GRAND ANSE ESTATE BACKGROUND REPORT

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PREPARED BY THE CONSERVATION COUNCIL OF NATIONS
(DBA ICCF GROUP) FOR THE PROJECT

ADVANCING CONSERVATION IN THE EASTERN CARIBBEAN

JULY 2022

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ACKNOWLEDGEMENTS

This Background Report reflects the hard work and insights of many people who care about Saint Lucia, the Iyanola region, and the Grande Anse Estate. While the photographs and writing are those of the author, this report borrows heavily from published, and sometimes draft, research documents. It reflects the views of many people who recognize the important natural and cultural values of Grande Anse, and sets the stage for its future for conservation, community support, and economic benefit.

In particular, the author would like to thank Hippolyte "Chine" Vitalis, ICCF Group's Caribbean Program Officer, who was invaluable in arranging meetings with knowledgeable people both inside and outside of government, past and present, during the author's time in Saint Lucia (see Appendix 1). My sincere appreciation to everyone on that list for taking the time to meet, share your knowledge and your insight, and provide copies of past reports.

Thank you also to Olivia Blanchette and Mel Turner of the International Conservation Caucus Foundation (ICCF) for their support, and Clare Falcone and Frederic Brizzi also of ICCF for their amazing help in finalizing the document.

This report is an important first step towards an exciting future for the Grand Anse Estate. The values and the challenges identified here are all opportunities waiting to be creatively incorporated into a management plan.

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EXECUTIVE SUMMARY

This background report has been prepared as part of a larger project, Advancing Conservation in the Eastern Caribbean, funded by the Global Environment Facility, with the United Nations Environment Programme acting as implementing partner. The project, which is being executed by the Conservation Council of Nations (dba International Conservation Caucus Foundation Group), aims to support biodiversity through enhanced political will and improved management of existing and proposed marine protected areas and protected areas. The project has two components.

The first component will provide parliamentarians with knowledge, expertise, and capacity to formulate and implement sound national conservation policies and programs. The second component will assist with the delivery and implementation of protected area management plans for selected sites in four countries: Antigua and Barbuda, Dominica, Grenada, and Saint Lucia.

In Saint Lucia, the Component 2 project is the preparation of a management plan for the Grande Anse Estate, a 1,683-acre privately owned property that runs along a 1.25-mile-long sandy beach on the Atlantic Ocean. The Grand Anse Estate was identified in A Systems Plan for Protected Areas in Saint Lucia (2009) as part of the proposed Iyanola National Park.

This background report details the significance of the natural and cultural features of the Estate, including the important dry deciduous forest and grassland and a small mangrove forest.

The Grand Anse beach provides nesting habitat for three species of marine turtles. In addition, the area in general is part of the home of the endemic Saint Lucia iguana and is included within the Northeast Important Bird Area. The Estate has a long history of human habitation and is considered to be a Prime Historical Site.

While the beach is not safe for swimming due to strong ocean waves and currents, the Estate is blessed with incredible beauty and the endless sound of the ocean. Access to the property is limited to two very rough roads from the community of Des Barras.

The natural and cultural values of the Grande Anse Estate continue to be impacted by unauthorized farming, logging, sand mining, turtle poaching, invasive species, and charcoal production. The beach is currently covered in sargassum seaweed, which impacts both its beauty and its importance for nesting turtles.

This background report has been prepared to support the development of a management plan. The management plan is intended to act as a model to consider the management of additional areas to support previous land use policies proposed as part of the Iyanola Project.

Once the background report has been approved, the management plan will be prepared. The management plan will identify specific land uses and policies for both conservation and development in order to support conservation, livelihoods, and economic opportunities, including eco-tourism and the sale of the property. This report has been prepared by Wayne Stetski, an International Conservation Corps volunteer with the ICCF Group.

INTRODUCTION

1.1 GRANDE ANSE BACKGROUND REPORT

The Northeast coast, Iyanola Region, has been called Saint Lucia's last frontier. In 2007, a large, mostly undeveloped area, over 12,500 acres, was proposed as a national park as part of the Systems Plan for Protected Areas in Saint Lucia (Figure 1). The proposal was intended to protect the last area of extensive, undeveloped coastline, most of the island's dry forest ecosystem, and habitats of the most rare and endemic species, such as the iguanas and turtles.

More recently, in 2018, a development and conservation plan was prepared for the Iyanola Region. This plan aims to improve the effective management and sustainable use of the natural resource base of the northeast coast as part of the broader objective of contributing to global environmental security. It seeks to address issues relating to biodiversity, climate change, and land degradation.

The overall plan recommended a balanced approach to land use where

Figure 1. From Systems Plan for Protected Areas in Saint Lucia, 2009.

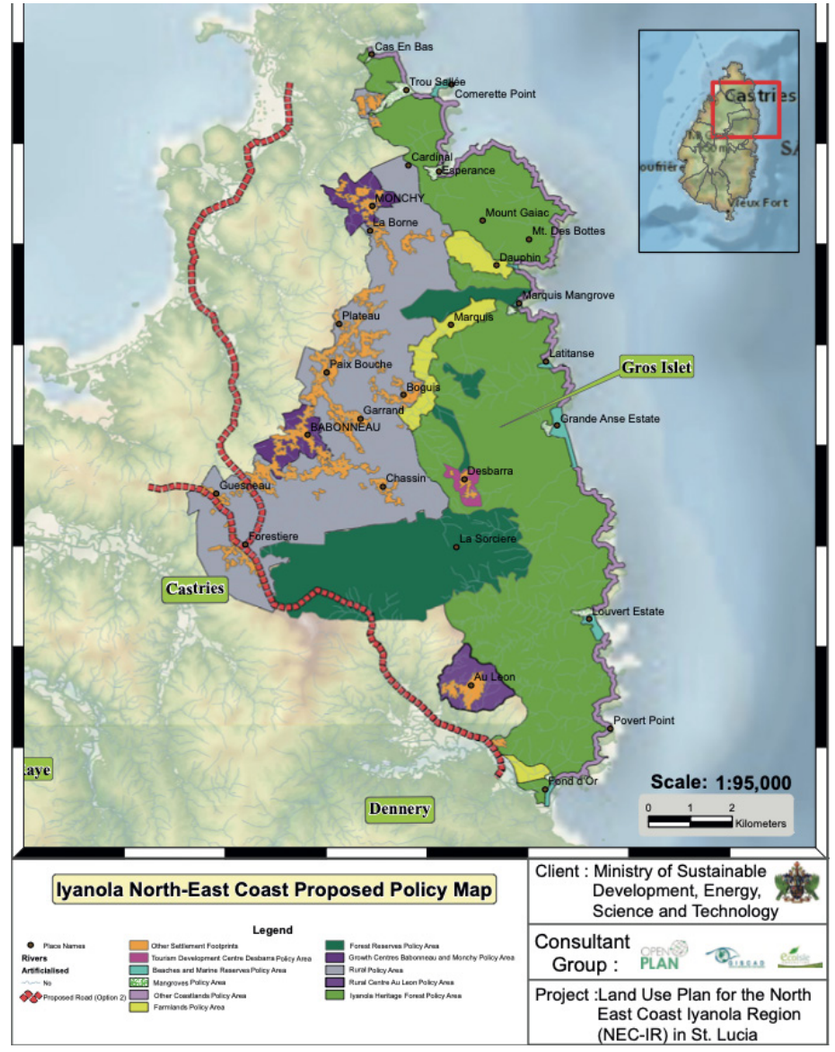


Figure 2. From *A Spatial Development and Conservation Plan for the Iyanola Region, 2018*

conservation of the natural environment and ecosystems is regarded as paramount and the policy intention is to allow for low-impact development, appropriately located, designed, and managed, that can co-exist with the natural environment without damaging it.

Within the overall plan, the eastern half is identified as the Iyanola Heritage Coast and Forest where conservation is considered most significant. The identified area generally reflects the 2007 proposed boundary for a national park. The plan proposed policies for four areas, including beaches and the marine reserve, mangroves, other coastlands, and the Iyanola Heritage Forest. These policy areas are depicted in Figure 2.

The proposed national park/heritage coast and forest includes a significant amount of private land, including the 1,683-acre Grande Anse Estate. The Estate represents some 12% of the overall national park proposal. The Estate borders the Grande Anse Marine Reserve and the Central Forest Reserve as shown in Figure 2.

Grande Anse Estate (Figure 3) is an important part of the Iyanola region and the proposed national park, and has long been recognized for its conservation and heritage values and for its development potential. The owners of the Grande Anse Estate have listed their property for sale and have agreed to allow access to the Estate so that the UNEP GEF project can prepare a report on the Estate's natural and cultural values. This background report will document those values and form the basis for continued discussion and potentially for the production of a management plan.

