



**ORGANISATION OF EASTERN CARIBBEAN STATES
ENVIRONMENT AND SUSTAINABLE DEVELOPMENT UNIT**

**PROTECTED AREAS SYSTEMS PLAN FOR
ST. KITTS AND NEVIS**

FINAL SYSTEMS PLAN REPORT



ECO REPORT NO : 43/2009

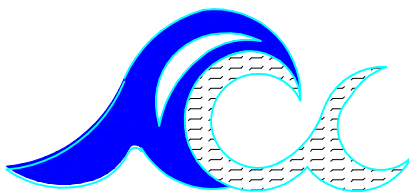
APRIL 07, 2010

PREPARED BY

Ecoengineering Caribbean Limited

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EXECUTIVE SUMMARY

INTRODUCTION

The Governments of the OECS Participating Member States (PMS) have made significant commitments to protecting their countries' resources as signatories to international conventions and through policy statements, legal and institutional instruments, recent environmental programs, and financial support of conservation activities through budget allocations. They have also recognised the importance of establishing protected areas as the primary method of preserving biodiversity and conserving valuable natural resources assets.

In terms of planning for PAs, only some of the PMSs have Systems Plans in place, most of which are outdated and do not encompass existing and proposed terrestrial and marine areas in a comprehensive nor cohesive manner.

The OECS Secretariat through its Environment and Sustainable Development Unit (ESDU) is implementing the OECS Protected Areas and Associated Sustainable Livelihoods (OPAAL) Project. The projected outputs for Component 1 of the OPAAL Project address Policy, Legal and Institutional Arrangements Reform within PMSs and include eight goals. This National Protected Areas Systems Plan for St. Kitts and Nevis is being implemented under Goal v: "updated or new national PA System Plans".

Objectives of the PA Plan

The following are the objectives of this study and report:

- To present a practical, time-frame specific phased approach to implementation of the PA Plan;
- To provide the full range of required resources and capacity building for establishing and managing the system;
- To recommend means of financing the operationalisation of the plan;
- To indicate the level of priority for each of the proposed system components;
- To provide a means to monitor and evaluate the system and its effectiveness over the timeframe of the plan; and
- To provide the proposed boundaries of the sites being proposed.

Limitations

There were a number of limitations encountered while drafting this Systems Plan, including the following:

- Unavailability of Site Specific Data on Biological Diversity;
- Limitation of Site Visits;
- Unclear Rationale for consideration of Specific Sites; and
- Timing of Parallel OECS Studies.

PLAN PREPARATION

The process for writing this Systems Plan was as follows:

- Workplan;
- Review of Data;
- Site Visits;
- Workshops;
- Data Analysis; and
- Public Participation.

At the beginning of the project a Workplan and Inception Report were submitted to the OECS-ESDU which detailed the information requirements for the project, highlighted the output documents at the various stages and provided a schedule for completing the project.

As would be expected for a document of this type, there was a heavy reliance on existing data either from parallel studies under the OPAAL project or from other sources. This data was accessed for use in this study. Additionally, a series of site visits was conducted to provide critical data on the variety of habitat types that were being considered to be included in the Systems Plan as well as to provide updated information on the present status of some of these sites.

In accordance with the scope of works provided by the OECS-ESDU for this project, two workshops were also facilitated in-county to gather information on the biological diversity of ecological sites as well as to determine the management structure and requirements for all sites (or classes of sites) being considered. These two workshops - The Ecological Gap Assessment (EGA) and Rapid Assessment and Prioritization of Protected Areas Management (RAPPAM) - provided invaluable information for this Systems Plan.

Throughout this project and in preparing this plan there was the obvious need to consult with the public. This occurred at these various stages:

- Document Review,
- Site Assessment and Consultation with Stakeholders,
- Presentation of Draft Systems Plan.

FRAMEWORK FOR PA SYSTEM

Before the actual analysis of the sites (or classes of sites) to be considered for including in the Systems Plan there must be some discussion of the context in which this Systems Plan will exist on a number of levels: local, national, regional and international. The overarching legislation that would govern the management and administration of protected areas is the draft National Conservation and Environmental Management Act (NCEMA, 2009) which is intended to supersede the existing National Conservation and Environmental Protection Act (NCEPA, 1987). At a regional and international level, the designation of protected areas will partially fulfil the requirements of the country under the Convention on Biological Diversity. Other conventions such as the MARPOL convention and its enforcement will also have considerable impact on the marine protected areas that will form part of this National Systems Plan. There is also need for this Systems Plan to link with the existing national planning initiatives of the country namely the St. Christopher National Physical Development Plan and the Nevis Physical Development Plan.

ECOLOGICAL DIVERSITY (ST. KITTS AND NEVIS)

The small size and geographic location of St. Kitts and Nevis, as well as the climatic conditions experienced influences the terrestrial ecology and contribute to the relatively high endemism and vulnerability of its biota. The country borders the American continent which provides a stopover for migratory avian species during the winter months. In addition, some of the country's beaches are known to be nesting sites for various species of marine turtles.

The following is a brief summary of the biological diversity of the islands of St. Kitts and Nevis:

Terrestrial Resources

- St. Kitts and Nevis has 145 Pteridophyte species (fern and fern-allies), 22 of which occur on Nevis but not in St. Kitts and 41 of which occur in St. Kitts, but not on Nevis. There are also 45 plant species known to be endemic to the country or to the Lesser Antilles.

- There is no country-specific data on invertebrate diversity. However, some work has been done on the island of Nevis for invertebrate species that are of some importance, prominence or pose a hazard. These include Poisonous Centipede, Caribbean Mud Fiddler Crabs, Wolf Spiders, Great Land Crab, Donkey Spiders, Ghost Crab, Scorpions, Land Hermit Crab, Crayfish, Sally Lightfoot Crab, Lesser Blue Crab and Honeybees.
- Bats are the only terrestrial mammals native to St. Kitts and Nevis, and they constitute the largest mammalian group (a total of six species in total for the country). Other mammals (all introduced) in the country include the Agouti (no longer reported), White-tailed Deer, Indian Mongoose, Rats, Mouse and the African Green (or Vervet) Monkey (abundant).
- There are 9 species of freshwater fish reported for St. Kitts and 5 reported for Nevis.
- Only two species of amphibians are found on the islands of St. Kitts and Nevis, the Piping Tree Frog and the Marine Toad. The Crapaud or Mountain Chicken, a native to St. Kitts and Nevis became extirpated through habitat modification and overexploitation for food.
- The islands of St. Kitts and Nevis are home to ten (possibly eleven) recorded species or sub-species of terrestrial reptiles. They include Tortoise, Common Woodslave Gecko, Giant Woodslave Gecko, Lesser Antillean Iguana, Green Iguana, Green Lizard, Brown Lizard, Ground Lizard, Blind Snake, a subspecies of the Blind Snake and Racer Snake recorded for both islands.
- Of the 116 species of birds found in St. Kitts and Nevis, 113 are indigenous species and 3 are non-native species. Of the 72 native, non resident species, 22 are seabirds, waterfowl or other aquatic species, 26 are shorebirds, 7 are non-passerine landbirds and 17 are passerine landbirds.

Coastal Resources

- The island of St. Kitts has a total coastline of 78.1 km, consisting of 34.7 km of cliff rocks, 10.8 km of cobble, 6.3 km of boulders and rocks, 13.1 km of black volcanic sand and 13.2 km of golden sand. Nevis also has sandy beaches, rocky shores and massive sea cliffs. The most prominent sandy beach is a 4 km stretch of coastline north from Charlestown to Cades Bay, called Pinneys Beach.

- On the island of St. Kitts, there are a number of saltwater ponds located on the Southeast Peninsula. Nevis has a system of freshwater lagoons located throughout the island, some of which are along the coast and are therefore subject to saltwater intrusion. Two small ponds located northeast of Basseterre are the only freshwater ponds on the island of St. Kitts. These ponds provide habitats for many migratory seabirds and shorebirds in the fall and spring
- Generally, the mangroves are not abundant on the island of St. Kitts. The most extensive mangrove systems occur on the Southeast Peninsula. On the island of Nevis, red and black mangroves no longer occur naturally in any of the mangrove systems. Stands of white mangroves are dominant on the island, accompanied by fewer buttonwood species. These mangrove systems can be found at Bath Bogs / Bath Stream, Parris Pond, Pinneys Pond , Jessups Bogs / Bowrin Pond, Fort Ashby Lagoon, Mariners Pub Lagoon / Lawrence's Pond, Cades Bay, Jones Bay, Oualie Beach, Newcastle, Nisbet's, Long Haul Bay and at Indian Castle / White Bay .

Marine Resources

- In St. Kitts and Nevis, coral reefs and seagrass beds occur primarily along the Southwest coast between Nag's Head and the southern end of Basseterre Bay, the Northwest coast between Sandy Point and Dieppe Bay, the East coast between Conaree and Friar's Bay, the Southeast coast adjacent to the Narrows, the island of Nevis (reasonable balance of coral reefs surrounding the island), and the Northwestern and southern coasts of Nevis.
- The species of coral found in the waters of the islands virtually span the entire spectrum of tropical coral diversity from the finger coral to the Staghorn and Elkhorn corals. Other species such as sponges and soft corals usually accompany these stony hard corals. Seagrass communities are typically co-dominated by Turtle Grass and Manatee Grass.
- Migrant mammals include Humpback Whale, Sperm Whale, Bottled nosed Dolphins, Rough-toothed Dolphins, and Spinner Dolphins.
- There are 462 species of marine fish tabulated for St. Kitts and Nevis of which 16 species are deemed threatened.

- There are three species of sea turtles that are known to nest in St. Kitts and Nevis, the Hawksbill Turtle, Green Turtle, and Leatherback Turtle. All are internationally classified as endangered.
- Eighteen invasive species have been identified for St. Kitts and Nevis on the Global Invasive Species Database.

PRESENT STATUS OF ECOLOGICAL AND CULTURAL HISTORICAL BASE

The following table summarizes the present status of the ecological and cultural resources to be considered for including into the Protected Areas System:

| ITEM | COMMENT |
|--|---|
| BRIMSTONE HILL FORTRESS NATIONAL PARK | |
| Location and Extent | Brimstone Hill Fortress National Park (BHFNP) is situated on the West Coast of St. Kitts, between Half Way Tree and Sandy Point Town. It occupies an area of approximately 15 ha including a buffer zone of approximately 400 m. |
| Legal Status | BHFNP is a National Park under both the NCEPA and draft NCEMA Acts of St. Kitts and Nevis and a World Heritage Site listed by UNESCO. |
| Features | <p>Heritage Outstanding British fortress.</p> <p>Exceptional example of 17th and 18th century British Military architecture.</p> <p>Ecological Nesting site for eight species of birds.</p> <p>Geological Emerged as a result of underlying volcanic activity some 6000 years ago.</p> |
| Pressures and Threats | <ul style="list-style-type: none"> • Exceeding carrying capacity. • Fires, which originate in the surrounding cane fields and grassland. • Hurricanes have weathered walls in this Century. • Heavy and prolonged rainfall can produce rock and land slides. • Dirt and grime can affect external walls over time. • Earthquake and volcanic eruption are potential dangers in these Caribbean islands. |

| ITEM | COMMENT |
|---|--|
| Pressures and Threats (Cont'd) | <ul style="list-style-type: none"> • Inappropriate Development; • Potential for Geothermal Energy Power; and • Livestock Grazing. |
| Management Structure and Challenges | <p>The Society for the Restoration of Brimstone Hill was managed the fortress until 1987 when the NCEPA Act gave management authority to the Brimstone Hill Fortress National Park Society.</p> |
| CENTRAL FOREST RESERVE NATIONAL PARK | |
| Location and Extent | <p>The Central Forest Reserve National Park (CFRNP) is situated in the centre of the island of St. Christopher, and occupies all lands above the 1,000ft contour. The CFRNP occupies approximately 50 km² of land, or 12,500 acres.</p> |
| Legal Status | <p>The Central Forest Reserve was designated a National Park by the Government of St. Kitts and Nevis on 23 October 2006, and officially gazetted on 29 March 2007.</p> |
| Features | <ul style="list-style-type: none"> • Various vegetation types including, Elfin Sierra Palm Cloud Forest, Evergreen Forest Sierra Palm Forest, Sierra Palm Transitional Tall Cloud Forest, and Steep Montane Non-Forest Vegetation. • It represents the primary source of water for human consumption on the island of St. Christopher. • The CFRNP houses a series of nature and scenic trails which support eco-tourism ventures as well as recreational and educational programmes. |
| Pressures and Threats | <ul style="list-style-type: none"> • Erosion; • Overcrowding; • Extraction of Ornamental and Medicinal Plants; • Illegal Farming; • Hurricanes / Natural Disasters; • Damage to Water Resources; and • Invasive Species. |
| Management Structure and Challenges | <ul style="list-style-type: none"> • Management responsibility for the CFRNP is vested in the Department of Physical Planning and the Environment (DPPE). • The lack of capacity and practical experience presently impedes the proper management of the CFRNP. • There is also currently a poor relationship between the stakeholders involved in CFRNP and the DPPE. • The lack of a defined (on the ground) boundary for the CFRNP. • High difficulty in monitoring of illegal activities such as illegal growth of marijuana, plant extraction and littering; |

| ITEM | COMMENT |
|---|---|
| Management Structure and Challenges (Cont'd) | <ul style="list-style-type: none"> • Difficulty in monitoring or preventing agricultural encroachment, unsanctioned development and trail cutting; • Law enforcement is low; and • Recruitment and retention of managers is difficult. |
| NEVIS PEAK NATIONAL PARK AND CAMPS RIVER WATERSHED | |
| Location and Extent | <ul style="list-style-type: none"> • The Nevis Peak National Park includes all land on the island above the 1,000 foot contour, ascending to the top of the 3,232 foot tall Mount Nevis. • This protected area links the Camps River Watershed to the north north-east, via Camps Ghaut and wetlands to the coast. |
| Legal Status | The NPNP is earmarked under the Draft Nevis Physical Development Plan as a protected area. |
| Features | <ul style="list-style-type: none"> • Volcanic formations, • Vegetative zones such as Elfin Woodland, Rainforest, Montane Thicket, Palm Brake, and Riparian Forests. • The island's major watershed and springs • A freshwater lagoon, and • The largest living reef system around Nevis. |
| Pressures and Threats | <ul style="list-style-type: none"> • Charcoal Production; • Built Development; • Overharvesting of Plants; • Clearing for Farming; • Livestock Grazing; • Water Contamination from Farming; • Water Contamination from Wild Monkeys; • Water Contamination from Domestic Sources; and • Dumping of Industrial and Construction Wastes. • The lack of proper (on the ground) boundary demarcation. |
| Management Structure and Challenges | <p>The management plan envisages that:</p> <ul style="list-style-type: none"> • The Ministry of the Environment (Physical Planning Department) has the overall responsibility for the management of the Nevis Peak National Park; • The Nevis National Trust has been created as a statutory corporation under the draft Nevis National Trust Ordinance, 2007 to administer its affairs; and • The Nevis Peak National Park Advisory Committee is responsible for advising the National Trust Council on matters specifically pertaining to the proposed park. |

| ITEM | COMMENT |
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| Management Structure and Challenges (Cont'd) | Management Challenges include: <ul style="list-style-type: none"> • Difficulty in monitoring or preventing agricultural encroachment, • Unsanctioned development; • Trail cutting; • Low enforcement is low; and • Difficulty in securing the sites. |
| BASSETERRE VALLEY AQUIFER NATIONAL PARK | |
| Location and Extent | The Basseterre Valley Aquifer National Park (BVANP) is situated generally to the east of the town of Basseterre, occupying an area of approximately 197 ha. |
| Legal Status | The St. Kitts National Physical Development Plan, 2006 lists the BVANP as a proposed Protected Area. |
| Features | A significant portion of the public supply of potable water in St. Kitts comes from this aquifer. |
| Pressures and Threats | <ul style="list-style-type: none"> • Climate variability and the recurrence of drought. • Effects of previous fertilizer application to cane fields, • Sewage treatment and disposal • Storm water run off along major roads which cross the aquifer. • Inappropriate Development; • Stray Animals; • Illegal Dumping; • Agrochemical Contamination; • Industrial Waste; • Contaminated Airport Runoff; • Illegal Topsoil Removal; • Fires; and • Toilet Waste / Sewage. |
| Management Structure and Challenges | The Basseterre Valley Aquifer Protected Area project falls under the jurisdiction of the Basseterre Valley Advisory Committee. Management Challenges include: <ul style="list-style-type: none"> • Managing the resources (water) given the high demand for it; and • Difficulty in managing illegal activities such as arson and illegal dumping. |
| MARINE AREAS | |
| Location and Extent | <ul style="list-style-type: none"> • The South East Peninsula Marine Management wraps around the South-east Peninsula of St. Kitts and extends to the north coast of Nevis. |

| ITEM | COMMENT |
|-------------------------------------|---|
| Location and Extent (Cont'd) | Sandy Shoal Coral Reef can be found on the north-west corner and leeward side of the island at the town of Sandy Point. |
| Legal Status | The Southeast Peninsula Marine Management Area and Sandy Point Marine Management Area are designated as protected areas in the St. Kitts National Physical Development Plan, 2006. |
| Features | <ul style="list-style-type: none"> • Sea grass and calcareous algae. • Salt ponds which possess a mangrove fringe. • Three species of endangered sea turtles, the green, hawksbill and leatherback turtle, nest at the South-east Peninsula beaches. • Local fisheries such as finfish, conch and lobster. • Two bird nesting sites at Booby Island and Nag's Head. |
| Pressures and Threats | <ul style="list-style-type: none"> • Uncontrolled diving and indiscriminate anchoring of boats, • Overfishing; • Climate Change; • Closure of Sugar Industry; • Tourism Development; • Theft of Cultural Resources; • Sand Mining; • Anchor Damage to Reefs and Seagrass Beds; • Geothermal Pipeline / Cable Construction; • Invasive Species; and • Solid Waste including International Garbage. |
| Management Structure and Challenges | <p>The SEPMMMA will be under the responsibility of the Ministry of Sustainable Development. Proposal for a Management Committee comprising of Fisheries Management Unit, Dive operators, fishers organizations, Port Authority, Coast Guard, etc.</p> <p>Management challenges include:</p> <ul style="list-style-type: none"> • Difficulty in monitoring the harvesting of juvenile / undersized species, • Poaching of turtles and their eggs, • Poaching of Bobby eggs and • The extraction of marine artefacts. |
| TURTLE NESTING BEACHES | |
| Location and Extent | <ul style="list-style-type: none"> • Sea Haven Turtle Nesting Beach is situated on the north coast of Nevis overlooking The Narrows. • Keys Turtle Nesting Beach is situated on the windward coast, between Barker's Point and Cayon. |

| ITEM | COMMENT |
|-------------------------------------|---|
| Legal Status | <ul style="list-style-type: none"> Sea Haven Beach is identified as a Coastal Conservation Area under the Nevis Physical Development Plan, 2008. Keys Turtle Nesting Beach is a proposed protected area. |
| Features | <p>Both beaches have one or a combination of the features below making them suitable for nesting:</p> <ul style="list-style-type: none"> Flatter slopes to make it easier for the turtles to cross the beach. Firm sand to allow for the flippers to gain “purchase” to drag the turtle up the beach Clear beach area without debris. Back beach vegetation suitable for nesting Hawksbill turtles Stable sand conditions for successful hatching. |
| Pressures and Threats | <ul style="list-style-type: none"> Inappropriate Development; Human Activity (Driving, Horseback Riding, Littering and Sand Mining); Poaching; Light Pollution; and Predation. |
| Management Structure and Challenges | <ul style="list-style-type: none"> Sea Haven Beach is currently monitored by the Nevis Turtle Group. Keys Beach is monitored by the St. Kitts Sea Turtle Monitoring Network. <p>Management challenges include:</p> <ul style="list-style-type: none"> Difficulty in controlling the poaching of eggs and animals, Monitoring and controlling sand mining (legal and illegal), Unsanctioned development (creating light sources), and The removal of vegetation. |
| SALT PONDS | |
| Location and Extent | <ul style="list-style-type: none"> On the island of St. Kitts there are a number of saltwater ponds, many of which are concentrated on the Southeast Peninsula. Pond size varies greatly. For example, Great Salt Pond covers an area of 200 ha while Friars Bay Salt Pond is approximately 20 acres of which approximately 10 acres is actual pond. |
| Legal Status | Salt Ponds are considered owned by the person that owns the surrounding lands. |

| ITEM | COMMENT |
|-------------------------------------|--|
| Features | <ul style="list-style-type: none"> • Salt ponds are usually located close to the sea, just landward of the beach berm (dunes). • They function as part of the surface drainage system, with some surface water entering the ponds from the landward side before being discharged to the sea. • Variable hydrology with the dry and wet seasons. • As the dry season progresses the water in the ponds can become hypersaline, supporting a specialized fauna and microfauna. • Many support a mangrove fringe and diverse and abundant bird life. |
| Pressures and Threats | <ul style="list-style-type: none"> • Tourism development, • cutting of the dune barrier, • dumping of rubble and garbage, • removal of the vegetative screen, and • eutrophication as a result of continuous run-off from the golf course. |
| Management Structure and Challenges | <ul style="list-style-type: none"> • The management structure related to the Salt Ponds is unclear at this time. • The DPPE appears to exercise some control on the modification of these ponds under the planning approvals process. <p>Management challenges include:</p> <ul style="list-style-type: none"> • Monitoring illegal dumping at the ponds. • Removal of mangrove vegetation. |
| FRESHWATER LAGOONS | |
| Location and Extent | Nevis has a system of freshwater lagoons (ponds and wetlands) located throughout the island, some of which are along the coast. |
| Legal Status | <ul style="list-style-type: none"> • Camps Springs and the Associated Wetland are part of the overall Nevis Peak National Park / Camps Watershed Protected Area/ • Bath Bogs and Gallows Bay Bog are part of the Bath Bogs Protected Area. • Pinney's Pond, Parris Pond and Nelson's Spring are all part of a proposed protected area, Pinney's Beach Conservation Area in the draft Nevis Physical Development Plan. |

| ITEM | COMMENT |
|-------------------------------------|--|
| Legal Status (Cont'd) | <ul style="list-style-type: none"> • Jessup's Pond is located within the proposed Pinney's Beach Conservation Area according to the map attached to the Nevis Development Plan although it is not identified as a part of the Conservation Area in the actual plan. • New River Springs (which is part of a larger area being proposed as a protected area) has no legal designation at this time. |
| Features | <ul style="list-style-type: none"> • Nelson Springs, Camps Springs and New River Springs are known to provide water to their respective Parishes. • There is predominantly coconut plantation in the vicinity of some lagoons. • There are also areas of mangrove around others. • Within some of the smaller, shallower lagoons there are prominent reeds and sedges. • These lagoons provide habitats for many migratory seabirds and shorebirds in the Northern Autumn and Spring seasons. |
| Pressures and Threats | <ul style="list-style-type: none"> • Disease. • Pollution from nearby restaurants and built up areas. • Non-native species; • Filling-in; • Marinas; • Illegal dumping; • Overfishing; and • Harvesting of Mangroves. |
| Management Structure and Challenges | <p>The management structure related to the Freshwater Lagoons is unclear at this time. There is some control on built development around freshwater lagoons by The Physical Planning Department of the Nevis Island Administration.</p> <p>Management challenges include:</p> <ul style="list-style-type: none"> • Controlling the ease of access to these freshwater lagoons; • Preventing the overexploitation of these resources; and • Challenges in preventing the development of land in these areas. |
| THE GHAUTS | |
| Location and Extent | Ghauts are distributed around both islands. The size of each ghaut depends on the area which it drains. |

| ITEM | COMMENT |
|-------------------------------------|--|
| Legal Status | Ghauts on St. Kitts and Nevis are listed as areas of special concern in the NCEPA and NCEMA Acts. |
| Features | <ul style="list-style-type: none"> • The primary importance of ghauts is effective drainage. • The reduction in the potential for localized flooding. • Ghauts also serve as vegetated corridors which host several species of plants and animals. • Legal and regulated sand mining in Wash, Tabernacle and Mansion Ghauts. |
| Pressures and Threats | <ul style="list-style-type: none"> • Illegal sand mining. • Unauthorized development. • Agricultural encroachment. • Squatting. • Indiscriminate dumping of garbage and other types of solid waste. |
| Management Structure and Challenges | <p>The management of sand mining in the Ghauts in St. Kitts is the responsibility of the Ministry of Public Works. On both islands, the control of built development very close to or within the ghauts is the responsibility of the respective Physical Planning agency.</p> <p>Management challenges include:</p> <ul style="list-style-type: none"> • Difficulty in monitoring illegal activities such as sand mining, illegal dumping, unauthorized construction and livestock grazing/farming; • Controlling the ease of access to these ghauts; and • Managing the sustainable use of the resources which ghauts have to offer. |
| DRY FOREST | |
| Location and Extent | <p>Small areas of dry forest are found at the following locations:</p> <ul style="list-style-type: none"> • The slopes of Brimstone Hill in St. Kitts; • On selected peaks on the Southeast Peninsula of St. Kitts; and • The northernmost, southeast and southwest slopes of Nevis Peak. |

| ITEM | COMMENT |
|-------------------------------------|---|
| Legal Status | <ul style="list-style-type: none"> • The dry forest on the slopes of Brimstone Hill is protected as part of the BHFNP. • The dry forests on the slopes of Nevis Peak are protected as part of the Nevis Peak National Park. • The status of the dry forest on the small peaks on the Southeast Peninsula is subject to some question. |
| Features | <ul style="list-style-type: none"> • Dry forests are a diverse system consisting mainly of deciduous trees which shed their foliage in the dry season. • Dry forest plants have multiple adaptations to dry conditions, including drought avoidance and resistance through a variety of morphological and behavioural characteristics. • Common species include Silk Cotton and the shrub <i>Boufferea succulenta</i> in St. Kitts. • On the island of Nevis common species include White Cedar, Black Mast and Loblolly. |
| Pressures and Threats | <ul style="list-style-type: none"> • Erosion / Landslides; • Extraction of Ornamental and Medicinal Plants; • Illegal Farming; • Invasive Species; • Charcoal Production; • Livestock Grazing; and • Illegal dumping of waste. |
| Management Structure and Challenges | <ul style="list-style-type: none"> • Management of the dry forests in the Brimstone Hill National Park and the Nevis Peak National Park is as described above for these sites. • There is no formal management structure for other areas of dry forests. <p>Management challenges include:</p> <ul style="list-style-type: none"> • Difficulty in monitoring illegal activities; • Controlling overexploitation of the valuable resources found in the area; and • Controlling the ease of access to these forested areas; |
| HISTORIC CHARLESTOWN | |
| Location and Extent | <ul style="list-style-type: none"> • The town of Charlestown is located on the west coast of the island. • At present the town is approximately 490 acres in extent. |

| ITEM | COMMENT |
|-------------------------------------|--|
| Legal Status | <ul style="list-style-type: none"> • The draft Nevis Physical Development Plan identifies Charlestown as a Priority Area and recommended the development of a Physical Action Plan. • The legal status of individual units is not as clear cut. |
| Features | <ul style="list-style-type: none"> • It is compact and easily walkable, • Its historic urban structure is largely intact and suffers few alien changes, • Its historic buildings are both charming and, for the most part, pleasant and comfortable with several 'special spaces', many fine trees and old stonewalls, • It enjoys views out to sea and, inland, dramatic glimpses of Mount Nevis. • There is also architectural display of the 'skirt and blouse' style, timber balconies, gingerbread or scrollwork, jalousie windows and hurricane shutters, lapped wood or shingled walls, hipped roofs largely in corrugated steel, distinctive paintwork and signboards, and arches, breezeways and courtyards. |
| Pressures and Threats | <ul style="list-style-type: none"> • Neglect of sites and buildings. • Poor repairs and restoration, • Ill-considered redevelopment; • Exceeding carrying capacity; • Property Theft and Destruction; • Littering; and • Graffiti. |
| Management Structure and Challenges | <ul style="list-style-type: none"> • At present there is no formal management structure associated with Historic Charlestown. • There is some protection of historic sites through the system of planning permission administered by the Physical Planning Department. <p>Management challenges include:</p> <ul style="list-style-type: none"> • Monitoring of illegal activities such as graffiti; • Lack of clear internal organization; • Lack of transparency in decision-making; • Lack of communication with the community in decision-making; • Ongoing disputes due to land tenure or use rights; and • Lack of adequate financial resources to conduct critical law enforcement. |

| ITEM | COMMENT |
|---------------------|---|
| Location and Extent | <p style="text-align: center;">HISTORIC SITES</p> <ul style="list-style-type: none"> • Petroglyphs at Old Road Town, St. Kitts <ul style="list-style-type: none"> ○ Size of a household lot. • Stonefort, St. Kitts; <ul style="list-style-type: none"> ○ Extends 200 m on both sides of the ravine and 500 m from the Island Main Road. • Belmont Estate, St. Kitts; <ul style="list-style-type: none"> ○ 3 acres • Mansions Estate, St. Kitts; <ul style="list-style-type: none"> ○ 3 acres • Spooner’s Ginnery, St. Kitts; <ul style="list-style-type: none"> ○ 1.8 acres • Black Rocks, St. Kitts; <ul style="list-style-type: none"> ○ 30 m coastal strip • Charles Fort, St. Kitts; <ul style="list-style-type: none"> ○ 7 acres • Indian Castle Protected Area, Nevis; <ul style="list-style-type: none"> ○ 15 acres • Fort Ashby, Nevis; <ul style="list-style-type: none"> ○ Household lot • Bath Hotel, Nevis; <ul style="list-style-type: none"> ○ Part of a larger 57 acre site • New River Estate, Nevis; and <ul style="list-style-type: none"> ○ Unclear • Fort Charles, Nevis <ul style="list-style-type: none"> ○ 3 acres |
| Legal Status | <ul style="list-style-type: none"> • Petroglyphs at Old Road Town, St. Kitts <ul style="list-style-type: none"> ○ Ministry of Tourism • Stonefort, St. Kitts; <ul style="list-style-type: none"> ○ St. Christopher National Trust • Belmont Estate, St. Kitts; <ul style="list-style-type: none"> ○ St. Christopher national Trust • Mansions Estate, St. Kitts; <ul style="list-style-type: none"> ○ St. Christopher National Trust • Spooner’s Ginnery, St. Kitts; <ul style="list-style-type: none"> ○ St. Christopher National Trust • Black Rocks, St. Kitts; <ul style="list-style-type: none"> ○ Ministry of Tourism • Charles Fort, St. Kitts <ul style="list-style-type: none"> ○ Crown lands |

| ITEM | COMMENT |
|-----------------------|---|
| Legal Status (Cont'd) | <ul style="list-style-type: none"> • Indian Castle Protected Area, Nevis; <ul style="list-style-type: none"> ○ Ministry of Agriculture • Fort Ashby, Nevis; <ul style="list-style-type: none"> ○ Ministry of Tourism • Bath Hotel, Nevis; <ul style="list-style-type: none"> ○ Ministry of Tourism • New River Estate, Nevis; and <ul style="list-style-type: none"> ○ Ministry of Tourism • Fort Charles, Nevis; <ul style="list-style-type: none"> ○ Private land |
| Features | <ul style="list-style-type: none"> • Petroglyphs at Old Road Town, St. Kitts; <ul style="list-style-type: none"> ○ Amerindian rock carvings • Petroglyphs at Stonefort, St. Kitts <ul style="list-style-type: none"> ○ Amerindian rock carvings amounting to 115 numbered inscriptions. • Belmont Estate, St. Kitts <ul style="list-style-type: none"> ○ Remnants of 18th and 19th sugar plantation including chimneys, Great House, windmill, factory and old plantation buildings. • Mansions Estate, St. Kitts <ul style="list-style-type: none"> ○ Remnants of 18th and 19th sugar plantation including chimneys and old plantation buildings such as the Manager's House, Overseer's House, windmill, factory, cistern, pen, stables and privy. • Spooner's Ginney, St. Kitts <ul style="list-style-type: none"> ○ Remnants of cotton ginney including equipment as well as 19th century Great House, 19th century stone factory and chimney, 18th century mill and factory and 1940's manager's house. • Black Rocks, St. Kitts <ul style="list-style-type: none"> ○ Volcanic rocks in a scenic setting. • Charles Fort, St. Kitts <ul style="list-style-type: none"> ○ Remnants of old fort including cistern, guard room, cannons etc. • Indian Castle Protected Area, Nevis <ul style="list-style-type: none"> ○ Amerindian artefacts and remnants of Fort George. |

| ITEM | COMMENT |
|-------------------------------------|---|
| Features (cont'd) | <ul style="list-style-type: none"> • Fort Ashby, Nevis <ul style="list-style-type: none"> ○ Remnants of Old Fort including cannons, building. • Bath Hotel, Nevis <ul style="list-style-type: none"> ○ Bath Hotel which has been maintained, original bath house, thermal springs, newly constructed bath houses. • New River Estate, Nevis <ul style="list-style-type: none"> ○ Amerindian artefacts, springs, water wheel. • Fort Charles, Nevis <ul style="list-style-type: none"> ○ Stone walls, cistern and cannons. |
| Pressures and Threats | <ul style="list-style-type: none"> • Inappropriate Development; • Squatting; • Exceeding Carrying Capacity; • Property Theft and Destruction; • Littering; • Destructive Earthquake / Volcanic Eruption; • Hurricanes / Storm Surges and Flooding; • Deterioration of Structures; • Vandalism; • Abandonment of Buildings; • Fires; and • Traffic Congestion and Inadequate Parking. |
| Management Structure and Challenges | <ul style="list-style-type: none"> • There is no organized management structure for all sites. • There is some management under the Physical Planning department as part of the planning approvals process. • Some of the sites are loosely managed by the Nevis Historical and Conservation Society and the St. Christopher National Trust. • Some of the sites are also managed by various Government ministries such as the Ministry of Tourism and the Ministry of Agriculture. <p>Management challenges include:</p> <ul style="list-style-type: none"> • Difficulty in monitoring illegal activities such as the removal of facing stone and theft of artefacts and equipment; • Difficulty in managing the use of the resources. |

DEVELOPMENT STRATEGY FOR PA SYSTEM

| ITEM | ACTUAL OR SUGGESTED |
|---|--|
| Brimstone Hill Fortress National Park | |
| Area / Layout | <ul style="list-style-type: none"> As presently defined, the hill and a quarter-mile buffer zone around it. |
| NCEMA Categories | <ul style="list-style-type: none"> National Park (Category I). Also listed as a World Heritage Site. |
| Management Agency | Existing: <ul style="list-style-type: none"> Brimstone Hill Fortress National Park Society |
| Financing Strategies | <ul style="list-style-type: none"> User Fees and Government Subvention for recurrent expenses. Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | Includes areas of Dry Forest. |
| Central Forest Reserve National Park | |
| Area / Layout | Areas in excess of 1,000 feet above mean sea level (needs to be marked in the field). |
| NCEMA Categories | National Park (Category I). |
| Management Agency | Proposed: <ul style="list-style-type: none"> Department of Physical Planning and Environment, with inputs from Water Department, Department of Tourism and Department of Agriculture. |
| Financing Strategies | <ul style="list-style-type: none"> Public Service Salaries for management expenses. Public Service Salaries, User Fees and Government Subventions for recurrent expenses. Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | Very important to the public water supply. |
| Nevis Peak and Camps River National Park | |
| Area / Layout | Areas in excess of 1,000 feet above mean sea level, and extending down the Camps River Valley to the coast (needs to be marked in the field). |
| NCEMA Categories | National Park (Category I). |
| Management Agency | Proposed: <ul style="list-style-type: none"> Nevis Physical Planning Department with inputs from Nevis Water Department, Nevis Tourism Authority and the Nevis Department of Agriculture. |

| ITEM | ACTUAL OR SUGGESTED |
|--|--|
| Financing Strategies | <ul style="list-style-type: none"> • Public Service Salaries for management expenses. • Public Service Salaries, User Fees and Government Subventions for recurrent expenses. • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | <ul style="list-style-type: none"> • Very important to the public water supply. • Includes an area of Dry Forest. |
| Basseterre Valley Aquifer National Park | |
| Area / Layout | 197 ha east of the town of Basseterre and west of the Conaree Hills |
| NCEMA Categories | <ul style="list-style-type: none"> • National Park (Category I). • Botanic Gardens (Category VII). |
| Management Agency | Proposed: <ul style="list-style-type: none"> • Basseterre Project Steering Committee. |
| Financing Strategies | <ul style="list-style-type: none"> • User Fees and Government Subventions for recurrent expenses. • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | Very important to the public water supply. |
| Marine Management Areas | |
| Area / Layout | <ul style="list-style-type: none"> • Southeast Peninsula and The Narrows. • Sandy Point Marine Management Area. |
| NCEMA Categories | <ul style="list-style-type: none"> • Marine Reserves (Category IV). • Nature Reserves (Category III). • Areas of Special Concern (Category V). |
| Management Agency | Proposed: <ul style="list-style-type: none"> • Fisheries Departments of both islands with inputs from other Government Departments, conservationists, water sports operators and representatives from nearby communities. |
| Financing Strategies | <ul style="list-style-type: none"> • Public Service Salaries for Planning Controls. • User Fees and Public Service Salaries for recurrent expenses. • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | These areas include salt ponds and turtle nesting beaches. |
| Turtle Nesting Beaches | |
| Area / Layout | <ul style="list-style-type: none"> • Within the proposed Marine Protected Areas at Southeast Peninsula and the Narrows and at Sandy Point. • Other locations around St. Kitts and Nevis. |
| NCEMA Categories | Areas of Special Concern (Category V). |

| ITEM | ACTUAL OR SUGGESTED |
|---------------------------|---|
| Management Agency | Existing: <ul style="list-style-type: none"> Fisheries Departments in St. Kitts and Nevis with inputs from the St. Kitts Sea Turtle Monitoring Network and the Nevis Turtle Group. |
| Financing Strategies | <ul style="list-style-type: none"> User Fees and Public Service Salaries for recurrent expenses. |
| Other Comments | Keys Turtle Nesting Beach is part of a proposal for the St. Mary's Biosphere Reserve under the UNESCO Man and the Biosphere Reserve Program. |
| Salt Ponds | |
| Area / Layout | <ul style="list-style-type: none"> Within the proposed Southeast Peninsula and the Narrows Marine Management Area. Other locations around St. Kitts. |
| NCEMA Categories | Areas of Special Concern (Category V). |
| Management Agency | Existing: <ul style="list-style-type: none"> Department of Physical Planning and the Environment in St. Kitts. |
| Financing Strategies | <ul style="list-style-type: none"> Public Service Salaries for planning controls. Grants from International Donor Agencies and proposed Environmental Trust Fund for enhancement and rehabilitation of two Ponds (in the first instance) for ecotourism and educational purposes. |
| Other Comments | Ponds with existing planning permission to be radically modified were not included in this analysis. |
| Freshwater Lagoons | |
| Area / Layout | <ul style="list-style-type: none"> Within the proposed Nevis Peak and Camps River National Park. Other locations around Nevis. |
| NCEMA Categories | Areas of Special Concern (Category V). |
| Management Agency | Existing: <ul style="list-style-type: none"> Nevis Department of Physical Planning, Nevis Tourism Department and Nevis Water Department. |
| Financing Strategies | Public Service Salaries for planning controls. |
| Other Comments | Some of these lagoons provide potable water to nearby parishes. These lagoons are part of larger protected areas as recommended in the Nevis Physical Development Plan. |
| The Ghauts | |
| Area / Layout | <ul style="list-style-type: none"> Throughout both islands. 81 in St. Kitts and 33 Ghauts in Nevis. |
| NCEMA Categories | Areas of Special Concern (Category V). |

| ITEM | ACTUAL OR SUGGESTED |
|-----------------------------|--|
| Management Agency | Existing: <ul style="list-style-type: none"> • Department of Physical Planning on both islands. • Ministry of Works for legal sand mining in Ghauts. |
| Financing Strategies | Public Service Salaries for planning controls. Government subvention or Grants from International Donor Agencies for conduct of a Strategic Impact Assessment. Government subvention for restoration works deemed necessary. |
| Other Comments | There is some question as to the agency responsible for policing illegal sand mining. |
| Dry Forests | |
| Area / Layout | <ul style="list-style-type: none"> • Within Brimstone Hill Fortress National Park, • A new area on the Southeast Peninsula of St. Kitts to be included in the CFRNP. • Within Nevis Peak and Camps River National Park. |
| NCEMA Categories | Areas of Special Concern (Category V). |
| Management Agency | Proposed: <ul style="list-style-type: none"> • Brimstone Hill Fortress National Park Society. • Nevis Physical Planning Department. |
| Financing Strategies | <ul style="list-style-type: none"> • Public Service Salaries for management expenses. • Public Service Salaries, User Fees and Government Subventions for recurrent expenses. • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | -- |
| Historic Charlestown | |
| Area / Layout | Within the town of Charlestown. |
| NCEMA Categories | Historic Site (Category II). |
| Management Agency | Existing: <ul style="list-style-type: none"> • Nevis Physical Planning Department. • Nevis Historical and Conservation Society. • Nevis Tourism Authority. |
| Financing Strategies | <ul style="list-style-type: none"> • Public Service Salaries for planning controls. • Government Subventions for recurrent expenses (User Fees may also be considered). • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | Other sites / buildings may be added after the designation of the initial listing of sites / buildings. |
| Other Historic Sites | |
| Area / Layout | Throughout St. Kitts and Nevis. |

| ITEM | ACTUAL OR SUGGESTED |
|----------------------|--|
| NCEMA Categories | Historic Sites (Category II). Scenic Sites (Category VI) |
| Management Agency | Existing: <ul style="list-style-type: none"> • St. Kitts Tourism Department. • Nevis Tourism Authority. • St. Christopher National Trust. • Nevis Historical and Conservation Society. |
| Financing Strategies | <ul style="list-style-type: none"> • Public Service Salaries for planning controls. • Government Subventions for recurrent expenses (User Fees may also be considered). • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | Some of these historic sites are part of larger protected areas as recommended in the Nevis Physical Development Plan. |

THE WAY FORWARD

In order to implement the Protected Areas Systems Plan for St. Kitts and Nevis a number of steps must be taken. These are discussed under the following headings:

- Approval of the Plan,
- Prioritizing Individual Sites,
- Organizational Arrangements,
- Further Studies,
- Training, and
- Updating the Systems Plan.

Firstly, the Plan requires approval at the highest level of decision-making: the Government of St. Kitts and Nevis as well as the Nevis Island Administration. Next there is the need to prioritize the various actions recommended in the Plan. These action items have been prioritized into the following categories:

- Highest - Those actions which should be taken as soon as practical.
- High - Those actions that should be taken within the next 3 years; and
- Medium - Those actions which should be taken within the next 5 years.

While there are no actions that will be described as having low priority, there are some that will take a longer period of time to implement either due to restrictions in time, money or other resources.

Highest Priority

The following actions are to be given the highest priority:

- Acceptance of this National Protected Areas Systems Plan.
- Enact and Assent to the National Conservation and Environmental Management Act (NCEMA).
- Operationalize the Environmental Trust Fund as envisaged under the NCEMA.
- Establish the National Conservation Commission as envisaged under the NCEMA.
- Declaration of Nevis Peak and Basseterre Aquifer as National Parks under the NCEMA Act, 2009.
- Revision of the Management Plan for the Central Forest Reserve to include joint management of the four key agencies (Physical Planning and Environment, Water Department, Tourism Department and Agriculture Department).
- Revision of the Management Plan for the Nevis Peak and Camps River Watershed to include joint management of the four key agencies (Physical Planning, Water Department, Nevis Tourism Authority and Nevis Department of Agriculture).
- Declaration of Booby Island as a Nature Reserve in accordance with the NCEMA Act.
- Conduct of ecological studies to determine the extent of Nag's Head Nesting Site.
- Conduct of fisheries studies to determine the boundaries of fish and shellfish propagation areas to be included in the SEPNMMA.
- Declare Keys Turtle Nesting Beach (St. Kitts) as a beach of "Special Concern" under the NCEPA Act.
- Declare Sea Haven Turtle Nesting Beach (Nevis) as a beach of "Special Concern" under the NCEPA Act.
- Completion of an assessment of the structures and a determination of the boundaries at Spooner's Ginnery, Mansions Estate, Belmont Estate, Charles Fort, Indian Castle, Fort Charles and Fort Ashby to determine any restoration works that will be needed.

High Priority

The following actions are to be given high priority:

- Adjustment of the Admission Fees for the BHFNP.
- Declaration of Nag's Head as a Nature Reserve in accordance with the NCEMA Act.
- Enhancement and Rehabilitation of Frigate Bay and Half Moon Bay Salt Ponds.
- Conduct ecological studies to determine the extent of dry forest on the S. E. Peninsula that is considered suitable for protection.
- Conduct fisheries studies to determine the boundaries of fish and shellfish propagation areas to be included in the SPMMA.
- Declaration of Marine Reserves within the SEPNMMA and SPMMA under the Fisheries Act, 1984.
- Review regulations on closed season for turtle harvesting with a view to recommending a moratorium on all harvesting of turtles and eggs both onshore and in the marine environment.
- Declaration of Muddy Point Salt Pond and Greatheeds Pond as protected areas where no additional development will be permitted.

Medium Priority

The following actions are to be given medium priority:

- Conduct a Strategic Environmental Impact Assessment to identify specific locations for legal sand mining.
- Amalgamation of identified areas of dry forest on the S. E. Peninsula into the CFRNP.
- Conduct restoration works at New River Estate to bring the trails and associated infrastructure up to a level suitable for use by tourists.

Organizational Arrangements

A number of institutional arrangements need to be put in place as part of the implementation of the Protected Areas Systems Plan for St. Kitts and Nevis:

- Establishment of the proposed National Conservation Commission.
- Establishment of a working relationship between the St. Kitts Department of Physical Planning and the Environment, Water Department, Department of Tourism and Department of Agriculture relative to the management of the Central Forest Reserve National Park.
- Establishment of the proposed Basseterre Valley Project Steering Committee.
- Establishment of a working relationship between the Nevis Peak National Park Advisory Committee to manage the Nevis Peak and Camps Valley National Park.
- Establishment of a management authority to manage marine management areas which should comprise of Fisheries Departments of both islands, other Government Departments, conservationists, water sports operators and representatives from nearby communities.

Training

There is of course the need for training on two levels in order for the effective implementation of Systems Plan. The first is a training workshop with key stakeholder in order to present and explain various aspects of the approved Systems Plan. The second is focussed on in-depth training needs as highlighted in the Training Needs Assessment conducted under the OPAAL project.

Updating the Systems Plan

This systems plan is intended to be a “living document” which is updated on a regular basis as new information comes to hand. Specifically, it is envisaged that a major update will be taken after about 36 months, when the results of Further Studies have been completed and routine updates will be taken every 5 years thereafter.

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GLOSSARY

| | |
|----------------|---|
| Antiquity | Refers to objects surviving from ancient cultures |
| Artefacts | Anything made or used by mankind |
| Brackish | Brackish water is water that has more salinity than fresh water, but not as much as seawater. It is mostly the result of mixing of seawater with fresh water, as in estuaries |
| Catchment | An extent of land where water from precipitation drains into a body of water |
| Cotton Ginnery | A cotton gin (short for cotton engine) is a machine that quickly and easily separates the cotton fibres from the seeds, a job previously done by hand. These seeds are either used again to grow more cotton or, if badly damaged, are disposed of. It uses a combination of a wire screen and small wire hooks to pull the cotton through the screen, while brushes continuously remove the loose cotton lint to prevent jams. |
| Endangered | A taxon is Endangered when the best available evidence indicates that it is therefore considered to be facing a very high risk of extinction in the wild. |

| | |
|----------------|--|
| Endemic | An organism being "endemic" means exclusively native to a place or biota |
| Eutrophication | Eutrophication is an increase in the concentration of chemical nutrients in an ecosystem to an extent that increases the primary productivity of the ecosystem. Depending on the degree of eutrophication, subsequent negative environmental effects such as anoxia and severe reductions in water quality, fish, and other animal populations may occur. |
| Ghaut | Deeply incised drainage channels that are the primary means of channelling runoff to the sea. |
| Hydrology | Hydrology is the study of the movement, distribution, and quality of water throughout Earth, and thus addresses both the hydrologic cycle and water resources. |
| Microfauna | Small, often microscopic animals, especially those inhabiting the soil, an organ, or other localized habitat. Single-celled protozoans, small nematodes, small unsegmented worms, and tardigrades (eight-legged arthropods) are the most common components of microfauna. Many inhabit water films or pore spaces in leaf litter and in the soil, feeding on smaller microorganisms that decompose organic material. |
| Migratory | Migratory birds are birds that undertake a regular seasonal journey. Bird movements include those made in response to changes in food availability, habitat or weather. These however are usually irregular or in only one direction and are termed variously as nomadism, invasions, dispersal or irruptions. Migration is marked by its annual seasonality |
| Monospecific | Refers to a taxon (at any rank) that includes only one species. |
| Threatened | Threatened species are any species (including animals, plants, fungi, etc.) which are vulnerable to extinction in the near future. World Conservation Union (IUCN) is the foremost authority on threatened species, and treats threatened species not as a single category, but as a group of three categories: vulnerable, endangered, and critically endangered, depending on the degree to which they are threatened. |
| Watershed | a watershed refers to a divide that separates one drainage area from another drainage area |

ACRONYMS

| | |
|--------|--|
| BPOA | Barbados Programme of Action |
| BHFNP | Brimstone Hill Fortress National Park |
| BVANP | Basseterre Valley Aquifer National Park |
| CCA | Caribbean Conservation Association |
| CFRNP | Central Forest Reserve National Park |
| CNPPA | Commission on National Parks and Protected Areas |
| CZMP | Coastal Zone Management Plan |
| ED | Enumeration District |
| EDDR | Early Detection and Rapid Response |
| EGA | Ecological Gap Analysis |
| EIA | Environmental Impact Assessment |
| ERDMP | Emergency Recovery & Disaster Management Project |
| ESDU | Environment and Sustainable Unit |
| GDP | Gross Domestic Product |
| GEF | Global Environment Facility |
| GIS | Geographical Information System |
| GOSKN | Government of St Kitts & Nevis |
| HCL | Hyder Consulting Limited |
| ICC | International Cricket Council |
| ICZM | Integrated Coastal Management |
| IUCN | International Union for Conservation of Nature |
| IWCAM | Integrating Watershed and Coastal Areas Management |
| KAP | Knowledge Attitude Practice |
| MPA | Marine Protected Area |
| NBSAP | National Biodiversity Strategy and Action Plan |
| NCEPA | National Conservation and Environmental Protection Act |
| NCEMA | National Conservation and Environmental Management Act |
| NDPD | National Draft Physical Development Plan |
| NHCS | Nevis Historic & Conservation Society |
| NIA | Nevis Island Administration |
| NICE | National Implementation Coordinating Entity |
| NNE | North North East |
| NPDP | National Physical Development Plan |
| OAS | Organisation of American States |
| OECS | Organisation of Eastern Caribbean States |
| OPAAL | OECS Protected Areas and Associated Livelihoods |
| PA | Protected Area |
| PERB | Protecting the Eastern Caribbean Region's Biodiversity |
| PMS | Participating Member States |
| RAPPAM | Rapid Assessment and Prioritization of Protected Areas Management |
| SCHS | St. Christopher Heritage Society |
| SCNT | St. Christopher National Trust |
| SEP | South East Peninsula |

| | |
|--------|--|
| SEPMPA | South East Peninsula and Narrows Marine Protected Area |
| SGD | St. George's Declaration |
| SIDS | Small Island Developing States |
| SKN | St Kitts & Nevis |
| SKTA | St Kitts Tourism Authority |
| SPMMA | Sandy Point Marine Management Area |
| TOR | Terms of Reference |
| UNDP | United Nations Development Programme |
| US | United States |
| USA | United States of America |
| WHO | World Health Organisation |

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ECO REPORT No. 43/2009

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**ORGANISATION OF EASTERN CARIBBEAN STATES
ENVIRONMENT AND SUSTAINABLE DEVELOPMENT UNIT**

**PROTECTED AREAS SYSTEMS PLAN FOR
ST. KITTS AND NEVIS**

SYSTEMS PLAN REPORT

1 INTRODUCTION

This Systems Plan was prepared by Ecoengineering Caribbean Limited for the Environment and Sustainable Development Unit of the Organisation of Eastern Caribbean States (OECS-ESDU). It was conducted in accordance with our proposal dated December 22, 2008, submitted to OECS-ESDU.

This report contains 8 chapters. The remainder of this chapter provides a brief background and the rationale for the proposed project, indicates the scope of the report, provides the objectives of the proposed project, and finally lists limitations for the use of the Plan. Chapter 2 describes the process by which this Plan was prepared and lists the sources of the information used while Chapter 3 discusses the framework for the PA System including the legal framework, international obligations, the OPAAL Project, the basis for considering the proposed PAs and finally how this plan is linked to other national planning strategies. Chapter 4 summarizes the ecological status of the two islands that make up the Federation of St. Kitts and Nevis while Chapter 5 describes the present status of the Ecological and Historical / Cultural Base of the proposed protected areas.

Chapter 6 describes the units of the National Protected Areas System on the basis of resources / assets, pressures / threats and suitability of units. Chapter 7 presents the development strategy for the Protected Areas System with respect to the NCEMA Act, existing and proposed management strategies and existing and proposed financing strategies.

Finally, Chapter 8 comments on the way forward and outlines the priorities for individual units of the PA System, makes some comments on organizational arrangements and recommends further studies and training.

For ease of reading and to make the document more manageable all figures are included as Appendix A to this report. Additionally, more detailed data or supporting studies are contained in the following additional appendices:

| | |
|-------------|---|
| APPENDIX B: | RESULTS OF ECOLOGICAL GAP ASSESSMENT |
| APPENDIX C: | RESULTS OF RAPPAM WORKSHOP |
| APPENDIX D: | NOTES OF FINAL CONSULTATION MEETINGS |
| APPENDIX E: | FRAMEWORK OF THE PA SYSTEM |
| APPENDIX F: | SPECIES LISTS |
| APPENDIX G: | STATUS OF THE ECOLOGICAL AND HISTORICAL / CULTURAL BASE |

1.1 Background

The OECS Secretariat through its Environment and Sustainable Development Unit (ESDU) is implementing the OECS Protected Areas and Associated Sustainable Livelihoods (OPAAL) Project.

Recognizing the importance of the sustainable management of its natural resources and rich biodiversity, the Governments of the OECS Participating Member States (PMS) have made significant commitments to protecting their countries' resources as signatories to international conventions and through policy statements, legal and institutional instruments, recent environmental programs, and financial support of conservation activities through budget allocations. They have also recognised the importance of establishing protected areas as the primary method of preserving biodiversity and conserving valuable natural resources assets.

Nonetheless, significant impediments continue to exist in terms of an effective framework for establishing and managing protected areas (PAs) if they are to function effectively to prevent further biodiversity degradation. Existing institutional arrangements within PMSs are weakened by gaps in the present policy framework, including limited incorporation of environmental and social costing into economic decision making and inadequate systems in support of integrated planning, information sharing and collaboration among agencies and other stakeholders. As a result, tourism and coastal development, upstream construction and rural development continue to cause detrimental levels of coastal sedimentation and erosion, and unsustainable exploitation of both living and non-living resources with inadequate planning and coordination continue to pose significant threats to biodiversity conservation.

In terms of planning for PAs, only some of the PMSs have Systems Plans in place, most of which are outdated and do not encompass existing and proposed terrestrial and marine areas in a comprehensive nor cohesive manner. The projected outputs for Component 1 of the OPAAL Project address Policy, Legal and Institutional Arrangements Reform within PMSs and include eight goals. This National Protected Areas Systems Plan for St. Kitts and Nevis is being implemented under Goal v: “updated or new national PA System Plans”.

1.2 Rationale

The development of this Systems Plan is a direct result of the recognition of the importance of establishing protected areas as the primary method of preserving biodiversity and conserving valuable natural resources assets and historical / archaeological sites. The establishment of this System of Protected Areas also puts the Federation of St. Kitts and Nevis in line with other OECS Member States which already have Systems Plans in place. Finally, this Systems Plan was written to integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity and cultural heritage into relevant sectoral or cross-sectoral plans, programs and policies.

