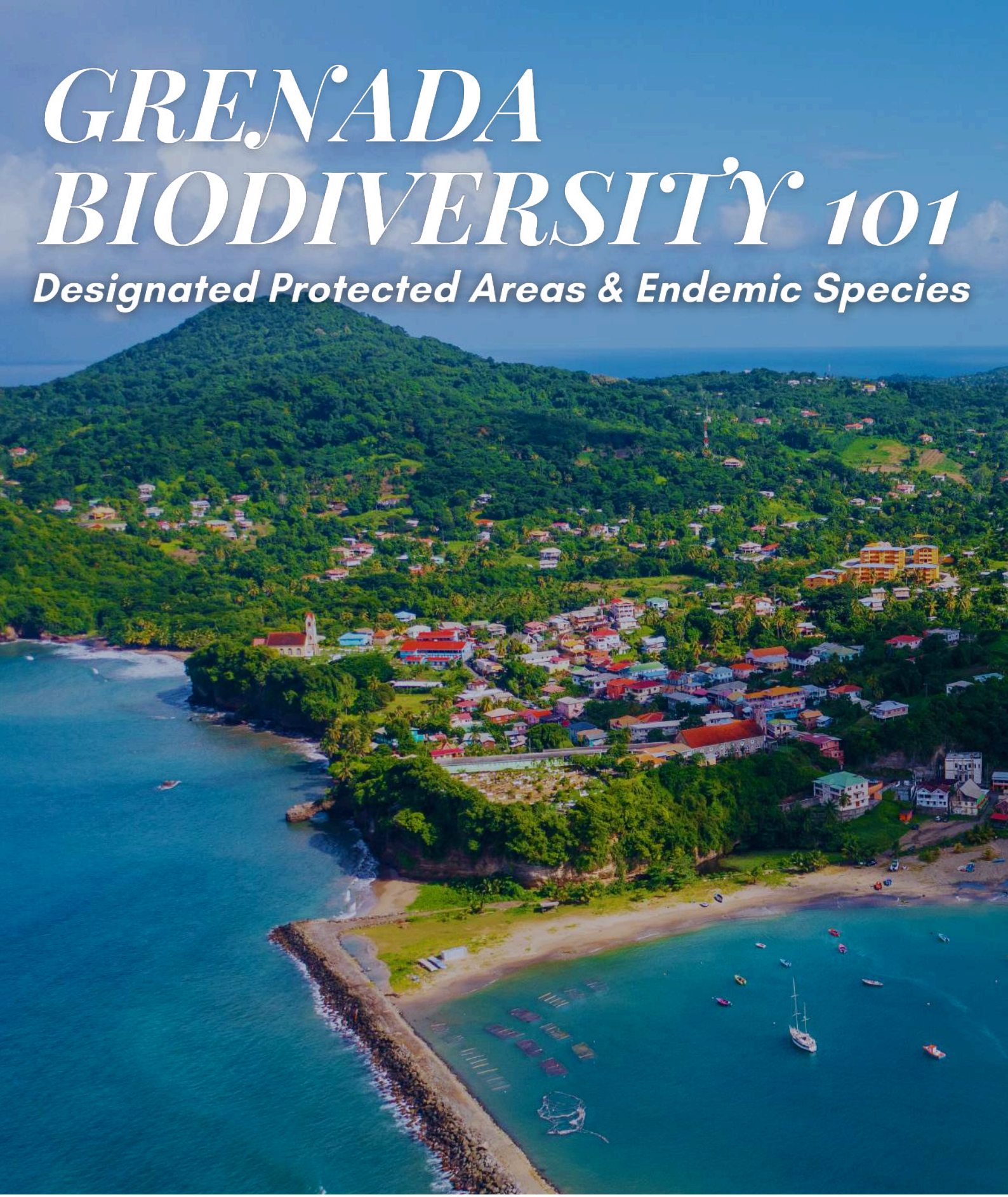
GRENADA BIODIVERSITY 101

Designated Protected Areas & Endemic Species



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GRENADA SUSTAINABLE DEVELOPMENT TRUST FUND INC.

CPAG CARIBBEAN PROTECTED AREAS GATEWAY

CARIBBEAN BIODIVERSITY FUND

AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

FFEM FONDS FRANÇAIS POUR L'ENVIRONNEMENT MONDIAL

Table of Contents

This publication has been authored and designed by Alyssa White, distinguished as the recipient of the 2023 Caribbean Regional Architecture for Biodiversity (CRAB) Internship. The CRAB Project's internship programme was pleased to lend support to Grenada Sustainable Development Trust fund to facilitate the creation of a public awareness and conservation knowledge tool for the implementation of target-focused and evidence-based conservation. within **Main-land Grenada** This internship was made possible with the financial support of Agence Française de Développement (AFD), French Global Environmental Facility (FFEM) and the Caribbean Biodiversity Fund (CBF). The internship is thankful to have received technical support from the Caribbean Protected Areas Gateway.

It is imperative to note that the views expressed in this magazine do not necessarily reflect those of the Government of Grenada or any international entities. The content draws from meticulously conducted interviews and comprehensive research, which were interpreted through the lens of the author, prioritizing significant topics and concerns identified by stakeholders.

Gratitude is extended to the Grenada Sustainable Development Trust Fund team, for their instrumental role in hosting the six-month internships and fostering valuable connections with some of Grenada's biodiversity experts. Furthermore, acknowledgment is duly rendered to CPAG for their instrumental contributions in developing the species distribution maps and visualizing the protected areas and their respective boundaries.

Glossary

IUCN Red List Categories

The IUCN Red List categories is a classification system developed by IUCN to understand the vulnerability status of species populations. This system is broken down into nine (9) categories as follows:

Not Evaluated The species population has not been assessed or evaluated.

Data Deficient There is inadequate information to make a direct or indirect assessment of its risk of extinction based on its population status or distribution.

Least Concern The species is assessed and seems to be thriving, with a distribution or population status that is neither threatened nor near threatened.

Near Threatened The species population size or distribution is small and may become smaller and has declined from previous assessments.

Vulnerable The species is likely to become endangered within the foreseeable future due to its population trend trajectory.

Endangered The species is considered to be facing a very high risk of extinction in the wild. And may soon be extinct within its native range.

Critically Endangered The species is considered to be facing an extremely high risk of extinction in the wild. And may be extinct within its native range.

Extinct in the Wild The species is not found in the wild and its last living members are kept in captivity or as a naturalized population outside its native range.

Extinct The species is no longer found in the wild and the last living member may have died.

Species Distribution Maping

The species distribution mapping was created utilizing data from open data sources such as BirdLife International and the IUCN Red List Database. The points indicated on the maps show locations that the species is expected to be in with a 2km radius around each point. These maps provide a representation of locations where endemic species are known to be found or may frequent. Data availability was one of the major issues encountered in this process due to the lack of assessments done for specific endemic species. Therefore only a small percentile were able to be visually represented through mapping. It is expected that the information provided can bolster conservation efforts and guide data collection for population abundance.

Pearls Airport, St. Andrew
Photography by Samuel Ogilvie

FONDS FRANÇAIS POUR L'ENVIRONNEMENT MONDIAL

Introduction to The French Fund for Global Environment (FFEM)

The French Fund for Global Environment (Le Fonds Français pour l'Environnement Mondial/FFEM) is a promoter of innovation in favour of environmental protection and sustainable socio-economic development in developing countries. Created in 1994 by the French government following the first Earth Summit, it has already supported more than 400 projects in more than 120 countries, two-thirds of which are in Africa. The FFEM works in partnership with public, private and civil society actors, from the South and the North, and with other donors and international organizations. The projects it finances generate environmental, social and economic benefits locally. They help preserve biodiversity, the climate, international waters, land and the ozone layer and fight against pollution. FFEM focuses on pilot projects to learn lessons and disseminate their innovations on a larger scale.

AFD
AGENCE FRANÇAISE
DE DÉVELOPPEMENT

Introduction to The French Development Agency (AFD)

The French Development Agency (Agence Française de Développement/AFD) group contributes to implementing France's policy on development and international solidarity, targeting areas of Climate, biodiversity, peace, education, urban planning, health and governance. AFD teams are involved in 4,200 projects with strong social and environmental impact in French overseas territories and more than 150 countries thus contributing to the commitment of France and the French to the Sustainable Development Goals (SDGs).

Lake Antoine, St. Andrew
Photography by Samuel Ogilvie

Introduction to the Caribbean Biodiversity Fund

The Caribbean Biodiversity Fund (CBF) is a regional umbrella environmental fund, established in 2012, that uses a flexible structure to implement innovative solutions and consolidate resource mobilisation in the Caribbean through a range of financial instruments. Working towards the vision of a Caribbean where both its natural environment and people thrive, the CBF aims to create reliable, long term funding for conservation and sustainable development in the region and now has 3 programs:

- The Conservation Finance Program based on an endowment fund and focuses on a Caribbean Sustainable Finance Architecture
- The Climate Change Program focused on Ecosystem-based Adaptation (EbA) approaches, and
- The Nature Based Economies Program working towards Advancing Circular Economy (ACE) Principles

The Caribbean Regional Architecture for Biodiversity (CRAB) Project

The CRAB Project was designed to contribute to the development of sustainable and sufficient resources for the conservation of ecosystems in the Caribbean Region. This will support, in the long term, the maintenance and restoration of the Caribbean's biodiversity and natural resources. The duration of the project, which started in July 2022, is 5 years. The final beneficiaries of the CRAB project will be the National Conservation Trust Funds (NCTFs) partners of CBF, protected areas managers, communities, and French actors in the region working in biodiversity conservation. Funding for the CRAB Project is 7 million Euros with resources from French Global Environmental Facility (FFEM) and Agence Française de Développement (AFD) of 4 million Euros, German Development Bank (KFW) of 500,000 Euros and Caribbean Biodiversity Fund (CBF) of 2.5 million Euros. The CRAB Project intends to achieve the following 3 main outcomes:

1. Strengthen the financial and operational capacities of the "Architecture" - both the CBF and partner NCTFs.
2. Position the "Architecture" as a key player in regional approaches to biodiversity issues.
3. Strengthen the capacity of the network to respond to local and regional conservation needs, especially in the context of emergency responses such as the COVID-19 pandemic.

Introduction to the Grenada Sustainable Development Trust Fund (GSDTF)

The **GSDTF** was established as a **Community-Based Non-Profit Organisation** in **2016** in connection with and formed part of, the Sustainable Financing & Management of Eastern Caribbean Marine Ecosystems Project, undertaken by the Global Environment Facility (GEF), The Nature Conservancy (TNC) and the governments of Antigua and Barbuda, Grenada, Saint Kitts and Nevis, Saint Lucia, and Saint Vincent and the Grenadines.

The project aimed to contribute to enhancing the long-term sustainability of protected area (PA) networks in the Organization of Eastern Caribbean States (OECS) region by (i) establishing sustainable financing mechanisms, (ii) strengthening MPA networks, and (iii) deploying a regional monitoring and information system for PA networks in the OECS region.

The Caribbean Biodiversity Fund (CBF) was established on **September 6, 2012**, as a non-profit organization under the Charity Commission for England and Wales, aimed at ensuring a sustainable funding stream for conservation and sustainable development in the Caribbean. Supported by the German government through KfW, The Nature Conservancy (TNC), the Global Environment Facility (GEF) via UNDP, and the World Bank, the CBF serves as a regional umbrella environmental fund. It focuses on enhancing regional conservation efforts through various financial instruments, with its first being the CBF Endowment. This endowment, initiated with **$42 million** in pledges from its donors, is designed to generate annual disbursements from investment earnings to support specific countries in the Caribbean.

Since the **GSDTF's** operations commenced in **2018**, the primary goal of the organization is to support the conservation and effective management of coastal, marine, and terrestrial ecosystems and sustainable development activities in Grenada.

Vision Statement

Promoting economic and human development through the conservation of our natural systems.

Mission Statement

T*o provide sustainable funding for environmental conservation and management.*

Introduction to the Caribbean Protected Areas Gateway (CPAG)

CPAG functions as a ***"Resource and Information Hub"*** for the Caribbean region, providing up-to-date, pertinent and accurate data and information, tools, resources and services to facilitate and promote viable decisions and policies by decision-makers and resources managers for effective and sustainable management of biodiversity and protected and conserved areas. It was launched in **November 2014** to be hosted by the **University of the West Indies** (UWI) and housed at the **Centre for Resource Management and Environmental Studies** (CERMES) at the **UWI Cave Hill Campus**. Two implementing partners support CPAG: 1) **the International Union for Conservation of Nature** (IUCN) and 2) the **European Commission-Joint Research Centre** (EC-JRC). CPAG is overseen by the IUCN Regional Office for Mexico, Central America and the Caribbean (ORMACC). CPAG works closely with the UN Environment-World Conservation Monitoring Centre (UNEP-WCMC), the entity responsible for the management of global knowledge products such as the World Database on Protected Areas (WDPA).

