Reducing the threats to endangered reptiles from habitat loss and Invasive Alien Species (IAS) through enhanced biodiversity governance and strengthened bio-security in Barbados

Part I: Project Information

GEF ID
10942

Project Type
MSP

Type of Trust Fund
GET

CBIT/NGI
CBIT **No**
NGI **No**

Project Title
Reducing the threats to endangered reptiles from habitat loss and Invasive Alien Species (IAS) through enhanced biodiversity governance and strengthened bio-security in Barbados

Countries
Barbados

Agency(ies)
UNEP

Other Executing Partner(s)
Centre for Agriculture and Bioscience International (CABI)

Executing Partner Type
Others

GEF Focal Area
Biodiversity

Taxonomy
Community Based Natural Resource Mngt, Protected Areas and Landscapes, Biodiversity, Focal Areas, Theory of change, Learning, Capacity, Knowledge and Research, Invasive Alien Species, Species, Terrestrial Protected Areas, Threatened Species, Financial and Accounting, Conservation Finance, Influencing models,

Transform policy and regulatory environments, Demonstrate innovative approache, Strengthen institutional capacity and decision-making, Stakeholders, Communications, Education, Behavior change, Awareness Raising, Public Campaigns, Local Communities, Beneficiaries, Private Sector, Individuals/Entrepreneurs, SMEs, Type of Engagement, Information Dissemination, Participation, Partnership, Consultation, Civil Society, Non-Governmental Organization, Academia, Community Based Organization, Gender Equality, Gender Mainstreaming, Women groups, Gender-sensitive indicators, Sex-disaggregated indicators, Gender results areas, Knowledge Generation and Exchange, Capacity Development, Indicators to measure change, Targeted Research, Knowledge Generation, Innovation

Sector

Rio Markers
Climate Change Mitigation
Climate Change Mitigation 0

Climate Change Adaptation
Climate Change Adaptation 0

Duration
48 In Months

Agency Fee($)
82,008.00

Submission Date
6/10/2022

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount($)	Co-Fin Amount($)
BD-2-6	GET	863,241.00	6,105,056.00
	Total Project Cost ($)	**863,241.00**	**6,105,056.00**

B. Indicative Project description summary

Project Objective

To support implementation of innovative management interventions to lessen threats to critically endangered reptilian biodiversity from the impacts of habitat loss and alien invasive species and strengthen national capacity to maintain viability of target populations and prevent new IAS threats in Barbados.

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount($)	Co-Fin Amount($)

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount($)	Co-Fin Amount($)
Component 1: Strengthening the enabling environment for reducing threats to biodiversity loss through improved policy and governance	Technical Assistance	**1.1** National lead agencies and relevant stakeholders adopt an improved integrated, regulatory framework to address drivers of biodiversity loss and enhance biosecurity *Indicators: (i) Number of lead agencies with responsibility for biodiversity and biosecurity that endorse and adopt the National Biodiversity Conservation Bill, associated regulations and management recommendations*	**1.1.1** *Policy recommendations*, *drafting instructions and draft National Biodiversity Conservation Bill* with biosecurity elements based on the Cabinet-Approved Policy for National Biodiversity Management, made available to Cabinet for consideration. **1.1.2** *Suite of regulations and gender-sensitive management recommendations* and *capacity building* to support operationalization of the proposed legislative and regulatory framework, endorsed by stakeholders, for consideration by Cabinet **1.1.3** *Suite of educational resources* and an *interactive public awareness campaign* for uptake by stakeholders	GET	117,715.00	895,056.00

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount($)	Co-Fin Amount($)
Component 2: Targeted interventions to reduce threats to endangered biodiversity and enhance population viability	Technical Assistance	**2.1** Enhanced national capacity for conservation of global populations of critically endangered endemic reptilian fauna *Indicators: (i)number of reports on distribution, survivorship /recruitment data to track species recovery trends; (ii) number of management protocols successfully applied; (iii) number of specialists trained and demonstration of enhanced skills; (iv) number of financial mechanisms/policies approved for long-term financial commitment/flows to facility and management operations.*	**2.1.1** *Additional bio-secure facility installed at Ragged Point (with predator exclusion, habitat augmentation and conservation education centre) for safeguarding endangered reptilian fauna, associated operational protocol/manuals and capacity building* for use by lead national agencies and partners. **2.1.2** *Population status and threat assessments, and conservation requirements* to inform management planning and interventions by lead national agencies. **2.1.3** *Financial sustainability options and targeted education and awareness resources to support the species recovery* presented to key stakeholders to secure long-	GET	667,050.00	4,600,000.00

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount($)	Co-Fin Amount($)
				Sub Total ($)	**784,765.00**	**5,495,056.00**
Project Management Cost (PMC)						
				GET	78,476.00	610,000.00
				Sub Total($)	**78,476.00**	**610,000.00**
				Total Project Cost($)	**863,241.00**	**6,105,056.00**

Please provide justification

C. Indicative sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Recipient Country Government	Ministry of Environment and National Beautification	Grant	Investment mobilized	80,000.00
Recipient Country Government	Ministry of Environment and National Beautification	In-kind	Recurrent expenditures	1,711,056.00
Recipient Country Government	Ministry of Agriculture and Food Security	In-kind	Recurrent expenditures	432,000.00
Recipient Country Government	Ministry of Housing, Lands and Rural Development / Town and Country Planning Development Office	In-kind	Recurrent expenditures	48,000.00
Recipient Country Government	Barbados Defence Force	In-kind	Recurrent expenditures	192,000.00
Recipient Country Government	Office of the Attorney General	In-kind	Recurrent expenditures	144,000.00
Recipient Country Government	Environmental Health Department	In-kind	Recurrent expenditures	1,440,000.00
Recipient Country Government	National Conservation Commission	In-kind	Recurrent expenditures	480,000.00
Recipient Country Government	Natural Heritage Department	In-kind	Recurrent expenditures	48,000.00
Other	Caribbean Youth Environment Network (CYEN)	In-kind	Recurrent expenditures	30,000.00

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Other	CAB International (CABI)	In-kind	Recurrent expenditures	300,000.00
Other	University of the West Indies (UWI)	In-kind	Recurrent expenditures	240,000.00
Other	Fauna & Flora International (FFI)	In-kind	Recurrent expenditures	480,000.00
Other	Re:wild	In-kind	Recurrent expenditures	480,000.00
			Total Project Cost($)	**6,105,056.00**

Describe how any "Investment Mobilized" was identified

In GEF ?Guidelines on Co-financing? https://www.thegef.org/sites/default/files/documents/Cofinancing_Guidelines.pdf only 'Investment Mobilized" is defined. "Investment Mobilized means Co-financing that excludes recurrent expenditures". In defining recurrent expenditure the following definition from https://meteor.aihw.gov.au/content/index.phtml/itemId/269132 was used "Recurrent expenditure on goods and services in expenditure, which does not result in the creation or acquisition of fixed assets (new or second-hand). It consists mainly of expenditure on wages, salaries and supplements, purchases of goods and services and consumption of fixed capital (depreciation)." All the co-financing is at this stage determined as recurrent expenditure, as it covers salaries and purchases of goods and services. The IA will make an assertive effort to identify additional co-financing during the PPG stage that will result in the 'creation or acquisition of fixed assets'. The Government of Barbados under the Ministry of Environment and National Beautification will contribute $80,000 as investment mobilized through core budget allocation toward the project management costs.

D. Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
UNEP	GET	Barbados	Biodiversity	BD STAR Allocation	863,241	82,008	945,249.00
				Total GEF Resources($)	**863,241.00**	**82,008.00**	**945,249.00**

E. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount ($)

50,000

PPG Agency Fee ($)

4,750

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
UNEP	GET	Barbados	Biodiversity	BD STAR Allocation	50,000	4,750	**54,750.00**
				Total Project Costs($)	**50,000.00**	**4,750.00**	**54,750.00**

Core Indicators

Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
6000.00	0.00	0.00	0.00

Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
6,000.00			

Indicator 4.2 Area of landscapes that meets national or international third party certification that incorporates biodiversity considerations (hectares)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Type/Name of Third Party Certification

Indicator 4.3 Area of landscapes under sustainable land management in production systems

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4.4 Area of High Conservation Value Forest (HCVF) loss avoided

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Documents (Please upload document(s) that justifies the HCVF)

Title	Submitted

Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	550			
Male	550			
Total	1100	0	0	0

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

Part II. Project Justification

1a. Project Description

1a. *Project Description: Global environmental and/or adaptation problems, root causes and barriers that need to be addressed*

Barbados, the most easterly of the Caribbean islands, is a small coral limestone island with an area of 431 km2 and a coastline measuring 97 kilometres. The island lies in the north-east trade wind belt and has a moderate tropical marine climate with average annual temperatures of 26-30oC. The rainfall is seasonal with a dry season from December to May and a wet season from around June to October. Average annual rainfall ranges between 1,254 mm in the lower elevations to approximately 1,650 mm in higher elevations. Barbados lies within the southern region of the Atlantic Hurricane Basin, hence has been affected occasionally by major hurricanes, notably Hurricane Janet which struck directly in 1955 and caused major damage and loss of life. Hurricane Allen in 1980 and Hurricane Elsa in 2021 caused significant infrastructural damage and loss of trees. Barbados has been affected by other natural disasters such as the recent eruption of the La Soufriere volcano in St. Vincent, which blanketed the island in ash fall. This event had a number of short-term impacts on biodiversity, and some lasting effects on particularly vulnerable species such as the Barbados Leaf-toed Gecko (*Phyllodactylus pulcher*).

About 86% percent of Barbados is capped by a layer of coral up to 90 m thick that is dissected by a complex system of gullies that extend from the upland regions in the central parts of the island to the west coast. These gullies form an integral part of the island?s natural drainage system, acting as major conduits of recharge to the limestone aquifers via underground streams, and discharging into the west coast. The coral limestone cap has been completely eroded from about 14% of the island, exposing the complex mix of impermeable clays that comprise the sedimentary formations that lie beneath. Known as the Scotland District, this may be regarded as the most distinctive physiographic region of the island, presenting a set of unique land management and other environmental problems. It is marked by highly rugged terrain with areas of slippage and slumping, presenting some of the most scenic landscapes on the island.

According to the National Biodiversity Strategy and Action Plan (2002)[1][1] the estimated total tree cover of Barbados is 2% of the area of the island or about 800 ha, which includes gullies, coastal wetlands, undercliff woods and planted wooded areas. Remnants of the xerophytic coastal forest can be

found at Cluffs, Bath and Batts Rock and is essentially an inland extension of the Coccoloba association of the beaches and sandy bushland. Turner's Hall wood (approx. 21 ha), in the Scotland District is the least disturbed wooded habitat in Barbados and is the best example of a Tropical Mesophytic (semi-deciduous) forest. There are two discernable canopy layers, occasionally a third layer consisting mainly of palms, a moderately developed evergreen shrub layer, a poorly developed herbaceous layer, poorly developed climbers and few epiphytes. Of the roughly 700 species of flowering plants on the island, two are known to be endemic, *Phyllanthus andersonii* - a gully shrub, and *Metastelma barbadense* - a slender climber. These species are found only in the wooded areas of the island. A preliminary conservation assessment in 2017 determined that both these species met the IUCN Red List criteria for classification as endangered, but neither of them is currently categorised as such. Some 23 plant species require protection at the national level, although all are found elsewhere in the Lesser Antilles.