1.3 Objectives of PA Plan

The following are the objectives of this study and report:

- To present a practical, time-frame specific phased approach to implementation of the PA Plan;

- To provide the full range of required resources and capacity building for establishing and managing the system;
- To recommend means of financing the operationalisation of the plan;
- To indicate the level of priority for each of the proposed system components;
- To provide a means to monitor and evaluate the system and its effectiveness over the timeframe of the plan; and
- To provide the proposed boundaries of the sites being proposed.

1.4 Scope of Study

This Systems Plan represents the fifth in a series of report deliverables under the contract for the preparation of a Protected Areas Systems Plan for St. Kitts and Nevis. This report is written in compliance with Task 4: Drafting of the Systems Plan under the Scope of Services required as part of the Terms of Reference for this project.

1.5 Limitations

There were a number of limitations encountered while drafting this Systems Plan, including the following:

- Unavailability of Site Specific Data on Biological Diversity;
- Limitation of Site Visits;
- Unclear Rationale for consideration of Specific Sites; and
- Timing of Parallel OECS Studies.

Each of these limitations will be discussed below. Based on that discussion, it will be clear that the available information is somewhat lower in extent and quality than would be desirable for preparing a Protected Areas Systems Plan. Notwithstanding this, the available information does provide a basis for preparing an initial System Plan. However, as will be discussed in the concluding chapter, it will be necessary to revise this Plan as soon as additional data becomes available.

1.5.1 Unavailability of Site-Specific data on Biological Diversity

At the majority of sites being considered for this Systems Plan, biodiversity was cited as a key factor. Unfortunately, biological data on individual sites (and indeed for the country) as a whole was very limited. Where data was available, it was patchy and there was also some inconsistency in the data (that is, one paper would often times contradicted another).

1.5.2 Limitation on Site Visits

Early in the life of this study, a lengthy listing of potential sites was identified for potential inclusion in this Systems Plan. In the absence of comprehensive data on all of these sites (see Section 1.5.1, above), site visits were the most important data-gathering mechanism for determining whether a specific site would, in fact, be included in the Systems Plan. Unfortunately, the schedule and budget for this assignment precluded visits to all of those sites. While this was a reasonable approach to preparing this initial Systems Plan, it must be cautioned that recommendations related to specific sites may be subject to revision when more site-specific information becomes available .

1.5.3 Unclear Rationale for Consideration

As indicated in Section 1.5.2, above, a lengthy listing of potential sites was identified for potential inclusion in this Systems Plan. To do this, Ecoengineering relied on information and suggestions from various in-country agencies (Government Agencies and other Key Stakeholders). We consider this to be a very effective approach, since in-country personnel inevitably have a firmer grasp of the issues involved than our staff can be expected to develop in a relatively short assignment. There was clear consensus among stakeholders as to the rationale for including many of the larger sites. It must be noted, though, that the rationale for suggesting some of the smaller sites was not always clear. In such cases, the sites were not eliminated from the listing. Instead, Ecoengineering described the rationale based on our own evaluation of the site.

1.5.4 Timing of Parallel OECS Studies

This System Plan study was one of several similar studies being conducted in St. Kitts and Nevis and the wider OECS at roughly the same time. This resulted in two challenges: apparent lack of effective co-ordination and availability of outputs.

Ecoengineering did not receive adequate information on parallel studies that were being undertaken, even where we asked for this; and it appears that stakeholders and other consultants had a similar problem. For example, on one occasion a consultant on one study received an email from a stakeholder requesting clarification on another study. While parallel studies may have some very important benefits (see below), that approach also has some drawbacks. In countries as small as St. Kitts and Nevis, stakeholders may become “fatigued” by requests (often for similar information) from different consultants in a relatively short space of time. The same holds true for requests to devote time to Workshops, etc.

Related to this comment is the sequencing of particular studies. The Ecological Gap Assessment and the Sustainable Financing Study preceded the Systems Plan study, and so outputs from those studies formed useful inputs to this study. Unfortunately, the outputs from other studies (such as the Ecological and Socio-Economic Studies for the Central Forest Reserve) were not available to this study, which contributed to the unavailability of information on biological diversity discussed in Section 1.5.1, above.

2 PROCESS OF PLAN PREPARATION

This chapter outlines the process by which this Systems Plan was prepared. The plan was drafted, in consideration of the objectives stated in the Terms of Reference provided by the OECS-ESDU such that:

The plan is to be practical, time-frame specific (and is to cover a minimum period of 10 years) and should specify a phased approach to implementation. The scope of the plan and its approach to systems management will reflect the intent of the OECS Model PA Systems Plan Act and Policy. It should detail the full range of required resources and capacity building for establishing and managing the system and recommend means of financing its operationalisation, and indicate the level of priority for each of these aspects. The plan must prescribe a means to monitor and evaluate the system and its effectiveness over the timeframe of the plan. The plan must include geo-referenced maps of the specific areas being recommended for inclusion in the Plan, identifying their proposed boundaries, topography, distribution of resources and habitats, existing infrastructure, settlements, existing management zones, and whatever else is deemed necessary to complete the various site profiles.

This chapter is sub-divided into the following headings:

- Workplan;
- Review of Data;
- Site Visits;
- Workshops;
- Data Analysis; and
- Public Participation.

2.1 Workplan

The workplan developed for this assignment was as follows:

- Inception Meeting / Conference Call and Finalization of Work Plan,
- Review of Relevant Documents,
- Site Visits,

- Conduct of Ecological Gap Analysis and RAPPAM Workshops,
- Preparation of Draft Systems Plan,
- Presentation of Draft Plan to NICE, Steering Committee and National Technical Advisory Committee, and
- Submission of Finalized Systems Plan and Final Report to ESDU.

The first output of this assignment was a report detailing this workplan. This document was submitted to OECS-ESDU on March 31, 2009.

2.2 Review of Data

Three sources of information were accessed for this review:

- Documents listed in the Terms of Reference,
- Published Documents, and
- Internet Sources.

2.2.1 Documents listed in the Terms of Reference

The documents listed in the TOR (where available) were accessed from two sources:

- OECS-ESDU; and
- Governmental and Non-Governmental Agencies in St. Kitts and Nevis.

As part of the overall OPAAL project, OECS-ESDU assembled a number of reports and other documents. These documents (where available) were made available to Ecoengineering for use on this assignment.

In addition, Ecoengineering circulated a data request to a number of agencies in St. Kitts and Nevis for any information on the protected areas being proposed. The receipt of data by this method proved to be slow and a decision was therefore taken to send an Ecoengineering staff member to St. Kitts and Nevis to meet with the various agencies and gather data. This method proved more fruitful and the data gathered were used to assemble a Literature and Information Review Report which was submitted to OECS-ESDU on August 20, 2009.

2.2.2 Published Documents and Internet Sources

A number of documents on the following topics were also accessed for use in developing this Systems Plan:

- Existing Systems Plans in the Wider Region;
- RAPPAM Methodology; and
- System Planning Guidance documents.

Again, as noted in Section 2.2.1 the output of this review of documents was a Literature and Information Review Report.

2.3 Site Visits

One of the first activities undertaken in-country was a visit to a representative number of existing and proposed protected areas to verify their nature and status. These site visits were conducted over a period of 2 days on June 19 and 20, 2009. We were guided by the NICE as well as our review of the available documents to determine which PAs were considered representative of a wide range of habitat types and were therefore suitable for visiting. The actual sites to be visited and the schedule for these visits were finalized in conjunction with the NICE. These are listed in Table 2-1.

TABLE 2-1: SITES VISITED IN JUNE 2009

| ST. KITTS | NEVIS |
|---|------------------------------|
| BASSETERRE VALLEY AQUIFER NATIONAL PARK | BATH PROTECTED AREA |
| SOUTH-EAST PENINSULA MARINE PARK | NEVIS PEAK NATIONAL PARK |
| FRIGATE BAY SALT POND | INDIAN CASTLE PROTECTED AREA |
| HALF MOON POND | FORT ASHBY |
| OLD ROAD TOWN PETROGLYPH | NELSON SPRINGS |
| CENTRAL FOREST RESERVE NATIONAL PARK | PINNEY'S ESTATE |
| BRIMSTONE HILL FORTRESS NATIONAL PARK | NEW RIVER ESTATE |
| BELMONT ESTATE | NEW RIVER SPRINGS |
| BLACK ROCKS | SEA HAVEN |
| SPOONER'S GINNERY | HISTORIC CHARLESTOWN |

At each site visit a checklist was filled out to note the status of the sites. The observations made during the site visits were contained in a Report on the Site Visit which was submitted to OECS-ESDU on July 27, 2009. The information in these checklists as well as other documents received during the data collection phase was used to draft Chapters 5 and 6 of this Systems Plan.

2.4 Workshops

Two workshops were held to gather information for drafting this Systems Plan:

- An Ecological Gap Assessment Workshop (June 22 & 23, 2009); and
- A Rapid Assessment and Prioritization of Protected Areas Management Workshop (RAPPAM) {June 25 & 26, 2009}.

2.4.1 Ecological Gap Assessment

2.4.1.1 Overview

As part of a parallel study of protected areas in St. Kitts and Nevis, The Nature Conservancy facilitated an Ecological Gap Assessment workshop on June 22 and 23, 2009 at the Nevis Cooperative Credit Union building. This workshop's objective was to inform the plan content in terms of key threats and needs for existing and proposed PAs, management needs, priorities and strategies. This workshop was a follow-up to an initial Gap Assessment Workshop held on November 13 & 14, 2008. Appendix B provides a full description of the Ecological Gap Assessment Workshop.

2.4.1.2 Summary of Workshop Objectives

The first workshop (held on November 13 & 14, 2008) was focussed on identifying the terrestrial, freshwater and marine key species and ecological systems that need protection, setting conservation goals for each target, and documenting the associated threats to the targets. This listing of targets and threats was reviewed during the second workshop held on June 22 & 23, 2009.

At the second workshop a significant amount of time was also spent verifying data pertaining to Nevis since this data had been difficult to come by in the period between the first and second workshop.

2.4.1.3 Limitations

The following limitations were identified either during the workshop or during the model runs:

- In some cases, critical species were listed as potential conservation targets. However, either due to lack of supporting GIS data, or lack of information on specific habitats, they were not selected as conservation targets.
- In other cases, although the species were deemed significant, the inability to map specific locations due to widespread occurrences resulted in them not being included on the target list.

2.4.2 RAPPAM

2.4.2.1 Overview

A Rapid Assessment and Prioritization of Protected Areas Management (RAPPAM) workshop was conducted on June 25 and 26, 2009. The workshop was initially planned for St. Kitts but the facilitators (Ecoengineering Caribbean Limited) decided to host the first day in St. Kitts (June 25th) and to host the second day in both St. Kitts and Nevis (June 26th). This was considered a “lesson learnt” from the drop-off in attendance on the second day of the Gap Assessment workshop.

2.4.2.2 Summary of Workshop Objectives

The objective of the RAPPAM workshop was to receive inputs from key stakeholders concerning present and proposed protected areas in St. Kitts and Nevis by responding to the following categories of questions:

- Threats to Protected Areas;
- Vulnerability of Protected Areas;
- Planning Objectives;
- Management Decision-Making;
- Finances;
- Legal Security;
- Socio-Economic Context;
- Management Processes;

- Infrastructure;
- Staffing; and
- Communication and Information.

2.4.2.3 Limitations

There were a number of limitations encountered in conducting the RAPPAM Workshop. These included the following:

- Time Availability,
- Undeveloped Sites, and
- Terrestrial as opposed to Marine Sites.

The full RAPPAM Methodology involves a large number of questions which are time-consuming to answer if there is lively discussion on specific points. Rather than limit the discussion time, Ecoengineering selected a number of questions which could be answered using independently gathered data, and others which were not relevant to St. Kitts and Nevis. Those were excluded from the workshop. Even with that approach, the participants from Nevis were not able to complete all of the questions during the workshop and so had to answer some of the questions by way of follow-up e-mails.

Some of the questions in the RAPPAM Methodology clearly relate to established sites (for example, questions on staffing, availability of management plans, etc) as opposed to sites that are only proposed. Such questions were marked as “not applicable” by the participants when discussing proposed sites.

Several of the participants at the Workshop were more familiar with the terrestrial sites than the marine sites. Where that was the case, the participants identified the persons who were most knowledgeable about the marine sites and elected to adopt their opinions for the entire group. Similarly, the participants identified some persons as being more knowledgeable about the historical sites, and again elected to adopt their opinions for the entire group.

2.5 Data Analysis

2.5.1 Ecological Gap Assessment

The data collected at both the initial workshop and the second workshop were used as input data for the Marxan model runs (see Appendix B).

2.5.2 RAPPAM Workshop

The information collected from the RAPPAM workshop and follow-up collection of data from Nevis participants, was analysed to show the trends in the data in relation to the following main headings:

- Context,
- Planning,
- Inputs, and
- Processes.

A full description of the methods used to analyze the data as well as the results and charts showing trends are included as Appendix C to this report.

2.6 Public Participation

Public participation is an integral aspect of developing this Systems Plan. In fact, the Terms of Reference provided for this assignment identified several occasions where public participation was recommended. Consultation for this assignment was undertaken at the following times:

- Document Review,
- Site Assessment and Consultation with Stakeholders, and
- Presentation of Draft Systems Plan.

2.6.1 Document Review

As noted in Section 2.3 above, the initial approach to document collection was to send a letter requesting information to a number of agencies and perceived stakeholders based on initial discussions with the Department of Physical Planning and the Environment. This approach was found to be lacking and the decision was taken to visit St. Kitts and Nevis to meet with the various agencies. Meetings were held with the following agencies / organizations:

| DATE | AGENCY | CONTACT PERSON |
|--------------|---|---------------------------------|
| May 19, 2009 | Planning Unit, Nevis | Rene Walters |
| May 19, 2009 | Nevis Historical and Conservation Society | John Guilbert |
| May 20, 2009 | Agricultural Department, St. Kitts | Raquel Williams |
| May 20, 2009 | Brimstone Hill National Park | Kathleen Orchard |
| | St. Christopher Heritage Society | Jacqueline Armony D. Mottram |
| May 21, 2009 | Planning and Environment | June Hughes |
| May 21, 2009 | Department of Fisheries | Joseph Simmons |

2.6.2 Site Assessment and Consultation with Stakeholders

The second phase of consultation was undertaken during the second in-country visit. This consultation took the form of two workshops as described in Section 2.4 above. These workshops brought together a cross section of agencies and other stakeholders to discuss various aspects of the proposed protected areas as well as to provide information for later analysis. The lists of attendees for both workshops are included in Appendices B and C.

2.6.3 Presentation of Draft Systems Plan

A first draft of the Protected Areas Systems Plan was submitted to the OECS-ESDU on December 17, 2009. A second draft of the Protected Areas Systems Plan was prepared and circulated to the in-country stakeholders on February 01, 2010. Subsequent to this, four in-country meetings were held to present the second draft Protected Areas Systems Plan as follows:

- | | | |
|---------------------|---|---------------------------------------|
| March 01, 2010 (PM) | - | NICE members / St. Kitts Stakeholders |
| March 02, 2010 (AM) | - | Nevis Stakeholders |
| March 02, 2010 (PM) | - | St. Kitts Stakeholders |
| March 04, 2010 (AM) | - | Decision-makers |

Appendix D contains an overview of each meeting as well as the lists of the attendees at each meeting. The feedback received from these meetings was incorporated into the Systems Plan report.

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3 FRAMEWORK FOR THE PA SYSTEM

This chapter highlights the context within which this Protected Areas System will be implemented. It summarizes a more detailed discussion of local, national, regional and international instruments contained in Appendix E. For convenience, this chapter is arranged under the following headings:

- Legal Framework;
- International Obligations;
- OECS Protected Areas and Associated Livelihoods Project (OPAAL);
- Basis for Consideration of Proposed PAs;
- Linkage with other National Planning Initiatives; and
- Funds, Fees and Levies.

3.1 Legal Framework

The following existing and draft laws contain requirements for the establishment and / or the management of protected areas:

- National Conservation and Environmental Protection Act, 1987;
- The National Conservation and Environmental Management Bill (Draft Act), 2009;
- Fisheries Act, 1984
- South-East Peninsula Land Development and Conservation Act, 1986; and
- Development Control and Planning Act, 2000.

3.1.1 National Conservation and Environmental Protection Act, 1987

This Act (NCEPA) was first enacted in 1987 and amended in 1996 and 2001. Its objective is *“to provide for better management and development of the natural and historic resources of Saint Christopher and Nevis for purposes of conservation; the establishment of national parks, historic and archaeological sites and other protected areas of natural and cultural importance including the Brimstone Hill Fortress National Park; the establishment of a Conservation Commission; and for other matters connected thereto.”*

Specific aspects of this Act with regard to Protected Areas are as follows:

- i. The Minister of Physical Planning may designate any land or marine area as a protected area. The purposes and objectives of each protected area must be gazetted. Private lands needed for a protected area may either be acquired or right of access or control of the land may be obtained through a written agreement with the private land owner.
- ii. The Minister or anyone he / she may designate can select, manage and administer a protected area.
- iii. A National Conservation Commission may be appointed and the Act provides for funding of the work of the Conservation Commission.
- iv. The Act establishes the following Protected Areas –
 - Brimstone Hill Fortress National Park; and
 - Bath Hotel (Nevis) historic site.
- v. A licence is required before digging or searching for an antiquity (even on private property). A list of special buildings to be preserved for their historic and cultural value may be developed, and incentives may be provided to owners for the restoration of such buildings.
- vi. The 1996 amendment creates the Department of the Environment.
- vii. The 2001 amendment concerns public beach access, preservation of beaches, pollution of the coastal zone, and damage or destruction to any historic building, site or monument.

The Act ends with Schedules concerning:

- Constitution of the Conservation Commission;
- Legal Description of the Brimstone Hill Fortress National Park;
- Wild Animals and Wild Birds;
- Description of Bath Hotel; and
- International Conventions.

3.1.2 The National Conservation and Environmental Management Bill, 2009

This bill represents a revision of the NCEPA Act and amendments, and will form the primary basis for creating, managing and regulating Protected Areas in St. Kitts and Nevis once it is enacted and proclaimed. Its purpose will be *“to provide for the conservation of the natural and cultural heritage of St. Christopher and Nevis, the prevention of pollution and the management of the environment, for the purpose of ensuring that the development of the country is sustainable, and for other connected matters.”*

The objectives of the Act are:

- a) the conservation and sustainable use of the natural heritage of Saint Christopher and Nevis (including conservation of biological diversity);
- b) the designation, continuation and management of National Parks and other protected areas;
- c) the prevention and mitigation of pollution of the environment (including the control of hazardous substances) and the protection of human health;
- d) the allocation of administrative responsibilities for environmental management;
- e) the implementation of multilateral environmental agreements;
- f) the regulation of the trade in indigenous biological resources;
- g) the provision of stable, adequate, secure and sustainable funding to finance the conservation and management of the environment; and
- h) any other matter related or ancillary to the foregoing purposes.

Specific aspects of this Bill with regard to Protected Areas are as follows:

- i. As with the NCEPA, the Minister of Physical Planning may designate any land or marine area as a protected area. The purposes and objectives of each protected area must be gazetted. Private lands needed for a protected area may either be acquired or right of access or control of the land may be obtained through a written agreement with the private land owner.
- ii. The Minister is to coordinate with other ministers and the Nevis Island Administration to secure consistency in the implementation of this Bill.
- iii. The composition, functions and Funding of the National Conservation Commission are all addressed.
- iv. The Minister in collaboration with the Commission is responsible for the management of protected areas. The Minister may delegate this to a competent authority (which may include a non-governmental organisation).
- v. A Management Plan is needed for each protected area, prepared in consultation with key stakeholders and reviewed at least once in every 10 years.
- vi. The Act establishes the following Protected Areas –
 - Brimstone Hill Fortress National Park;
 - Bath Hotel (Nevis) National Park; and
 - Booby Island Nature Reserve.
- vii. The Department of Environment as responsible for the development of a national strategy, plan and programme for the conservation of biological diversity.
- viii. All beaches are vested in the crown and that the public has a right to use the beaches for recreational purposes, so there must be at least one public access to all beaches. The Department of Environment is responsible for developing a Coastal Zone Management Plan which must be reviewed at least every ten years.
- ix. Pollution of any beach is prohibited and protected beaches may be declared.
- x. As with the NCEPA, a licence is required before digging or searching for an antiquity (even on private property). A list of special buildings to be preserved for their historic and cultural value may be developed, and incentives may be provided to owners for the restoration of such buildings.

- xi. The Minister may designate substances as pollutants, and a Register of Sources of Pollutants is to be developed. Standards regarding releases of pollutants are also to be developed.
- xii. Hazardous substances may be designated; and standards and procedures for handling, re-cycling and re-using, treatment and disposal of waste established.

The Bill also provides for an Environmental Trust Fund, which will be discussed in more detail in Section 3.6.1. It ends with a number of Schedules as follows:

- Categories of Protected areas;
- Description of the Brimstone Hill Fortress National Park;
- Description of Bath Estate National Park;
- Threatened or Endangered Species;
- Game Animals;
- Pests;
- Purpose For Which Trust Funds May/ May Not Be Used;
- Amendments and Repeals;
- National Conservation Commission - membership and procedures;
- Wild Animals and Wild Birds; and
- Multilateral Environmental Agreement to which St. Christopher and Nevis is a party.

3.1.3 Fisheries Act, 1984

This Act provides for the management of the fishery resources of St. Kitts and Nevis, and makes provision for the declaration of marine reserves with the following objectives:

- Protection of flora and fauna;
- Protection of natural breeding grounds and habitats of aquatic life (particularly those in danger of extinction);
- Allow for natural regeneration of aquatic life;
- Promote scientific study; or preserve and enhance natural beauty of these areas.

3.1.4 South-East Peninsula Land Development and Conservation Act, 1986

This Act designates the entire South-East Peninsula a conservation area, to focus on the protection of wildlife and its habitat. It requires that an environmental protection plan be developed to advise land use planning, which should also include proposals for the “preservation and management of the scenic and other natural resources”. Unfortunately, these provisions do not appear to have been implemented. On reviewer notes a lack of evidence of any serious planning for protected areas, coastal conservation, or the maintenance of environmental quality, as required by the Act. As such, critical natural resources and fragile wildlife habitat continues to be threatened (Environmental Support Services, 2006).

3.1.5 Development Control and Planning Act, 2000

This Act provides for the orderly development of land, and recognizes the need for conservation and protected areas. It supports the National Conservation and Environmental Protection Act (1987) through the mechanism of interim preservation orders to protect sites and immovable assets and plant protection orders to protect a group of plants, sites, or landscapes. The provision for environmental protection areas under this Act implies that specially demarcated areas require special treatment.

3.2 International Obligations

The Government of St. Kitts and Nevis has several obligations under a number of multilateral environmental agreements (MEAs). These include:

- The United Nations Convention on Biological Diversity (CBD),
- The United Nation Framework Convention on Climate Change (UNFCCC),
- The Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), and
- The Convention for the Prevention of Pollution from Ships (MARPOL).

3.2.1 The United Nations Convention on Biological Diversity (CBD)

The CBD aims to make the best use of and mitigate threats to biological diversity. As a party to the CBD, the government of St. Kitts and Nevis is required to:

- Integrate conservation and sustainable use of the products of biodiversity into national planning.
- Identify, monitor, regulate and conserve biological diversity.
- Where appropriate, establish and manage a system of protected areas.
- Practice principles of conservation and sustainability both within and outside of protected areas.
- Take measures to rehabilitate endangered species, prevent introduction of alien species and control / eliminate those which threaten ecosystems or species.
- Maintain local knowledge & practices relevant to sustainable use of biodiversity.
- Implement a legal / regulatory framework to protect endangered species and enhance their recovery.

The St. Kitts and Nevis Government has emphasized the provisions of the CBD in two crucial articles in the National Biodiversity Strategy and Action Plan. These will be discussed in Section 3.5.1, below.

3.2.2 The United Nation Framework Convention on Climate Change

The UNFCCC aims to control and reduce the effects on the environment of greenhouse gas emissions. As a party to this agreement, the Government of St. Kitts and Nevis is required to consider issues of climate change in overall national planning, enact national programmes to mitigate (or adapt to) climate change, and promote sustainable management and conservation. Since large forested areas constitute “carbon sinks”, protected areas such as the Central Forest Reserve and Nevis Peak and Camps River would constitute areas which mitigate against climate change. And many of the other proposed protected areas will promote sustainable management and conservation.

3.2.3 The Convention on International Trade in Endangered Species (CITES)

The Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) is an international agreement between Governments which aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. It now accords varying degrees of protection to more than 30,000 species, the following are found in St. Kitts and Nevis: Green Turtle (*Chelonia mydas*), Hawksbill Turtle (*Eretmochelys imbricata*) and Leatherback Turtle (*Dermochelys coriacea*).

Relevant to this System Plan are the Leatherback Turtle which are known to nest particularly on the Northern Beaches such as Cayon River, Friars Bay Beach and North Frigate Bay; the Hawksbill Turtle which nests primarily on the Southeast Peninsula on beaches such as Major's Bay, Banana Beach and Cockleshell Bay and the Green Turtle which usually nest at North Frigate Bay, Half Moon Bay and around Conaree.

3.2.4 The Convention for the Prevention of Pollution from Ships (MARPOL).

The MARPOL Convention is the main international convention covering prevention or pollution of the marine environment by ships from operational or accidental causes. Specifically, it seeks to:

- generally control the discharging of oil and oily ballast from ships;
- prohibit the discharging of any oil from a tanker within 50 miles of the nearest land;
- prohibit the discharging of residues containing noxious substances within 12 miles of the nearest land;
- generally control the discharging of sewage from ships;
- prohibit the discharging comminuted and disinfected sewage within three nautical miles from the nearest land; and
- prohibit the discharging sewage which is not comminuted or disinfected within 12 nautical miles from the nearest land.

A serious problem associated with marine protected areas throughout the region is pollution, and the enforcement of this convention will go some way toward reducing marine pollution.

3.3 OECS Protected Areas and Associated Livelihoods Project (OPAAL)

The OECS OPAAL Project consists of three main components:

- Protected Areas, Policy, Legal and Institutional Arrangements Reform;
- Protected Areas management and Associated alternative Livelihoods; and
- Building Capacity for biodiversity Conservation.

This section discusses each of these components and then summarizes the OECS Policy on Protected Areas and the OECS Model Protected Areas System Act.

3.3.1 Regulatory Reforms

The first component seeks to establish more effective institutional frameworks for conservation management and seeks to adopt a harmonized approach to the creation and management of protected areas (PA) in the OECS Region.

3.3.2 Alternative Livelihoods

The second component focuses on establishing and enhancing protected areas. Six sites have been selected and designated as OPAAL Sites, including the Central Forest Reserve on the island of St. Kitts. Support is being given to baseline studies, management plans, and micro-financing.

3.3.3 Capacity Building

The third component focuses on training, capacity-building and awareness, not only at the OPAAL sites but elsewhere in all countries.

3.3.4 OECS Policy on Protected Areas Systems

The purpose of the OECS Policy on Protected Areas Systems is to provide member states with a policy document outlining the international obligations, vision, goals, objectives and principles of a common policy regarding the management of protected areas. It is a precursor to adopting a Protected Areas System Act and as such, provides the overall direction for the Act. Key Principles which guide the Policy include:

1. A consultative, representative and participatory approach.
2. Biological systems are best managed as a whole.
3. Harmonization of protected areas systems beyond national borders.
4. Cooperation and collaboration among institutions and individuals.
5. Transparency in decision-making.
6. Decision-making based on sound science.
7. The precautionary principle should be applied where all scientific information is not available.
8. Conservation is indispensable for equitable and sustainable development.

3.3.5 The OECS Model Protected Areas System Act

The objects and purposes of this model Act are to:

- Support the long-term growth and sustainable development in business, tourism, recreation, education, and scientific research;
- Provide for the sustainability of biodiversity, culture, livelihoods, heritage, watershed protection and other ecosystem services;
- Protect wilderness areas;
- Facilitate the implementation of the requirements, goals, and aims of applicable international agreements;

- Assist in the mitigation of natural and anthropogenic disasters; and
- Prepare for and respond to the impacts of climate change.

This Act envisages both a Protected Areas Coordinating Body and a Management Authority. It identifies the need for management planning, and also addresses coordination with other entities. In addition, it provides the criteria for Management Plans and addresses the implementation of management plans by means of annual operational plans.

3.4 Basis for Consideration of Proposed PAs

The proposed protected areas can be divided into two main categories:

- Biological / Natural Heritage Sites; and
- Historical / Cultural Sites.

3.4.1 Biological / Natural Heritage

The basis for the consideration of proposed Protected Areas in St. Kitts and Nevis stem from the IUCN's international guidance on the categorization of protected areas. The 1992 version of this listing consists of six categories, as shown in Table 3-1. The central principle of the IUCN's guidelines is that categories should be defined by the objectives of management (and not simply by the title of the area) or by the effectiveness of management in meeting those objectives. For example, areas could be managed for:

- Strict Protection,
- Ecosystem Conservation and Recreation,
- Conservation of Natural Features,
- Conservation through Active Management,
- Landscape / Seascape Conservation and Recreation, or
- Sustainable Use of Natural Ecosystems.

The island of St. Kitts and Nevis has prepared a National Conservation and Environmental Management Act, 2009 (Draft) {see Section 3.1.2} which, under its first Schedule, has implemented categories of protected areas. These categories are based on IUCN's list and are presented in Table 3-2 below.

TABLE 3-1: IUCN LIST OF PROTECTED AREAS

| IUCN CATEGORY | DEFINITION |
|--|--|
| Ia – Strict Nature Reserve: Protected area managed mainly for science | Area of land and/or sea possessing some outstanding or representative ecosystem, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring. |
| Ib – Wilderness Area: Protected area managed mainly for wilderness protection | Large area of unmodified land and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition. |
| II – National Park: Protected Area Managed Mainly for Ecosystem Protection and Recreation | Natural area of land and/or sea, designated to: (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area, and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible. |
| III – Natural Monument: Protected Area Managed Mainly for Conservation of Specific Natural Features | Area containing one, or more, specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance. |
| IV – Habitat/Species Management Area: Protected Area Managed Mainly for Conservation through Management Intervention | Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species |
| V – Protected Landscape/Seascape: Protected Area Managed Mainly for Landscape/Seascape Conservation and Recreation | Area of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. |

| IUCN CATEGORY | DEFINITION |
|--|---|
| VI – Managed Resource Protected Area: Protected Area Managed Mainly for the Sustainable Use of Natural Ecosystems | Area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural produces and services to meet community needs. |

TABLE 3-2: ST. KITTS AND NEVIS CATEGORIES OF PROTECTED AREAS

| CATEGORY | DEFINITION |
|-----------------------------|---|
| I – NATIONAL PARK | An area consisting of a relatively large land or marine area or some combination of land or sea, containing natural and cultural features or scenery of national or international significance and managed in a manner to protect such resources and sustain scientific, recreational and educational activities on a controlled basis. |
| II – HISTORIC SITE | A place or site which is historic by reason of an association with the past and its part of the cultural or historical heritage of Saint Christopher and Nevis, and such a classification may include archaeological sites, historic landmarks, and areas of special historic or cultural interest. |
| III – NATURE RESERVE | An area containing outstanding or fragile natural features or life forms of national importance that need protection in an undisturbed state where the only permitted activities are management measures, controlled scientific research and educational study. |
| IV – MARINE RESERVE | An area as provided in Section 23 of the Fisheries Act, 1984. |
| V – AREA OF SPECIAL CONCERN | A place or site needing special protection and controlled use in order to stabilize or restore important ecological features or functions. |
| VI – SCENIC SITE | An area containing a scenic feature of national or local importance. |
| VII – BOTANIC GARDEN | A garden established for the preservation display and propagation of the national botanical resources. |

3.4.2 Historical / Cultural

The Tourism Master Plan (1993) separates heritage sites into four categories, as shown in Table 3-3. The Tourism Master Plan recommends that all category 1 sites should be designated as “protected areas”, and that protected area designation should also be considered for all Category 2 sites. Sites located at Bloody Point, Palmetto Point, and Black Rocks are priorities in terms of conservation and research and as tourist attractions. Archaeological sites on the southeast peninsula should be protected and incorporated into the development and tourism planning for that region.

TABLE 3-3: CATEGORIES OF HERITAGE SITES

| CATEGORY | DEFINITION |
|------------|--|
| CATEGORY 1 | Sites or complexes of exceptional historical and/or architectural value, which are presently or potentially essential to the tourism activity and must be preserved and treated with great sensitivity. |
| CATEGORY 2 | Sites of considerable historical and/or architectural merit, with high potential for enhancing the tourism product. These sites should be protected but could be renovated for an adaptive use consistent with their use in tourism (major plantation inns, important historic churches, government and commercial buildings in current use. |
| CATEGORY 3 | Windmills and chimneys (which represent two different technological eras in the history of plantation sugar production) and other important landmarks. These stone structures dot the countryside of St. Kitts and should be protected, stabilized and maintained. |
| CATEGORY 4 | Other cultural and historical sites with limited importance and/or integrity that should be preserved with appropriate development and can be used to enhance the tourism program. |

3.5 Linkage with other National Planning Initiatives

This Protected Areas System Plan cannot exist in isolation. Instead, it must be in harmony with other national planning initiatives to ensure that resources and capacity are allocated toward the same or similar national goals. Some of those are discussed below.

3.5.1 National Biodiversity Strategy and Action Plan (NBSAP)

The St. Kitts and Nevis National Biodiversity Strategy and Action Plan (NBSAP) constitutes the first of a set of actions by St. Kitts and Nevis to fulfil its obligations under the CBD Convention. It seeks to present a focused and dynamic report on strategies for the conservation of the biological resources of the country through:

- The specification of goals and objectives;
- Defining the current known range and status of biodiversity;
- Describing the probable sources of biodiversity losses;
- Analysis of gaps between current reality and aspirations; and
- Identification of actions that can address these gaps;

The NBSAP outlines a total of twenty three (23) projects to be executed by Government Agencies, NGO's and research groups, in a time frame of eleven (11) months to five (5) years.

3.5.2 National Environmental Management Strategy and Action Plan (NEMS)

The preparation of this plan for St. Kitts and Nevis (SKN) is a requirement of the government under the St. Georges Declaration (SGD) of Principles for Environmental Sustainability in the Organization of Eastern Caribbean States (OECS). The NEMS covers obligations under Principle 11 of SGD: Ensure the Sustainable Use of Natural Resources. This principle involves five (5) strategies:

- Manage terrestrial, marine and atmospheric resources, organisms and ecosystems in an appropriate manner to obtain the optimum sustainable productivity, while maintaining the integrity of natural and ecological processes and inter relationships.
- Design, promote and implement measures to prevent, mitigate and control degradation of aquatic, terrestrial and atmospheric environmental quality and processes conducive to desertification.
- Work together with Civil Society Organization to promote and facilitate improved national capability for the management of natural resources.
- Take all necessary measures within its legal and policy framework, including enactment of new legislation where appropriate, to ensure that conservation and management of natural resources are treated as an integral part of development planning at all stages and levels.
- Develop a schedule of development activities for which environmental impact assessment will be required as part of project definition and design, and the results of which will be considered in determining whether how a project will proceed.

3.5.3 St. Christopher Physical Development Plan

The 2006 National Physical Development Plan (NPDP) provides a framework to guide activities that are aimed at achieving strategic goals through the concrete implementation of projects that further economic growth and social progress on the island of St. Kitts. It states that the Government of St. Kitts and Nevis holds the strong conviction that conservation policies seek to protect and enhance landscapes as natural assets for recreational, aesthetics, economic and ecological reasons. The facets of the natural landscape that are of main conservation interest include national parks, special landscape features, trees and other sites of scenic value. Arising out of this Plan are the following:

- Coastal Area Management;
- Watershed Management;
- Management of Protected Areas; and
- Conservation of the Built Development.

3.5.3.1 Coastal Area Management

Beaches, coral reefs, sea grass beds and other endangered species found in the nearshore waters of St. Kitts are a major attraction to tourists, and these must be preserved if their contribution to tourism is to continue. Development and natural disasters (primarily storms) are the main factors that threaten these resources. Vulnerable sites include Conyers, Parsons, Frigate Bay, Irish Town Bay Road and Fortlands which require coastal protection works. The Plan envisages the preparation of a comprehensive Coastal Zone Management Plan, which will include specific measures to protect the Coastal Areas of St. Kitts.

3.5.3.2 Watershed Management

Key watershed areas and coastal aquifers are of vital importance to sustainable development, particularly in relation to water supply, fuel wood and the prevention of erosion and landslides. However, these areas are being threatened by development activities and unsustainable use of the resources which they have to offer. The Plan proposes to implement a comprehensive reforestation program; establish suitable tree crop plantations (silviculture); declare the Wingfield, Frankland, Stonefort, Greenhill, Phillips and Lodge catchment areas as Protected Areas; and adopt other measures to protect these valuable resources.

3.5.3.3 Management of Protected Areas

The environmental strategies proposed by the NPDP seek to protect and enhance landscapes as natural assets for recreation, aesthetic, economic and ecological reasons. Unique terrestrial habitats such as forests, ponds, mangroves, sand dunes, coral reefs, seagrass beds and beaches need to be designated for preservation. The NPDP therefore proposes to develop a Park and Protected Areas System Plan; restrict development on the Basseterre Valley Aquifer; establish marine reserves to protect coastal resources (Southeast Peninsula and Sandy Shoal); and declare other national parks and exercise controls on built development in inappropriate areas.

3.5.3.4 Conservation of the Built Development

The NPDP recognises the value of using the country's heritage resources as tourist attractions and educational tools. Some of the objectives of the NPDP in the conservation of built development include establishing a National Trust; preparing an Urban Revitalization Master Plan for the city of Basseterre; expediting projects for Spooner's Estate Yard, The De Poincy Chateau and Old Road Town; and seeking UNESCO World Heritage designation for Fort Charles.

3.5.4 Nevis Physical Development Plan

The main purpose for preparing an Island Physical Development Plan is to improve spatial planning for the enhancement of economic, social and environmental conditions for residents and for visitors to Nevis, and to sustain the Island for future generations. Under this Plan four areas have been identified where conservation and enhancement of the natural environment should take precedence over development:

- Nevis Peak Protected Area;
- Bath Bogs Protected Area;
- Camps River Wetland Protected Area; and
- Indian Castle Protected Area.

In addition to the four Protected Areas mentioned above, two Coastal Conservation Areas have been identified:

- Pinney's Beach Conservation Area; and
- Sea Haven Conservation Area.

Development may be allowed within these areas, but it must respect the natural quality of the area in its design, scale and type of use.

3.6 Funds, Fees and Levies

This section summarizes information on the Environmental Trust Fund envisaged under the draft NCEMA, as well as a number of other environmental fees and levies which are presently collected in St. Kitts and Nevis. The purpose of this presentation is to demonstrate that such fees and levies are not a new concept, and that there is precedent for collecting funds specifically for environmental purposes.

3.6.1 Environmental Trust Fund

NCEMA makes provision for an Environmental Trust Fund (see Section E.1.2.13 in Appendix E), administered by a Board of Trustees appointed by the Governor General. The resources of the fund will include allocations from Parliament; collections from relevant taxes, charges or fees; grants from foreign states of regional or international organizations and agencies; earnings on investments of the Fund, etc. The fund may be used to make grants for environmental programs or projects, and also to defray expenses of the Board. The Fund is exempt from all taxes, duties, fees levies, etc.

It is envisaged that this Fund will be a primary source of funding for programs and projects to be undertaken as part of this Protected Areas Systems Plan.

3.6.2 Other Taxes, Fees and Levies

Other environmental taxes, fees and levies presently collected in St. Kitts and Nevis are:

- Environmental Levy for Solid Waste,
- Environmental Levy on Used Motor Vehicles,
- Bottles and Cans Deposit Levy, and
- Fee for Tours.

An Environmental Levy of \$EC 5.00 is charged on departure from the Federation. This is intended to defray the cost disposing solid waste generated by visitors, and is deposited to the Solid Waste Management Company.

An Environmental Levy is also charged on the importation of used motor vehicles. This is also intended to defray the eventual cost of disposing of these vehicles, but is deposited to the Consolidated Fund. The levy is \$EC 5,000.00 for vehicles more than 5 years old, \$EC 3,000.00 for vehicles between 3 and 5 years old, and \$EC 1,000.00 for vehicles between 1 and 3 years old.

The Bottles and Cans Deposit Levy is paid on importation of non-returnable bottles and cans of beer, stout, malt and other drinks. Finally, information received during one of the consultation meetings is that an Environmental Tax Levy of \$1.50 is charged on all tourism related activities. Efforts to get further information on this levy proved futile.

4 ECOLOGICAL DIVERSITY OF ST. KITTS AND NEVIS

The small size and geographic location of St. Kitts and Nevis, as well as the climatic conditions experienced influences the terrestrial ecology and contribute to the relatively high endemism and vulnerability of its biota. The country borders the American continent which provides a stopover for migratory avian species during the winter months. In addition, some of the country's beaches are known to be nesting sites for various species of marine turtles. This chapter discusses the general biodiversity of the island of St. Kitts and Nevis under the following sub-headings:

- ▶ Terrestrial Resources,
- ▶ Coastal Resources, and
- ▶ Marine Resources.

The last section in this chapter discusses invasive species that have been observed in St. Kitts and Nevis and also provides some indication of their impact on the biodiversity of the islands.

4.1 Terrestrial Resources

This section on terrestrial resources will be discussed under the following headings:

- Vegetation,
- Invertebrates,
- Vertebrates,
- Amphibians,
- Reptiles, and
- Avifauna.

4.1.1 Vegetation

During the 1940's, J.S. Beard began field work and mapping to identify the various vegetation types which are found on the islands of St. Kitts and Nevis. As identified by Beard (1949), the vegetation types are discussed in Table 4-1 below. Approximately 121 species of trees are found in St. Kitts and Nevis (Horwith and Lindsay, 1999).

**TABLE 4-1: VEGETATION ZONES, (AS IDENTIFIED BY BEARD, 1949)
IN ST. KITTS AND NEVIS**

(Adapted from: *St. Kitts and Nevis Environmental Profile, 1991 and Vegetation Classification of St. Kitts and Nevis, 1999*)

| VEGETATION ZONE | DESCRIPTION |
|-------------------------------------|--|
| ST. KITTS | |
| Rainforest | This forest type is located at two areas in St. Kitts: one lying in the headwaters of the Wingfield River and the other above Mansion Estate. The principal species in these areas are the relatively undisturbed Gommier (<i>Acryodes excelsa</i>) with under-story trees of Gommier and Palms. |
| Dry Evergreen Forest | Beard identified this as secondary forest, consisting of mainly intolerant pioneer species, occupying the lands below the rain forest. Some species include the Silk Cotton Tree (<i>Ceiba pentandra</i>) and the shrub <i>Bourreria succulenta</i> . |
| Palm Brake | This type of vegetation is found above elevations ranging from 1,200 to 1,800 feet. The dominant trees are the Mountain Palm (<i>Euterpe globosa</i>) which forms over 60 per cent of the total crop. Tree ferns and small trees make up the balance of the vegetation. |
| Elfin Woodland | This vegetative type occurs above the 2,000 foot contour. Beard describes it as a low, tangled growth, approximately 12 feet high with mosses and epiphytes. There is no distinct stratification, but for this classification system, this forest system is divided into a tree layer and a herbaceous layer. Species include the shrub Sardine (<i>Miconia spp.</i>), Wild Pine (<i>Podocarpus coriaceus</i>) and grasses such as <i>Isachne angustifolia</i> . |
| Dry Scrub Woodland | This type of vegetation (which was originally a deciduous seasonal forest) is concentrated in the Southeast Peninsula. There are 39 species identified in this area. Some species include Logwood (<i>Haematoxylon campechianum</i>) and <i>Comocladia dodonaea</i> . |
| NEVIS | |
| Rain Forest and Humid Forest | <p>The northwestern side of the mountain above Jessup's has abundant rainfall conditions and ample protection from prevailing winds. These conditions allow for the establishment of the only substantial stand of tall forest on the island. The dominant species in this forest type are the Mountain Cabbage (<i>Euterpe globosa</i>), Gumlin (<i>Dacryodes excelsa</i>) and Burrwood (<i>Slonea truncate</i>), which forms a thick dense canopy.</p> <p>The humid forest zone is the surrounding forest which resembles rain forest in terms of species content. The only difference is that the trees are smaller and do not form a thick dense canopy since they are exposed to high wind exposure. The prominent vegetation here is the Redwood (<i>Coccolobis diversifolia</i>).</p> |
| Elfin Woodland | This forest type is found on the summit of Nevis Peak and contains low (<3 meters), gnarled, tangled growth due to high wind exposure. Low woody plants and herbaceous plants are common here. Orchids (<i>Maxillaria coccinea</i>), mosses, ferns, anoids and grasses (<i>Isachne angustifolia</i>) are also abundant. |

| VEGETATION ZONE | DESCRIPTION |
|-----------------------------|---|
| Montane Thicket | Located just above the rain forest and found only on the west side of the mountain, this forest type is dominated by Weedee (<i>Podocarpus coriceus</i>) and Mountain Cabbage Palm (<i>Euterpe globosa</i>). |
| Palm Brake | Palm brake is a band of Montane Forest that is located on very steep slopes where there are high winds (>550 meters on the eastern and southern slopes and >700 m on the northern and western slopes). This zone is dominated by Mountain Cabbage Palm (<i>Euterpe globosa</i>) and the rest of the forest consists of tree ferns (<i>Cyathea arborea</i>) and small trees. |
| Dry Scrub Woodland | This forest type is found on the low hills of the island and the dominant trees are various species of Acacia and Cassia. Other tree species include: Century Plant (<i>Agave americana</i>), Prickly Pear Cactus (<i>Opuntia rubescens</i>) and Pope's Head or Barrel Cactus (<i>Euphorbia pulcherrima</i>). |
| Dry Evergreen Forest | This forest type is found on the lower slopes of Nevis Peak. The dominant trees are White Cedar (<i>Tebuia heterophylla</i>), Black Mast (<i>Diosyros ebenaster</i>) and Loblolly (<i>Pisconia fragrans</i>). |
| Mangrove Woodlands | On the western and northern coastal regions of the island, there exists a series of White Mangrove Stands (<i>Lagunclaria racemosa</i>) which surround the fresh or brackish water lagoons. |
| Littoral Woodland | In the unaltered areas of Nevis's coastline, there exists a thin band of coastal vegetation, which functions as a barrier that prevents wave and wind erosion. Species which occur here are Seagrape (<i>Coccoloba uvifera</i>), Red Mangrove (<i>Rhizophora mangle</i>), White Mangrove (<i>Laguncularia racemosa</i>) and a type of Black Mangrove (<i>Avicennia nitida</i>). |
| Dry Zone Flora | This vegetation type is found in most of the island and is the result of disturbance for agricultural purposes. Very little of the original vegetation still exists, however it has been found that in recent years, most of the agricultural land has been abandoned and most of the vegetation is bushy pioneer forest. The dominant species are Logwood (<i>Haematoxylum camechianum</i>), Wild Tamarind (<i>Leucaena leucocephala</i>), Loblolly (<i>Pisconia fragrans</i>), Acacia (<i>Acacia sp.</i>), Genip and Clammy Cherry (<i>Cordia collococca</i>). Many agricultural and ornamental species have also become wild and can now be considered part of the natural vegetation. |

Based on recent biodiversity studies (Horwith and Lindsay, 1999) St. Kitts and Nevis has 145 Pteridophyte species (fern and fern-allies), 22 of which occur on Nevis but not in St. Kitts and 41 of which occur in St. Kitts, but not on Nevis. Eighty-two species occur on both islands. There are also 45 plant species known to be endemic to the country or to the Lesser Antilles (Horwith and Lindsay, 1999). It should be noted that there are far more numbers of plant species which should be given conservation concern, however, the inadequacy of botanical data proves to be a hindrance in this matter. The list of endemic species in St. Kitts and Nevis, according to the list generated by R. Howard is presented in Table F-1 of Appendix F.

4.1.2 Invertebrates

Worldwide, invertebrates comprise far more taxa than the better studied vertebrate animals. However, for most taxa, no country-specific data on invertebrate diversity are well documented (Horwith and Lindsay, 1999). On the island of Nevis, some work has been done for invertebrate species that are of some importance, prominence or pose a hazard (CCA, 1991). These include:

- ▶ Poisonous Centipede (*Scolopendra dromorpha*)
- ▶ Wolf Spiders (*Lycosidae*)
- ▶ Donkey Spiders (*Theraphosidae*)
- ▶ Scorpions (*Scorpionida*)
- ▶ Crayfish (*Macrobrachium acanthurus*)
- ▶ Lesser Blue Crab (*Callinectes similes*)
- ▶ Caribbean Mud Fiddler Crabs (*Uca rapax*)
- ▶ Great Land Crab (*Cardisoma guanhumi*)
- ▶ Ghost Crab (*Ocypode quadrata*)
- ▶ Land Hermit Crab (*Icoenabita clypeatus*)
- ▶ Sally Lightfoot Crab (*Grapsus grapsus*);
- ▶ Honeybees (*Apis mellifera*)

Based on information compiled from various researchers and reports generated for the Caribbean Region, Table F-2 of Appendix F provides information on the invertebrates found globally and in the Caribbean.

4.1.3 Vertebrates

The vertebrates in St. Kitts and Nevis are discussed under the following subsections:

- ▶ Mammals
- ▶ Freshwater Fish
- ▶ Amphibians
- ▶ Reptiles
- ▶ Avifauna

4.1.3.1 Mammals

Bats are the only terrestrial mammals native to St. Kitts and Nevis, and they constitute the largest mammalian group. Six species in total for the country (see Table F-3 of Appendix F) have been recorded (Horwith and Lindsay, 1999). However, two others were documented during recent research (Horwith and Lindsay, 1999). Of these bats, the Long-tongued Fruit Bat (*Monophyllus plethodon*) is listed as 'Near Threatened' and the Dominican Myotis (*Myotis dominicensis*) is listed as 'Vulnerable' according to the IUCN's Red List of Threatened Species. All other species are of 'Least Concern'.

Based on information from the St. Kitts and Nevis Country Profile (1991) and the Biodiversity Profile for St. Kitts and Nevis (1999), other mammals in the country include:

- ▶ Agouti (*Dasyprocta agouti*): believed to be an Amerindian introduction, however, this animal is no longer reported to be on either island.
- ▶ White-tailed Deer (*Odocoileus virginianus*): introduced from Puerto Rico in 1931 to the Lodge Estate in St. Kitts.
- ▶ Indian Mongoose (*Herpestes javanicus*): introduced in the late 1800s to control rats that infested sugar cane plantations.
- ▶ Rats (*Rattus rattus* and *R. norvegicus*): inadvertently introduced since 1600s or earlier.
- ▶ Mouse (*Mus muscalus*): inadvertently introduced since 1600s or earlier.
- ▶ African Green (or Vervet) Monkey (*Cercopithecus aethiops*): introduced from West Africa approximately 300 years ago as a pet, escaped and naturalized.

4.1.3.2 Freshwater Fish

There are 9 species of freshwater fish reported for St. Kitts and 5 reported for Nevis. Mountain Mullet (*Agonostomus monticola*) and Mudfish (*Gobiidae*) occur in ephemeral pools or streams after prolonged periods of rain. *Poecelia reticulata* can be found in the streams on St. Kitts' southwestern side. The *Gambusia* species, Trout, Tilapia and Goldfish species were introduced to the islands, however, the Trout species did not survive and the status of the Tilapia species is not known (Horwith and Lindsay, 1999) although there are some indications that the species is still farmed in St. Kitts.

Freshwater fish are abundant in both coastal lagoons and mountain streams of Nevis, however there is limited identification of the species found there (CCA, 1991). The island is known to have the *Gambusia* species, Mudfish (*Gobiidae*) and one or two species of Tilapia. Mountain Mulletts (*Agonostomus monticola*) are also found on the island, however their current status is unknown (Horwith and Lindsay, 1999). Table F-4 in Appendix F gives a list of the Freshwater Fishes for St. Kitts and Nevis (Fishbase, 2008).

4.1.3.3 Amphibians

Only two species of amphibians are found on the islands of St. Kitts and Nevis. Firstly, the small Piping Tree Frog (*Eleutherodactylus johnstonei*) is native to St. Kitts and Nevis and is a Lesser Antillean Endemic (Horwith and Lindsay, 1999). They are primarily found in moist forests or similar habitats in bromeliads (CCA, 1991). Secondly, the Marine Toad (*Bufo marinus*) was introduced on the islands as a biological control for rats and mice (CCA, 1991). The Crapaud or Mountain Chicken (*Leptodactylus fallax*), a native to St. Kitts and Nevis became extirpated through habitat modification and overexploitation for food (CCA, 1991).

A recent introduction to the island of Nevis is the Cuban Tree Frog (*Ostopilus septentrionalis*) which was discovered on the property of the Four Seasons Resort in Nevis. This frog is confined to areas of permanent freshwater and reports indicated that it may have colonized Jessup's, just above the resort (Horwith and Lindsay, 1999).

4.1.3.4 Reptiles

The islands of St. Kitts and Nevis are home to ten (possibly eleven) recorded species or sub-species of terrestrial reptiles (Horwith and Lindsay, 1999). They include:

- ▶ Tortoise (*Geochelone carbonaria*): presumed to be introduced by the Amerindians. This tortoise occurs on both islands, although it is very wild.
- ▶ Common Woodslave Gecko (*Hemidactylus mabouia*): occurs throughout the Lesser Antilles.
- ▶ Giant Woodslave Gecko (*Thecadactylus rapicauda*): occurs throughout the Lesser Antilles.

- ▶ Lesser Antillean Iguana (*Iguana delicatissima*): thought to be extirpated in St. Kitts but may still exist on Nevis and the St. Eustatius Bank on the island of St. Eustatius.
- ▶ Green Iguana (*Iguana iguana*): recent sightings of this species in St. Kitts may be escaped pets.
- ▶ Green Lizard (*Anolis bimaculatus bimaculatus*): a subspecies endemic to St. Kitts, Nevis and St. Eustatius.
- ▶ Brown Lizard (*Anolis wattsi schwartzi*): also endemic to St. Kitts, Nevis and St. Eustatius.
- ▶ Ground Lizard (*Ameiva erythrocephala*): endemic to St. Kitts, Nevis and St. Eustatius.
- ▶ Blind Snake (*Typhlops monastus*): fairly common in both St. Kitts and Nevis. Found on wetter habitats on the slopes of moist forests.
- ▶ *Typhlops monastus geotomus*: is a subspecies of the Blind Snake also occurring on both islands.
- ▶ Racer Snake (*Alsophis rufiventris*): recorded for both islands, however, there have been no confirmed sightings for several years and it is suspected that the species has been extirpated by the mongoose.

4.1.3.5 Avifauna

This section begins with a description of the avian diversity of the entire country as derived from several sources and follows with a brief overview of the avian diversity of three Important Bird Areas as defined by Bird Life International.

4.1.3.5.1 Country Diversity

The forested areas, salt ponds, wetland areas and coastal areas of St. Kitts and Nevis are known for their rich avifaunal diversity. Previous literature from St. Kitts and Nevis have documented that St. Kitts and Nevis support less than 100 bird species, however, recent research has increased this number to 116 species (Horwith and Lindsay, 1999). Of the 116 species of birds found in St. Kitts and Nevis, 113 are indigenous species (at least 41 currently or formerly breeding on the island) and 3 are non-native species. Of

the 72 native, non resident species, 22 are seabirds, waterfowl or other aquatic species, 26 are shorebirds, 7 are non-passerine landbirds and 17 are passerine landbirds (Steadman, et. al., 1997). Fieldwork conducted in 1997-1998 has documented several new sightings of birds in St. Kitts and Nevis:

ST KITTS

- ▶ Sandwich Tern (*Sterna sandvicensis*)
- ▶ Blue Grosbeak (*Guiraca caerulea*)
- ▶ House Sparrow (*Passer domesticus*)

NEVIS

- ▶ Pied-Bill Grebe (*Podilymbus podiceps*)
- ▶ American Wigeon (*Anas Americana*)
- ▶ Purple Gallinule (*Porphyryla martinica*)
- ▶ Mangolia Warbler (*Dendroica magnolia*)
- ▶ Prothonotary Warbler (*Protonotaria citrea*)
- ▶ Kentucky Warbler (*Oporornis formosus*)
- ▶ Summer Tanager (*Piranga rubra*)

Several surveys and projects were conducted over the years on the biodiversity of the country. Based on three of these reports, Table F-5 of Appendix F compares the bird species identified for these reports.