Mission Statement

To improve the long-term conservation and sustainable use of natural resources by reinforcing the management and governance of protected and conserved areas through better use and monitoring of data and information and via the enhancement of capacities throughout the Caribbean region.

Objectives

- To collate the most up-to-date, accurate and salient data and information from international, regional, national and local levels.
- To develop and provide tools and services to facilitate improved conservation and sustainable use of natural resources.
- To foster collaboration and facilitate networking and sharing amongst constituents.
- To communicate and disseminate relevant and pertinent information such as best practices, lessons learned, events, opportunities etc.

Kunming Montreal Global Biodiversity Framework

The Kunming-Montreal Global Biodiversity Framework is a global plan aimed at stopping the rapid loss of biodiversity around the world. The framework aims to respond to a major report from the ***Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*** (IPBES), which indicates that nature is declining at an alarming rate never seen before in human history. The report warns that without immediate action, about 1 million species could go extinct in the coming decades.

Biodiversity refers to biological diversity which is fundamental to human well-being, a healthy environment, and economic stability (CBD 2022). Inevitably, biodiversity is the foundation that supports all life on earth. Society is dependent on biodiversity for food, medicine, water, and many other essentials that ensure human survival.

This Framework builds upon previous efforts and lessons learned from the 2011-2020 biodiversity plan, setting ambitious goals to change the way societies interact with nature. By 2030, it aims to significantly reduce biodiversity loss, and by 2050, the goal is for humans to live in harmony with nature, aligning with the broader Sustainable Development Goals (CBD 2022).

The main goals of the Framework are to:

1. Encourage urgent and transformative action from governments, local communities, and everyone in society to reverse the trend of biodiversity loss.
2. Guide countries in updating and implementing their national plans for nature conservation, ensuring these efforts are focused on clear results.
3. Improve cooperation and consistency among different environmental agreements and organizations to strengthen global efforts to protect nature.

The Kunming-Montreal Global Biodiversity Framework is a call to action for the whole world to come together and work towards preserving the diversity of life on Earth. It emphasizes the need for immediate, coordinated actions to safeguard our natural world for future generations through a holistic approach that requires participation from both government/local authorities and local communities.

*According to the **IPBES** (2019), "An average of around 25 percent of species in assessed animal and plant groups are threatened, suggesting that around 1 million species already face extinction, many within decades, unless action is taken to reduce the intensity of drivers of biodiversity loss. Without such action, there will be a further acceleration in the global rate of species extinction, which is already at least tens to hundreds of times higher than it has averaged over the past 10 million years".*

Source: Convention on Biodiversity Kunming Montreal Global Biodiversity Framework Fifth Meeting Report

ALL ABOUT GRENADA

Grenville Town, St. Andrew
Photography by Samuel Ogilvie

Fact Sheet

Size of Island : ***348 km²***

Length of Coastline: ***121 km***

No. Designated Protected Areas: ***9***

No. Proposed Protected Areas: ***40***

No. of Endemic Species: ***39***

Ratified Conventions:

- *Convention on Biodiversity:* ***Since 1994***
- *Cartagena Protocol:* ***Since 2004***

Grenada and its sister islands, Carriacou and Petit Martinique, span approximately 348 km² and feature a rich diversity of ecosystems along their 121 km coastline, including mangroves, coral reefs, and seagrass beds. The nation has 71 watersheds while Carriacou has 8 major watersheds, Petit Martinique lacks permanent freshwater sources.

According to the Convention on Biodiversity Country Profile on Grenada (2023), agriculture dominates Grenada's land use, with about 75% of the land dedicated to farming, primarily permanent crops. Forests, mainly secondary growth following Hurricane Janet, comprise 20.8% of the land, with an annual forest loss rate of 0.9% since 1995. Data on forest status and trends is scarce. The country profile states that the island boasts unique biodiversity, including two endemic plant species and one tree species. Its fauna includes several species of amphibians, lizards, snakes, birds (with 18 considered threatened or endangered), native terrestrial mammals, and bats.

Mangroves cover approximately 3.4 km², featuring various types like red, black, white mangrove, and buttonwood. Coral reefs around Grenada occupy about 12.5 km². The island supports 233 marine species, 69 marine/brackish water species, numerous sea birds, and 17 freshwater species, underscoring its ecological significance and rich biodiversity.

Ecosystem Services

Ecosystem Services are the direct and indirect contributions ecosystems provide to human well-being and quality of life. These services can be broken down into four distinct categories: **provisional**, **reglating** **cultural**, and **supporting**These benefits can be received in the form of goods, materials, security, and health.

Mountain ecosystems are vital for their rich biodiversity and the numerous benefits they offer, including climate regulation, water cycling, and both recreational and cultural values. They are essential in supplying fresh water and are home to plants with medicinal properties. Additionally, these areas play a critical role in offering protection against natural hazards and erosion, underlining their importance in ecological balance and human well-being.

Mountain Ecosystem

Forest ecosystems support biodiversity, aid in climate regulation through carbon sequestration, and offer watershed services for freshwater management. They play critical roles in preventing land degradation, stabilizing soil, and serving as natural buffers against natural hazards, while also providing recreational spaces and essential resources. Also a prime location for Agro-foresty.

Forest Ecosystem

Freshwater ecosystems, encompassing lakes, rivers, and ponds, are crucial for providing water access and habitats for species yielding resources like food and medicine. These water bodies reflect the health of adjacent ecosystems, particularly forests, by regulating soil moisture and supporting the sustainability and biodiversity of surrounding environments.

Freshwater Ecosystem

Sandy beach ecosystems, favored for settlements and recreation, play a crucial role in defending against coastal erosion, high tides, and coastal hazards. Beyond protection, they offer goods and services meeting human needs, including support for nearshore fisheries, habitats for coastal birds and species, and key nesting sites for sea turtles, some which are also endangered ones.

Beach Ecosystem

Mangrove ecosystems provide critical environmental and economic benefits, such as wood and charcoal, coastal protection, and habitats for diverse species, supporting the marine food chain and fisheries. Additionally, they function as natural filtration systems and boost tourism, showcasing their multifaceted importance to both ecology and human activity.

Mangove Ecosystem

Seagrass beds are vital coastal ecosystems, serving as natural buffers and filtration systems, and offering regulatory services similar to other coastal ecosystems. They are important habitats and food sources for marine species, including urchins, turtles, and herbivorous fish, highlighting their crucial role in maintaining marine biodiversity and ecosystem health.

Seagrass Ecosystem

Coral reefs are vital ocean health indicators, providing essential habitats and food for marine species, and offering significant services like coastal protection, natural filtration, and tourism value. They also support fisheries, maintain genetic diversity, and possess intrinsic worth, highlighting their critical role in marine and human ecosystems.

Coral Reef Ecosystem

Designated Protected Areas

Grenada has a network of designated Protected Areas aimed at conserving its unique biodiversity and natural landscapes. These protected regions include national parks, marine protected areas, multiple-use resource areas and wildlife sanctuaries. Each Protected Area serves to preserve the island's rich ecosystems, such as its lush rainforests, vibrant coral reefs, and diverse mangrove swamps. Key Protected Areas include the Grand Etang National Park, known for its crater lake and diverse wildlife, and the Levera Wetland, which encompasses a significant wetland area important for bird life and migratory species. Additionally, the Moliniere-Beausejour Marine Protected Area safeguards part of Grenada's delicate coral reef systems and marine life. These Protected Areas play a crucial role in environmental conservation efforts, research, education, and sustainable tourism, contributing to Grenada's natural heritage and ecological balance. It is important to not only understand what is present within these areas but what inhibits effective conservation of these diverse ecosystems.

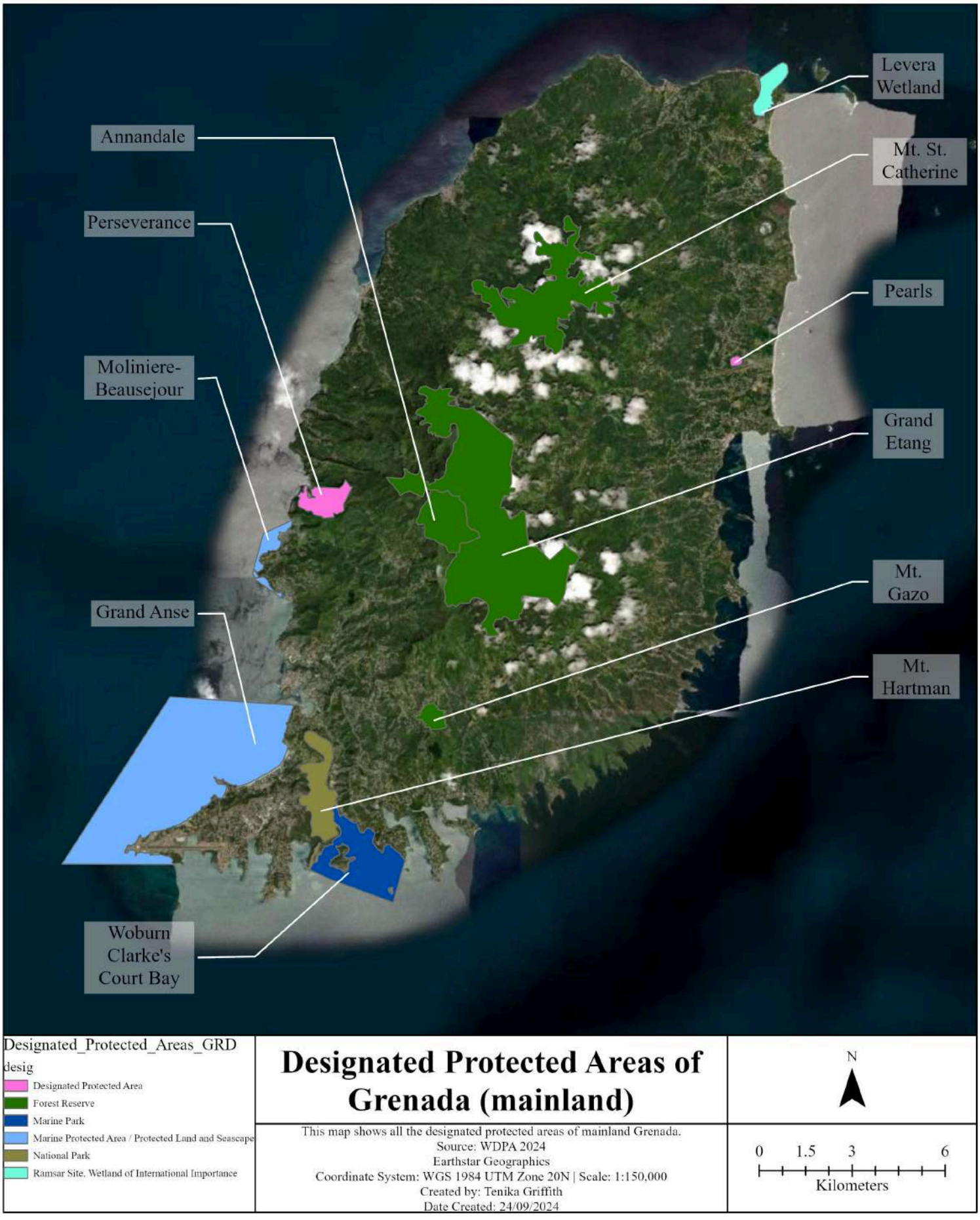
Terrestrial Protected Areas

- **Grand Etang Forest Reserve**
- **Mount St. Catherine Forest Reserve**
- **Annandale Forest Reserve**
- **Perseverance Dove Sanctuary**
- **Levera National Park Inclusive of Levera RAMSAR Site**
- **Mount Hartman National Park**
- **Morne Gazo Forest Reserve**
- **Pearls Crownlands**

Marine Protected Areas

- **Grand Anse**
- **Woburn Clarke's Court Bay**
- **Molinière-Beauséjour**

The Pearls PA was not designated for its ecological value but primarily for its historical and culture significance. Therefore, the PA's information was not documented within this magazine.