Partly due to the widespread destruction of natural vegetation for monocultures of sugar cane, and other crops, following European colonization, terrestrial fauna in Barbados is severely limited. Barbados has 261 recorded species of birds, but most are migratory visitors. Barbados lies within the North Atlantic Flyway and is therefore a stop-over for many species of migratory birds undertaking transoceanic flights. Of note are shorebirds such as the American Golden-Plover (Pluvialis dominica) and the Near-Threatened Red Knot (Calidris canutus; Endangered in Canada) and Buff-breasted Sandpiper (Calidris subruficollis; considered a species of Special Concern in Canada)[2] which would benefit from coastal protections. Only about 34 bird species are resident and/or breed in Barbados. Four species of snakes (one of which, the Barbados Racer, *Erythrolamprus perfuscus*[3][2], is listed as extinct), two amphibians and eight species of lizards have been recorded (NBSAP, 2020). The only indigenous mammals on the island are six species of bats. Of conservation interest are the Critically Endangered endemic Barbados Threadsnake (*Tetracheilostoma carlae*)[4][3], the Barbados Leaf-toed Gecko (*Phyllodactylus pulcher*)[5][4] and the Barbados Skink (*Alinea lanceolata*)[6][5], although the latter has not been seen for more than 50 years. Other reptile species of concern are the Hawksbill Turtle (*Eretmochelys imbricata*) and the endangered Leatherback Turtle (*Dermochelys coriacea*).

Other species of conservation interest include the Barbados Bullfinch (*Loxigilla barbadensis*), the only endemic bird species on Barbados. The bird is common across the island and classified by IUCN as ?Least concern?[7] however given its very restricted geographic range, is of global significance. There are six endemic avian sub-species; the Antillean Crested Hummingbird (*Orthorhyncus c. cristatus*), Caribbean Elaenia (*Elaenia martinica barbadensis*), Scaly-breasted Thrasher (*Allenia fusca atlanticus*), Yellow Warbler (*Dendroica p. petechia*), Carib Grackle (*Quiscalus lugubris fortirostris*) and the Bananaquit (*Coereba flaveola barbadensis*). The Scaly-breasted Thrasher is possibly extinct.[8] The Barbados Anole (*Anolis extremus*) is also endemic to the island (with populations established on some

of the neighboring islands). It is classified as Least Concern by IUCN assessment [9] but is of global significance given its extremely narrow global range. The Barbados Myotis (*Myotis nyctor*) is an insectivorous a bat species known only from Barbados and Grenada and is listed as Vulnerable[10] by IUCN.

Of the island?s molluscan fauna, the endemic snail *Pseudopineria barbadensis* is of note. It is a small terrestrial species rediscovered in 2003 with a highly fragmented population spread among a few small, isolated patches of habitat (Fields, 2014)[11]. Little is known about the ecology of this species except that it is found only on limestone rock habitat on the coasts of Barbados. The lack of gene flow as a result of their small population size and the isolated nature of their sub-populations makes this species highly vulnerable to extinction. Habitat destruction and degradation is likely a primary cause for the species? rarity as habitat is lost to expansion of residential and commercial development.

Threats: Biodiversity is of enormous importance in all aspects of human life and the biodiversity of Barbados, apart from its global significance, is equally important at the national level for food, industrial and agricultural products, medicines and as a basis for recreation and tourism. Threats to biological diversity in Barbados are closely associated with issues related to landscape modification and land degradation over the past 300 years, including large scale land clearing for the practice of plantation agriculture, contributing to significant biodiversity loss. The Barbados Cedar (*Juniperus barbadensis var barbadensis*) for example, previously found only on Barbados and Saint Lucia, is now extinct on Barbados having been lost over 280 years ago as natural habitats were converted to sugar cane fields. The species now only occurs on Saint Lucia, confined to a single mountaintop in the southwest of the island, rediscovered in 1985 (classified as IUCN Red List of Threatened Species in 2012 as critically endangered)[12][6]. The construction of hotels and marinas, particularly along the west and south coasts, has caused the destruction of native plant communities and negatively impacted sea turtle nesting sites. Although there is no scientific data available it is postulated that free range grazing by cattle, sheep and goats, a common practice in rural Barbados, has also had a negative impact on selected natural plant communities.

Besides landscape and habitat modification, invasive alien species (IAS) are among the biggest threats to biodiversity in Barbados. Settlement of the island from the early seventeenth century saw the introduction of brown and black rats, cats, mice, mongoose, hares, goats, cane toads, tilapia, centipedes, and others. In the 1600s, the Green Monkey (*Chlorocebus sabaeus*), native to West Africa was introduced to the island. The species has been considered an agricultural pest since the 1680s, when a bounty was first offered for their heads. The population has grown and declined several times over the past four hundred years. There are more recent arrivals, some of which are accidental releases associated with the pet trade, for example the Rose-ringed Parakeet (*Psittacula krameri*), Giant Ameiva (*Ameiva ameiva*), and Common Green Iguana (*Iguana iguana*). The proliferation of IAS in Barbados has been enhanced in large measure to landscape modification and the creation of disturbed

environments that have made it more conducive to the expansion of invasive populations. IAS have probably contributed to the declines in some notable species. Green Monkeys have an eclectic diet and will opportunistically feed on birds? eggs and reptiles (Horrocks, 1986). The relatively recently introduced parthenogenetic Brahminy Blindsnake (*Indotyphlops braminus*) is a potential competitor with the endemic thread snake, while mongoose prey on terrestrial and marine reptiles and their eggs (Leighton et al., 2008). Of highest conservation concern, are impacts of faunal IAS on the endemic Barbados Leaf-toed Gecko, Barbados Threadsnake and the Barbados Skink while presenting a wider threat to faunal biodiversity in general (some of those identified in the preceding section). In terms of flora, there are nine species of verified invasive terrestrial plants; five tree, two shrub, one vine, and one grass species. Notable species include Casuarina (*Casuarina equisetifolia*), River tamarind (*Leucaena leucocephala*), Sweet lime (*Triphasis trifolia*) and Johnson grass (*Sorghum halepense*). Several other plant species have been flagged as potentially invasive in the island?s gully ecosystems including Flamboyant (*Delonix regia*), Ackee (*Melicoccus bijugatus*) and the African tulip tree (*Spathodea campanulata*).

In 2016, the Barbados Leaf-toed Gecko, one of few extant endemic vertebrate species in Barbados and the only species of this genus in the Lesser Antilles, gained the designation of Critically Endangered status (IUCN, 2017)[13][7]. It had not been sighted for 30 years, and was assumed extinct, until a small population was reported on Culpepper Island off the east coast of Barbados in 2011, where its range was estimated at only 0.31 km2 (Williams et al., 2015)[14][8]. Based on surveys that were completed in 2014, the population was estimated through extrapolation to be approximately 12,000 individuals. However, this estimate was based on mark-recapture in only a few locations and needed to be expanded to improve confidence. The most recent estimate of the spatial extent of distribution reported by Blades (2019) was more conservative, proposing only 0.18 km2 of occupied habitat, nearly half of the 2014 estimate. The gecko inhabits limestone coastal cliff habitats on the north, east and southeast coasts of the island, but whether this is the preferred habitat or the only remaining habitat that it has been able to survive in is unknown. Sighting locations are often isolated. Small populations with reduced gene flow make the species vulnerable to extinction. *Phyllodactylus* usually lays one egg into rock crevices and cracks, and preys on invertebrates including spiders, cockroaches, crickets and termites (Williams et al., 2015).

The Barbados Threadsnake (*Tetracheilostoma carlae*) is a critically endangered (Daltry et al 2016) [15][9] species endemic to Barbados. Little is known about this species due to its cryptic subterranean habit of hiding under rocks and burrowing in soil. The threadsnake is known to be oviparous, producing one large egg at a time. Holding the record of the world?s smallest snake, hatchlings are half

the size of adults which only grow to 10.4 cm in length and weigh 0.6 g (Hedges 2008)[16][10]. A very rare species, the last recorded specimen was collected in 2008 in a small remnant of secondary growth forest from east-central Barbados. Prior to this it was only recorded in 1918, 1966, 1997, and 2005 (Daltry et al 2016). Records are confined to gullies and forest habitats which cover only 4,000 ha of Barbados? terrestrial surface. Its rarity is likely a direct result of extensive habitat loss from urbanization and agriculture although it likely also faces detriment from the introduced competitor Brahminy blindsnake (*Indotyphlops brahminus*). The Brahminy blindsnake likely outcompetes the endemic Threadsnake due to its larger size and parthenogenetic reproductive strategy. To preserve the Barbados Threadsnake among many other native and endemic species on the island will require efforts to not only protect existing forest but also to promote forest regrowth in suitable areas to increase the area of small habitat patches and to facilitate habitat interconnectedness.

The Barbados skink (*Alinea lanceolata*) is listed as critically endangered (Horrocks and Daltry 2016)[17][11]. It is only known from two wetland sites on the southern tip of the island, Graeme Hall Swamp and Chancery Lane Swamp, which are separated by 8 km (Hedges and Conn 2012)[18][12]. In total, these two sites represent an area of less than 1 km2 of habitat. Only three specimens of the skink are known, and the last confirmed record was in 1889 over 130 years ago. Nothing is known about its ecology or biology except that it is viviparous. The cause for their catastrophic decline is likely a combination of factors between predation by invasive mongooses and rats, and habitat loss from housing development and agriculture. If this species still exists, the protection of its wetland habitat will be an essential component of conservation efforts.

The threats to these endangered reptiles are noted to include predation, likely from Small Indian Mongoose (*Herpestes auropunctatus*), black rats (*Rattus rattus*), brown rats (*Rattus norve*gicus), domestic cats (*Felis catus*) and in the case of the leaf-toed gecko there has been confirmed predation by centipedes (*Scolopendra* spp.). This is likely the cause of the high incidence of tail loss reported in individuals studied, but tail loss may also result from intra-species aggression (Itescu et al., 2016). The populations may be impacted by the non-native competitors such as the Brahminy Blindsnake (*Indotyphlops braminus*) in the case of the threadsnake, and the Common Tropical House Gecko (*Hemidactylus mabouia*) which is a competitor for habitat and prey of the leaf-toed gecko (Williams et al., 2015). As noted above, each species is affected by habitat loss through the expansion of residential and commercial development leading to the loss of primary and secondary forests, as well as urban and touristic development along coastal cliffs (Williams et al., 2016). The gecko has been found on the small offshore islet, Culpepper Island, but the island is close enough for rats to swim across to, and the habitat is likely sub-optimal judging by the condition of geckos found there (Williams et al., 2016).

In the case of the gecko, the populations are considered to remain under significant risk in light of the prevailing developmental pressures. Coastal cliffs are protected from development activities in accordance with the Physical Development Plan, but the vicinity of human development to these critical habitats means that IAS are abundant and pose a significant risk. In the context of conservation of the gecko, this needs to be addressed with most urgent priority. Based on expert assessment there has to be additional investment in the establishment of protected areas that meets the urgent conservation requirements to stave off the worsening risks that are likely being posed to species. The *UNEP-GEF Preventing COSTS of Invasive Alien Species (IAS) in Barbados and the OECS Countries Project* (GEF-UNEP IAS Project for short) that is under implementation will assist to some measure, but expanded national efforts are required. The needed conservation measures for the gecko that are being advanced under the GEF-UNEP IAS Project, this proposed project, and other national interventions are anticipated to have co-benefits for the threadsnake and the skink.

Climate change is expected to take a toll on the country, including on its biodiversity, already evident by the loss of sea turtle nesting beaches and storm-caused damage to vegetation. According to the Barbados State of the Environment Report 2000 and supported by the Barbados 2021 Update of the First Nationally Determined Contribution (NDC) under the Paris Agreement on Climate Change[19][13], the foremost concerns are the accelerated rates of change in mean sea level with associated possibilities for increased coastal flooding and shoreline instability, possible changes in weather patterns, including the potential for increases in the intensity and frequency of tropical storms and hurricanes, and changes in precipitation and temperature patterns. Most highly at risk are the tourism and agriculture sectors that are particularly vulnerable to adverse climatic regimes and extreme weather events and sea level rise. Manufacturing and other commercial sectors are similarly vulnerable, given that a large proportion of industrial parks and business houses are located within two kilometres of the shore, below the 25 m contour. The impacts of climate change on biodiversity of the country are not well understood and is identified as a gap in the NBSAP. However, it is recognized that a changing climatic regime will likely drive water and temperature-related stressors, triggering hazards such as fire occurrence, proliferation of invasives among others, that will in turn result in changes in ecosystems and threaten biodiversity.

