup>: During April to August each year these isolated cays become home to many species of nesting seabirds. The eastern cliffs of Shroud Cay host a large colony of White-tailed Tropicbirds and Clapper rails and Yellow Warblers nest in the mangrove wetlands. The largest known colony of nesting Audubon's Shearwaters in the Exumas is found on Long Rock (also called Long Cay). These birds are nocturnal, they only come ashore at night. The birding highlight on Warderick Wells is the colony of White-tailed Tropicbirds nesting in the seaward cliffs at the north end of the island. Least Terns and Wilson's Plovers also nest here. Other resident birds you are likely to see in the ECLSP are; Bahama Mockingbird, Common Ground Dove, Zenaida Dove, Thick-billed Vireo, Black-faced Grassquit, Bananaquit, Barn Owl, White-cheek Pintail, Black-necked Stilts, Killdeer and Osprey. Gray Kingbirds and Antillean Nighthawks are common summer residents. Non-bird biodiversity: Hutias have been introduced on Warderick Wells, in 1996 this rodent population was estimated to be about 25,000. They are nocturnal and not usually seen during the day, so you would have to go ashore after dark to look for them.

Populations of IBA trigger species<sup>26</sup>:

- Species: White-tailed Tropicbird *Phaethon lepturus*; IUCN Red-list Category: LC; Season: Breeding; Population Est.: 250 – 999 breeding pairs
- Species: Least Tern *Sternula antillarum*; IUCN Red-list Category: LC; Season: Breeding; Population Est.: 50 – 249 individuals

Information on Globally Threatened Species found in the KBA:

**Scientific Name: *Geocapromys ingrahami***<sup>27</sup>

- Common Names: Bahaman Hutia, Ingraham's Hutia
- Red-list Category: Vulnerable
- Range Description: The species is known from the type locality (East Plana Keys, Bahamas) and introduced populations on Little Wax Cay and Warderick Wells Cay, Bahamas.
- Countries occurrence: Native – Bahamas
- Population: This species is poorly known. It has been extirpated from much of its range; it may be locally abundant on the three small islands where it remains. Out-dated population estimates: East Plana Key (12,000 individuals), Little Wax Key (1,200).

<sup>20</sup> BirdLife International (2017) Important Bird Areas factsheet: Conception Island. Downloaded from <http://www.birdlife.org> on 28/01/2017.

<sup>21</sup> BirdLife International (2017) Important Bird Areas factsheet: Conception Island. Downloaded from <http://www.birdlife.org> on 28/01/2017.

<sup>22</sup> BirdLife International (2017) Important Bird Areas factsheet: Conception Island. Downloaded from <http://www.birdlife.org> on 28/01/2017.

<sup>23</sup> <https://www.ibat-alliance.org>

<sup>24</sup> BirdLife International (2017) Important Bird Areas factsheet: Exuma Cays Land and Sea Park. Downloaded from <http://www.birdlife.org> on 28/01/2017.

<sup>25</sup> BirdLife International (2017) Important Bird Areas factsheet: Exuma Cays Land and Sea Park. Downloaded from <http://www.birdlife.org> on 28/01/2017

<sup>26</sup> BirdLife International (2017) Important Bird Areas factsheet: Exuma Cays Land and Sea Park. Downloaded from <http://www.birdlife.org> on 28/01/2017

<sup>27</sup> Turvey, S. & Dávalos, L. 2008. *Geocapromys ingrahami*. The IUCN Red List of Threatened Species 2008:

e.T9002A12949103. <http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T9002A12949103.en>. Downloaded on 28 January 2017.

Current Population Trend: Stable

- *Habitat and Ecology*: This species is found on coral atolls with semi-arid woody scrub and thicket; it is the most terrestrial of the hutias. It is herbivorous and is known to eat fruits, leaves and trunks of island vegetation and occasionally seaweed.
- *Major threats*: Populations remain stable on the few islands where the species persists, however, these islands are susceptible to being wiped out by stochastic events such as hurricanes. All populations are threatened by the possibility of feral cat arrivals.

**Scientific Name:** *Cyclura cychlura*<sup>28</sup>

- *Common Name*: Northern Rock Iguana
- Red-list Category: Vulnerable
- *Range Description*: Found on Andros and Exuma Islands, The Bahamas. Extent of occurrence is <20,000 km<sup>2</sup>. At least three main subpopulations are known on Andros and 13 subpopulations in the Exuma Islands.
- Countries occurrence: Native – Bahamas
- *Population*: The current global population is less than 5,000 and is declining. Of the three subpopulations on Andros, there are <500 in the northern part of the island, < 1,500 in the middle, and < 2,000 in the south of the island. Satellite cays hold < 1,000.
- Subpopulation sizes in the Exuma Islands: Bitter Guana Cay (20-50); Gaulin Cay (275-325); White Bay Cay (200-250); Noddy Cay (200-250); North Adderly Cay (235 –m275); Leaf (<10); Guana Cay (80-90); Pasture Cay (16); Alligator Cay (75-90); Leaf Cay north of Highbourne Cay (500); U-Cay (300); Allen Cay (15); Flat Rock Cay (10). Current Population Trend: Decreasing
- *Habitat and Ecology*: Preferred habitats are tropical dry forest, pine barrens, coastal coppice, mangrove and beach strand vegetation areas. The iguana is a herbivorous, ground dwelling, saxicolous species using limestone crevices, or burrows constructed in sandy loam, as retreats. Juveniles and subadults often climb trees and shrubs in the morning to feed and bask. The islands are low-relief (< 20 m above sea level) karst limestone platforms.
- Average generation length is around 20 years.
- *Major Threats*: On Andros Island, there is island-wide logging, construction of homes, and roads, feral animals and fire for agriculture or crab hunting. In the Exumas, main threats to the species are feral animals (e.g. goats), fire caused by tourists, and rapid, private land acquisition. A direct threat to the population is hunting. This species is the target of illegal subsistence hunting for the animal's meat, and collection for the international pet trade. The species inhabits two distinctly different island areas in the Bahamas. The Andros population is threatened based on the acceleration of perturbations, such as habitat loss, feral animals, and subsistence hunting. Although the island is large and some undisturbed subpopulations exist, it is only a matter of time before humans or feral animals degrade the subpopulations. A suggestive north/south trend in population decline is noted and procedures must be implemented to stop further degradation of populations and habitat. The Exuma Island populations inhabit an area that is becoming increasingly popular with tourists – both as a sailing destination and region to buy islands. Increased human traffic brings potential and distinct deleterious consequences to the local fauna and flora. In 2004, a large-scale fire was reported on an iguana-inhabited island that has recently become a designated tourist destination; the fire was purportedly the result of a tourist cigarette. Also, in recent years, there has been an increase in feral animals and wildlife smuggling in the islands. Continued population monitoring must be a priority along with recognizing that the fragmented population faces a precarious future.