Levera Wetland
Annandale
Mt. St. Catherine
Perseverance
Pearls
Moliniere-Beausejour
Grand Etang
Mt. Gazo
Grand Anse
Mt. Hartman
Woburn Clarke's Court Bay
Designated_Protected_Areas_GRD
desig
Designated Protected Area
Forest Reserve
Marine Park
Marine Protected Area / Protected Land and Seascape
National Park
Ramsar Site, Wetland of International Importance
Designated Protected Areas of Grenada (mainland)
This map shows all the designated protected areas of mainland Grenada.
Source: WDPA 2024
Earthstar Geographics
Coordinate System: WGS 1984 UTM Zone 20N | Scale: 1:150,000
Created by: Tenika Griffith
Date Created: 24/09/2024
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0 1.5 3 6
Kilometers

Grand Etang Forest Reserve

Fact Sheet

Size of TPA : **3816 acres**

Ecosystem Type: **Tropical Forest Ecosystem**

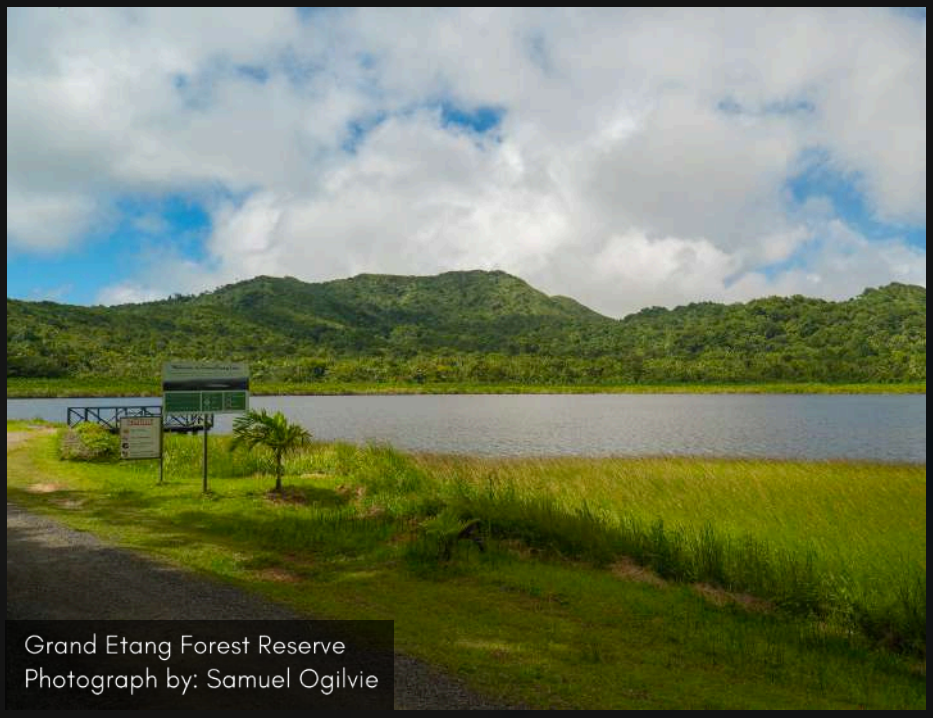
Year of Designation: **1906**

Year Gazetted: **1906**

Designation Type: **Forest Reserve**

Purpose: **Forest Reserve & Wildlife Sanctuary**
Management Type: **National Agency**

Governance Agency: **Forestry & National Parks Department**



Grand Etang Forest Reserve
Photograph by: Samuel Ogilvie

The Grand Etang Forest Reserve is located in the south-central mountains of Grenada. It spans across the parishes of St. John, St. Andrew, St. David, and St. George. The reserve is home to a diverse range of ecosystems including major forest communities such as Cloud Forest, Montane Thicket, Secondary Tropical Forest, and Lower Montane Rainforest. The Grand Etang Forest Reserve experiences an average annual rainfall of 2500mm and plays a crucial role in maintaining the ecological balance and providing habitats for various threatened animal species. The forest reserve is very valuable, especially the Grand Etang Lake which is utilized for fresh water consumption on the island. It is home to many valuable species such as the **Nine Banded Armadillo**, **Mona Monkey**, **Endemic and Endangered Grenada Piping Frog**, **Lesser Antillean Tanager**, and much more. The geological features of the reserve serve as an important water catchment area which is one of its significance for being designated a protected area. The reserve was designated over 100 years ago within the mid 1960's. The current status of the reserve is unknown as the reserve experiences a lack of assessments due to resource and technical deficiencies.

Ecosystem Services

Source: : Annandale and Grand Etang Forest Reserves Management Plan (2019)

The goal of designating Grand Etang Forest Reserve as a protected area is to protect and preserve the forested lands within the area and ensure a constant supply of water to the communities within Grenada. The objectives of the TPA are to:

- Ensure the conservation of the forested areas within the reserve to maintain their ecological integrity and biodiversity.
- Maximize the benefits of the tropical forest for the adjacent communities by implementing sustainable resource use and economic opportunities.
- Fulfill and comply with obligations under the Convention of Biological Diversity related to biodiversity conservation and sustainable resource management.
- Increase public awareness about the environmental, social, and economic values of the Forest Reserve.
- Foster partnerships with non-governmental organizations and local communities for the effective management of the reserve.

Management Issues & Needs

Ecological Management & Conservation	Operational Resources	Capacity Building & Enforcement
Invasive species pose a significant threat to the reserves' biodiversity, with plants like Bamboo and aquatic species like Tilapia altering natural habitats. Additionally, unregulated tourism activities contribute to trail erosion, demanding improved management practices and conservation strategies to protect ecosystem integrity. Siltation and eutrophication in Grand Etang Lake are caused by the aquatic reed Mocu Mocu, reducing water storage capacity and increasing water loss through evapotranspiration.	The reserves face critical shortages in staffing and transportation, with only three dedicated rangers responsible for extensive areas and no vehicles or bikes for mobility. Infrastructure is also in disrepair due to inadequate maintenance, hampering effective management and operations within the reserves.	Rangers and guards lack essential training and the authority to enforce regulations, limiting their effectiveness in conservation efforts. The absence of a structured capacity-building program and enforcement power undermines the reserves' protection and regulatory compliance.

Mt. St. Catherine Forest Reserve

Fact Sheet

Size of TPA : **2308 acres**

Ecosystem Type: **Elfin Cloud Forest**

Year of Designation: **2018**

Year Gazetted: **N/A**

Designation Type: **Forest Reserve**

Purpose: **Endangered Ecosystem & Ecosystem Services Protection**

Management Type: **National Agency**

Governance Agency: **Forestry and National Parks Department**

Tufton Hall Waterfalls
Photograph by S. aucoin

The Mount St. Catherine Forest Reserve in Grenada is a crucial conservation area due to its biodiversity and ecosystem functions. The reserve is home to the largest area of Elfin cloud forest on the island, as well as important geological features like hot springs and geothermal pools. It serves as a significant water catchment area for Grenada's citizens, making its protection essential for water supply sustainability. The water resources in the cloud-forest ecosystem of the reserve play a vital role in providing significant rainfall and mist condensation that contribute to the island's water supply. Protecting the Mount St. Catherine Forest Reserve is crucial not only for biodiversity conservation but also for maintaining water resources, mitigating natural hazards, and preserving the unique ecological features of Grenada's highland forests. Forestry activities in the reserve has been limited, with no timber production, and efforts to impede deforestation. Agriculture surrounding the area primarily includes nutmeg and other tree crops, with a focus on climate-smart practices for soil and watershed protection. Tourism potential lies in developing tourism products around the plantations and geothermal features which also provides opportunity for renewable energy. Hiking trails offer diverse experiences from gentle strolls to challenging treks, with plans for upgrading signage and guides.

Ecosystem Services

Source: : Mount St. Catherine Management Plan (2019) & Aucoin. S (2018) Mount St. Catherine Forest Reserve Environmental Baseline Assessment

The Mount St Catherine Forest Reserve is home to various endemic species, both fauna, and flora, such as the Grenada Piping Frog, Grenada Tree Boa, Tree Ferns, and more. According to the latest environmental baseline assessment done in 2018 and drafted management plans, the objectives for the reserve's designation can be deciphered as:

- To safeguard the diverse range of endemic and threatened species within the reserve to preserve its ecological integrity.
- To effectively capture, filter, and maintain the reserve's water supply, ensuring its sustainability for domestic and agricultural use and preserving water quality.
- To enhance the reserve's resilience against climate change by employing conservation strategies that address temperature increases, rainfall variability, and their effects on ecosystems and water resources.
- To foster sustainable land use and eco-tourism within and around the reserve, engaging local communities in conservation efforts.
- To establish the reserve as a hub for scientific research and environmental education, focusing on conservation, ecology, and the impacts of climate change, thereby fostering a greater understanding and appreciation of these critical issues.

Management Issues & Needs

Socio-Economic Integration	Climate Change & Water Resource Management:	Environmental Management
Integrating sustainable land use and promoting eco-friendly tourism are vital for the reserve's socio-economic development. This involves community engagement and sustainable forestry practices to mitigate deforestation, developing eco-tourism to leverage the reserve's potential while ensuring conservation, and engaging stakeholders to address hunting and land use conflicts.	Adaptation to climate change with increased temperatures and reduced rainfall is essential, focusing on enhancing the resilience of ecosystems and water resources. Efforts should include comprehensive water management to preserve water quality and quantity, alongside increased research to inform adaptive strategies and monitor ecosystem processes.	The Mount St. Catherine Forest Reserve requires targeted biodiversity conservation to protect endemic species and manage habitat loss. Mitigation strategies are needed for natural hazards like landslides and flash floods, and controlling invasive species is crucial to maintaining the ecological balance and protecting native biodiversity.

Annandale Forest Reserve

Fact Sheet

Size of TPA : **590 acres**

Ecosystem Type: **Tropical Rainforest Ecosystem**

Year of Designation: **2006**

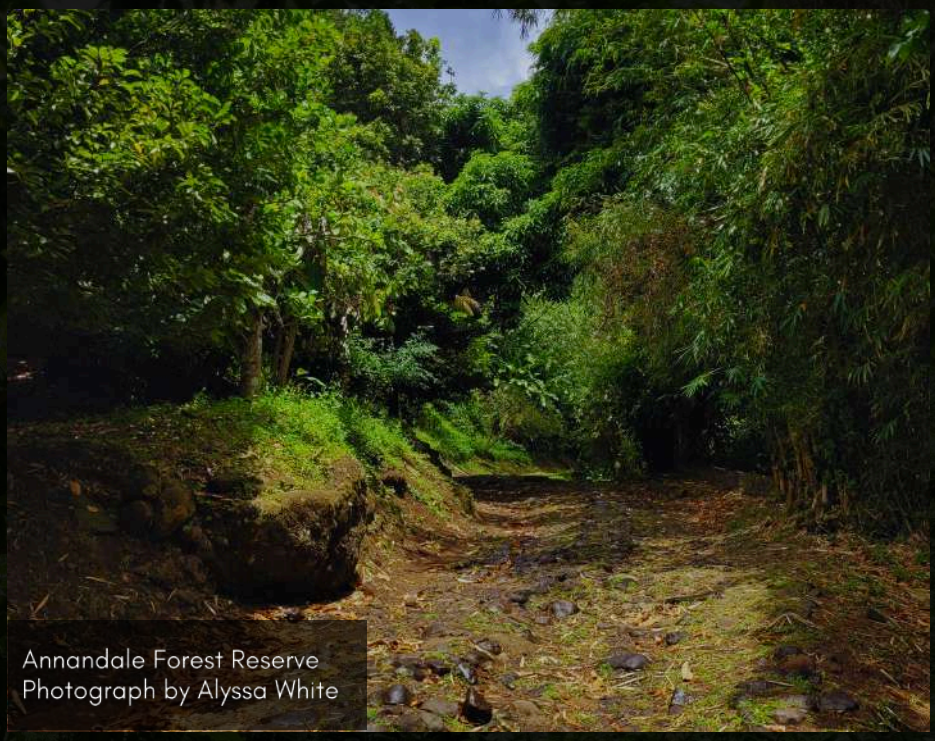
Year Gazetted: **2006**

Designation Type: **Forest Reserve**

Purpose: **Forest Preservation & Sustainable Resource Use**

Management Type: **National Agency**

Governance Agency: **Forestry & National Parks Department**



Annandale Forest Reserve
Photograph by Alyssa White

Annandale Forest Reserve is located in the central part of the island. The area possesses a tropical rainforest ecosystem and is characterized by its high annual rainfall, nutrient-rich soil, high average temperatures, and rich biodiversity. The area was designated for sustainable resource use. Currently, a large part of the reserve is utilized for agriculture, primarily "**Agro-forestry**". Farmers on the outskirts of the reserve benefit from the dense tree cover. Within the reserve, the Annandale Dam can be found which contributes to the water supply of the island. Additionally, the reserve features a popular tourist attraction called the Annandale Waterfalls. It is one of the island's highlights for tourism and you will often find the area frequently populated to visits the attraction. In regards to the forest reserve, it is unknown the current status of the reserve or the communities within the protected area due to a lack of clarity and assessments of the area. This potentially stems from staffing deficiencies.

Ecosystem Services

Source: : Annandale and Grand Etang Forest Reserves Management Plan (2019)

The goal of designating Annandale Forest Reserve as a Protected Area was to conserve its biodiversity, protect its natural resources, and provide opportunities for sustainable resource use and recreation. To achieve this, the designation is to facilitate:

- The conservation and preservation of biodiversity within the forest reserve to maintain ecological balance and prevent species loss.
- The protection and safeguarding of natural resources within the reserve.
- Promote sustainable resource use by implementing responsible and sustainable practices and utilization of forest resources without depleting the ecosystem.
- Creating recreational opportunities and supporting sustainable livelihoods by incorporating eco-tourism within the reserve to generate income.
- The protection of wildlife and cultural heritage sites within the reserve and maintain their intrinsic value and significance.
- Implementing measures to mitigate erosion and soil infertility while addressing soil conservation and water management.