The *long-term problem* is that critically endangered reptile species endemic to Barbados, notably the Barbados Leaf-toed Gecko, the Barbados Threadsnake and the Barbados Skink will likely face extinction if more direct conservation measures are not applied that address the issue of land conversion, and that measures to curb the influence of invasive species that pose direct risks, are not implemented. This threat extends to other native biodiversity in the country. This is problem is exacerbated by the fact that the country does not have effective integration between national lead agencies and relevant stakeholders with responsibility for management of biodiversity and management

of land resources. Without this integration, the drivers of biodiversity loss that include proliferation of IAS will remain. A joined-up approach that is enshrined in policy, and supported by legislative and regulatory provisions, political and societal commitment, and the fiscal means to enhance sustainability of investments is needed.

Barriers: The project considers key long-term solutions to address the risk of loss of a globally threatened species that occurs only in Barbados in the wider drivers of terrestrial biodiversity loss, with continued emphasis on addressing IAS, while addressing landscape development (and habitat conversion) that does not take adequately into account protection of threatened biodiversity. There are two key barriers that need to be addressed under the project:

Barrier 1: Lack of integrated framework to effectively reduce risk to terrestrial biodiversity:
Development planning in the economic sectors in the country does not sufficiently incorporate conservation of terrestrial biodiversity and remains at a relatively low level in national development priority. Further, the policy and legislative environment is fragmented across sectors with significant areas of non-clarity, agency overlap and institutional conflict. Additional constraints include low human and financial capacity and lack of information sharing between agencies. There is, in reality, an expansive legislative and regulatory framework in the country that governs various aspects that has some bearing on biodiversity management and conservation. Key among those related to land resource management include the *Town and Country Planning Act (Cap. 240)*, *Land Acquisition Act (Cap. 228), Section 16 of The Constitution, Soil Conservation (Scotland District) Act (Cap. 396), National Conservation Commission Act (Cap. 393), Trees (Preservation) Act (Cap. 397), Cultivation of Trees Act (Cap. 390), Physical Development Plan (amended 2017)*. In respect to the conservation of terrestrial biodiversity, legislation include the *Wild Birds Protection Act (Cap. 398), Protection of New Plant Varieties Act,* a draft Zoos legislation and the *International Trade in Endangered Species of Wild Fauna and Flora Act (Cap. 262)*.

Notwithstanding the availability of these legislative instruments, mechanisms to foster improved integration of the provisions of existing biodiversity-related legislation into landscape development planning is poorly defined. This is due to the fact that overarching policy to drive this integration process is weak, from which it follows that the regulatory instruments and operational practice are not appropriately effected. In the context of biosecurity and IAS control, the enabling regulatory environment is not robust enough to safeguard against future introductions of IAS. A closely related contributing factor is that policy makers, the private sector and the wider community are not sufficiently aware or sensitized to the compounding issues of landscape development on the country?s biodiversity. Under the regional GEF-UNEP IAS Project, the country has been developing a National Invasive Species Strategy and Action Plan (NISSAP) that will provide policy direction, but it is anticipated that the process will require continued support into the medium to longer term, that extends beyond timeframe of that project. A Policy for National Biodiversity Management (2020) was approved in conjunction with Barbados? revised National Biodiversity Strategy and Action Plan, which speaks to the legal and institutional requirements for the effective conservation and management in Barbados. However, execution of the policy directions and actions under the NBSAP is challenged given the limited fiscal space of the government to make significant investments, hence innovative means of financing need to be sought.

Barrier 2: Inadequate national capacity to mitigate loss of globally threatened biodiversity: While there has been some level of concerted research effort in assessing the status of the population and ranges of the Barbados Leaf-toed Gecko, Barbados Threadsnake and Barbados Skink with the elaboration of urgent management measures that are needed, a key gap that remains is how to effectively transition these recommendations into sustainable in-field action. This is both in terms of investment in on-ground habitat restoration solutions and investment in the human resource capacity. Under the national sub-project of the regional GEF-UNEP IAS Project, the government is collaborating with CABI and Fauna and Flora International (FFI) to support an initial pilot investment in a bio-secure facility to safeguard a population of the Leaf-toed Gecko. This investment is a fraction of what is required however, as recent assessments on requirements for safeguarding and conserving a viable population suggests that additional safe zones need to be established[20][14]. This was borne out by evidence in the aftermath of the heavy volcanic ashfall from the eruption of La Soufri?re Volcano on St. Vincent in April 2021, where the site at Paragon designated for installation of a bio-secure facility under the GEF-UNEP IAS Project was blanketed with ash. Body measurements in a sample population of Leaf-toed Geckos suggested physiological stresses likely due to the changed local habitat conditions[21][15]. While the work on installation of the bio-secure facility continues at Paragon, having only one secure conservation area is considered a risk in the event of disaster. A closely associated requirement is the need for trained expertise in population and habitat quality assessments that need to form the basis of dynamic management decisions in linking operations between the bio-secure facility to restorative actions in the field. There have been several relevant studies and investments on establishment and operation of bio-secure environments in other parts of the globe that local authorities in Barbados have yet to gain familiarity and experience with, which constitutes a capacity gap. The other crucial gap is the financial means to ensure long-term sustainability in the management and operation of environments that have been rendered bio-secure from invasive alien species and other threats. Financial flows from non-consumptive use of biodiversity particularly via ecotourism enterprises can offset operational costs. A potential financial viability model for conservation spaces that can be drawn upon, is the Folkestone Marine Museum, which hosts a visitor and interpretation centre within the boundaries of the Folkestone Marine Reserve, Barbados? first marine protected area (MPA). The facility, which is run by the National Conservation Commission, has been in operation since 1994 and uses a combination of governmental support, visitor fees, usage fees and a gift shop as parts of its effective cost-recovery strategy.

2) Baseline scenario and any associated baseline projects

Baseline - Government investments: The Biodiversity Conservation and Management Section of the Ministry of Environment and National Beautification is the frontline agency for policy coordination of biodiversity matters in the country. Although lacking a specific national legislative and regulatory instrument and framework, the Section does operate within the scope of a Biodiversity Conservation and Management Programme where it collaborates with other line agencies including representatives from the Ministry of Agriculture?s plant and animal quarantine services and stakeholders. The Section

coordinates the Working Group on Biodiversity, which has been appointed by Cabinet (Note 20 969/MENB 48; October 2020) to serve as a scientific and technical advisory body on issues related to conservation and management of Biodiversity, the implementation of Biodiversity and Land Management related Multilateral Environmental Agreements and as the project steering committee for national projects executed by the Biodiversity Conservation and Management Section. The Government of Barbados has approved a Policy for National Biodiversity Management in 2020 which directs the constitution of a National Biodiversity Unit (upgrade of the current Biodiversity Conservation and Management Section) with adequate allocation for staffing and funding to address key threats to the preservation and conservation of biodiversity.

Relevant legislative instruments towards the management of biodiversity and biosecurity (including IAS control) in the context of regulation of import and export of biological resources into and out of the country include the *Quarantine Act*, the *Animal (Diseases and Importation) Act Chapter 253*, *Plant Pest and Disease (Importation control)*, *Protection of New Plant Varieties Act*, the *International Trade in Endangered Species of Wild Fauna and Flora Act (Cap. 262)* and the *Wild Birds Protection Act (Cap. 398)*. There is also a Draft Zoos Act that seeks to govern the acquisition, housing, maintenance and treatment of exotic species, including those that might become invasive if released into the wild, by various private sector entities. The lead collaborating agencies are the Plant Quarantine Unit which oversees and enforces phytosanitary requirements for all plant imports and exports, the Veterinary Services Department which overseas and enforces animal health requirements for all anime imports and exports, including meats, the Entomology Unit of the Ministry of Agriculture which addresses invasive species which may pose threats to species relevant to Agriculture and the Vector Control Unit of the Ministry of Health which is tasked with the control of various IAS that pose a risk to human health and wellness.

The guiding framework that governs management of the land resource base in the context of terrestrial habitat conservation is the *Barbados Physical Development Plan (PDP)*[22][16]. Since 1970, Barbados has produced Physical Development Plans that seek to identify land use practices, community facilities and physical infrastructure that would support the island?s development goals. The 2017 PDP lays out policies to guide relationships among land uses, built form, mobility, community facilities and physical infrastructure. It is intended to be a framework to facilitate and guide investment, both public and private, in Barbados to the year 2035. The Plan lays out strategic policies[23][17] that are centered around promoting sustainable development and protecting core assets, specifically the resource base for food and agriculture, maintaining a natural heritage system, water resources, natural park, cultural heritage and community core. The policy areas most closely linked to the proposed GEF investment are assets related to the natural heritage system, water resources and the natural park. It noted further that the PDP has highly relevant provisions in the context of this project for developing and implementing restoration plans for open land areas within Groundwater Protection Zones, open gullies and maintaining, managing, and increasing forest cover, including through the development of National Forest Sites and minimizing habitat modification and loss in gully ecosystems.

The *Barbados National Park Plan*[24][18] under the remit of the Natural Heritage Department, is intended to establish policies to guide future land use and development within the National Park. The Plan aims to conserve and enhance the character and quality of the landscape and marine resources in the Park and define and protect a functionally connected natural heritage system based on an ecosystem approach. It also aims to ensure sustainable use and management of the land and marine resources in the Park that is supportive of the social and economic development of local communities and mitigate against activities which conflict with or are detrimental to the landscape, seascape and environmental qualities that led to National Park designation. The Plan seeks to foster an awareness of the value of the National Park to the daily lives of residents of Barbados and provide opportunities for passive recreation and to promote an understanding and enjoyment of the special qualities of the park. The development, maintenance and operation of green open spaces is the remit of the National Conservation Commission, which was established to conserve the natural beauty, topographic features, historic buildings, sites and monuments of Barbados as well as control, maintain and develop the public parks, public gardens and beaches of Barbados.

Based on the recurrent investments through the work of frontline agencies in biodiversity management, the government invests approximately US$2 million annually as baseline contributions. Over the project period it is estimated that continued investment will approximate US$8 million.

Baseline - donor and partner assistance programmes: Since 2013, the Government of Barbados with technical guidance and assistance from the University of West Indies, Fauna & Flora International (FFI) and Durrell Wildlife Conservation Trust, conceptualized through preliminary surveys and consultations, the concept of establishment of a ?mainland island?[25][19] or ecological island on Barbados, to safeguard a core population of the Leaf-toed Gecko. This is based on proof-of-concept initiatives that have been successfully implemented New Zealand, Hawaii and the Christmas Islands for similar species.

As part of the GEF-UNEP IAS Project, the erection of an invasive pest-proof bio-secure fence is being executed in partnership with CABI, FFI and UWI. A one-hectare (1 ha) area on lands under the control of the Barbados Defence Force at Paragon has been selected for an initial pilot with support from the Ministry of Housing and Lands and the Office of the Attorney General. However, based on recent assessments by FFI and UWI, in collaboration with the Ministry of Environment, and in light of stresses on the species imposed by the recent La Soufriere volcanic eruption of April 2021, further investment is needed in development of additional bio-secure areas and the augmentation of relevant habitats to encourage the proliferation of the species at multiple sites to reduce the risk of extinction. The national pilot of the GEF-UNEP IAS Project also includes contribution to strengthening of the policy environment related to IAS control with the development of a National Invasive Species Strategy and Action Plan (NISSAP), an associated legal framework and heightening awareness around the impacts of IAS. The project is also assisting with the identification of cost recovery financial mechanisms to support IAS control measures that are typically capital-intensive.