Generally, the species of birds present in previous studies are also present in recent studies. The health and status of the populations of some of the species are yet to be determined. However, Alan Vittery's 2006 survey did reveal healthy populations of certain bird species such as the Black-necked Stilt (*Himantopus mexicanus*), which is noted in the book 'The Birds of the West Indies' as 'Uncommon in Northern Lesser Antilles.' Vittery, (2006) also saw healthy populations (up to 24 birds) of the endangered White-Cheeked Pintail (*Anas bahamensis*). In addition, Mr. Vittery has sighted several new bird species on the island such as the Pacific Golden Plover (*P. fulva*) and has heard from resident bird watchers, that the Red-capped Bullfinch (*Pyrrhula erythrocephala*) {once thought to be extinct} probably still exists in the high forests on the volcano.

4.1.3.5.2 Diversity of St. Kitts Central Forest Reserve

Bird Life International lists 10 species that are considered range-restricted to the Central Forest Reserve. These are: Bridled Quail-dove (*Geotrygon mustacea*), Lesser Antillean Flycatcher (*Myiarchus oberi berlepshii*), Purple-throated Carib (*Eulampis jugularis*), Green-throated Carib (*Eulampis holosericeus*), Antillean Crested Hummingbird (*Orthorhyncus cristatus*), Brown Trembler (*Cinclocerthia ruficauda pavidus*), Pearly-eyed Thrasher (*Margarops fuscatus*), Scaly-breasted Thrasher (*Margops fuscus*), Lesser Antillean Bullfinch (*Loxigilla noctis*), and Antillean Euphonia (*Euphonia musica*).

4.1.3.5.3 Diversity of S. E. Peninsula Ponds

The ponds of the South East Peninsula are also listed as an Important Bird Area by Bird Life International. The website lists the following ponds as important to birds on the peninsula: Greatheeds Pond and beach, Half Moon, Friar's Bay, Great Salt, Major's Bay, Mosquito Bay, Little Salt, and Frigate Bay Ponds. The boundaries would be limited by an area thirty meters from the high water line of each pond.

Least Terns (*Sterna antillarum*) nest at three sites on the Southeast Peninsula. A survey in 2004 revealed that Mosquito Bay Pond has 20 Least Tern pairs, Great Salt Pond has 27 pairs, and Greatheeds Beach (which is just north of the peninsula) has 18 pairs. Although St. Kitts' population of 65 pairs meets the Important Bird Area requirements, there is no one site where concentrations are sufficient to classify as an IBA. It is important to note that Least Tern colonies have previously been recorded at other nearby sites, indicating possible movement between breeding sites.

4.1.3.5.4 Diversity of Booby Island

Booby Island, which is located approximately halfway between St. Kitts and Nevis is the only remaining breeding location for a number of species including: Red-billed Tropicbird (*Phaethon aethereus*) (2 pairs), Laughing Gull (*Larus atricilla*) (125 pairs), Roseate Tern (*Sterna dougallii*) (6 pairs), Bridled Tern (*Sterna anaethetus*) (60 nests), Sooty Tern (*Sterna fuscata*) (225 nests), and Brown Noddy (*Anous stolidus*) (8 pairs). This island is also listed as an Important Bird Area by Bird Life International.

4.2 Coastal Resources

Freshwater lagoons, saltwater lagoons, mangrove systems, coral reefs and seagrass beds are the five coastal habitats which are of critical importance to the nearshore tropical marine ecosystems of St. Kitts and Nevis (Planning Unit, 2004). The sandy beaches of the island also play an important role in the country's tourism.

4.2.1 Beaches

The island of St. Kitts has a total coastline of 78.1 km, consisting of 34.7 km of cliff rocks, 10.8 km of cobble, 6.3 km of boulders and rocks, 13.1 km of black volcanic sand and 13.2 km of golden sand (coralline and shell) {Planning Unit, 2004}. These coralline and shell sand golden beaches occur at Frigate Bay (north and south) and the beaches of the Southeast Peninsula, including: Friars Bay, Turtle Bay, Canoe Bay, Mosquito Bay (Turtle Beach), Majors Bay, Cockleshell Bay, Sandbank Bay and Banana Bay. Beaches at Sandy Point, Dieppe Bay and Conaree are mixed terrigenous and marine. The rest of the beaches are mostly volcanic black sand (HCL, 2003).

Nevis also has sandy beaches, rocky shores and massive sea cliffs. The most prominent sandy beach is a 4 km stretch of coastline north from Charlestown to Cades Bay, called Pinney's Beach. It is composed of both coral fragments and terrestrial soils that give it a yellow appearance and is typical of a number of beaches found along the leeward coast of the island (Planning Unit, 2004). South of Charlestown, there is a progression to black sand beaches which have been formed from volcanic materials. Black sand beaches are more typical of the east coast and are generally less extensive (HCL, 2003).

The golden sand beaches of the island are notorious for their influx of tourists. St. Kitts and Nevis's tourism is primarily sun, sand and sea and tourism on the island contributes approximately 6.4% to the GDP (1993-2002) {Planning Unit, 2004}.

4.2.2 Freshwater and Salt Water Lagoons

On the island of St. Kitts, there are number of saltwater ponds located on the Southeast Peninsula. The largest of these natural salt ponds is The Great Salt Pond which covers 1.6 km in diameter. The other ponds of the Peninsula include The Little Salt Pond,

Friars Bay Salt Pond (saline to brackish water) and the salt ponds at Major's Bay and Cockleshell Bays. Saltwater ponds are a body of water of varying surface area with characteristic high salinity as a result of high evaporation of runoff waters from catchment basins. These ponds are not being used for salt production as a result of a number of economic factors. Nevertheless, they possess great diversity with the production of brine shrimps at certain times of the year (Biodiversity Action Plan and Steadman, et.al, 1997).

Two small ponds located northeast of Basseterre are the only freshwater ponds on the island of St. Kitts. One of them, the Greatheeds Pond is described as a natural freshwater ecosystem which also functions as a sink for both natural and man-induced sediment runoff. The pond has no visible connection to the sea (Walters, 1995 and US Army Corps of Engineers, 2004).

Nevis has a system of freshwater lagoons located throughout the island, some of which are along the coast and are therefore subject to saltwater intrusion (US Army Corps of Engineers, 2004). These lagoons may be as a result of either mountain ghaut (stream) run-off, as in the case of Pinney's Estate Lagoons, or underground springs as evidenced at Nelson Spring in Cotton Ground (Planning Unit, 2004).

These ponds provide habitats for many migratory seabirds and shorebirds in the fall and spring such as the Great Blue Heron (*Ardea herodias*) and the Western Sandpiper (*Calidris mauri*). Three local nesting shorebirds have been documented: Black-necked Stilt (*Himantopus mexicanus*), Wilson's Plover (*Charadrius wilsonia*) and Snowy Plover (*Charadrius alexandinus*). Other waterbirds such as ducks and coots such as the American Coots (*Fulica americana*), Caribbean Coots (*Fulica caribaea*) and the Blue-winged Teal (*Anas discors*) use the local salt ponds as wintering habitats (Planning Unit, 2004). The lagoons and ponds also support mangrove systems (see Section 4.2.3).

4.2.3 Mangroves

Mangrove systems are known to be of ecological importance since they:

- ▶ Provide the primary habitat for various species of waterfowl, other migratory shorebirds and seabirds, fish, mammals and insects. These areas are also known to be popular breeding ground for waterfowl as well as a nursery for various species of fish and shellfish;

- ▶ Act as a sieve that naturally filters and recharges the water that comes from upstream rivers and catchments. They act as giant sponges, slowing the flow of surface waters and reducing the impact of flooding; and
- ▶ Prevent soil and coastal erosion. They buffer water bodies from potentially damaging land use activities such as agriculture and industrial activities.
- ▶ Protect the coastline from damaging storm surges and tidal waves.

Generally, the mangroves are not abundant on the island of St. Kitts. The most extensive mangrove systems occur on the Southeast Peninsula (Planning Unit, 2004). According to Beard (1949), the main mangrove types are Red (*Rhizophora mangle*), White (*Laguncularia racemosa*) and Black Mangroves (*Avicennia nitida*). The red mangroves are usually dominant and the black and white mangroves occupy the landward margins of the pond systems.

On the island of Nevis, red and black mangroves no longer occur naturally in any of the mangrove systems, although they were present less than 20 years ago (HCL, 2003). Stands of white mangroves are dominant on the island, accompanied by fewer buttonwood species. These mangrove systems can be found at:

- ▶ Bath Bogs / Bath Stream (Southwest coast adjacent to the Gallows Bay immediately south of Charlestown)
- ▶ Parris Pond (Southern extremity of Pinney's Pond immediately north of Pinney's Beach Hotel)
- ▶ Pinney's Pond (About ½ km north of Parris Pond along Pinney's Beach)
- ▶ Jessup's Bogs / Bowrin Pond (West of Jessup's along Pinney's Beach)
- ▶ Fort Ashby Lagoon (Northwest coast next to the ruins of Fort Ashby)
- ▶ Mariners Pub Lagoon / Lawrence's Pond (Northwest coast next to the Cla-chadel Restaurant)
- ▶ Cades Bay (Northwest coast close to Prinderella's Restaurant)
- ▶ Jones Bay (Northwest coast north of Cliff Dwellers)

- ▶ Oualie Beach (Northwest coast in Mosquito Bay)
- ▶ Newcastle (Adjacent to eastern end of Newcastle Bay on north coast)
- ▶ Nisbet's (Nisbet's Beach on the north coast [western end])
- ▶ Long Haul Bay (Long Haul Bay on north coast)
- ▶ Indian Castle / White Bay (Southeast coast) {Nevis Physical Planning Unit, 1998}

4.3 Marine Resources

Marine resources of St. Kitts and Nevis include:

- Coral Reefs and Seagrass Beds,
- Marine Mammals,
- Marine Fish, and
- Marine Reptiles.

4.3.1 Coral Reefs and Seagrass Beds

The islands of St. Kitts and Nevis are surrounded by the warm, shallow waters of the Caribbean Sea which provide ideal conditions for the growth of coral reefs and seagrass beds. Globally, these are considered critical habitats as they provide healthy ecosystems in which a rich diversity of marine organisms thrives. Seagrass and coral reef communities provide a habitat for commercially important species such as the spiny lobster (*Panulirus argus*) and conch, nurseries for delicate juvenile organisms and act as a barrier during periods of heavy wave attack (HCL, 2003). In St. Kitts and Nevis, coral reefs and seagrass beds occur primarily along:

- ▶ The Southwest coast between Nag's Head and the southern end of Basseterre Bay;
- ▶ The Northwest coast between Sandy Point and Dieppe Bay;
- ▶ The East coast between Conaree and Friar's Bay;
- ▶ The Southeast coast adjacent to the Narrows;

- ▶ The island of Nevis (reasonable balance of coral reefs surrounding the island); and
- ▶ The Northwestern and southern coasts of Nevis (Seagrass Beds)

The species of coral found in the waters of the islands virtually span the entire spectrum of tropical coral diversity from the finger coral (*Porites porites*) to the Staghorn and Elkhorn corals (*Acropora formosa* and *A. palmate*). Other species such as sponges and soft corals usually accompany these stony hard corals. Unfortunately, there have also been many reports of the deterioration of the coral reefs around both islands as a result of human activities. Seagrass communities are typically co-dominated by Turtle Grass (*Thalassia testudinum*) and Manatee Grass (*Syringodium filiforme*) (CCA, 1991).

4.3.2 Marine Mammals

For the Caribbean, 26 species of Cetaceans have been recorded. Of this, one third have been sighted (or are expected to occur) in Kittitian-Nevisian waters during migrations (Horwith and Lindsay, 1999). Migrant mammals include:

- ▶ Humpback Whale (*Megaptera novangliea*);
- ▶ Sperm Whale (*Physeter catodon*);
- ▶ Bottled nosed Dolphins (*Tursiops truncatus*);
- ▶ Rough-toothed Dolphins (*Steno bredanensis*); and
- ▶ Spinner Dolphins (*Stenella longirostris*).

Of these mammals, the Sperm Whale is listed as 'Vulnerable' according to the IUCN's Red List of Threatened Species.

4.3.3 Marine Fish

Marine fishes in St. Kitts and Nevis, are those typical of the Lesser Antillean Region, and have played a prominent role in fishing activities around the islands for a long time (CCA, 1991). According to Fishbase, there are 462 species of marine fish tabulated for St. Kitts and Nevis. Of these 462 species, 16 species are deemed threatened (see Table F-6 of Appendix F).

4.3.4 Marine Reptiles

There are three species of sea turtles that are known to nest in St. Kitts and Nevis:

- ▶ Hawksbill Turtle (*Eretmochelys imbricate*);
- ▶ Green Turtle (*Chelonia mydas*); and
- ▶ Leatherback Turtle (*Dermochelys coriacea*)

The IUCN's Red List of Threatened Species classes these three species as endangered. The Loggerhead Turtle (*Caretta caretta*), which does not nest in St. Kitts and Nevis, is sometimes caught in open waters surrounding the islands. This species is also classified as endangered (Horwith and Lindsay, 1999).

Historically, the Leatherback Turtle has been known to nest on nearly all of the beaches in St. Kitts; however recent field observations indicate that several sites are critically important. Such areas are the Northern Beach from northwest of Cayon River, Friars Bay Beach, and the southeastern-most 2 km of North Frigate Bay (Horwith and Lindsay, 1999). In addition, information obtained from the St. Kitts Sea Turtle Monitoring Network website indicated that leatherbacks nest primarily on the Atlantic side of the island. The two major leatherback nesting beaches mentioned on this website are Keys to Cayon River and North Friar's Bay.

Hawksbill Turtle nests are most concentrated on the Southeast Peninsula on beaches such as Major's Beach, Banana Beach and Cockleshell Bay. Green Turtles usually nest at North Frigate Bay, Half Moon Bay and around Conaree (Horwith and Lindsay, 1999).

On Nevis, the highest density of nesting (Hawksbills) occurs on Lover's / Sea Haven Beach. Apart from Sea Haven, nesting occurs on Jones Bay, Cades Bay, Pinney's Beach, Gallows Bay, Beach Lands, Long Haul Beach, Black Bay and Dog Bay.

4.4 Invasive Species

Invasive alien species are a significant threat to native biodiversity, natural ecosystems and ecosystem services. The Global Invasive Species Database recognises that these species are particularly devastating to island ecosystems due to the relative isolation of populations. St. Kitts and Nevis has also experienced the effects of invasive species on its biodiversity but significantly on the agricultural sector where economic losses have been severe.

Eighteen invasive species have been identified for St. Kitts and Nevis on the Global Invasive Species Database. These include ten species considered alien, one whose biological status is unknown and 7 that are considered invasive but are native. Table F-7 of Appendix F provides a brief description of these species.

5 STATUS OF THE ECOLOGICAL AND HISTORICAL / CULTURAL BASE

This chapter summarizes the present status of the ecological and historical-cultural base in St. Kitts and Nevis.

5.1 Layout of Chapter

Information is firstly provided on four sites which have already been assigned (or will shortly be assigned) protected area status:

- ▶ Brimstone Hill Fortress National Park,
- ▶ Central Forest Reserve National Park,
- ▶ Nevis Peak National Park and Camps River Watershed, and
- ▶ Basseterre Valley Aquifer National Park.

The remainder of the chapter focuses on groups of sites which may not presently be protected but should be considered for inclusion in a wider protected areas system:

- ▶ Marine Areas,
- ▶ Turtle Nesting Beaches,
- ▶ Salt Ponds,
- ▶ Freshwater Lagoons,
- ▶ The Ghauts,
- ▶ Dry Forest,
- ▶ Historic Charlestown, and
- ▶ Historic Sites.

Rain forest is not discussed as a separate group since there are significant areas of this forest type in the Central Forest Reserve National Park and Nevis Peak National Park and Camps River Watershed

In each case, information is provided on:

- ▶ Location and Extent,
- ▶ Legal Status,
- ▶ Features,
- ▶ Pressures and Threats, and
- ▶ Management Structure and Challenges

A full description of the status of existing sites and groups of sites is provided in Appendix G to this Protected Areas Systems Plan Report.

5.2 Brimstone Hill Fortress National Park

The following is a summary of the present status of the Brimstone Hill Fortress National Park:

| ITEM | COMMENT |
|--|---|
| BRIMSTONE HILL FORTRESS NATIONAL PARK | |
| Location and Extent | Brimstone Hill Fortress National Park (BHFNP) is situated on the West Coast of St. Kitts, between Half Way Tree and Sandy Point Town. It occupies an area of approximately 15 ha including a buffer zone of approximately 400 m. |
| Legal Status | BHFNP is a National Park under both the NCEPA and draft NCEMA Acts of St. Kitts and Nevis and a World Heritage Site listed by UNESCO. |
| Features | <p>Heritage Outstanding British fortress.</p> <p>Exceptional example of 17th and 18th century British Military architecture.</p> <p>Ecological Nesting site for eight species of birds.</p> <p>Geological Emerged as a result of underlying volcanic activity some 6000 years ago.</p> |
| Pressures and Threats | <ul style="list-style-type: none"> • Exceeding carrying capacity. • Fires, which originate in the surrounding cane fields and grassland. • Hurricanes have weathered walls in this Century. • Heavy and prolonged rainfall can produce rock and land slides. • Dirt and grime can affect external walls over time. • Earthquake and volcanic eruption are potential dangers in these Caribbean islands. • Inappropriate Development; • Potential for Geothermal Energy Power; and • Livestock Grazing. |

| ITEM | COMMENT |
|-------------------------------------|--|
| Management Structure and Challenges | The Society for the Restoration of Brimstone Hill was managed the fortress until 1987 when the NCEPA Act gave management authority to the Brimstone Hill Fortress National Park Society. |

5.3 Central Forest Reserve National Park

The following is a summary of the present status of the Central Forest Reserve National Park:

| ITEM | COMMENT |
|---|--|
| CENTRAL FOREST RESERVE NATIONAL PARK | |
| Location and Extent | The Central Forest Reserve National Park (CFRNP) is situated in the centre of the island of St. Christopher, and occupies all lands above the 1,000ft contour. The CFRNP occupies approximately 50 km ² of land, or 12,500 acres. |
| Legal Status | The Central Forest Reserve was designated a National Park by the Government of St. Kitts and Nevis on 23 October 2006, and officially gazetted on 29 March 2007. |
| Features | <ul style="list-style-type: none"> • Various vegetation types including, Elfin Sierra Palm Cloud Forest, Evergreen Forest Sierra Palm Forest, Sierra Palm Transitional Tall Cloud Forest, and Steep Montane Non-Forest Vegetation. • It represents the primary source of water for human consumption on the island of St. Christopher. • The CFRNP houses a series of nature and scenic trails which support eco-tourism ventures as well as recreational and educational programmes. |
| Pressures and Threats | <ul style="list-style-type: none"> • Erosion; • Overcrowding; • Extraction of Ornamental and Medicinal Plants; • Illegal Farming; • Hurricanes / Natural Disasters; • Damage to Water Resources; and • Invasive Species. |
| Management Structure and Challenges | <ul style="list-style-type: none"> • Management responsibility for the CFRNP is vested in the Department of Physical Planning and the Environment (DPPE). • The lack of capacity and practical experience presently impedes the proper management of the CFRNP. |

| ITEM | COMMENT |
|--|--|
| Management Structure and Challenges (Cont'd) | <ul style="list-style-type: none"> • There is also currently a poor relationship between the stakeholders involved in CFRNP and the DPPE. • The lack of a defined (on the ground) boundary for the CFRNP. • High difficulty in monitoring of illegal activities such as illegal growth of marijuana, plant extraction and littering; • Difficulty in monitoring or preventing agricultural encroachment, unsanctioned development and trail cutting; • Law enforcement is low; and • Recruitment and retention of managers is difficult. |

5.4 Nevis Peak National Park and Camps River Watershed

The following is a summary of the present status of the Nevis Peak National Park and Camps River Watershed:

| ITEM | COMMENT |
|---|---|
| NEVIS PEAK NATIONAL PARK AND CAMPS RIVER WATERSHED | |
| Location and Extent | <ul style="list-style-type: none"> • The Nevis Peak National Park includes all land on the island above the 1,000 foot contour, ascending to the top of the 3,232 foot tall Mount Nevis. • This protected area links the Camps River Watershed to the north north-east, via Camps Ghaut and wetlands to the coast. |
| Legal Status | The NPNP is earmarked under the Draft Nevis Physical Development Plan as a protected area. |
| Features | <ul style="list-style-type: none"> • Volcanic formations, • Vegetative zones such as Elfin Woodland, Rainforest, Montane Thicket, Palm Brake, and Riparian Forests. • The island's major watershed and springs • A freshwater lagoon, and • The largest living reef system around Nevis. |
| Pressures and Threats | <ul style="list-style-type: none"> • Charcoal Production; • Built Development; • Overharvesting of Plants; • Clearing for Farming; • Livestock Grazing; • Water Contamination from Farming; • Water Contamination from Wild Monkeys; • Water Contamination from Domestic Sources; |

| ITEM | COMMENT |
|-------------------------------------|--|
| Pressures and Threats (Cont'd) | <ul style="list-style-type: none"> • Dumping of Industrial and Construction Wastes. • The lack of proper (on the ground) boundary demarcation. |
| Management Structure and Challenges | <p>The management plan envisages that:</p> <ul style="list-style-type: none"> • The Ministry of the Environment (Physical Planning Department) has the overall responsibility for the management of the Nevis Peak National Park; • The Nevis National Trust has been created as a statutory corporation under the draft Nevis National Trust Ordinance, 2007 to administer its affairs; and • The Nevis Peak National Park Advisory Committee is responsible for advising the National Trust Council on matters specifically pertaining to the proposed park. <p>Management Challenges include:</p> <ul style="list-style-type: none"> • Difficulty in monitoring or preventing agricultural encroachment, • Unsanctioned development; • Trail cutting; • Low enforcement is low; and • Difficulty in securing the sites. |

5.5 Basseterre Valley Aquifer National Park

The following is a summary of the present status of the Basseterre Valley Aquifer National Park:

| ITEM | COMMENT |
|--|---|
| BASSETERRE VALLEY AQUIFER NATIONAL PARK | |
| Location and Extent | The Basseterre Valley Aquifer National Park (BVANP) is situated generally to the east of the town of Basseterre, occupying an area of approximately 197 ha. |
| Legal Status | The St. Kitts National Physical Development Plan, 2006 lists the BVANP as a proposed Protected Area. |
| Features | A significant portion of the public supply of potable water in St. Kitts comes from this aquifer. |

| ITEM | COMMENT |
|-------------------------------------|---|
| Pressures and Threats | <ul style="list-style-type: none"> • Climate variability and the recurrence of drought. • Effects of previous fertilizer application to cane fields, • Sewage treatment and disposal • Storm water run off along major roads which cross the aquifer. • Inappropriate Development; • Stray Animals; • Illegal Dumping; • Agrochemical Contamination; • Industrial Waste; • Contaminated Airport Runoff; • Illegal Topsoil Removal; • Fires; and • Toilet Waste / Sewage. |
| Management Structure and Challenges | <p>The Basseterre Valley Aquifer Protected Area project falls under the jurisdiction of the Basseterre Valley Advisory Committee.</p> <p>Management Challenges include:</p> <ul style="list-style-type: none"> • Managing the resources (water) given the high demand for it; and • Difficulty in managing illegal activities such as arson and illegal dumping. |

5.6 Marine Management Areas

The following is a summary of the present status of the Marine Management Areas:

| ITEM | COMMENT |
|--------------------------------|---|
| MARINE MANAGEMENT AREAS | |
| Location and Extent | <ul style="list-style-type: none"> • The South East Peninsula Marine Management wraps around the South-east Peninsula of St. Kitts and extends to the north coast of Nevis. • Sandy Shoal Coral Reef can be found on the north-west corner and leeward side of the island at the town of Sandy Point. |
| Legal Status | The Southeast Peninsula Marine Management Area and Sandy Point Marine Management Area are designated as protected areas in the St. Kitts National Physical Development Plan, 2006. |

| ITEM | COMMENT |
|-------------------------------------|---|
| Features | <ul style="list-style-type: none"> • Sea grass and calcareous algae. • Salt ponds which possess a mangrove fringe. • Three species of endangered sea turtles, the green, hawksbill and leatherback turtle, nest at the South-east Peninsula beaches. • Local fisheries such as finfish, conch and lobster. • Two bird nesting sites at Booby Island and Nag's Head. |
| Pressures and Threats | <ul style="list-style-type: none"> • Uncontrolled diving and indiscriminate anchoring of boats, • Overfishing; • Climate Change; • Closure of Sugar Industry; • Tourism Development; • Theft of Cultural Resources; • Sand Mining; • Anchor Damage to Reefs and Seagrass Beds; • Geothermal Pipeline / Cable Construction; • Invasive Species; and • Solid Waste including International Garbage. |
| Management Structure and Challenges | <p>The SEPMMMA will be under the responsibility of the Ministry of Sustainable Development. Management will be in the form of a Management Committee comprising of Fisheries Management Unit, Dive operators, fishers organizations, Port Authority, Coast Guard, the St. Christopher Heritage Society and the Department of Physical Planning and Environment.</p> <p>Management challenges include:</p> <ul style="list-style-type: none"> • Difficulty in monitoring the harvesting of juvenile / undersized species, • Poaching of turtles and their eggs, • Poaching of Bobby eggs and • The extraction of marine artefacts. |

5.7 Turtle Nesting Beaches

The following is a summary of the present status of the Turtle Nesting Beaches:

| ITEM | COMMENT |
|-------------------------------------|---|
| TURTLE NESTING BEACHES | |
| Location and Extent | <ul style="list-style-type: none"> • Sea Haven Turtle Nesting Beach is situated on the north coast of Nevis overlooking The Narrows. • Keys Turtle Nesting Beach is situated on the windward coast, between Barker’s Point and Cayon. |
| Legal Status | <ul style="list-style-type: none"> • Sea Haven Beach is identified as a Coastal Conservation Area under the Nevis Physical Development Plan, 2008. • Keys Turtle Nesting Beach is a proposed protected area. |
| Features | <p>Both beaches have one or a combination of the features below making them suitable for nesting:</p> <ul style="list-style-type: none"> • Flatter slopes to make it easier for the turtles to cross the beach. • Firm sand to allow for the flippers to gain “purchase” to drag the turtle up the beach • Clear beach area without debris. • Back beach vegetation suitable for nesting Hawksbill turtles • Stable sand conditions for successful hatching. |
| Pressures and Threats | <ul style="list-style-type: none"> • Inappropriate Development; • Human Activity (Driving, Horseback Riding, Littering and Sand Mining); • Poaching; • Light Pollution; and • Predation. |
| Management Structure and Challenges | <ul style="list-style-type: none"> • Sea Haven Beach is currently monitored by the Nevis Turtle Group. • Keys Beach is monitored by the St. Kitts Sea Turtle Monitoring Network. <p>Management challenges include:</p> <ul style="list-style-type: none"> • Difficulty in controlling the poaching of eggs and animals, • Monitoring and controlling sand mining (legal and illegal), • Unsanctioned development (creating light sources), and • The removal of vegetation. |

5.8 Salt Ponds

The following is a summary of the present status of the Salt Ponds:

| ITEM | COMMENT |
|-------------------------------------|--|
| SALT PONDS | |
| Location and Extent | <ul style="list-style-type: none"> • On the island of St. Kitts there are a number of saltwater ponds, many of which are concentrated on the Southeast Peninsula. • Pond size varies greatly. For example, Great Salt Pond covers an area of 200 ha while Friars Bay Salt Pond is approximately 20 acres of which approximately 10 acres is actual pond. |
| Legal Status | Salt Ponds are considered owned by the person that owns the surrounding lands. |
| Features | <ul style="list-style-type: none"> • Salt ponds are usually located close to the sea, just landward of the beach berm (dunes). • They function as part of the surface drainage system, with some surface water entering the ponds from the landward side before being discharged to the sea. • Variable hydrology with the dry and wet seasons. • As the dry season progresses the water in the ponds can become hypersaline, supporting a specialized fauna and microfauna. • Many support a mangrove fringe and diverse and abundant bird life. |
| Pressures and Threats | <ul style="list-style-type: none"> • Tourism development, • cutting of the dune barrier, • dumping of rubble and garbage, • removal of the vegetative screen, and • eutrophication as a result of continuous run-off from the golf course. |
| Management Structure and Challenges | <ul style="list-style-type: none"> • The management structure related to the Salt Ponds is unclear at this time. • The DPPE appears to exercise some control on the modification of these ponds under the planning approvals process. <p>Management challenges include:</p> <ul style="list-style-type: none"> • Monitoring illegal dumping at the ponds. • Removal of mangrove vegetation. |

5.9 Freshwater Lagoons

The following is a summary of the present status of the Freshwater Lagoons:

| ITEM | COMMENT |
|---------------------------|--|
| FRESHWATER LAGOONS | |
| Location and Extent | Nevis has a system of freshwater lagoons (ponds and wetlands) located throughout the island, some of which are along the coast. |
| Legal Status | <ul style="list-style-type: none"> • Camps Springs and the Associated Wetland are part of the overall Nevis Peak National Park / Camps Watershed Protected Area/ • Bath Bogs and Gallows Bay Bog are part of the Bath Bogs Protected Area. • Pinney's Pond, Parris Pond and Nelson's Spring are all part of a proposed protected area, Pinney's Beach Conservation Area in the draft Nevis Physical Development Plan. • Jessup's Pond is located within the proposed Pinney's Beach Conservation Area according to the map attached to the Nevis Development Plan although it is not identified as a part of the Conservation Area in the actual plan. • New River Springs (which is part of a larger area being proposed as a protected area) has no legal designation at this time. |
| Features | <ul style="list-style-type: none"> • Nelson Springs, Camps Springs and New River Springs are known to provide water to their respective Parishes. • There is predominantly coconut plantation in the vicinity of some lagoons. • There are also areas of mangrove around others. • Within some of the smaller, shallower lagoons there are prominent reeds and sedges. • These lagoons provide habitats for many migratory seabirds and shorebirds in the Northern Autumn and Spring seasons. |
| Pressures and Threats | <ul style="list-style-type: none"> • Disease. • Pollution from nearby restaurants and built up areas. • Non-native species; • Filling-in; • Marinas; • Illegal dumping; • Overfishing; and • Harvesting of Mangroves. |

| ITEM | COMMENT |
|-------------------------------------|---|
| Management Structure and Challenges | <p>The management structure related to the Freshwater Lagoons is unclear at this time.</p> <p>There is some control on built development around freshwater lagoons by The Physical Planning Department of the Nevis Island Administration.</p> <p>Management challenges include:</p> <ul style="list-style-type: none"> • Controlling the ease of access to these freshwater lagoons; • Preventing the overexploitation of these resources; and • Challenges in preventing the development of land in these areas. |

5.10 The Ghauts

The following is a summary of the present status of the Ghauts:

| ITEM | COMMENT |
|-----------------------|--|
| THE GHAUTS | |
| Location and Extent | Ghauts are distributed around both islands. The size of each ghaut depends on the area which it drains. |
| Legal Status | Ghauts on St. Kitts and Nevis are listed as areas of special concern in the NCEPA and NCEMA Acts. |
| Features | <ul style="list-style-type: none"> • The primary importance of ghauts is effective drainage. • The reduction in the potential for localized flooding. • Ghauts also serve as vegetated corridors which host several species of plants and animals. • Legal and regulated sand mining in Wash, Tabernacle and Mansion Ghauts. |
| Pressures and Threats | <ul style="list-style-type: none"> • Illegal sand mining. • Unauthorized development. • Agricultural encroachment. • Squatting. • Indiscriminate dumping of garbage and other types of solid waste. |

| ITEM | COMMENT |
|-------------------------------------|--|
| Management Structure and Challenges | <p>The management of sand mining in the Ghauts in St. Kitts is the responsibility of the Ministry of Public Works. On both islands, the control of built development very close to or within the ghauts is the responsibility of the respective Physical Planning agency.</p> <p>Management challenges include:</p> <ul style="list-style-type: none"> • Difficulty in monitoring illegal activities such as sand mining, illegal dumping, unauthorized construction and livestock grazing/farming; • Controlling the ease of access to these ghauts; and • Managing the sustainable use of the resources which ghauts have to offer. |

5.11 Dry Forest

The following is a summary of the present status of the Dry Forest:

| ITEM | COMMENT |
|---------------------|--|
| DRY FOREST | |
| Location and Extent | <p>Small areas of dry forest are found at the following locations:</p> <ul style="list-style-type: none"> • The slopes of Brimstone Hill in St. Kitts; • On selected peaks on the Southeast Peninsula of St. Kitts; and • The northernmost, southeast and southwest slopes of Nevis Peak. |
| Legal Status | <ul style="list-style-type: none"> • The dry forest on the slopes of Brimstone Hill is protected as part of the BHFNP. • The dry forests on the slopes of Nevis Peak are protected as part of the Nevis Peak National Park. • The status of the dry forest on the small peaks on the Southeast Peninsula is subject to some question. |
| Features | <ul style="list-style-type: none"> • Dry forests are a diverse system consisting mainly of deciduous trees which shed their foliage in the dry season. • Dry forest plants have multiple adaptations to dry conditions, including drought avoidance and resistance through a variety of morphological and behavioural characteristics. |

| ITEM | COMMENT |
|-------------------------------------|---|
| Features (Cont'd) | <ul style="list-style-type: none"> • Common species include Silk Cotton and the shrub <i>Bouyeria succulenta</i> in St. Kitts. • On the island of Nevis common species include White Cedar, Black Mast and Loblolly. |
| Pressures and Threats | <ul style="list-style-type: none"> • Erosion / Landslides; • Extraction of Ornamental and Medicinal Plants; • Illegal Farming; • Invasive Species; • Charcoal Production; • Livestock Grazing; and • Illegal dumping of waste. |
| Management Structure and Challenges | <ul style="list-style-type: none"> • Management of the dry forests in the Brimstone Hill National Park and the Nevis Peak National Park is as described above for these sites. • There is no formal management structure for other areas of dry forests. <p>Management challenges include:</p> <ul style="list-style-type: none"> • Difficulty in monitoring illegal activities; • Controlling overexploitation of the valuable resources found in the area; and • Controlling the ease of access to these forested areas; |

5.12 Historic Charlestown

The following is a summary of the present status of Historic Charlestown:

| ITEM | COMMENT |
|-----------------------------|---|
| HISTORIC CHARLESTOWN | |
| Location and Extent | <ul style="list-style-type: none"> • The town of Charlestown is located on the west coast of the island. • At present the town is approximately 490 acres in extent. |
| Legal Status | <ul style="list-style-type: none"> • The draft Nevis Physical Development Plan identifies Charlestown as a Priority Area and recommended the development of a Physical Action Plan. • The legal status of individual units is not as clear cut. |
| Features | <ul style="list-style-type: none"> • It is compact and easily walkable, • Its historic urban structure is largely intact and suffers few alien changes, |

| ITEM | COMMENT |
|-------------------------------------|--|
| Features (Cont'd) | <ul style="list-style-type: none"> • Its historic buildings are both charming and, for the most part, pleasant and comfortable with several 'special spaces', many fine trees and old stonewalls, • It enjoys views out to sea and, inland, dramatic glimpses of Mount Nevis. • There is also architectural display of the 'skirt and blouse' style, timber balconies, gingerbread or scrollwork, jalousie windows and hurricane shutters, lapped wood or shingled walls, hipped roofs largely in corrugated steel, distinctive paintwork and signboards, and arches, breezeways and courtyards. |
| Pressures and Threats | <ul style="list-style-type: none"> • Neglect of sites and buildings. • Poor repairs and restoration, • Ill-considered redevelopment; • Exceeding carrying capacity; • Property Theft and Destruction; • Littering; and • Graffiti. |
| Management Structure and Challenges | <ul style="list-style-type: none"> • At present there is no formal management structure associated with Historic Charlestown. • There is some protection of historic sites through the system of planning permission administered by the Physical Planning Department. <p>Management challenges include:</p> <ul style="list-style-type: none"> • Monitoring of illegal activities such as graffiti; • Lack of clear internal organization; • Lack of transparency in decision-making; • Lack of communication with the community in decision-making; • Ongoing disputes due to land tenure or use rights; and • Lack of adequate financial resources to conduct critical law enforcement. |

5.13 Historic Sites

The following is a summary of the present status of the Other Historic Sites:

| ITEM | COMMENT |
|-----------------------|--|
| HISTORIC SITES | |
| Location and Extent | <ul style="list-style-type: none"> • Petroglyphs at Old Road Town, St. Kitts <ul style="list-style-type: none"> ○ Size of a household lot. • Stonefort, St. Kitts; <ul style="list-style-type: none"> ○ Extends 200 m on both sides of the ravine and 500 m from the Island Main Road. • Belmont Estate, St. Kitts; <ul style="list-style-type: none"> ○ 3 acres • Mansions Estate, St. Kitts; <ul style="list-style-type: none"> ○ 3 acres • Spooner’s Ginnery, St. Kitts; <ul style="list-style-type: none"> ○ 1.8 acres • Black Rocks, St. Kitts; <ul style="list-style-type: none"> ○ 30 m coastal strip • Charles Fort, St. Kitts; <ul style="list-style-type: none"> ○ 7 acres • Indian Castle Protected Area, Nevis; <ul style="list-style-type: none"> ○ 15 acres • Fort Ashby, Nevis; <ul style="list-style-type: none"> ○ Household lot • Bath Hotel, Nevis; <ul style="list-style-type: none"> ○ Part of a larger 57 acre site • New River Estate, Nevis; and <ul style="list-style-type: none"> ○ Unclear • Fort Charles, Nevis <ul style="list-style-type: none"> ○ 3 acres |
| Legal Status | <ul style="list-style-type: none"> • Petroglyphs at Old Road Town, St. Kitts <ul style="list-style-type: none"> ○ Ministry of Tourism • Stonefort, St. Kitts; <ul style="list-style-type: none"> ○ St. Christopher National Trust • Belmont Estate, St. Kitts; <ul style="list-style-type: none"> ○ St. Christopher national Trust • Mansions Estate, St. Kitts; <ul style="list-style-type: none"> ○ St. Christopher National Trust • Spooner’s Ginnery, St. Kitts; <ul style="list-style-type: none"> ○ St. Christopher National Trust |

| ITEM | COMMENT |
|-----------------------|---|
| Legal Status (Cont'd) | <ul style="list-style-type: none"> • Black Rocks, St. Kitts; <ul style="list-style-type: none"> ○ Ministry of Tourism • Charles Fort, St. Kitts <ul style="list-style-type: none"> ○ Crown lands • Indian Castle Protected Area, Nevis; <ul style="list-style-type: none"> ○ Ministry of Agriculture • Fort Ashby, Nevis; <ul style="list-style-type: none"> ○ Ministry of Tourism • Bath Hotel, Nevis; <ul style="list-style-type: none"> ○ Ministry of Tourism • New River Estate, Nevis; and <ul style="list-style-type: none"> ○ Ministry of Tourism • Fort Charles, Nevis; <ul style="list-style-type: none"> ○ Private land |
| Features | <ul style="list-style-type: none"> • Petroglyphs at Old Road Town, St. Kitts; <ul style="list-style-type: none"> ○ Amerindian rock carvings • Petroglyphs at Stonefort, St. Kitts <ul style="list-style-type: none"> ○ Amerindian rock carvings amounting to 115 numbered inscriptions. • Belmont Estate, St. Kitts <ul style="list-style-type: none"> ○ Remnants of 18th and 19th sugar plantation including chimneys, Great House, windmill, factory and old plantation buildings. • Mansions Estate, St. Kitts <ul style="list-style-type: none"> ○ Remnants of 18th and 19th sugar plantation including chimneys and old plantation buildings such as the Manager's House, Overseer's House, windmill, factory, cistern, pen, stables and privy. • Spooner's Ginnery, St. Kitts <ul style="list-style-type: none"> ○ Remnants of cotton ginnery including equipment as well as 19th century Great House, 19th century stone factory and chimney, 18th century mill and factory and 1940's manager's house. |

| ITEM | COMMENT |
|-------------------------------------|---|
| Features (cont'd) | <ul style="list-style-type: none"> • Black Rocks, St. Kitts <ul style="list-style-type: none"> ○ Volcanic rocks in a scenic setting. • Charles Fort, St. Kitts <ul style="list-style-type: none"> ○ Remnants of old fort including cistern, guard room, cannons etc. • Indian Castle Protected Area, Nevis <ul style="list-style-type: none"> ○ Amerindian artefacts and remnants of Fort George. • Fort Ashby, Nevis <ul style="list-style-type: none"> ○ Remnants of Old Fort including cannons, building. • Bath Hotel, Nevis <ul style="list-style-type: none"> ○ Bath Hotel which has been maintained, original bath house, thermal springs, newly constructed bath houses. • New River Estate, Nevis <ul style="list-style-type: none"> ○ Amerindian artefacts, springs, water wheel. • Fort Charles, Nevis <ul style="list-style-type: none"> ○ Stone walls, cistern and cannons. |
| Pressures and Threats | <ul style="list-style-type: none"> • Inappropriate Development; • Squatting; • Exceeding Carrying Capacity; • Property Theft and Destruction; • Littering; • Destructive Earthquake / Volcanic Eruption; • Hurricanes / Storm Surges and Flooding; • Deterioration of Structures; • Vandalism; • Abandonment of Buildings; • Fires; and • Traffic Congestion and Inadequate Parking. |
| Management Structure and Challenges | <ul style="list-style-type: none"> • There is no organized management structure for all sites. • There is some management under the Physical Planning department as part of the planning approvals process. • Some of the sites are loosely managed by the Nevis Historical and Conservation Society and the St. Christopher National Trust. • Some of the sites are also managed by various Government ministries such as the Ministry of Tourism and the Ministry of Agriculture. |

| ITEM | COMMENT |
|--|--|
| Management Structure and Challenges (Cont'd) | Management challenges include: <ul style="list-style-type: none"> • Difficulty in monitoring illegal activities such as the removal of facing stone and theft of artefacts and equipment; • Difficulty in managing the use of the resources. |

5.14 Summary

The following are the salient points that summarize the rationale for selecting individual units or representatives from groups of sites for the Protected Areas Systems Plan:

- The Brimstone Hill Fortress National Park is an important heritage site which must form a key element of the St. Kitts and Nevis Protected Area System Plan. In addition to its heritage significance, it also offers the opportunity to protect a small area of dry forest. Finally, the geologic significance of the site also makes it worthy of protection.
- The Central Forest Reserve National Park is a large and important ecological site which must form a key element of the St. Kitts and Nevis Protected Area System Plan. Its present functions of protecting biodiversity, watershed protection and supporting ecotourism and recreation will continue to be important into the future.
- The Nevis Peak National Park / Camps River Watershed is a large and important ecological site which must form a key element of the St. Kitts and Nevis Protected Area System Plan. Its present functions of protecting biodiversity, watershed protection and supporting ecotourism and recreation will continue to be important into the future.
- The proposed BVANP is a novel approach to protecting a very important ground water resource, increasing the resource endowment to the country's tourism industry, and showcasing native plants as a means of enhancing conservation awareness.
- Given the status of St. Kitts and Nevis as a Small Island Developing State (SIDS) in the Caribbean, it is expected that marine protected areas will form an integral and important part of the System of Protected Areas. The SEPMP, in particular, provides an opportunity to establish a protected area which spans the narrows and is harmonized between the two islands.

- Turtle nesting is important for the preservation of biodiversity and the propagation of endangered or threatened species of marine turtles. Sea Haven Beach is the most important turtle nesting beach in the Federation, and Keys Beach is the most important in St. Christopher. These and other turtle nesting beaches may be considered for inclusion in the Protected Areas System.
- Salt ponds are important to biodiversity, and (at minimum) a number of carefully-selected examples would form an important part of the Protected Areas Systems Plan.
- Freshwater Lagoons are important to biodiversity, and a few are also important sources of potable water. A number of carefully-selected examples would form an important part of the Protected Areas Systems Plan.
- Ghauts are recognized as areas of special concern in the NCEPA and NCEMA. They play a key role in effective drainage (and hence the prevention of localized flooding). They also serve as vegetated corridors and (when done legally) as a resource for construction sand. The System Plan must therefore address the type of protection that is to be afforded to these features.
- Dry Forest is a distinct forest type from tropical rain forest and therefore makes a different contribution to the overall biodiversity of the Federation. Consideration must therefore be given to protecting selected areas of dry forest within the overall Protected Areas System Plan.
- The historic core of Charlestown is an important resource that can be managed as part of the tourism thrust of the island of Nevis. It provides recreational, educational and cultural opportunities. The restoration of select buildings in the past and the inclusion of this initial list of buildings for preservation will ensure that this historic centre continues to contribute to the character of the town of Charlestown.
- Historical Sites are important to both citizens of St. Kitts and Nevis and the Tourist Industry. Such sites provide recreational, educational and cultural opportunities, and selected examples should therefore be included under the System Plan

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6 UNITS OF NATIONAL PROTECTED AREAS SYSTEM

The previous chapter provided a description of the present status of the ecological and historical / cultural base in St. Kitts and Nevis. This chapter will draw on that information to present a comparison of the individual units that are being proposed and finally propose the best representation of these assets to include in the Protected Areas System. Two systems of classification are used in this chapter:

- ▶ for sites where the objective is primarily nature and biodiversity conservation, the classification system developed by the International Union for the Conservation of Nature (IUCN), and
- ▶ for sites where the objective is primarily preservation of the historical cultural heritage, the classification system adopted by the Tourism Department is used.

6.1 Scope of Chapter

In this chapter, the focus will be on the groups of sites (identified in Chapter 5) which are not presently protected but are being considered for the Protected Areas System. These include:

- Marine Areas,
- Turtle Nesting Sites,
- Salt Ponds,
- Freshwater Lagoons,
- The Ghauts,
- Dry Forests, and
- Historic Sites.

In each case we compare the units on the basis of resources and assets and on the basis of pressures and threats. Each Section ends with our proposals for the Protected Areas System. The only exception to this approach is in areas where all the examples of a particular class of site are proposed for consideration. This will be highlighted in the appropriate section.

The following four sites are already established or are almost established and therefore will not be discussed here:

- Brimstone Hill Fortress National Park, which would be classified as Category 1 under the system used by the Tourism Department;
- Central Forest Reserve National Park, which would be classified as Category II under the IUCN system;
- Nevis Peak National Park and Camps River Watershed, which would be classified as Category II under the IUCN system; and
- Basseterre Valley Aquifer National Park, which would be classified as Category VI under the IUCN System.

In addition, there are sites that are recommended which are included in a previous document such as the respective island Physical Development Plans that form part of larger areas proposed for protection. Where this occurs, the individual units will be discussed but the level of protection will take into consideration the larger area.

6.2 Marine Areas

As noted in Section 5.6, there are two marine areas which are being considered for the National Protected Areas System as Marine Protected Areas (MPAs):

- The marine area surrounding the South East Peninsula, and
- Sandy Point Marine Area.

Additionally, there is a marine component of the Nevis Peak National Park that encompasses the marine area to the north of Nevis. The integration of this marine area with the boundary of the proposed MPA for the S. E. Peninsula will be discussed in Section 6.2.3.1.3.

6.2.1 Resources / Assets

6.2.1.1 South East Peninsula Marine Area

The S.E. Peninsula marine area contains a number of environmental assets including (see Figure 6-1):

- Fringing Coral Reefs,
- Rocky Shores,
- Lobster Spawning Grounds (in the Narrows between St. Kitts and Nevis),
- Turtle Nesting Beaches,
- Salt Ponds, and
- Mangrove Systems.

The following salt ponds present on the peninsula also support a variety of bird species and they are listed as Important Bird Areas (IBAs) by Birdlife International:

- Friar's Bay Pond,
- Great and Little Salt Ponds,
- Major's Bay Salt Pond,
- Mosquito Bay Salt Pond, and
- Frigate Bay Salt Pond.

Additionally, Booby Island, an uninhabited island located approximately 2 km to the south east of the peninsula is also an important habitat for a number of species (see Section G.5.3 in Appendix G). The marine area supports the productivity of local fisheries as well as providing foraging grounds and nesting sites for endangered marine turtles.

6.2.1.2 Sandy Point Marine Area

At Sandy Point the important environmental assets include the following:

- Coral reefs (fringing and deep), and
- Seagrass Beds.

The data on the resources at Sandy Point is very patchy but all indications are that the reef system at Sandy Point is fairly diverse and includes a mixture of stony and encrusting corals. The corals in the area are distributed into a main coral ridge approximately 3 hectares in extent with a number of patches of coral outcrops scattered throughout. Apart from the corals, the reef system also includes a diverse collection of sponges. This reef system supports small populations of coral reef fishes. The information provided by a study conducted in 1995 suggests that the diversity of reef fish is low and at that time the population was dominated by juvenile species.

However, it should also be noted that the Sandy Point area has supported the local fishery for many years. A more detailed inventory of the resources is needed at the site level to determine the nature and diversity of the marine resources in the area.

The seagrass beds in the Sandy Point area are situated between the coral reef and the shoreline and consist of a mixture of turtle grass (*Thalassia testudium*) and manatee grass (*Syringodium filiforme*).

There are also a couple of turtle nesting beaches in the vicinity of Sandy Point at:

- Belle Tete; and
- Just north of Charles Fort.

6.2.2 Pressures / Threats

6.2.2.1 South East Peninsula Marine Area

Development on the terrestrial portion of the Peninsula continues to impact on the marine environment. There are several construction projects that are either ongoing or have been earmarked that have the potential to impact the marine area (see Figure 6-2 for identified threats on the S. E. Peninsula). These include the following proposals:

- Single family residential use north, south and east of Great Salt Pond;
- Marinas at Whitehouse Bay, Cockleshell Bay, Mosquito Bay, Major's Bay and Little Salt Pond;
- Public recreation areas at South Friar's Bay;
- Public parking at sites on Friar's Bay Beach and Cockleshell beach;

- Inns at Friar's Bay;
- Hotels at Sand bank, Cockleshell, Banana and Major's Bay; and
- Ferry Terminal at Major's Bay.

Additionally, as noted in Section G.5.4, there are a number of existing activities that continue to impact on the marine area of the Peninsula and will continue to be a threat if left to continue.

These activities have led to direct impacts such as:

- Clearing of vegetation,
- Loss of habitat,
- Contamination of water quality,
- Adverse changes to surface hydrology,
- Loss of nursery areas, and
- Degradation of nearshore seagrass and coral reefs.

Apart from the impacts associated with development activity, there are also impacts associated with use of existing resources such as:

- Depletion of fish stock,
- Damage to reefs by indiscriminate diving,
- Damage to reefs and scarring of seagrass beds through the dropping of anchors, and
- Contamination of water quality through the release of bilge water from overnight boaters.

6.2.2.2 Sandy Point Marine Management Area

At Sandy Point, the assets have already shown signs of deterioration due to past extreme weather as well as from the anchoring of boats associated with either fishing or diving. The marine area at Sandy Point has been and continues to be a source of conflict between fishermen and dive operators. While no specific information on future development projects in the Sandy Point area was made available for inclusion in this study, it is anticipated that any such activity will result in the potential impacts discussed above for the S. E. Peninsula.

6.2.3 Suitability of Units

In this section, the suitability of each unit is discussed under the following headings:

- Status / Representiveness,
- Ecological Gap Analysis,
- Boundaries and Extent,
- Level of Protection, and
- Challenges to Protection.

6.2.3.1 S.E. Peninsula

This discussion recognises the opportunity to create a Unit which spans the narrows to include the north coast of Nevis, thus linking the Proposed South East Peninsula Marine Protected Area with the area of living coral now included in the Nevis Peak / Camps River system. It also recognises that different levels of protection would be appropriate at different locations within the wider area.

6.2.3.1.1 Status / Representiveness

It is recommended that the S. E. Peninsula marine area be established as a protected area and included in the National System of Protected Areas since it contains the following:

- ▶ Beaches where endangered turtles come up to nest such as North Friar's Bay Beach, Major's Bay, Banana Bay, Cockleshell Bay and Turtle Bay;
- ▶ Coralline, sandy beaches which are important for tourism occur at Friar's Bay, Canoe Bay, Turtle Bay, Sand Bank Bay, Mosquito Bay, Major's Bay, Cockleshell Bay and Banana Bay.
- ▶ The coral reefs and seagrass beds support productivity of many commercial species such as Conch, Spiny Lobster (*Panulirus argus*) and finfish, which are more abundant in the vicinity of the Southeast Peninsula than on any other coasts of St. Kitts.
- ▶ The Southeast Peninsula is known to be the single most important commercial fishing and recreational diving area within the nation (CCA, 1991).

- ▶ The majority of salt ponds on the island of St. Kitts are found on the S. E. Peninsula. These ponds support a number of internationally important species and are listed as an Important Bird Area by Birdlife International.
- ▶ The only nesting sites for the Least Terns (*Sterna antillarum*) on the island.
- ▶ Booby Island which is the only remaining breeding location for a number of species including: Red-billed Tropicbird (*Phaethon aethereus*), Laughing Gull (*Larus atricilla*), Roseate Tern (*Sterna dougalli*), Bridled Tern (*Sterna anaethetus*), Sooty Tern (*Sterna fuscata*), Brown Noddy (*Anous stolidus*). The island is also listed as an Important Bird Area by Birdlife International.

6.2.3.1.2 Ecological Gap Analysis

As noted in Appendix B, the output of the Ecological Gap Analysis (EGA) were two model runs that best met the targets proposed for inclusion in the Protected Areas System. Both runs recommend the majority of the S. E. Peninsula marine area for inclusion into a System of Protected Areas since the majority of targets are met in this area (see Figures 6-3 and 6-4). The exception to this is the exclusion of Nag's Head and the nearshore marine area surrounding the headland in Run A. However, this area should be included since Nag's Head is an important nesting areas for a number of species. Another key output of the EGA was the importance placed on the lobster spawning area referred to locally as "the narrows". This area bridges the two islands and the importance of this area to the local fisheries is significant enough to justify its inclusion into any Marine Protected Area being considered for the peninsula.

6.2.3.1.3 Boundaries and Extent

Figure 6-5 shows the proposed boundaries of the Marine Management Area proposed for the S. E. Peninsula and extending across The Narrows (hereinafter loosely termed South East Peninsula and The Narrows Marine Management Area – SEPNMMA). These boundaries were drawn based on the combination of the results of the EGA and the proposed boundaries from past studies. It should be noted that the southern limit of the MMA is the northern coastline of Nevis, a part of which is delimited as the marine component of the Nevis Peak National Park. Given the nature of marine areas, there is no need for a buffer zone around the entire area. Instead buffering of the entire system will be achieved through the management of adjoining coastal areas through the approval and control of development via the planning approval process. Additionally, in

the case of the S.E. Peninsula, the associated salt ponds and mangroves which are considered transition zones and are proposed for inclusion in the SEPNMMPA will form their own buffer for the marine environment. It should be noted though that these systems of themselves are vulnerable to adverse impacts and should be buffered where land space is so available.

Within the SEPNMMA different levels of protection will be recommended (see Section 6.2.3.1.4) below. When these areas are so designed, some measure of a buffer will need to be considered especially where “use” areas abut areas recommended for strict protection.

6.2.3.1.4 Level of Protection

Based on the IUCN’s listing of protected areas categories, the overall level of protection recommended for the SEPNMMA is Category VI which refers to a Managed Resource Protected Area. In accordance with the definition of a Category VI system, the SEPNMMA should be managed for sustainable use of its natural ecosystems which includes those listed in Section G.5.3 in Appendix G.

Within this overall classification, it is envisaged that there will be a number of “management use” zones such as fishing, recreation, areas of strict protection, etc. While an exact definition of each of these management uses is outside the scope of this System Plan Report (since it will require more detailed study), the following general comments give an appreciation of what is to be established:

- Booby Island and Nag’s Head would be managed as Category Ia areas under the IUCN system, since they have been identified as being critical to bird nesting and should be strictly protected.
- The 6 turtle nesting sites located within the S. E. Peninsula as well as the major turtle nesting site at Sea Haven in Nevis would be managed as Category IV areas under the IUCN system, since they are nesting areas for endangered species and therefore require special protection. Specifically, there is the need for better enforcement of the regulations of 1995 that relate to turtles and prohibits harvesting of turtles including eggs during the period February to October.