Management Issues & Needs

Community Engagement and Education	Financial Constraints	Research and Monitoring
The problems of invasive species introduction, and inadequate regulation of tour operators, can be resolved through community involvement in conservation efforts. This suggests a need for increased community engagement and education. Educating the local community and visitors about the reserves' ecological value and the impact of their actions can be crucial in mitigating threats like invasive species introduction and trail degradation.	The lack of adequate financial resources is implied through issues like the inability to reimburse rangers for travel expenses, the absence of equipment for patrolling and managing the reserves, and insufficient funds for infrastructure maintenance. This suggests a broader issue of budgetary limitations affecting various operational aspects of reserve management.	The lack of natural resource management, monitoring, and research activities suggests an underlying issue related to inadequate data collection and baseline information to examine trends and projections. This includes the absence of quantifiable data on the impact of invasive species and the lack of regular monitoring to inform management decisions and conservation strategies.

Perseverance Dove Sanctuary

Fact Sheet

Size of TPA : **280 acres**

Ecosystem Type: **Mix Dry & Humid Forest**

Year of Designation: **1996**

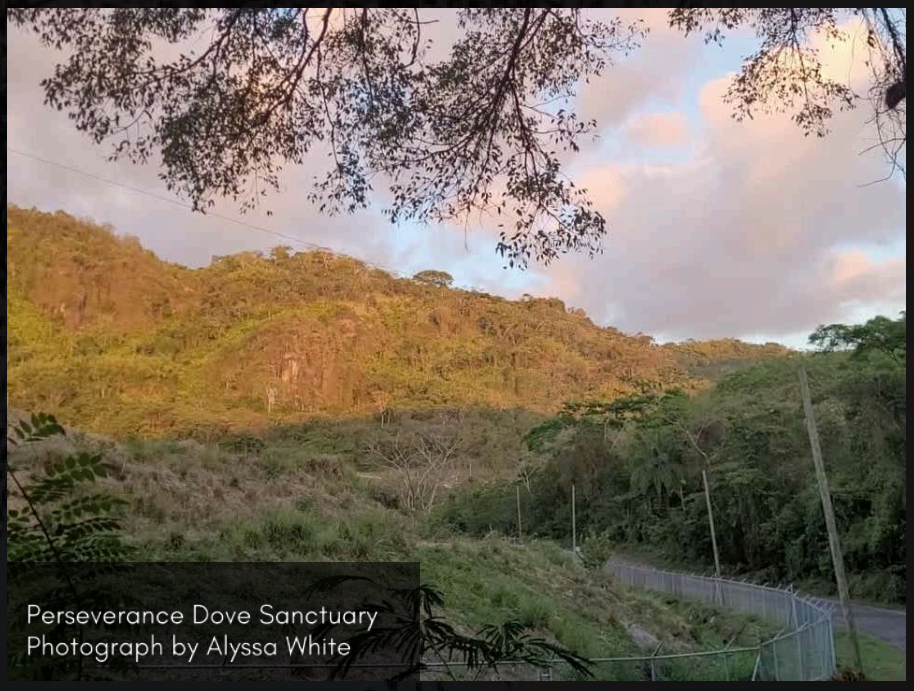
Year Gazetted: **2008**

Designation Type: **National Park**

Purpose: **Dove Sanctuary**

Management Type: **National Agency**

Governance Agency: **Forestry & National Parks Department**



Perseverance Dove Sanctuary
Photograph by Alyssa White

The Perseverance Protected Area (PPA) and Dove Sanctuary in Grenada is a significant conservation site covering 280 acres of diverse ecosystems. Situated in a tropical climate with an annual rainfall of 1500-2000 mm, the area boasts steep concave slopes that drain into the Salle and Douce rivers. The PPA is characterized by a mix of secondary scrub woodland and deciduous forest, hosting a variety of native and exotic species. Canopy species like Haemotoxylon campechianum and Pisonia fragrans, along with understory plants such as Acacia macrantha and Citharexylum fruticosum, contribute to the rich biodiversity of the area. It is significant to note that this protected area is adajcent to the country's dumping site which may pose a challenge to the dove sanctuary and Grenada dove populations.

Ecosystem Services

Source: : Perseverance Management Plan (2019)

The primary focus of the PPA is the protection of the Grenada Dove, a critically endangered endemic bird species. Designated as an Important Bird Area, the PPA plays a crucial role in conserving the habitat of this rare bird. The goal of the PPA is to conserve critical habitat and species, with objectives focusing on:

- Maintaining key ecological processes.
- Improving environmental sustainability.
- Supporting international conservation agreements.
- Raising national awareness.
- Enhancing livelihoods.
- Facilitating partnerships for effective Protected Area Management.

Management Issues & Needs

Community Engagement and Utilization	Conservation Strategies	Resource Allocation and Infrastructure
Another critical issue is the lack of specific plans to enhance community participation, promote sustainable resource utilization, and address livelihood opportunities within the PPA. Engaging local communities in conservation efforts, providing alternative livelihood options, and fostering partnerships for sustainable resource management are essential for achieving conservation goals and ensuring the long-term success of the Protected Area.	The primary management issue revolves around the development and implementation of effective conservation strategies to safeguard the globally endangered Grenada Dove and its habitat within the Perseverance Protected Area (PPA). This includes addressing threats such as invasive species and habitat degradation to ensure the long-term survival of the species and maintain biodiversity. Issues surrounding the nearby dumping site should also be addressed.	Limited staffing, inadequate budget allocation for management activities, and the absence of essential infrastructure pose significant challenges for the effective management of the PPA. Insufficient resources hinder the implementation of conservation programs, maintenance of facilities, and enforcement of regulations, impacting the overall protection and sustainability of the area.

Levera National Park

Fact Sheet

Size of MPA : **450 acres & 26 km²**

Ecosystem Type: **Tropical Terrestrial & Marine Ecosystem**

Year of Designation: **N/A**

Year Gazetted: **N/A**

Designation Type: **National Park**

Purpose: **Significant Mangrove Swamp**

Management Type: **National Agency**

Governance Agency: **Forestry & National Parks Department and Marine Resources Division**

Levera Wetland
Photograph by Samuel Ogilvie

Levera is located in the northeastern corner of Grenada and consists of three out islands: Sugarloaf Island, Green Island, and Sandy Island. The area is also regarded as a Local Marine Managed Area (LMMA). The area possesses a tropical marine ecosystem consisting of mangroves, sandy beaches, seagrass beds, and coral reefs. Levera Beach is famous for being a popular nesting site for the endangered leatherback and hawksbill sea turtles as well as other turtle species. Despite being a Protected Area, Levera is not designated and has no legal protection status in Grenada but possess some form of legal protection as the area is identified as a RAMSAR site under the RAMSAR Convention due to its significant mangrove wetland. However, the wetland is currently under development and has undergone dramatic changes in recent changes. Due to the disconnection between the wetland and the sea, the area is subject to flooding with water beyond its holding capacity. This has inhibited locals and stakeholders in the area from accessing the wetlands during certain times of the year (predominantly wet season).

Ecosystem Services

Source: Grenada Sustainable Development Trust Fund Situational Analysis of MPAs in Grenada

The goal is to designate Levera as a marine management area (LMMA) to maintain and improve the ecological integrity and resilience of the ecosystem to negate the negative impacts of climate change (Grenada Coral Reef Foundation 2018). The objectives of this designation are similar to the other MPAs on the island. The objectives are to facilitate:

- The protection and enhancement of the marine and terrestrial resources situated within the MPA.
- The development and maintenance of current and future sustainable livelihoods within and adjacent to the MPA.

Management Issues & Needs

Awareness and Educational Initiatives	Legal and Management Structures	Environmental Challenges and Development Concerns
There is a concern about the lack of awareness of regulations, protocols, and management in the Levera area. Knowledge Exchange visits with locals and stakeholders are highlighted as a valuable tool for inspiring change, acceptance, and a shared vision among communities regarding the potential benefits of Marine Protected Areas (MPAs) and their designation. These visits are especially crucial for fishermen and local communities whose livelihoods are intertwined with the MPA. It will also be inclusive of education about the benefits of the proposed area with organized site visits and incentives for positive practices is suggested as methods to foster acceptance and participation.	There is uncertainty regarding the potential for legal arrangements with local organizations to aid in managing the proposed LMMA and the involvement of surrounding community residents. A comprehensive management approach that balances conservation with community needs and livelihoods including practices such as catch and release are crucial for effective management of the marine and terrestrial spaces.	Concerns have been raised about the potential environmental impacts of the massive hotel development within the Levera wetland, including accelerated beach erosion, and the multifaceted threats to Levera Pond and the beach. These factors compromise the ecological integrity of the area, necessitating discussions on sustainable development practices and conservation measures to mitigate these effects.

Mt. Hartman National Park and Dove Sanctuary

Fact Sheet

Size of MPA : **152.8 acres**

Ecosystem Type: **Dry Forest Ecosystem**

Year of Designation: **1996**

Year Gazetted: **2008**

Designation Type: **National Park**

Purpose: **Wildlife Sanctuary**

Management Type: **National Agency**

Governance Agency: **Forestry & National Parks Department**

Mt. Hartman National Park
Photograph by: Grenada Land Actors

Mt. Hartman National Park and Dove Sanctuary is located in Grenada and covers a landscape with secondary dry scrub forest, grassland patches, and various plant species. The Mt. Hartman National Park is situated on a flat to undulating hills topography with elevations ranging from sea level to 400 ft. It is bordered by residential subdivisions, a marina, and a research facility. Activities in the area include wildlife viewing, birdwatching, and nature trails, with significance lying in the conservation of the Grenada Dove and other species such as the endemic subspecies, the Grenada Hook Billed Kite. The park serves as a critical habitat for the Grenada Dove and other wildlife species, offering ecosystem services like supporting biodiversity, protecting coastal areas, and providing recreational opportunities for visitors such as hiking and picnicking.

Ecosystem Services

Source: : Mt. Hartman National Park Management Plan (2019)

The primary goal of designating the Mt Hartman National Park as a Protected Area is to safeguard the habitat of the critically endangered Grenada Dove and other wildlife species endemic to Grenada. It can be derived that the objectives surrounding the establishment of this Protected Area are:

- Conserve biodiversity, particularly the habitat of the Grenada Dove and other endemic species.
- Protect critical habitats such as coastal areas, seagrass beds, and coral reefs.
- Promote sustainable land use practices within the park.
- Provide opportunities for research, education, and eco-tourism to raise awareness and support conservation efforts.

Management Issues & Needs

Research and Scientific Monitoring	Infrastructure Maintenance	Biodiversity Conservation
There is a need for ongoing research, scientific monitoring, and data collection to assess the health of the park's biodiversity, track changes over time, and make informed management decisions to support conservation efforts effectively. It is suspected that the endemic species, Grenada Dove, is declining, and monitoring is needed to evaluate their health and status.	There is a concern for the quality and maintenance of the area. The park requires regular maintenance of facilities such as the Visitor Center, trails, and viewing towers to ensure they are functional and safe for visitors and staff. However, this would require better staffing of the managing agency to execute these needs especially since there is an expected human resource challenge regarding these areas.	There is concerns regarding the protection of the Grenada Dove and other endemic species which currently are impacted by proposed developments within the area cause habitat degradation. There should also be an emphasis on the management of invasive species for the dove's protection.

Morne Gazo National Park

Fact Sheet

Size of MPA : **62 acres**

Ecosystem Type: **Semi- deidous Dry-Forest Ecosystem**

Year of Designation: **1906**

Year Gazetted: **1999**

Designation Type: **Forest Reserve**

Purpose: **Forest Reserve & Wildlife Sanctuary**

Management Type: **National Agency**

Governance Agency: **Forestry & National Parks Department**

Morne Gazo National Park Look Out Point
Photograph by Alyssa White

The Morne Gazo Forest Reserve is located in Grenada specifically in the southern part of the island, near the villages of Perdmontemps, Morne Delice, Berrotte, Belplane, Old Westerhall, La Femme, and St. Pauls. It primarily consists of tropical semi-deciduous rainforest with evergreen trees like Bois Bande at higher elevations. The area provides essential ecosystem services such as climate regulation and supports sustainable livelihoods, ecotourism, and rural communities. As a Forest Reserve, it plays a crucial role in biodiversity conservation, soil and water management, and preserving cultural heritage, making it a significant Protected Area in Grenada. Highlights should be given to the GSDTF and the aid of the Forestry Department for the work being done within the reserve in collaboration with a local business owner to address issues regarding safety and infrastructure deficiencies.