1.2 GRANDE ANSE ESTATE

Grande Anse Estate is a 1,683.4-acre property located on the northeast coast of Saint Lucia. It is an important part of the proposed Iyanola

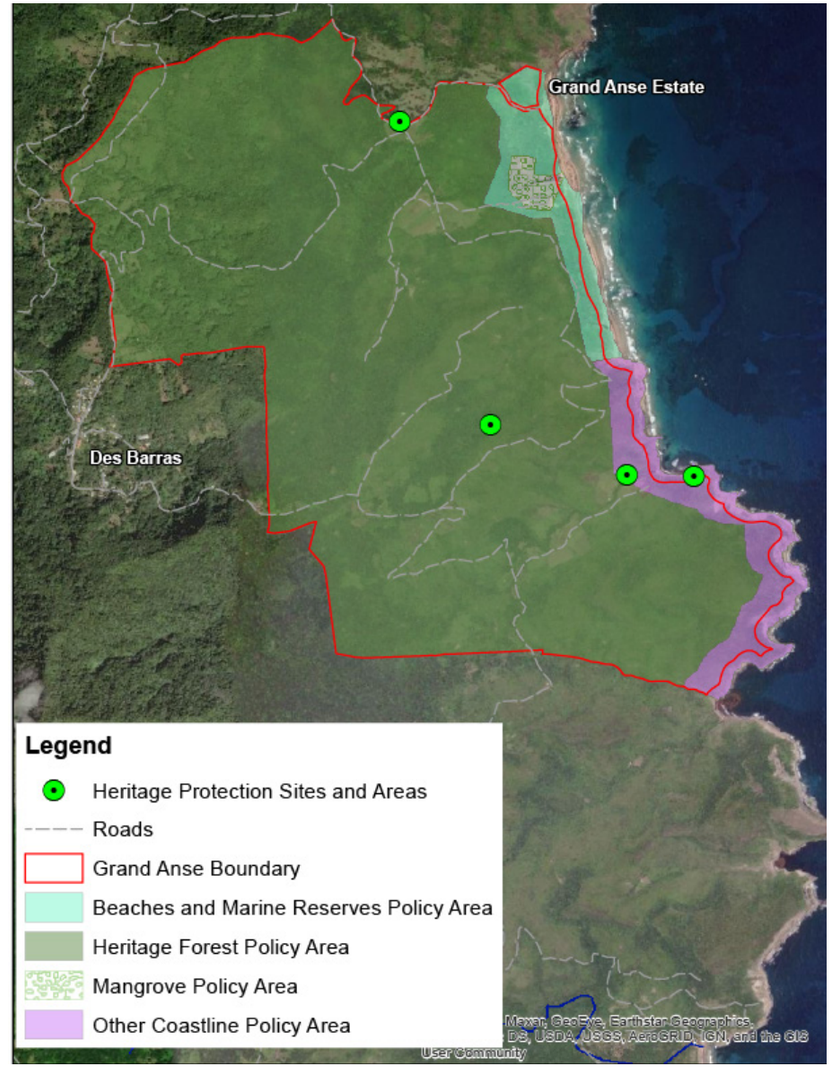
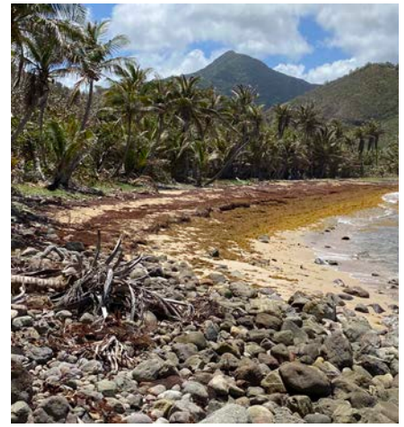


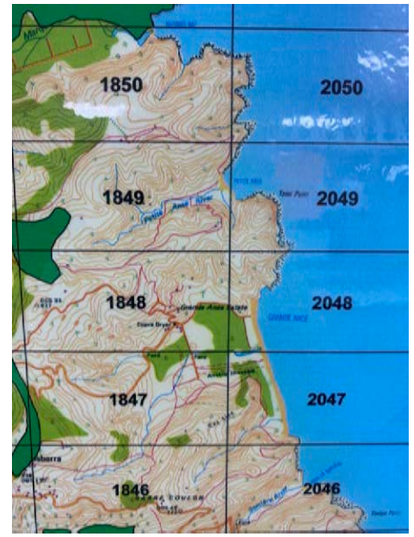
Figure 3. Grand Anse Estate Boundary Showing Policy Areas from *A Spatial Development and Conservation Plan for the Iyanola Region, 2018*

National Park, which covers much of the northeast region of Saint Lucia. The estate runs along a one-and-a-quarter-mile-long (1.6 km) sandy beach facing the Atlantic Ocean, a small but important mangrove swamp, three mountain ridges (maximum 1,200m above sea level) on three sides with spectacular headlands, two valleys, dry inland forests, grasslands, hundreds of acres of flat land, and about 60 acres of beachfront property known as the Queens Chain, which is a strip of land measuring 186.5 feet (56.58 meters) between the high water mark of the ocean and the private land behind it. The property has three rivers, two of which form lagoons behind the beach, while the third empties into the Atlantic Ocean.

Grande Anse is at the core of the northeast coast Important Bird Area, with approximately 53 bird species including five of the seven Saint Lucia endemic birds. Five of the island's endemic reptile species are found there. Thirteen of the plant species found at Grande Anse are classified as rare or of restricted range with four of these species only known to occur in this area. (Morton M. 2007) Much of the vegetation is secondary dry forest and shrubs.

Grande Anse is a nesting area for Leatherback, Hawksbill, and Green turtles. Its natural values include designation of the mangrove area as a marine reserve under the Fisheries Act No. 10 of 1984. Grand Anse is a prime historical site, including a known burial site and a number of areas with Amerindian pottery dating back to 600 AD. Access to the estate is currently limited to two very rough roads, which has contributed to keeping the area relatively undeveloped.





2.0 NATURAL RESOURCE VALUES

2.1 CLIMATE

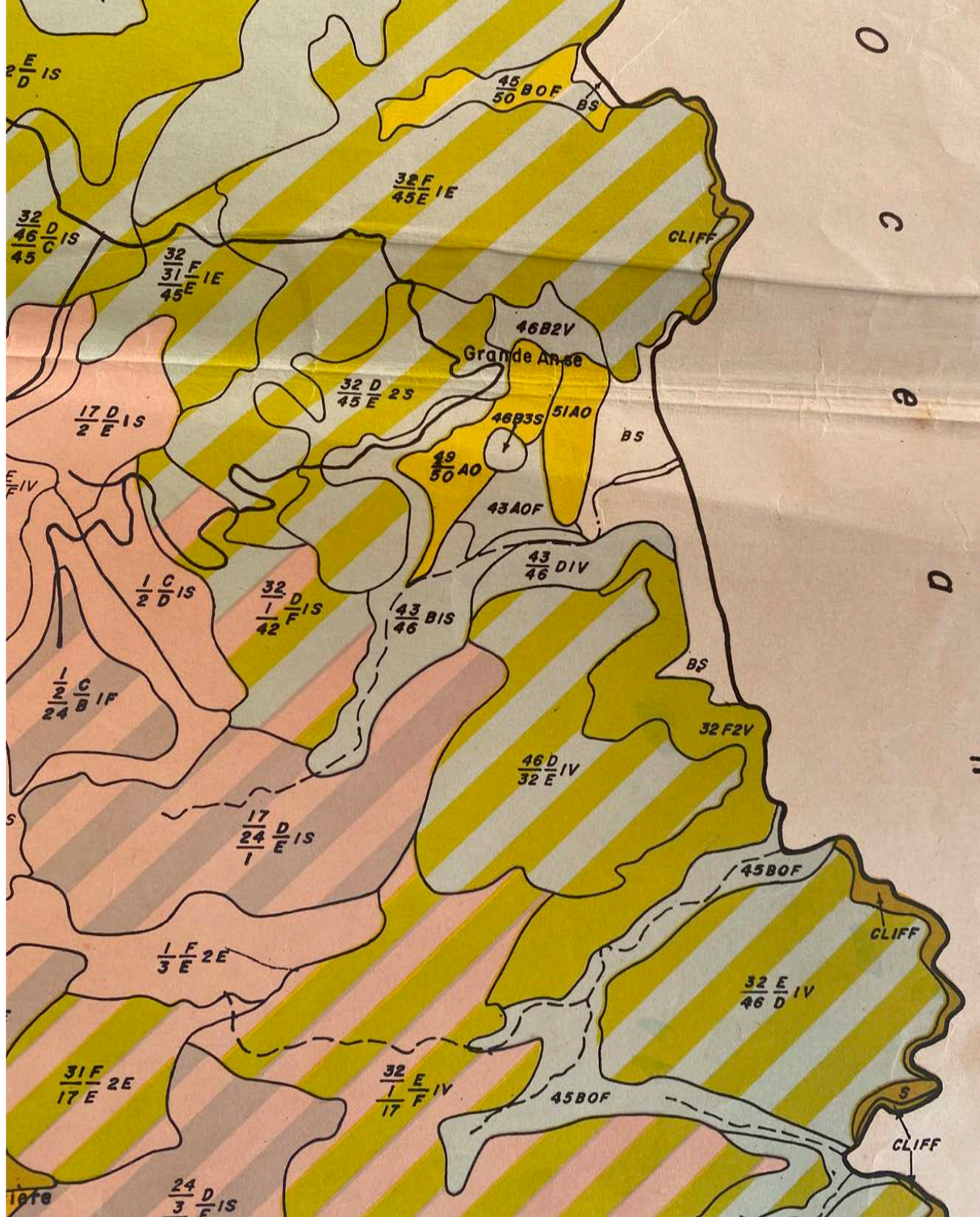
Saint Lucia has a tropical marine climate characterized by relatively uniform high temperatures throughout the year. There is a dry season from roughly December to May and a rainy season from June to November/ December.

Tropical storms and hurricanes are infrequent, with the majority of West Indian tropical cyclones passing to the north of Saint Lucia. Cyclones that have impacted the island include Hurricane Allen in 1980, Tropical Storm Debby in 1994, Hurricane Tomas in 2010, Hurricane Dorian in 2019, and Tropical Depression Gonzalo in 2020. The direct impact of these storms on Grande Anse Estate is not documented.