The Ministry of Environment maintains a working partnership with the University of the West Indies to support undergraduate and graduate research into population numbers, density, distribution and genetic analysis through the development and execution of graduate theses and research projects. The Ministry also provides annual grants to support the work of UWI projects in reptile conservation. Through partnerships with FFI the Ministry has been able to identify external and innovative sources of funding for IAS management for the training of national stakeholders, procurement of bait and traps for IAS control and removal as well as public awareness, education and community engagement in relevant areas. The Ministry also leverages significant technical support from UWI and FFI, to support the work of the Biodiversity Section in surveying methods, IAS removal and eradication and predator exclusion.

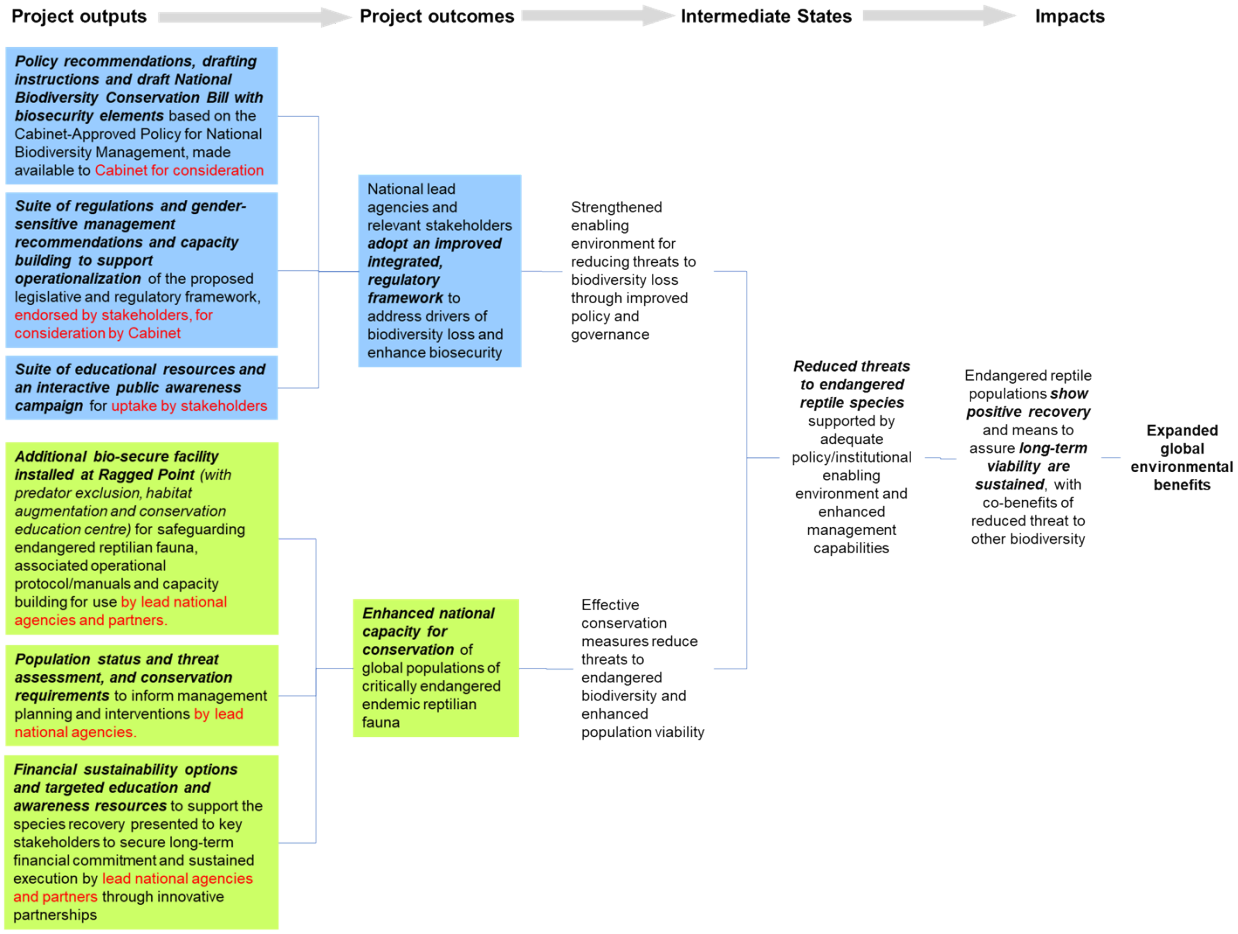
The value of the baseline investment through cooperative efforts with partners in recent years approximates US$1 million annually, which is expected to be maintained over the project period.

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

Project Overview: The GEF?s incremental funding and co-financing resources will be used to overcome the identified barriers that prevents the country from advancing a coherent policy response framework and innovative time-sensitive solutions to address the drivers of loss of endangered biodiversity particularly through the threats posed by habitat change and inability to address biosecurity risks. The project is substantially focused on conservation of reptilian endemic biodiversity that are now critically endangered on the island; however, management measures supported under the project will contribute to the conservation of other endemic species and subspecies found in Barbados (for example the Barbados Bullfinch, Barbados Anole, Barbados Myotis, Pseudopineria barbadensis) that also constitute globally very small and relatively vulnerable populations. The targeted species are the Barbados Leaf-toed Gecko and the Barbados Threadsnake, given the highly vulnerable status of known remaining populations, based on IUCN assessments of 2015 (Daltry et al, 2016). While there have been no recent sightings of the Barbados Skink and the population status remains uncertain based on the 2015 IUCN assessment (Horrocks, J. & Daltry, J.C. 2016) and it is thought that the Barbados Racer is likely extinct (cite Daltry/IUCN), conservation efforts under the project will provide the opportunity for associated conservation co-benefits for conservation of these species. The project addresses the overarching significant risk that remaining populations of the gecko and threadsnake can be extirpated if urgent management measures are not implemented, while ensuring that the wider threats to native biodiversity can be minimized.

The project theory of change is underpinned by achieving desired intermediate states of (a) a strengthened enabling environment for reducing threats to biodiversity loss through improved policy and governance and (b) effective conservation measures that reduce threats to endangered biodiversity and enhanced population viability. Attainment of these intermediate states is expected to lead to reduced threat to endangered reptilian biodiversity and other species at a broader level, supported by adequate policy/institutional enabling environment and enhanced, sustained management capabilities among lead management agencies and stakeholders. In the longer term, it is anticipated that the project contributions will eventually create conditions that leads to the populations of the Barbados Leaf-toed

Gecko and the Barbados Threadsnake showing positive recovery, with the means to assure long-term viability sustained, while realizing co-benefits of reduced threat to other biodiversity. This will contribute to global environmental benefits. The project design is reflective of a causal pathways captured in the theory of change below.



Investment under **Component 1** will realize the outcome of adoption of an integrated regulatory framework to address drivers of biodiversity loss and enhance biosecurity by national lead agencies and relevant stakeholders. This component will contribute to enhancing long-term sustainability of investments under Component 2. Investment under **Component 2** will realize an enhanced national capacity among lead national agencies and stakeholders including the Ministry of the Environment; UWI; and the National Conservation Commission for long-term conservation of global populations of critically endangered reptiles endemic to Barbados with co-benefits to other native biodiversity.

The project is framed against the backdrop of *assumptions* that have bearing on the anticipated outcomes to be realized through the proposed causal pathways. A critical assumption is that there will be a *continued strong policy directive* to conserve remaining natural spaces and critical habitats for threatened and endangered biodiversity that is enshrined in the Policy for National Biodiversity Management (and NBSAP) and that it will transition into the eventual adoption of a National

Biodiversity Conservation Bill with provisions to address biosecurity (including IAS) within a strong regulatory framework. A foundational assumption is that there will be *buy-in by lead governmental partners, the private sector and wider beneficiary stakeholders* in the national strategy to strengthen biosecurity and IAS management as elaborated under the NISSAP and other relevant policy instruments to realize the desired outcomes. It is also assumed that there will be *sufficient dedicated resources* from Government with co-financing from partners and stakeholders to maintain investments made in addressing mitigation of threats from IAS. It is further assumed that partner *collaborations established and/or strengthened sustained under the project, will continue* post-project. Another critical assumption is that the *technical knowledge and know-how developed and piloted under the project in conservation of endangered biodiversity will build sustainable capacity* among front-line agencies and positively influence behavior change from direct beneficiary to policy-maker level. The project also assumes that should hurricanes and other natural or man-made events occur during implementation, the *impacts will not completely debilitate continuity, and that adaptive mechanisms will be effected*. Finally, with the ongoing COVID-19 pandemic, a crucial assumption is that the Government of Barbados through its frontline health care sector will be able to *mitigate and manage the impacts, and that business continuity is maintained* within mandated protocols.

The components are described in more detail below.

Component 1: Strengthening the enabling environment for reducing threats to biodiversity loss through improved policy and governance. This component will result in the realization of ***Outcome 1.1:*** *National lead agencies and relevant stakeholders adopt an improved integrated, regulatory framework to address drivers of biodiversity loss and enhance biosecurity.*

The Government of Barbados, under its Biodiversity Conservation and Management Programme, led by the Biodiversity Conservation and Management Section of the Ministry of Environment and National Beautification will engage relevant stakeholders in contribution to the continued strengthening of the policy environment. There will be specific focus on critical requirements for enhancing biosecurity and management of IAS, safeguarding critical habitats and landscapes that need to remain intact in the interest of conservation of biodiversity, and determining pathways toward sustainability. This effort will be framed against the backdrop of the National Biodiversity Strategy and Action Plan, the Sixth National Communication to the CBD and the National Invasive Species Strategy and Action Plan (NISSAP). Charting the way forward will require guidance from the Town and Country Planning Department in consideration of the Physical Development Plan (2017).

The project will contribute to the enabling environment strengthening in a two-pronged approach; (1) strengthen the legislative and regulatory framework within the scope of the draft National Biodiversity Conservation Bill and (2) rationalization of the required organizational framework to effect the provisions of the Bill once passed into law. Based on policy directions by the Government of Barbados, the Biodiversity Conservation Bill is intended to provide an overarching framework for integrating relevant legislative instruments across sectors within the framework of the Policy for National Biodiversity Management. The project component will contribute to sustainability of the investment proposed under Component 2.

Through a series of national consultations and focus group dialogues building on the existing policy and strategies, an expert group will prepare a *suite of policy recommendations* to update the Policy for National Biodiversity Management focusing on (i) improved landscape management to safeguard

critical habitat for endangered species with emphasis on the gecko and threadsnake with conservation co-benefits for other species that inhabit these ecosystems and (ii) enhancing biosecurity measures to reduce threats to biodiversity in an integrated manner that considers IAS management and port security. Related to item (i) it should be noted that the critical habitat for the Barbados Leaf-toed Gecko are coastal cliff areas, where in accordance with the Physical Development Plan, some 6,000 ha are zoned as cliff areas. These cliff areas are important nesting areas for seabirds (terns, tropicbirds, shearwaters, boobies), and other species. The government intends to eventually designate these cliff areas under national parks that will be in alignment with the NBSAP in the context of specie recovery plans for gecko. These recommendations will consider all existing policy/legislative and regulatory instruments and associated areas of deficiency and incoherence among these instruments, and specify required improvements. It should be underscored that proposed updated policy directives will ensure that wider ecosystem services benefits will be attended to in the context of maintaining and preserving natural spaces for species conservation, maintaining and enhancing productive landscapes for livelihood benefits. These policy recommendations, as vetted and accepted by the Working Group on Biodiversity will be presented by the Biodiversity Conservation and Management Section to the lead management agencies, specifically Town and Country Development Planning Office in the context of land planning and development, and the Plant Quarantine, Veterinary Services Department, Entomology and the Vector Control Units in the context of biosecurity, in addition to customs and the air and sea ports authorities, for consideration and adoption as an updated Policy for National Biodiversity Management. The *capacities of relevant policy and technical personnel in the associated agencies will strengthened through interactive training* by the lead specialists.