- A suitable area may be defined for the protection of lobsters (and other economically important marine species) during the spawning season, and this would be managed as a Category IV area under the IUCN System. The management of this area may include the declaration of an off-season for the catching and sale of lobsters (for example). Such sites, as recommended in the National Physical Development Plan, 2006 includes Cockleshell Bay, Banana Bay, Mosquito bay and Major's Bay.
- Outside of the marine reserves (as described above), there is a recommendation in the National Physical Development Plan for designating Fish Priority Areas or managed resources protected areas which are Category VI sites under the IUCN classification system.
- The Salt Ponds on the peninsula would be managed as Category IV sites under the IUCN system. These are important to the biodiversity of the Federation, and require protection from development activities, in particular.
- Finally, the National Physical Development Plan also refers to areas for snorkelling and diving (an existing important use of the marine areas surrounding the S. E. Peninsula) as category V sites under the IUCN classification System.

6.2.3.1.5 Challenges to Protection

During discussions with the Physical Planning and Environment Department, it has been suggested that only the marine component of the S. E. Peninsula be considered for inclusion in the Systems Plan since the majority of land is privately owned (see Figure 6-6 and Section G.5.2 in Appendix G). However, it is difficult to protect the marine component in isolation of the many areas of connectivity to the terrestrial side such as at the salt ponds, the beaches and the mangroves. It is therefore recommended that the area to be included should also contain these assets.

6.2.3.2 Sandy Point Marine Management Area

This discussion of the proposed Sandy Point Marine Management Area (SPMMA) recognises the opportunity to create a unit that will serve the purpose of protecting the natural resources of the area as well as supporting the sustainable use of these resources by the many stakeholders.

6.2.3.2.1 Status / Representiveness

It is recommended that the Sandy Point marine area be established as a protected area and included in the National System of Protected Areas since it contains the following (see Figure 6-7):

- Beaches where endangered turtles come up to nest such as at Fig Tree and just north of Fort Charles.
- Extensive coral reefs (fringing and offshore) and seagrass beds which are already showing signs of damage.
- Fisheries resources that support the fishing industry which is the main income generator for the town of Sandy Point.
- The reefs which also support dive tourism.

6.2.3.2.2 Ecological Gap Analysis

Both runs of the EGA also proposed the Sandy Point marine area for inclusion in the System of Protected Areas (see Figures 6-8 and 6-9). Run B seen in Figure 6-9 shows only the northern section of the Sandy Point / Pump Bay area as suitable for inclusion into the Protected Areas System. Due to the lack of reliable information on the extent of the offshore reef, the EGA did not include the offshore reef, instead, only the fringing reef and the associated seagrass beds are included. Notwithstanding this, Ecoengineering recommends that this offshore reef be included in this proposed Marine Protected Area.

6.2.3.2.3 Boundaries and Extent

The proposed Sandy Point Marine Management Area will extend for approximately 5 km from Brimstone Hill in the south to Belle Tete in the north (see Figure 6-10). These boundaries comply with those proposed in the St. Christopher National Physical Development Plan for the Sandy Point Marine Management Area.

Given the nature of marine areas, there is no need for a buffer zone around the entire area. Instead buffering of the entire system will be achieved through the management of adjoining coastal areas through the approval and control of development via the planning approval process.

Within the SPMMA different levels of protection will be recommended (see Section 6.2.3.24) below. When these areas are so designed, some measure of a buffer will need to be considered especially where “use” areas abut areas recommended for strict protection.

6.2.3.2.4 Level of Protection

As with the SEPMMMA, the proposed SPMMA would accommodate a mixture of uses under a common management plan. The literature suggests the establishment of fish priority areas and marine reserves in accordance with the Fisheries Act. Given the significance of this marine area to the socio-economic livelihood of the nearby town it is unrealistic to manage the area for strict protection. Instead, it is envisaged that this marine protected area would include:

- Fish stock propagation areas classified as Category IV under the IUCN system. Fishing would be prohibited or seasonally restricted in those areas.
- Turtle nesting beaches as described above in Section 6.2.3.2.1. These would be classified as Category IV under the IUCN system.
- Tourism and recreation areas for snorkelling, diving, etc. These would be classified as Category V under the IUCN system.
- Fishing areas classified as Category VI under the IUCN system. Fishing areas may be further subdivided into areas for artisanal fishing and areas for sport fishing, if it is necessary to avoid conflict and preserve the rights of stakeholders.

It is critical that these areas / zones should be established only after meaningful consultation with all stakeholders.

6.2.3.2.5 Challenges to Protection

There have been a number of conflicts in the Sandy Point area between users of the resources for subsistence i.e. the fishermen and users of the resource for recreation, i.e. the dive operators. Any further work to be conducted for establishing the MMA at Sandy Point must be done in consultation with all stakeholders to ensure that no group is excluded. One of the most important lessons learnt in establishing protected areas throughout the region and elsewhere is the need to have “buy-in” from the local communities.

6.2.4 Proposals

In summary, three marine areas have been identified for protection:

- areas adjacent to the Southwest Peninsula,
- an area on the North East Coast of Nevis, and
- the Sandy Point Area.

The first two areas will be included in the proposed South East Peninsula and the Narrows Marine Management Area (SEPMMMA), while Sandy Point would be a separate Marine Management Area (SPMMA). In both cases, the proposed management areas will involve management for a variety of uses, ranging from strict conservation to recreational use and fishing.

6.3 Turtle Nesting Sites

As noted in Section 4.3.4, there are many turtle nesting sites throughout St. Kitts and Nevis. This section will focus on the two most important sites being considered for inclusion into the Protected Areas System Plan:

- Keys Turtle Nesting Beach (St. Kitts), and
- Sea Haven Turtle Nesting Beach (Nevis).

Sea Haven is included in the proposed SEPNMMA. Other turtle nesting beaches (North Frigate Bay, Frigate Bay, South Friar's Bay, Sand Bank Bay, Mosquito Bay, Cockleshell, Banana Bay and Major's Bay) are included within the proposed SEPNMMA (see Section 6.2.1.1), and yet others (Belle Tete and north of Charles Fort) within the SPMMA (see Section 6.2.1.2).

6.3.1 Resources / Assets

6.3.1.1 Keys Turtle Nesting Beach

The Cayon to Keys stretch of beach is approximately 4 km long and is the most important site for the nesting of leatherback turtles (*Dermochelys coriacea*). Monitoring on Keys Beach began in 2003 with the establishment of the St. Kitts Sea Turtle Monitoring Network as part of the Sea Turtle Recovery Action Plan for St. Kitts and Nevis. The main assets / resources on this beach and the surrounding area include (see Figure 6-11):

- Suitable beach characteristics for nesting;
- Fringing Coral Reefs; and
- Seagrass Beds.

As noted in Section G.6.3, the suitability of a beach for turtle nesting is related to its profile, condition, vegetation, sand stability and human factors. In the case of the leatherback turtles they prefer deep, unobstructed underwater access and a relatively steep beach profile.

No specific information was available on the status of the coral reefs and seagrass beds in this area. This is one area where more research needs to be conducted but this would be part of the site specific studies to be undertaken during the implementation of the National Systems Plan.

6.3.1.2 Sea Haven Turtle Nesting Beach

The Sea Haven Beach is a 1.2 km long stretch of beach located just west of the airport on the north of the island of Nevis. Monitoring on Sea Haven (also called Lovers Beach) Beach began in 2002 with the establishment of the Nevis Turtle Group. The main assets / resources on this beach and the surrounding area include:

- Suitable beach characteristics for nesting;
- Fringing Coral Reefs;
- Seagrass Beds; and
- Lobster spawning grounds.

As noted in Section G.6.3, the suitability of a beach for turtle nesting is related to its profile, condition, vegetation, sand stability and human factors. Three species of marine turtles nest at this beach: leatherback, hawksbill and green. In the past 3-5 years 80 hawksbill, 4 green and 6 leatherback turtles have been tagged although it is estimated that approximately 200 turtles have nested on the beach during this period.

Again, no specific information was available on the status of the coral reefs and seagrass beds in this area. This is again an area where more research needs to be conducted but this would be part of the site specific studies to be undertaken during the implementation of the National Systems Plan.

6.3.2 Pressures and Threats

6.3.2.1 Keys Turtle Nesting Beach

The turtles that nest on Keys Beach are listed as internationally endangered species and are very sensitive to activities that impact either their nesting beaches or their foraging or feeding habitats. The following activities are either ongoing or are proposed for the Keys Beach:

- Horseback Riding,
- Sand Mining,
- Removal of Beach Vegetation,
- Driving on Beach,
- Camp Fires,
- Dumping of garbage such as plastics; and
- Poaching.

These activities have led to direct impacts such as:

- Crushed eggs and hatchlings;
- Loss of habitat;
- Increased erosion and creation of dangerous pits which females and hatchlings fall into, become trapped, and perish;
- Compact sand, crushed eggs and creation of deep tracks that hatchlings cannot escape. Additionally, sand compaction causes decreased oxygen circulation and can suffocate developing embryos.
- Photo-pollution which can mislead hatchlings and adult females, causing them to wander around aimlessly on land and away from the ocean.
- Depletion of adult stock and loss of recruitment into adult population.

6.3.2.2 Sea Haven Turtle Nesting Beach

The beach is an important nesting area mainly for the hawksbill turtle with some nesting of leatherback turtles. The following activities are either ongoing or proposed for the Sea Haven Beach area:

- Construction of a Marina;
- Sand Mining;
- Removal of Beach Vegetation;
- Driving on Beach;
- Camp Fires; and
- Poaching.

The direct impacts as a result of these activities are the same as those discussed above in Section G.6.4.

6.3.3 Suitability of Site

In this section, the suitability of each unit is discussed under the following headings:

- Status / Representiveness,
- Ecological Gap Analysis,
- Boundaries and Extent,
- Level of Protection, and
- Challenges to Inclusion.

6.3.3.1 Keys Turtle Nesting Beach

6.3.3.1.1 Status / Representiveness

It is recommended that the Keys Turtle Nesting Beach be established as a protected area and included in the National System of Protected Areas for the following reasons (see Figure 6-11):

- It is a preferred nesting beach for the internationally endangered leatherback turtles;
- It is the index beach for monitoring leatherback turtles on the island;
- It is the subject of intensive monitoring and tagging of turtles since the formation of the St. Kitts Sea Turtle Monitoring Network.
- It is a nesting site for the Least Tern (*Sterna antillarum*).
- There are suitable foraging grounds in the form of coral reefs and seagrass beds offshore.

6.3.3.1.2 Ecological Gap Analysis

Both model runs that were chosen as those that best met the targets proposed for inclusion in the Protected Areas System included parts of the Keys Beach (see Figures 6-12 and 6-13). The target for turtle nesting beaches was just 60% and this was met by other nesting sites. It is however, recommended that the entire length of the Keys to

Cayon stretch of beach be protected. While no detailed information on the use of the coral and seagrass habitats located offshore is available, it is also recommended that these habitats being included for protection given the importance of protecting foraging grounds as well as nesting sites.

6.3.3.1.3 Boundaries and Extent

Figure 6-14 shows the proposed boundaries of the Keys Turtle Nesting Beach Protected Area. These boundaries are drawn based on the results of the EGA. It is recommended that a 30 m vegetated buffer be created adjacent to the actual beach area. Within this area it is expected that no development will take place. This buffer will be sufficient to ensure that activities of humans such as lighting and noise will be a sufficient distance away so as to have little impact on the nesting turtles or the hatchlings.

6.3.3.1.4 Challenges to Protection

One of the main challenges to protection of the Keys Turtle Nesting Beach is the cultural significance associated with the harvesting of turtles and the consumption of the meat and eggs. Although communication with members of the St. Kitts Sea Turtle Monitoring Network has revealed that the poaching of turtles at Keys and other beaches has been reduced, there is still evidence that it is ongoing. With the numbers of these internationally endangered species reducing, even a small amount of poaching is unacceptable.

Another challenge to protection is the use of the northern section of the Keys Beach for sand mining. The need for more aggregate and sand is only expected to increase with the increase in construction associated in part with the tourism sector. If alternative sources of sand are not found or the existing sources are not managed sustainably then there is little incentive to stop sand mining.

A third challenge is the use of the beach for horseback riding. This problem may only be solved when the beach is afforded protection under the National Protected Areas System Plan. At that time there may be resources available to ensure that continued use of the beach for horseback riding is stopped. It is also important to engage in dialogue with nearby communities and businesses to inform them of the harm their activities will have on these endangered species.

The final challenge is the enforcement of the existing regulations regarding turtles and their nesting beach which are highlighted in the Fisheries Act as well as in the National Conservation and Environmental Protection Act or the newly drafted National Conservation and Environmental management Bill (2009). In addition, it is recommended that the regulations related to the closed season for harvesting of turtles and their eggs be strengthened to recommend a moratorium on turtle harvesting.

6.3.3.2 Sea Haven Turtle Nesting Beach

6.3.3.2.1 Status / Representiveness

It is recommended that the Sea Haven Turtle Nesting Beach be established as a protected area and included in the National System of Protected Areas for the following reasons (see Figure 6-15):

- It is a preferred nesting beach for three internationally endangered marine turtles: Hawksbill, Green and Leatherbacks;
- It is the index beach for monitoring leatherback turtles on the island;
- It is the subject of intensive monitoring and tagging of turtles since the formation of the Nevis Turtle Group.
- There are suitable foraging grounds in the form of coral reefs and seagrass beds offshore.

6.3.3.2.2 Ecological Gap Analysis

Of the two best model runs obtained from the EGA, only Run A included the Sea Haven Turtle Nesting Beach as suitable for inclusion in the Protected Areas System (see Figures 6-16 and 6-17). Run B included only the western portion of the beach area. Both runs included the marine area associated with the beach, although this may be due to the importance of the “Narrows” as lobster spawning grounds and therefore this inclusion is associated with another target.

6.3.3.2.3 *Boundaries and Extent*

Figure 6-5 shows the proposed boundaries of the proposed Sea Haven Turtle Nesting Beach Protected Area. What should be noted here is that the marine area offshore this beach which is also recommended for inclusion in this protected area has already been included in the MPA associated with the S. E. Peninsula. It is recommended that a 30 m buffer be created adjacent to the actual beach area. Within this area it is expected that no development will take place. This buffer will be sufficient to ensure that activities of humans such as lighting and noise will be a sufficient distance away so as to have little impact on the nesting turtles or the hatchlings.

6.3.3.2.4 *Challenges to Protection*

One of the main challenges to protection of this very valuable turtle nesting beach is lack of political will. One of the outputs of the RAPPAM workshop for the island of Nevis was the apparent inability of regulators to enforce laws in the face of political pressure. Discussions with representatives of the Planning Department revealed that there were a few instances where the Planning Department may have decided against a particular development and have that decision overturned. For example, there is a proposal for a marina at this site that is being received favourably by some Government representatives even though such a development will result in the loss of the beach for turtles. If any of the protected areas being proposed in this report are to become more than “paper parks” there has to be “buy-in” by all sectors of Government.

Another challenge to protection of this beach is the support of the nearby local community. One of the main threats to the turtles that use this beach is poaching by villagers. There has to be a comprehensive educational campaign that would target the local community to show the adverse impacts of continued poaching of the turtles. One of the key factors is the fact that this poaching is seen as part of the culture of the area especially since poachers associate the activity with an almost spiritual feeling (looking for signs in the sky etc.).

6.3.4 Level of Protection

As noted in Sections 6.2.3.1.4 and 6.2.3.2.4, Turtle Nesting Beaches would be classified as Category IV sites under the IUCN system, because they are nesting areas for rare or endangered species. Therefore, they would be protected to ensure the maintenance of habitats for the requirements of the specific species (marine turtles) that use these areas.

6.3.5 Proposals

In summary, it is proposed that the following turtle nesting beaches be protected under the Protected Areas System Plan:

- Keys Beach in St. Kitts,
- Beaches on the South East Peninsula in St. Kitts,
- Beaches close to Sandy Point in St. Kitts, and
- Sea Haven in Nevis.

6.4 Salt Ponds

The salt ponds described in this section are all found on St. Kitts (see Figure 6-18):

- Greatheeds Pond,
- Muddy Point Salt Pond,
- Half Moon Bay Salt Pond,
- Frigate Bay Salt Pond,
- Friar's Bay Salt Pond,
- Great Salt Pond,
- Little Salt Pond
- Mosquito Bay Salt Pond,
- Cockleshell Bay Salt Pond, and
- Major's Bay Salt Pond.

In considering ponds for protection, cognisance was taken of planning permission that has already been granted for development on the South East Peninsula. Specifically, information has been received about permission or permission in principle for the following developments of salt ponds on the peninsula:

- A marina at Little Salt Pond dredged and opened to the sea.
- A residential development on Great Salt Pond which is connected to Little Salt Pond.
- A high-end waterfront hotel, restaurant, villas, etc at Majors Pond.
- A marina and high-end villa development at Cockleshell Bay which impacts both Cockleshell Bay and Mosquito Bay Salt Ponds.

Based on the grant of permission for these developments, Ecoengineering considered it impractical to recommend these particular ponds for protection. Simply put, the revoking of planning permission could make the Government of St. Kitts and Nevis liable to pay compensation for loss of anticipated earnings, which in these cases would involve very large sums of money. The discussion in the remainder of this section therefore excludes these ponds.

The following sections provide some additional information on these ponds (where available).

6.4.1 Resources and Assets

Figure 6-19 shows the resources and assets associated with the salt ponds.

6.4.1.1 Greatheeds Pond

Greatheeds pond was originally a fresh water pond which is now brackish due to extensive disturbance in the past. The pond and surrounding area supports the following resources / assets:

- Remnant coastal scrubland including species such as Acacia (*Acacia sp.*), Loblolly (*Pisconia fragrans*), Torchwood (*Amyris balsamifera*) and Wild Tamarind (*Leucaena leucocephala*);
- Coastal species such as Sea Grape (*Coccoloba uvifera*) and Manchineel (*Hippomane mancinella*);

- Habitat for avian species such as Common Stilt (*Himantopus mexicanus*), Lesser Yellow Legs (*T. flavipes*) and West Indian Tree Duck (*Dendrocygna arborea*);
- Habitat for terrestrial avian species such as Turtle Dove and Cattle Egret (*Bubulcus ibis*);
- Habitat for other fauna such as Fiddler crabs (*Uca sp.*), Mongoose (*Herpestes auropunctatus*) and Tree Lizards.

6.4.1.2 Muddy Point Salt Pond

Muddy Point Salt Pond and surrounding area supports the following resources / assets:

- Habitat for avian species such as Great Blue Heron (*Ardea herodias*), Grey Heron (*A. cinerea*), Belted Kingfisher (*Ceryle alcyon*), Yellow Billed Cuckoo (*Coccyzus americanus*), Mangrove Cuckoo (*Coccyzus minor*), Killdeer (*Charadrius vociferus*), American Golden Plover (*Pluvialis dominica*), Pacific Golden Plover (*Pluvialis fulva*);
- Small stand of mangrove trees.

6.4.1.3 Half Moon Bay Salt Pond

Half Moon Bay Salt Pond and surrounding area supports the following resources / assets:

- Fringing mangrove habitat,
- Associated avifauna species such as Baird's Sandpiper (*Calidris bairdii*), Willet (*Catoptrophorus semipalmatus*), Northern Waterthrush (*Seiurus noveboracensis*), Louisiana Water Thrush (*Seiurus motacilla*), Black-bellied Plover (*Pluvialis squatarola*), Veery Semi-Palmated Plover (*Charadrius semipalmatus*), Wilson's Plover (*Charadrius wilsonia*), and
- Unique fauna such as brine shrimp.

The mangrove at Half Moon Pond is dominated by black mangrove trees. During the site reconnaissance conducted in June, this vegetation was fairly dense and healthy. This mangrove system supports a healthy diversity of bird species and this pond is also listed as an important bird area.

During the site visit this pond was physically divided into discrete coves and we were told that there was once cultivation of brine shrimp practiced. Our understanding is that this is no longer practised although the team did see brine shrimp in a number of the coves.

6.4.1.4 Frigate Bay Salt Pond

The important environmental assets associated with this salt pond are:

- Fringing mangrove habitat,
- Associated avifauna species, and
- Unique fauna such as brine shrimp.

Fringing mangroves can be found at almost all the salt ponds including the Frigate Bay Salt Pond. However, the mangrove at this pond is not extensive and there is evidence of pruning. The pond does support a number of bird species and it is listed as an Important Bird Area due to the breeding of three species:

- Least Tern (*Sterna antillarum*),
- Brown Pelican (*Pelecanus occidentalis*), and
- Roseate Tern (*S. dougalli*).

Other avian species seen at this salt pond are:

- Eight species of Herons and Egrets;
- Common Moorhens (*Gallinula chloropus*);
- Blue-winged Teal (*Anas discors*);
- Black-necked stilt (*Himantopus mexicanus*);
- Stilt Sandpipers (*Calidris himantopus*);
- Soras (*Porzana Carolina*);
- Clapper Rail (*Rallus longirostris*); and
- Tricoloured Heron (*Egretta tricolor*).

Apart from the birds, salt ponds, due to the level of salinity (especially in the dry season) also support a specialized fauna and microfauna.

6.4.1.5 Friar's Bay Salt Pond

Friar's Bay Salt Pond and associated vegetation support the following resources / assets:

- Dense mangrove habitat (black, red and white) supporting terrestrial avian species such as Yellow Warblers (*Dendroica petechia*), Northern Water Thrush (*Seiurus noveboracensis*) and Mangrove Cuckoo (*Coccyzus minor*);
- Associated avifauna species such as Common Moorhens (*Gallinula chloropus*), Blue-winged Teal (*Anas discors*), Clapper Rails (*Rallus longirostris*), White-cheeked Pintail (*A. bahamensis*), and
- Unique fauna.

6.4.2 Pressures and Threats

Figure 6-20 shows some of the pressures and threats associated with the salt ponds.

6.4.2.1 Greatheeds Pond

This pond is arguably the most disturbed of all the ponds under discussion. To the west of the pond is a quarry with an associated block factory. There is also encroachment of the pond margins by low and medium density housing. To the south of the pond is the existing landfill that has also started to encroach upon the pond margins. Other developments that have been established close to the pond include garages and a car wash. There is also some small scale agriculture and (in the past) the area has been used as a firing range. Finally, the Agriculture Department used oil on the margins of the pond for mosquito control.

6.4.2.2 Muddy Point Salt Pond

This pond is under threat from one main source: an existing golf course. The site visit conducted in June 2009 showed that the pond is under stress from run-off from the golf course.

6.4.2.3 Half Moon Bay Salt Pond

This salt pond is under threat through two activities:

- Past use of the pond for cultivation of brine shrimp; and
- Sand mining

During the site visit in June 2009, the pond was divided into discrete coves and shrimp was still observed in the pond. The extent to which the natural hydrology of the pond has been affected by this activity is unknown but it is certainly disturbed. Sand mining was also observed during this site visit. The mining of sand off the dunes between the pond and the sea could result in the opening up of the pond to salt water intrusion thus again altering the natural hydrological cycle of the pond.

6.4.2.4 Frigate Bay Salt Pond

The Frigate Bay Salt Pond is located in the middle of the tourism area of the island. It is therefore under threat from increased construction / establishment of hotels, golf courses and restaurants.

6.4.2.5 Friar's Bay Salt Pond

Friar's Bay is also an area earmarked for increased tourism development. It is therefore under threat from increased construction / establishment of hotels etc. The area has also been used in the past for military manoeuvres.

6.4.3 Suitability

The suitability of the salt ponds for inclusion into the System of Protected areas will be discussed under the following headings:

- Status / Representiveness;
- Ecological Gap Analysis,
- Boundaries and Extent,
- Levels of Protection,
- Challenges to Protection.

6.4.3.1 Greatheeds Pond

6.4.3.1.1 Status and Representativeness

The Greatheeds pond is a highly disturbed system which has deteriorated to the extent that its main characteristics have changed. However, as noted in Section 6.4.1.1 the following assets are recommended for protection:

- It is surrounded by the remnants of coastal scrub vegetation which supports some terrestrial avifaunal species;
- The pond which is now brackish supports a low diversity and abundance of shorebirds;

6.4.3.1.2 Ecological Gap Analysis

Neither of the best model runs recommended the protection of the Greatheeds Pond within the System of Protected Areas (see Figures 6-21 and 6-22). The percentage target for salt ponds was only 50% which was met by including other systems.

6.4.3.1.3 Boundaries and Extent

The pond and associated habitat is approximately 320 acres in extent. Figure 6-23 shows the proposed boundaries of the Greatheeds Pond Protected Area. This was determined based on the results of the EGA as well as past biodiversity and ecology studies on the pond and environs.

6.4.3.1.4 Challenges to Protection

The main challenge to protection of this system is the fact that the pond is almost entirely surrounded by developments that are having a negative impact on it. The fact that these developments have been allowed to continue to discharge directly into the pond greatly affects the level of protection that can be provided for this system.

However, as discussed above in Section 6.4.1.1, there is still some value to protection of this system.

6.4.3.2 Muddy Point Salt Pond

6.4.3.2.1 *Status and Representiveness*

The Muddy Point Salt Pond is a highly disturbed system which has deteriorated to the extent that its main characteristics have changed. However, as noted in Section 6.4.1.2 the following assets are recommended for protection:

- The salt pond supports a fair diversity of shorebird and wetland species;
- There is a small stand of mangrove.

6.4.3.2.2 *Ecological Gap Analysis*

Neither of the best model runs recommended the protection of Muddy Pond within the System of Protected Areas (see Figures 5-21 and 5-22). The percentage target for salt ponds was only 50% which was met by including other systems.

6.4.3.2.3 *Boundaries and Extent*

The pond and associated habitat is approximately 2 acres in extent. Figure 6-24 shows the proposed boundaries of the Muddy Point Salt Pond Protected Area. This was determined based on the results of the EGA as well as past biodiversity and ecology studies on the pond and environs.

6.4.3.2.4 *Challenges to Protection*

The main challenge to protection of this system is the fact that the pond is almost entirely surrounded by a golf course which is having a negative impact on it. The fact that this development has been allowed to continue to discharge directly into the pond greatly affects the level of protection that can be provided for this system.

However, as discussed above in Sections 6.4.1.2 and 6.4.3.2.1, there is still some value to protection of this system.

6.4.3.3 Half Moon Pond

6.4.3.3.1 Status / Representiveness

It is recommended that the Half Moon Bay Salt Pond be established as a protected area and included in the National System of Protected Areas since it contains the following:

- A healthy Mangrove System which is a depleted resource on the island;
- Abundant birdlife (Important Bird Area);

This pond is also one of the few remaining ponds that has not been irreparably damaged by existing development.

6.4.3.3.2 Ecological Gap Analysis

Both of the two model runs which provided the best outputs of the Marxan model included parts of Half Moon Salt Pond as recommended protected areas. Although the salt ponds were listed as a target for the model, the required goal was only 50% and this goal was met by other ponds on the island.

6.4.3.3.3 Boundaries and Extent

Figure 6-25 shows the proposed boundaries of the Half Moon Salt Pond Protected Area. A buffer of 30 m is recommended for this system. This buffer is constrained by the existing roads and the golf course.

6.4.3.3.4 Challenges to Protection

One of the main challenges to including the Half Moon Bay Salt Pond into the System of Protected Areas is the uncertainty of land tenure associated with salt ponds in St. Kitts. This is a concern since the majority of land in the area is private.

6.4.3.4 Salt Ponds of the S. E. Peninsula

The remaining salt ponds are located within the S.E. Peninsula and are therefore included in the SEPNMMA (see Section 6.2.1.1). These are:

- Frigate Bay Salt Pond;
- Friar's Bay Salt Pond;
- Great Salt Pond;
- Little Salt Pond;
- Mosquito Bay Salt Pond;
- Cockleshell Bay Salt Pond; and
- Major's Bay Salt Pond.

6.4.4 Level of Protection

Apart from the salt ponds which have been excluded from this discussion (Little Salt Pond, Great Salt Pond, Major's Bay Salt Pond, Mosquito Bay Salt Pond and Cockleshell Bay Salt Pond), two separate levels of protection are recommended for the Salt Ponds on St. Kitts. For those ponds which are still in relatively good condition and can be maintained as salt ponds, we recommend that they be classified as IV under the ICUN system. That is, areas of land and or/sea which is subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species. The objective here would be to preserve these ponds as salt ponds, with the attendant contribution to biodiversity due to the visiting bird life and the seasonal hypersaline conditions. Three of these ponds have been selected for rehabilitation for ecotourism and educational purposes (Frigate Bay Salt Pond, Friar's Bay Salt Pond and Half Moon Pond).

The second level of protection would apply to those ponds which have been altered significantly to the extent that it would be impractical to return them to nearly their original condition as salt ponds. Specifically, these would be Greatheeds Pond and Muddy Salt Pond. In these cases, it is recommended that the ponds should be preserved mainly as sediment sinks and bird roosting areas. Planning permission should not be given to fill in these ponds or to open them out to the sea, but beyond this there would be no additional conservation activity.

6.4.5 Proposal

In summary, three salt ponds are proposed for enhancement and rehabilitation for ecotourism and educational purposes under the Protected Areas System:

- Frigate Bay Salt Pond;
- Friar's Bay Salt Pond; and
- Half Moon Bay Salt Pond.

Of these three systems, Frigate Bay Salt Pond and Friar's Bay Salt Pond have been included in the S. E. Peninsula and the Narrows Marine Management Area (SEPNMMA).

Finally, it is considered to be impractical to return two ponds to nearly their original condition as salt ponds:

- Greatheeds Pond, and
- Muddy Point Salt Pond.

It is therefore recommended that these ponds should be preserved mainly as sediment sinks and bird roosting areas. Planning permission should not be given to fill in these ponds or to open them out to the sea and this should be strictly enforced, but beyond this there would be no additional conservation activity.

6.5 Freshwater Lagoons

There are a number of freshwater lagoons on Nevis. Of these only the following are being recommended for inclusion into the National System of Protected Areas:

- Bath Bogs;
- Nelson Springs;
- Jessup's Pond,
- New River Spring;
- Pinney's Pond; and
- Parris Pond.

6.5.1 Resources / Assets

6.5.1.1 Bath Bogs Protected Area

The Bath Bogs is part of a larger area being considered for protection which includes the Bath Hotel and the Bath Stream. The Bath Bogs contains the following environmental assets (see Figure 6-26):

- Wetland habitat at the mouth of the Bath Stream;
- Small White Mangrove Belt;
- Habitat for a number of avian species.

The area is known as the largest wetland area on the island of Nevis. Bath Bog itself is separated from the sea by Gallows Bay Beach. There are various vegetation zones described in the area. At the centre of the area, there is a wet, boggy zone which has very poor drainage and fluctuating water levels. The dominant vegetation is Sourgrass (*Paspalum conjugatum*) with the occasional White Mangrove (*Laguncularia racemosa*). This zone is an important feeding spot for marsh birds such as herons and egrets.

West of the boggy zone, parallel to the coastline is the dune area. Dune vegetation helps to hold the sand and soil in place against erosion by rain and waves, therefore protecting the bog from heavy surf and sea blast. The dominant vegetation are Coconut (*Cocos nucifera*), Manchineel (*Hippomane mancinella*) and Acacia (*Acacia spp.*) in the overstory and Sourgrass (*Paspalum conjugatum*) and Beach Morning Glory (*Ipomoea pes-caprae*) in the understory.

Further east and south of the boggy zone are the drier zones. In these zones, the soil is a dry, hard-packed, light-coloured clay. These zones are dominated by Coconut (*Cocos nucifera*), Manchineel (*Hippomane mancinella*), Acacia (*Acacia spp.*), Wild Tamarind (*Leucaena leucocephala*) and Clammy Cherry (*Cordia collococca*) (Rodrigues, 1990).

The Bath Stream runs along the southern segment of the area. On either sides of this stream, there exists a small White Mangrove Belt. This mangrove system provides a good cover for wildlife and protects the stream from erosion. Cattle egrets (*Bubulcus ibis*) are known to roost and nest in the mangroves at the mouth of the stream.

Finally, south of the Bath Bog area, there is a dry zone flora which is dominated by Mexican Creeper (*Antigonon leptopus*), Acacia (*Acacia sp.*), Wild Physic nut (*Jatropha curcas*) and grasses such as Sourgrass, Purpletop (*Chloris inflata*) and Running Grass (*Digitaria sanguinalis*). This area is used as pasture land for goats and sheep.

6.5.1.2 Nelson Springs

Nelson spring is part of a larger area being considered for protection which includes, Parris Pond, Pinney's Pond and Jessup's Pond. Nelson Spring contains the following environmental assets:

- Marshland habitat;
- Habitat for a number of avian species;
- Adequate fresh water resources for supply to nearby communities.

During the site visit conducted in June, the marshland habitat showed no signs of degradation. As noted in Section 5.8.3, the spring is also used to provide water to the nearby parish of St. Thomas Lowland.

6.5.1.3 Jessup's Pond

Jessup's Pond is also part of a larger area being considered for protection which includes, Parris Pond, Pinney's Pond and Nelson Spring. Jessup's Pond contains the following environmental assets:

- Marshland habitat;
- Habitat for a number of avian species.

As noted in Section G.8.3, the spring is also used to provide water to the nearby parish of St. Thomas Lowland.

6.5.1.4 New River Estate and Springs

These springs are part of an estate that contained a number of key assets to be preserved including:

- Amerindian Artefacts;
- Spring;

- Frenchman's Cave;
- Devil's Copper.

During the site visit in June, the project team were able to visit a part of the site that included the hiking trail which was apparently frequently used by hikers. The trail was not well maintained and showed signs of frequent use. At the sides of the trail, railing had been constructed to assist hikers along steep stretches of the trail. These railings were in poor condition and in some instances posed a hazard since where it existed, the weakness of the structure could give-way and result in injury to hikers.

The spring was also found to be stagnant in some areas, although this seemed to be as a result of debris in the water. There were no signs of eutrophication to suggest that the spring was receiving excessive effluent.

6.5.1.5 Pinney's and Parris Ponds

Pinney's and Parris Ponds are located within the larger Pinney's Estate which is being proposed as a protected area. The estate contains the following resources / assets:

- Lagoons / wetlands including Pinney's Pond, Parris Pond, Cades Pond and Nelson Spring;
- Sandy Beach;
- Historical Sites including Fort Ashby, James Town and Golden Rock Pavilion;
- Opportunities for recreational fishermen; and
- Nesting of sea turtles.

Pinney's Pond, Parris Pond, Nelson Spring, Fort Ashby and the Sandy Beach area were all visited as part of the site reconnaissance in June. Nelson Spring was discussed in Section 6.5.1.2 above while Fort Ashby will be discussed in Section 6.9 under historic sites.

Parris Pond is a small wetland area located close to the southern end of the Pinney's Beach. The pond is surrounded by a small mangrove system dominated by white mangroves which provides habitat for a number of avifaunal species. There is a bridge across the pond which connects the land on which the Pinney's Beach Hotel is located with Pinney's Beach. At the time of the field visit, the pond water was stagnant since there was no connection to the sea.

Pinney's Beach is a 2.6 mile stretch of beach which is very popular with tourists. It is also a popular bathing area for locals. Artisanal fishing is also practised from this beach.

6.5.2 Pressures / Threats

6.5.2.1 Bath Bogs Protected Area

The location of the Bath Bogs adjacent to the town of Charlestown has resulted in a number of adverse impacts on the resources / assets of the area. The Bogs receive discharge from a number of businesses in the Charlestown area including untreated effluent from grease traps from nearby restaurants as well as untreated sewage from residences (see Figure 6-27). This has resulted in the die-off of the mangrove system as well as severe deterioration of the water quality of the stream and the wetland area. The area has also been used as an illegal dump site which contributes to the unsightly image and odour.

6.5.2.2 Nelson Springs

The main threat to Nelson Springs is the proposed development of villas and other residential developments. It is also our understanding that there has been clearing of trees around the springs. Any construction activities close to the springs may result in a deterioration of the water quality which could reduce its ability to support the resident wildlife. Deterioration in the water quality could also impair the quality of water available for distribution to the nearby communities.

6.5.2.3 Jessup's Pond

No information on any development proposed for the Jessup's area was available. However, the location of the pond is within an area that is already highly developed and therefore it is expected that additional development may be proposed. Any construction activities close to the pond may result in a deterioration of the water quality which could reduce its ability to support the resident wildlife. Deterioration in the water quality could also impair the quality of water available for distribution to the nearby communities.

6.5.2.4 New River Estate and Springs

One of the main threats to the site is overuse by tourists who hike up the trail to visit the springs, the Amerindian artefacts and the cave. This has resulted in the erosion of the trail and the deterioration of trail structures such as the railing and the benches.

6.5.2.5 Pinney's and Parris Ponds

Pinney's Pond and Parris Pond receive discharge from the nearby restaurant and hotel. This has resulted in the deterioration of the water quality of both systems. Recent construction works in the area has also resulted in increased sedimentation of the ponds.

6.5.3 Suitability of Units

6.5.3.1 Bath Bogs Protected Area

6.5.3.1.1 Status / Representiveness

Bath Bogs is recommended for inclusion in the National System of Protected Areas for the following reasons:

- It is a habitat for both resident and migratory species;
- It is also a habitat for both resident and migrant shore birds;
- The wetland provides a habitat for crustaceans, adult and juvenile fish; and
- It also functions as a nursery for juvenile fish.

6.5.3.1.2 Ecological Gap Analysis

Both runs of the Ecological Gap Analysis recommended the Bath Bogs for inclusion in the System of Protected Areas. The target being considered in this case was freshwater ponds of which 100% were recommended for conservation (see Figures 6-28 and 6-29).

6.5.3.1.3 *Boundaries and Extent*

Figure 6-30 shows the boundaries of the Bath Bogs Protected Area which includes the Bath Hotel and Bath Stream. This site is 57 acres in extent. Although the EGA recommended only the Bogs for inclusion, this is expected since the targets were based on the conservation of biodiversity. However, the area that will be protected will be a wider area including the historic Bath Hotel and the scenic Bath Stream. Within this larger area to be protected there has been provision for a buffer.

6.5.3.1.4 *Challenges to Protection*

The main challenge to inclusion of the Bogs area is the advanced state of deterioration of this resource. As noted in Section 6.5.2.1, the Bogs have received the effluent from residents, businesses and the old Power Station for a number of years. This has resulted in the deterioration of the water quality and the die-off of some of the mangrove vegetation.

There is also little room for the creation of a buffer around this bog area since there is development to the east and north with the coastline to the west. To the south is the Bath Hotel and stream.

6.5.3.2 *Nelson Spring*

6.5.3.2.1 *Status / Representiveness*

Nelson Spring is recommended for inclusion in the National System of Protected Areas for the following reasons:

- It is a habitat for both resident and migratory species;
- It is also a habitat for both resident and migrant shore birds; and
- The springs are also tapped for use as bottled water.

As noted above in Section 6.5.1.2, the springs are included as part of a larger protected area called Pinney's Beach Conservation Area.

6.5.3.2.2 *Ecological Gap Analysis*

Both runs of the Ecological Gap Analysis recommended the Nelson Spring for inclusion in the System of Protected Areas. The target being considered in this case was freshwater ponds of which 100% were recommended for conservation (see Figures 6-31 and 6-32).

6.5.3.2.3 *Boundaries and Extent*

As noted in Section 6.5.1.2, the Nelson Spring is part of a larger area being considered for protection. This larger area, the Pinney's Beach Conservation Area is 472 acres in extent. This area is shown in Figure 6-33. Again, due to the fact that the spring is located within a larger area for protection, there is provision for a buffer within its boundaries.

6.5.3.2.4 *Challenges to Protection*

As with the Bath Bogs, the main challenge to inclusion of the Pinney's Beach Conservation Area which includes Nelson Spring is the potential for additional development. The fact that some of the land is private makes this a very real threat and a challenge since the experience has been for private developers to resist the attempt by Government to control development on their land.

6.5.3.3 *Jessup's Pond*

6.5.3.3.1 *Status / Representiveness*

As noted above in Section 6.5.1.3, the springs are included as part of a larger protected area called Pinney's Beach Conservation Area. This pond area is relatively small and very little information was available on the nature and status of the resources. However, the reasons stated for the inclusion of the other ponds are also applicable here.

6.5.3.3.2 *Ecological Gap Analysis*

Both runs of the Ecological Gap Analysis recommended Jessup's Pond for inclusion in the System of Protected Areas. The target being considered in this case was freshwater ponds of which 100% were recommended for conservation.

6.5.3.3.3 *Boundaries and Extent*

As noted in Section 6.5.1.3, Jessup's Pond is part of a larger area being considered for protection. This larger area, the Pinney's Beach Conservation Area is approximately 472 acres in extent. This area is shown in Figure 6-33. Again, the provision of a buffer was taken into consideration when identifying the larger Pinney's Beach area for protection.

6.5.3.3.4 *Challenges to Protection*

As noted above in Section 6.5.2.3, the main challenge to inclusion of the Pinney's Beach Conservation Area which includes Jessup's Pond is the potential for additional development. The fact that some of the land is private makes this a very real threat and a challenge since the experience has been for private developers to resist the attempt by Government to control development on their land.

6.5.3.4 *New River Estate and Springs*

6.5.3.4.1 *Status / Representiveness*

It is recommended that the new river springs are suitable for inclusion into the system of protected areas for the following reasons:

- It is contained within a larger area proposed for protection;
- The springs provide an important drainage function;
- The springs are used as a source of potable water by nearby communities;
- The springs seem to be in fairly good condition and there were no obvious signs of pollution; and
- There is the potential for the creation of a buffer.

6.5.3.4.2 *Ecological Gap Analysis*

Both runs of the Ecological Gap Analysis recommended the spring associated with the New River Stream for inclusion in the System of Protected Areas. The target being considered in this case was freshwater ponds of which 100% were recommended for conservation. However, as noted above in Section 6.5.1.4, the New River Spring is part of a larger area being considered for protection which includes historic / cultural sites that were not considered in the EGA.

6.5.3.4.3 *Boundaries and Extent*

The proposed boundaries of the New River Protected area are unclear. More information on the location of the springs, the artefacts and the caves is needed before boundaries can be proposed.

6.5.3.4.4 *Challenges to Protection*

The main challenge for protection is the level of uncertainty associated with the resources at this site. Additional information is needed before the site can be properly assessed for inclusion into the System of Protected Areas.

6.5.3.5 *Pinney's and Parris Ponds*

6.5.3.5.1 *Status / Representiveness*

Pinney's Pond and Parris Pond are recommended for inclusion into the system of protected areas for the following reasons:

- They are contained within a larger area proposed for protection;
- The ponds provide an important drainage function; and
- The associated vegetation provide habitat for a number of avian species.

6.5.3.5.2 *Ecological Gap Analysis*

Both runs of the Ecological Gap Analysis recommended Pinney's and Parris Ponds for inclusion in the System of Protected Areas. The target being considered in this case was freshwater ponds of which 100% were recommended for conservation. However, as noted above in Section 6.5.1.5, both ponds are part of a larger area being considered for protection which includes historic / cultural sites that were not considered in the EGA.

6.5.3.5.3 *Boundaries and Extent*

The proposed boundaries of the Pinney's Beach Conservation Area are shown in Figure 6-33. The fact that these ponds are located within a larger area being considered for conservation provides some buffer for the ponds.

6.5.3.5.4 *Challenges to Protection*

As noted above in Section 6.5.2.5, the main challenge to inclusion of the Pinney's Beach Conservation Area which includes Pinney's and Parris Ponds is the potential for additional development. The fact that some of the land is private makes this a very real threat and a challenge since the experience has been for private developers to resist the attempt by Government to control development on their land.

6.5.4 *Level of Protection*

We recommend that freshwater lagoons be classified as VI under the ICUN system. That is, an area which contains predominantly unmodified natural systems which would be managed to ensure long term protection and maintenance of biodiversity while providing a sustainable flow of natural products and services to meet community needs. The objective here would be to preserve these lagoons as fresh water systems, with the attendant contribution to biodiversity due to the bird life.

6.5.5 Proposal

Based on the discussions in the previous sections, the following freshwater lagoons are recommended for inclusion into the System of Protected Areas:

- Bath Bogs,
- Nelson Spring,
- Jessup's Pond,
- New River Springs,
- Parris Pond, and
- Pinney's Pond.

6.6 The Ghauts

There are approximately 81 Ghauts on St. Kitts and 33 Ghauts on Nevis. These drainage channels, locally called "ghauts" are very important in the islands' overall drainage systems (see Section G.9.3).

6.6.1 Resources / Assets

The Ghauts are physical channels that flow from the mountains at the centre of both islands and transport water from these heights to the sea. These ghauts contain or maintain the following resources / assets (see Figures 6-34 and 6-35):

- Sand / Aggregate (in St. Kitts),
- Habitat for Faunal Species.

The Ghauts provide ideal habitat for numerous mountain bird species such as Brown Tremblers, Pearly-eyed Thrashers, Rainforest Pigeons, and Bridled-quail Doves.

6.6.2 Pressures / Threats

There are a number of pressures on the Ghauts (see Figures 6-36 and 6-37):

- Erosion – In the past, severe erosion at College Ghaut has threatened villages such as Lower Monkey Hill and Wades Garden. Many other ghauts on the island have severe erosion problems almost with similar intensity to that of College Ghaut with the exception, however, that they may not be passing through highly populated areas.
- Illegal sand mining.
- Squatting on the banks of ghauts predisposes the land to erosion and degradation.
- Illegal and unauthorized development.
- Illegal farming and grazing of animals.
- Illegal dumping.

The illegal sand mining has led to severe erosion resulting in the loss of arable farmland. In addition, excessive silt from erosion is deposited into the sea, contributing to negative effects on the sea grass beds, coral reefs and other spawning grounds in the marine environment.

On Nevis, although there is no illegal sand mining within ghauts, quarrying occurs in close proximity to several ghauts such as at Hick's, New River, Indian Castle and Dogwood Estate. This quarrying has resulted in sediments being transported down adjacent ghauts into the nearshore environment and led to a subsequent deterioration of the nearshore ecosystems.

6.6.3 Suitability of Units

6.6.3.1 Status / Representiveness

As noted in Section G.9.3, the Ghauts play an important role in the drainage of the both islands. While the majority of Ghauts on St. Kitts are in good condition, there are some that have been degraded by the activities listed above. For example Wash Ghaut (which was visited during the June site visits) was being mined and information from the

Department of Physical Planning was that this mining was significant. Apart from Wash Ghaut, other sites known to be mined include College Ghaut, Tabernacle Ghaut and Holland Ghaut. Additionally, at Bridge Ghaut which was also visited there was evidence of illegal dumping. The Ghauts on Nevis are considered to be in better condition since they are not mined.

6.6.3.2 Ecological Gap Analysis

Ghauts were not considered as a target in the EGA.

6.6.3.3 Boundaries and Extent

The boundaries of individual Ghauts are clearly defined. Although the exact acreage covered by all the Ghauts of St. Kitts and Nevis is not clear, it is expected to be a significant proportion of land. One of the ways in which a buffer can be provided for protection of the ghauts is by the designation of a setback for development from the edge of the ghauts. The St. Christopher Physical Development Plan recommends a minimum of 20 m buffer from the edge of Ghauts. A similar distance is recommended for Nevis Ghauts. This would fall under the purview of the Development Control Board under the Development Control Act.

6.6.3.4 Level of Protection

6.6.3.4.1 St. Kitts

Two separate levels of protection are recommended for the Ghauts of St. Kitts. For those ghauts which are still in a relatively good condition and have not been designated as legal sand mining sites, we recommend that they be classified as Category II under the IUCN system. That is a natural area of land, designated to:

- Protect the ecological integrity of one or more ecosystems for present and future generations,
- Exclude exploitation or occupation inimical to the purposes of designation of the area, and
- Provide a foundation for spiritual, scientific, educational, and recreational and visitor opportunities, all of which must be environmentally and culturally compatible.

The objective here would be to preserve these ghauts as ghauts, with the attendant contribution to biodiversity.

The second level of protection would apply to those ghauts which have been altered significantly to the extent that it would be impractical to return them to nearly their original condition as ghauts. Specifically, these would be College Ghaut, Tabernacle Ghaut, Wash Ghaut and Holland Ghaut. Planning permission should not be given to development within the proposed 20 m setback distance from the edge of the ghauts, but beyond this there would be no additional conservation activity. Additionally, there would be management of these ghauts to ensure that the sand / aggregate resource is not unsustainably used resulting in adverse downstream effects.

6.6.3.4.2 Nevis

Given the fact that the ghauts in Nevis are not mined for sand / aggregate, we recommend that they be classified as Category II under the IUCN system. That is a natural area of land, designated to:

- Protect the ecological integrity of one or more ecosystems for present and future generations,
- Exclude exploitation or occupation inimical to the purposes of designation of the area, and
- Provide a foundation for spiritual, scientific, educational, and recreational and visitor opportunities, all of which must be environmentally and culturally compatible.

The objective here would be to preserve these ghauts as ghauts, with the attendant contribution to biodiversity.

6.6.3.5 Challenges to Protection

The main challenge to be faced in considering Ghauts as protected areas is the use of Ghauts for illegal mining in St. Kitts. This mining has led to downstream impacts that can continue to harm the marine environment and the fragile ecosystems that exist there. In Nevis, quarrying adjacent to ghauts has led to sedimentation of the nearshore environment. The challenge is the fact that the majority of these quarries are privately owned and operate with little or no legal or regulatory guidelines (JECO Caribbean Inc. 2007).

The other challenge to inclusion of the Ghauts is the enforcement of regulations regarding unauthorized development and setbacks from the edge of the ghauts on both islands.

6.6.4 Proposal

It is recommended that the Ghauts of both St. Kitts and Nevis be included in the System of Protected Areas since they provide a unique function in the drainage system of the islands and also function as vegetated corridors.

6.7 Dry Forest

As noted in Section G.10.3 of Appendix G, the vegetation type classified as “dry forest” is really made up of four deciduous vegetation types (see Figure 6-38). Vegetation classified as “dry forest” can be found in the following three main areas:

- Brimstone Hill;
- Hilltops of the S. E. Peninsula; and
- Northernmost, Southeast and Southwest slopes of Nevis Peak.

6.7.1 Resources / Assets

“Dry Forests” contain the following resources:

- 21 species unique to dry evergreen forests in St. Kitts;
- 39 species of scrub unique to dry scrub woodland in St. Kitts;
- Supports a small population of white tailed deer on St. Kitts.

Common species that characterize these forests types include:

- *Acacia farnesiana*
- *Bursera simaruba*
- *Croton flavens*
- *Calotropis procera*

- *Plumeria alba*
- *Cephalocereus royenii*
- *Erithalis fruticosa*
- *Cordia obliqua*
- *Conocarpus erectus*
- *Ardisia obovata*
- *Randia aculeata*
- *Coccoloba uvifera*

6.7.2 Pressures / Threats

There are a number of pressures / threats associated with dry forests in St. Kitts and Nevis:

- Conversion to other uses;
- Clearing for built development;
- Extraction of Ornamental and Medicinal Plants;
- Illegal Farming;
- Invasive Species;
- Charcoal Production;
- Livestock Grazing; and
- Illegal dumping of waste.

6.7.3 Suitability of Units

This type of forest is being cleared at alarming rates for built development, and the need to protect this forest type has been discussed in Section 6.7.1. There has been some protection of dry forests within the boundaries of the Brimstone Hill Fortress National Park as well as within the Nevis Peak National Park in Nevis. Outside these areas, the majority of dry forests occur on the S. E. Peninsula, where they grow on private land. Even though it is recognized that the establishment of any protected area will be difficult due to private ownership, Ecoengineering considers it useful to include some area of dry forest on the Southeast Peninsula in the Systems Plan, as will be discussed in Section 7.11.2. The vegetation types that are classified as “dry forests” were included as targets in the Ecological Gap Assessment and the targets for conservation were met by the best model runs from the modelling exercise. It is therefore recommended that a suitable area of dry forest on the S. E. Peninsula be identified for protection (see Section 7.11.2).

6.8 Historic Charlestown

6.8.1 Resources / Assets

Historic Charlestown as a historic site contains the following assets (see Figure 6-39):

- Buildings of unique architectural value;
- Diversity of structures;
- Unique character and charm; and
- Tourism potential.

6.8.2 Pressures and Threats

As noted in Section G.11.4, some of the pressures / threats associated with Historic Charlestown include:

- Neglect of sites and buildings,
- Poor repairs and restoration,
- Ill-considered redevelopment;
- Exceeding carrying capacity;
- Property Theft and Destruction;
- Littering; and
- Graffiti.

It is also our understanding that the Government has recently leased some land in Charlestown for private development that may potentially impact one of the buildings recommended for protection as part of Historic Charlestown.

6.8.3 Suitability of Units

6.8.3.1 Status / Representiveness

Table 6-1 below highlights the individual buildings being proposed for initial inclusion into the historic site that is Historic Charlestown:

TABLE 6-1: STATUS OF HISTORIC BUILDINGS

| BUILDING | STATUS / REPRESENTIVENESS |
|------------------------------------|---|
| Austin Hotel, | Built in the English Architectural Style known as “Georgian”. |
| Library Building | Built in the English Architectural Style known as “Georgian”. |
| Alexander Hamilton Museum | Excellent Condition. Presently part of walking tour by Department of Tourism. |
| St., Theresa’s Catholic Church | Good condition. Presently part of walking tour by Department of Tourism. |
| Slave Market | The wall representing the location of the slave market is the only evidence. There is a sign providing information on the location of the slave market and its significance. This site is also part of a walking tour by the Department of Tourism. |
| Wesleyan Holiness Church and Manse | Excellent Condition. Presently part of walking tour by Department of Tourism. |
| Treasury Building | Well maintained. Present use as offices of Department of Tourism. |
| Customs House | The Customs building holds a sports store, Department of Culture and a gift shop. |
| Old Great House | Built in the English Architectural Style known as “Georgian”. |

6.8.3.2 Boundaries and Extent

The exact boundaries of Historic Charlestown are limited to the boundaries of the town of Charlestown. It is important to note that the individual buildings being considered are just the first ones being offered. There is therefore the intension of adding other buildings. However, these will all be limited to the present extent of the town. This also means that there is little potential for a buffer.

6.8.3.3 Level of Protection

The level of protection appropriate for Historic Charlestown is effected by Category II Historic Site for the following reasons:

- Historic Buildings associated with the past;
- Part of historical and cultural heritage;
- Includes historic landmarks.

6.8.3.4 Challenges to Protection

The main challenge to inclusion of the buildings for Historic Charlestown is the present tenure of the individual buildings. While a number of the buildings are provided for Government use and have been used for this purpose in the past, there are a number that are privately owned. It is unclear whether these property owners would be willing to cede these buildings to the state for including in the System of Protected Areas.

6.8.3.5 Proposal

It is therefore recommended that the buildings listed in Table 6-1 be included within the System of Protected Areas as Historic Charlestown for the reasons listed in Section G.11.6.

6.9 Historic / Cultural Sites

As noted in Section 5.12, a number of sites have been offered for consideration into the System of Protected Areas either as individual sites or as parts of larger sites with multiple assets. These include (see Figure 6-40):

- ▶ Old Road Town Petroglyphs, St. Kitts;
- ▶ Petroglyphs at Stonefort, St. Kitts;
- ▶ Belmont Estate, St. Kitts;
- ▶ Mansions Estate, St. Kitts;
- ▶ Spooner's Ginnery, St. Kitts;
- ▶ Black Rocks, St. Kitts;
- ▶ Charles Fort, St. Kitts;
- ▶ Indian Castle Protected Area, Nevis;
- ▶ Fort Ashby, Nevis;
- ▶ Bath Hotel, Nevis;
- ▶ New River Estate, Nevis; and
- ▶ Fort Charles, Nevis.