The hottest period is May to October, and the coolest December to March, giving a mean annual temperature of approximately 26 degrees Celsius at sea level. Annual rainfall varies from 1,524 - 1,778 mm in the north (Grande Anse area) to 2,540 - 3,683 mm in the mountainous interior of the south.

2.2 SOILS AND AGRICULTURE

Grande Anse Estate includes the following soil types: Beach Sands, Smectoid Clay Soils (imperfectly drained shallow soils over Andesic or Basaltic Agglomerate) - #46 Franciou Stony Clay; and #45 Hardy Clay and #43



Delonel Clay – poorly drained soils over Andesic or Basaltic Agglomerate and #45 Hardy Clay. Skeletal soils over Andesite or Basaltic Agglomerates, Dykes and Lava Flow - #32 Falaise Stony Loam.

The more productive land is marked in yellow on the soils map – Alluvial soils which are freely drained, light textured, gravelly, and boulderly alluvial soils #51 Piaye Silty Clay and #50 Reveneau Clay which are also Smectoid Clay Soils.

Agriculture has long been practiced in Grande Anse Estate, and trespass farming continues today, in some cases with second generation farmers. These are not operations that are hidden – in fact, the farmers have invested in irrigation systems, fencing, and buildings. This was evident from field trips to both the north and south sections of Grande Anse.

A variety of crops are grown, including watermelon, cantaloupe, honeydew, cassava, pineapple, white and purple cabbage, arrowroot, cucumbers, bell peppers, avocados, coconuts, cashews, bread fruit, yams, sweet potatoes, and bananas.

2.3 MARINE ENVIRONMENT

Saint Lucia is surrounded by a narrow coastal shelf that supports a diverse marine ecosystem of mangroves, seagrasses, coral reefs, and beaches. Artisanal fisheries contribute to the economy, with the most important species being parrotfish, angelfish, triggerfish, spiny lobster, conch, and white sea urchin. Elkhorn reefs are of particular interest in Saint Lucia's coast.

In 2016 Saint Lucia had nine designated Marine Managed Areas, totalling approximately 49 km2, with proposals for an additional nine Marine Managed Areas totalling approximately 350 km2. No coral reefs were specifically identified off Grande Anse; however, Grand Anse does have a "protected" mangrove forest described further in the Forestry Section of this report that was recommended for inclusion in a new 14.3 km2 East Coast Marine Managed Area.

The key habitats that support productive fisheries, stabilize coastlines, and support tourism are coral reefs, mangroves, and seagrass beds, the latter two being important nursery areas and corridors for resident and transient species.

The major threats to marine biodiversity in Grande Anse are domestic and agrochemical pollution, deforestation and associated sedimentation, sand mining, climate change, and hurricanes.

2.4 MANGROVES

Mangrove forests are a group of trees and shrubs that live in coastal intertidal zones and only grow at tropical and subtropical latitudes.

They are recognized by their dense tangle of roots, which allow the trees to handle the rise and fall of tides.

Although mangroves grow in salt water, they grow in areas where there is freshwater runoff because they need minerals such as nitrogen, phosphorous, and iron.

The importance of mangrove habitat in Saint Lucia has been recognized

through designation of twelve mangroves as Marine Reserves under the Fisheries Act, October 1986. These areas were included in the revised list of marine reserves and priority fishing areas in the Saint Lucia Gazette of April 22, 2000. They were identified by location name only - their actual extent and area have not yet been legally established.

The majority of St. Lucia's mangroves are found on the east coast and range from small, degraded patches of scrub-like trees to extensive stands of mature trees up to 18m in height.

Data was collected at seven mangrove sites across St. Lucia, including Grande Anse, which exhibited the following characteristics:

- Canopy: Height 22.5m DBH (cm) – 155.2
- Percent Cover: Canopy 35%, Shrub 21.5%, Ground 70%
- Water Chemistry: Salinity 26, Redox 249, Sulfides 1.1

The Grande Anse mangrove is 3.14 ha (7.76 acres) in size and is set back from the coast by a wide sand beach. Red mangrove trees form a narrow fringe along its banks, with a narrow band of white mangrove extending to the north. Human impact is limited, but significant sand mining is a major threat. The area likely does not contribute to fisheries but could be important for erosion and sediment control, particularly in the event of development that resulted in vegetation clearance inland in the catchment area.

The Grande Anse mangrove was ranked #8 in importance of the 12 designated Marine Reserves and was classified as Moderate Status for ongoing protection.

Healthy mangroves provide a wide range of benefits, including:

- Shoreline protection from storm impacts by buffering wave action during intense tropical storms and hurricanes. The low-elevation coastal areas occupied by mangroves are those most vulnerable to inundation and wave impacts. This is particularly significant in the case of St. Lucia where these habitats are most common on the exposed windward coast.
- Economically valuable products, particularly timber and charcoal, fish, and invertebrates.
- Stabilization of soil and shoreline sediments during periods of heavy rainfall.
- Trapping of sediment, reducing siltation of inshore environments, particularly seagrass meadows and coral reefs.
- Provision of wildlife habitat, including a diverse assemblage of invertebrates and resident and migratory birds. A pond at Grande Anse is the only known nesting site in Saint Lucia for the Masked Duck.
- Filtering pollution and reducing its impact on the coastal environment. Heavy metals leached from industrial waste affect mangrove fauna. Where leach water passes through intact mangroves, heavy metals are bound to sediments that settle in the mangrove before they reach the sea. Herbicides and pesticides affect both fauna and flora, but both can also bind to sediments that settle in the mangrove where they break down under the typical anoxic conditions. Where mangroves are cleared, this function is lost, resulting in the contamination of coastal waters. In the case of sewage pollution, the effects vary with the level of input. At lower levels the nutrients support growth of the mangrove flora which thereby acts as an effective wastewater treatment system. This wastewater can also serve to reduce salinity, which slows plant growth at higher levels. However, at higher levels of sewage input the excess nutrient load becomes detrimental, resulting for example in excess

growth of algae.

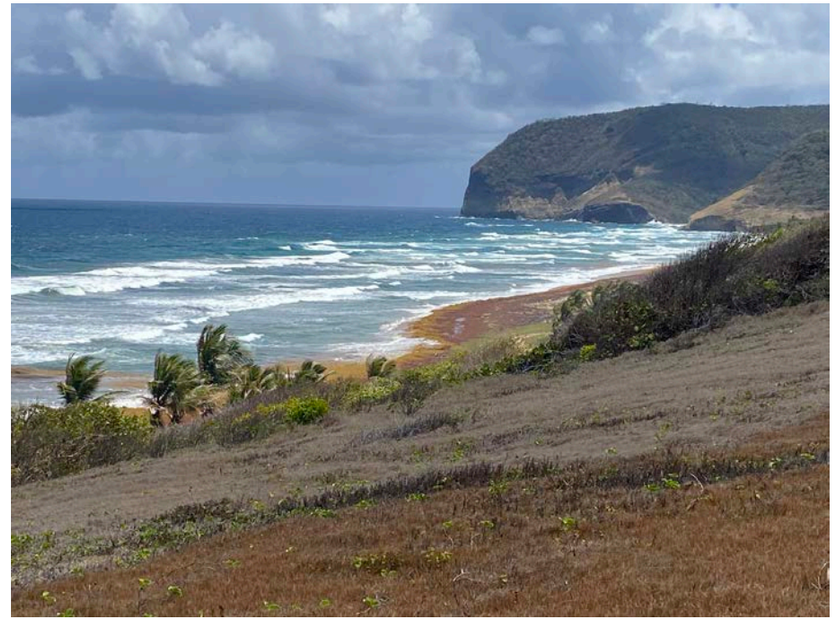
- Nutrients from breakdown of leaf litter contribute to aquatic food webs, which support a large segment of the tropical aquatic community, including many important commercial fisheries.

Scientists have discovered that mangroves have the highest net productivity of carbon sequestration of any natural ecosystem; on average they have the ability to absorb about 100 lbs per acre (45 kg per 0.4 hectares) per day, a positive contribution to fighting climate change. From an economic perspective, mangroves provide fuel in the form of firewood and charcoal, as well as construction materials such as timber and thatching. Mangroves provide marine life such as fish, mollusks, and crustaceans for consumption. They also contribute to products such as furniture, glue, wax, paper, and matchsticks.

2.5 FLORA

Saint Lucia's forests perform essential functions in safeguarding and regulating the island's water supply, preventing soil erosion and landslides, storing carbon, and supporting the country's present and future fuel supply. The forests also support, and are maintained by, a rich diversity of animals and plants, many of which are unique to Saint Lucia.

The Northeast Coast Iyanola Region (NEC-IR) is considered the only remaining frontier in Saint Lucia with landscapes of outstanding natural beauty and quality with different types of ecosystems from marine to mangrove to deciduous forest to evergreen forest and rainforest. In addition, several rare and endemic flora and fauna species are found here.



Included in the Iyanola Region is Grande Anse Estate. The northern slopes of Grande Anse feature deciduous seasonal forests with the rare understory tree Morisonia americana and the only population of Eugenia trinitatis, a rare Lesser Antillean endemic. Very rare vines are found along the river including Tanaecium crucigerum (Jenny et al 2009). Important species such as Latannye palm (Coccothrinax barbadensis) are naturally present, but over-harvested. Grande Anse also contains a mangrove forest and deciduous seasonal forest and grasslands.

Deciduous and semi-evergreen forests such as those found at Grande Anse support an even greater variety of indigenous species than the rainforests, including a larger number of island endemics and globally threatened species. However, these seasonal forests also contain the majority of alien invasive species. A large number of Saint Lucian forest species are globally threatened with extinction and should be added to the International Union for Conservation of Nature's Red List. Daltry (2009) found that the greatest diversity and abundance of reptiles and amphibians is found in mature deciduous seasonal forests. This forest type also includes 276 beetle species, including 22.8% of Saint Lucia's endemics and 32.3% of the Lesser Antillean endemics.