The recommendations within the updated Policy for National Biodiversity Management will lay the basis for definition of *drafting instructions* that will upgrade the draft National Biodiversity Conservation Bill so as to adequately integrate required considerations identified in the policy analysis. These drafting instructions will be developed by the project?s legal specialists under the guidance of the Working Group on Biodiversity and Biodiversity Conservation and Management Section. The Office of the Attorney General will play a critical advisory role in guiding the project team in development and preparation of these instructions that will be the primary framework for upgrading the National Biodiversity Conservation Bill that will be presented to stakeholders for validation and submitted to Cabinet for consideration.

Importantly, the project will contribute to the determination of pathways for strengthened interagency collaboration that will be defined under the framework of the upgraded Policy for National Biodiversity Management and the updated National Biodiversity Conservation Bill. This will be elaborated within a proposed *agency operational framework* that will include revised agency mandates and responsibilities, terms of reference for key personnel, inter-agency memoranda of understanding and cooperation agreements as relevant. Considerations for enhancing engagement of non-governmental organizations and participation by civil society will also form part of this framework. Accompanying the proposed framework will be an analysis and presentation of the *recurrent cost requirements to be borne by the Government of Barbados and other key collaborating organizations*. This framework will be nested within oversight of the Working Group on Biodiversity.

To support the stakeholder engagement process and solicit buy-in for the proposed policy reforms, *targeted educational resources and an interactive public awareness campaign* will be developed and executed. These resources will be produced in various media formats for dissemination via radio,

television and the web, channeled through the main government information service and the Ministry of Environment and National Beautification.

Component 2: Targeted interventions to reduce threats to endangered biodiversity and enhance population viability. This component will contribute to realizing ***Outcome 2.1:*** *Enhanced national capacity for conservation of global populations of critically endangered endemic reptilian fauna.*

The project will support work that has been initiated on the conservation of the Barbados Leaf-toed Gecko under the regional GEF-UNEP Preventing the Costs of Invasive Alien Species in Barbados and OECS Countries (IAS) Project. The project, under execution and technical oversight by CABI, has financed the construction of a bio-secure area within the lands at Paragon situated just south of the Grantley Adams International Airport in Christ Church (see Map 1), which have been designated by Cabinet for the Sole Use in the protection and conservation of the species. The site is a rocky, wind-swept cliff area underlain by a thick limestone substrate and thin sedimentary soil layer, supporting salt resistant grasses and other flora (such as seaside sage) which represents the same habitat that the gecko is known to inhabit and in which they are naturally occurring. An implementation plan for management of the site, informed by an extensive monitoring programme by UWI and FFI has been underway since 2013. A Memorandum of Understanding to effect management of the site between the Ministry of Environment and National Beautification and the Ministry of Housing and Lands is operational. The rate of progress under the regional GEF-UNEP IAS Project was however stymied to a significant extent due to the COVID-19 pandemic management measures over 2020 into 2021. These measures restricted the ability to bring in the originally targeted external technical expertise to oversee the work, however CABI, the Biodiversity Conservation and Management Section worked with FFI to identify other partners (such as Pacific Rim and Wildlife Management International Ltd), who will be engaged in construction of the bio-secure enclosure at Paragon.

Based on preliminary costings derived during development of the GEF-UNEP IAS project, it was determined that a two-hectare (2 ha) site was optimal to balance cost while attaining a healthy population size for species recovery. However, as a result of significant cost increases due to travel and shipping during the COVID-19 pandemic, the site at Paragon was down-sized to 1.2 ha. Additionally, vulnerability of having only a single site was exposed by challenges recently faced by the population at Paragon specifically. Based on expert assessment, this area was heavily impacted by the La Soufriere Volcano ashfall event of April 2021, with individuals at Paragon exhibiting reduced body condition (low weight-to-length ratio) since the event, in comparison to other populations, such as Ragged Point. The development of a second conservation site at Ragged Point would not only increase the total conservation area for the species nationally but provide resilience against site specific environmental impacts caused by unforeseen natural disasters. Investment in an additional site, while with a primary focus on conservation of the gecko, will also have conservation co-benefits for the threadsnake (known from adjacent forest in St. Philip, St. John and St. Joseph (Daltry et al, 2016)), and the skink.

The project will contribute to the establishment of a second *bio-secure environment at Ragged Point*. Preliminary research carried out by UWI and FFI[26[20]] suggests that the eradication of invasive

species and their further exclusion from the biosecure areas should have significant positive impacts on endangered reptiles, ground foraging birds, invertebrates and coastal shrubs. This is supported by similar IAS eradication work in Christmas Island, Hawaii and Redonda Island. Ragged Point is located in the parish of Saint Phillip on the east coast of Barbados approximately 12 kilometres northeast of the site at Paragon (Maps 1 and 2). The site has similar ecological characteristics as the site at Paragon and suitable habitat for the species. Ragged Point is dominated by short grasses and shrubs, but also represents a more vertical and three-dimensional landscape. This provides additional vegetative cover, more complex rocky substrate and a greater number of crevices in which individuals can find shelter, escape predation, nest and breed. The ecosystem, typical to the Atlantic coast has evolved under sustained exposure to windy saline conditions with a rainfall regime of 1,200 mm per annum, mostly distributed between the months of June and November. The area that remains relatively undeveloped at Ragged Point comprises of approximately 11 hectares, dominated by a relatively flat grassy area at the Ragged Point headland to the east, with steep wooded areas extending westward along the coastline toward Culpepper Island. The Ragged Point Lighthouse and the Barbados Advanced Global Atmospheric Gases Experiment (AGAGE) station are located in the area. The AGAGE station was established in 1978 as part of a global network to measure the composition of the global atmosphere. its scientific program is supervised by the University of Bristol and its operation is funded by NASA and NOAA [27].

The bio-secure enclosure will cover approximately 5,000 square metres over the rocky coastal cliff at Ragged Point (Map 2). The enclosure is anticipated to accommodate between 500 and 1,500 individuals based on observed population densities in adjacent wild where the gecko has been found and studied. The enclosure design will replicate the configuration that has been installed at the Paragon site (under component two of the regional IAS Project) and will comprise of corrugated metal mesh fencing, clad in PVC for environmental resistance, affixed to wooden posts with metal skirting and hoods. The enclosure will be designed to exclude predators that have been determined most likely to pose a threat to the gecko; these include mongoose, rats, cats, cane toads, and giant centipedes. The health of the populations of will be monitored within the bio-secure area and protocols developed for possible translocation of individuals into non-secure adjacent areas with suitable habitat quality. Other release sites will be determined during the PPG phase and will be the subject of ongoing research during the project execution and beyond. Given the location of the proposed site, there will be conservation benefits to other species, notably birds that nest in the coastal cliff habitats, such as terns, tropicbirds, shearwaters, boobies whose eggs and fledglings may be subject to predation due to invasive species.

Immediately adjacent to the biosecure area, the project will support the construction of a *conservation education centre* featuring the leaf-toed gecko and the threadsnake as primary conservation focus given their high conservation profile. This centre will allow for creation for ?easy-reach? visibility and learning opportunities that can greatly assist with conservation messaging and gaining buy-in from stakeholders and the general public, given the otherwise difficulty to observe the species in open ?natural? conditions. In this regard, a number of animals will be collected from the wild and maintained in reptile terrariums or appropriate enclosures that will serve as interaction focal points for visitors, with minimal risk posed to the animals. A range of interactive (tactile and digital) and static interpretive displays will highlight information on the reptiles along with the wider context natural history of Barbados. The facility will include spaces to allow for visitors to interact with staff and be

integrated within the wider adjacent biosecure area with appropriate access controls. The facility will incorporate state-of-the-art green technologies such renewable energy systems (likely photo-voltaic power), use of rainwater and recycling systems and feature educational content that promotes sustainable management practices related to resource use efficiency as it relates to creating positive impacts for biodiversity and land resource management. The design and detailed costing will be developed during the PPG phase of the project development by herpetological specialists. The designs will be based on best practices drawn from successful programmes in other parts of the globe.

It should be noted that the Ragged Point site is under government ownership, and an *operational agreement* will be signed between the Government of Barbados and the National Conservation Commission for management of the overall facility (inclusive of the biosecure area and the conservation education centre). The institutional management arrangements for the centre will be modelled on the arrangements of the Marine and Coastal Interpretive Centre, another currently operating educational facility, which is located within the Folkestone Marine Protected Area. The details of the agreement will be finalized during the PPG phase of project development. This effort will include strengthening or setting a similar group like Herptile Conservation group of Jamacia with the aim of studying and conserving native reptiles in Barbados.

The project will support the development of associated *operational protocol/manuals on predator exclusion, predator removal, habitat augmentation and population monitoring* to be utilized in a *capacity building programme for lead national agencies* and collaborators. This effort will be built on best practices that has been successfully demonstrated in programmes in other parts of the globe. It is anticipated the facility (biosecure enclosure and conservation education centre) will require 4 full-time operational staff and an additional 8 persons who will be employed on a part-time basis and/or volunteer arrangements. The protocols/manuals will be made available in print and digital formats within a partnership programme with affiliated organizations including Ministry of Environment, National Conservation Commission, University of the West Indies, Fauna and Flora International. The project will support *in-country training* on a range of related topics including reptile capture, handling, identification, measurement, relocation and population distribution; bio-secure fence construction, repair and maintenance. In addition, the project will support twinning capacity building activities with programmes run by Fauna and Flora International, Pacific Rim in Hawaii and the Christmas Island National Park.

The project will continue to provide support to ongoing *scientific assessments on population status, threats and conservation requirements* to inform management planning and intervention by lead national agencies that will build on the pervious and ongoing scientific work. The primary focus of the continued research within the scope of the project will be to map distribution of the target reptile species over the island and identify the most threats they face. It is generally accepted that there are direct pressures from potential predation from rats, mice, mongooses and giant centipedes, and competition from other invasive reptilian species, but more studies are needed to adequately inform long-term management measures from direct field conservation to land development policy.

The additional research findings, lessons learned from the management and operation of the bio-secure facility and accompanying recommendations amassed under the project will contribute to a *management and species recovery plan.* The management and species recovery plan will include in addition to the conservation actions, *financial sustainability options* for future investment and

maintenance of the bio-secure areas (Paragon and Ragged Point) inclusive of the interpretation centre operations. The analysis of financial requirements for the programme will inform budgetary requirements from recurrent government resources, linked to the wider finance commitments to be assessed under Component 1. A component of the financial sustainability options will be a business management plan for the Ragged Point bio-secure facility taking into account revenue generation potential from visitation to that facility. It will also serve as the basis for further resource mobilization through the engagement of conservation partners, including local and international private sector.

During the project execution, a suite of *public awareness resources* will be produced that focus on conservation of the country?s endangered reptilian biodiversity guided by a *stakeholder engagement plan* and *knowledge management strategy* that will be developed during the PPG phase in elaboration of the full project dossier. As with the awareness resources to be developed in association with the policy reform interventions under Component 1, content will be produced in various media formats for dissemination via radio, television and the web, channeled through the main government information service and the Ministry of Environment and National Beautification. The project will facilitate opportunities for on-site learning and interaction with facility staff, scientists and affiliates. Strong emphasis will be placed on school engagement.

A *project monitoring and evaluation system* will be put in place to ensure continual assessment of progress in meeting project outcome and output targets.