Ecosystem Services

Source: : Morne Gazo Management Plan (2019)

The main goal of establishing the Morne Gazo Forest Reserve is to conserve biodiversity, manage soil and water resources sustainably, and provide ecosystem services that support recreational activities, ecotourism, and other services enjoyed at the site. It can be derived that the objectives surrounding the establishment of this Protected Area are:

- Prevent encroachment and illegal harvesting within the Reserve
- Develop sustainable livelihoods at the community level
- Enhance safety and security on-site
- Improve visitors' experience through creativity and innovation
- Increase visitors' numbers within the site's carrying capacity
- Sustain viable ecotourism and recreational opportunities in harmony with existing policies and standards

Management Issues & Needs

Governance and Stakeholder Engagement

The Morne Gazo Forest Reserve faces challenges in establishing effective governance mechanisms that involve local community stakeholders in decision-making processes. Strengthening co-management arrangements is crucial to ensure active participation and shared responsibility for the Reserve's management. Enhancing communication and coordination among various departments and organizations is essential to streamline efforts and achieve common conservation goals.

Visitor Safety and Experience

The Reserve faces challenges in implementing solid waste management guidelines and procedures to maintain cleanliness and environmental sustainability. Ensuring the maintenance of facilities and trails is essential to prevent risks of injuries and fatalities among visitors. Developing Standard Operating Procedures for Emergency Preparedness and Response is crucial to enhance visitor safety and provide efficient emergency management services on-site.

Financial and Resource Management

Access to sustainable financing and resources for prime management is a critical issue for the Reserve. Conducting capacity assessments to identify and address priority human and material needs is necessary to enhance operational efficiency. Developing alternative livelihood options for individuals engaged in illegal harvesting activities can help alleviate pressure on the Reserve's resources.

Grand Anse

Fact Sheet

Size of MPA : **19.7 km²**

Ecosystem Type: **Tropical Marine Ecosystem**

Year of Designation: **2018**

Year Gazetted: **2020**

Designation Type: **Marine Park**

Purpose: **Marine Protected Area**

Management Type: **National Agency**

Governance Agency: **Marine Resource Division**

Grand Anse Beach
Photograph by: Samuel Ogivile

The Grand Anse Marine Protected Area is located along the southwestern coast of Grenada and extends approximately 2 miles seaward from the shoreline. The boundaries of the MPA extend from the entrance of St. George Harbor to the south of the Airport's shores. The major coastal marine habitats within the boundaries of Grand Anse are coral reefs, seagrass beds, and sandy beaches. The seaward boundaries of the MPA contain critical shallow water habitats that provide a habitat nursery to key marine commercial species and critical deep-water habitats that are mainly for fisheries and mooring fields. The MPA is one of the most popular beach areas on the island and is utilized regularly by local beach users, boat operators, and hotel/tourism businesses. The MPA is divided based on a drafted zonation system to allow for sustainable usage of marine resources while safeguarding key marine species. The Multi-use area is subdivided into further zones where specific fishing practices are prohibited in some designated areas, primarily the shallow-water areas. Grand Anse was designated a marine protected area (MPA) in 2018 and officially legalized and gazetted in March 2020 under the Fisheries Marine Protected Area Order. However, since 2020, there has been no active management of the MPA.

Ecosystem Services

Source: Grenada Sustainable Development Trust Fund Situational Analysis of MPAs in Grenada

The goal for the establishment of the Grand Anse MPA is to maintain the ecological integrity of the marine ecosystems within the MPA and improve its resilience to the impacts of climate change. The objectives outlined in the 2016 management plan aim to facilitate:

The protection and enhancement of habitats in the area for key fish and other aquatic species.

- To maintain and enhance the quality of marine resources in the area for sustainable livelihoods.
- To improve user experiences in the Marine Protected Area.
- To maintain ecological integrity for the Grand Anse reef system and enhance its resilience to the impacts of climate change.

Management Issues & Needs

Legislation and Enforcement	Community Engagement and Livelihoods	Safety and Environmental Management
Clarification in legislation is crucial to outline clear roles and responsibilities for those enforcing the Marine Protected Area (MPA) regulations. There's also a need to update cruising charts and other maritime documents to ensure they accurately represent the MPA's boundaries and rules, aiding in better compliance. Addressing perceptions of biased enforcement among fishers by adopting fair and consistent enforcement strategies is essential for maintaining trust and cooperation. It should be noted that revision of fees and fines for users is recommended for effective management.	The implementation of the MPA has led to concerns among fishers about their livelihoods being disproportionately affected. It is vital to explore and revisit alternative livelihood opportunities to support the community's transition. Furthermore, fostering partnerships with fishers for enforcement patrols presents an innovative approach to enforcement and offers an alternate source of income, while discussions with beach seine operators on rule adaptations reflect the need for regulatory flexibility in response to changing practices.	Safety concerns arise from yachts navigating on autopilot and speeding within the MPA, necessitating the introduction of specific safety measures to protect all MPA users. Additionally, the establishment of waste handling protocols within the MPA is crucial for preventing pollution and safeguarding the marine environment's health. These steps are integral to ensuring the MPA's sustainable management and the safety of its diverse users.

Woburn Clarke's Court Bay

Fact Sheet

Size of MPA : **4.21 km²**

Ecosystem Type: **Tropical Marine Ecosystem**

Year of Designation: **2001**

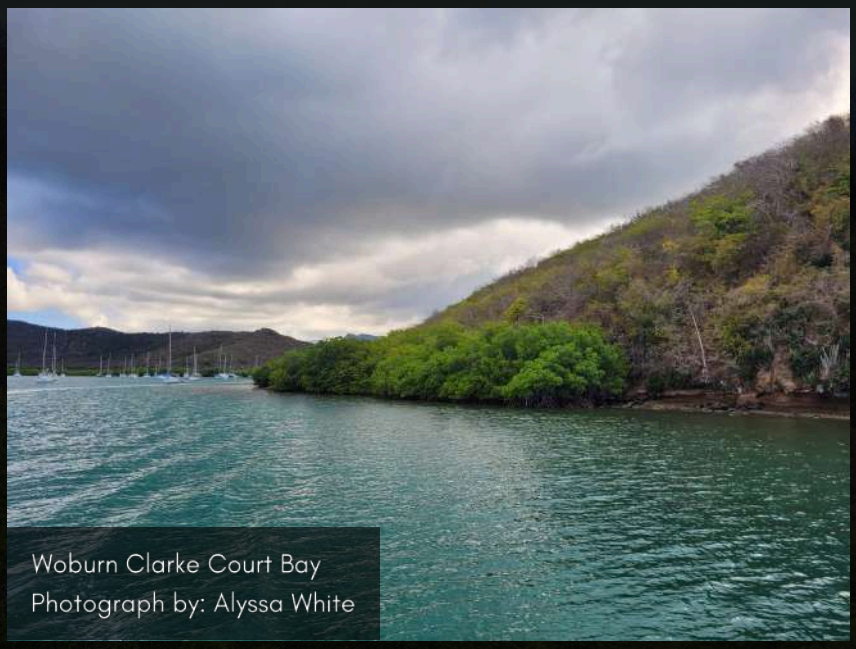
Year Gazetted: **2001**

Designation Type: **Marine Park**

Purpose: **Sustainable Resource Use**

Management Type: **National Agency**

Governance Agency: **Marine Resource Division**



Woburn Clarke Court Bay
Photograph by: Alyssa White

Woburn Clarke Courts Bay (WCCB) is located on the island's Southeastern side. The boundaries of the MPA consist of a natural enclosed seascape including a marine basin adjacent to Hog Island and Calivigny Island. The MPA is designated as a marine park and a sustainable resource-use area. WCCB possesses four marine ecosystems: mangrove forests, sandy beaches, seagrass beds, and coral reefs, and is the most complete representation of an intact tropical marine ecosystem on the island. However, the mangrove forest within the MPA has seen a significant reduction of its mangroves. The MPA was designated and legalized in 2001 under the "Fisheries Act". In 2018 the MPA designation and management was revisited and officially legalized in 2020. However, since 2001, there has been no active or effective management of the MPA. Originally in 2012, the MPA main objectives were to safeguard and conserve ecosystem services and implement sustainable utilization of eco-assets by applying strategic and integrated management through lessons learned and sustainable practices. The area has become a home for over-water residents where many foreign users have settled within the MPA and contributed to negative impacts the area is facing in conjunction with the Woburn Clarke Courts Bay Marina which is currently operational within the protected area.

Ecosystem Services

Source: Grenada Sustainable Development Trust Fund Situational Analysis of MPAs in Grenada

The goal for establishing WCCB as a Marine Protected Area was for sustainable management of the key marine ecosystems and to allow existing ecosystems within the MPA to maintain a rate of regeneration to compensate for past and current impacts of resource use. With this new development, the management plan for the MPA was updated to accommodate these new homeowners. Not only is the MPA geared towards conservation of its marine resources, their health and sustainable resource use but also to facilitate:

- Implementing zoning and usage rules for yachts and eco-assets by tourists and locals.
- Establishing standard operating procedures for sea tenure rights to balance conservation and economic development.
- Enhancing governance through collaborative efforts of multiple government agencies for sustainable policy implementation.
- Controlling pollution and waste management to protect the ecosystem and public health within the Marine Protected Area (MPA).
- Developing a Communication Strategy to manage environmental impacts from ridge to reef.
- Monitoring economic changes within the MPA to inform the government on resource and condition status.

Management Issues & Needs

Navigation and Marine Traffic Regulations	Facility Development & Safety Initiatives	Environmental Protection & Conservation
There is a need for marine navigation safety, equitable access to marine resources, and the prevention of ecological damage caused by improper anchoring and high-speed vessel operation. Implementing clear navigation rules, including speed limits and anchoring restrictions, ensures safe, equitable use of marine resources while protecting the environment.	There is a need for safe and environmentally friendly docking facilities, personal safety measures for vessel operators, and effective sewage management systems for boats to prevent water pollution. Enhancing marine area management through improved docking facilities, safety measures like mandatory life vests, and comprehensive boat sewage handling reflects a commitment to safety and environmental stewardship.	There is a need for restoration and protection of marine ecosystems, pollution control from industrial and marine activities, and the removal of hazardous debris, all aimed at preserving marine biodiversity and water quality. Therefore restoring ecosystems and regulating pollutants are essential for marine biodiversity preservation and sustaining healthy marine environments.

Molinière-Beauséjour

Fact Sheet

Size of MPA : **0.6 km²**

Ecosystem Type: **Tropical Marine Ecosystem**

Year of Designation: **2001**

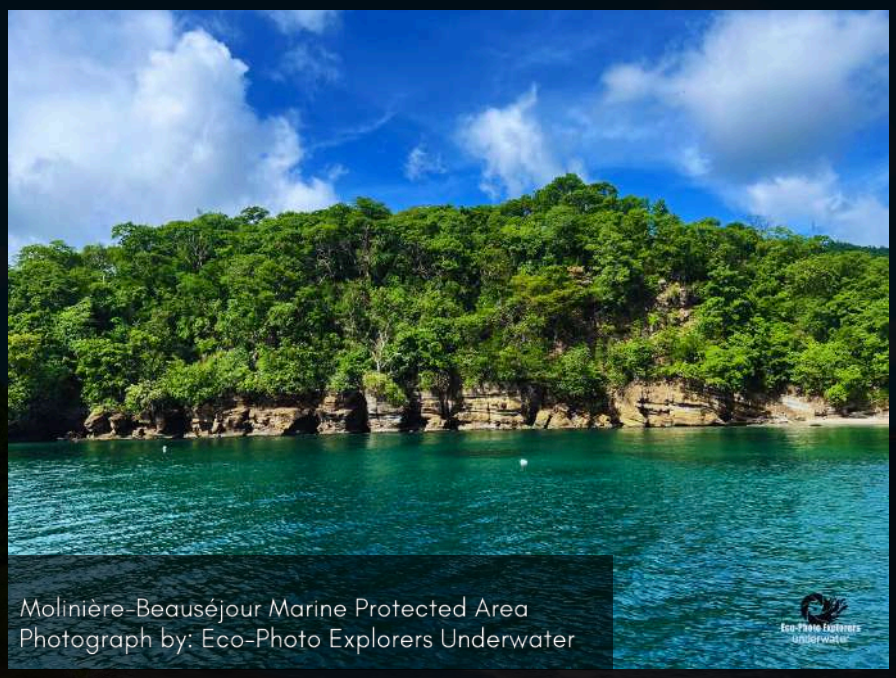
Year Gazetted: **2001**

Designation Type: **Marine Park**

Purpose: **Sustainable Resource Use**

Management Type: **National Agency**

Governance Agency: **Marine Resource Division**



Molinière-Beauséjour Marine Protected Area
Photograph by: Eco-Photo Explorers Underwater

The Molinière-Beauséjour Marine Protected Area (MBMPA) is located on the central-western coastline of Grenada. It extends from Brizan to Grand Mall Bay. It consists of several bays such as Beauséjour, Flamingo, Dragon, and Monliniere. MBMPA was designated and gazetted in 2001 by the Fisheries Order and officially launched under active management in 2018. It was identified as a priority area for having protected status in 1988 according to the Grenada Plan and Policy System document for National Parks and Protected Areas. It is designated as a Marine Park for sustainable resource use. The main marine ecosystems with the MPA are small amounts of mangroves, sandy beaches, seagrass beds, and coral reefs. Many of the mangroves have either been removed or cut off from the tropical marine ecosystem which presents a disruption in the natural processes. However, significant research and coral restoration projects have been installed within the area in addition to Grenada's famous underwater sculpture park.