The 2009 Biodiversity Assessment of Saint Lucia (Daltry) includes Grande Anse in its North East Dry Forests classification, which is rated as a High to Very High priority area for biodiversity conservation for areas currently outside forest reserves in Saint Lucia. In addition to its important flora, the Estate is also rated highly for conservation as it is a nesting area for Saint Lucia iguanas and three species of sea turtles, has significant populations of Saint Lucia pygmy geckos (Sphaerodactylus microlepis microlepis) and Saint Lucia worm lizards (Gymnophthal mus pleii luetkeni), and is Saint Lucia's only known breeding site for Masked Duck (Nomonyx Dominicus).

Carbon sequestration is another important role of forests. An estimated 2.0 million tonnes of carbon are stored within Saint Lucia's forest reserve and 3.5 million tonnes outside the forest reserve. Although not extensive, the deciduous seasonal forests and the mangrove swamp in Grande Anse

contribute to storing carbon.

Plantations and modified natural forests face greater disturbances and risks for large-scale losses due to climate change than primary forests because of their reduced biodiversity.

2.6 BIRDS

As of May 2021, the avifauna of Saint Lucia includes a total of 191 species according to Bird Checklists of the World. Six of them are endemic, three have been introduced by humans, 116 are rare or accidental, and six species are globally threatened. This means that Saint Lucia has more endemic bird species and more globally threatened bird species than any other country in the Eastern Caribbean; if they are lost from Saint Lucia, they are lost for the world.

The six endemic species are Saint Lucia Parrot (known locally as Jacquot; national bird), Saint Lucia Pee Wee, St. Lucia Warbler, St. Lucia Oriole, St. Lucia Black Finch, and the Sempers Warbler (rare or extinct). Regional endemic species include White-breasted Thrasher, Rufous Nightjar, and House Wren (Saint Lucia Birds Wildlife Ambassadors – birding@stluciawildlife.com). Globally Threatened species include the Masked Duck, Forest Thrush, Sempers Warbler, Red-billed Tropicbird, Royal Tern, and Roseate Tern.

The ranked species of birds that are of most concern in Saint Lucia include the Saint Lucia Nightjar; Forest Thrush; Saint Lucia Black Finch; Sempers Warbler; Saint Lucia Amazon (Parrot); White-breasted Thrasher; and Saint Lucia Wren.

Three of these species, the Nightjar, the Wren, and the White-breasted Thrasher, are restricted to deciduous seasonal forests found primarily in the northeast coast including the Grande Anse Estate. This area (referred to in reports as LC001) is considered to be an Important Bird Area in Saint Lucia but is currently unprotected. It includes a considerable portion of St. Lucia's tropical dry forest life zone and is characterized by low canopy scrub forest. This proposed Important Bird Area includes agriculture, pastureland, and undeveloped secondary forest. Grande Anse is one of only six sites identified in Saint Lucia as having high migrant bird diversity. While not pristine habitat, its remoteness is key to its high biodiversity.

Grande Anse is important for the endangered White-breasted Thrasher and the endangered St. Lucia Black Finch. It is a last stronghold for the endemic subspecies of Rufous Nightjar and supports populations of the Lesser Antillean Flycatcher and the House Wren. A pond at Grande Anse is the only known location where the Masked Duck breeds in Saint Lucia. Red-billed Tropicbird may nest on the sea cliffs (P. 281 – BirdLife International (2008); Reference: Birdlife International (2008) Important Bird Areas in the Caribbean: Key sites for conservation. Cambridge, UK: Birdlife International (BirdLife Conservation Series No. 15).

Migrant species reports from Grande Anse from 1990 – 2004 include Songbirds, Northern Waterthrush, Ducks, Blue Winged Teal, American Widgeon Herons and Egrets, Great Blue Heron, Sandpipers and Plovers, Solitary Sandpiper, Common Snipe, Semipalmated Plover, Killdeer, Upland Sandpiper, Swifts and Swallows, Caribbean Martin, Crested Hummingbird, Lesser Antillean Bullfinch, Antillean Flycatcher, Lesser Antillean Saltator, Little Blue Heron, Scaly-breasted Thrasher, Saint Lucia Warbler, White-breasted Thrasher, and Saint Lucia Nightjar.

Major threats to birds include loss of habitat and alien invasive species like the mongoose, cats, dogs, rats, and mannikou (opossum).

2.7 MAMMALS

The native terrestrial mammal fauna of St. Lucia is comprised only of bats. Sigmodontine rodents (rice or musk rats) were endemic but are now extirpated. Included in Saint Lucia's native mammalian fauna are at least nine bat species:

- frugivorous: Jamaican Fruit Bat (Artibeus jamaicensis jamaicensis), Little Yellow Shouldered Bat (Sturnira lilium luciae), Tree Bat (Ardops nichollsi luciae)
- nectivorous: Insular Long-tongued Bat (Monophyllus plethodon luciae)
- insectivorous: Davy's Naked-backed Bat (Pteronotus davyi davyi), Common Free-tailed Bat (Molossus molossus), Brazilian Free-tailed Bat (Tadarida brasiliensis antiillularum)
- piscivorous: Greater Fishing Bat (Noctilio leporinus mastivus)
- omnivorous: Antillean Fruit Bat (Brachyphylla cavernarum cavernarum)

Bats have key ecological roles and are important in pollinating fruit crops.

Studies on mammals suggest that no native non-flying mammals occur on any of the islands in the West Indies, including Saint Lucia. The St. Lucian Giant Rice Rat (Megalomys luciae) once occurred on the island but has not been observed in the wild since 1881 and is likely extinct.

In 2009 Visual Encounter Surveys and Acoustic Surveys were conducted at Grande Anse for bats. While none were identified, just north of Grande Anse at the Marquis Estate, 18 Jamaican Fruit Bats, 147 Brazilian Free-Tailed Bats, and one Common Free-Tailed Bat were captured.

Alien mammals introduced to St. Lucia include the Small Asian Mongoose (Herpestes javanicus), mice (Musculus musculatus), rats (Rattus rattus and Rattus norvegicus), and feral pigs.

With respect to Grande Anse, reducing opossums could benefit iguanas and marine turtles, which nest there. The Small Asian Mongoose is one of the world's worst invasive species as they are a threat to endangered birds, reptiles, and other wildlife. Rats are known to contribute to extinctions or declines of flightless invertebrates, ground dwelling reptiles, land birds, and burrowing seabirds.

2.8 AMPHIBIANS AND REPTILES

Nineteen native species of reptiles and amphibians (three extinct) have been recorded in St. Lucia up to 2009. Seven species are nationally endemic, along with an additional five endemic sub-species. At least six endemics qualify as globally threatened with extinction under IUCN categories of threat: Saint Lucia Racer (Critically Endangered), Saint Lucia Whiptail (Endangered), Saint Lucia Pygmy Gecko (both subspecies are Vulnerable), Saint Lucia Thread Snake (Vulnerable), and Saint Lucia Fer-de-Lance (Vulnerable). The Saint Lucia Iguana (assuming it is taxonomically distinct) also qualifies as Critically Endangered. Saint Lucia was once named Iyanola, which means where iguanas are found.

There are three species of turtles in St. Lucia: Leatherback turtle (Dermochelys coriacea; Globally Threatened and Critically Endangered); Hawksbill turtle (Eretmochelys imbricata; Globally Threatened and Critically Endangered); Green turtle (Chelonia mydas; Globally Threatened and Endangered). All three species have been known to use the Grande Anse beach for nesting.

Areas surveyed by Daltry in 2009 included Grande Anse Estate, with the following results:

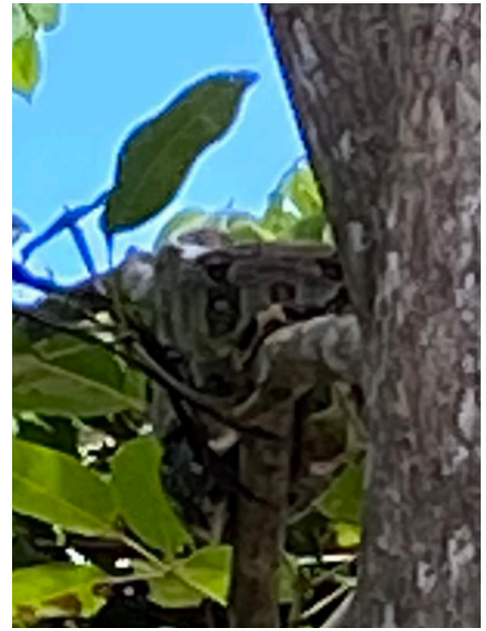
- Saint Lucia Anole (Anolis Luciae) – 44
- Johnstones Whistling Frog (Eleutherodactylus johnstonei) – 12
- Rough Scaled Worm Lizard (Gymnophthalmus pleii) – 17 – Near Threatened
- Saint Lucia Pygmy Gecko (Sphaerodactylus microlepis) – 22 – Vulnerable

The greatest threats to Saint Lucia's native forest herpetofauna are alien invasive animals: opossum, rats, dogs, cats, feral pigs, and mongoose. Introduced green iguanas near Soufriere are a threat to the St. Lucia iguana through competition and cross-breeding. The alien Watts anole appears to be displacing the Saint Lucia anole in disturbed habitats. Habitat loss, hunting, and agrochemical pollution are also negatively affecting herpetofauna. Climate change impact on ecosystems is also a concern.