4) Alignment with GEF focal area and/or Impact Program strategies

Biodiversity Focal Area objective: BD-2-6 Address direct drivers to protect habitats and species through the Prevention, Control and Management of Invasive Alien Species: The project is in full alignment with the GEF7?s focal area objective in addressing invasive alien species, one of the critical drivers of biodiversity loss, a concern that is significant on islands. It is recognized that islands have exceptionally high numbers of endemic species, with 15% of bird, reptile and plant species on only 3% of the world?s land area hence support under GEF7 will help address IAS on island ecosystems. The project will contribute to the main elements of the GEF strategy in bolstering prevention and early detection measures and investment in control and management frameworks that mitigate adverse outcomes, by focusing on the high-risk invasion pathways. The project will build on already ongoing efforts from GEF6 under the regional IAS project within Barbados and the OECS, that has demonstrated initial successes and important lessons on approaches for targeted low-cost, and effective eradication measures.

5) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing;

Baseline	Incremental Cost

Baseline	Incremental Cost
Under the baseline scenario, the fragmented approach to management of biodiversity and low capability to manage biosecurity and IAS risks will likely persist. The current lack of integration between management and development of landscapes in the interest of protection of threatened biodiversity will continue to contribute to the detriment of critically endangered reptile species such as the Barbados Leaf-toed Gecko. This will be amplified by the fact that the legislative and regulatory framework will remain inadequate to allow for closer institutional coordination among concerned agencies with the inability to effectively execute organizational mandates. The baseline situation of relatively low policy level priority accorded to management of biodiversity and IAS will continue to manifest in low human and finance resource commitment that will remain insufficient to address the operational requirements for effectively addressing biosecurity risks and IAS in the country. Although there are efforts to raise public awareness on the status of biodiversity, IAS and general issues of concern related to the state of the environment, articulation of needed actions may remain diffuse without clear understanding of roles across different segments of society, private sector and concerned stakeholders. Stakeholders will likely remain insufficiently aware of the compounding impacts of landscape development on the country?s biodiversity and possible economic opportunity loss.	With the GEF incremental investment the country will advance to close the institutional policy coordination gap, reduce fragmentation of approaches in management of biodiversity, and enhance effectiveness in management of IAS and reduction of biosecurity risks in the country. This will serve to create an improved enabling regulatory and decision-making environment for long-term conservation particularly of endangered species including the Barbados Leaf-toed Gecko and Barbados Threadsnake with wider biodiversity conservation benefits. This will be supported by a strengthened legislative and regulatory framework that enhances institutional roles and responsiveness to management needs. The GEF investment will lend continued support to raising the policy level priority that can be anticipated to translate to increased human and financial resource commitment as reflected in national budgets. The project will enhance the level of awareness of the urgent challenges of conservation of threatened biodiversity and risks posed by IAS so as to elicit behavioral change among stakeholders across all sectors, particularly in relation to how physical development impacts the landscape and habitat quality particularly for the critically endangered reptile species. A heightened level of awareness will support buy-in to new policy and legislative instruments and enhance active stakeholder participation in ongoing efforts, those under the proposed project, and in future investments.

Baseline	Incremental Cost
Under a business-as-usual scenario the threat to survivorship of the critically endangered reptiles, notably the Barbados Leaf-toed Gecko and Barbados Threadsnake will remain unabated and status of the population species will likely become more critical. This comes against the backdrop that the favored habitats of the species are becoming increasingly occupied by development in areas of its known distribution. In addition, the threats posed by IAS remain high without further targeted intervention. While there are efforts to develop a bio-secure habitat that is free of IAS and other threats needed to safeguard a core population, expanded efforts are necessary, which are currently beyond the means of the country. Without expanding capability to ensure protection of habitats the species could be subjected to genetic erosion from a declining gene pool that will likely result in the inability of maintaining a resilient viable population in the long term. Under the baseline scenario, national capacity to routinely assess and monitor the status of the populations may be challenged and relegated to sporadic academic studies that may not be sufficient to guide management decisions at critical decision points. Human and institutional capacity limitations will have implications for ongoing work with respect to the current investment in the bio-secure facility for the Leaf-toed Gecko (at Paragon) in terms of long-term maintenance. This is linked to the current lack of a financial recovery mechanism where resources can be ploughed back into operations of the facility. Under the prevailing conditions, professionals in the country have not gained needed exposure to best practice examples from other parts of the globe to learn methods and tools that are needed to realize successful replication in Barbados.	The GEF investment will contribute further concrete investment that will boost the country?s efforts at protecting the critically endangered endemic reptiles with focus on the Barbados Leaf-toed Gecko and Barbados Threadsnake and enhance the chances of maintaining stable viable populations into the long term that are resilient to IAS threats and landscape modifications within their natural ranges on the island. This will be done through additional investment in transforming areas into bio-secure zones, specifically an area at Ragged Point, to augment initial pilot efforts and applying the lessons learned. The project will significantly enhance local capacity to carry out routine scientific assessments on the species that can inform dynamic decision making and be responsive to address threats, rather than place sole reliance of sporadic scientific assessments by specialized research partners. With the GEF contribution the issue of cost recovery measures and development of innovative financial streams to support IAS control and management of bio-secure facilities will be explored. Business models will be proposed to encourage expanded investment from core government budgetary allocation and incentivize partnership with the private sector. Under the project, technical exchange opportunities will be made available for local professional to see and learn firsthand tools and methods applied in other countries in conservation of critically endangered species and reducing threats from IAS.

6) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF);

Barbados is an island that has had a very long period of landscape modification initiated with European colonization that dated back to the early 1600s. The extent and completeness of the landscape changes over the island was attributable to the gentle terrain that yielded ideal conditions to sugar cultivation. This was compounded by the influence of IAS introduced to the island and as a result, the original

biodiversity that will have once flourished on the island was largely extirpated. The Barbados Anole, Barbados Leaf-toed Gecko, Barbados Threadsnake and the Barbados Skink are the only endemic species that remain today, the latter three which are critically endangered and are of significant global conservation priority. The project will make very direct conservation to ongoing national efforts to conserve the Barbados Leaf-toed Gecko with co-benefits to the Threadsnake and Skink. This will assure that the country has enhanced capacity to undertake measures to safeguard the remaining populations and ensure that threats to survival are mitigated in the long-term, in consideration of IAS management, developmental pressures and the background threat posed by climate change. The project will assist improving understanding of ecosystem level impacts with the ability to deliver appropriate response that will contribute to global environmental benefits and benefits to livelihoods. The project will build collective knowledge on lessening biosecurity risks, management of IAS and implementation of innovative biosecurity safeguard measures in Barbados, and assist building the community of practice in the Caribbean region that will widen experiences and knowledge at the SIDS and global levels.

7) Innovation, sustainability and potential for scaling up.

Innovation: The project will contribute innovative approaches to conservation of a critically endangered species in an island environment that has a high level of landscape modification. Solutions to reduce conflictive land use and consequent threats to biodiversity will be conveyed in specific innovative recommendations for action within a coordinated approach to integrated spatial planning. These will be enshrined in synergistic policy directives in the scope of the Physical Development Plan, National Biodiversity Strategy and Action Plan, National Park Plan and National Action Plan for Sustainable Land Management. It should be further noted that the Barbados Physical Development Plan is innovative among Caribbean SIDS (where few Caribbean countries have fully developed such plans), as it provides the spatial framework for realizing its national sustainable development agenda, inclusive of biodiversity management that via this project, can provide a model for learning within the region. The project will continue to support ongoing efforts to pilot test bio-security measures and associated capacity building to increase the likelihood of long-term survivorship of the Barbados Leaf-toed Gecko with co-benefits to the Barbados Threadsnake and the Barbados Skink and other native biodiversity found within the target area. The project will draw on successful approaches tried and tested in New Zealand, Hawaii and the Christmas Islands where these treatments will be adapted to conditions in Barbados. The project will seek out innovative avenues to enhance national coordination and stakeholder inclusion for biodiversity conservation and foster sustainable funding options to ensure national actions are sustained over time.

Sustainability: Long-term institutional sustainability of the project outputs will be based on the strengthened policy environment that the project will contribute to. Key will be high-level policy buy-in along with buy-in from the stakeholders and beneficiaries. The country has already recognized the issues to be addressed under the project as having critical importance as referenced in the National Biodiversity Strategy and Action Plan which was endorsed by Cabinet in 2020. Barbados is participating in the regional GEF-UNEP IAS project, where the national sub-project is lending support to conservation of the gecko and addressing the impacts of IAS in the country. The contributions from

this project will be leveraged to secure engagement of private sector and other partners to expand targeted and sustainable interventions by enhancing the conditions to generate opportunities for increased and sustainable revenue streams for conservation.

In contribution to the installation of the biosecure area and conservation education centre dedicated to the conservation of some of the planet?s most critically endangered species, the combined facility will be the very first of its kind in Barbados and in the Eastern Caribbean and will be promoted as a significant educational asset for schools and local communities, as well as a tourism attraction. There are at least 35 active environmental clubs and affiliated organizations engaged with environmental conservation in the country and within the outreach and awareness-raising work under the project, these organizations will be brought into active engagement with the project. The facility will be a hub for learning and engagement of the community to support field conservation efforts around reptile conservation and support ongoing IAS controls. Prior to the onset of the COVID-19 pandemic, the country received some 1.5 million visitors annually, with an estimated 53% of those from cruise ships. Of that overall number of visitors, the Barbados Tourism and Marketing Inc (BTMI) estimates that between 20,000 and 80,000 would partake of nature-oriented excursions to various sites across the island. Based on demand for such experiences, the addition of this conservation attraction will constitute a significant asset with high revenue generation potential that will be a critical underpinning of the sustainability model post-project.

Already the National Conservation Commission successfully manages and operates the Folkestone Marine Park & Museum, from which relevant approaches will be adapted in development of the facility at Ragged Point. The Folkestone Marine Museum was established in 1994 with extensive assistance and capacity building facilitated by the Barbados Museum. In addition to the financial commitment from the government of Barbados, the National Conservation Commission has implemented entrance fees, usage fees and a gift shop which increases the revenue generating capacity. Based on this successful experience, the National Conservation Commission will bear responsibility of maintenance and monitoring of this facility alongside the accompanying biosecure area intended at Ragged Point. The project will consider long-term national financing needs from government and other collaborators and all potential avenues for revenue generation in definition of the sustainability model.

The scaling ? up potential: The prospect for replication of project outputs and results will be very high as conservation of endangered species under threat from habitat modification and IAS is of interest particularly in SIDS. The opportunity for exchange of lessons and learning from this project will be of use to other countries in the Caribbean and global SIDS that are attempting to address similar issues. The tools and approaches will be designed, keeping in mind the inherent resource limitations in small islands in maintaining operational protocols and infrastructure. A key aspect to ensuring sustainability of scaling up opportunities will be through continued partnership building with research organizations, private sector and relevant stakeholder groups, supported by wider public engagement.

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[1] https://www.cbd.int/doc/world/bb/bb-nbsap-01-en.pdf

[2] https://www.shorebirdplan.org/wp-content/uploads/2018/08/Shorebird-hunting-Barbados-Wege-2014.pdf

[3] https://www.iucnredlist.org/species/12081/115104581

[4] https://www.iucnredlist.org/species/203637/115351519

[5] https://www.iucnredlist.org/species/48443321/115401286

[6] https://www.iucnredlist.org/species/44579133/115387376

[7] https://www.iucnredlist.org/species/22734682/95094761

[8] https://bou.org.uk/barbados-sample.pdf

[9] https://www.iucnredlist.org/species/203883/2771991

[10] https://www.iucnredlist.org/species/76435059/76435083

[11] https://www.researchgate.net/publication/268746158_Under_threat_-_the_molluscan_fauna_of_Barbados

[12] https://threatenedconifers.rbge.org.uk/conifers/juniperus-barbadensis-var.-barbadensis, https://www.iucnredlist.org/species/44164/2992304

[13] https://www.iucnredlist.org/species/48443321/115401286

[14] https://www.researchgate.net/publication/275211264_Natural_history_distribution_and_conservation_status_of_the_Barbados_leaf-toed_gecko_Phyllodactylus_pulcher_Gray_1828_Squamata_Gekkonidae

[15] Daltry, J.C., Powell, R. & Henderson, R.W. 2016. Tetracheilostoma carlae (errata version published in 2017). The IUCN Red List of Threatened Species 2016: e.T203637A115351519. https://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T203637A2769298.en. Accessed on 18 May 2022.