6.9.1 Resources / Assets

Table 6-2 provides information on the resources and assets at these historic sites:

TABLE 6-2: RESOURCES OF HISTORIC SITES

| SITE | RESOURCE / ASSET |
|--------------------------------------|---|
| Old Road Town Petroglyphs, St. Kitts | Amerindian rock carvings. Already part of tourism tour. |
| Petroglyphs at Stonefort, St. Kitts | Amerindian rock carvings. |
| Belmont Estate, St. Kitts | Remnants of sugar plantation, with chimneys and old plantation buildings. |
| Mansions Estate, St. Kitts | Remnants of sugar plantation, with chimneys and old plantation buildings. |
| Spooner's Ginnery, St. Kitts | Remnants of cotton ginnery, with original equipment. |
| Black Rocks, St. Kitts | Coastal geologic feature, with existing local involvement. Already part of tourism tour. |
| Charles Fort, St. Kitts | Remnants of old fort including cistern, guard room, prison, magazine and cannons. |
| Indian Castle Protected Area, Nevis | Remnants of Fort George. Amerindian artefacts. |
| Fort Ashby, Nevis | Remnants of fort, including fort building and cannon. Part of a larger site including several freshwater lagoons. |
| Bath Hotel, Nevis | Restored historic hotel, including Bath stream and original bath house and newly constructed bath house. Part of a larger site including Bath Bogs. |
| New River Estate, Nevis | Amerindian artefacts, water wheel. Part of a larger site containing and important water source and hiking trails. |
| Fort Charles, Nevis | Certain local stone walls remain and a dug stone-lined cistern, as do a number of cannons. |

6.9.2 Pressures / Threats

Pressures and threats associated with each site are highlighted in Table 6-3 below:

TABLE 6-3: PRESSURES AND THREATS ASSOCIATED WITH HISTORIC SITES

| SITE | PRESSURES / THREATS |
|--------------------------------------|---|
| Old Road Town Petroglyphs, St. Kitts | Over use of site. Development. Climatic conditions leading to deterioration of carvings. |
| Petroglyphs at Stonefort, St. Kitts | Over use of site. Development. Climatic conditions leading to deterioration of carvings. |
| Belmont Estate, St. Kitts | Unauthorized development Neglect of buildings and other structures such as the chimney and mill. |
| Mansions Estate, St. Kitts | Unauthorized development Neglect of buildings and other structures such as the chimney. |
| Spooner's Ginnery, St. Kitts | Unauthorized development. Illegal livestock grazing. Neglect of buildings and other structures. |
| Black Rocks, St. Kitts | Over use. "Acts of God" such as earthquake, landslide. |
| Charles Fort, St. Kitts | Neglect of buildings and other structures. |
| Indian Castle Protected Area, Nevis | Unauthorized development. Livestock grazing. Neglect of buildings and other structures. |
| Fort Ashby, Nevis | Unauthorized development. Neglect of buildings and other structures. |
| Bath Hotel, Nevis | Inappropriate use. Neglect of buildings and other structure. Inappropriate renovations / additions. |
| New River Estate, Nevis | Over use of site. Development. |
| Fort Charles, Nevis | Neglect of buildings and other structure. Inappropriate development. |

6.9.3 Suitability of Units

6.9.3.1 Status / Representiveness

Table 6-4 highlights the status / representiveness of the sites being considered:

TABLE 6-4: STATUS OF HISTORIC SITES

| SITE | STATUS / REPRESENTIVENESS |
|--------------------------------------|---|
| Old Road Town Petroglyphs, St. Kitts | Well maintained. Good representation of Amerindian carvings. |
| Petroglyphs at Stonefort, St. Kitts | Good representation of Amerindian carvings. Not very well maintained. |
| Belmont Estate, St. Kitts | Good representation of sugar estate industry by layout and structures. Not very well maintained. |
| Mansions Estate, St. Kitts | Good representation of sugar estate industry by layout and structures. Not very well maintained. |
| Spooner's Ginnery, St. Kitts | Good representation of cotton ginnery with original equipment. However, the building is in extremely poor condition and the surrounding environment is littered with solid waste and other types of waste. |
| Black Rocks, St. Kitts | Rocks an interesting geologic feature. Its position makes it difficult to be disturbed by man but (as noted above in Section 6.9.2) "Acts of God" can create extensive damage. The nearby strip of coastal land is used by locals during tourist visits. Existing huts are in good condition. |
| Charles Fort, St. Kitts | Fort building in a state of disrepair. Surroundings overgrown and not maintained. |
| Indian Castle Protected Area, Nevis | Fort building in a state of disrepair. Amerindian artefacts need to be classified to determine their worth. |
| Fort Ashby, Nevis | Fort building in a state of disrepair. Amerindian artefacts need to be classified to determine their worth. Cannon in fairly good condition. Surrounding environment is littered with solid waste. |
| Bath Hotel, Nevis | Bath Hotel in excellent condition. |
| New River Estate, Nevis | Amerindian artefacts need to be classified to determine their worth. The trail to the sites is not very well maintained. |
| Fort Charles, Nevis | The site has lost a significant amount of ambience due to an inappropriate development immediately adjacent to it, which suffered hurricane damage and has never been completed. It is now a site of a number of partly completed dilapidated buildings which ideally should be demolished (Hyder, 2008). |

6.9.3.2 Boundaries and Extent

Information on the boundaries and extent of the sites is listed in Table 6-5 below:

TABLE 6-5: BOUNDARIES OF HISTORIC SITES

| SITE | BOUNDARIES / EXTENT |
|--------------------------------------|--|
| Old Road Town Petroglyphs, St. Kitts | The boundaries are well defined. The area is fenced and the approximate size of a household lot. No potential for buffer around fenced area but there is an approximate 3 m buffer around carving. |
| Petroglyphs at Stonefort, St. Kitts | The boundaries and extent are not well defined but the site has been described as extending 200 m on both sides of the ravine about 500 m from the Island Main Road. There is some potential for the creation of a buffer. |
| Belmont Estate, St. Kitts | The estate yard is approximately 3 acres in extent. There is some potential for the creation of a buffer. |
| Mansions Estate, St. Kitts | The estate yard is approximately 3 acres in extent. There is some potential for the creation of a buffer. |
| Spooner's Ginney, St. Kitts | This site is estimated to be 1.8 acres. There is limited potential for the creation of a buffer. |
| Black Rocks, St. Kitts | The boundaries of the formation are well defined. The boundaries of the associated coastal strip used by local not so well defined though it is approximately 30 m. There is limited potential for the creation of a buffer. |
| Charles Fort, St. Kitts | This site is approximately 7 acres (28,200m ²) in size. |
| Indian Castle Protected Area, Nevis | 15 acres. Area fenced. There is the potential for a buffer. |
| Fort Ashby, Nevis | Boundaries well defined. Area is fenced. The site is approximately the size of a household lot. The fort is part of a larger area being considered for protection which has an extent of 472 acres. |
| Bath Hotel, Nevis | Boundaries well defined. Area is fenced. The site is approximately the size of 2-3 houselots. The fort is part of a larger area being considered for protection which has an extent of 57 acres. |
| New River Estate, Nevis | Potential for a buffer. No clear indication of the boundaries of the site and therefore the extent is not known. |
| Fort Charles, Nevis | This site is approximately 3 acres (11,706 m ²) in size. |

6.9.3.3 Level of Protection

Table 6-6 below provides suggestions for the level of protection recommended for each historic site:

TABLE 6-6: LEVEL OF PROTECTION PROPOSED FOR HISTORIC SITES

| SITE | TOURISM MASTER PLAN/ IUCN CATEGORY |
|--------------------------------------|------------------------------------|
| Old Road Town Petroglyphs, St. Kitts | Category 1 |
| Petroglyphs at Stonefort, St. Kitts | Category 1 |
| Belmont Estate, St. Kitts | Category 2 |
| Mansions Estate, St. Kitts | Category 3 |
| Spooner's Ginnery, St. Kitts | Category 4 |
| Black Rocks, St. Kitts | Category VI (IUCN) |
| Charles Fort, St. Kitts | Category 2 |
| Indian Castle Protected Area, Nevis | Category 1 |
| Fort Ashby, Nevis | Category 2 |
| Bath Hotel, Nevis | Category 1 |
| New River Estate, Nevis | Category 2 |
| Fort Charles, Nevis | Category 2 |

6.9.3.4 Challenges to Protection

Table 6-7 provides information on the challenges to inclusion of individual historic sites to the System of Protected Areas:

TABLE 6-7: CHALLENGES TO PROTECTION OF HISTORIC SITES

| SITE | CHALLENGES TO PROTECTION |
|--------------------------------------|--|
| Old Road Town Petroglyphs, St. Kitts | None identified |
| Petroglyphs at Stonefort, St. Kitts | Inaccessibility of the site. |
| Belmont Estate, St. Kitts | Advanced state of disrepair of structures. Uncertainty of tenure. |
| Mansions Estate, St. Kitts | Advanced state of disrepair of structures. Uncertainty of tenure. |

| SITE | CHALLENGES TO PROTECTION |
|-------------------------------------|--|
| Spooner's Ginnery, St. Kitts | Advanced state of disrepair of structures. Uncertainty of tenure. |
| Black Rocks, St. Kitts | Inappropriate development. Unauthorized development. |
| Charles Fort, St. Kitts | Stigma attached to past use as a Leprosarium. Close proximity of residential neighbours. Advanced state of disrepair of structures. |
| Indian Castle Protected Area, Nevis | Incompatible use of the site for agriculture. Advanced state of disrepair of structures. |
| Fort Ashby, Nevis | Advanced state of disrepair of structures. |
| Bath Hotel, Nevis | Maintenance of historic nature of building and compatibility of use for office space. |
| New River Estate, Nevis | Little knowledge of artefacts. Deterioration of the structures on the sites. |
| Fort Charles, Nevis | Inappropriate development and the resultant loss of ambience. Private tenure of property. Advanced state of disrepair of structures. |

6.9.4 Proposal

Based on the discussions in the sections above, it is recommended that the following historic sites be included in the System of Protected Areas:

- ▶ Old Road Town Petroglyphs, St. Kitts;
- ▶ Petroglyphs at Stonefort, St. Kitts;
- ▶ Belmont Estate, St. Kitts;
- ▶ Mansions Estate, St. Kitts;
- ▶ Spooner's Ginnery, St. Kitts;
- ▶ Black Rocks, St. Kitts;
- ▶ Charles Fort, St. Kitts;
- ▶ Indian Castle Protected Area, Nevis;
- ▶ Fort Ashby, Nevis;
- ▶ Bath Hotel, Nevis;
- ▶ New River Estate, Nevis; and
- ▶ Fort Charles, Nevis.

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7 DEVELOPMENT STRATEGY FOR PROTECTED AREAS SYSTEM

This chapter contains our recommendations regarding the elements of the proposed protected area system. As in Chapters 5 and 6, specific sites and groups of sites are discussed separately. In each section, information is presented and recommendations made concerning:

- NCEMA Categories;
- Management Strategies (Management Structure, Management Plan and Staffing); and
- Financing Strategies.

With regard to financing strategies, our recommendations rely heavily on the report entitled “Sustainable Financing of Protected Areas in the OECS” prepared by The Environment and Development Group (2009). Information for this section was also obtained during consultation meetings on the draft report during the period March 01 to 04, 2010.

7.1 Overall Structure

7.1.1 NCEMA Categories

The existing NCEPA Act, 1987 addresses the establishment and operation of protected areas. A new draft NCEMA (last revision in 2009) is expected to supersede the NCEPA and also addresses the establishment and operation of Protected areas (see Section 3.1.2). In anticipation of the passing of this Act the categories of protected areas in this chapter are those listed in that law. This is in contrast to earlier chapters which described Protected Areas in the context of categories established by the IUCN and the Tourism Masterplan.

7.1.2 Management

7.1.2.1 Overall Management Structure

Given the diversity of the Protected Areas that will be described in this chapter, as well as the differing Management Objectives at different Protected Areas, it is inevitable that a range of organizations and agencies will have responsibility for their management. In

this situation, we recommend that an “umbrella” body be established to co-ordinate the efforts of the various management agencies. This “National Conservation Commission” (see Section 3.1.2) will have oversight responsibility for the entire system of protected areas, and would have the following functions or roles:

- Policy decision making;
- Selection of protected areas;
- Coordinating of individual Site Management Bodies;
- Harmonization of activities;
- Recommendations for disbursements under the Environmental Trust Fund; and
- Ensuring accountability by Individual Site Management Bodies.

The suggested composition of the National Conservation Commission would be made up of fifteen members appointed by the Minister:

Chairman
Vice Chairman
Secretary
Coordinator (Ex Officio)

Members

Department of Physical Planning and Environment (St. Kitts)
Physical Planning Department (Nevis)
Water Department (St. Kitts)
Water Department (Nevis)
Department of Tourism (St. Kitts)
Nevis Tourism Authority (Nevis)
Nevis Historical and Conservation Society
St. Christopher National Trust

It is further suggested that the Body be supported by a full-time secretariat consisting of a Co-ordinator and two administrative staff members. The co-ordinator would be an ex-officio member of the Body. The secretariat would be established under the Ministry of Physical Planning and Environment. The level of training required for the Co-ordinator would be a University Degree in Environmental Science or History / Archaeology, with specialized training in Management. The training for the administrative staff would be secretarial / administration.

7.1.2.2 Site Specific Management Structure

Day-to-day responsibility for the management of individual sites would, however, be the responsibility of individual agencies. Their role or function would be as follows:

- Formulation and implementation of Management Plans;
- Day-to-Day Management;
- Hiring of staff;
- Setting and collection of fees (if applicable); and
- Formulation of projects.

It is important to note that the composition of each board or management agency must reflect the diversity of stakeholders of a particular site. It is not the recommendation of this consultancy that a management agency be created for each individual site; instead it may be prudent to group certain sites together because of commonality of features or proximity. This refers, for example to such sites as the marine management areas and some of the historic sites.

Where protected areas have already been suggested by other existing planning documents such as the respective physical development plans, it is our recommendation that these boundaries be kept. For example, there are several protected areas in Nevis (recommended by the Nevis Physical Development Plan) that include both historic and biodiversity elements. It is our recommendation that this arrangement be maintained and therefore that the management agency in charge of those particular sites manage all aspects of the sites. However, it is expected that the composition of the board of such a management agency reflect the skills needed to manage the diversity of elements within the site.

7.1.3 Financing Strategies

Funding for the various elements in the Protected Areas Systems Plan is also discussed in this section. The strategies to be discussed are mainly those listed in the Sustainable Financing Study Report:

- ▶ Government Subventions,
- ▶ Funding from International Donor Groups,

- ▶ User Fees, and
- ▶ Environmental Levies.

The Environmental Trust Fund described under the NCEMA is also referenced.

The discussion of funding in this chapter is presented in broad concepts, focussing on what is presently done and what may be required in the future. However, it must be emphasized that a detailed discussion of funding at any individual site (such as an estimate of capital and operational cost and cash flow) is outside the scope of this study.

With particular reference to the secretariat for the National Conservation Commission (see Section 7.1.2, above), typical levels of salary in St. Kitts for the Co-ordinator and the administrative staff were kindly provided by the NICE. Using these salary levels, and applying the “rule-of-thumb” that non-salary costs (office accommodation, office equipment, electricity, telephones, stationery, etc) are about 125% of salaries, it is estimated that the cost of the secretariat would be of the order of \$US 8,500.00 per month.

7.2 Brimstone Hill Fortress National Park

Brimstone Hill Fortress is internationally the best-known heritage site in St. Kitts and Nevis, with a 40-year history of successful management by the Brimstone Hill Fortress National Park Society.

7.2.1 NCEMA Categories

BHFNP is already a National Park (Category I) as defined in the draft NCEMA 2009. This includes the 400 m buffer on all sides. There is no need to change this designation. This area is also a World Heritage Site.

7.2.2 Management Strategies

7.2.2.1 Management Structure

As noted above, there is a long history of successful management of this site by the Brimstone Hill Fortress National Park Society (and its predecessor The Society for the Restoration of Brimstone Hill), and this arrangement should be maintained. In summary, the Board of the Society consists of:

- President,
- Vice President,
- Treasurer,
- Members
- Corporate Member Representative,
- Student Member,
- Government Members,
- Honorary Secretary, and
- General Manager.

7.2.2.2 Management Plan

BHFNP presently operates under a Management Plan. One challenge which was highlighted during the RAPPAM workshop is maintaining the visitorship of the Park within the carrying capacity of the site. One approach to this could be adjusting the admission fees (see Section 7.2.3 below).

7.2.2.3 Staffing

BHFNP is currently staffed by a combination of employees and volunteers.

7.2.3 Financing Strategies

Historically, the BHFNP has been financed by three mechanisms:

- User Fees,
- Government Subvention, and
- Grants from International Agencies.

Under the NCEPA 1987, the Society is empowered to collect admission fees from visitors to the park, and this appears to be the primary source of funding at present. At the RAPPAM workshop there was consensus that funding has been adequate over the past five years, but there are doubts that this situation will continue. Notwithstanding this, there was a moderate level of confidence that the long-term financial outlook for this site is stable.

Based on the information at hand, it appears that this Park can continue to rely on user fees for its day-to-day operation (recurrent expenditure). The Sustainable Financing Study (The Environment and Development Group, 2009) noted that user fees at this site and other sites in the region are somewhat lower than comparable international fees. As noted above therefore, the Society may consider an upward adjustment of the admission fees to control the level of visitorship so as not to exceed the carrying capacity of the site. In contrast, funding for capital expenditure such as restoration of buildings may have to rely on solicitation of grants from International Donor Agencies or grants from the proposed Environmental Trust Fund (see Section 3.6.1).

7.3 Central Forest Reserve National Park

7.3.1 NCEMA Categories

This unit has been established as a National Park, and satisfies the criteria for Category I in the NCEMA:

- It is relatively large land area;
- It contains important natural features of national significance (biodiversity of the forests, tourism attractions by way of the system of trails, and its importance as water supply recharge to springs and the aquifer); and
- It must be managed in a manner to protect these resources.

It is also noted that specific areas within this National Park may have to be protected as a Category III - Nature Reserve; that is:

“An area containing outstanding or fragile natural features or life forms of national importance that need protection in an undisturbed state where the only permitted activities are management measures, controlled scientific research and educational study”.

The definition of such areas requires detailed ecology surveys of the National Park, which are outside the scope of this study. Relevant information for such decision-making is expected to come from the Environmental and Socio-Economic Studies for the Central Forest Reserve which has been commissioned under the OPAAL Project.

7.3.2 Management Strategies

7.3.2.1 Management Structure

Management of this unit is primarily entrusted to the Department of Physical Planning and Environment (DPPE), but this jurisdiction must be shared with both the Water Department and the Department of Tourism. It is therefore envisaged that a joint management structure would be established between these three agencies. Should a dispute arise on a specific management issue (for example, if the Department of Tourism wishes to expand a trail into an area which the DPPE considers to be environmentally sensitive), the first effort would be to resolve it directly between the three agencies. If that fails, it would then be referred to the National Conservation Commission (see Section 7.1.2).

7.3.2.2 Management Plan

As noted in Section G.2.5, a Management Plan has been prepared for this Protected Area. Ecoengineering recommends that the principle of joint management under the three agencies listed above be included in that Management Plan. The relationship of the three agencies to the National Conservation Committee vis-à-vis the management of this Protected Area would be included in a revision to the Management Plan once that Committee has been established.

7.3.2.3 Staffing

The Management Plan for CFRNP envisages 6 full-time staff members during the first year of this project:

- ▶ a Protected Area Manager,
- ▶ a Community Co-ordinator / Assistant Manager,
- ▶ a Public Outreach Specialist,
- ▶ a Natural Resources Specialist, and
- ▶ 2 Visitor Services Rangers.

The plan appears to envisage that these will all be employees of the St. Kitts Department of Physical Planning and the Environment. The plan also makes provision for necessary equipment and some capital expenditure on facilities.

In addition to the full-time staffing listed above, the Management Plan acknowledges that the Defence Force has assisted in emergency response within the CFRNP, and that both the Defence Force and the police have been involved in the eradication of illegal crops (marijuana). It is expected that these two organizations will continue to play these roles on an as-needed basis.

7.3.3 Financing Strategies

The Management Plan for CFRNP does not provide global cost projections for the operation of the park, but it does project a funding gap of \$US 130,000.00 in the first year rising to \$US 350,000.00 in the third year. Ecoengineering envisages that the management and operation of this National Park would be funded by a combination of five mechanisms:

- Public Service Salaries,
- User Fees,
- Government Subvention,
- Grants from International Agencies, and
- Grants from the proposed Environmental/Conservation Trust Fund.

Because the management of this National Park would be entrusted to three Government Agencies, it is envisaged that the basic salaries of the officers who would undertake this task will continue to be paid by those agencies. In several West Indian countries, a small stipend would be paid to those officers over and above their normal salaries, to acknowledge the higher level of responsibility they will assume and also the fact that meetings may be held outside of normal working hours. This stipend, too, would be paid by their agencies, but it is important to harmonize the quantum of the stipend.

Maintenance and upkeep of the National Park would be paid for by a combination of Public Service Salaries, User Fees and Government Subvention. It is considered likely that maintenance functions would be undertaken by the staff of the three Government Agencies, and that these staff costs would be covered by their normal salaries. The

possible exception may be the DPPE who may be required to hire dedicated staff to upkeep the trails, etc. In that case, the recurrent expenditure for day-to-day operations (salary costs of the dedicated staff as well as equipment and materials for maintenance) would require a government subvention during the early years of operation.

Given the size and likely user attractiveness of this National Park, it is considered likely that a system of user fees can be developed similar to what applies at Brimstone Hill Fortress National Park. Such fees would replace part of the government subvention to cover recurrent expenditure over time, but it is not clear that it would entirely replace the subvention in the short term (next 5 years).

Again as at Brimstone Hill Fortress National Park, funding for capital expenditure is likely to rely on solicitation of grants from International Donor Agencies or grants from the proposed Environmental Trust Fund (see Section 7.1.3). Such capital expenditure could include the establishment of an Interpretation Centre, significant expansion of trails, purchase of emergency response equipment and material, etc.

7.4 Nevis Peak and Camps River National Park

7.4.1 NCEMA Categories

This unit is also being established as a National Park, and satisfies the criteria for Category I in the NCEMA:

- It is relatively large land area;
- It contains important natural features of national significance (biodiversity of the forests, tourism attractions by way of the system of trails, and its importance as water supply recharge to springs and the aquifer); and
- It must be managed in a manner to protect these resources.

It is also noted that specific areas within this National Park may have to be protected as a Category III - Nature Reserve; that is:

“An area containing outstanding or fragile natural features or life forms of national importance that need protection in an undisturbed state where the only permitted activities are management measures, controlled scientific research and educational study”.

As with CFRNP (see Section 7.3, above) the definition of such areas requires detailed ecology surveys of the National Park, which are outside the scope of this study.

7.4.2 Management Strategies

7.4.2.1 Management Structure

Management of this unit is primarily entrusted to the Physical Planning Department in Nevis, but this jurisdiction must be shared with the Nevis Water Department, the Department of Tourism and the Department of Agriculture. In the Management Plan for this National Park (see Section 7.4.2.2, below), it is envisaged that a National Park Advisory Committee would be established with a wide membership including Government Agencies, business interests, conservationists and local stakeholders (including area residents).

7.4.2.2 Management Plan

As noted in Section G.3.5, a Management Plan has been prepared for this Protected Area. Ecoengineering recommends that the principle of joint management under the three agencies listed above be included in that Management Plan. The relationship of the four agencies to the National Conservation Committee vis-à-vis the management of this Protected Area would be included in a revision to the Management Plan once that Committee has been established.

7.4.2.3 Staffing

The Management Plan for NPNP is silent on the levels of staffing that would be required; noting that it is premature in the process of creating the Park to provide meaningful recommendations about how to administer it. Notwithstanding this, Ecoengineering envisages that (as for CFRNP – see Section 7.3.2.3, above) there would be full-time staff members for this Park, and that they will be employees of the Nevis Physical Planning Department.

7.4.3 Financing Strategies

The Management Plan is silent on the question of an operating budget for this Park. Notwithstanding this, Ecoengineering envisages that (as for CFRNP - see Section 7.3.3, above) the management and operation of this National Park would be funded by a combination of five mechanisms:

- Public Service Salaries for the management activity.
- Public Service Salaries, User Fees, and Government Subvention for recurrent expenditure (day-to-day operations and maintenance); with User Fees reducing (but not necessarily replacing) the Government Subvention over time.
- Grants from International Agencies and Grants from the proposed Environmental Trust Fund for capital expenditure.

7.5 Basseterre Valley Aquifer National Park

As noted in Section G.4.5, the BVANP is geared to the use of the area for conservation as part of the resource endowment to the country's tourism industry and also to preserve the Basseterre Aquifer (an important source of public water supply for the island of St. Christopher).

7.5.1 NCEMA Categories

This unit is described as a National Park, and appears to satisfy the criteria for Category I in the NCEMA:

- It is relatively large land area;
- It contains an important natural feature of national significance (the aquifer as water supply); and
- It must be managed in a manner to protect this resource.

In addition, the proposed development will also satisfy Category VII, Botanic Garden; described as a garden established for the preservation, display and propagation of the national botanical resources.

7.5.2 Management Strategies

7.5.2.1 Management Structure

Management of this unit must include representatives of the Water Department and the Department of Tourism, the two important stakeholders of this resource. Given the high cost of developing other water sources for the public supply, maintenance and protection of the aquifer should be a cornerstone of the management of BVANP. This objective is included in the Management Plan which has been prepared for this protected area.

Given the concept of this National Park, it would appear that a separate management structure (akin to BHFNP) would be appropriate. Ecoengineering therefore supports the proposed Basseterre Valley Project Steering Committee arising out of the Advisory Committee described in the Paper IWCAM GEF Project Priority Demonstration.

According to this paper, A Project Management Unit (PMU) will be set up under the St. Kitts and Nevis Development Control and Planning Board. The PMU will consist of a Project Manager and Administrative Assistant. The PMU will be guided and instructed by a Steering Committee. This Committee will include representatives from the relevant government departments. It will also include representation from the community, from at least one relevant NGO, and from the private sector. Other members may be co-opted at the discretion of the permanent membership. The Steering Committee will be chaired by a member of the Development Control and Planning Board. The Steering Committee will report to the Cabinet of Ministers through its chair in the DCPB. The Steering Committee will evolve out of the existing Basseterre Valley Advisory Committee, ensuring that there is appropriate facility for non-government stakeholder participation.

7.5.2.2 Management Plan

A Management Plan has been prepared for this Protected Area. While the Plan is silent on specific management arrangements for the Basseterre Valley Aquifer National Park, Ecoengineering recommends that the principle of joint management under the Steering Committee described above be considered.

7.5.2.3 Staffing

Ecoengineering envisages that (as for CFRNP – see Section 7.3.2.3, above) there would be full-time staff members for this Park, and that they will be employees of the appropriate Government Department.

7.5.3 Financing Strategies

The Management Plan for the Basseterre Valley Aquifer National Park envisages a number of different revenue streams including:

- Entrance fees,
- Performance, Program and Special Events Fees,
- Concession Fees,
- Rental Fees for Private / Special Events,
- Individual and Corporate donations of cash,
- Concession Fees,
- Grants, and Government in-kind contributions such as technical support, monitoring, etc.

The capital expenditure for establishing the facility would be sourced from grants and Government subventions. Recurrent expenditure will have to be sourced from Government subventions for the first several years after the facility is established. However, the objective would be to fund such expenditure from the other charges listed above as the facility becomes more established.

7.6 Marine Management Areas

As noted in Section 6.2.4 marine management areas must form an integral role and important part of the System of Protected Areas. The two marine areas proposed are the SEPMMMA and the SPMMA.

7.6.1 NCEMA Categories

Under the NCEMA, Marine Management Areas would be classified as “Marine Reserves” (Category IV); that is, an area as provided in Section 23 of the Fisheries Act, 1984. The Act describes Marine Reserves as areas where special measures are necessary:

- To afford special protection to the flora and fauna of such areas and to protect and preserve natural breeding grounds and habitats of aquatic life, with particular regard to flora and fauna in danger of extinction;
- To allow for the natural regeneration of aquatic life in areas where such life has been depleted;
- To promote scientific study and research in respect of such areas; or
- To preserve and enhance the natural beauty of such areas.

Some areas within these Reserves will also be classified as Category III Nature Reserve; that is, an area containing outstanding or fragile natural features or life forms of national importance that need protection in an undisturbed state where the only permitted activities are management measures, controlled scientific research and educational study. Those would be the Nags Head and Booby Island. Booby Island is expected to be preserved in its entirety but while the general area of Nag’s Head is well-established, additional ecological studies will be required to define the exact boundaries for special protection. Such ecological studies would cost an estimated \$US 12,500.00, but they are outside the scope of this assignment.

Finally, there will be some areas classified as Category V Area of Special Concern; that is, a place or site needing special protection and controlled use in order to stabilize or restore important ecological features or functions. Such areas would be the turtle nesting beaches and any area defined for fish and shellfish propagation. The limits of the turtle nesting beaches are reasonably well-established, but additional ecological / fisheries studies would be required to establish the boundaries of the reserves for fish and shellfish propagation. Such ecological / fisheries studies may be undertaken by the Fisheries Departments in St. Kitts and Nevis, but they are outside the scope of this assignment.

7.6.2 Management Strategies

7.6.2.1 Management Structure

The most important management functions with regard to marine management areas are:

- Strict protection of nesting sites for internationally important bird species;
- Strict protection of spawning grounds for commercial species;
- Managed use of commercial fishing and diving areas;
- Prevention of interference with nesting turtles; and
- Enforcement of Planning Regulations to prevent development which would result in excessive noise or artificial lighting of the beaches during the nesting season.

At present, there is no agency responsible for the monitoring of avifauna. Instead, *ad hoc* inventories have been associated with short term projects. The St. Christopher National Trust on St. Kitts and the Nevis Historical and Conservation Society on Nevis do play a role in capturing some data on birds but this role is unclear at this time. It is proposed that the St. Christopher National Trust and the Nevis Historical and Conservation Society take charge of the monitoring of birds on the Peninsula particularly at the ponds, Nag's Head and Booby Island.

The marine environment is under the jurisdiction of the Fisheries Department of both islands. Under the Fisheries Act, this Department is responsible for the development of a Fisheries Management and Development Plan to sustainably manage the Federations' fisheries resources. Also as noted above, this Department can also declare Fishing Priority Areas and Marine Reserves. Notwithstanding this, there is some merit to considering the creation of a Management Committee for identified marine areas to assume the role of management of these areas. This Committee would be co-chaired by the Fisheries Departments in St. Kitts and Nevis, and would include representatives from other government departments, conservationists, water sports operators, and representation from the nearest communities.

Planning approvals and enforcement of planning regulations is the responsibility of the Physical Planning Departments in both St. Kitts and Nevis. It is envisaged that these departments will continue to be responsible for preventing inappropriate development adjacent to turtle nesting beaches, since (as before) there is no need (nor any logic) to transfer these responsibilities to a new agency or to another existing agency.

7.6.2.2 Management Plan

The development of a Management Plan for these Marine Management Areas will be an early requirement for their successful implementation.

7.6.2.3 Staffing

Ecoengineering envisages that (as for CFRNP – see Section 7.3.2.3, above) there would be full-time staff members for the operation and maintenance of these MMAs, and that they will either be employees of the appropriate Fisheries Departments in St. Kitts and in Nevis, or they will work directly for the Management Committee of the MMAs. However, the planners will continue to work for the respective Physical Planning Departments in St. Kitts and in Nevis.

7.6.3 Financing Strategies

Based on recent costs for preparing Management Plans for Protected Areas in the West Indies, we estimate that the preparation of a Management Plan for these proposed marine management areas will be of the order of \$US 35,000.00.

No estimates were available to Ecoengineering on the budget requirements for these proposed Marine Protected Areas. However, an appreciation can be gained by what is being spent at other sites in the West Indies. According to the Sustainable Financing Study, annual expenditure at Tobago Keys Marine Park in St. Vincent and the Grenadines is of the order of \$US 750,000.00. Similarly, at North East Marine Management Area in Antigua and Barbuda, the annual expenditure is \$US 320,000.00. Given the respective sizes of those two marine protected areas, a “ballpark” estimate for the two proposed marine protected areas in St. Kitts and Nevis is likely to be of the order of \$US 500,000.00.

Funding for Marine Areas will be from two sources:

- User Fees associated with use of the resources within the marine area such as for diving, snorkelling, mooring etc; and
- Public Service Salaries (for members of the Fisheries Department) for the day-to-day management activity such as enforcement of management zones etc.

According to the Sustainable Financing Study, Marine Protected Areas in the West Indies have a successful track record of generating user fees which approach the level of their expenditure (in contrast to the land-based protected areas, which generally appear to require significant subventions and grants.

Responsibility for granting (or denying) planning permission in and around turtle nesting beaches, and for taking enforcement action against offenders, lies with the Physical Planning Departments. Funding for those activities will therefore come from the normal budget of those departments.

7.7 Turtle Nesting Beaches

Turtle nesting beaches are of critical importance to biodiversity, and they play a key role in the life cycle of endangered marine turtles. Some of these beaches fall within other units of the proposed Protected Areas System, such as the marine management area along the Southeast Peninsula of St. Kitts and across The Narrows to Nevis.

7.7.1 NCEMA Categories

As noted in Section 7.6.1, Turtle Nesting Beaches would be classified under NCEMA as Category V Area of Special Concern; that is, a place or site needing special protection and controlled use in order to stabilize or restore important ecological features or functions. This classification would prevent killing or injury to the turtles themselves as well as avoiding factors which would discourage laying of eggs (light, noise, etc). However, it would allow other uses on the beach, especially during turtle nesting season.

7.7.2 Management Strategies

The most important management functions with regard to turtle nesting beaches are:

- Prevention of interference with nesting turtles; and
- Enforcement of Planning Regulations to prevent development which would result in excessive noise or artificial lighting of the beaches during the nesting season.

At present, patrolling of turtle nesting beaches and recording the numbers of nests are undertaken by the St. Kitts Sea Turtle Monitoring Network and the Nevis Turtle Group in conjunction with the respective Fisheries Departments. Ecoengineering envisages that these same groups will continue to undertake these tasks. A draft Management Plan for turtles has been prepared, and this includes specific recommendations for protecting these species.

Planning approvals and enforcement of planning regulations is the responsibility of the Physical Planning Departments in both St. Kitts and Nevis. It is envisaged that these departments will continue to be responsible for preventing inappropriate development adjacent to turtle nesting beaches, since (as before) there is no need (nor any logic) to transfer these responsibilities to a new agency or to another existing agency.

7.7.3 Financing Strategies

Based on discussions with Government Agencies, the primary need for funding on Turtle Nesting Beaches relates to transport of persons to and from the beaches during the turtle nesting season. There appears to be no regular source of funding to support this activity, and that in turn has hindered its effectiveness. Such funding may be sourced from a user fee or from a government subvention or grant from a funding agency. Within the Caricom Region where several of the most important turtle nesting beaches in Trinidad have been declared prohibited areas, the authorities have levied a small “entrance fee” for turtle watching during the nesting season. This fee is used to support the building of facilities at these beaches and to support monitoring and tagging of turtles. That model may be applied in St. Kitts and Nevis.

Responsibility for granting (or denying) planning permission in and around turtle nesting beaches, and for taking enforcement action against offenders, lies with the Physical Planning Departments. Funding for those activities will therefore come from the normal budget of those departments.

7.8 Salt Ponds

Salt Ponds in St. Kitts are special systems which sustain salt resistant species during the dry season. They also attract both local and migratory bird species. As such, the salt ponds play a key role in preserving biodiversity. Unfortunately, salt ponds have been adversely affected by the effects of adjacent development, modification of their flow regimes and contaminated discharges and runoff. Five of the ponds on the Southeast Peninsula have been earmarked for development and will cease to function as salt ponds.

7.8.1 NCEMA Categories

Under the NCEMA, Salt Ponds would be classified as “Areas of Special Concern” (Category V); that is, sites needing special protection and controlled use in order to stabilize or restore important ecological features or functions. This classification would not accommodate further alterations which would affect the basic hydraulics of the ponds (approval of ponds for development as marinas, or opening up the ponds to the sea, for example).

7.8.2 Management Strategies

The most important management functions with regard to salt ponds are:

- Enforcement of Planning Regulations to prevent development which would alter the basic hydraulics of the ponds;
- Enhancement and Rehabilitation of selected ponds for eco-tourism and education; and
- Monitoring and policing to detect and prevent illegal alterations of the ponds.

Planning approvals and enforcement of planning regulations is the responsibility of the Department of Physical Planning in St. Kitts, and enhancement of selected ponds would be the responsibility of the Environment Department in St. Kitts. There is no need (nor any logic) to transfer these responsibilities to a new agency or to another existing agency. However, it is important that the objectives of preserving the remaining ponds (and enhancing selected ponds) be accepted at the highest decision-making level of the Government of St. Kitts and Nevis. In the absence of such acceptance of these objectives, it will not be possible for the Physical Planning Department to refuse planning applications on this basis, nor will it be possible for either the Planning Department or the Environment Department to take action against offenders.

7.8.3 Financing Strategies

Responsibility for granting (or denying) planning permission in and around the salt ponds, and for taking enforcement action against offenders, lies with the Physical Planning Department. Funding for those activities will therefore come from the normal budget of that department. In contrast, funding for the enhancement and rehabilitation of selected ponds will require a special Government subvention, a grant from an International Donor Agency, or a grant from the proposed Environmental Trust Fund. The cost of such enhancement and rehabilitation work would be site specific and cannot be estimated until the nature of each restoration has been determined. The specialized, detailed studies needed to determine the nature of those restoration projects are outside the scope of this study.

7.9 Freshwater Lagoons

Freshwater Lagoons in Nevis also have a special function as part of the drainage system and attract both local and migratory bird species. As such, they play a key role in preserving biodiversity. Freshwater Lagoons have been under threat due to adjacent development, modification of their flow regimes and (to a lesser extent) contaminated discharges and runoff.

7.9.1 NCEMA Categories

Under the NCEMA, Freshwater Lagoons would also be classified as “Areas of Special Concern” (Category V); that is, sites needing special protection and controlled use in order to stabilize or restore important ecological features or functions. Again, this classification would not accommodate alterations which would affect the basic hydraulics of the lagoons.

7.9.2 Management Strategies

As with Salt Ponds, the most important management functions with regard to freshwater lagoons are:

- Enforcement of Planning Regulations to prevent development which would alter the basic hydraulics of the ponds;
- Enhancement and rehabilitation of selected ponds for eco-tourism and education; and
- Monitoring and policing to detect and prevent illegal alterations of the ponds.

Planning approvals and enforcement of planning regulations is the responsibility of the Department of Physical Planning in Nevis. As before, there is no need (nor any logic) to transfer this responsibility to a new agency or to another existing agency. However, it is important that the objectives of preserving them be accepted at the highest decision-making level of the Nevis Island Administration. In the absence of such acceptance of these objectives, it will not be possible for the Nevis Physical Planning Department to refuse planning applications on this basis, nor will it be possible for them to take action against offenders.

7.9.3 Financing Strategies

Responsibility for granting (or denying) planning permission in and around the freshwater lagoons, and for taking enforcement action against offenders, lies with the Physical Planning Department. Funding for those activities will therefore come from the normal budget of that department. In contrast, funding for the enhancement and rehabilitation of selected lagoons will require a special Government subvention, a grant from an International Donor Agency, or a grant from the proposed Environmental Trust Fund. As noted before, the cost of such enhancement and rehabilitation work would be site specific and cannot be estimated until the nature of each restoration has been determined. The specialized, detailed studies needed to determine the nature of those restoration projects are outside the scope of this study.

7.10 The Ghauts

Ghauts form an integral part of the island-wide surface drainage system, conveying rainfall runoff from the heights of the mountains to the sea. In St. Kitts they are under threat from illegal sand mining and unauthorized built development, and in Nevis from unauthorized built development.

7.10.1 NCEMA Categories

Under the NCEPA and NCEMA, Ghauts are classified as “Areas of Special Concern” (Category V). This category is further explained as sites needing special protection and controlled use in order to stabilize or restore important ecological features or functions. This classification would accommodate legal sand mining in St. Kitts as “controlled use”.

7.10.2 Management Strategies

The most important management functions with regard to Ghauts are:

- Enforcement of Planning Regulations to prevent unauthorized development in the Ghauts;
- Monitoring and policing to detect and prevent illegal sand mining;
- Regulation of legal sand mining to ensure sustainability; and
- Regulation of quarrying in the vicinity of ghauts to prevent sedimentation.

Enforcement of planning regulations is the responsibility of the Department of Physical Planning and the Environment in St. Kitts and the Department of Physical Planning in Nevis. Enforcement of planning regulations should remain the responsibility of the two Physical Planning Departments. There is no need (nor any logic) to transfer this responsibility to a new agency or to another existing agency.

During meetings with Government Agencies in St. Kitts, some uncertainty was expressed as to the responsibility for policing illegal sand mining. The Department of the Environment held the view that such policing was the responsibility of the Ministry of

Public Works since they regulate legal sand mining. In contrast, the Ministry of Works indicated that their responsibility was only for legal sand mining whereas illegal sand mining is an environmental issue. It is strongly recommended that this question be resolved to ensure that illegal sand mining is effectively and aggressively policed. Once this issue has been resolved, responsibility for policing illegal sand mining will remain with the respective agency. As before, there is no need (nor any logic) to transfer this responsibility to a new agency or to another existing agency.

Regulation of legal sand mining in St. Kitts is clearly the responsibility of the Ministry of Works. It does not appear that the Department of the Environment is formally consulted when decisions are made to establish legal sand mines in Ghauts. It is recommended that such consultation be established to ensure that environmental issues are fully integrated into the site selection process for legal sand mines. In parallel with this, the Government of St. Kitts and Nevis may consider undertaking a Strategic Impact Assessment to identify specific locations which may be suitable for legal sand mining in the future. It is expected that regulation of legal sand mining will remain the responsibility of the Works Department with advice from the Department of the Environment. As before, there is no need (nor any logic) to transfer this responsibility to a new agency or to another existing agency.

The regulation of quarrying in the vicinity of ghauts in Nevis is the responsibility of the Nevis Housing and Land Development Co-operation and the Physical Planning Unit. The Nevis Housing and Land Development Co-operation provide the lease terms and conditions for the land if it is owned by the Nevis Island Administration while the Physical Planning Unit will address the issues of zoning and operations (JECO Caribbean Inc. 2007).

7.10.3 Financing Strategies

As stated above, responsibility for managing the Ghauts lies with existing Government agencies, and is funded out of their normal budgets. It is expected that this arrangement will continue. However, funding for a Strategic Impact Assessment (estimated to cost \$US 50,000.00 to \$US 60,000.00) will require a special Government subvention or may be funded by an International Donor Agency. If specific restoration work is deemed necessary in any of the Ghauts (to repair the effects of illegal sand mining or unauthorized development) this will also require a special government subvention. The cost of such restoration work would be site specific and cannot be estimated until the nature of each restoration has been determined.

7.11 Dry Forests

As noted in Section G.10.6, dry forests are a distinct forest type from rainforest and the conservation of this type of forest makes a different contribution to the overall biodiversity of the Federation. In Section G.10.1 it is recommended that examples of this type of forest should be protected under the Systems Plan at the following locations:

- Slope of Brimstone Hill (St. Kitts);
- Selected Peak(s) of the Southeast Peninsula (St. Kitts); and
- Northernmost, Southeast and Southwest slopes of Nevis Peak.

7.11.1 NCEMA Categories

Under the NCEMA, the selected areas of dry forest would be classified as “Areas of Special Concern” (Category V). This category is further explained as sites needing special protection and controlled use in order to stabilize or restore important ecological features or functions. This classification would accommodate a limited amount of hiking trails, birdwatching, etc.

7.11.2 Management Strategies

The first management action required for this type of forest is to identify a suitable area of dry forest on the Southeast Peninsula for inclusion in the Protected Area Systems Plan. This would require consultation between the Environment Department, the Department of Physical Planning and the South-East Peninsula Land Development and Conservation Board to select potential candidate site(s). This would be followed by detailed ecological / forestry studies to recommend the specific site(s) to be protected under the Systems Plan. Such consultation and ecology / forestry studies are outside the scope of this assignment.

Once the site(s) on the Southeast Peninsula have been identified, Ecoengineering recommends that, for management and financing purposes, it / they should be amalgamated into the Central Forest Reserve National Park, and the Management Plan for the CFRNP should be modified to reflect this. As such:

- ▶ the dry forest at Brimstone Hill will be managed as part of the Brimstone Hill Fortress National Park (see Section 7.2.2);
- ▶ the dry forest on the Southeast Peninsula will be managed as part of the Central Forest Reserve National Park, (see Section 7.3.2); and
- ▶ the dry forest on Nevis will be managed as part of the Nevis Peak National Park, (see Section 7.4.2).

7.11.3 Financing Strategies

It is expected that the studies to identify suitable areas on the Southeast Peninsula (estimated to cost \$US 10,000.00) would be financed by a subvention from the Government, or a grant from an international donor agency. Financing for recurrent and capital expenditure will be:

- ▶ as part of the Brimstone Hill Fortress National Park (see Section 7.2.3);
- ▶ as part of the Central Forest Reserve National Park, (see Section 7.3.3); and
- ▶ as part of the Nevis Peak National Park, (see Section 7.4.3).

7.12 Historic Charlestown

The largest historic site in the Federation after Brimstone Hill Fortress is Historic Charlestown, Nevis. The concept being pursued is to preserve the historical ambience of the area by maintaining the characteristic architecture and managing the physical planning process. Significant buildings which contribute to the concept of Historic Charlestown are Austin Hotel, Library Building, The Alexander Hamilton Museum, St. Theresa's Catholic Church, Slave Market, Wesleyan Holiness Church and Manse, Treasury Building and Customs House and Old Great House.

7.12.1 NCEMA Categories

Historic Charlestown is clearly a historic site (Category II) as defined in NCEMA. This is a place or site which is historic by reason of an association with the past and its part in the cultural or historical heritage of St. Kitts and Nevis. At the present time there exists a Physical Action Plan for Historic Charlestown, issued under the draft Nevis Physical Development Plan. It is recommended that designation of Charlestown as a “Priority Area” in the Physical Development Plan be formalized as soon as NCEMA becomes law.

7.12.2 Management Strategies

The most intensive management of Historic Charlestown at present is effected through the system of planning approvals administered by the Physical Planning Department. The effectiveness of this approach has been proved on one site close to the waterfront where developmental works were stopped when historical artefacts were discovered on the site. The Department has also been successful in encouraging the preservation of the typical Nevis architecture on a number of buildings which have recently been upgraded or rebuilt. There is also a role for the Nevis Department of Tourism since this Department currently manages a walking tour through Charlestown which includes stops at some of the buildings recommended for initial inclusion in the Protected Areas System.

On a wider scale, the organization in Nevis which presently spearheads the thrust to preserve heritage sites is the Nevis Historical and Conservation Society. The Executive Board of the society is composed of a minimum of eleven persons, including its President, Vice-president, Secretary, and Treasurer, and an ex officio member appointed by the Nevis Island Administration. The current membership of fifteen also includes an appointed 'Youth' representative.

Despite financial limitations, the Nevis Historical and Conservation Society appears to be doing a creditable job. Specifically, their efforts appear to be effective at the limited number of sites which they now manage. It is therefore recommended that, in the short term, management of Historic Charlestown be assigned to the Nevis Historical and Conservation Society actively supported by the Physical Planning Department and the Nevis Department of Tourism. This should not be an ad hoc arrangement. Instead, a formal Memorandum of Understanding should be executed between the three agencies. This MOU should address issues such as:

- Specific responsibilities,
- Policy-making,
- Policy Implementation,
- Staffing and Funding,
- Accounting and accountability, and
- Public Involvement.

7.12.3 Financing Strategies

At the present time, the Physical Planning Department and the Nevis Department of Tourism are funded through the normal Public Service budget, and the Nevis Historical and Conservation Society is funded through grants and membership fees. This situation is expected to continue into the future. The levying of an entrance fee is not practical since this is the working capital city of Nevis. However, there are guided walking tours in Historic Charlestown, and this offers an opportunity for part of the tour guides fee to be paid to the Nevis Historical and Conservation Society. This may be difficult to implement since the tour guides will resist the “sharing” of their income.

7.13 Other Historic Sites

In addition to Brimstone Hill Fortress and Historic Charlestown, there are a number of individual sites which have been identified as worthy of consideration for protection and rehabilitation under the Systems Plan:

- ▶ Old Road Town Petroglyphs, St. Kitts;
- ▶ Petroglyphs at Stonefort, St. Kitts;
- ▶ Belmont Estate, St. Kitts;
- ▶ Mansions Estate, St. Kitts;
- ▶ Spooner’s Ginnery, St. Kitts;
- ▶ Black Rocks, St. Kitts;
- ▶ Charles Fort, St. Kitts;
- ▶ Indian Castle Protected Area, Nevis;
- ▶ Fort Ashby, Nevis;
- ▶ Bath Hotel, Nevis;
- ▶ New River Estate, Nevis; and
- ▶ Fort Charles, Nevis.

7.13.1 NCEMA Categories

The sites listed above would fall under several categories as follows:

| CATEGORY | | | SITE |
|-------------|---|--|--|
| Category II | – | | <ul style="list-style-type: none"> ▶ Old Road Town Petroglyphs, St. Kitts; ▶ Petroglyphs at Stonefort, St. Kitts; ▶ Belmont Estate, St. Kitts; ▶ Mansions Estate, St. Kitts; ▶ Spooner’s Ginnery, St. Kitts; ▶ Charles Fort, St. Kitts ▶ Indian Castle Protected Area, Nevis; ▶ Fort Ashby, Nevis; ▶ Bath Hotel, Nevis; ▶ New River Estate, Nevis; ▶ Fort Charles, Nevis. |
| Category VI | – | | <ul style="list-style-type: none"> ▶ Black Rocks, St. Kitts; ▶ Indian Castle Protected Area, Nevis; ▶ New River Estate, Nevis. |

7.13.2 Management Strategies

Different management strategies will apply in St. Kitts and Nevis.

7.13.2.1 St. Kitts

The Tourism Department is presently involved in maintaining the Petroglyphs at Old Road Town and also in developing the site at Black Rocks. The other sites with the exception of Charles Fort have been or are in the process of being vested in the St. Christopher National Trust. The membership of the Council of the St. Christopher National Trust is as follows:

- one President (elected from among the members for a period of 3 years)
- the Immediate Past President
- one Vice President (elected from among the members)
- one Honorary Treasurer
- two individual members representatives
- two corporate members representative

- one student members representative
- one life members representative
- one representative appointed by the Ministry of Culture
- one representative appointed by the Ministry of Environment
- one representative appointed by the Ministry of Tourism
- one nominee of the Brimstone Hill Fortress National Park Society
- one nominee of the Chamber of Industry and Commerce
- the Hon. Secretary and Executive Director who both shall be non-voting members

Information received during the consultation meetings on the draft Systems Plan Report is that Charles Fort will best be managed as part of Brimstone Hill Fortress National Park. This approach is endorsed in the St. Christopher National Physical Development Plan.

Ecoengineering supports the designation of the St. Christopher National Trust to have overarching responsibility for heritage sites in St. Kitts.

7.13.2.2 Nevis

In Nevis, heritage sites (except Historic Charlestown) are managed by the Nevis Historical and Conservation Society. Our comments on their work are contained in Section 7.12.2, and it is envisaged that they will be given responsibility for additional heritage sites in Nevis. The Executive Board of the Nevis Historical and Conservation is composed of a minimum of 11 persons including its president, vice-president, Secretary, Treasurer and an *ex officio* member appointed by the Nevis Island Administration. There is also a 'youth' representative.

7.13.3 Financing Strategies

Unlike larger heritage sites like Brimstone Hill and Historic Charlestown, these smaller sites attract lower numbers of visitors. In fact, their present attraction appears to be as part of a wider tour (such as a number of sites included in the St. Kitts Island Railway Tour). This affects the financing options which are realistically available for sites of this kind.

7.13.3.1 St. Kitts

At the present time, the Tourism Department is funded through the normal Public Service budget and the St. Christopher National Trust is funded through grants. This situation is expected to continue into the future. The levying of an entrance fee at these locations is likely to be problematic. The cost of a “fee collector” at each site is likely to approach or even exceed the value of the fees to be collected. An alternative would be to have the tour operator collect a global fee and pass this along to the St. Christopher National Trust. However, as was noted in Section 7.12.3, there may be resistance on the part of tour operators to “sharing” their fees; and this may result in under reporting of visitor numbers where there is no on-site representative of the St. Christopher National Trust.

7.13.3.2 Nevis

Of the sites in Nevis, Bath Hotel (as opposed to The Baths) clearly operates under a different financing arrangement than the other small heritage sites. Specifically, Bath Hotel is the office building for a Government agency and is therefore operated and maintained under the normal Public Service budget. It is not anticipated that Bath Hotel would be opened to visitors, since this would raise significant security concerns. However, it is expected that the exterior of the hotel would be maintained in its historic character to maintain the ambience of The Baths. Under this arrangement, funding for Bath Hotel is expected to continue as at present.

The levying of an entrance fee at the other locations is also likely to be problematic for the reasons given in Section 7.13.2.3.1.above.

8 THE WAY FORWARD

Table 8–1 summarizes the proposals for the Protected Areas Systems Plan as described in Chapters 5, 6 and 7. This chapter summarizes the actions which are required to implement the proposed Protected Areas Systems Plan for St. Kitts and Nevis, under the following headings:

- ▶ Approval of the Plan,
- ▶ Prioritizing Actions,
- ▶ Organizational Arrangements,
- ▶ Further Studies,
- ▶ Training, and
- ▶ Updating the Systems Plan.

8.1 Approval of the Plan

This Protected Areas Systems Plan has important implications for environmental policy, land use policy, tourism policy, fishing policy and educational policy in the Federation of St. Kitts and Nevis. As such, it requires approval at the highest level of decision-making: the Government of St. Kitts and Nevis as well as the Nevis Island Administration. To ensure buy-in to the concepts reflected in this plan, such approval should be preceded by consultation on the draft Plan in the form of focus group meetings with key stakeholders as well as presentation to and discussion with the public. This is recognized in the scope of services for this assignment, as two of the outputs are:

Task 5 – Finalization and Endorsement of Systems Plan: The consultant will undertake a consultative process for securing finalization of the plan based on the draft and its endorsement by national stakeholders and present the draft plan to the NICE, Steering Committee and National Technical Advisory Committee for OPAAL for feedback and recommendations prior to its finalization.

Task 6 – Submission of Finalised Systems Plan: The consultant will submit a finalised Systems Plan and draft Cabinet memo to ESDU, through the NICE, having incorporated feedback from the NTAC and other key national agencies.