The Wildlife Protection Act of 1980, revised in 2001, did not adequately address the protection of herpetofauna, including shortfalls in protecting seven of the 12 native forest species and all six of the extant alien species.

Under the Act, four species are Protected: Saint Lucia Racer (Liophis ornatus); Saint Lucia Whiptail Lizard (Cnemidophorus vanoi); Saint Lucia Iguana, (Iguana cf iguana); and Saint Lucia Boa (Boa constrictor orophias). No species are Partially Protected (may be hunted during specified seasons). One is unprotected – Saint Lucia Fer-de-Lance (Bothrops caribbaeus); it may be kept in captivity with license and may be hunted, trapped, or traded year-round.

Saint Lucia has been part of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 1983. CITES is an international agreement among governments that aims to ensure that international trade in specimens of wild animals does not threaten their survival.



In St. Lucia all three species of marine turtles are listed in Appendix I – Commercial trade is permitted only in exceptional circumstances. All species of iguana and all members of the Boa (Boiidae) family are listed in Appendix II – Commercial trade must be controlled and monitored to prevent over-exploitation. The Appendices apply to all parts and processed goods, like marine turtle shell jewellery, and not just entire animals.

During a March 29, 2022 field trip to the northern end of Grande Anse estate, the author personally observed a dog carrying a large bright green iguana (Critically Endangered) in its mouth. On an April 6, 2022 field trip to the southern end of Grande Anse Estate, the author personally saw and photographed a young Boa in a tree.

3.0 ARCHAEOLOGICAL AND HISTORICAL VALUES

Archaeologists have concluded that the islands in the Caribbean were settled in two major population dispersals that likely originated in South America and, based on the age of artifacts, reached islands in the northern Antilles before reaching the more southerly islands like St. Lucia 1,800 – 500 years before present.

The history of human occupation of Saint Lucia starts within Rouse's Period (AD 150) associated with Cedrosan ceramics, described as highly decorated with paint, incisions, and modeled-incised adornos, which have been found at Grande Anse. St. Lucia was first colonized by Amerindians, the Ciboneys. By 200 AD the Arawaks had established themselves on the island, but they were displaced by the Caribs. Colonization of St Lucia changed hands many times between Britain and France before it was ceded to Britain in 1814. St. Lucia became fully independent in 1979.

Grande Anse Bay is recognized as a Prime Historical Site and was recommended to be designated a Protected Area under the System of Protected Areas for St. Lucia. It has four known archaeological sites, including a known burial site, and numerous other areas where Amerindian pottery is found. An archaeological excavation and exploration on St. Lucia conducted by the University of Vienna refers to a burial site in Grande Anse recorded in 1966 along with fragments of decorated and engraved Amerindian pottery.

In the book Saint Lucia Historical Sites by Robert Devaux (Saint Lucia National Trust, 1975, page 15), it says with respect to Grande Anse: "One of the richest

sites yet discovered. It is extensive and parallels the beach for much of its length. Some of the finest specimens of "three pointed stones" were found by Mr. M. Albert, who has these in his collection. Adelaide Bullen undertook a study of a skeleton found there and has dated it to about 600 AD. This exhibit is on display at the museum."

According to Laurent Jean (Jomo) Pierre, who provided much of the information in this section, "the above museum no longer exists. However, the skeleton may be housed in the St. Lucia Archaeological and Historical Societies Collection in Castries." According to Ute Lawaetz, one of the owners of the Estate, several boxes of archaeological material collected at Grande Anse were given to the Archaeological and Historical Society; the whereabouts of the material are currently unknown.

More recently, Grande Anse has a history of agriculture. As early as 1815 the Estate was farmed as a sugar plantation with 88 slaves under the ownership

of Charles Aquart. From 1818 to 1899 the property was owned jointly by the P. McCracken and J. Murchie families with up to 101 slaves. By 1849, seventy acres of the estate was owned by D. Ferguson and included a steam mill. The Grande Anse archaeological remains and the sugar mill remains are recognized locally as heritage sites.

Trespass farming continues to be part of Grande Anse's history today, including second generation families who have cleared forested land, put in substantial irrigation systems, and planted a variety of crops, feeding their families and selling produce to local communities.

Illegal sand mining continues at Grand Anse, along with concerns about its impact on archaeological artifacts and turtle nesting.

The Grande Anse Sea Turtle and Nature Defenders group is a revitalized Turtle Watch Group of Des Barras, Babboneau. The group's purpose is to conserve and protect the sea turtles that come on shore at Grande Anse during the nesting season, March – October, as well as to protect the natural habitat of many species of birds, some of which are endemic to St. Lucia, and the endemic St. Lucia iguana. The group organized tours to Grande Anse to watch turtles nesting, including overnight tours, commencing in 2001. At least one young person from almost every household in Des Barras was trained as a tour guide, and revenue increased steadily until 2004. A number of factors including internal issues within the tour guides combined with the end to the 1996 moratorium on harvesting sea turtles in 2004 led to the demise of the turtle tours.

There is an all-terrain vehicle (ATV) tour that is being sold as "driving over well-established nature trails through plantations and rural communities with amazing views of Grande Anse Beach and the Atlantic coast." (Aanansi ATV Tours website) These tours use roads on the top (most westerly) part of the Estate but do not travel down to the beach.

Grande Anse Estate has been owned by the Lawaetz family since the 1960s.

The land included a 2,000-foot airport runway, and there was a proposal for a 100-suite hotel complete with swimming pool, golf course, tennis courts, and a breakwater for safe swimming. (https://youtu.be/TkpMLWd7HHY) Coconut groves, banyan trees, and banana plantations were all present on the land. The development proposal was known as Club Santa Lucia, and 450 memberships were offered for sale at $3,950 per share. The development did not proceed.

The Grande Anse Estate is currently for sale for US $30 million. In past years,

according to locals, potential purchasers included the Kohler family, Serena and Venus Williams, England's Manchester United Football Club, and the San Diego Zoo.

4.0 ISSUES

There are a number of issues that must be addressed in a Management Plan for Grande Anse Estate, some of which are long-standing. These issues are summarized here; additional details can be found throughout the report.

4.1 LANDOWNER/GOVERNMENT RELATIONS

Grande Anse Estate, along with 95% of all land proposed for Iyanola National Park status, is privately held. Saint Lucia's governments have long recognized the importance of the Estate for conservation as outlined in this report. The two parties will need to work together to find the right balance between protecting biodiversity and ensuring economic and community benefits.

4.2 LEGAL DESIGNATIONS

The importance of Grande Anse for conservation and for future public access for recreation has been recognized by the government by designation of a Marine Reserve/Management Area that includes the beach and the mangrove forest, and recognition as an Important Bird Area. An

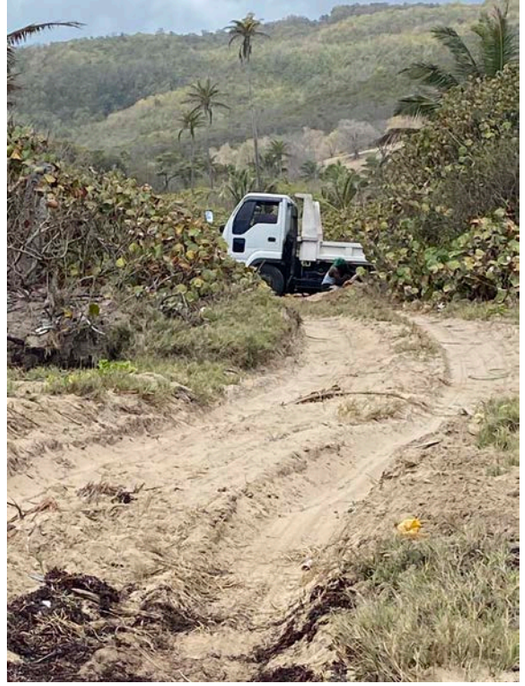
important next step that is currently missing (from what the author of this report has been able to determine) involves legal descriptions of these areas so the designations are enforceable.

4.3 SAND MINING

Mining of the beach sand has long been a concern, and it continues today even though it is illegal. The removal of sand impacts turtle nesting and disturbs potentially significant historical sites/artifacts.

In October 1986 the Grande Anse Beach and Mangrove were declared a Marine Reserve, and that information was published in the Gazette in accordance

with Fisheries Act No. 10 of 1984 and subsequently included under Fisheries Regulation No. 9 of 1994. Under Section 22 2(c) of the Fisheries Act No. 10 of 1984, any person who "(c) Dredges, extracts sand or gravel, discharges or deposits waste or any other polluting matter, or in any way disturbs, alters or destroys the natural environment; is guilty of an offence and shall be liable to a maximum fine of five thousand dollars ($5000)."



4.4 TURTLE POACHING/ KILLING

The poaching of green, hawksbill, and leatherback turtles, and the sale of turtle eggs and adult body parts, has been an ongoing concern at Grande Anse. This activity was significantly curtailed by the Turtle Watch Group of Des Barras (now called the Sea Turtle and Nature Defenders), founded in 2001, who conducted educational tours at Grande Anse during turtle nesting season from 2001 - 2004. Beach mining also decreased with the group's presence on-site.

A moratorium on the harvesting of sea turtles established in 1996 was lifted in 2004. Saint Lucia law currently prohibits the harvesting of sea turtles from January 1 to September 30.

All species of sea turtles found in Saint Lucia are endangered or critically endangered based on the International Union for Conservation of Nature's Red List.

On May 25, 2022 the Saint Lucia Times headline read "Concern Over Killing of Leatherback Turtle at Grand Anse Beach." The turtle, which appeared to be a mature nesting female turtle laying her eggs, "died after a cutlass blow to the back of the neck."