Ecosystem Services

Source: Grenada Sustainable Development Trust Fund Situational Analysis of MPAs in Grenada

The goal for establishing MBMPA was and still is to protect and maintain the ecosystems within the marine park and its natural features, providing opportunities for recreation, interpretation, research, environmental education, and the protection of over-exploited marine species. The MPA was also designated to provide a management framework that reduces user conflicts and preserves marine resources. The management plan in 2010 described the long-term goal of the MPA as an area for sustainable use of its resources and ensuring provisions of livelihoods and viable ecosystems are safeguarded for current and future generations. The MPA Stakeholder Committee finalized the objectives of the MPA and its management to facilitate:

- An enabling and coherent institutional and legislative framework for an efficient management of the MPA.
- Develop local communities' ownership of the MPA and promote responsible behaviour of resource users.
- Halt the degradation of habitats and resources while promoting social harmony among MPA users.
- Improve the effectiveness and efficiency of the adaptive management plan on a continuous basis.
- Ensure adequate and sustainable resources for implementing the MPA management plan over the long term.

Management Issues & Needs

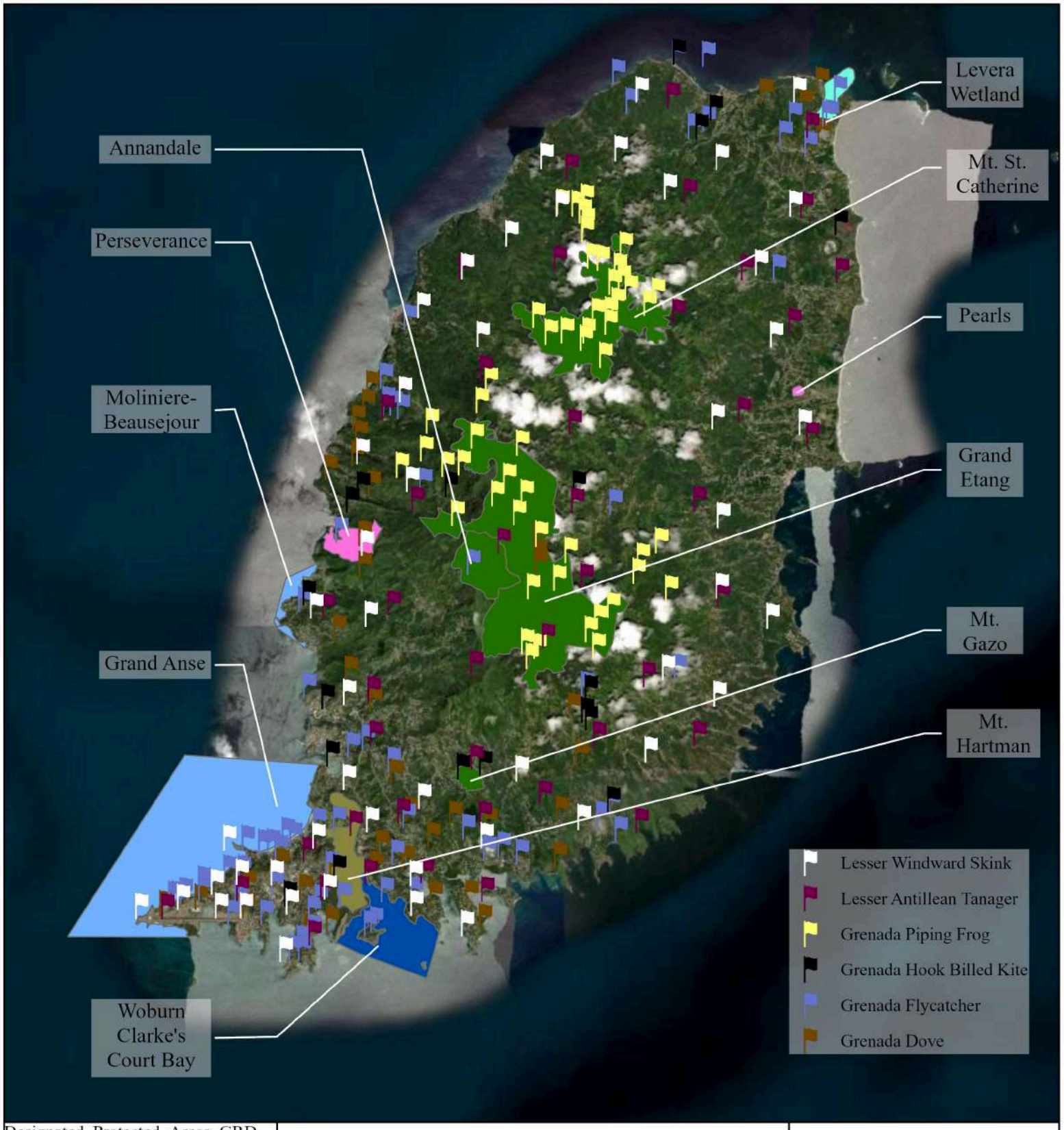
Governance and Community Engagement	Infrastructure and Access	Environmental Protection and Promotion
Effective governance and management are lacking, necessitating better communication and awareness of regulations. Engaging the community more deeply, through meetings and considering their livelihood in environmental strategies, is vital for sustainable management and resilience building.	Key infrastructure improvements, like a jetty in Dragon Bay, efficient garbage collection, and additional moorings, are essential for ensuring accessibility and sustainability. Clear signage for easier navigation to Dragon Bay by land will enhance visitor experience and local convenience.	Tackling pollution from rivers and promoting an integrated approach to land and sea conservation are priorities. Elevating the visibility and appeal of Dragon Bay and the MPA through targeted promotion can drive environmental protection efforts and community involvement.

Endemic Species

Endemic species hold significant importance and value to Grenada's biodiversity. These species are unique to Grenada and the Lesser Antilles and are not found anywhere else in the world. The importance of endemic species lies in their contribution to the overall genetic diversity of Grenada's ecosystems. They play a crucial role in maintaining the balance of the local ecosystem and are often considered indicators of the health of the environment. Additionally, endemic species can have cultural significance, forming part of the identity and heritage of the nation.

In terms of value, endemic species can have both intrinsic and instrumental value. Globally, plant and marine genetic resources, including those of endemic species, are known to be economically important as they may contain novel chemicals with potential uses in various industries such as pharmaceuticals, cosmeceuticals, and nutraceuticals. For example, venom from local ants may contain unique compounds that could be utilized in pharmaceutical applications (Agard, J., St. Louis, A., and Boodram, N. 2023).

Overall, the endemic species of Grenada are valuable assets that need to be protected and conserved to ensure the continued biodiversity and ecological balance of the island. Their preservation is essential for the well-being of Grenada's ecosystems and for future generations to appreciate and benefit from their unique genetic resources.


Levera Wetland
Annandale
Mt. St. Catherine
Perseverance
Pearls
Moliniere-Beausejour
Grand Etang
Mt. Gazo
Grand Anse
Mt. Hartman
Lesser Windward Skink
Lesser Antillean Tanager
Grenada Piping Frog
Grenada Hook Billed Kite
Grenada Flycatcher
Grenada Dove
Woburn Clarke's Court Bay
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Designated Protected Area
Forest Reserve
Marine Park
Marine Protected Area / Protected Land and Seascape
National Park
Ramsar Site, Wetland of International Importance
Endemic Species of Grenada (mainland)
This map shows all the endemic species found within mainland Grenada.
Source: WDPA 2024
Earthstar Geographics
Coordinate System: WGS 1984 UTM Zone 20N | Scale: 1:150,000
Created by: Tenika Griffith
Date Created: 24/09/2024
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The Grenada Piping Frog

Pristimantis euphronides

Grenada Piping Frog
Photograph by: GAEA Conservation Network

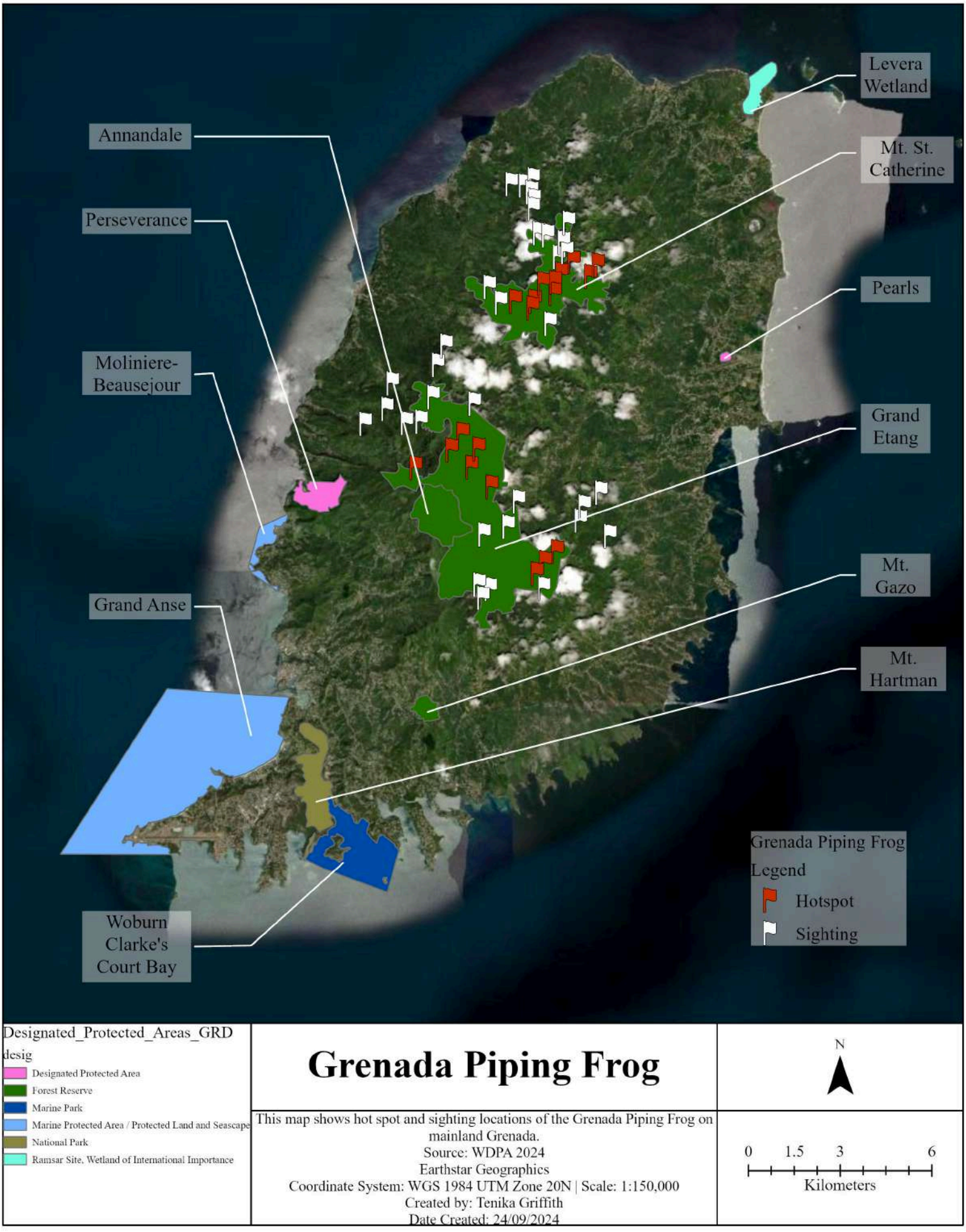
Fact Sheet

Family:
Eleutherodactylidae

Vulnerability Status:
Critically Endangered

Population Trend:
Decreasing

The Grenada Piping Frog is a small, nocturnal species exclusive to Grenada, making it endemic. These frogs are primarily active at night, with their calls often heard near the Grand Etang Forest Reserve. The Reserve is where they feed solely on insects. Males, slightly smaller than females, measure around 27 mm compared to 39 mm, approximately the length of a $1 XCD coin. Although the exact population size is still unknown despite a population assessment being conducted between 2004-2021 by PhD student Billie Harrison, there is still much to be understood about the species but the overall trend shows a decline in populations. Due to recent work the frog's status has changed from endangered to critically endangered due to habitat fragmentation and other factors that may contribute to their decline. Habitat loss is significant, as much of Grenada's native Evergreen and Upper Mountain rainforests have been degraded. Additionally, climate change poses a risk by potentially shifting these habitats further inland (GAEA Conservation Network , 2018).