[16] Hedges, B. 2008. At the lower size limit in snakes: two new species of threadsnakes (Squamata: Leptotyphlopidae: Leptotyphlops) from the Lesser Antilles. Zootaxa 1841: 1-30.

[17] Horrocks, J. & Daltry, J.C. 2016. Alinea lanceolata (errata version published in 2017). The IUCN Red List of Threatened Species 2016: e.T44579133A115387376. https://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T44579133A44579169.en. Accessed on 18 May 2022.

[18] Hedges, S.B. and Conn, C.E. 2012. A new skink fauna from Caribbean islands (Squamata, Mabuyidae, Mabuyinae). Zootaxa 3288: 1-244.

[19] https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Barbados%20First/2021%20Barbados%20NDC%20update%20-%2021%20July%202021.pdf

[20] Based on expert evaluation from the University of the West Indies, 2022

[21] J. Horrocks, pers. comm. 2022

[22] http://www.townplanning.gov.bb/pdp/#:~:text=What%20is%20the%20PDP%3F,community%20facilities%20and%20physical%20infrastructure.

[23] http://www.townplanning.gov.bb/pdp/Downloads/files/pdp/A-02_Strategic%20Policies.pdf

[24] http://heritage.gov.bb/national_park.html#:~:text=The%20National%20Park%20Plan%20which,of%20natural%20and%20cultural%20heritige.

[25] The mainland island is an area of suitable habitat enclosed by a pest-proof barrier intended to exclude predator and other harmful IAS

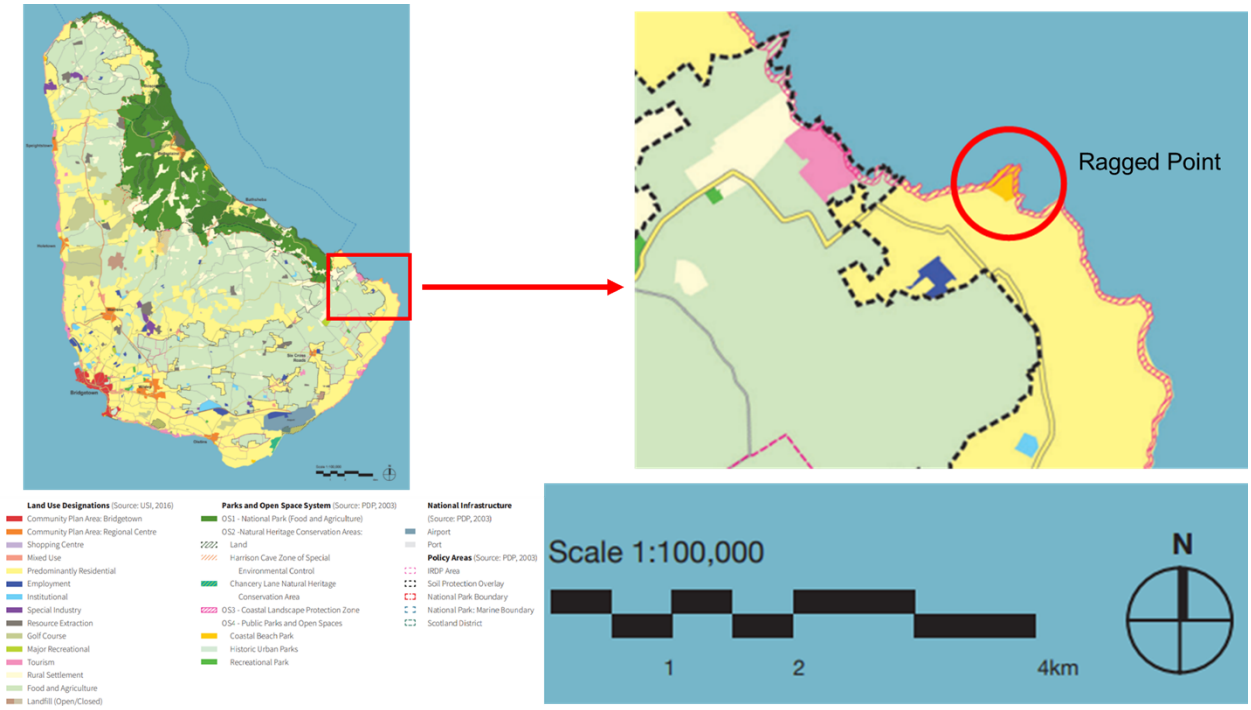
[26] Prof. Julia Horrocks and Dr. Jenny Daltry, per comms

[27] https://agage.mit.edu/stations/ragged-point

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

The site-specific Component 2 of the project will focus on Ragged Point, situated on the east coast of Barbados.



Map 1. Land use (2017) at Ragged Point and adjacent areas (Barbados Physical Development Plan - National Maps[28])

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[28] http://www.townplanning.gov.bb/pdp/Downloads/files/pdp/X_Appendix%20A%20-%20National%20Maps.pdf

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Indigenous Peoples and Local Communities Yes

Civil Society Organizations Yes

Private Sector Entities Yes

If none of the above, please explain why:

In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement

Refer to Annex F for a summary of stakeholder consultative process in development of the PIF.

Stakeholders	Roles in Project Preparation
Ministry of Environment and National Beautification (MENB) - Biodiversity Conservation and Management Section	The Ministry, through the Biodiversity Conservation and Management Section will provide overall project direction to CABI that will serve the role of project Executing Agency and will lead and coordinate the development of the project with stakeholders, and as Operational Focal Point, will be the liaison with UNEP and GEF. The Working Group on Biodiversity (Cabinet-appointed) will provide policy and technical oversight.
Ministry of Agriculture and Food Security ? Agronomy plant quarantine and veterinary services	Policy and technical inputs in project design related to approaches to biosecurity enhancement at the national level
Ministry of Agriculture and Food Security ? Plant Quarantine	Policy and technical inputs in project design related to operational aspects of mitigation of IAS entry and export.
Town and Country Development Planning Office	Policy-level inputs in project design in addressing land management and habitat conservation/protection for the Leaf-toed Gecko under Component 1.
Environmental Health Department	Inputs in project design related to policy formulation and operational approaches in IAS (including rodents) management under both project components.
Coastal Zone Management Unit	Policy-level inputs on coastal zone conservation aspects in project design of significance to habitat conservation related to the Leaf-toed Gecko under Component 1.
Office of the Attorney General	Inputs in project design related to legislative enhancement mainly under Component 1.
Bureau of Gender Affairs	Inputs on integration of gender in the project design within policy aspects and benefits accrual to achieve gender equity and equality.

Stakeholders	Roles in Project Preparation
National Conservation Commission	Policy-level inputs in project design related to enhancing environmental resource management and expanding stakeholder engagement under both project components. Key role in development, operation and management of the proposed biosecure environment and conservation education centre.
Ministry of Tourism & International Transport	Policy-level inputs in project design related to private sector development and investment opportunities linked to conservation.
Barbados Defence Force	Inputs on operational aspects on the installation of the bio-secure facility at Paragon
Barbados Environmental Conservation Trust (BECT)	Inputs in project design related to resource mobilization in environmental resource management.
Barbados Hotel and Tourism Association	Inputs on project design related to land development policy and critical habitat conservation and resource mobilization in environmental resource management.
Barbados Real Estate Association	Inputs on project design related to land development policy and critical habitat conservation.
Barbados Estate Agents & Valuers Association Inc	Inputs on project design related to land development policy and critical habitat conservation.
Communities of Ragged Point and wider areas within Saint Phillip (communities of Bayfield, Sealy Hall, Whitehaven)	Broad consultative inputs with the Biodiversity Conservation and Management Section in formulation of the 2020 National Biodiversity Strategy and Action Plan and local landscape conservation. The communities will continue to be consulted to ensure that the project planning and development maintains local quality of life and creates potential for increased economic opportunity.
CABI	Project Executing Agency. Will lead the development of the full project proposal and coordinating inputs from all the stakeholders under the direction of the Biodiversity Conservation and Management Section of the MENB.
University of the West Indies (UWI)	Lead in provision of technical inputs in the design of project activities with particular focus on Component 2 in conservation of the Leaf-toed Gecko.

Stakeholders	Roles in Project Preparation
Fauna & Flora International (FFI)	Lead in provision of technical inputs in the design of project activities with particular focus on Component 2 in conservation of the Leaf-toed Gecko.
Re:wild	Lead in provision of technical inputs in the design of project activities with particular focus on Component 2 in conservation of the Leaf-toed Gecko. Crucial partner in sourcing private sector and international grant funding to aid in construction for Ragged Point Conservation Education Centre.
Caribbean Herpetological Society	Advisory inputs in the design of project activities with particular focus on Component 2 in conservation of the Leaf-toed Gecko.

3. Gender Equality and Women's Empowerment

Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).

The project will ensure gender equality, and during the project PPG design phase there will be assurance that there is balanced engagement of women and men to provide inputs on potential activities and priorities to be addressed under the project, that will continue through into implementation. In this regard, a gender action plan will be prepared under the full project development. This will draw on lessons and best practices from relevant projects. The project will utilize gender-disaggregated indicators to track equitable participation at both policy and technical levels and track the degree to which there are equitable accrual of benefits to stakeholders. This will be particularly relevant to the livelihood support elements of the project, particularly under Component 2 where potential for revenue generation associated with tourism linked to operation of the bio-secure environment/conservation education centre will be developed. Emphasis will be placed on enhancing community-based opportunities with attention paid to gender equity. The project will consider risks and limitations in respect to achieving gender balance that will need to be addressed not only during the course of project implementation, but also in realizing long term sustainability. Barbados has a Draft Gender Policy (2016), which was reviewed and endorsed by Cabinet in 2020. It is currently being reviewed by the Ministry of People Empowerment and Elder Affairs before being laid in Parliament. The project will emulate the strategic directions laid out in the national gender policy.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment? Yes

closing gender gaps in access to and control over natural resources;

improving women's participation and decision-making; and/or Yes

generating socio-economic benefits or services for women. Yes

Will the project?s results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Will there be private sector engagement in the project?

Yes

Please briefly explain the rationale behind your answer.

It is well recognized that the private sector will need to play a critical role in the project. This is mainly related to how property and infrastructure investment may be compromising ecosystem and habitat quality across landscapes. The core habitat of the Leaf-toed Gecko falls within highly sought-after coastal lands that possess views of the sea and access to beaches. Habitats for the other endangered target species, the Threadsnake and the Skink are confined to remnant forest fragments and wooded gullies that in many areas are potentially under threat from development. Land values are high and there is a strong drive for development and conservation that poses direct threat to the species. The project will have to engage stakeholders in the hospitality and the real estate development sectors to consider their perspectives and build consensus in long-term development options in areas that are deemed crucial for conservation of these endangered species. These dialogues will need to be in close consultation with the Town and Country Development Planning Office. The private sector will also be instrumental in working toward development of viable enterprises around potential ecotourism and other opportunities that marries conservation objectives and landscape conservation.

The combined facility that includes the biosecure area and conservation education centre, dedicated to conservation of some of the planet?s most critically endangered species, will be the very first of its kind in Barbados and in the Eastern Caribbean and will be promoted as a significant tourism attraction in the country. The project anticipates willing private sector uptake through already existing nature-based tourism offerings that are available. It will complement key attractions that include Harrisons Cave, Flower Forest, Andromeda Botanical Garden, Welchman Hall Gully and the Barbados Wildlife Reserve where based on most recent estimates from the BTMI upwards of 80,000 visitors take nature-based excursions annually. Based on demand for such experiences, the addition of this conservation attraction will constitute a significant asset with high revenue generation potential that will be a critical underpinning of the sustainability model post-project. Engagement of private sector particularly in the hospitality sector will be helpful in design elements of the proposed conservation attraction that will build on and maximize visitor experience in the context of marketing a unique Barbadian experience.