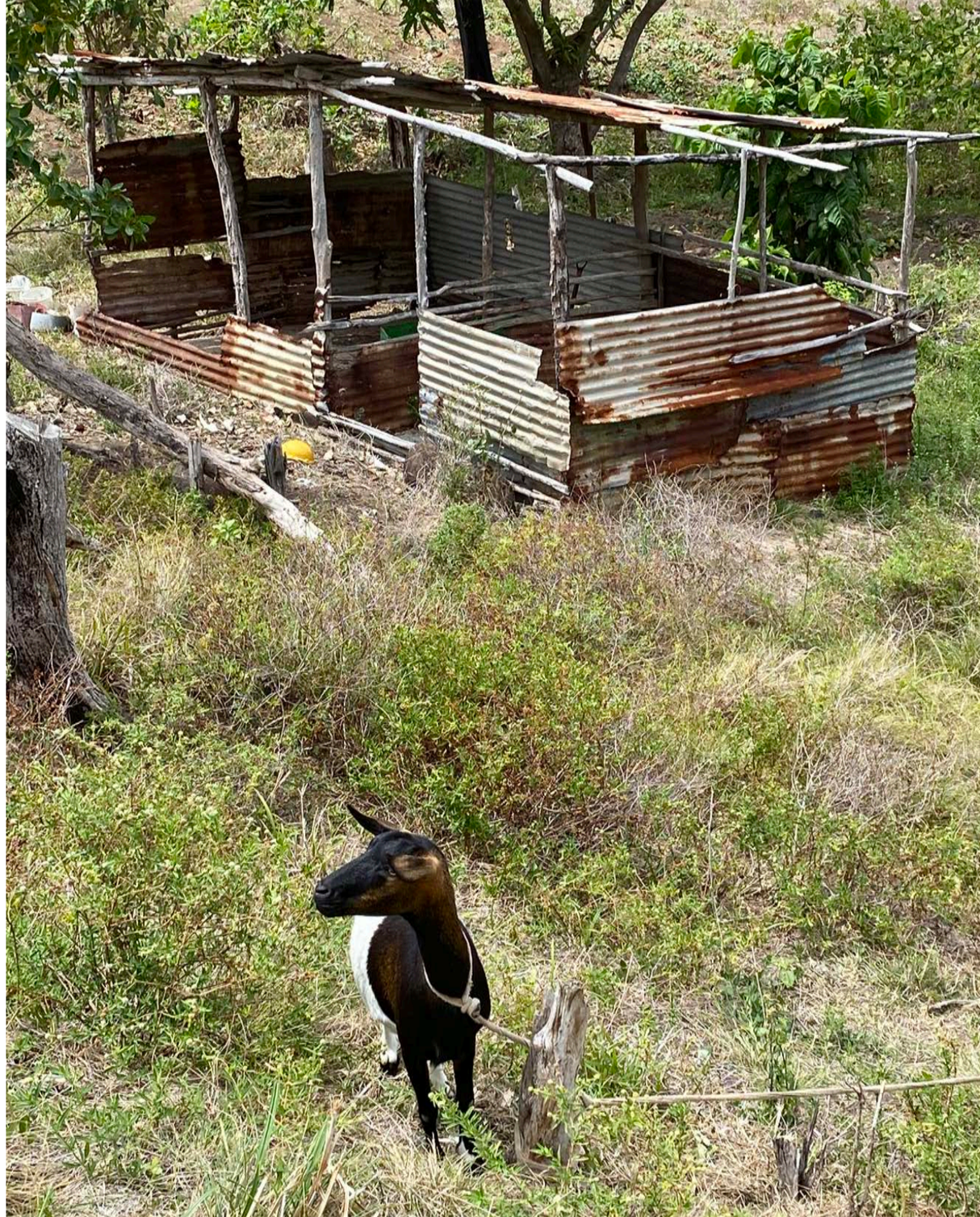
4.5 TRESPASS FARMING

Grande Anse Estate was once a sugar plantation farmed with slaves in the 1800s. It continues to be farmed today by squatters, some of whom are second generation land occupiers, who grow a variety of crops detailed in the Soils and Agriculture Section of this report. Forested land has been cleared, buildings erected, irrigation systems put in place, and crops

planted and harvested. These activities, while illegal, are important to the economy of Des Barras.

An article by Alicia Valassa called "The Grande Anse Saga Continues," published in the St. Lucia Star newspaper on October 24, 2015 summarizes the issue well. It says in part:

> "Decades ago the people of Des Barras, Cailles Des and surrounding areas toiled incessantly on the Grande Anse Estate to care for their families. They toiled the land and were paid, but the vitality of the estate would not last. The changing of the guards would prove to be detrimental.
>
> Scores of people were now unemployed. The new guardian for the estate, with scores of cows, rampaged the gardens on the estate... showing no remorse or concern for the families who would inevitably plunge into a new cycle of poverty. Children were pulled out of school on Wednesdays to work on banana plantations. Child labour was rampant but an acceptable means of survival.
>
> Mortality would eventually slay the guardian and this would spark an unprecedented silent aura of "acceptable crimes." Cows vanished as people stole them for compensation for their gardens and "pain and suffering" brought on by poverty. Many individuals returned to the estate to recommence their farms on the land to which they believed that had a right. But did they?
>
> This "dormant approach" has led to indiscriminate dumping of garbage on the Grande Anse Estate (a place frequented by tourists) and the destruction of habitats to facilitate charcoal making and the cultivation of root crops. What are the implications for the endangered and endemic species as well as migratory birds that depend on this habitat? Is it possible to adequately balance the needs of the locals and the need to preserve the environment?"



This challenge remains today and must be addressed in a Management Plan as both an issue and an opportunity.

4.6 DEFORESTATION AND CHARCOAL MAKING

Growing crops requires the removal of forests, as does charcoal making, both of which continue in Grande Anse today. This has an impact on habitat important to the St. Lucia iguana and potentially to endemic bird species and to bats who rely on older forest ecosystems. Tree removal and its impact on the “protected” mangrove forest is also of concern.

4.7 INVASIVE SPECIES

Endemic flora and fauna are negatively impacted by invasive species worldwide. While no extensive invasive species research has been documented for Grande Anse, the island of Saint Lucia has concerns with over 300 invasive species of plants and animals.

Of particular concern at Grande Anse is the impact that mongoose, opossum, rats, and feral cats can have on nesting sea turtles and their eggs. There is also concern about potential future cross-breeding between the invasive Green iguana and the endemic Saint Lucia iguana. During the author’s March 29, 2022 Field Trip to the northern end of Grande Anse Estate, we observed a feral dog carrying away a mature bright green iguana in its mouth. Future study of invasive species and a plan to manage them is required at Grande Anse Estate.

4.8 ARCHAEOLOGICAL/HISTORICAL VALUES

There is evidence of the human occupation of Grande Anse going back to at least 150 AD, and the Estate is considered to be a Prime Historical Site. Walking the land today it is easy to find Amerindian pottery pieces. Sand mining disturbs intact archaeological sites as does farming, and any future development should proceed with caution and with respect for the Estate’s historical importance.

4.9 IMPACTS OF CLIMATE CHANGE

Climate change is an issue that must be considered in many aspects of the natural values of Saint Lucia. Its specific impacts on Grande Anse

Estate are unknown, but all are relevant.

Potential concerns are:

- Bleaching, increased disease, and mortality in marine environments due to rising temperatures.
- Oceans will become more acidic due to dissolving more carbon dioxide, reducing calcification in corals.
- Ocean water will become saltier.
- Hurricane frequency and intensity will increase, damaging corals, coastlines, and infrastructure.
- Coastal areas will be flooded as sea levels rise.
- Air temperatures could rise by 5.6 degrees by the end of the 21st century.
- Annual precipitation is expected to decrease by around 4% per degree of temperature warming.
- Dry conditions will be enhanced by increased evapotranspiration over land with longer dry spells. Combined with the increasing temperatures and decreasing precipitation, desertification and increased wildfires are of concern.
- Extreme precipitation events will increase, causing flooding and soil erosion.
- Potential increase in non-indigenous species (primarily plants and invertebrates) as future warming is predicted to induce a northward shift at a speed of 37 – 55 km per decade of current major non-indigenous marine species along with an opportunity for new non-indigenous species adapted to drier environments to become established.

4.10 SARGASSUM SEAWEED

Sargassum is a genus of brown microalgae in the order Fuvales. There are numerous species, and they are expanding in temperate and tropical oceans around the world, including Mexico and the Caribbean, potentially due to climate change. The magnificent beaches of Grande Anse are currently covered in up to a metre of sargassum, which seriously impacts their scenic quality and turtle nesting. There is a possibility of turning sargassum seaweed into a business opportunity, as it is used as a thickening agent for pharmaceutical products and creams, as biofertilizer in the agricultural industry, and as a corrosion inhibitor in oil and gas pipelines.