Levera Wetland
Annandale
Mt. St. Catherine
Perseverance
Pearls
Moliniere-Beausejour
Grand Etang
Mt. Gazo
Grand Anse
Mt. Hartman
Woburn Clarke's Court Bay
Grenada Piping Frog Legend
Hotspot
Sighting
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Designated Protected Area
Forest Reserve
Marine Park
Marine Protected Area / Protected Land and Seascape
National Park
Ramsar Site, Wetland of International Importance
Grenada Piping Frog
This map shows hot spot and sighting locations of the Grenada Piping Frog on mainland Grenada.
Source: WDPA 2024
Earthstar Geographics
Coordinate System: WGS 1984 UTM Zone 20N | Scale: 1:150,000
Created by: Tenika Griffith
Date Created: 24/09/2024
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Kilometers

The Grenada Dove

Leptotila wellsi

Grenada Dove
Photograph by: Grenada National Archives

Fact Sheet

Family: **Columbidae**

Vulnerability Status:
Critically Endangered

Population Trend:
Decreasing

The Grenada Dove, scientifically known as *Leptotila wellsi*, is one of Grenada's endemic species found only on the island. According to the IUCN, the Grenada Dove is critically endangered with the most recent population survey in 2015 by Rivera-Milan et. al estimating that there are **182 mature individuals left**. Due to the population decline, it is expected that the population will decrease further over the next three generations (BirdLife International, 2021).

Historically population distribution was widespread across dry coastal zones. However, the Grenada Dove has experienced significant population decline and populations were presumed to be limited to sites in the West and Southwest. It was assumed that these populations were connected but it is presumed that they are isolated due to the 9-kilometre distance. The Grenada Dove particularly likes areas that include both dry and mixed evergreen forests. These habitats have thick canopies and leguminous trees and shrubs which are presumed to provide food supplies to doves (Peters et. al 2023). Populations of the Grenada Dove are threatened by habitat loss from industrial and commercial development. Certain areas were designated as Dove sanctuaries such as Perseverance and Mt. Hartman. However, the commercial development in the Mt. Hartman area has drastically reduced that habitat area and leaves this species further at risk of extinction. This reality is augmented further as extreme weather events such as Hurricane Ivan in 2004 significantly impacted the population size.

Designated_Protected_Areas_GRD
desig
- Designated Protected Area
- Forest Reserve
- Marine Park
- Marine Protected Area / Protected Land and Seascape
- National Park
- Ramsar Site, Wetland of International Importance

Grenada Dove

This map shows hot spot and sighting locations of the Grenada Dove on mainland Grenada.
Source: WDPA 2024
Earthstar Geographics
Coordinate System: WGS 1984 UTM Zone 20N | Scale: 1:150,000
Created by: Tenika Griffith
Date Created: 15/10/2024

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Kilometers

The Grenada Flycatcher

Myiarchus nugator

Grenada Flycatcher
Photograph from: Bird Forum

Fact Sheet

Family: **Tyrannidae**

Vulnerability Status: **Least Concern**

Population Trend: **Decreasing**

The Grenada Flycatcher, scientifically *Myiarchus nugator*, has a long, black, triangular beak with a fully developed hook and rectal bristles. It has plumage that is brownish-gray on the dorsal part of the body, with a gray breast and throat and light-yellow under-tail coverts and abdomen (Williams 2020). The Grenada Flycatcher feeds predominantly on fruits, seeds, katydids, and insects including caterpillars and moths. The Grenada Flycatcher is endemic to the island of Grenada and St. Vincent and the Grenadines, and therefore, is only found in the Lesser Antilles. This species occupies habitats that are either in the cloud forest, mangroves, and lowland evergreen forests. Their population has not been quantified, and their population trend in Grenada is unknown (Williams 2020) but suspected to be declining. This highlights the need for surveys to be conducted on this species to gain an accurate understanding of the current population size.

Designated_Protected_Areas_GRD
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- Designated Protected Area
- Forest Reserve
- Marine Park
- Marine Protected Area / Protected Land and Seascape
- National Park
- Ramsar Site, Wetland of International Importance

Grenada Flycatcher

N

This map shows hot spot and sighting locations of theGrenada Flycatcher on mainland Grenada.
Source: WDPA 2024
Earthstar Geographics
Coordinate System: WGS 1984 UTM Zone 20N | Scale: 1:150,000
Created by: Tenika Griffith
Date Created: 15/10/2024

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Kilometers

The Grenada Hook-Billed Kite

Chondrohierax uncinatus mirus

Grenada Hook-Billed Kite
Photograph by: Wiki Avies de Colombia

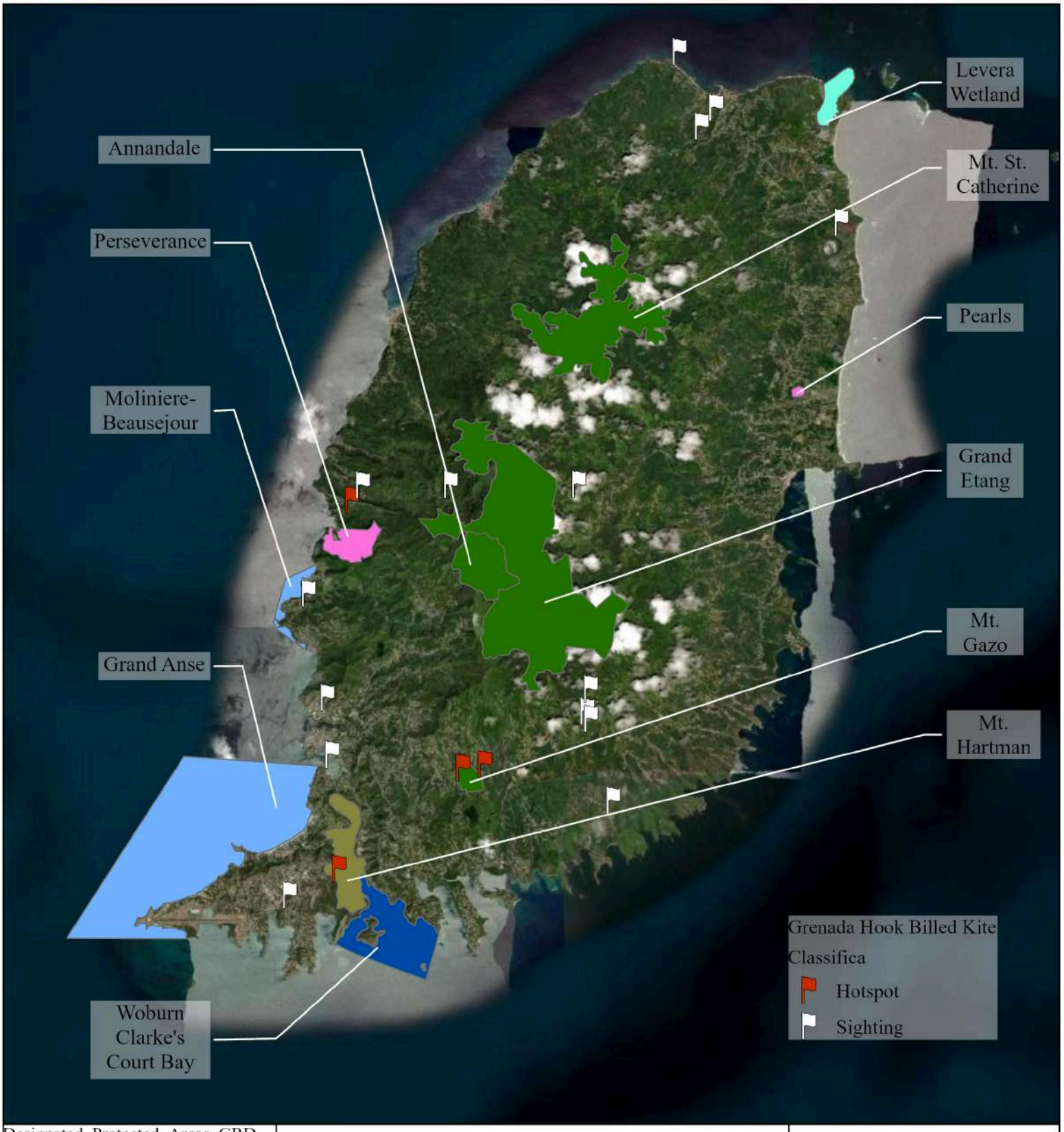
Fact Sheet

Family: **Accipitridae**

Vulnerability Status:
Least Concern

Population Trend:
Decreasing

The Grenada Hook-billed Kite is generally recognized as an endemic subspecies of the Hook-billed Kite (*Chondrohierax uncinatus*) (Lenoble, Charles and Serrand 2022). The kite's diet consisted mainly of land snails, and its fondness for Grenada's dry forests makes it highly vulnerable to habitat destruction caused by development, especially the building of tourism facilities. Before Hurricane Janet in 1955, the Grenada Hook-billed Kite was considered to be extinct. However, sightings of the kite disproved those earlier speculations asserting its extinction (Lenoble, Charles and Serrand 2022). This species is considered to be endangered due to its low abundance despite the species having a vulnerability status of least concern (Williams, Warrington & Koper 2023). This is due to the lack of assessments on their population density as well as their declining population The last population estimates of this kite in 2008, indicated that there may only be 50-75 mature individuals currently existing on the island (Thorstrom & Mcqueen, 2008).



Designated_Protected_Areas_GRD
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- Designated Protected Area
- Forest Reserve
- Marine Park
- Marine Protected Area / Protected Land and Seascape
- National Park
- Ramsar Site, Wetland of International Importance

Grenada Hook Billed Kite

This map shows hot spot and sighting locations of the Grenada Hook Billed Kite on mainland Grenada.
Source: WDPA 2024
Earthstar Geographics
Coordinate System: WGS 1984 UTM Zone 20N | Scale: 1:150,000
Created by: Tenika Griffith
Date Created: 24/09/2024

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Kilometers

The Lesser Antillean Tanager

Stilpnia cucullata

Lesser Antillean Tanager
Photograph by: Knut Hansen

Fact Sheet

Family: **Thraupidae**

Vulnerability Status:
Least Concern

Population Trend:
Decreasing

The Lesser Antillean Tanager (*Stilpnia cucullata*), known locally as the "Prince Bird," is endemic to St. Vincent and the Grenadines and Grenada, and revered as one of the most vibrant birds in these regions. Historically valued by sugar plantation owners as a symbol of prestige, it remains sought after by the elite on Bequia (BirdsCaribbean.org 2023). The male sports a distinctive plumage with yellowish buff, gray, and turquoise, while the female and juveniles are more muted. This bird adapts to various habitats, from forests to parks, and feeds primarily on fruits like plums and mangoes, with occasional insects. Breeding occurs from April to July, with nests resembling those of the Lesser Antillean Bullfinch. Despite not being globally threatened, the tanager faces local risks from habitat destruction and environmental changes, highlighting the importance of ongoing conservation efforts on its native islands (BirdsCaribbean.org 2023).

Designated_Protected_Areas_GRD
desig
- Designated Protected Area
- Forest Reserve
- Marine Park
- Marine Protected Area / Protected Land and Seascape
- National Park
- Ramsar Site, Wetland of International Importance

Lesser Antillean Tanager

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This map shows hot spot and sighting locations of the Lesser Antillean Tanager on mainland Grenada.
Source: WDPA 2024
Earthstar Geographics
Coordinate System: WGS 1984 UTM Zone 20N | Scale: 1:150,000
Created by: Tenika Griffith
Date Created: 24/09/2024

0 1.5 3 6
Kilometers

Endemic Species: Vertebrates

Common Name: Lesser Chapman's Opossum
Scientific Name: *Mormosa robinsoni chapmoni*
Vulnerability Status: Unknown
Population Trend: Unknown

Common Name: Grenada Giant Rice Rat
Scientific Name: *Megalomys camerhogne*
Vulnerability Status: Extinct
Population Trend: Extinct

Common Name: Grenada Tree Anole
Scientific Name: *Anolis richardii*
Vulnerability Status: Least Concern
Population Trend: Stable

Common Name: Grenada Worm Snake
Scientific Name: *Amerotyphlops tasymicris*
Vulnerability Status: Endangered
Population Trend: Unknown

Common Name: Windward Islands Ditch Frog
Scientific Name: *Leptodactylus validus*
Vulnerability Status: Least Concern
Population Trend: Stable

Common Name: Grenada Tree Boa
Scientific Name: *Corallus grenadensis*
Vulnerability Status: Least Concern
Population Trend: Unknown

Endemic Species: Plants

Common Name: Unknown
Scientific Name: *Charianthus grenadensis*
Plant Type: Flowering Plant
Vulnerability Status: Unknown
Population Trend: Unknown

Common Name: Unknown
Scientific Name: *Rhytidophyllum caribaeum*
Plant Type: Shrub
Vulnerability Status: Threatened
Population Trend: Unknown

Common Name: Scaly Tree Fern
Scientific Name: *Cyathea elliottii*
Plant Type: Tree Fern
Vulnerability Status: Unknown
Population Trend: Unknown

Breakwater Beach in Sauteurs, St. Patrick
Photograph by: Samuel Ogivile

Summary of Grenada's Protected Areas

Overview of Grenada's Diverse Protected Areas Network

Grenada features a network of designated Protected Areas including national parks, marine protected areas, and wildlife sanctuaries aimed at conserving its diverse ecosystems such as lush rainforests, vibrant coral reefs, and mangrove swamps. Prominent among these are Grand Etang National Park, Levera National Park, and the Moliniere-Beausejour Marine Protected Area, each pivotal in supporting environmental conservation, facilitating scientific research, and promoting education and sustainable tourism. Each Protect Area is significant to Grenada, whether it be ecological, cultural, or historical. Nonetheless, these areas are crucial to Grenada's identity.