TABLE 8-1: SUMMARY OF SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL OR SUGGESTED |
|---|--|
| Brimstone Hill Fortress National Park | |
| Area / Layout | <ul style="list-style-type: none"> • As presently defined, the hill and a quarter-mile buffer zone around it. |
| NCEMA Categories | <ul style="list-style-type: none"> • National Park (Category I). • Also listed as a World Heritage Site. |
| Management Agency | Existing: <ul style="list-style-type: none"> • Brimstone Hill Fortress National Park Society |
| Financing Strategies | <ul style="list-style-type: none"> • User Fees and Government Subvention for recurrent expenses. • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | Includes areas of Dry Forest. |
| Central Forest Reserve National Park | |
| Area / Layout | Areas in excess of 1,000 feet above mean sea level (needs to be marked in the field). |
| NCEMA Categories | National Park (Category I). |
| Management Agency | Proposed: <ul style="list-style-type: none"> • Department of Physical Planning and Environment, with inputs from Water Department, Department of Tourism and Department of Agriculture. |
| Financing Strategies | <ul style="list-style-type: none"> • Public Service Salaries for management expenses. • Public Service Salaries, User Fees and Government Subventions for recurrent expenses. • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | Very important to the public water supply. |
| Nevis Peak and Camps River National Park | |
| Area / Layout | Areas in excess of 1,000 feet above mean sea level, and extending down the Camps River Valley to the coast (needs to be marked in the field). |
| NCEMA Categories | National Park (Category I). |
| Management Agency | Proposed: <ul style="list-style-type: none"> • Nevis Physical Planning Department with inputs from Nevis Water Department, Nevis Tourism Authority and the Nevis Department of Agriculture. |
| Financing Strategies | <ul style="list-style-type: none"> • Public Service Salaries for management expenses. • Public Service Salaries, User Fees and Government Subventions for recurrent expenses. • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |

| ITEM | ACTUAL OR SUGGESTED |
|--|--|
| Other Comments | <ul style="list-style-type: none"> • Very important to the public water supply. • Includes an area of Dry Forest. |
| Basseterre Valley Aquifer National Park | |
| Area / Layout | 197 ha east of the town of Basseterre and west of the Conaree Hills |
| NCEMA Categories | <ul style="list-style-type: none"> • National Park (Category I). • Botanic Gardens (Category VII). |
| Management Agency | Proposed: <ul style="list-style-type: none"> • Basseterre Project Steering Committee. |
| Financing Strategies | <ul style="list-style-type: none"> • User Fees and Government Subventions for recurrent expenses. • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | Very important to the public water supply. |
| Marine Management Areas | |
| Area / Layout | <ul style="list-style-type: none"> • Southeast Peninsula and The Narrows. • Sandy Point Marine Management Area. |
| NCEMA Categories | <ul style="list-style-type: none"> • Marine Reserves (Category IV). • Nature Reserves (Category III). • Areas of Special Concern (Category V). |
| Management Agency | Proposed: <ul style="list-style-type: none"> • Fisheries Departments of both islands with inputs from other Government Departments, conservationists, water sports operators and representatives from nearby communities. |
| Financing Strategies | <ul style="list-style-type: none"> • Public Service Salaries for Planning Controls. • User Fees and Public Service Salaries for recurrent expenses. • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | These areas include salt ponds and turtle nesting beaches. |
| Turtle Nesting Beaches | |
| Area / Layout | <ul style="list-style-type: none"> • Within the proposed Marine Protected Areas at Southeast Peninsula and the Narrows and at Sandy Point. • Other locations around St. Kitts and Nevis. |
| NCEMA Categories | Areas of Special Concern (Category V). |
| Management Agency | Existing: <ul style="list-style-type: none"> • Fisheries Departments in St. Kitts and Nevis with inputs from the St. Kitts Sea Turtle Monitoring Network and the Nevis Turtle Group. |
| Financing Strategies | <ul style="list-style-type: none"> • User Fees and Public Service Salaries for recurrent expenses. |

| ITEM | ACTUAL OR SUGGESTED |
|---------------------------|---|
| Other Comments | Keys Turtle Nesting Beach is part of a proposal for the St. Mary's Biosphere Reserve under the UNESCO Man and the Biosphere Reserve Program. |
| Salt Ponds | |
| Area / Layout | <ul style="list-style-type: none"> • Within the proposed Southeast Peninsula and the Narrows Marine Management Area. • Other locations around St. Kitts. |
| NCEMA Categories | Areas of Special Concern (Category V). |
| Management Agency | Existing: <ul style="list-style-type: none"> • Department of Physical Planning and the Environment in St. Kitts. |
| Financing Strategies | <ul style="list-style-type: none"> • Public Service Salaries for planning controls. • Grants from International Donor Agencies and proposed Environmental Trust Fund for enhancement and rehabilitation of two Ponds (in the first instance) for ecotourism and educational purposes. |
| Other Comments | Ponds with existing planning permission to be radically modified were not included in this analysis. |
| Freshwater Lagoons | |
| Area / Layout | <ul style="list-style-type: none"> • Within the proposed Nevis Peak and Camps River National Park. • Other locations around Nevis. |
| NCEMA Categories | Areas of Special Concern (Category V). |
| Management Agency | Existing: <ul style="list-style-type: none"> • Nevis Department of Physical Planning, Nevis Tourism Department and Nevis Water Department. |
| Financing Strategies | Public Service Salaries for planning controls. |
| Other Comments | Some of these lagoons provide potable water to nearby parishes. These lagoons are part of larger protected areas as recommended in the Nevis Physical Development Plan. |
| The Ghauts | |
| Area / Layout | <ul style="list-style-type: none"> • Throughout both islands. • 81 in St. Kitts and 33 Ghauts in Nevis. |
| NCEMA Categories | Areas of Special Concern (Category V). |
| Management Agency | Existing: <ul style="list-style-type: none"> • Department of Physical Planning on both islands. • Ministry of Works for legal sand mining in Ghauts. |
| Financing Strategies | Public Service Salaries for planning controls. Government subvention or Grants from International Donor Agencies for conduct of a Strategic Impact Assessment. Government subvention for restoration works deemed necessary. |
| Other Comments | There is some question as to the agency responsible for policing illegal sand mining. |

| ITEM | ACTUAL OR SUGGESTED |
|-----------------------------|--|
| Dry Forests | |
| Area / Layout | <ul style="list-style-type: none"> • Within Brimstone Hill Fortress National Park, • A new area on the Southeast Peninsula of St. Kitts to be included in the CFRNP. • Within Nevis Peak and Camps River National Park. |
| NCEMA Categories | Areas of Special Concern (Category V). |
| Management Agency | Proposed: <ul style="list-style-type: none"> • Brimstone Hill Fortress National Park Society. • Nevis Physical Planning Department. |
| Financing Strategies | <ul style="list-style-type: none"> • Public Service Salaries for management expenses. • Public Service Salaries, User Fees and Government Subventions for recurrent expenses. • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | -- |
| Historic Charlestown | |
| Area / Layout | Within the town of Charlestown. |
| NCEMA Categories | Historic Site (Category II). |
| Management Agency | Existing: <ul style="list-style-type: none"> • Nevis Physical Planning Department. • Nevis Historical and Conservation Society. • Nevis Tourism Authority. |
| Financing Strategies | <ul style="list-style-type: none"> • Public Service Salaries for planning controls. • Government Subventions for recurrent expenses (User Fees may also be considered). • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | Other sites / buildings may be added after the designation of the initial listing of sites / buildings. |
| Other Historic Sites | |
| Area / Layout | Throughout St. Kitts and Nevis. |
| NCEMA Categories | Historic Sites (Category II). Scenic Sites (Category VI) |
| Management Agency | Existing: <ul style="list-style-type: none"> • St. Kitts Tourism Department. • Nevis Tourism Authority. • St. Christopher National Trust. • Nevis Historical and Conservation Society. |

| ITEM | ACTUAL OR SUGGESTED |
|----------------------|--|
| Financing Strategies | <ul style="list-style-type: none"> • Public Service Salaries for planning controls. • Government Subventions for recurrent expenses (User Fees may also be considered). • Grants from International Donor Agencies and proposed Environmental Trust Fund for capital expenditure. |
| Other Comments | Some of these historic sites are part of larger protected areas as recommended in the Nevis Physical Development Plan. |

8.2 Prioritizing Individual Units

This Section summarizes the information documented in Chapters 6 and 7 by providing a priority listing of actions to be taken in implementation of this Systems Plan. Action items have been prioritized into the following categories:

- Highest - Those actions which should be taken as early as practical.
- High - Those actions that should be taken within the next 3 years; and
- Medium - Those actions which should be taken within the next 5 years.

While there are no actions that will be described as having low priority, there are some that will take a longer period of time to implement either due to restrictions in time, money or other resources.

8.2.1 Highest Priority

The following actions are to be given the highest priority:

- Acceptance of this National Protected Areas Systems Plan.
- Enact and Assent to the National Conservation and Environmental Management Act (NCEMA).
- Operationalize the Environmental Trust Fund as envisaged under the NCEMA.
- Establish the National Conservation Commission as envisaged under the NCEMA.

- Declaration of Nevis Peak and Basseterre Aquifer as National Parks under the NCEMA Act, 2009.
- Revision of the Management Plan for the Central Forest Reserve to include joint management of the four key agencies (Physical Planning and Environment, Water Department, Tourism Department and Agriculture Department).
- Revision of the Management Plan for the Nevis Peak and Camps River Watershed to include joint management of the four key agencies (Physical Planning, Water Department, Nevis Tourism Authority and Nevis Department of Agriculture).
- Declaration of Booby Island as a Nature Reserve in accordance with the NCEMA Act.
- Conduct of ecological studies to determine the extent of Nag's Head Nesting Site.
- Conduct of fisheries studies to determine the boundaries of fish and shellfish propagation areas to be included in the SEPNMMA.
- Declare Keys Turtle Nesting Beach (St. Kitts) as a beach of "Special Concern" under the NCEPA Act.
- Declare Sea Haven Turtle Nesting Beach (Nevis) as a beach of "Special Concern" under the NCEPA Act.
- Completion of an assessment of the structures and a determination of the boundaries at Spooner's Ginnery, Mansions Estate, Belmont Estate, Charles Fort, Indian Castle, Fort Charles and Fort Ashby to determine any restoration works that will be needed.

8.2.2 High Priority

The following actions are to be given high priority:

- Adjustment of the Admission Fees for the BHFNP.

- Declaration of Nag's Head as a Nature Reserve in accordance with the NCEMA Act.
- Enhancement and Rehabilitation of Frigate Bay and Half Moon Bay Salt Ponds.
- Conduct ecological studies to determine the extent of dry forest on the S. E. Peninsula that is considered suitable for protection.
- Conduct fisheries studies to determine the boundaries of fish and shellfish propagation areas to be included in the SPMMA.
- Declaration of Marine Reserves within the SEPNMMA and SPMMA under the Fisheries Act, 1984.
- Review regulations on closed season for turtle harvesting with a view to recommending a moratorium on all harvesting of turtles and eggs both onshore and in the marine environment.
- Declaration of Muddy Point Salt Pond and Greatheeds Pond as protected areas where no additional development will be permitted.

8.2.3 Medium Priority

The following actions are to be given medium priority:

- Conduct a Strategic Environmental Impact Assessment to identify specific locations for legal sand mining.
- Amalgamation of identified areas of dry forest on the S. E. Peninsula into the CFRNP.
- Conduct restoration works at New River Estate to bring the trails and associated infrastructure up to a level suitable for use by tourists.

8.3 Organizational Arrangements

A number of institutional arrangements need to be put in place as part of the implementation of the Protected Areas Systems Plan for St. Kitts and Nevis:

- Establishment of the proposed National Conservation Commission (see Section 7.1.2);
- Establishment of a working relationship between the St. Kitts Department of Physical Planning and the Environment, Water Department, Department of Tourism and the Department of Agriculture relative to the management of the Central Forest Reserve National Park (see Section 7.3.2).
- Establishment of the proposed Basseterre Valley Project Steering Committee (see Section 7.5.2).
- Establishment of the proposed Nevis Peak National Park Advisory Committee to manage the Nevis Peak and Camps Valley National Park (see Section 7.4.2).

8.4 Further Studies

This section addressed two levels of further studies that will be required:

- Further studies for the implementation of this Systems Plan; and
- Site Specific Plans for Individual Units.

8.4.1 Implementation of Systems Plan

A number of further studies will also be required to fill data limitations described in Section 1.5.1:

- The Environmental and Socio-Economic Studies of the Central Forest Reserve National Park (see Section 7.3.1).
- Detailed ecology survey of Nevis Peak and Camps Valley National Park, to identify areas of ecological significance which require a higher level of protection (see Section 7.4.1).

- Ecological Studies to establish the area to be reserved for the protection of the bird nesting sites at Nags Head (see Section 7.6.1).
- Ecology / Fisheries Study by the Fisheries Departments in St. Kitts and Nevis to establish the area to be reserved for the protection of fish and shellfish propagation areas in the proposed Southeast Peninsula and The Narrows Marine Management Area and the Sandy Point Marine Management Area (see Section 7.6.1).
- Strategic Impact Assessment on the winning of sand from the Ghauts in St. Kitts (see Section 7.10.2).
- Ecology / Forestry Study to identify a suitable area of Dry Forest in the Southeast Peninsula for inclusion in the Protected Areas System Plan (see Section 7.11.2).

8.4.2 Site Specific Plans

Once Individual units have been declared to be included as part of the National System of Protected Areas, Site Specific Plans must be prepared to guide the implementation of these units. In many instances, these plans will be in the form of a Management Plan, however, some sites may require more specialised plans such as Operational Plans. The NCEMA Act 2009 (Draft) identifies a number of components that should be included in Management Plans for individual sites:

- a) the long term goals of the protected area and the associated conservation, restoration, research, educational and recreational objectives of the area to meet these goals;
- b) a description of the manner and time frame within which various management measures will be undertaken, including the kinds of activities that will be regulated or prohibited;
- c) a statement of the projected capital and recurrent costs of implementing the management plan and an analysis of funding strategies for defraying these expenses; and
- d) a monitoring plan, including objective verifiable indicators for the determination of the effectiveness of management strategies.

- e) compliance requirements, commitments, or expected responsibilities under multilateral international and regional conventions, agreements, or programmes, including those related to designation of specially protected areas, wildlife on land or in the sea, conservation or migratory species, protection of wetlands for endangered waterfowl, conservation of biological diversity, protection of wildlife controlled in international trade and preservation of world heritage sites.

8.5 Training

This section discusses training at two levels:

- ▶ A Workshop on the Protected Areas Systems Plan, and
- ▶ More in-depth Training.

8.5.1 Workshop

Once this Systems Plan has been approved, it will be very useful to sensitize stakeholders to its contents. Ecoengineering therefore recommends that a 2- or 3- day workshop be held in St. Kitts and Nevis to discuss the approved Systems Plan. At this workshop, key stakeholders including Government Agencies and others will be familiarized with the plan and their expected roles under the plan.

8.5.2 In-depth Training

Training will play a critical role in the implementation of this National Protected Areas System Plan as well as in the establishment of individual System Units and the Management Plans for these units. Under the OPAAL project, a Protected Areas Training Needs Assessment was conducted to determine *site specific and national training needs to inform the design and implementation of training program(s) for building the capacity of stakeholders in protected area planning and management; and sustainable livelihoods* (Parsram, 2007). This report identified training needs at the national level, the site level and training for associated livelihood stakeholders. A summary of training needs identified in this report for the national and site level is as follows:

National Level

- Organizational Management and Leadership;
- Communications;
- Project Management;
- Protected areas financing;
- Fundraising and resource mobilization;
- Partnerships and Networking;
- Project Monitoring and Evaluation;
- Natural resources monitoring and assessments;
- Co-management;
- Ecosystems/conservation management;
- Site operations and Management;
- Community Outreach and management;
- Protected area planning methods and management plan development;
- Protected areas policy analysis, development and implementation;
- Enforcement;
- Tourism and sustainable livelihoods management; and
- Education awareness and outreach.

Site Level

- Organizational Management and Leadership;
- Communications;
- Project Management;
- Protected areas financing;
- Fundraising and resource mobilization;
- Partnerships and Networking;
- Project Monitoring and Evaluation;
- Natural resources monitoring and assessments;
- Co-management;
- Ecosystems/conservation management;
- Site operations and Management;
- Community Outreach and management;
- Protected area planning methods and management plan development;
- Protected areas policy analysis, development and implementation;
- Enforcement;
- Tourism and sustainable livelihoods management;
- Education awareness and outreach; and
- Socioeconomic and cultural resources.

8.6 Updating the Systems Plan

This systems plan is intended to be a “living document” which is updated on a regular basis as new information comes to hand. Specifically, it is envisaged that the following updates would be undertaken:

- ▶ A Major Update after about 36 months, when the results of Further Studies (see Section 8.3, above) have been completed.
- ▶ Routine updates every 5 years thereafter, based on experience with the Protected Area Systems Plan and additional information that would have come to hand.

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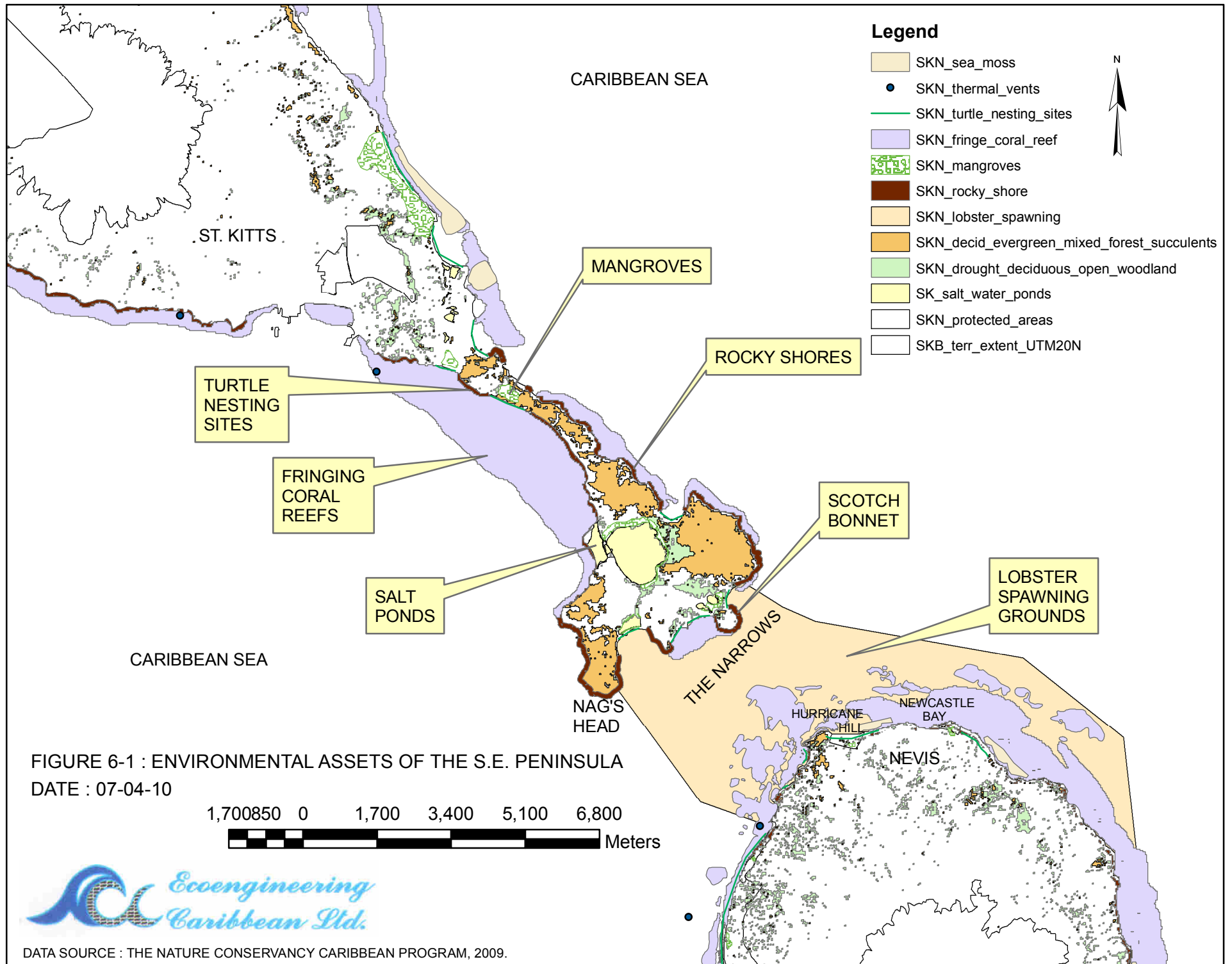
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APPENDIX A

FIGURES



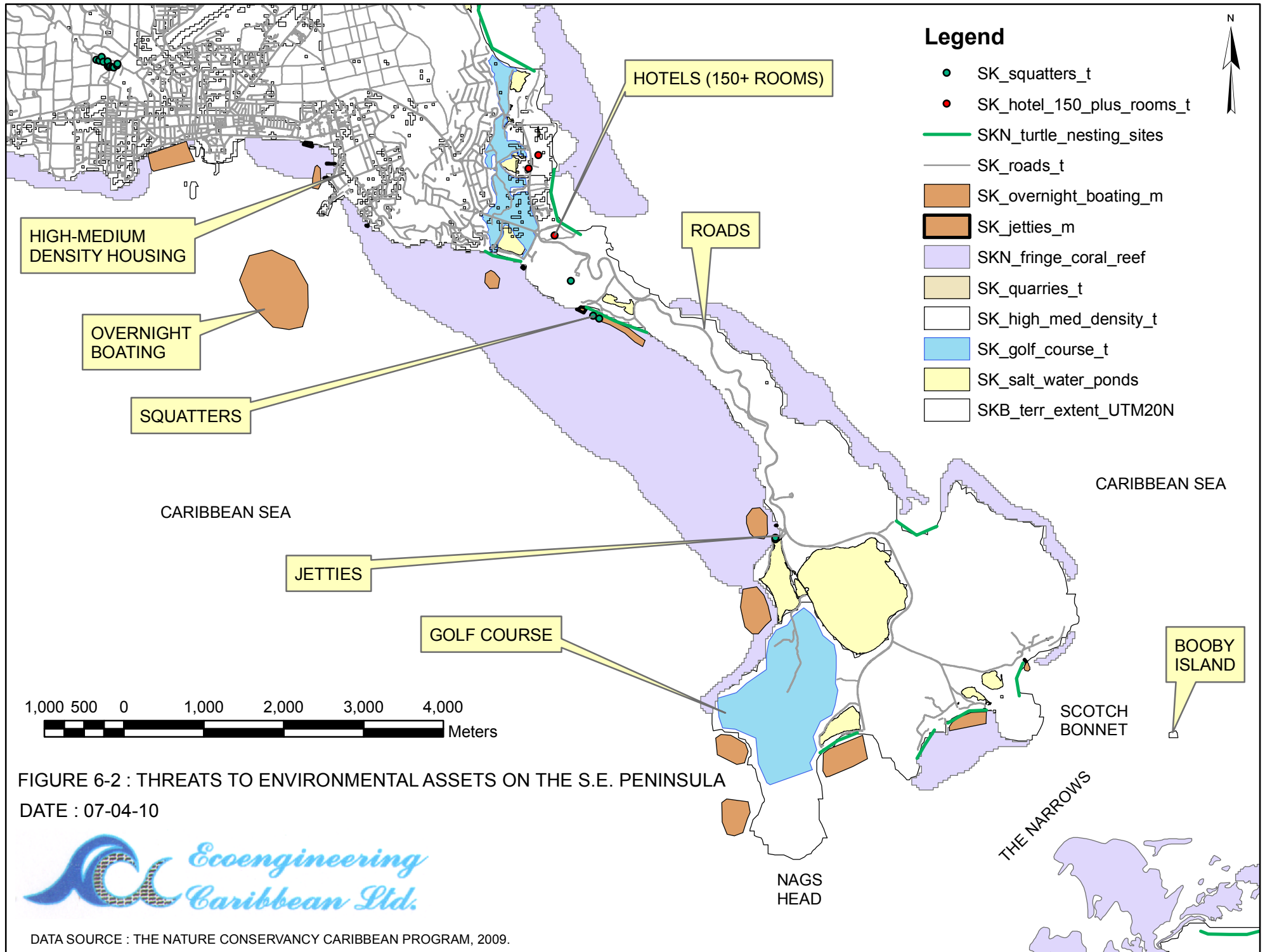


FIGURE 6-2 : THREATS TO ENVIRONMENTAL ASSETS ON THE S.E. PENINSULA

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.

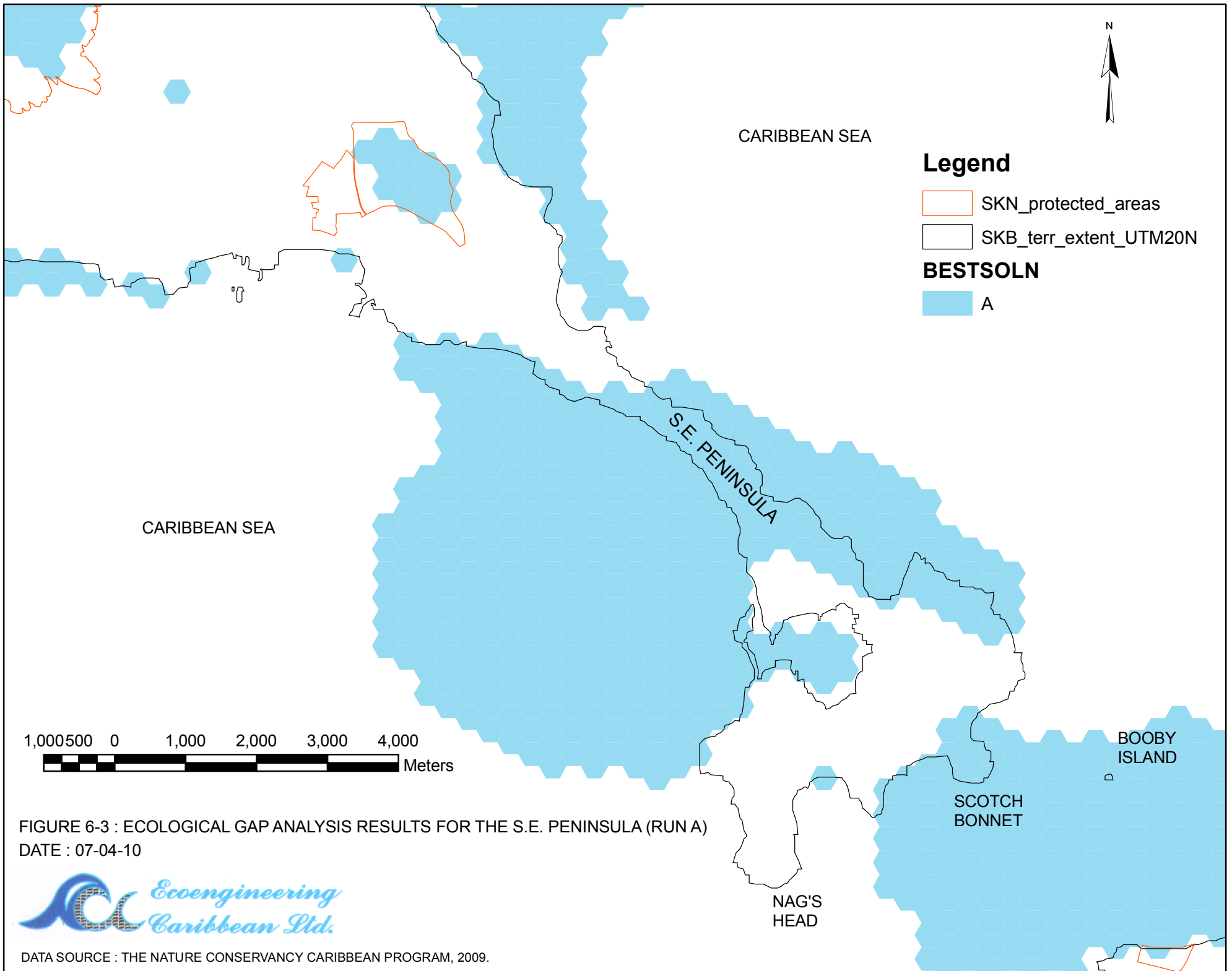


FIGURE 6-3 : ECOLOGICAL GAP ANALYSIS RESULTS FOR THE S.E. PENINSULA (RUN A)

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.

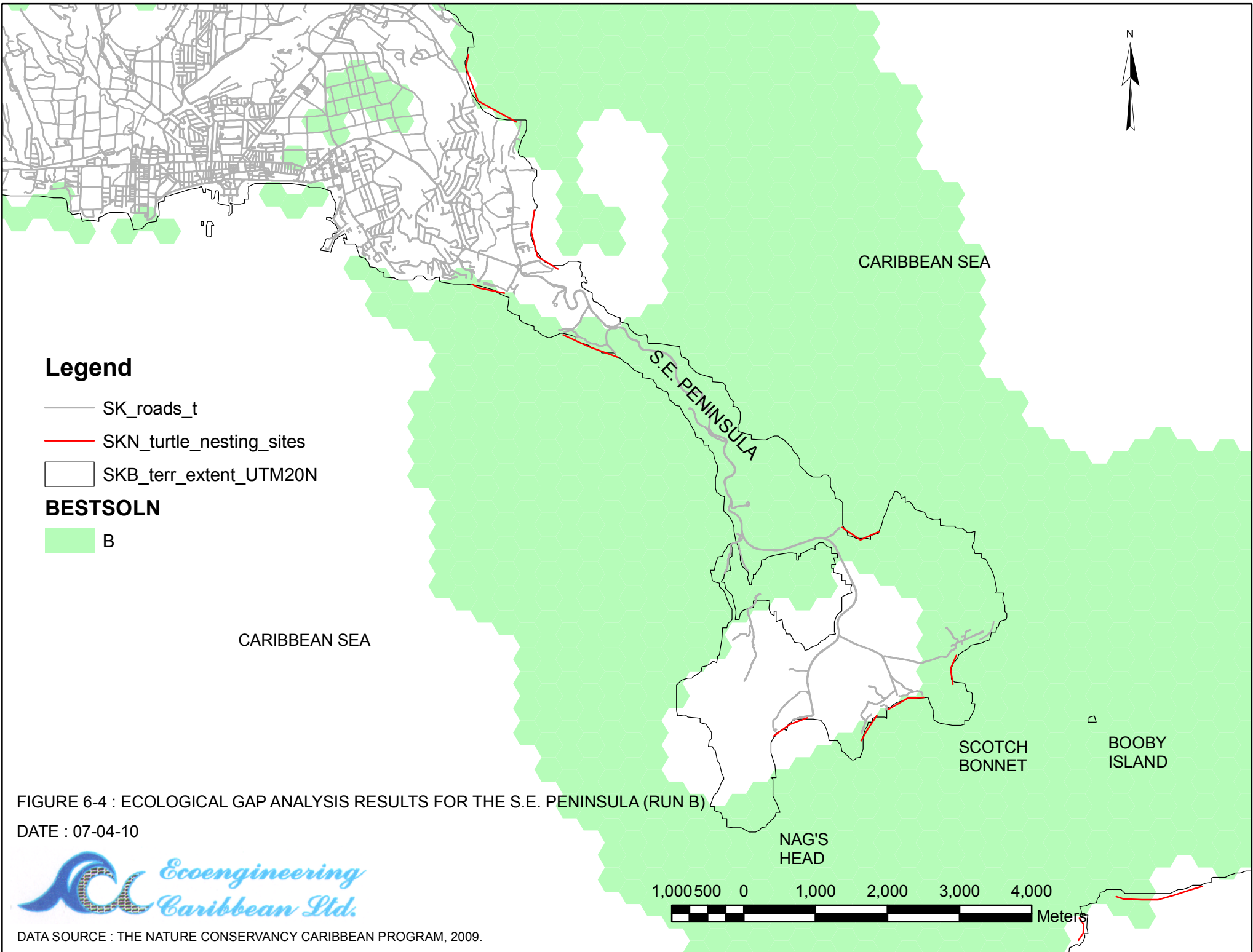
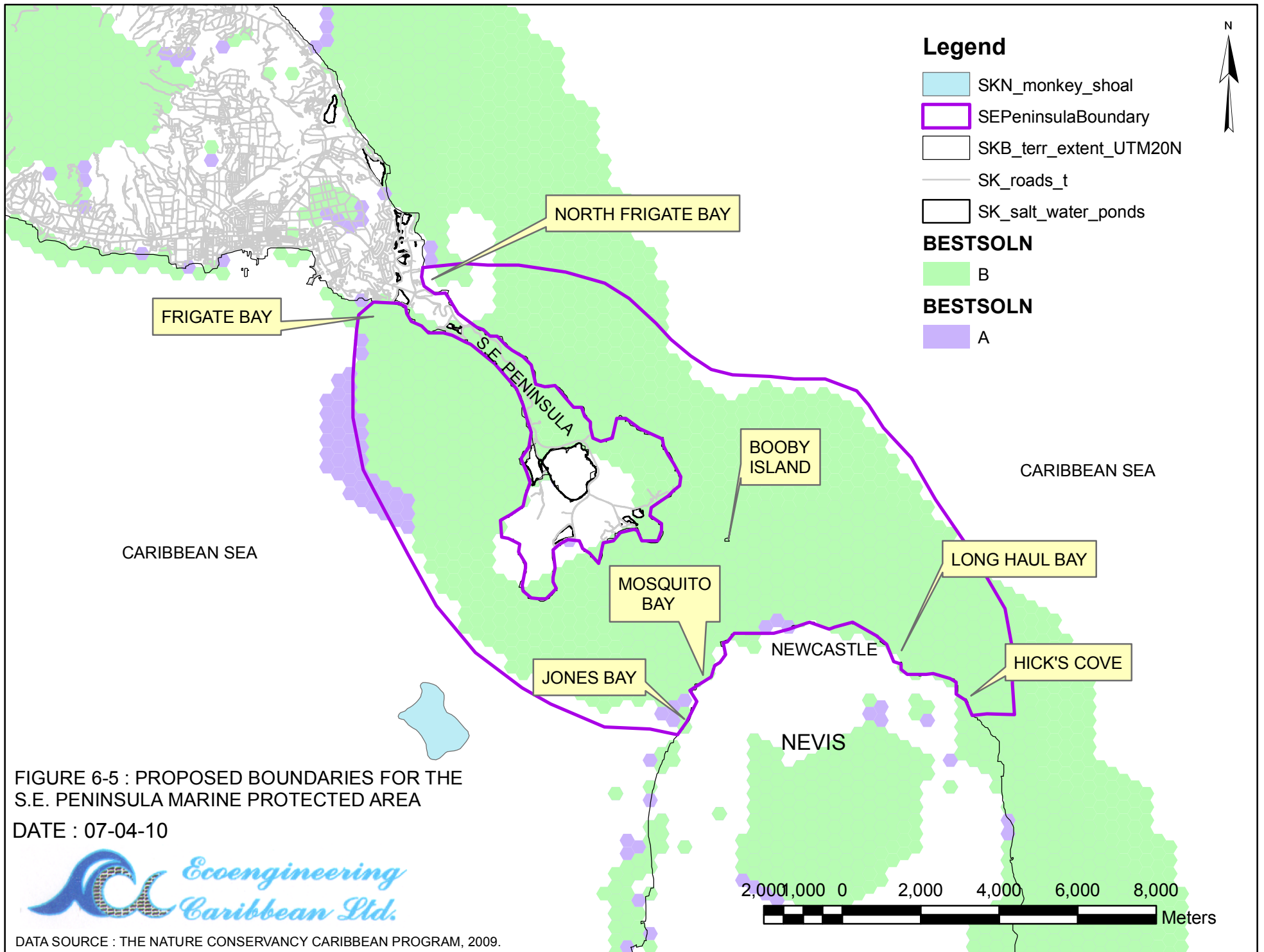


FIGURE 6-4 : ECOLOGICAL GAP ANALYSIS RESULTS FOR THE S.E. PENINSULA (RUN B)

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.



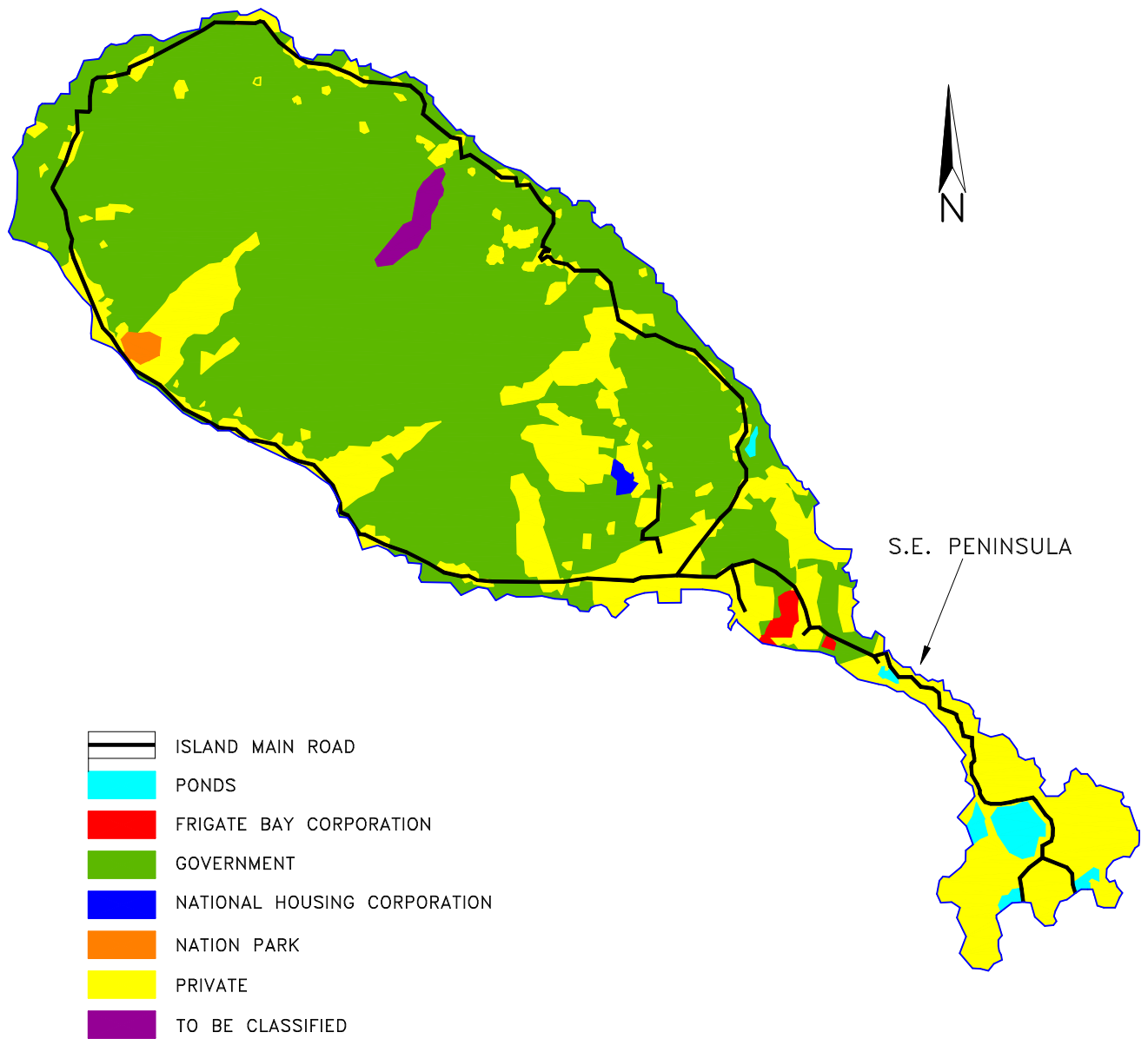


FIGURE 6-6 : LAND TENURE OF ST. KITTS
07-04-10

SANDY POINT

Legend

- SKN_thermal_vents
- SKN_turtle_nesting_sites
- SK_roads_t
- SKN_fringe_coral_reef
- SKN_rocky_shore
- SKN_protected_areas
- SKB_terr_extent_UTM20N



FIGURE 6-7 : ENVIRONMENTAL ASSETS OFF SANDY POINT

DATE : 07-04-10



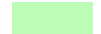
DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.

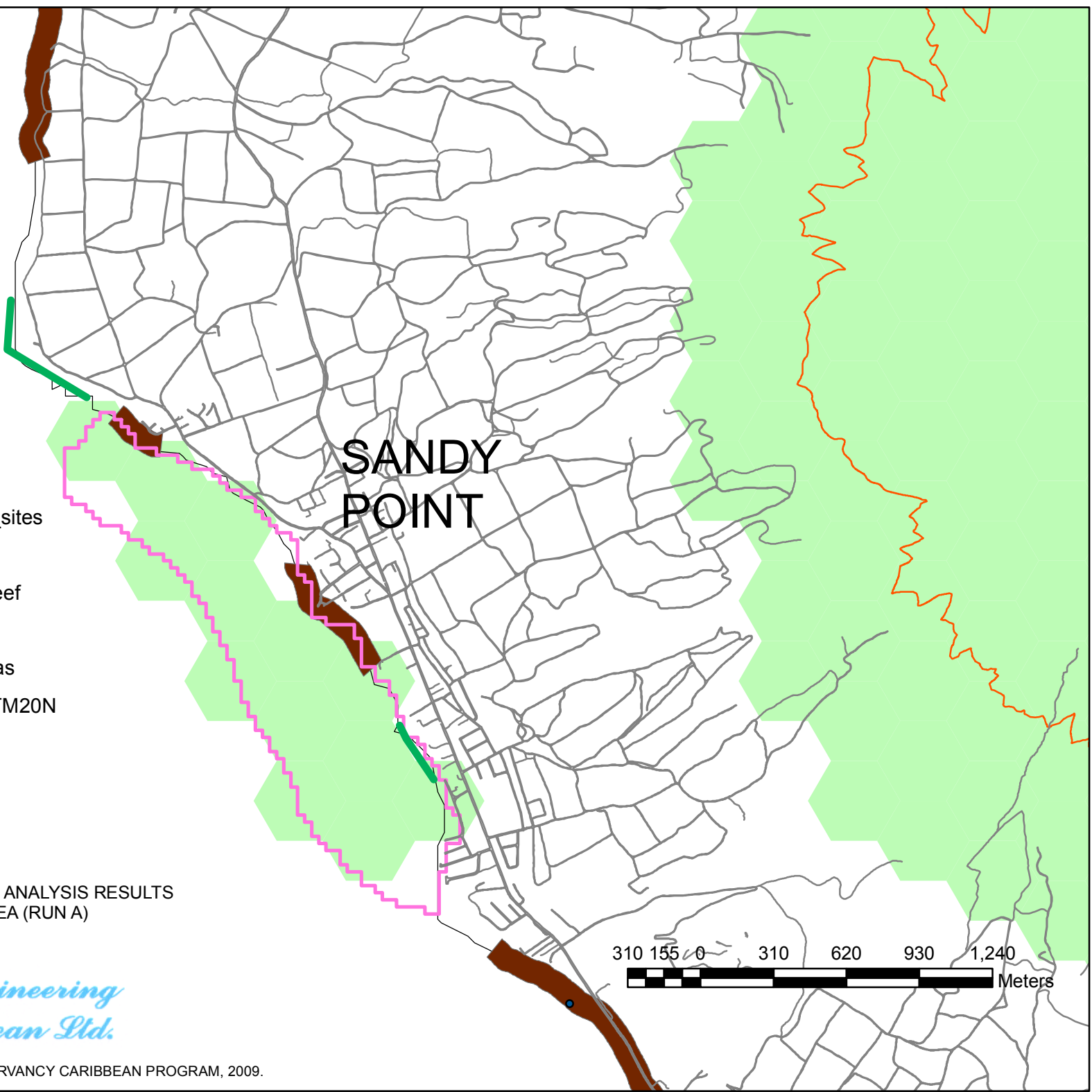


Legend

-  SKN_turtle_nesting_sites
-  SK_roads_t
-  SKN_fringe_coral_reef
-  SKN_rocky_shore
-  SKN_protected_areas
-  SKB_terr_extent_UTM20N

BESTSOLN

-  A



**SANDY
POINT**

FIGURE 6-8 : ECOLOGICAL GAP ANALYSIS RESULTS FOR SANDY POINT MARINE AREA (RUN A)

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.



SANDY POINT

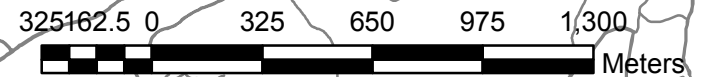
Legend

-  SKN_turtle_nesting_sites
-  SK_roads_t
-  SKN_fringe_coral_reef
-  SKN_rocky_shore
-  SKN_protected_areas
-  SKB_terr_extent_UTM20N

BESTSOLN








-  B

FIGURE 6-9 : ECOLOGICAL GAP ANALYSIS RESULTS FOR SANDY POINT MARINE AREA (RUN B)
DATE : 07-04-10



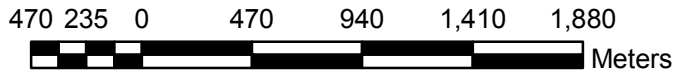


Legend

-  SKN_turtle_nesting_sites
-  SK_roads_t
-  SKN_fringe_coral_reef
-  SKN_rocky_shore
-  SKN_protected_areas
-  SKB_terr_extent_UTM20N
-  Sandy Point Boundary

BESTSOLN

-  B



SANDY POINT

FIGURE 6-10 : PROPOSED BOUNDARIES FOR THE SANDY POINT MARINE MANAGEMENT AREA

DATE : 07-04-10



FIGURE 6-11 : ENVIRONMENTAL ASSETS ASSOCIATED WITH KEYS TURTLE NESTING BEACH

DATE : 07-04-10

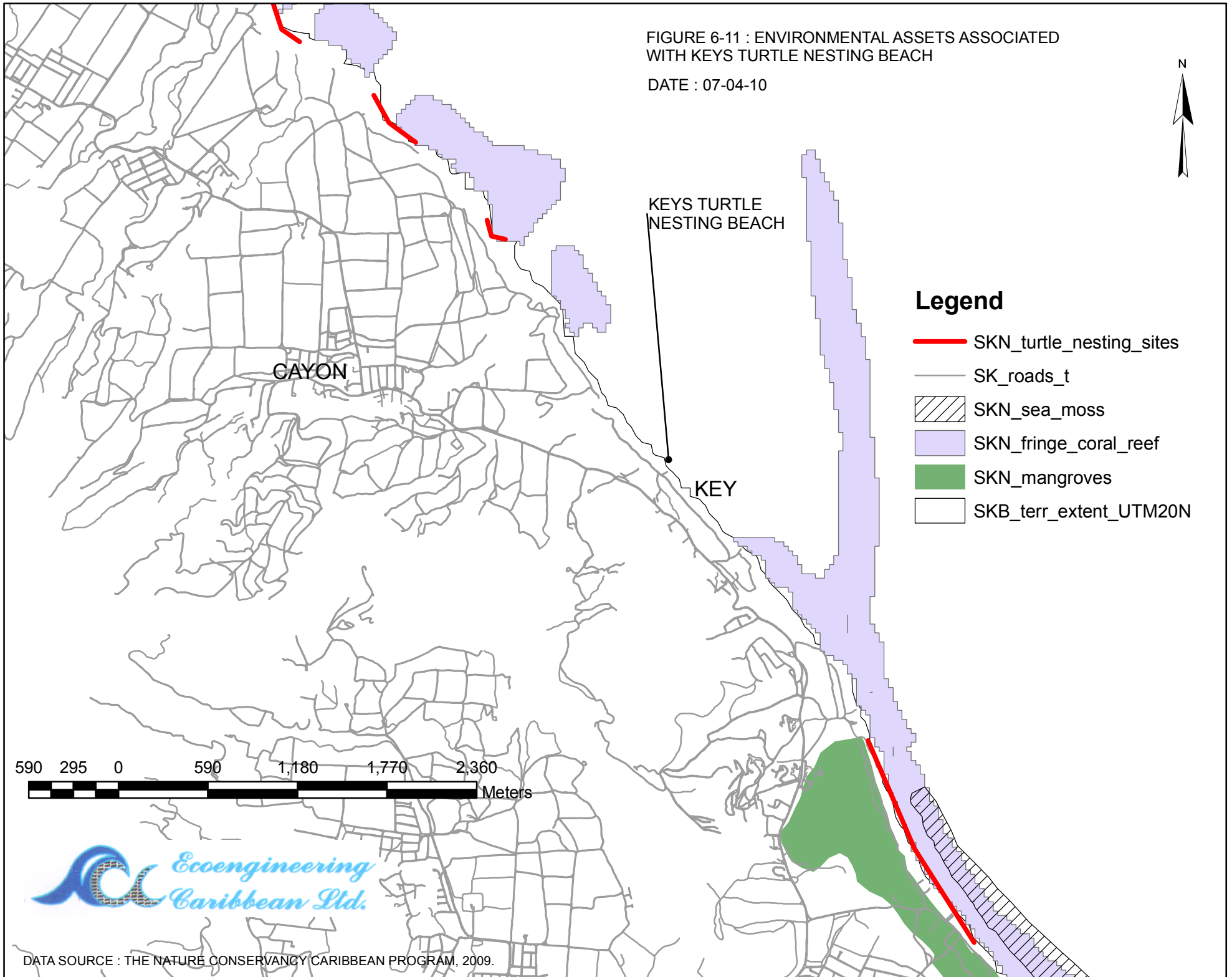
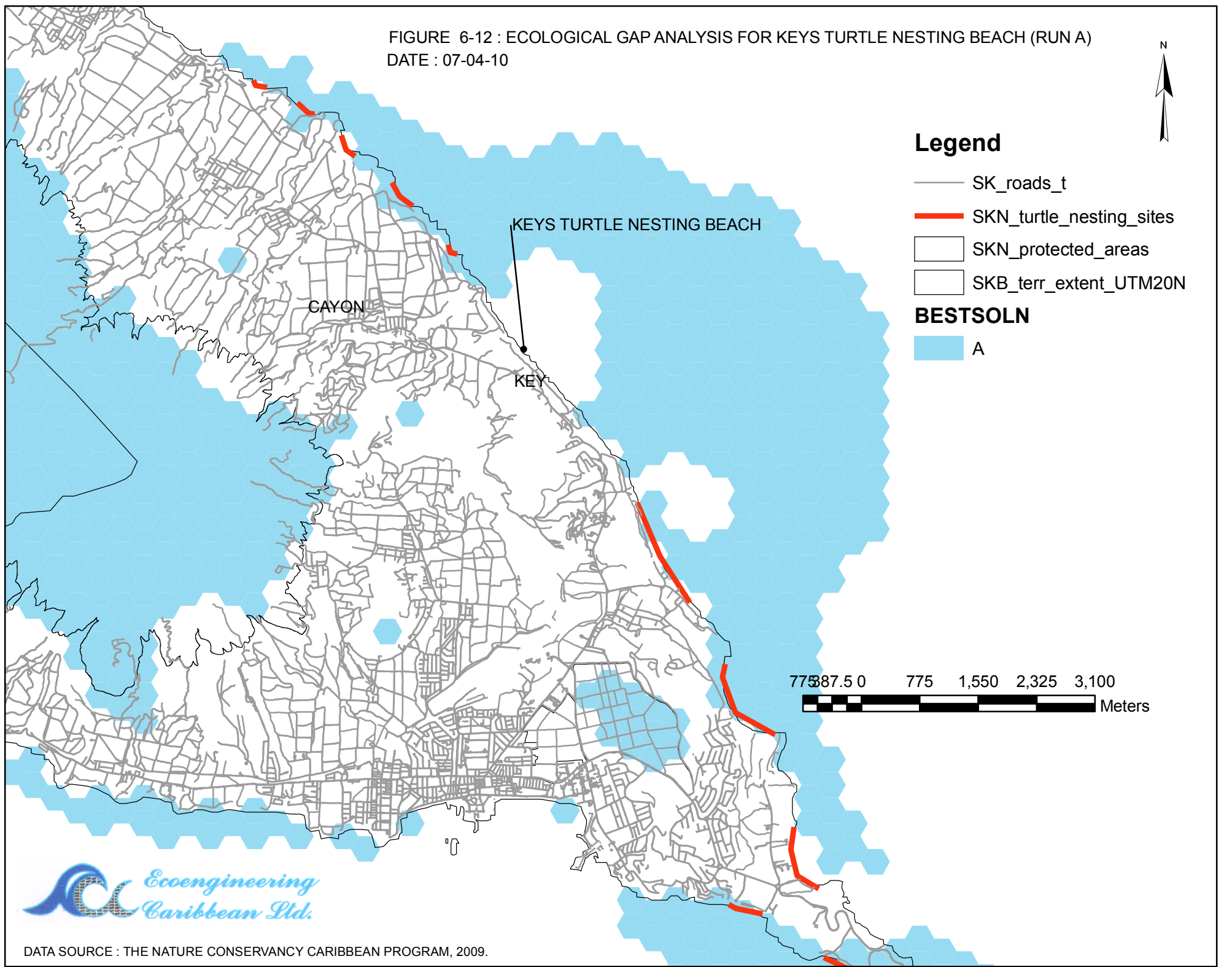


FIGURE 6-12 : ECOLOGICAL GAP ANALYSIS FOR KEYS TURTLE NESTING BEACH (RUN A)
DATE : 07-04-10



Legend

- SK_roads_t
- SKN_turtle_nesting_sites
- SKN_protected_areas
- SKB_terr_extent_UTM20N

BESTSOLN

- A

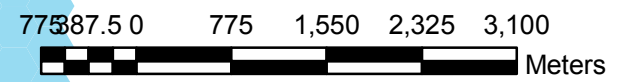


FIGURE 6-13 : ECOLOGICAL GAP ANALYSIS RESULTS FOR KEYS TURTLE NESTING BEACH (RUN B)
DATE : 07-04-10

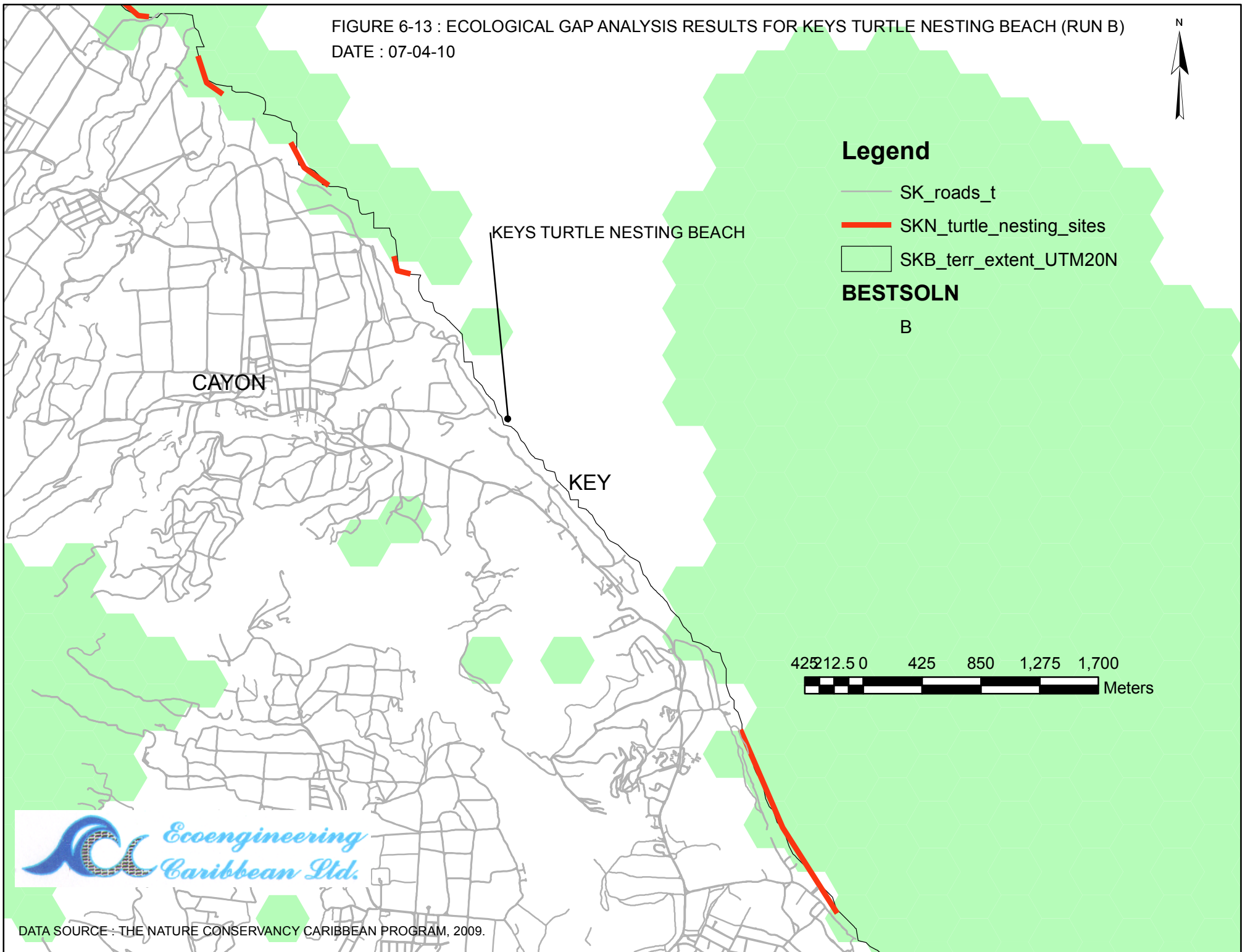
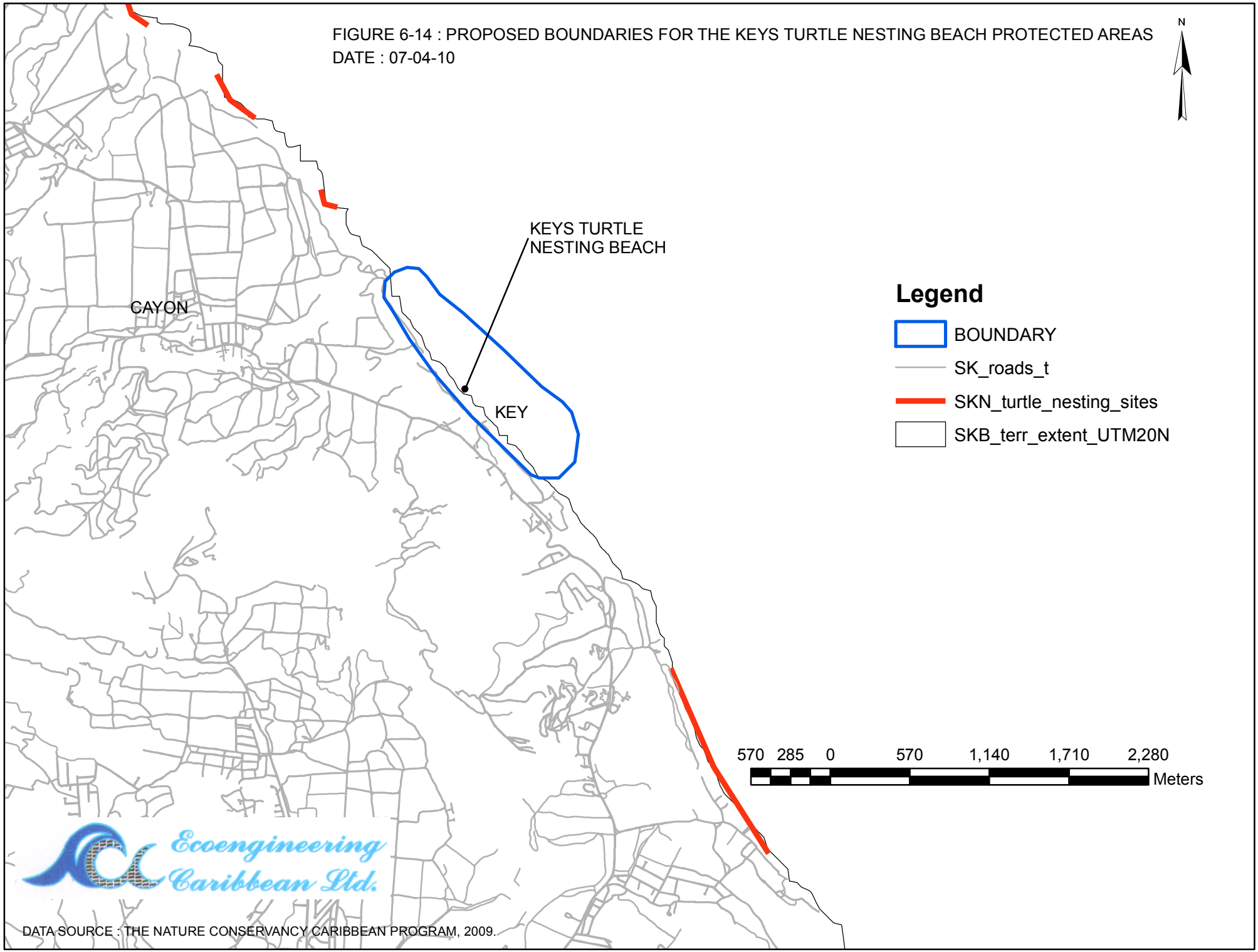


FIGURE 6-14 : PROPOSED BOUNDARIES FOR THE KEYS TURTLE NESTING BEACH PROTECTED AREAS
DATE : 07-04-10







CAYON

KEYS TURTLE
NESTING BEACH

KEY

Legend

-  BOUNDARY
-  SK_roads_t
-  SKN_turtle_nesting_sites
-  SKB_terr_extent_UTM20N

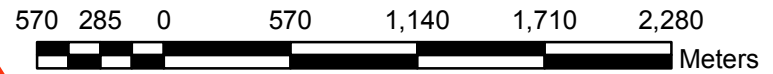












FIGURE 6-15 : ENVIRONMENTAL ASSETS & THREATS ASSOCIATED WITH SEA HAVEN TURTLE NESTING BEACH

DATE : 07-04-10

THE NARROWS

LOBSTER SPAWNING

Legend

-  SKB_terr_extent_UTM20N
-  NV_paved_roads_t
-  NV_dirt_roads_t
-  SKN_turtle_nesting_sites
-  NV_sea_moss_UTM20N_prep
-  SKN_fringe_coral_reef_UTM20N_prep
-  NV_airport_t
-  NV_brackish_ponds
-  NV_low_density_t
-  SKN_protected_areas

SEA HAVEN
TURTLE NESTING
BEACH

NEW CASTLE
BAY

HURRICANE
HILL

SEA HAVEN
ESTATE



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.