APPENDIX 1: SAINT LUCIA MISSION – CONSULTATION LIST – MARCH 27-APRIL 11, 2022

Opposition Party - United Workers Party

Mr. Andy Daniel (AD) – Former Speaker of the House

Senator the Hon. Dominic Fedee (DF) – Former Minister of Tourism

Senator the Hon. Harold Stanislaus (HS) – Former Minister of Physical Planning

Mr. Ricky Alexander (RA) – Technical Support

Government of Saint Lucia

Hon. Stephenson King (SK) - Minister for Physical Planning

Mr. Alwin Dornelly (AD) – Chief Forestry Officer

Ms. Nicole La Force (NLF) – Officer Responsible for the Restoration of the Iyanola Project

Mr. Michael Bobb (MB) – Chief Technical Advisor – Iyanola Project

Ms. Samanthia Justin (SJ) – Chief Technical Officer - Iyanola Project

Mr. Jason Ernest (JE) – Director, Water Resource Management Authority

Ms. Yvonne Edwin (YE) – Fisheries Biologist

Mr. Charles Prospere (CP) – Fisheries Biologist

Mr. John Calixte (JC) – Project Coordinator South East Coast Project GOSL/ GEF

Mr. Hildreth Lewis (HL) – Permanent Secretary, Ministry of Physical Planning

Ms. Deepa Girdari (DG) – Ministry of Tourism Rep GOSL

Mr. Kemuel Jn. Baptiste (KJB) – Chief Extension Officer, Ministry of Agriculture

Mr. Moses Wilfred – Forestry Officer/Driver, Iyanola Project

Mr. Thomas Nelson (TN) – Deputy Fisheries Officer

Mr. Ronald Polius (RP) – Chief Surveyor

Institutions/Agencies:

Mr. Gregg Rawlins (GR) – IICA Regional Representative

Mrs. Jeannine Compton (JC) – Director, St. Lucia National Trust

Mr. Laurent "Jomo" Jn Pierre (LJP) – Secretary, Archeological and Historical Society

Mr. Adam Toussaint (AT) – Fauna Flora International

Mr. Lyndon John (LJ) – Royal Society for the Protection of Birds

Mr. Christopher Cox (CC) – UNEP

Mr. Darryl Montrope (DM) – PS, Ministry of Public Service and Former Cabinet Secretary

Private/Civil Society/NGO

Sir Calixte George Sr (CG) - Former Minister

Mr. Felix Finisterre (FF) – Former MP and Parliamentary Rep. for Project Area

Mr. Donald Anthony (DA) – Senior Wildlife Officer

Mr. Trevor Naitram (TN) - Sea Turtle and Nature Defenders -Desbarra

Ms. Kimier Chastnet (KC) - Sea Turtle and Nature Defenders –Desbarra

Ms. Verena Lawaetz (VL) – Landowner, Grand Anse Estate

Ms. Ute Lawaetz (UL) – Landowner, Grand Anse Estate

Mr. Jeff Coyne (JC) – CEO, Grande Anse Beach Company

Mr. Mathias (M) – Local knowledge resident

Mr. Alleyne Regis – Consultant Education & Advocacy

APPENDIX 2: SUMMARY – GOVERNMENT RECOGNITION OF GRANDE ANSE VALUES

In order to better understand Grande Anse's values, meetings were held with a number of present and former government staff, Members of Parliament, and Cabinet Ministers. (See list in Appendix I attached.)

There was general recognition and concern for Grande Anse with respect to:

- Importance for turtle nesting and community economic benefit of turtle tours.
- Concern over illegal activities like farming, sand mining, and charcoal production while recognizing these activities support the local economy particularly for Desbarra. Topsoil mining occurred between 2007 – 2013.
- In the past, poachers impacted turtle eggs and adults. Turtle Watch tours helped to stop the practice and educate people on the ecological and economic importance of protecting turtles.
- Important area for birds, particularly the St. Lucia Nightjar, White

Breasted Thrasher, St. Lucia House Wren, Masked Duck.

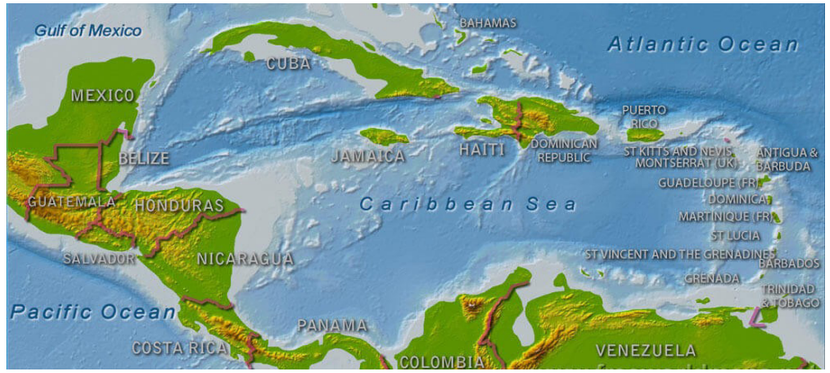
- Offshore reefs are important for Elkhorn and Branching Corals, and the area is highly productive for fishing due to ocean current upwelling.
- Grande Anse beach and mangrove were "protected" under the Fisheries Act No.10, Sections 18 & 19, in 1984.
- Invasive species are a concern including feral dogs, cats, and pigs; mongoose; rats; and opossums.
- Important habitat for iguanas.
- Important potential for tourism.
- Saint Lucians are very sensitive to land use decisions – must look at revenue gain versus revenue loss.

Government has proposed protected area status for Grande Anse in the past, but the Cabinet did not support it due to a lack of adequate public consultation.

APPENDIX 3: SAINT LUCIA – GLOBAL SIGNIFICANCE

Saint Lucia is the second largest island of the Lesser Antilles, with an area of 616km2, and with a maximum length and width of 45 km and 21 km, respectively. It is located within the Windward Islands of the Lesser Antilles in the West Indies, with Martinique 32km to the north and Saint Vincent 40km to the south, and has a population of 185,113 (2022). (On its western shores is the Caribbean Sea; on the eastern shore is the Atlantic Ocean.)

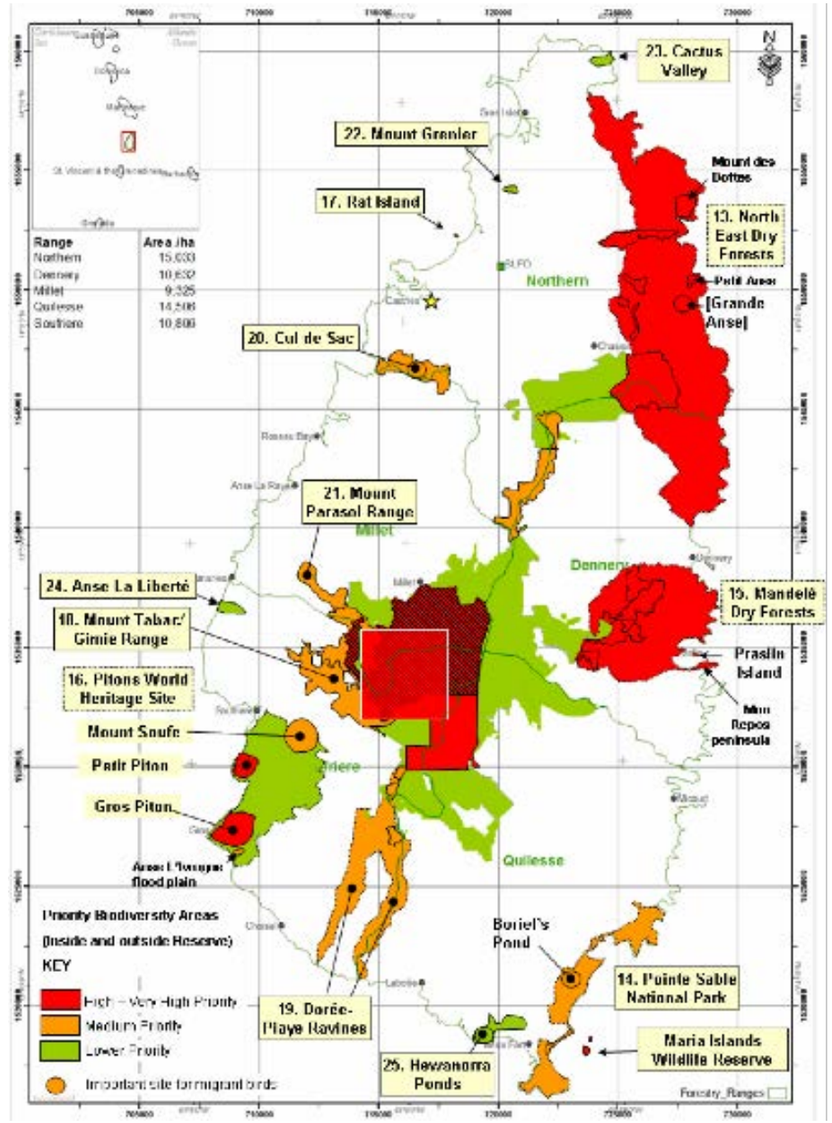
Predominantly igneous, Saint Lucia has a mountainous topography dominated by a central ridge running almost the full length of the island from north to



south with valley ('ravines') extending on either side to the coasts. Some valleys are broad with relatively large areas of flat land. The central southern part of the country has high mountains (Mount Gimie being the highest at 958m). The coastlines, particularly the east coast, are deeply indented by near-vertical cliffs and have a number of narrow sandy beaches. Two spectacular volcanic plugs that rise from the ocean in the southwest region of the island, Gros Piton (798m) and Petit Piton (743m), are a World Heritage Site.

The island has a tropical marine climate characterized by relatively uniform high temperatures throughout the year. There is a dry season from roughly January to April and a rainy season from May to August, with usually sunny, warm weather from September to October. Tropical storms and hurricanes are infrequent, with the majority of West Indian tropical cyclones passing to the north of Saint Lucia. The hottest period is May to October, and the coolest December to March, giving a mean annual temperature of approximately 26 degrees Celsius at sea level. Annual rainfall varies from 1,524-1,778mm in the

Figure 4 (right). From *Action Plan For Implementing the Convention on Biological Diversity's Programme of Work on Protected Areas*



north to 2,540-3,683mm in the mountainous interior of the south.