Conservation Challenges and Strategic Management Objectives

Grenada's protected areas face numerous challenges including habitat degradation, pollution, invasive species and ineffective enforcement of conservation regulations. These issues are compounded by gaps in governance, limited community engagement, and inadequate infrastructure and regulatory frameworks. The overarching conservation goals are centered on sustaining biodiversity, enhancing ecosystem resilience against climate impacts, and promoting the sustainable use of natural resources through strategic, integrated management approaches. However, progression will not occur if these institutional and social gaps are not addressed

Community Involvement in Environmental Conservation

The effectiveness of Grenada's conservation initiatives heavily relies on robust legal frameworks and the active involvement of local communities. Governance of the Protected Areas takes a top-down approach where the managing agency is responsible for the drafting and implementation of new regulations and management plans. Often more than not, without relevant consultations. Enhanced educational programs and the promotion of community-based management practices are crucial for fostering environmental stewardship and ensuring adherence to conservation regulations. This approach will allow local communities to not only develop a sense of ownership but also enable them to contribute effectively and suggest practical ideas. These collaborative efforts are essential for the long-term preservation of Grenada's ecological and cultural wealth, benefiting current and future generations.

Big Bay Telescope, St. Andrew
Photograph by: Samuel Ogivile

Alignment with Kunming Montreal Global Biodiversity Framework.

The Kunming-Montreal Global Biodiversity Framework sets forth specific targets aimed at both protecting biodiversity and promoting the sustainable use of natural resources. Grenada, along with other Caribbean nations, has committed to this international agreement and has actively implemented conservation measures through the establishment of various Protected Areas.

Alignment with Target 3: Protecting Ecosystems, Species, and Genetic Diversity

Target 3 of the Kunming-Montreal Framework aims to ensure that at least 30% of land and sea areas, especially areas of particular importance for biodiversity and its contributions to people, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of Protected Areas by 2030.

The establishment and management of multiple terrestrial and Marine Protected Areas in Grenada, such as Grand Etang National Park, Levera National Park, and the Moliniere Beausejour Marine Protected Area, contribute directly to this target. These areas are crucial in preserving diverse habitats like rainforests, wetlands, coral reefs, and mangrove swamps, which are vital for maintaining the island's biodiversity and ecological processes. Efforts to protect endemic species like the Grenada Dove, Grenada Flycatcher, and others through these Protected Areas also align with Target 3, as these species are critical components of their ecosystems and represent unique genetic diversity.

While Grenada has made notable progress in designating Protected Areas, the extent of coverage and the connectivity between these areas need further evaluation to determine if they meet the 30% conservation target. Currently there is no information that highlights the extent of the coverage and what percentage of the island Protected Areas currently take up. It is also important to note that the effectiveness of management and the equitable inclusion of local communities in these processes are also crucial for achieving this target. Regular assessments and the strategic expansion of Protected Areas may be necessary to fully align with the global 30% goal. In the case of Grenada, it may be problematic to realistically achieve this goal due to the issues of privatized land and the country's growing population which requires space and progressive development.

Alignment with Target 4: Recovery of threatened species and its Sustainable Use.

Target 4 goal is to urgently implement management actions to prevent human-caused extinction of threatened species, enhance their recovery, and reduce extinction risks. This includes maintaining and restoring the genetic diversity of native and domesticated species through both in situ and ex situ conservation methods, alongside sustainable management practices. Efforts should focus on effectively managing human-wildlife interactions to minimize conflicts and promote coexistence.

Management strategies in Grenada's MPAs, such as zoned areas for different uses, reflect an approach aimed at balancing human activity with conservation needs. Grenada's approach to dividing Marine Protected Areas into zones for fishing and no-take areas (such as in Grand Anse Marine Protected Area) exemplifies strategies to balance human use with conservation. This zonation helps manage resource use sustainably and ensures that marine habitats are not overexploited.

The management plans for these Protected Areas often involve regulating the activities of local communities, and public awareness so individuals can develop their sense of ownership in conservation efforts and promote responsible behavior among resource users. This approach helps integrate the economic, social, and cultural values of biodiversity into local development, ensuring that conservation efforts also contribute to local livelihoods. However, with the current governance system that currently manages these areas, this goal will continue to be hindered by community compliance especially with the lack of enforcement. There have been attempts for community involvement in management decisions, as seen in the engagement strategies in areas like Levera Wetlands, which point towards efforts to ensure that the benefits of biodiversity are shared equitably. Efforts such as this should be widespread in the country and allow for community contributions in important discussions that will in turn impact them.

Grenada has initiated measures to integrate sustainable use principles into its management of natural resources. However, the effectiveness of these measures in maintaining ecosystem health and providing equitable benefits has not been fully documented or assessed. It is essential that more comprehensive monitoring systems and regular reporting should occur and this would help in evaluating the impact of these strategies and in making necessary adjustments to meet this target effectively.

Grenada's Marine Protected Areas

Ineffectiveness of Top-Down Governance

Grenada's MPAs are currently managed through a top-down governance system that has proven to be ineffective, primarily due to insufficient consideration of community involvement and the reluctance to comply with regulations. According to a recent assessment commissioned by the Grenada Sustainable Development Trust Fund (GSDTF), there has been a noticeable lack of compliance with MPA regulations among local communities and users. This non-compliance is largely attributed to their exclusion from the decision-making process, highlighting the need for a more inclusive management approach where all key stakeholders are actively involved and consulted on any changes or new regulations.

Staffing and Resource Challenges

The management of these Protected Areas falls under the jurisdiction of the Marine Resources Division, which has faced significant challenges, including a shortage of technical personnel and being severely understaffed since 2016 — before the Grand Anse MPA was officially declared and gazetted. Despite recognizing the need for co-management to enhance the effectiveness of MPAs, the transition to co-governance has been hindered by the community's limited ability to manage these areas effectively which is also compounded by the lack of technical staffing. These highlight critical barriers including a lack of essential resources such as funding, technical capacity, and awareness which are hindering effective management.

Moving Towards Co-Management

There is an understanding of the importance of transitioning towards a co-management model that involves community participation especially after stakeholder consultations. This approach is essential for cultivating a sense of ownership and responsibility among local stakeholders, which has been emphasized because it can lead to improved community compliance and conservation outcomes. However, for this transition to be successful, there must be a concerted effort to enhance community capacities and provide the necessary resources to support effective management practices through sustainable financing mechanisms.

Observational Evidence of Damage in Grand Anse

Recent preliminary observations in the Grand Anse area of Grenada's Marine Protected Areas have revealed significant anchor damage to the nearshore reefs. This damage, evident from physical marks and degradation of the reef structure, poses a critical threat to the marine ecosystem. The exact sources of the damage—whether from fishers or boating operators—remain unclear. However, the impact is undeniable and the recovery of these reefs could take years without immediate and targeted intervention. This threatens the reef's integrity.

Need for Area Rehabilitation and Restricted Access

To address the immediate threat to the reef's integrity, it is imperative to initiate rehabilitation efforts within a confined area. Restricting user access to this zone is imperative to ensure the recovery process is undisturbed and effective. Such measures would help mitigate further physical damage and support the natural regrowth of the reef structures. However, this strategy would require consistent patrolling of the area and effective regulations but will not be exempted from non-anthropogenic threats to their health and rehabilitation.

Impact of Overfishing on Biodiversity

Beyond physical damage, there is a growing concern about the stress on the ecosystem caused by overfishing. This activity is recognized globally as one of the leading causes of biodiversity loss and is particularly problematic in Grenada, where extraction has been ongoing without a clear understanding of the status of reef health within protected areas. Overfishing depletes fish stocks within the MPA and disrupts marine habitats along with its ecological balance.

Zoning as a Management Strategy

Fortunately, the Marine Protected Areas in Grenada have been divided into various zones, including designated no-take and fishing zones. This zoning strategy allows for more effective management of marine resources by sectioning off areas based on their ecological needs and the level of human activity they can sustain. Adherence to these zones is expected to create a spillover effect, where benefits of well-managed zones extend into adjacent areas, enhancing overall marine biodiversity and ecosystem health. Effective implementation and compliance with these zoning regulations are essential for the success of conservation efforts in Grenada's Marine Protected Areas.

Grenada's Terrestrial Protected Areas

Inadequacies in Current Governance Models

Grenada's Terrestrial Protected Areas operate under a top-down governance model lacking the community aspect required to achieve its intended conservation goals, focusing primarily on human activity regulation. This system generally excludes local communities and stakeholders from meaningful participation in management decisions, potentially leading to resistance or non-compliance with protective regulations. Evidence of illegal activities, such as poaching and unauthorized harvesting within these areas, further highlights the need for a governance model that integrates community insights and values into conservation strategies which will bolster community compliance and possibly reduce the instances of illegal activity.

Staffing and Resource Deficiencies

One of the critical challenges facing the management of Protected Areas in Grenada is the severe shortage of staffing and resources. The responsible agency have been understaffed, severely hindering its ability to conduct essential functions such as regular patrolling, monitoring, and enforcement of conservation laws. This lack of capacity is rooted in inadequate funding and resource allocation, which also impairs related environmental departments' ability to support and sustain conservation efforts effectively.

Endemic Species and Their Conservation Importance

Grenada harbors several endemic species such as the critically endangered Grenada Dove and the Grenada Piping Frog, both at risk from ongoing habitat loss and environmental changes. The conservation of these species is critical, not only for maintaining the island's ecological balance but also for preserving its natural heritage. Efforts to protect these species are integral to Grenada's biodiversity strategy and would highlight the island's commitment to environmental stewardship. There is evidence of baseline information lacking among various endemic species. The situation may be similar for other native species as well. To conserve the genetic diversity and biological diversity of Grenada, the initial stages would require the collection of data to understand the current status of species and the identification of areas with high biological activity outside of the designated Protected Areas.

Habitat Degradation and Impacts on Biodiversity

The degradation and fragmentation of critical habitats such as mangrove swamps significantly threaten Grenada's biodiversity. These vital ecosystems provide numerous ecological services, including carbon storage, erosion control, and serving as breeding grounds for marine species. Habitat fragmentation not only disrupts ecological cycles but also jeopardizes the survival of endemic species, such as the armadillo and endemic opossums which may be under threat by activities such as illegal hunting. This habitat fragmentation from development further exacerbates the risk to species either native or endemic, potentially leading to their endangerment ,especially without proper monitoring and timely conservation efforts.

Need for Systematic Ecological Monitoring and Community Engagement

Grenada faces an urgent need to establish comprehensive ecological monitoring to track the health of ecosystems and population trends of critical species. Enhanced monitoring would support adaptive management strategies and help tailor conservation measures to meet real-world challenges. Additionally, involving local communities in monitoring conservation efforts can aid to its success. Integrating traditional knowledge with scientific approaches, fostering community-led initiatives, and enhancing educational programs can empower locals, ensuring they have a stake in preserving their natural heritage. This community-engaged approach can significantly improve compliance with regulations and the overall effectiveness of biodiversity conservation strategies.

Urgent Conservation Needs and Strategies

The situation calls for an urgent re-evaluation of conservation priorities and methodologies. Agroforestry in regions like Annandale shows how integrating sustainable practices can help balance ecological needs with human utilization, providing a model for other areas. Effective biodiversity conservation must prioritize the protection of unique species that contribute to Grenada's identity, enhancing the island's ecological and cultural heritage. This requires an immediate increase in funding and resources to develop robust monitoring systems, engage community stakeholders actively, and implement adaptive management practices that can respond dynamically to the challenges faced by these Protected Areas.

PRIORITY AREAS FOR EFFECTIVE CONSERVATION

Conservation Programs

1. Species Surveys
2. Habitat Rehabilitation
3. Protected Area Research and Data Collection

Capacity Building and Engagement

1. Capacity Building and Knowledge Sharing
2. Community Engagement Initiatives for PA Management

Sustainable Management and Financing

1. Development of Sustainable Management Strategies and Financing Mechanisms

Resources

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By Saucoin - Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=71561705 (Bottom tier of Tufton Hall Waterfalls in the Mt. St. Catherine Forest Reserve)

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Sauteurs, St. Patrick
Photograph by: Samuel Ogivile