### **Andros West Side National Park**

International [KBA] Name: South Andros Island

Area: KBA site 103,500 ha, within National Park 618,577 ha

Protection Status: 100% of site under protected area status

KBA Criteria<sup>29</sup>: The South Andros Island site (103,500 ha) within Andros West Side NP has been identified as a Key Biodiversity Area based on the presence of: 1) Significant populations of globally threatened species

Site Description: Andros is the largest island in the Bahamas' archipelago, at 161 km long and 72.4 km wide for a total area of 5,957 km<sup>2</sup>. It constitutes 43% of the total land area of the country. North Andros is separated from South Andros by three tidal creeks – North, Middle and South Bights. Andros has a population of approximately 10,000 inhabitants and over 80% of all economic activities are related to natural resources.

Information on Globally Threatened Species found in the KBA:

**Scientific Name:** *Cyclura cychlura*<sup>30</sup> (see description above under Exuma Cays Land and Sea Park)

**Scientific Name:** *Trachemys terrapen*<sup>31</sup>

- *Common Name*: Cat Island Freshwater Turtle
- Red-list Category: Vulnerable
- *Countries occurrence*: Native – Jamaica; Introduced – Bahamas

<sup>28</sup> Knapp, C.R., Iverson, J.B. & Buckner, S. 2004. *Cyclura cychlura*. The IUCN Red List of Threatened Species 2004: e.T6035A12356382. <http://dx.doi.org/10.2305/IUCN.UK.2004.RLTS.T6035A12356382.en>. Downloaded on 28 January 2017

<sup>29</sup> <https://www.ibat-alliance.org>

<sup>30</sup> Knapp, C.R., Iverson, J.B. & Buckner, S. 2004. *Cyclura cychlura*. The IUCN Red List of Threatened Species 2004: e.T6035A12356382. <http://dx.doi.org/10.2305/IUCN.UK.2004.RLTS.T6035A12356382.en>. Downloaded on 28 January 2017

<sup>31</sup> Tortoise & Freshwater Turtle Specialist Group. 1996. *Trachemys terrapen*. (errata version published in 2016) The IUCN Red List of Threatened Species 1996: e.T22027A97299558. Downloaded on 29 January 2017.

## Annex 2: Carbon Calculation

An assumption is made that in every of the five locations where the renewable energy change will be made a 100kW generator is currently in use. During PPG the exact size of generator will be established as well as the carbon emission emitted in transporting the diesel to the remote islands.

Every gallon of diesel contains 2,778 grams of pure carbon. Every grain of atomic carbon, when oxidised with oxygen forms 3.666 grams of carbon dioxide. In an average liquid hydrocarbon-burning engine, it can be assumed that about 99 percent of the fuel will oxidize (it is assumed that somewhat less than 1 percent will fail to fully oxidize, and will be emitted as particulates or unburned hydrocarbons instead of CO<sub>2</sub>).

Therefore, we can multiply the amount of carbon per gallon of diesel by the ratio of carbon weight to CO<sub>2</sub> weight by 99 percent:  
 $2.778\text{g} \times 3.66 \times 0.99 = 10,084 \text{ g}$

Each gallon of diesel fuel produces, on average, 10,084 g of CO<sub>2</sub>.  
60 kW Diesel Generator at  $\frac{3}{4}$  load fuel consumption = 5.8 gallon/hr<sup>32</sup>

PV solar panels' lifespan is considered 15 years – and will have neutral carbon emission.

The carbon avoided from emission is therefore the emissions of the diesel generator over the same period – it is estimated that the generator will run at least 8 hours a day for at least 300 days a year over the 15-year period – resulting in 210,553.9 tCO<sub>2</sub>-e emission reduction. For 5 locations, this equals 1,052,769 tCO<sub>2</sub>-eq.

Using the GEF's bottom up approach of Calculating Replication and Indirect Impacts, a replication factor of 2 is used. The indirect impact of the project is 2,105,539.2 tCO<sub>2</sub>-eq

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<sup>32</sup> [www.dieselserviceandsupply.com/Diesel\\_Fuel\\_Consumption.aspx](http://www.dieselserviceandsupply.com/Diesel_Fuel_Consumption.aspx)