There are over 20,000 hectares of natural vegetation types in Saint Lucia, of which 9,196 hectares are within the Government Forest Reserve (protected forests). Graveson (2009) described the different types of forest cover, which range from a very xeric littoral shrubland and mangroves on the coast to a lush rainforest and elfin shrubland on the high peaks.

Approximately 30% of Saint Lucia's land area is pastoral and arable land. Originally the mainstay of the economy, agriculture has been in decline in recent years. The economy of Saint Lucia has shifted to a service economy, with tourism the largest economic sector. Prior to the Covid pandemic Saint Lucia had 1,220,000 tourists in 2019, accounting for almost 50% of the Gross National Product. Unemployment rates are around 20%.

Saint Lucia is signatory to multinational environmental agreements including the Convention on Biological Diversity, focusing on conservation of biological resources, sustainable use, and the fair sharing of genetic resources, and the United Nations Framework Convention on Climate Change. Effectively managing the resources of the Iyanola East Coast Region is of critical importance to meeting international commitments and protecting island biodiversity.

Saint Lucia has a global responsibility to conserve its indigenous plants, animals, and their habitats as a signatory to the St. George's Declaration on Environmental Sustainability in the Organization of Eastern Caribbean States (2001 and 2006), the Protocol Concerning Specially Protected Areas and Wildlife (1990), and the Cartagena Convention (1984).

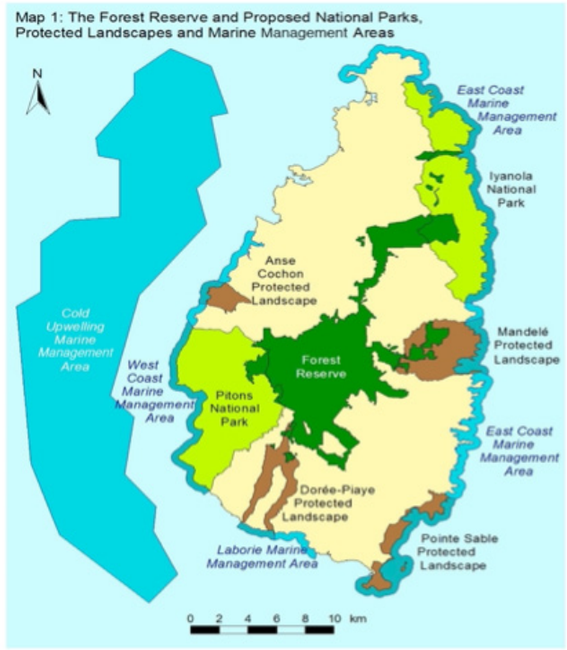


Figure 5. From *Systems Plan for Protected Areas in Saint Lucia, 2009*

APPENDIX 4: IYANOLA – SIGNIFICANCE TO SAINT LUCIA

The northeast coast has been called Saint Lucia's last frontier, and in order to properly manage what is still considered relatively undisturbed land, a proposal has been put forward to create Iyanola National Park (5,000 acres), including the Grande Anse Estate.

Figure 6. From UNEP Project Document Iyanola - Natural Resource Management of the NE Coast

The Iyanola project aims to improve the effective management and sustainable use of the natural resource base of the northeast coast as part of the broader objective of contributing to global environmental security. It seeks to address issues relating to biodiversity, climate change, and land degradation. The project has four components:

- Enhanced land use planning and regulatory framework
- Enhanced sustainable land management and carbon benefits in deciduous seasonal and low montane rainforest zones
- Conservation
- Enhanced capacity for the production of biodiversity-friendly goods and services in inland forest and coastal communities.

The 2018 – 2038 Consultation Draft recommends a balanced approach to land use where conservation of the natural environment and ecosystems is regarded as paramount and the policy intention is to allow for low-impact development, appropriately located, designed, and managed, that can co-exist with the natural environment without damaging it.

Grande Anse's proposed role in Iyanola includes policy designation as a Beach and Marine Reserve Policy Area, a Heritage Forest Policy Area, and a

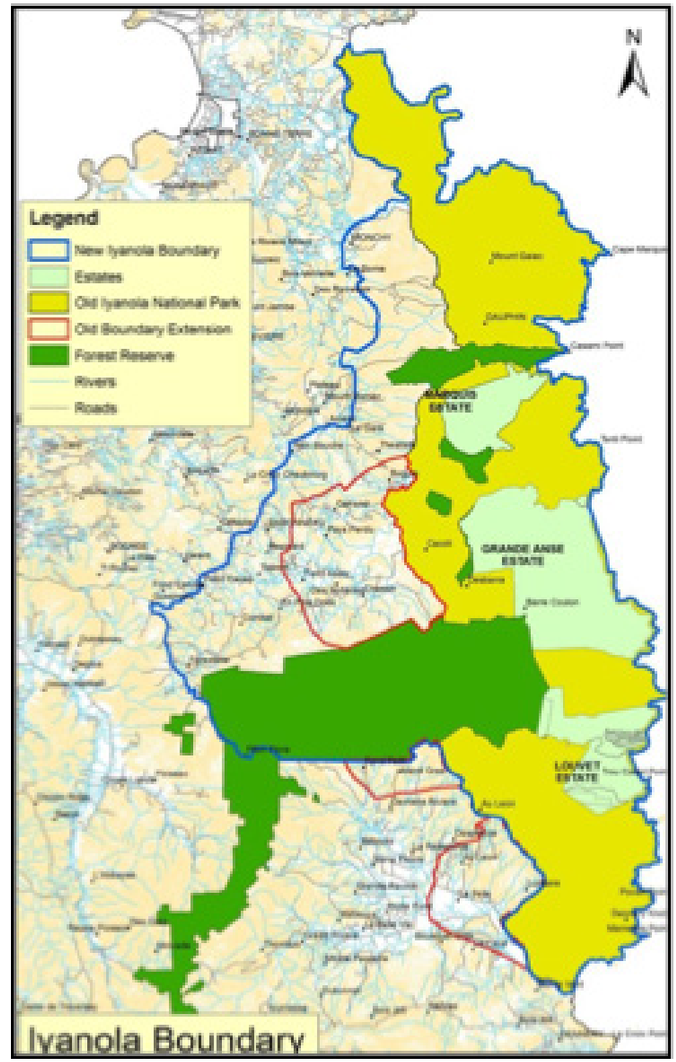


Figure 6. From UNEP Project Document Iyanola - Natural Resource Management of the NE Coast

Mangrove Policy Area.

Grande Anse is also important for conservation of Saint Lucia's heritage, including pre-Columbian remains of Amerindian civilization.

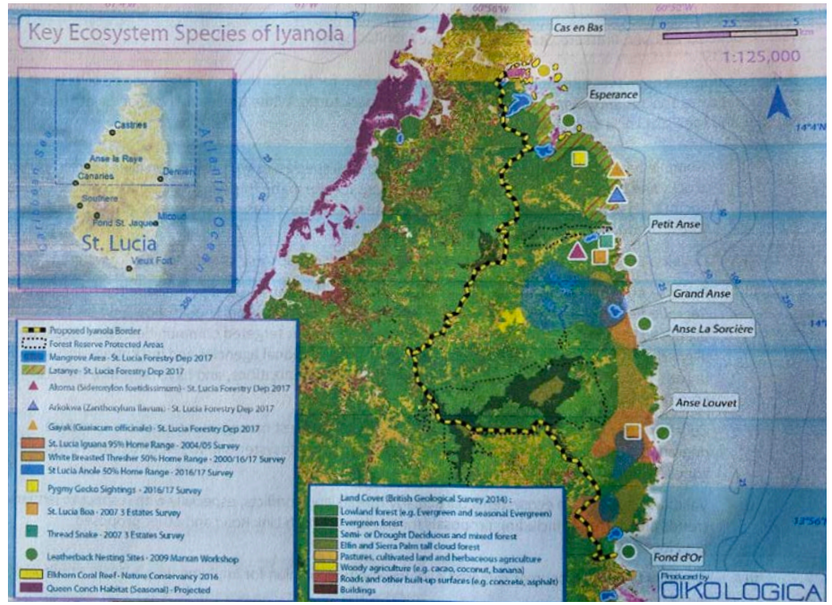
In the past, high-end tourism developments have been proposed for areas in Iyanola like Grande Anse. There is concern around these developments and their potential to bring irreversible harm to key marine, coastal, mangrove, and deciduous forest habitats.

The long-term vision for Iyanola is that it will be "a place of national and international significance; an iconic place, renowned for its blending of nature, enterprise, culture and history."

The Iyanola Project is funded by the Global Environment Facility, with the United Nations Environment Programme serving as Implementing Agency. (United Nations Environment Programme. Project Document). The United Nations identified the following roles for Grande Anse in reaching the Aichi 2020 Targets for Conservation Biodiversity:

- Target 6 Sustainable use of marine Biodiversity: A participatory based Site-Specific Management Plan for Grande Anse Marine Reserve will focus on reducing pressures on threatened terrestrial and marine species, incorporating sustainable financing options for local communities.
- Target 11 Inland water and coastal and marine areas: Formulate and commence implementation of a Participatory based Site-Specific Management Plan for Grande Anse Marine Reserve that will focus on reducing pressures on threatened terrestrial and marine species, incorporating sustainable financing options.

Implementing the Iyanola Project's objective to achieve sustainable forest and land management and restoration will result in enhanced resilience to climate change, rebuilding and conservation of carbon stocks, and a reduction



in emissions from deforestation and degradation. The carbon benefits are estimated (2009) at an annual sequestration of 23,056 tons CO2, with a potential total carbon benefit of 691,689 tons CO2 at the end of a 30-year period.

Figure 7. Saint Lucia National Strategic Action Plan for the Ministry of Agriculture

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