FIGURE 6-16 : ECOLOGICAL GAP ANALYSIS RESULTS FOR SEA HAVEN TURTLE NESTING BEACH (RUN A)
DATE : 07-04-10

THE NARROWS






BOOBY ISLAND

SEA HAVEN
TURTLE NESTING
BEACH


NEW CASTLE
BAY

HURRICANE
HILL

Legend

-  NV_paved_roads_t
-  SKN_turtle_nesting_sites
-  NV_airport_t
-  SKN_protected_areas
-  SKB_terr_extent_UTM20N

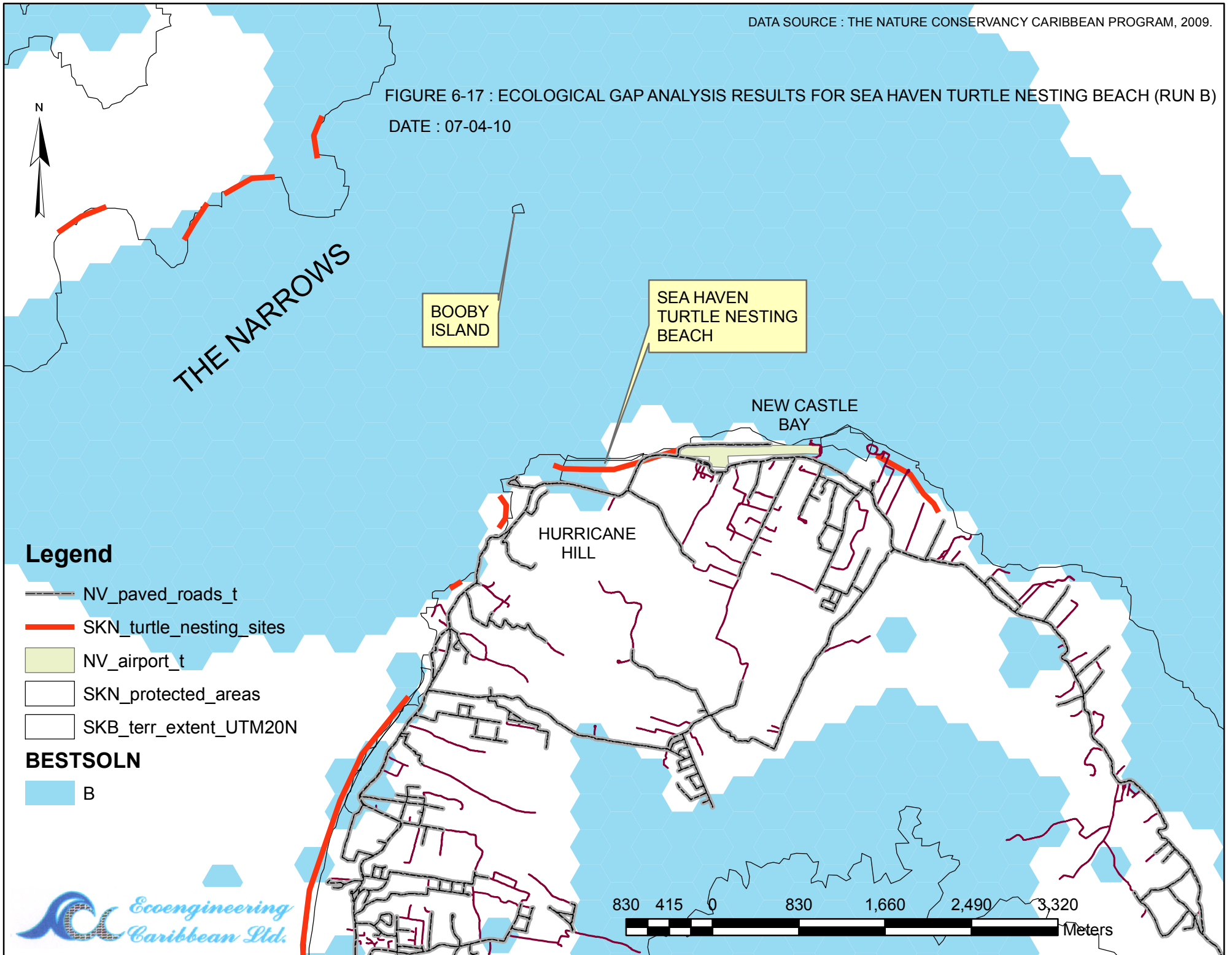
BESTSOLN

-  A



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.

FIGURE 6-17 : ECOLOGICAL GAP ANALYSIS RESULTS FOR SEA HAVEN TURTLE NESTING BEACH (RUN B)
DATE : 07-04-10



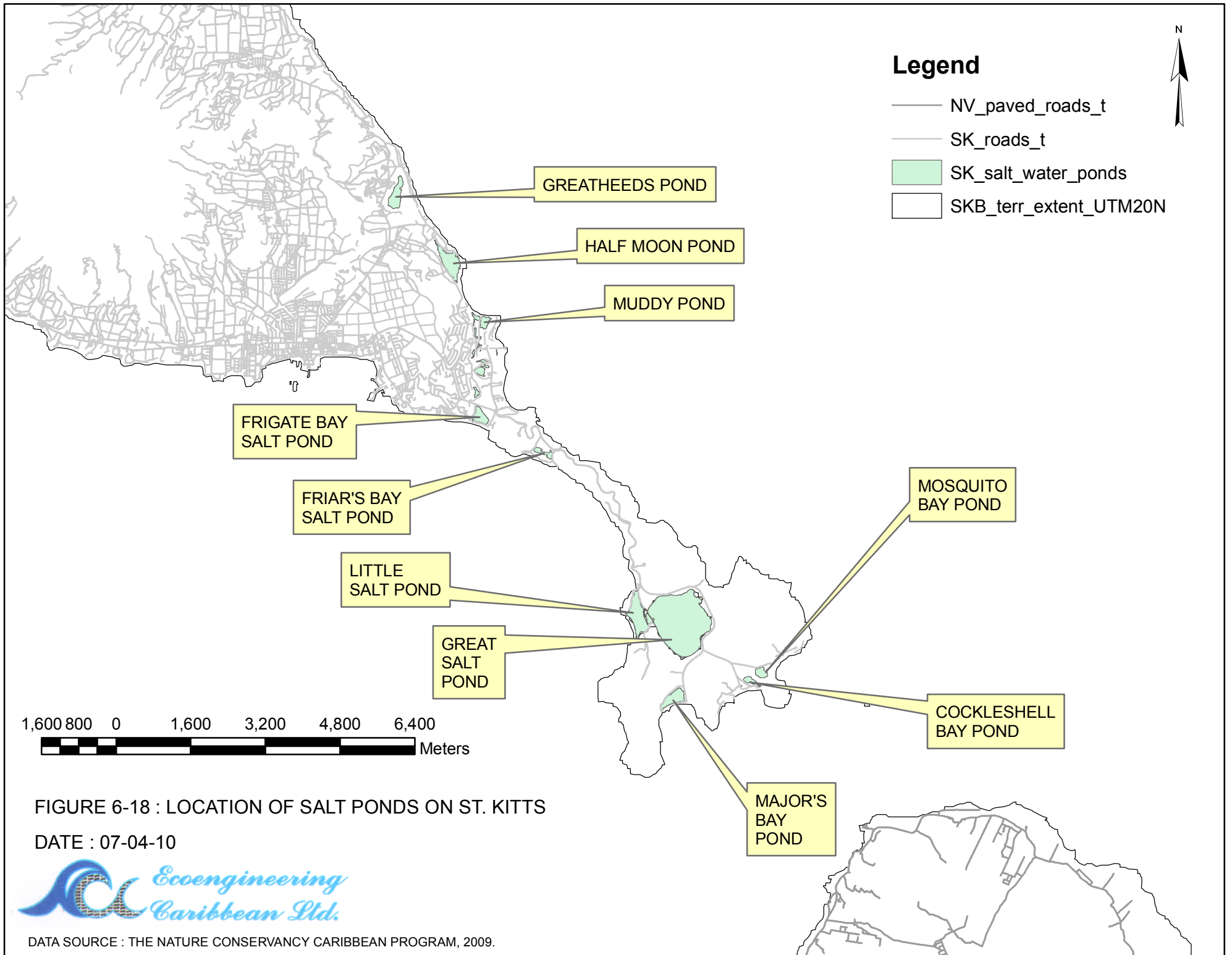
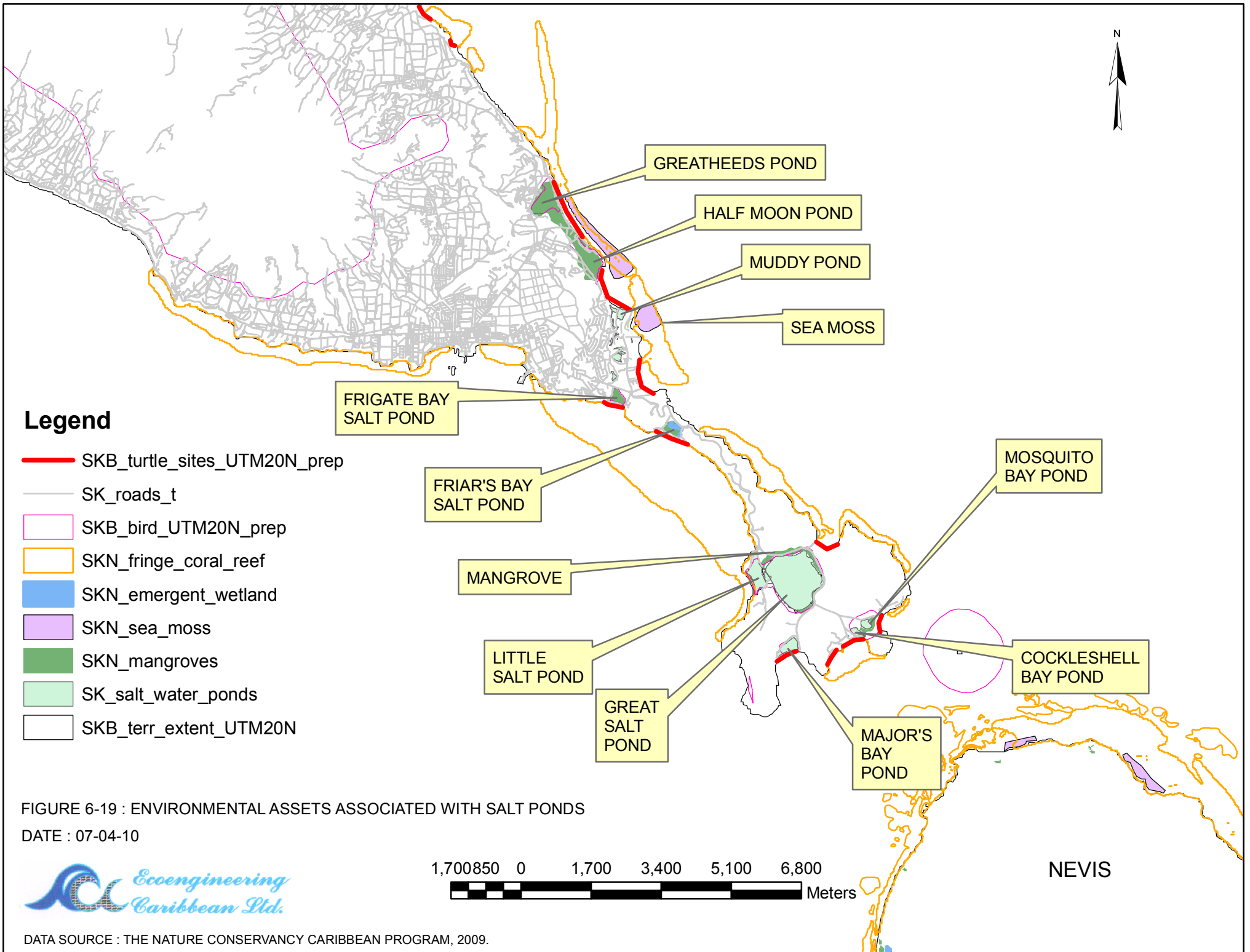


FIGURE 6-18 : LOCATION OF SALT PONDS ON ST. KITTS

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.

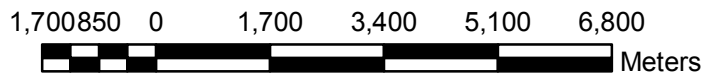


Legend

- SKB_turtle_sites_UTM20N_prep
- SK_roads_t
- SKB_bird_UTM20N_prep
- SKN_fringe_coral_reef
- SKN_emergent_wetland
- SKN_sea_moss
- SKN_mangroves
- SK_salt_water_ponds
- SKB_terr_extent_UTM20N

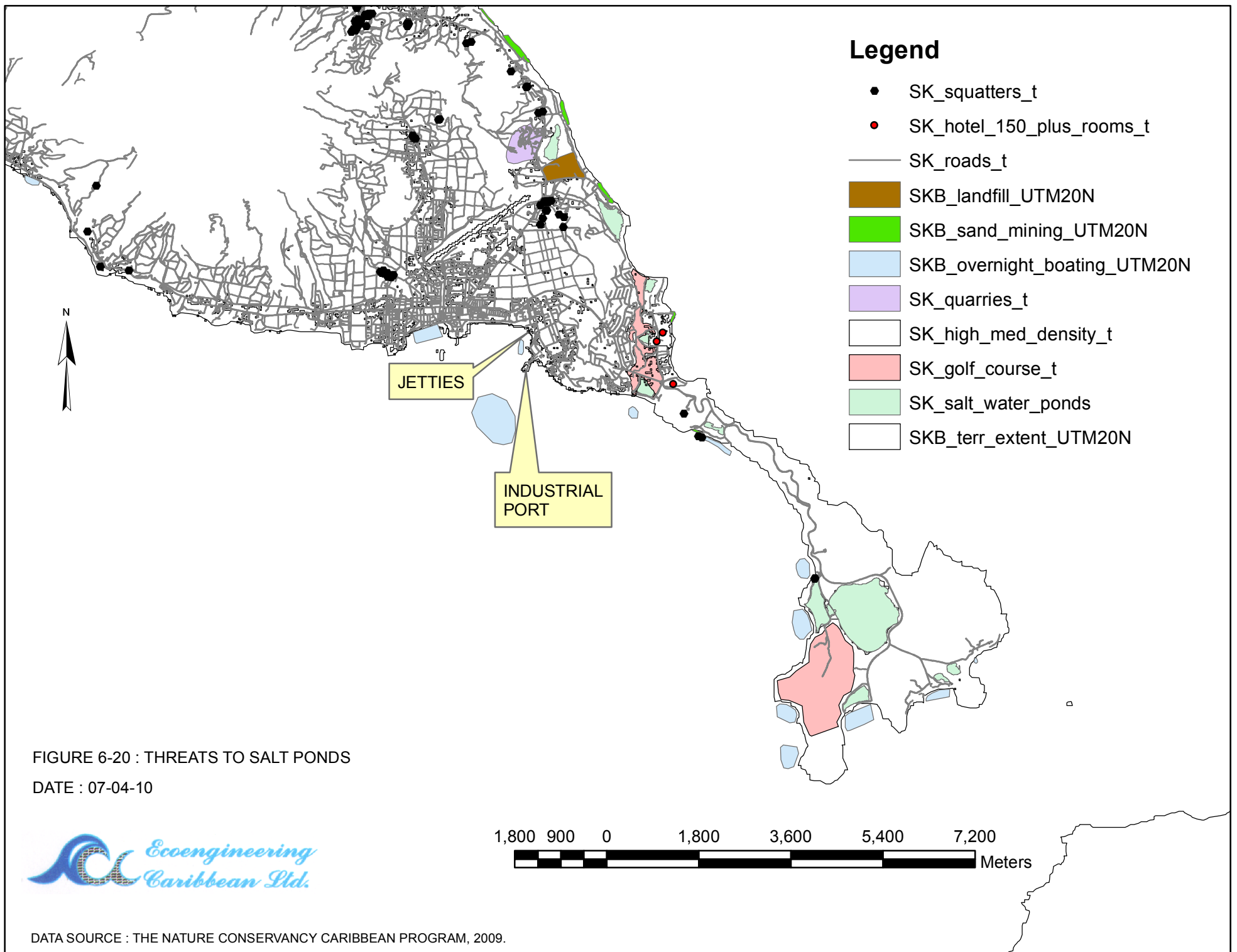
FIGURE 6-19 : ENVIRONMENTAL ASSETS ASSOCIATED WITH SALT PONDS

DATE : 07-04-10



NEVIS

DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.



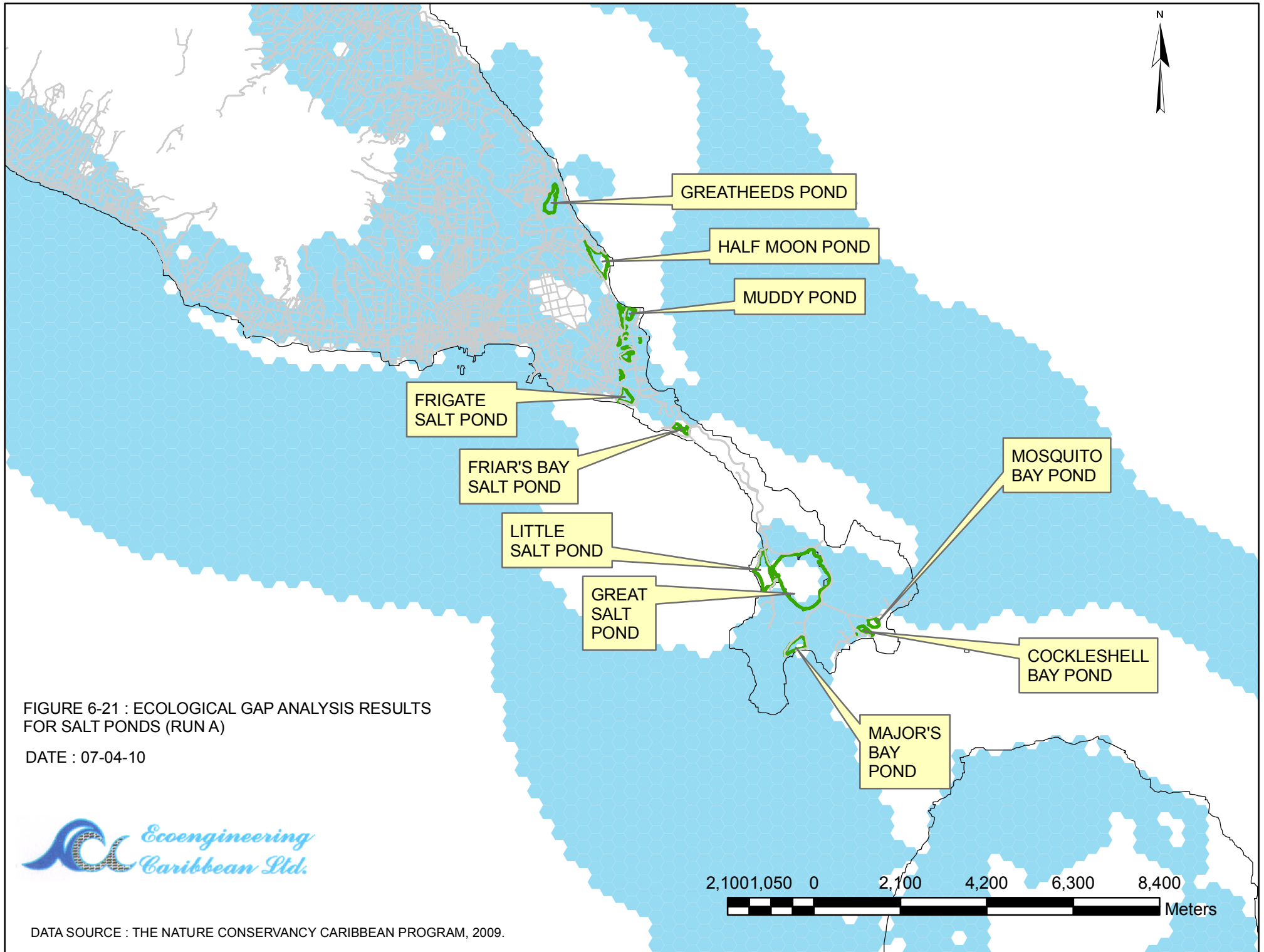


FIGURE 6-21 : ECOLOGICAL GAP ANALYSIS RESULTS FOR SALT PONDS (RUN A)

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.

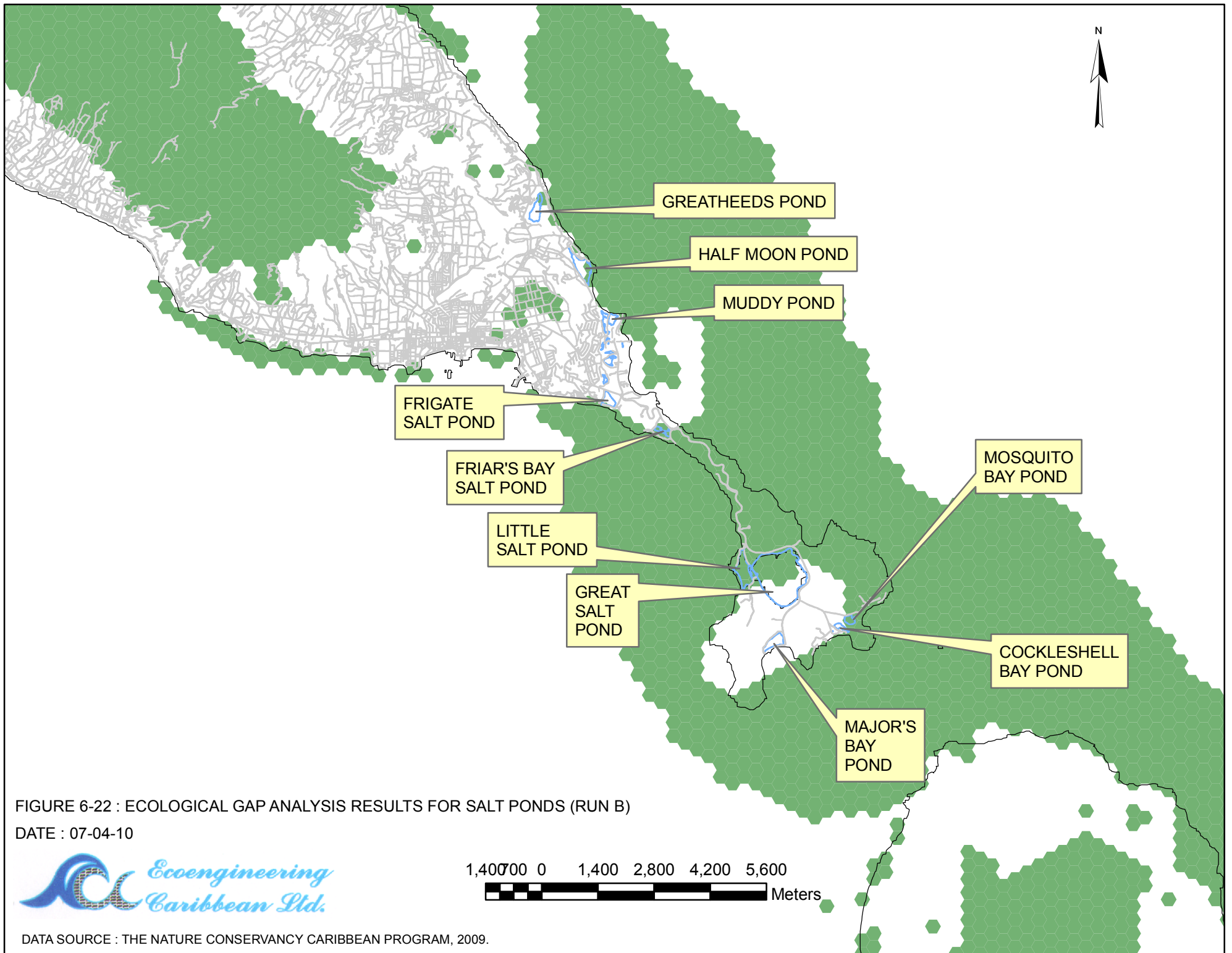
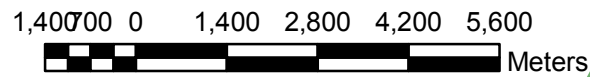


FIGURE 6-22 : ECOLOGICAL GAP ANALYSIS RESULTS FOR SALT PONDS (RUN B)

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.



FIGURE 6-23 : PROPOSED BOUNDARIES FOR GREATHEEDS POND PROTECTED AREA
DATE : 07-04-10



FIGURE 6-24 : PROPOSED BOUNDARIES FOR MUDDY POINT SALT POND PROTECTED AREA
DATE : 07-04-10



Legend

- NV_paved_roads_t
- SKN_turtle_nesting_sites
- SKN_important_bird_areas
- SKN_fringe_coral_reef
- SKN_mangroves
- SKN_protected_areas
- SKB_terr_extent_UTM20N

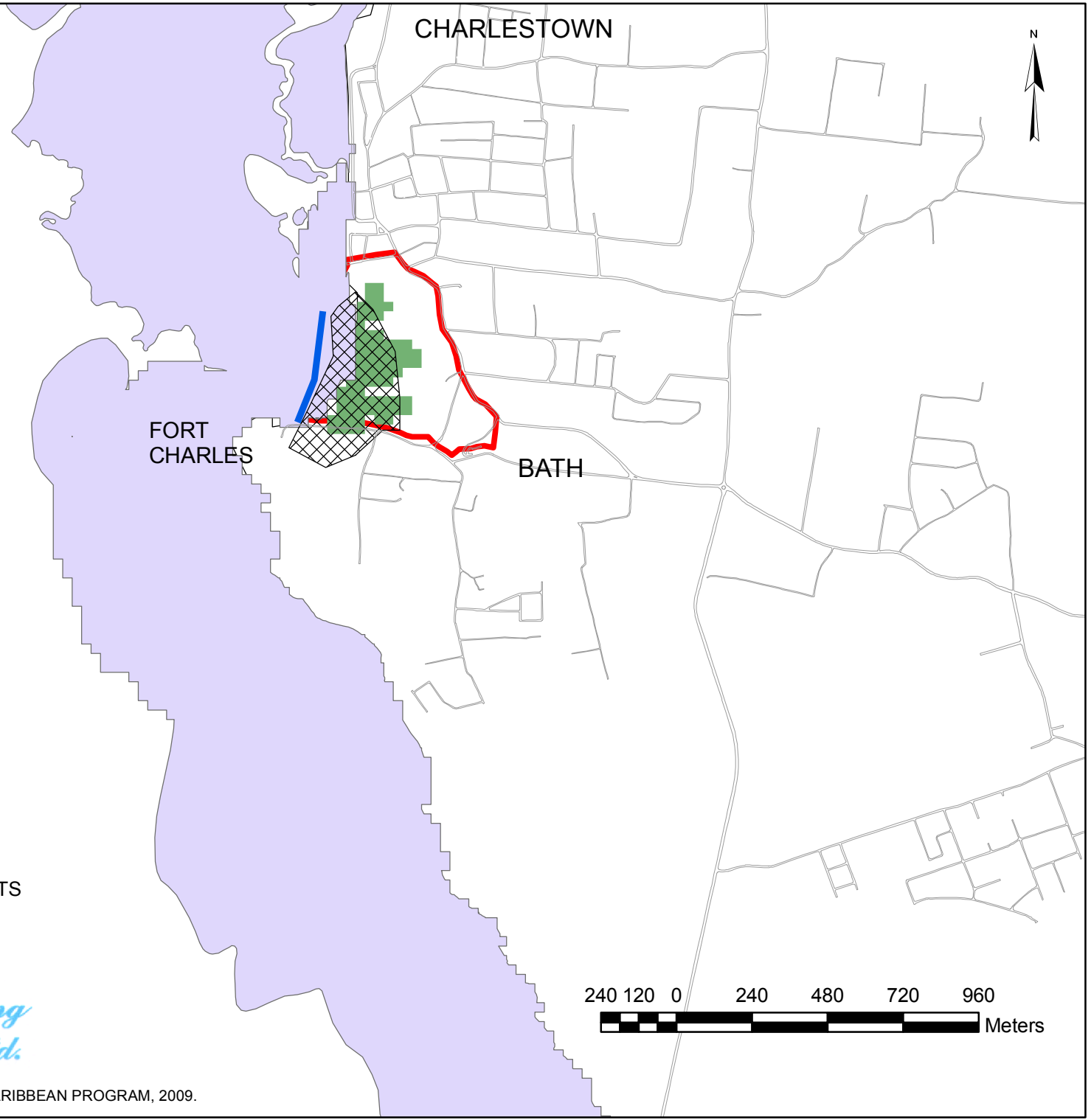
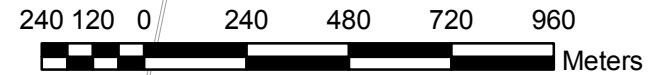


FIGURE 6-26 : ENVIRONMENTAL ASSETS ASSOCIATED WITH BATH BOGGS

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.



Legend

- NV_point_source_siltation_UTM20N
- NV_paved_roads_t
- SKN_protected_areas
- NV_high_med_density_UTM20N
- NV_low_density_t
- SKB_terr_extent_UTM20N

FORT CHARLES

BATH

FIGURE 6-27 : THREATS TO BATH BOGS PROTECTED AREA
DATE : 07-04-10







DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.





Legend

-  SKN_turtle_nesting_sites
-  SKN_protected_areas
-  NV_paved_roads_t
-  SKB_terr_extent_UTM20N

BESTSOLN

-  A

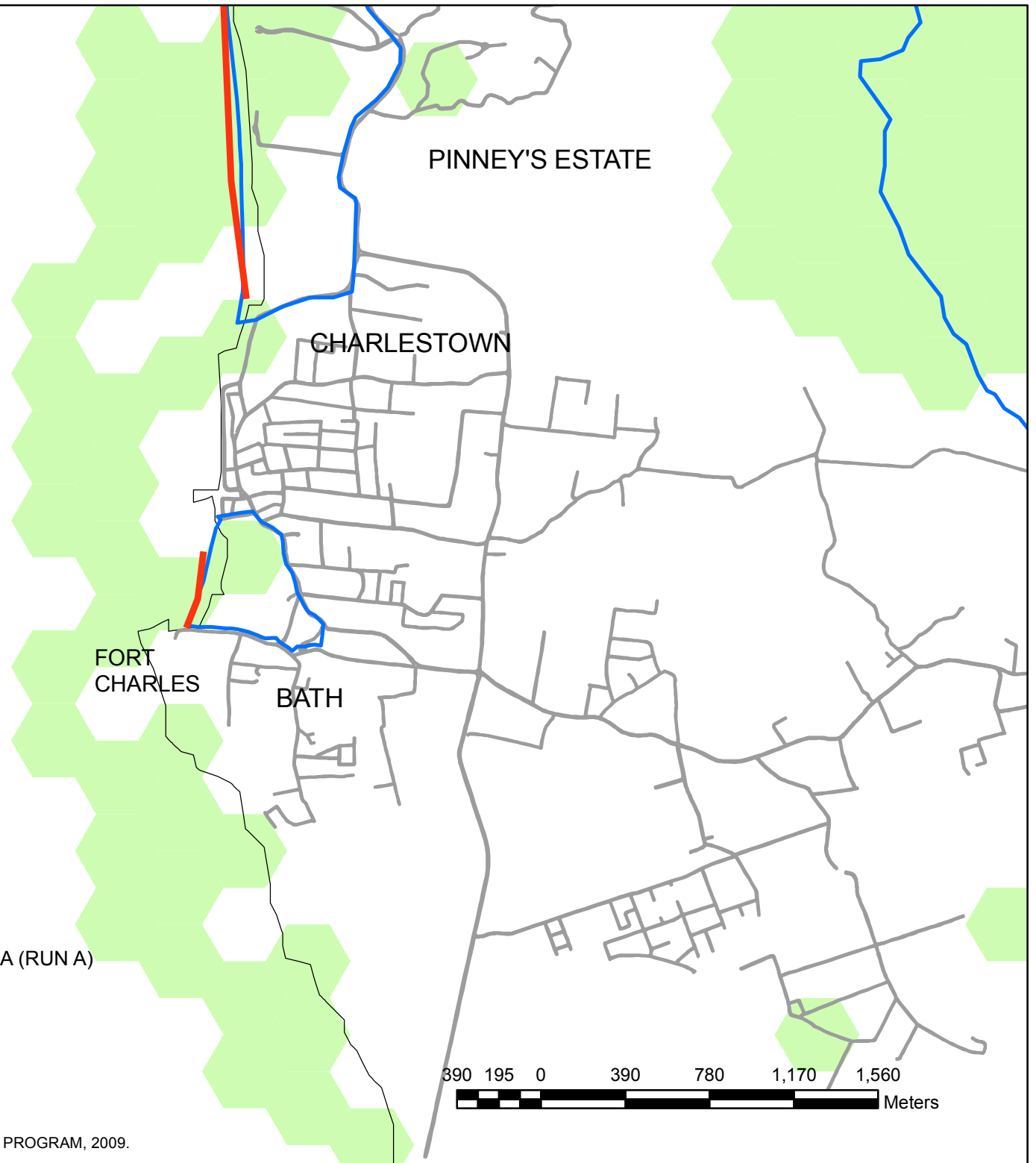


FIGURE 6-28 : ECOLOGICAL GAP ANALYSIS RESULTS FOR BATH BOGS PROTECTED AREA (RUN A)

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.

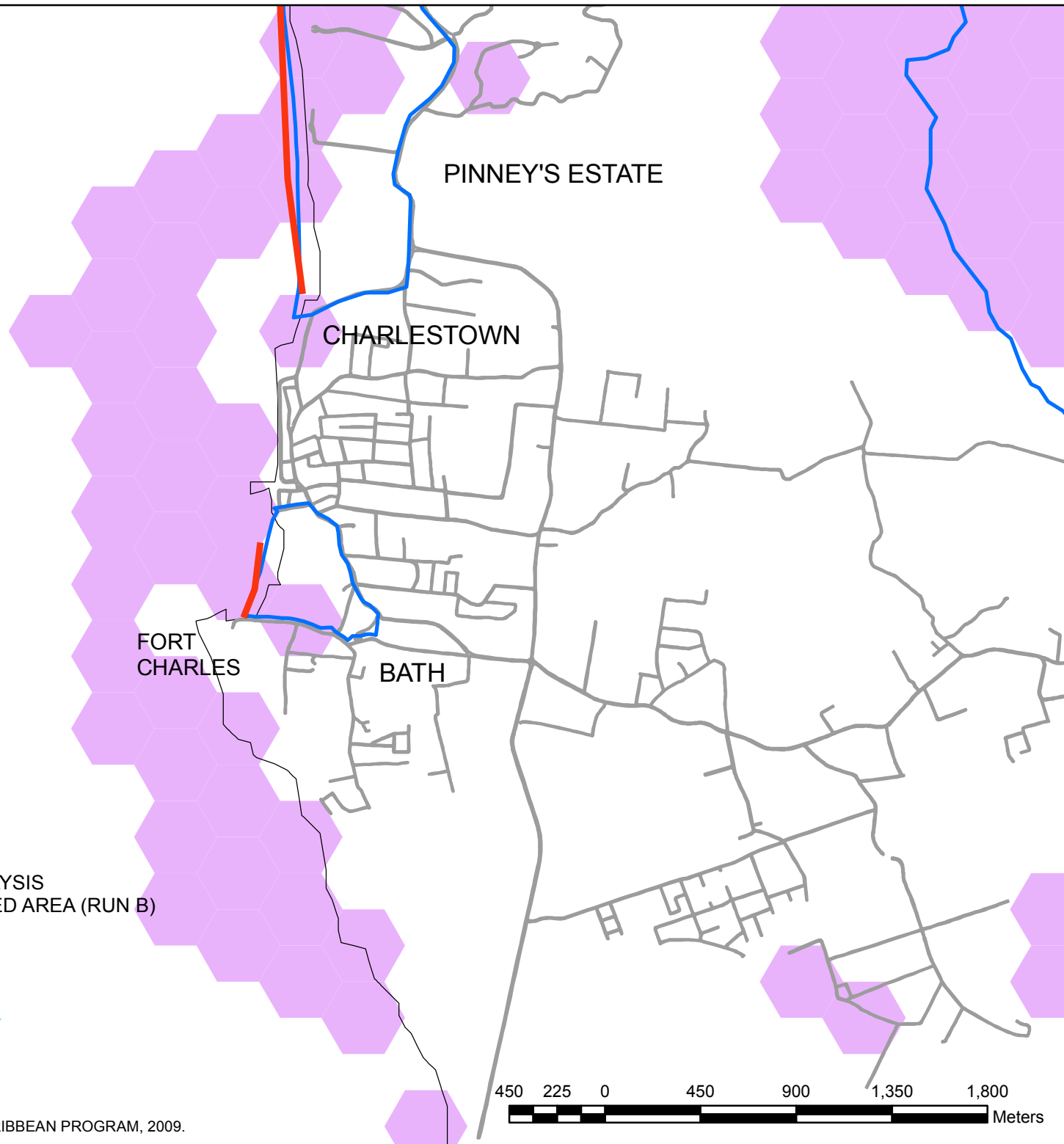
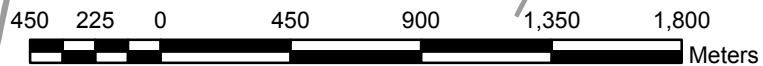


FIGURE 6-29 : ECOLOGICAL GAP ANALYSIS RESULTS FOR BATH BOGS PROTECTED AREA (RUN B)

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.



Legend

- NV_paved_roads_m
- Bath Bog
- SKB_terr_extent_UTM20N

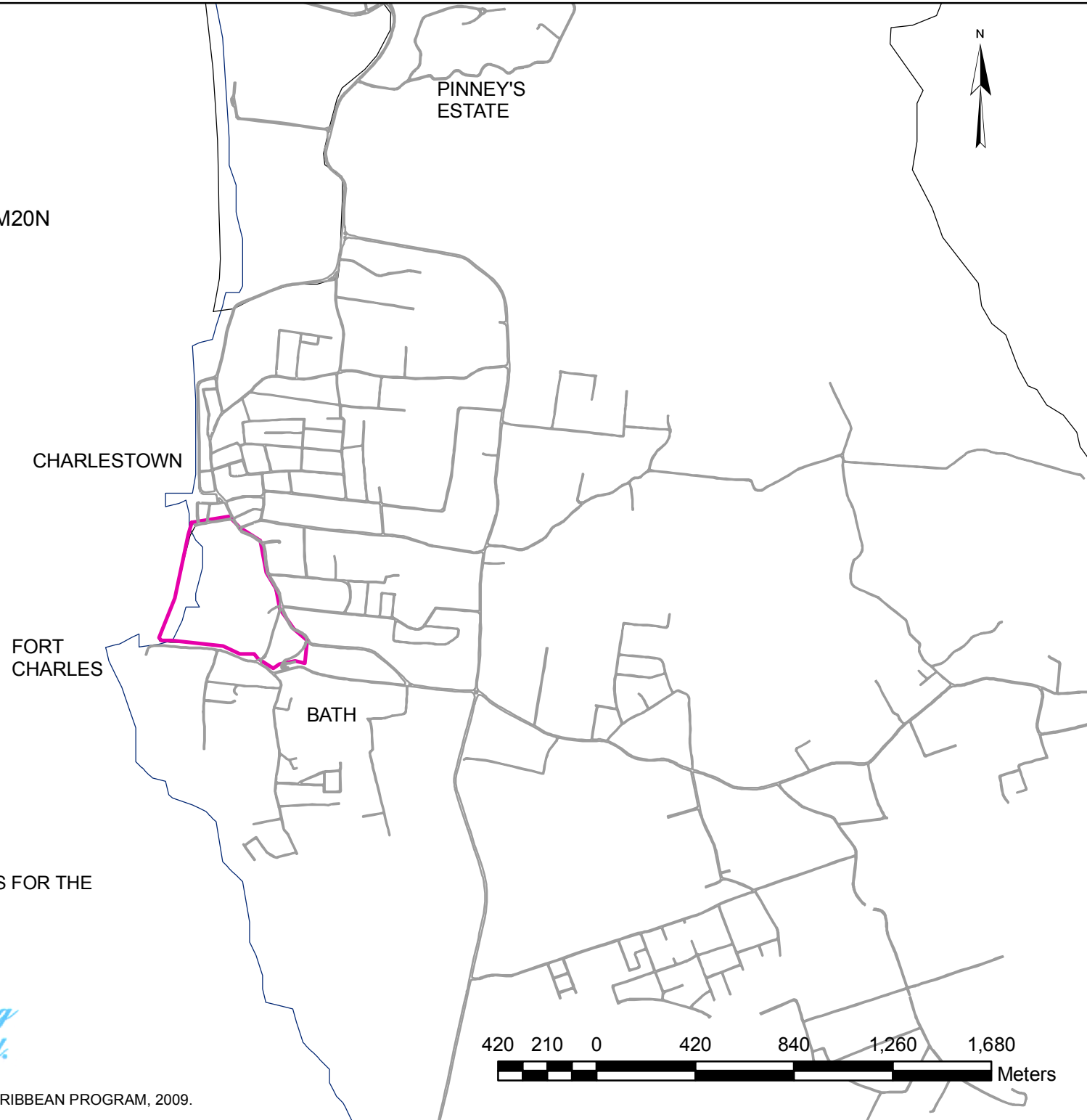


FIGURE 6-30 : PROPOSED BOUNDARIES FOR THE BATH BOGS PROTECTED AREA

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.



Legend

- NV_paved_roads_t
- SKN_turtle_nesting_sites
- NV_brackish_ponds
- SKN_protected_areas
- SKB_terr_extent_UTM20N

BESTSOLN

- A

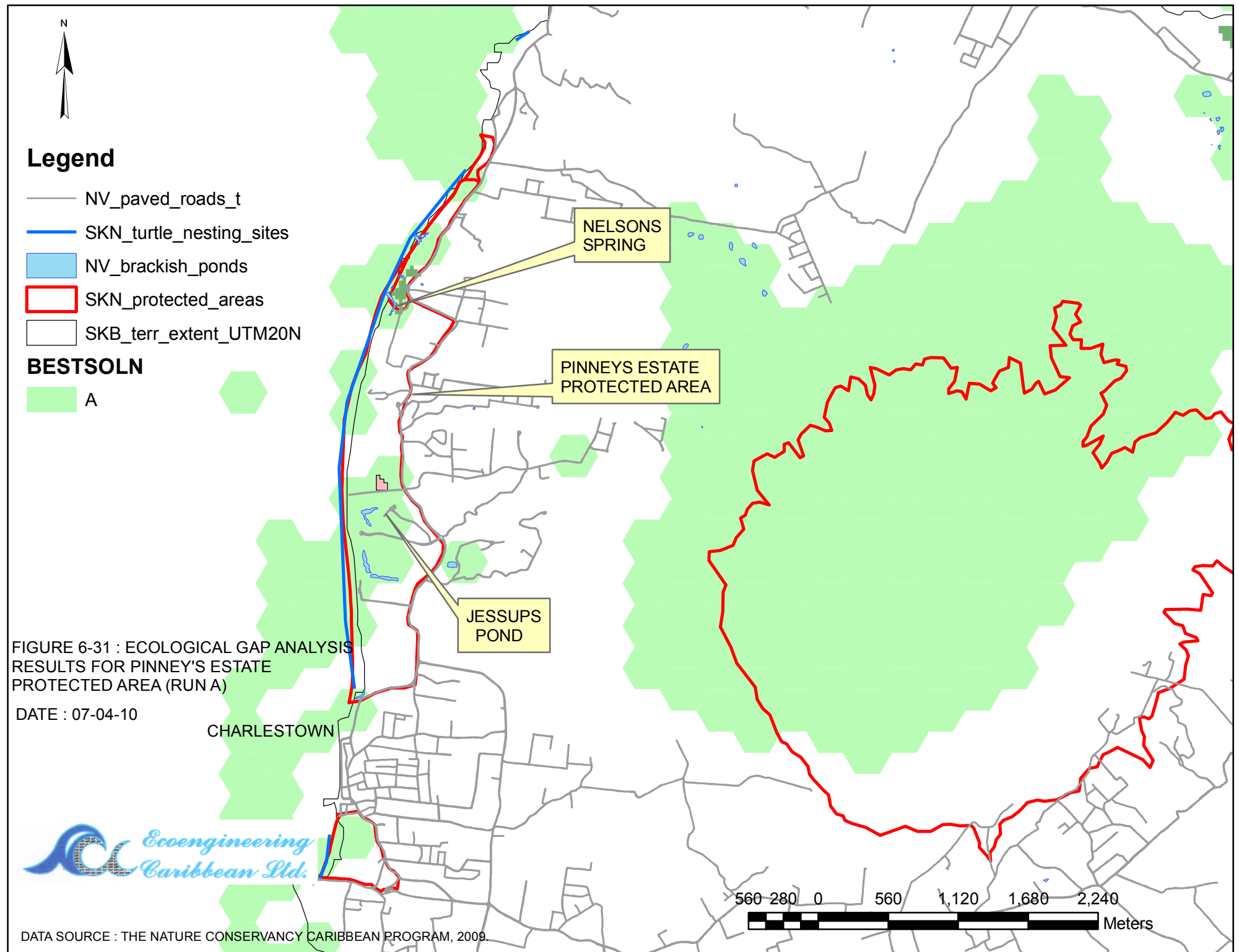


FIGURE 6-31 : ECOLOGICAL GAP ANALYSIS RESULTS FOR PINNEY'S ESTATE PROTECTED AREA (RUN A)

DATE : 07-04-10

CHARLESTOWN



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.

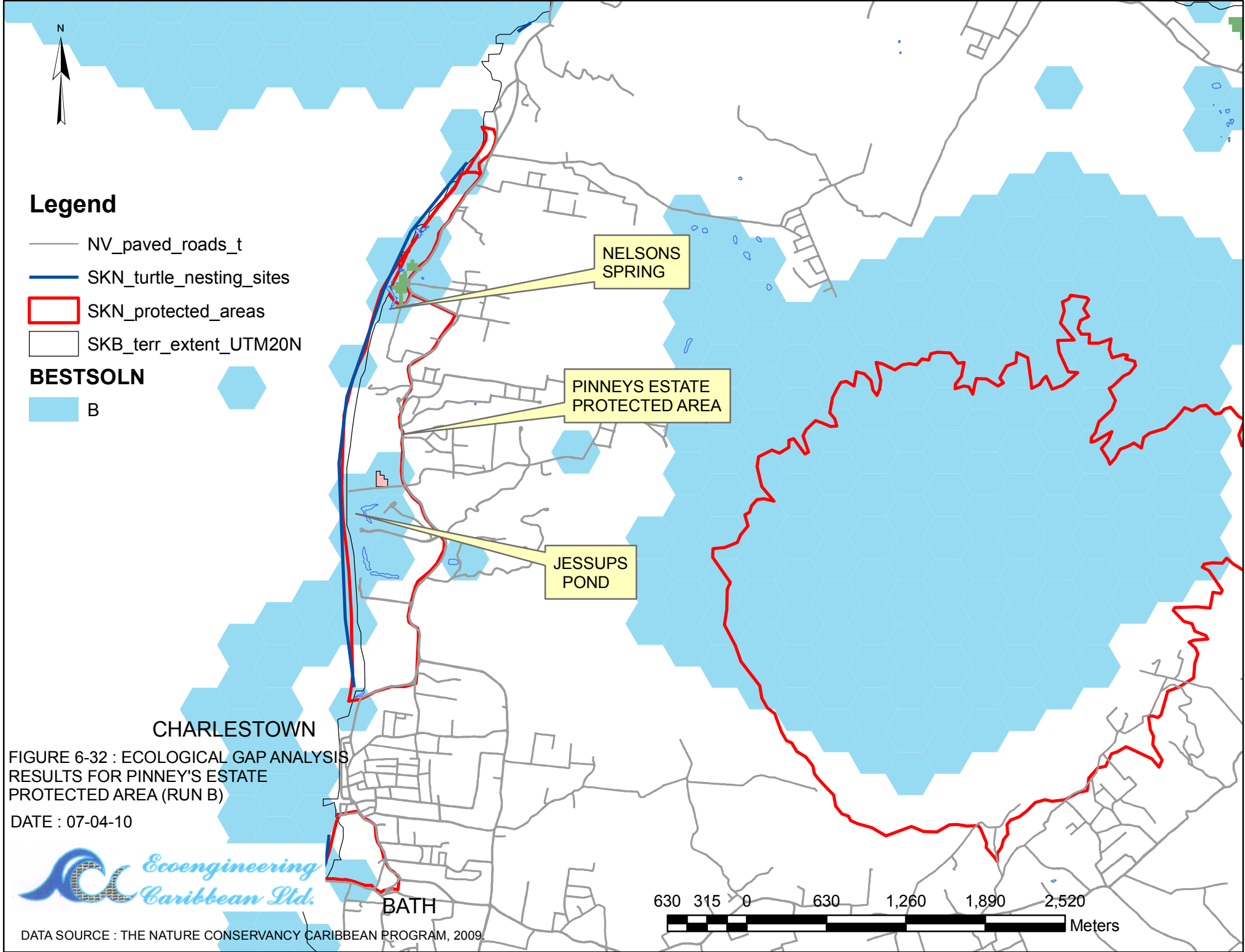


Legend

- NV_paved_roads_t
- SKN_turtle_nesting_sites
- SKN_protected_areas
- SKB_terr_extent_UTM20N

BESTSOLN

- B



CHARLESTOWN

NELSONS SPRING

PINNEYS ESTATE PROTECTED AREA

JESSUPS POND

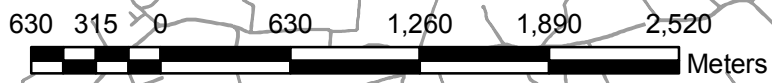
BATH

FIGURE 6-32 : ECOLOGICAL GAP ANALYSIS RESULTS FOR PINNEY'S ESTATE PROTECTED AREA (RUN B)

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009



Legend

- NV_paved_roads_m
- Pinneys Estate
- SKB_terr_extent_UTM20N

PINNEY'S BEACH

COTTON GROUND

LAWRENCE ESTATE

JESSUP ESTATE

PINNEY'S ESTATE

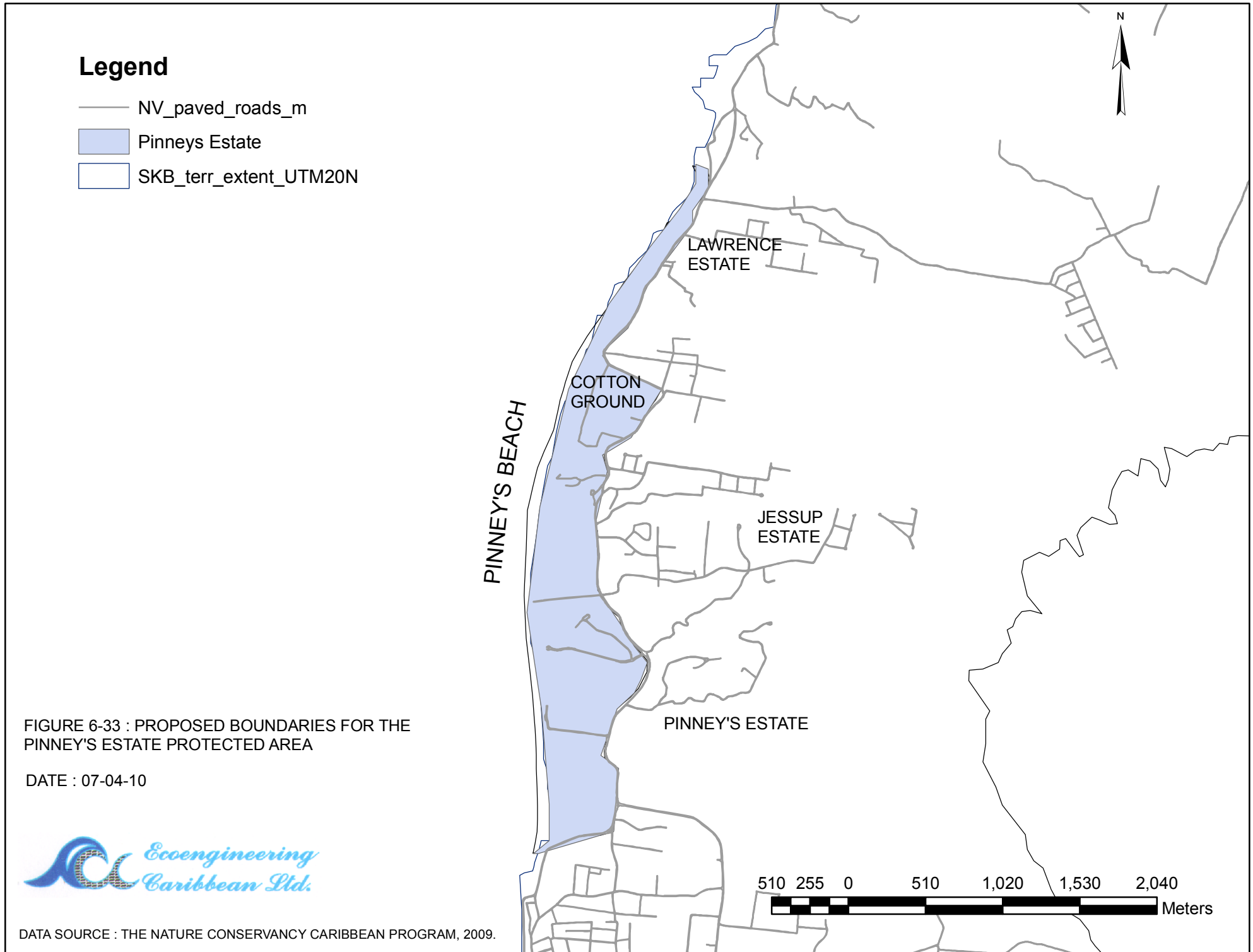
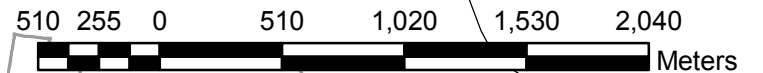


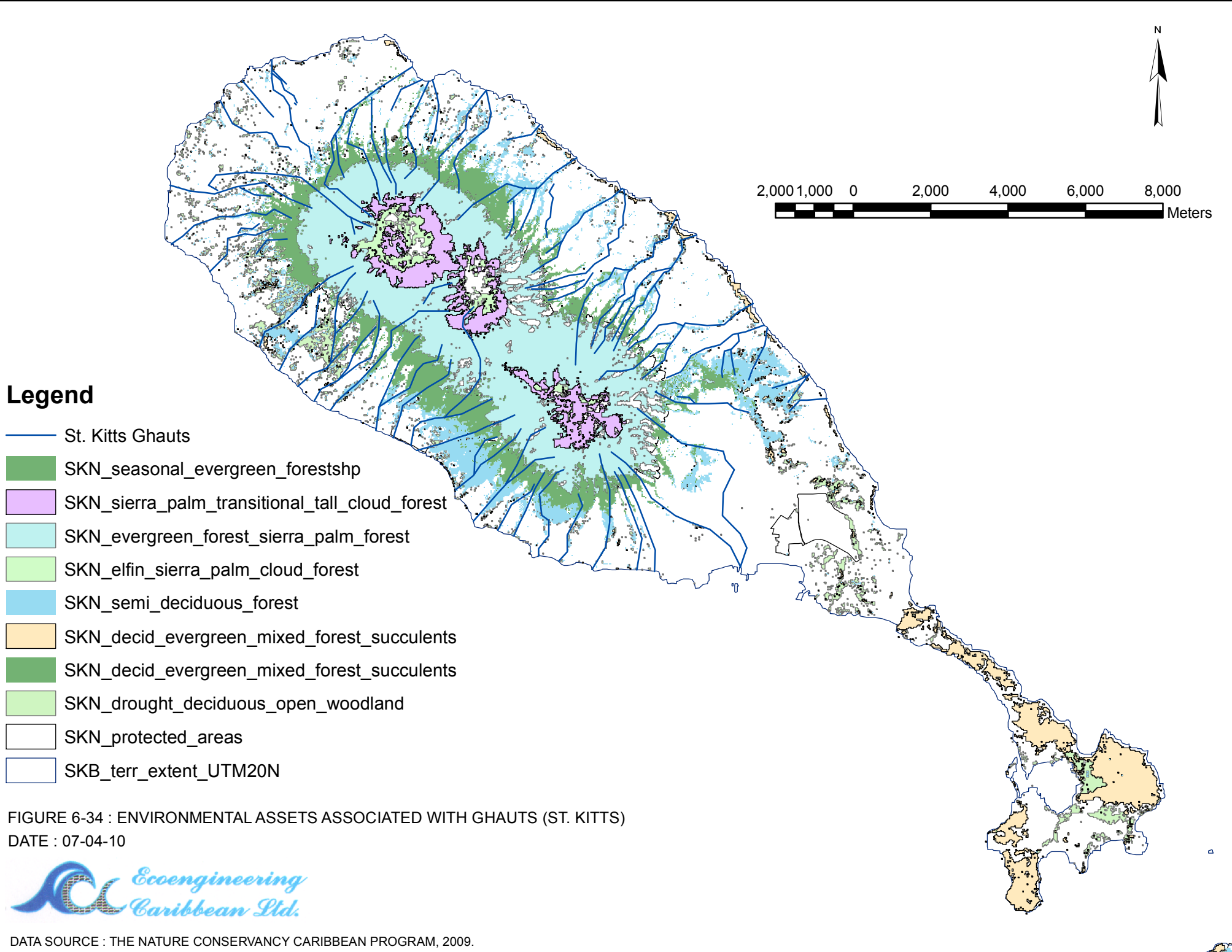
FIGURE 6-33 : PROPOSED BOUNDARIES FOR THE PINNEY'S ESTATE PROTECTED AREA

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.