Opportunities can be expanded in terms of raising resources via philanthropic efforts and other financial recovery means to plough into maintenance of the bio-secure areas, associated facilities and conservation in general across the country. These will be explored in the PPG phase of project development.

5. Risks to Achieving Project Objectives

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	Risk level	Mitigation Measures
Limited policy level buy-in in respect to perceived priority and other competing national priorities.	Medium	The project will seek to gain commitment through expanded awareness among stakeholders including decision makers, institutions, private sector and communities in recognition of safeguarding and conservation of endangered biodiversity while contributing to enhanced economic benefits.
Limited public awareness and stakeholder apathy	Low-Medium	The project will ensure inclusion of a comprehensive stakeholder education programme based on messaging that underscores benefits for participation and investment. The design and implementation of the communications and outreach strategy will be core to raising awareness and creating buy-in.
Lack of private sector participation	Medium	The project will establish working relationships with private sector groups and cooperatives to gain inputs in the project design and to maintain buy-in and active participation over the course of the project.
Occurrence of natural and climate change-induced hazards (particularly tropical storms/hurricanes)	Medium	The project will include hazard risk management approaches in design and execution that will be otherwise mainstreamed in developed national frameworks. During the PPG phase these risks and mitigation measures will be better defined.

Risk	Risk level	Mitigation Measures
Imposition of COVID19 transmission mitigation measures (if crisis situation persists) and associated disruptions; challenges potentially related to post-pandemic economic recovery in terms of changing policy and priorities, personnel and material deployment.	To be determined	The full extent of the impact of the COVID19 Pandemic is not yet known nor is the influence it may have in the coming period when the project is expected to be implemented. The international travel restrictions may have implications for moving human resources/expertise that are required to support project implementation. The pandemic has had implications for resource deployments at the government level, along with the other project partners in response to the economic fallout, that could have prolonged impacts in terms of implementation and co-financing commitments. The project design phase will need to consider how the course of the pandemic unfolds in the country and at the global level. The GEF COVID19 guidance on project design will be followed in assessing and designing to account for critical issues including *inter-alia*, possible re-instatement of COVID-19 containment measures, change in capacity of stakeholders, changes in the baseline, change in conditions of beneficiaries and processes for stakeholder engagement.

6. Coordination

Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.

Institutional project structure, monitoring, evaluation and coordination: The project Executing Agency will be the Centre for Agriculture and Bioscience International (CABI) as designated by the GEF Operational Focal Point agency, the Ministry of Environment and National Beautification (MENB). A Project Cooperation Agreement (PCA) will be issued by UNEP to the CABI to establish this executing function, with provision of financial resources. A Project Steering Committee (PSC) drawn from relevant agencies of the Working Group on Biodiversity (WGB) will oversee the project implementation. The Chair of the PSC will be a designate of the MENB. A Project Management Unit (PMU) will be established by CABI with co-supervision of Biodiversity Conservation and Management Section. The PMU to undertake day-to-day management of the project and will be responsible for all technical and financial reporting.

The project will have policy and technical oversight of the WGB, and will establish working groups as needed to provide guidance on thematic areas and ensure technical quality of outputs in accordance with defined terms of reference. These technical working groups will be constituted in as far as possible within existing institutional arrangements to ensure mainstreaming. The project will aim for gender parity in representation on the PSC. The PSC will convene on a quarterly basis to review workplan execution and reporting outputs, decide on project directions and integration within national frameworks.

UNEP in capacity as Implementing Agency will have a seat on the PSC and be recipient of substantive technical reports (half-year, and annual Project Implementation Review reports) and quarterly financial reports. The PMU will ensure annual financial audits of expenditure conducted and contribute to the

conduct of a mid-term review and terminal evaluation, with engagement of the PMU and beneficiary stakeholders.

Coordination with other relevant GEF-financed projects and other initiatives:

(1) *UNEP-GEF Preventing COSTS of Invasive Alien Species (IAS) in Barbados and the OECS Countries:* This project commenced in mid-2018 and is scheduled to be completed by the end of 2022. Barbados is one of the three countries for which targeted on-ground pilot interventions are being implemented. The country is also benefiting from regional-level cooperation for capacity building and strengthening of regulatory systems. Under the project a Critical Situation Analysis (CSA) on IAS has been completed and the National Invasive Species Strategies and Action Plan (NISSAP) for country is under development. The project is contributing to the legislative drafting required to effect IAS control. A key highlight in the national pilot is the establishment of a bio-secure site for threatened native reptiles including the Barbados leaf-toed Gecko at Paragon within the compound of the Barbados Defence Force. Research collaboration between UWI and FFI is ongoing to monitor the population and distribution of the gecko. Barbados? national sub-project also includes control of invasive alien plant species in the context of an Integrated Gully System Management Plan, a rat and mongoose control program associated with mitigating nesting predation of hawksbill turtles and lionfish assessment and management. The country will also benefit from implementation of a regional IAS strategy and action plan, the adoption of the Caribbean Biosecurity Interception Database in Barbados and the wider Caribbean, the ?Declare, Dispose or Be fined? pilot, implementation of recommendations of the various risk assessments and access to the IAS App and Field Guides for improving IAS surveillance.

(2) *Biodiversity Enabling Activities Project - Assessment of Capacity Building needs and Country Specific Priorities in the Conservation of Biodiversity and Participation in the National Clearing House Mechanism* which includes components on taxonomic assessment, IAS and ABS. Under this project, the IAS Component includes a review of Plant Quarantine and Veterinary Services facilities at ports of entry with a view of upgrading these facilities to reduce the likelihood of the introduction of IAS through trade and transboundary movements, a review of local pet shops and breeders of popular pet species to create an up-to-date baseline on the state of the pet shop industry and exotic wildlife breeding industry and a review of draft Zoos legislation and survey of zoos and zoo-like institutions (exotic animal display facilities) with a view of updating the current baseline of the industry.

(3) There have also been multiple training workshops on the local and regional level to train officers on different aspects of biodiversity, including but not limited to multiple stakeholder inclusion, risk assessment for biosafety, training in access to benefit sharing of genetic resources, training of enforcement officers on illegal wildlife trade. Regionally, there is also the CARICOM Biosafety Bill and the CARICOM Biodiversity Strategy which Barbados is implementing.

7. Consistency with National Priorities

Is the Project consistent with the National Strategies and plans or reports and assesments under relevant conventions?

Yes

If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc

National Biodiversity Strategy and Action Plan (NBSAP): The revised (from 2002) NBSAP of 2020[29] will guide the conservation, management and sustainable use of biodiversity through 2035. It defines the current status of Barbados? biodiversity resources, the threats leading to its degradation and the strategies and priority actions to ensure its conservation and sustainable use. It specifies priority actions that span across issues in the areas of conservation and sustainable utilization of biodiversity; public awareness and education on biodiversity; biodiversity research, data storage and monitoring of species conservation. Target 6 of the NBSAP addresses IAS; ?*By 2030, invasive alien species and pathways are identified and prioritised, priority established species are managed and measures are in place to prevent the introduction and establishment of new invasive alien species.*? The Strategic Objectives under this target are (1) To minimise the impacts of invasive alien species of flora and fauna on local biodiversity and (2) To reduce the pathways by which invasive alien species of flora and fauna can enter local ecosystems. The following are the strategic actions:

1. Identify and update the list of IAS to Barbados.

2. Compile existing information and conduct studies to determine the population size of the priority IAS identified and their impact on biodiversity to date.

3. Establish species-specific strategies to eradicate or control population sizes of IAS to manageable levels. In cases where IAS impacts on native biodiversity cannot be controlled, biosecure areas for the conservation of threatened native species will be identified and resources sought to implement them.

4. Establish monitoring programmes, in collaboration with key agencies, to track populations of priority invasive species and their impact on biodiversity.

5. Develop legislation or amend existing legislation and regulations for border controls at all seaports and the airport with respect to all imported species

Barbados Physical Development Plan: The Overall guiding framework that governs management of the land resource base is the Barbados Physical Development Plan (PDP). Since 1970, Barbados has produced Physical Development Plans that seek to identify land use practices, community facilities and physical infrastructure that would support the island?s development goals. The 2017 PDP lays out policies to guide relationships among land uses, built form, mobility, community facilities and physical infrastructure. It is intended to be a framework to facilitate and guide investment, both public and private, in Barbados to the year 2035. The Plan lays out strategic policies[30] that are centered around promoting sustainable development and protecting core assets, specifically the resource base for food and agriculture, maintaining a natural heritage system, water resources, natural park, cultural heritage and community core. The plan also includes advancing implementation of the National Park and the Barbados System of Parks and Open Spaces, to preserve and expand natural systems, protecting the agricultural land base from fragmentation and alienation of land to non-agricultural uses, reserving the highest classes of agricultural land for the growth of food crops, and that agricultural practices are environmentally sustainable and implementing restorative actions, such as increasing vegetative cover.

[29] https://biodiversity.gov.bb/wp-content/uploads/2021/02/NBSAP-Report-Barbados-2020.pdf

[30] http://www.townplanning.gov.bb/pdp/Downloads/files/pdp/A-02_Strategic%20Policies.pdf

8. 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 proposed project will be guided by a knowledge management strategy. That will support and expand contributions from the regional GEF-UNEP IAS Project in knowledge outputs, their uptake and application. Knowledge management will be integrally linked to all areas of capacity building where the project will put in place measures to ensure that the resources are within easy access to professionals and the user community within Barbados. The project will foster a learning-by-doing approach particularly in respect to the field measures to be implemented under Component 2, where opportunities for technical exchanges between field conservation, captive breeding and IAS projects in other SIDS regions will be explored. This will be facilitated by a network of capacity building collaborators nationally, regionally and internationally (taking into account evolution of COVID-19 management protocols). The work from this project will build into the regional Caribbean Invasive Alien Species Network[31], a collaborative effort to address the issue of IAS in the Caribbean.

[31] http://caribbeaninvasives.org/

9. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

Overall Project/Program Risk Classification*

PIF	CEO Endorsement/Approval	MTR	TE
Low			

Measures to address identified risks and impacts

Provide preliminary information on the types and levels of risk classifications/ratings of any identified environmental and social risks and potential impacts associated with the project (considering the GEF ESS Minimum Standards) and describe measures to address these risks during the project design.

This project seeks to address direct drivers to protect habitats and populations of a critically endangered sepcies of gecko found only in Barbados through the prevention, control and management of Invasive Alien Species (IAS), habitat destruction and other threats. The project will lead to national lead agencies and relevant stakeholders adopting an improved integrated, regulatory framework to address drivers of biodiversity loss and enhance biosecurity, and contribute to an enhanced national capability for conservation of global populations of the critically endangered Barbados Leaf-toed Gecko. The project will result in the formulaton of relevant policy recommendations, legislative drafting instructions and accompanying management recommendations to support operationalization of an upgraded legislative and regulatory framework that enhances conservation efforst. The project will result in the installation of an additional bio-secure facility for safeguarding the endangerd Barbados Leaf-toed Gecko, along with associated capacity building for lead national agencies and partners. Population status and threat assessment, and determination of conservation requirements to inform management planning and interventions will be provided. Financial sustainability options and targeted education and awareness resources to support the species recovery will be presented to key stakeholders to secure long-term financial commitment and sustained conservation efforts through innovative partnerships.

Supporting Documents

Upload available ESS supporting documents.

Title	Submitted
CRC SRIF Barbados IAS_clean (uploaded)	

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 with this template).

Name	Position	Ministry	Date
Charley Browne	Operational Focal Point	Ministry of Environment and National Beautification	3/10/2022

ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place

Map 2. Proposed location for the project investments at Ragged Point