Legend










- St. Kitts Ghauts
- SKN_seasonal_evergreen_forestshp
- SKN_sierra_palm_transitional_tall_cloud_forest
- SKN_evergreen_forest_sierra_palm_forest
- SKN_elfin_sierra_palm_cloud_forest
- SKN_semi_deciduous_forest
- SKN_decid_evergreen_mixed_forest_succulents
- SKN_decid_evergreen_mixed_forest_succulents
- SKN_drought_deciduous_open_woodland
- SKN_protected_areas
- SKB_terr_extent_UTM20N

FIGURE 6-34 : ENVIRONMENTAL ASSETS ASSOCIATED WITH GHAUTS (ST. KITTS)
 DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.

Legend

-  nevis ghauts
-  SKN_evergreen_forest_with_coconut_palm
-  SKN_evergreen_forest_sierra_palm_forest
-  SKN_emergent_wetland
-  SKN_drought_deciduous_open_woodland
-  SKN_decid_evergreen_mixed_forest_succulents
-  SKN_decid_evergreen_mixed_forest_succulents
-  SKN_protected_areas
-  SKB_terr_extent_UTM20N

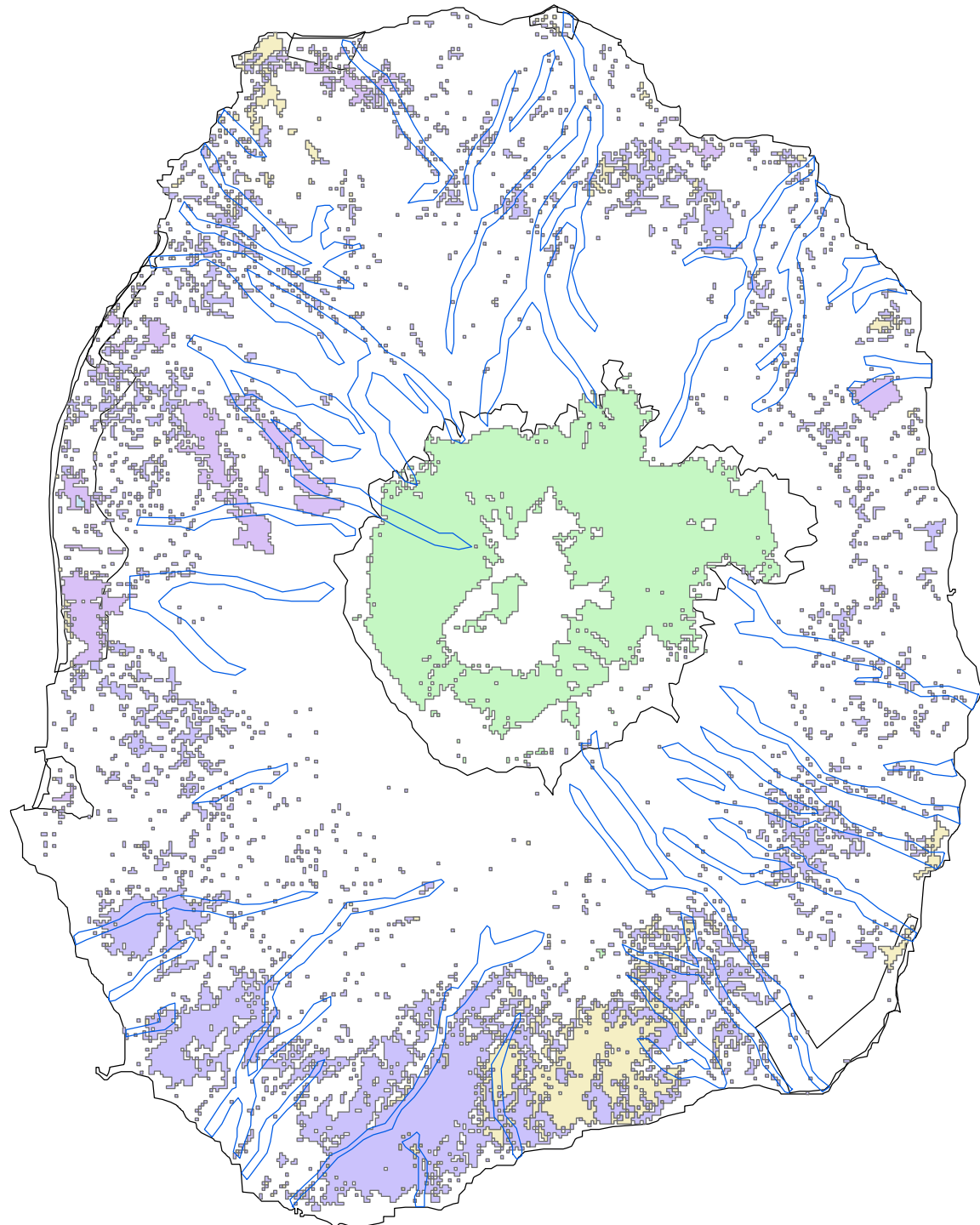
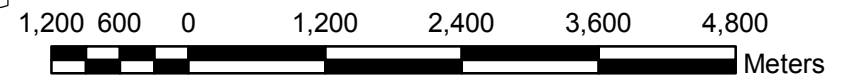


FIGURE 6-35 : ENVIRONMENTAL ASSETS ASSOCIATED WITH GHAUTS (NEVIS)











DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.



Legend

-  St. Kitts Ghauts
-  SK_ATV_trails_t
-  SK_rail_roads_t
-  SK_livestock_facilities_t
-  SK_low_density_t
-  SK_sand_mining_t
-  SK_roads_t
-  SKN_protected_areas
-  SKB_terr_extnt_UTM20N
-  SK_golf_course_t

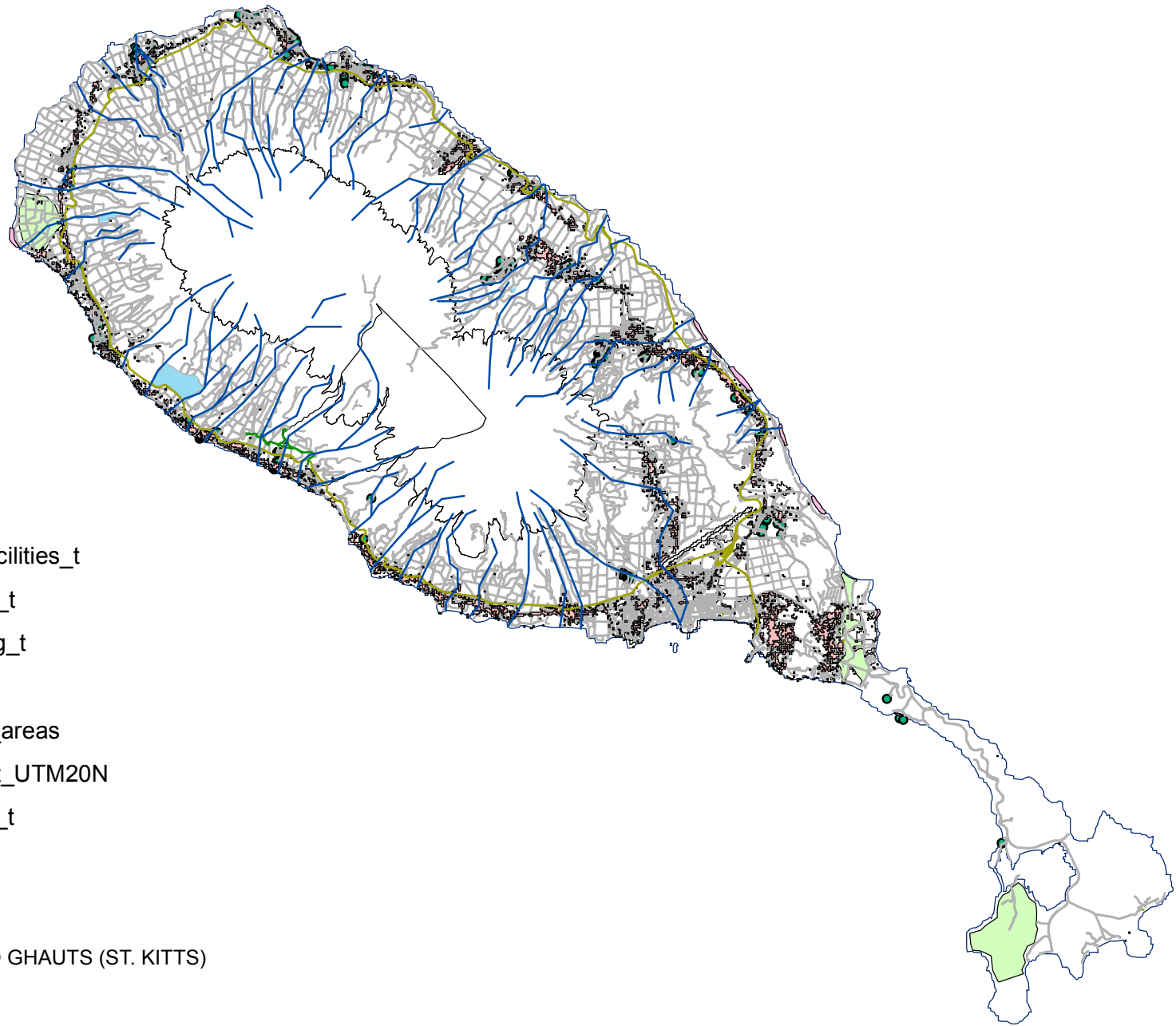
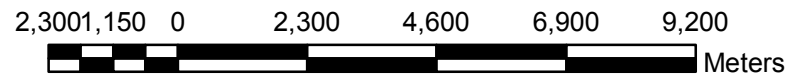


















FIGURE 6-36 : THREATS TO GHAUTS (ST. KITTS)

DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.

Legend

-  Nevis Ghauts
-  NV_hotel_25_49_rooms_UTM20N
-  NV_hotel_7_14_rooms_UTM20N
-  NV_point_source_siltation_UTM20N
-  NV_dirt_UTM20N
-  NV_paved_roads_UTM20N
-  NV_golf_course_UTM20N
-  NV_high_med_density_UTM20N
-  NV_industrial_port_UTM20N
-  NV_landfill_UTM20N
-  NV_livestock_facilities_UTM20N
-  NV_low_density_UTM20N
-  NV_powerplant_UTM20N
-  NV_quarries_UTM20N
-  SKN_protected_areas
-  SKB_terr_extent_UTM20N

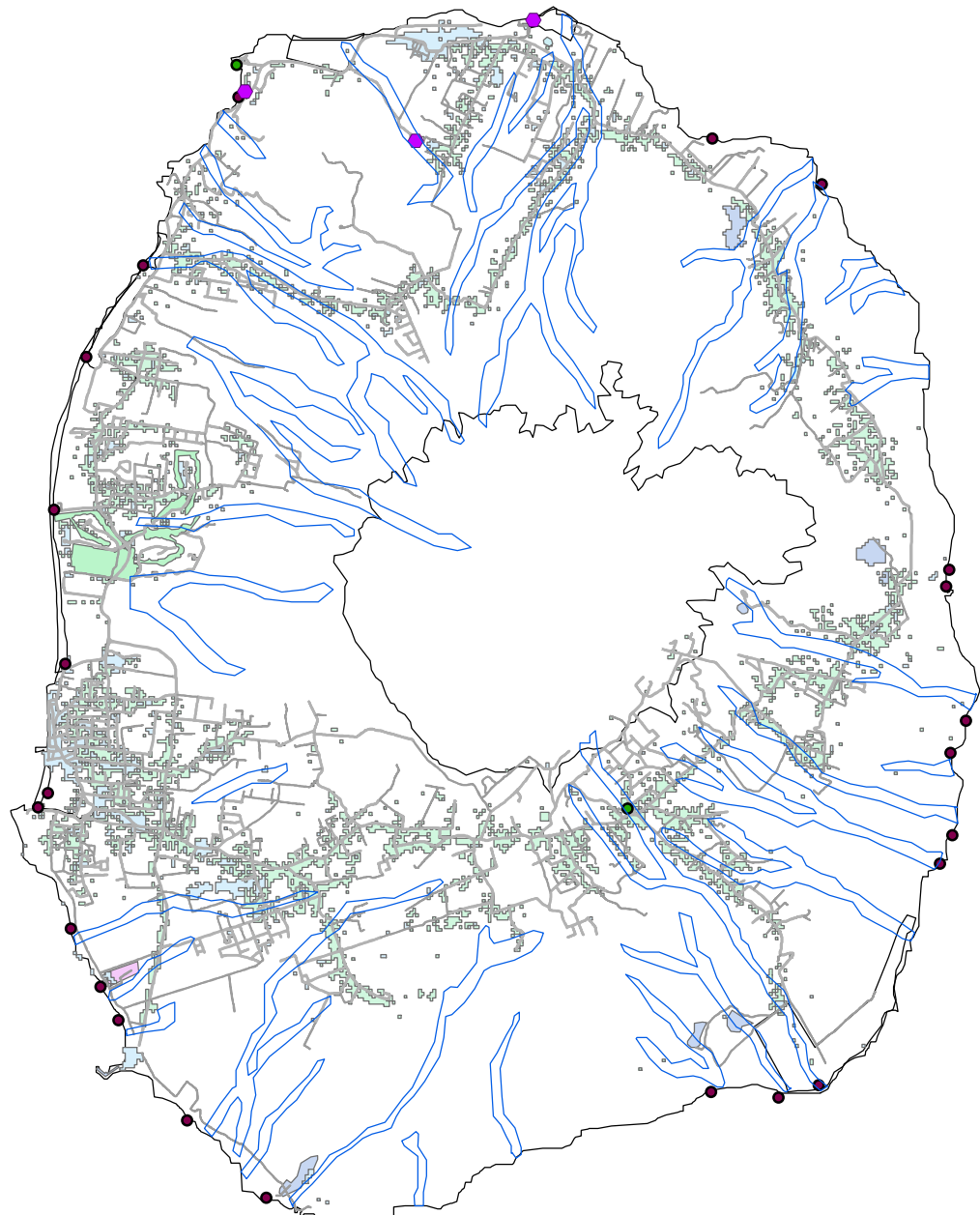
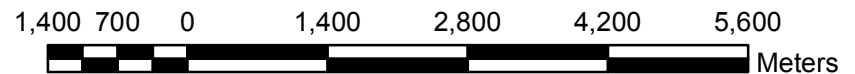
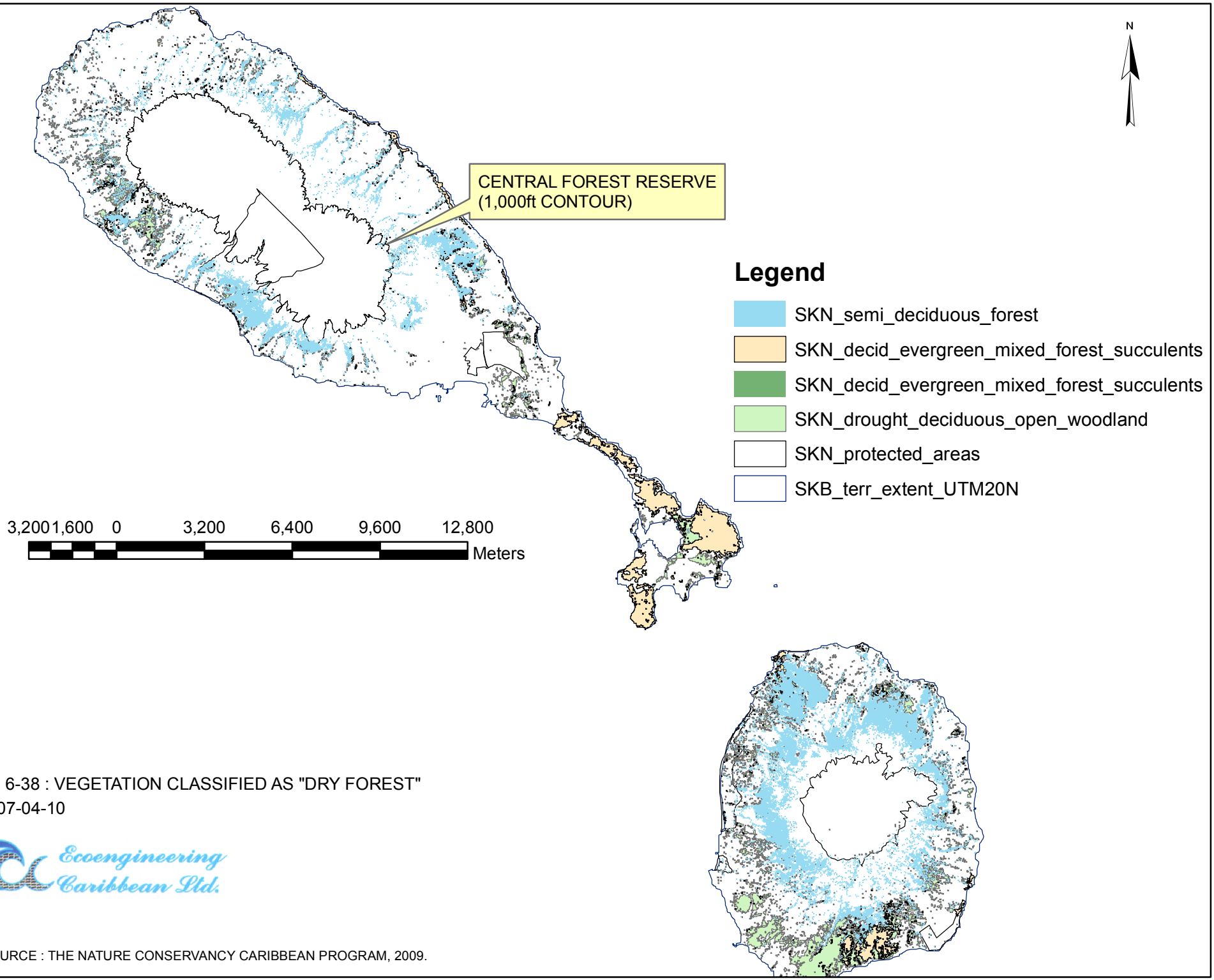


FIGURE 6-37 : THREATS TO GHAUTS (NEVIS)
 DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.



CENTRAL FOREST RESERVE
(1,000ft CONTOUR)

Legend

- SKN_semi_deciduous_forest
- SKN_decid_evergreen_mixed_forest_succulents
- SKN_decid_evergreen_mixed_forest_succulents
- SKN_drought_deciduous_open_woodland
- SKN_protected_areas
- SKB_terr_extent_UTM20N

3,200 1,600 0 3,200 6,400 9,600 12,800
Meters






FIGURE 6-38 : VEGETATION CLASSIFIED AS "DRY FOREST"
DATE : 07-04-10



DATA SOURCE : THE NATURE CONSERVANCY CARIBBEAN PROGRAM, 2009.



Legend

-  NV_paved_roads_UTM20N
-  Historic Charlestown
-  NV_dirt_UTM20N
-  SKN_protected_areas
-  SKB_terr_extent_UTM20N

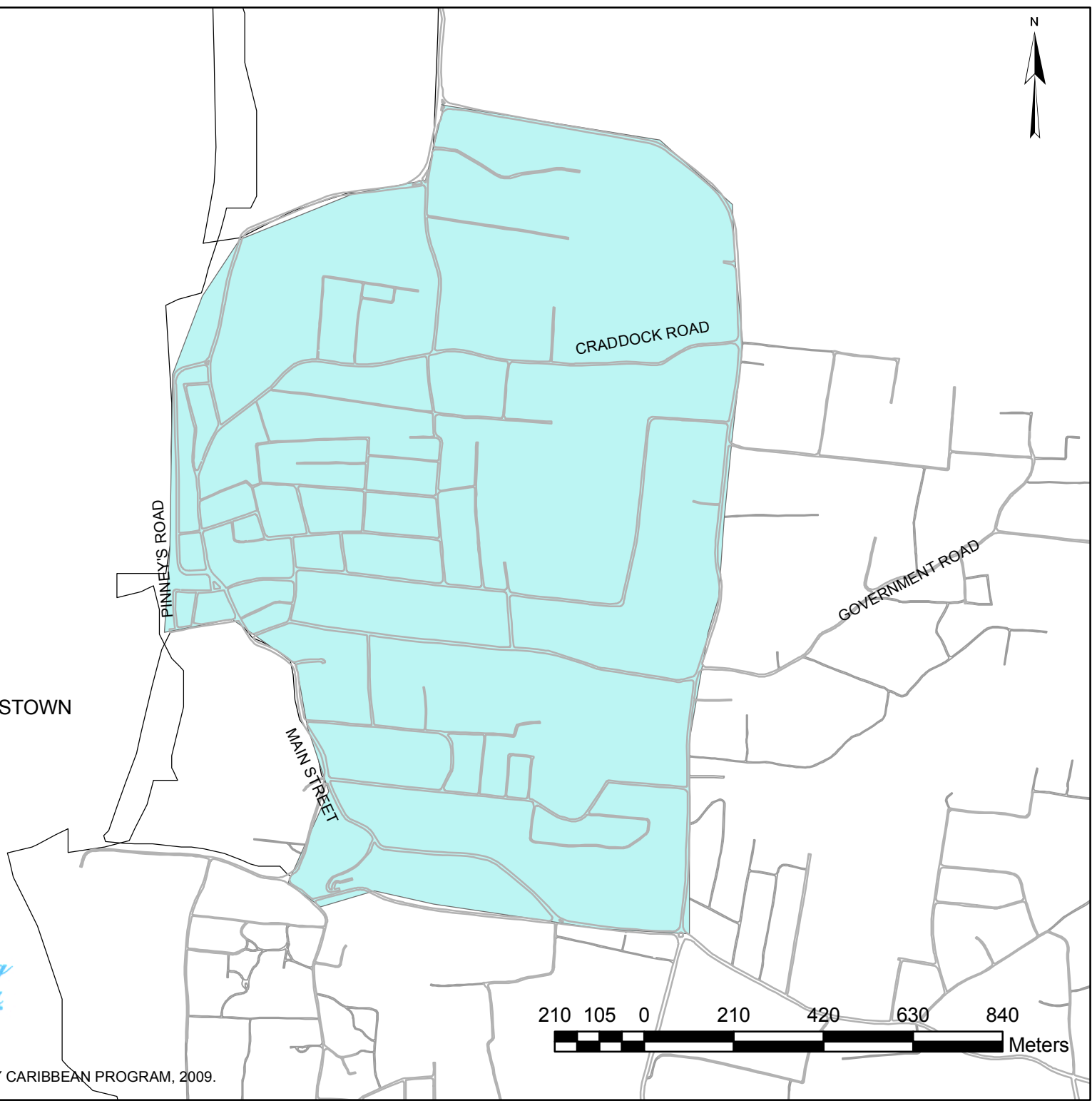
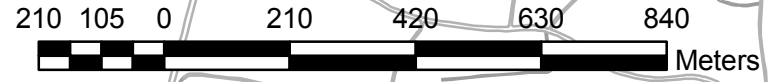


FIGURE 6-39 : HISTORIC CHARLESTOWN
DATE : 07-04-10



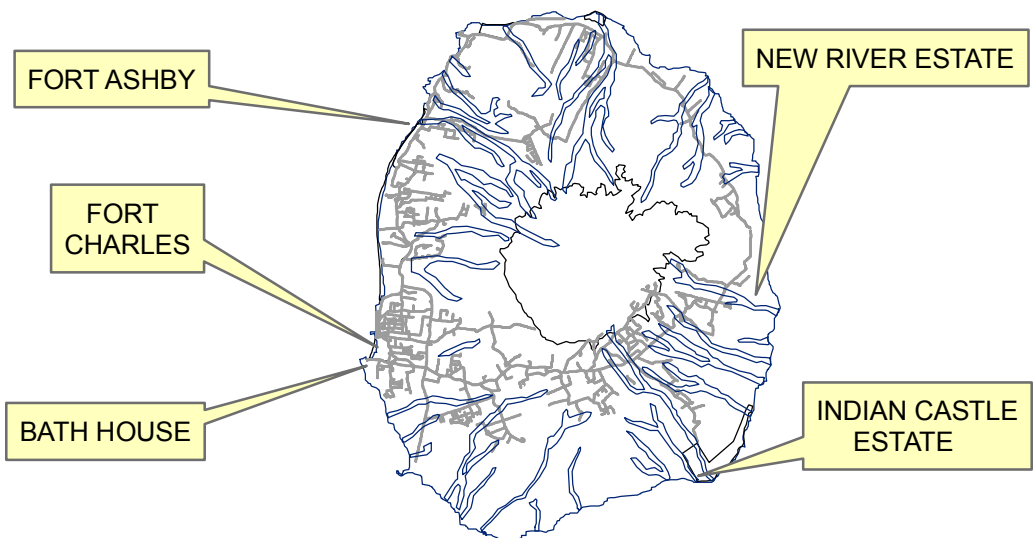
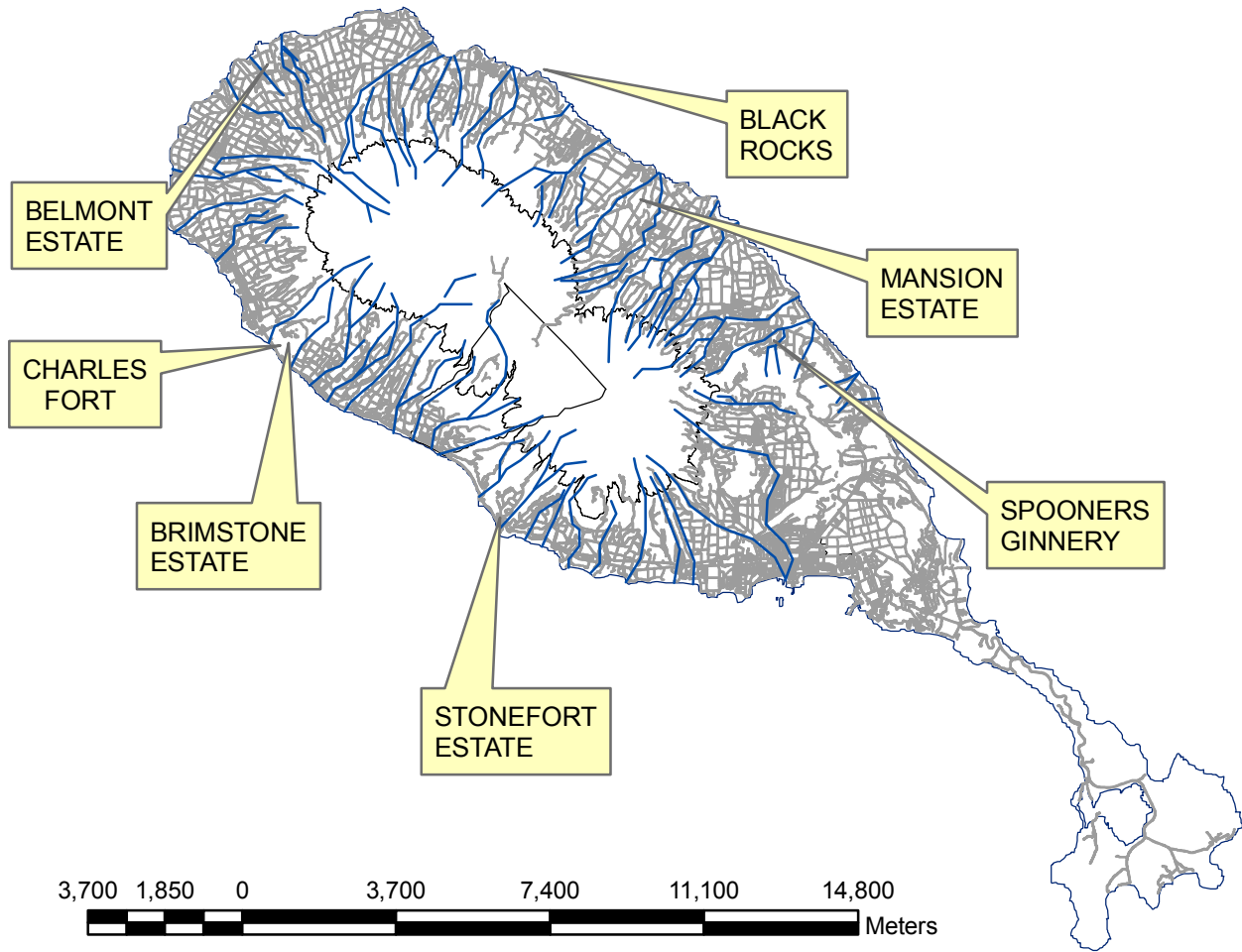


FIGURE 6-40 : OTHER HISTORIC SITES
DATE : 07-04-10





APPENDIX B

RESULTS OF ECOLOGICAL GAP ASSESSMENT

Results of the St. Kitts & Nevis Protected Area Ecological GAP Workshops November 13-14, 2008 & June 22 & 23, 2009

Overview

Experts from the Nature Conservancy (TNC), a US-based non-profit environmental organization, visited St Kitts & Nevis during the weeks of November 13-14, 2008 and June 22 & 23, 2009 to assist the Department of Planning & Natural resources and the Organization of Eastern Caribbean States (OECS) conduct a protected area ecological gap assessment. Results of these workshops are being used to determine where and how to scientifically strengthen the design of St. Kitts & Nevis's protected area network in order to fully represent the wide variety of biodiversity that exists on the islands and surrounding marine waters.

The first workshop was geared towards identifying the terrestrial, freshwater, and marine key species and ecological systems (also called *targets*) that need protection, setting conservation goals for each target, and documenting the associated threats to the targets. During this workshop, several mapping gaps were identified and a plan was outlined to fill these data gaps. Notes from this meeting can be found in Appendix I.

Following the first workshop, TNC worked closely with the Department of Planning, Natural Resources, and the Environment to manually digitize many of the missing targets and refine those targets that needed further validation using the 2004 and 2007 IKONOS imagery.

At the second workshop, local experts reviewed the spatial distribution for each of the target layers, paying particular attention to the new targets that had been mapped using the imagery. Prior to the meeting it was difficult to obtain significant information pertaining to Nevis. Great care was taken in the workshop to review each Nevis threat and target and to make necessary changes to the mapped files as needed. Notes from this meeting can be found in Appendix I.

Participants were also given an introduction to the software Marxan, freely available software created by the University of Queensland in Australia (Ball and Possingham, 2000). This software is widely adopted around the world as a tool for spatially optimizing conservation goals and requires the input of conservation targets, goals and corresponding threats. The Marxan software is able to arrive at an optimal conservation solution that efficiently meets all or most target goals. These areas are often times refined by manual inclusion and/or exclusion of areas based on the likelihood that they can be adopted into a government approved protected area plan.

After completing the necessary edits to threats and targets, workshop participants were presented with the results of a Marxan run using their target data, goals and threats. After reviewing the analysis outputs participants felt that additional target information needed to be collected and included in the run before significant work to refine the Marxan analysis could be done.

The final outcome of the second workshop produced a series of maps that show the spatial distribution of marine and terrestrial targets and threats. These maps can be found in Appendix I. Following the second workshop, the additional targets requested by the workshop participants were collected and included in the Marxan analysis. Two results were chosen for their ability to best meet conservation target goals. These two analysis runs produced a series of maps that show the optimal spatial configuration of a protected area network according to the Marxan software. These maps will need to be reviewed and refined by the Systems Plan consultants and local experts for incorporation into the Systems Plan.

This exercise was undertaken as part of the revision of the System of Protected Areas for St Kitts & Nevis, which is ongoing. The Systems Plan is currently being created with support from the OECS Protected Areas and Associated Livelihoods (OPAAL) Project. Information from this National Ecological Gap Assessment will be used by the Systems Plan consultants, Ecoengineering Caribbean Limited, when they create their final Systems Plan recommendation.

Identification of Targets and Threats

One key step in performing an ecological gap assessment is to determine the conservation targets for the country and the present and potential threats to these targets. Conservation targets are defined as the elements of biodiversity and related cultural features that will be the focus of conservation and management planning efforts. These may be marine or terrestrial, and can include:

- broad habitats and ecosystems;
- important areas for target species;
- rare or imperiled communities;
- places of cultural significance;
- threatened species;
- endemic and flagship species; and
- species of cultural significance, or economic importance.

Threats to the conservation targets are also included in undertaking a gap assessment, and may be natural (natural disasters, climate change, etc) or human-induced (extractive activities, unsustainable land practices, urban development, pollution, etc). In an effort to ensure widespread consultation and participation in the review process, TNC sought input from a large number of natural resource management agencies, local environmental groups, and interested individuals in determining the conservation targets and threats over the course of the two workshops and subsequent one-on-one meetings/interviews.

A distinction was made between coarse-filter targets (habitats, ecosystems, etc) and fine-filter targets (e.g. species). In some cases, critical species were listed as potential conservation targets. However, either due to lack of supporting GIS data, or lack of information on specific habitats, they were not selected as conservation targets. In other cases, although the species were deemed significant, the inability to map specific

locations due to widespread occurrences resulted in them not being included on the target list.

In addition, participants at each workshop assisted in verifying the quality and accuracy of data to be used in modeling the ecological gaps, and consequently creating a network of protected areas for effective biodiversity conservation. Where GIS data was unavailable, participants used institutional knowledge to manually mark targets on a map of Saint Lucia. Discussion was also held on potential sources for additions to, or verification of the existing data. Once conservation targets were agreed and finalized, a conservation goal was assigned, so that a draft model of the protected area system can be produced.

Target Descriptions

Table 1 is a list of conservation target that were identified as important to protect in St. Kitts & Nevis. This list reflects edits that were made subsequent to the first meeting and with feedback from the second meeting. Local experts set conservation goals for each target and efforts were made to spatially map each target in the most efficient and accurate way possible in order to be used in the Marxan software. Maps all of each target can be found in Appendix II.

Table 1. Terrestrial and Marine targets for the St. Kitts & Nevis National Ecological Gap Assessment. N/A indicates data not relevant or available at time of the analysis.

| Terrestrial | | | | | |
|---------------------------------|-----------------|-----|----------------------------------|-----|--|
| Target | Percentage Goal | | Data Included in Marxan Analysis | | Notes on Data Source |
| | SKB | NVS | SKB | NVS | |
| Intake springs | 100 | 100 | yes | yes | For NVS used the intake springs file only. Did not use the springs file. For SKB used Department of Physical Planning "Intake Springs" file. |
| Turtle nesting | 60 | 60 | yes | yes | Used combination of data from TNC. Verified with local experts. Removed some sites from TNC file and turned point data into line data to cover entire beaches. |
| Salt water ponds | 50 | N/A | yes | N/A | File from Department of Physical Planning. Removed fresh water ponds. |
| Freshwater ponds | 100 | N/A | yes | N/A | Located by experts. Digitized by TNC. |
| Brackish ponds | N/A | 90 | N/A | yes | Used NV_Natres07 and clipped "ponds" |
| Bird nesting sites | 50 | 60 | yes | yes | Located by local experts & digitized or digitized at June 09 meeting. |
| Aquifers | 50 | 50 | yes | no | SKB digitized by Department of Physical Planning. Data not available for Nevis. |
| Drought deciduous open woodland | 10 | 25 | yes | yes | Land cover* |
| Deciduous evergreen coastal & | 20 | 25 | yes | yes | Land cover* |

| mixed forest succulent | | | | | |
|--|-----------------|-----|----------------------------------|-----|---|
| Steep and montane non forest vegetation | 100 | 100 | yes | yes | Land cover* |
| Semi-deciduous forest (includes semi-evergreen forest) | 20 | 20 | yes | yes | Land cover* |
| Evergreen forest w/ coconut palms | 10 | 10 | yes | yes | Land cover* |
| Seasonal evergreen forests | 50 | 50 | yes | yes | Land cover* |
| Emergent wetland | 100 | 100 | N/A | yes | Land cover* |
| Elfin and Sierra palm cloud forest | 100 | 100 | yes | yes | Land cover* |
| Sierra palm, transitional an tall cloud forest | 100 | 100 | yes | yes | Land cover* |
| Evergreen forest (including Sierra palm forest) | 100 | 100 | yes | yes | Land cover* |
| Seasonally flooded savannahs and woodlands | N/A | 100 | N/A | yes | Land cover* |
| Rain fall greater than 75 inches/year | 100 | 100 | yes | no | digitized using rainfall contours. Creating polygon from everything greater than the 75" rainfall contour. Data not available for Nevis. |
| Marine | | | | | |
| Target | Percentage Goal | | Data Included in Marxan Analysis | | Notes on Data Source |
| | SKB | NVS | SKB | NVS | |
| Mangroves | 100 | 100 | yes | yes | taken from the land cover* data set for NVS and the TNC data set for SKB---then merged together |
| Fringe coral reefs | 90 | 90 | yes | yes | NV taken from NV_CRI_07 "coral" attribute. Added KN_reefFlat.shp and KN_NonReefFlat.shp. SKB used merged/dissolved KN_reefFlat and KNNonReefFlat. |

| | | | | | |
|----------------------------------|-----|-----|-----|-----|--|
| SPAG's/nursery (Nags Head) | 100 | N/A | yes | N/A | Digitized with Department of Physical Planning. |
| Lobster spawning/migratory route | 60 | 60 | yes | yes | Digitized with Department of Physical Planning |
| Rocky shore | 40 | 70 | yes | yes | SKB from SK_COASTYPE_01--used the "coble", "rocks", and "cliff& rocks" attributes. Dissolved file and generated a 50meter buffer for SKB_rocky_shores. NV-used the "coastal_sand_rocky_shore_or_bare_ground.shp" file from land cover* file---erased the "NV_Beaches.shp" file (obtained from Planning). |
| Sea moss | 50 | 80 | yes | yes | Digitized with Department of Physical Planning for SKB. |
| Thermal sea vents | 50 | 80 | yes | yes | SKB-digitized by Department of Physical Planning. |
| Monkey Shoal | N/A | 100 | N/A | yes | Digitized from admiral maps. |
| Southern Bank | N/A | 50 | N/A | yes | Digitized from admiral maps. |

*Land cover data developed by the International Institute of Tropical Forestry, USDA, Forest Service in 2005, as part of a joint project between USFS, USGS - Center for EROS, TNC, NASA, CSU - CEMML, USAID - Caribbean Program Office, Ministry of Agriculture, Fisheries, Cooperatives, Land and Housing, St. Kitts and Nevis, Nevis Island Department of Agriculture, Department of Physical Planning, Environment and Natural Resources, Physical Planning and Environment - Nevis and Physical Planning Division - St. Kitts, and Brimstone Hill National Park. Landsat imagery provided by NASA - GOFC, USGS - Center for EROS, and IITF.

Threat Model

GIS-based models called Environmental Risk Surfaces (ERS) were developed using mapped risk elements (e.g. human activities) to explore the overlap between risk elements and biodiversity features. A risk element can be defined as anything identified by experts as having a negative influence on the health of conservation targets, such as critical habitats or key species. The ERS models were designed to spatially identify habitats of low (intact) and high (threatened) risk areas, based on the spatial interaction of

underlying risk elements, and serve as input cost models for Marxan software (Ball and Possingham, 2000). In this way, an ERS model can be used to focus conservation site selection by steering selection away from high-risk areas where the abatement of pressures on biodiversity seems less likely. The composite or disaggregated individual surfaces can also be used to locate the specific environmental risks on the landscape that may be degrading the viability of particular conservation targets.

The Environmental Risk Surface tool is a freely available GIS-based tool developed in Visual Basic (ArcObjects) within ArcGIS 9.2, GIS software (ESRI, Redlands, CA) (Schill and Raber, 2006; download at <http://www.gispatools.org>). The first step in creating an ERS model requires assembling a suite of the best available GIS data that spatially represent the risk elements that are most likely to impact the health of terrestrial, freshwater, and/or marine habitat or species. All risk element features must be spatially mapped on the landscape as points, lines, or polygons using expert opinion to create or obtain the most accurate GIS data layers available. Human-induced landscape features such as agricultural and urbanized areas, tourism zones and hotels, roads, industrial areas, and surrogate indicators for human impacts such as population density are examples of risk elements that can be used in the creation of an ERS. The ERS models used for the St. Kitts ecological gap assessment were designed based on available input data and expert assessments for each risk element. The combination of risk elements and their respective intensity values and influence distances varies for each realm surface, thus accounting for the different ways that human activities impact biodiversity in each of the habitat realms (McPherson et al, 2008)

The intensity value represents the relative level of threat that the risk element poses to the targeted habitat or species. Separate intensity values were assigned to each risk element to capture the different relative levels of impact on different biodiversity targets. The intensity scores do not represent an absolute measure of the impact of risk elements on the biodiversity feature but rather the relative degree to which the biodiversity target in question is more likely to survive in one place over another based on the presence of one risk element in comparison to another. After the intensity values have been assigned, the next step is to determine the influence distance of each risk element. The influence distance is the spatial extent or footprint of the activity on the landscape and represents the maximum distance at which the feature has a negative impact on biodiversity. The influence distance is used to attribute an intensity value to risk elements outside of the immediate area of direct impact. As the distance of the buffer increases away from the center of the area (point, line or polygon) where the risk element is taking place, the intensity values of the cells within the buffers diminish progressively (distance decay) and the risk to the habitat is gradually lessened until the limit of the influence distance after which the feature is no longer considered to pose a risk to a given target.

Risk element tables were developed to indicate the intensity and influence distance of each risk element as assigned independently to each class and subclass based on the perceived threat level to terrestrial, freshwater or marine biodiversity (Table 2). These values were incorporated into the GIS coverage tables of each risk element for use in the development of the ERS. The final threat model can be seen in Appendix III and

demonstrates how individual polygon, line, and point risk elements translate into modeled risk surfaces with varying intensity values over their influence distances. The red areas represent higher combined risk and the blue areas, lower risk as modeled by the mapped risk element features. For a more detailed explanation on the creation of ERS models, please see McPherson et al, 2008.

Table 2. List of Risk Elements used in the St Kitts & Nevis Environmental Risk Surface Model and Associated Intensity and Influence Distances. N/A indicates data was not applicable or not available at the time of the analysis.

| Human Activity | Terrestrial Intensity | Terrestrial Distance (meters) | Marine Intensity | Marine Distance (meters) | Data Sources | Data available or used in final analysis | |
|--|-----------------------|-------------------------------|------------------|--------------------------|---|--|-----|
| | | | | | | SKB | NVS |
| ATV Trails | 60 | 100 | 80 | 100 | shp file from Department of Physical Planning | yes | N/A |
| Rail Road | 10 | 25 | 0 | 0 | | yes | N/A |
| Paved Roads | 70 | 100 | 60 | 100 | | yes | yes |
| Unpaved roads | 80 | 150 | 70 | 100 | | N/A | yes |
| Hospital Grey Water Point Source | 0 | 0 | 95 | 600 | Digitized with Department of Physical Planning for SK. Still need NV. | yes | N/A |
| Hotel/Resort: Tourism Hotel rooms 1-6 | 11 | 100 | 11 | 50 | Final layer was modified to include room data from the TNC shapefile, verified against the Tourism Development Corporation's record keeping and a list of hotel names used by the Physical Planning Department. | yes | yes |
| Hotel/Resort: Tourism Hotel rooms 7-14 | 25 | 500 | 25 | 300 | | yes | yes |
| Hotel/Resort: Tourism Hotel rooms 15-24 | 27 | 500 | 27 | 300 | | yes | yes |
| Hotel/Resort: Tourism Hotel rooms 25-49 | 35 | 500 | 35 | 500 | | yes | yes |
| Hotel/Resort: Tourism Hotel rooms 50-149 | 40 | 500 | 60 | 1600 | | yes | yes |
| Hotel/Resort: Tourism Hotel rooms 150+ | 40 | 500 | 80 | 1600 | | yes | yes |
| Point Source Siltation (ghaut outlets) | 40 | 50 | 80 | 1600 | SKB information gathered at November 2008 GAP meeting then digitized. NVS points digitized at June 09 meeting. | yes | yes |

| | | | | | | | |
|------------------------------|-----|------|----|------|--|-----|-----|
| Squatters | 50 | 500 | 50 | 50 | shp file from Department of Physical Planning | yes | N/A |
| Airport | 100 | 1000 | 60 | 1600 | Digitized with Department of Physical Planning | yes | yes |
| Anchoring | 0 | 0 | 75 | 20 | Digitized with Department of Physical Planning for SKB— Digitized at June 09 meeting for NVS | yes | yes |
| Boat Yards | 90 | 500 | 90 | 1000 | Digitized with Department of Physical Planning | yes | N/A |
| Marinas | 35 | 300 | 90 | 100 | Digitized with Department of Physical Planning for SKB | yes | N/A |
| Sea Ports (tourists) | 80 | 800 | 90 | 3200 | Data obtained from various planning department data files, which were verified and amended at June 09 meeting. | yes | N/A |
| Industrial Port (commercial) | 90 | 800 | 60 | 3200 | Data obtained from various planning department data files, which were verified and amended at June 09 meeting. | yes | yes |
| Overnight Boating | 0 | 0 | 30 | 5 | Digitized at June 09 meeting. Same file as anchoring. | yes | yes |
| Docks & Piers | 60 | 100 | 70 | 1600 | Digitized & verified at June 09 meeting. Groins were not included. | yes | yes |
| Jetties | 25 | 15 | 50 | 150 | Digitized with Department of Physical Planning for SKB-- Jetties built on pillars were left out. Only solid jetties were included. With this definition, Nevis did not have any jetties. | yes | yes |
| Golf Course | 40 | 50 | 40 | 100 | Nevis is 50 terrestrial-distance- Digitized from imagery for both SKB & NVS. Expert verification. | yes | yes |

| | | | | | | | |
|----------------------------|-----|-----|----|------|--|-----|-----|
| Landfills | 100 | 800 | 30 | 30 | Digitized with Department of Physical Planning for SKB—NVS Digitized at June 09 meeting | yes | yes |
| Livestock Facility | 90 | 50 | 10 | 25 | Nevis: same as a marina distance//intensity=80-- Digitized SKB file with Department of Physical Planning for SK. NVS was digitized at the June 09 meeting. | yes | yes |
| Power Plant | 100 | 500 | 0 | 0 | SKB shp file from Department of Physical Planning. NVS file digitized at June 09 meeting | yes | yes |
| Quarries | 95 | 800 | 0 | 0 | Nevis: Marine intensity=90 distance=1000---SK digitized with Department of Physical Planning. NV used land cover file. | yes | yes |
| Sewage Plant @ Frigate Bay | 50 | 0 | 50 | 600 | Digitized with Department of Physical Planning. | yes | N/A |
| Desalinization Plant | 60 | 10 | 70 | 200 | Digitized at June 09 meeting | yes | N/A |
| Low Density | 20 | 100 | 20 | 50 | Used Low Density Build up Land; Rural or residential attribute from the land cover file | yes | yes |
| High & Med Density | 40 | 500 | 80 | 1600 | Used high & medium density residential attribute from the land cover file | | |

Marxan Results

The results of the Marxan analysis can be found in Appendix IV. The two runs that are presented in this report demonstrate possible solutions to achieving the most efficient protection of the selected targets. No solution was able to meet all goals at the set levels. Appendix IV indicates the level to which each run was able to meet the specified targets.

For use in the systems plan it is recommended that these runs be used as a base for the systems plan. However, it should be noted that Monkey Shoal should be added to the portfolio as well as additional mangroves for both St. Kitts and Nevis. Although no run

was able to meet the goals set for several other targets, the mapped results, inset tables, and associated graphs indicate that other than Monkey Shoal and mangroves, the other targets were very close to being met.

References

- Ball, I & H. Possingham. 2000. *Marxan (v1.8.2): Marine reserve design using spatially explicit annealing. A manual prepared for The Great Barrier Reef Marine Park Authority.*
- McPherson, M., S. Schill, G. Raber, K. John, N. Zenny, and K. Thurlow, 2008, GIS-Based Modeling of Environmental Risk Surfaces (ERS) for Conservation Planning in Jamaica,” *Journal of Conservation Planning* Vol 4:60-89.

APPENDIX I

Meeting Notes

National Ecological Gap Assessment Workshop Minutes
Thursday 13th to Friday 14th November, 2008
Ocean Terrace Inn
Fishermans Wharf, St. Kitts, W.I.

Opening

The National Ecological Gap Assessment Workshop began at approximately 9:15 A.M. on November 13, 2008. The meeting convened at Ocean Terrace Inn on St. Kitts. Mr. Randolph Edmead from the St. Kitts Department of Physical Planning & Environment opened the meeting. This workshop took place over two days.

Present

See Appendix 1.

Day 1: Welcome & Introductions

Mr. Randolph Edmead from the St. Kitts Department of Physical Planning & Environment welcomed participants and explained the purpose of the two day workshop. He explained that the two day workshop was part of the National Ecological Gap Assessment being undertaken in collaboration with the OECS- Environment and Sustainable Development Unit, working in partnership with The Nature Conservancy. The National Ecological Gap Assessment will be used as a basis for assessing existing biodiversity assets and identifying areas which may be included in a National Protected Areas System.

Mr. Edmead explained that St. Kitts is part of the OECS Protected Areas and Associated Livelihood (OPAAL) Project and that one of its components is the establishment of a Protected Areas Systems Plan. The OPAAL Project is undertaken in the independent member states of the OECS and is aimed primarily at protecting and conserving biological diversity endemic to the region.

The project is financed by the World Bank, the French Government and the OAS. The OPAAL Project falls under the wider umbrella of the Convention on Biological Diversity (CBD). The Project forms part of the CBD's Programme of work on Protected Areas which has as one of its goals, "to establish and strengthen National and Regional Systems of Protected Areas, integrated into a global network, to reduce the rate of biodiversity loss."

In St. Kitts-Nevis there is currently only one officially declared protected area, the Central Forest Reserve. The goal is to develop a system of Protected Areas with both terrestrial and marine areas represented. The Ecological Gap Assessment process will help identify if and where the current Protected Areas System falls short of protecting important biodiversity.

Mr. Edmead explained that in addition to the Central Forest Reserve, which is the OPAAL Project Demonstration Site, the national aim is for the establishment of other Protected Areas in St. Kitts and Nevis. For example:

1. The Basseterre Valley Project which is undertaken as part of Integrated Watershed and Coastal Areas Management (IWCAM) Project.
2. The Proposed Marine Management Area, focusing on the protection of the coastal ecosystem between St. Kitts and Nevis.
3. The proposal by the Nevis Island Administration to declare the area around Nevis Peak protected.

It is anticipated that these areas will be included in the National Protected Areas System. Mr. Edmead explained that The Nature Conservancy (TNC) has agreed to work with the OECS in assisting Member States in undertaking the Ecological Gap Analysis as part of the implementation activities for the OPAAL Project.

Mr. Edmead concluded his welcome by underscoring the workshop objectives:

1. To identify conservation targets for terrestrial and marine ecosystems.
2. To identify the environmental threats for terrestrial and marine ecosystems.
3. To identify data gaps.
4. To set a work plan to fill the gaps.

Agenda Review, and Introduction to The Nature Conservancy & Protected Area System Planning

Ms. Ruth Blyther from The Nature Conservancy, explained that TNC has worked in the Mesoamerica and Caribbean region for the last 30 years. This region is the Conservancy's longest running international program and the relationship with partners here is well established. The Conservancy has been working in the Caribbean for the last 20 years and currently has offices in St. Croix, Jamaica, Bahamas, the Dominican Republic and the Florida Keys.

Ms. Blyther expressed excitement on behalf of The Nature Conservancy to have the opportunity to work with the government and partners of St. Kitts and Nevis to help meet the CBD's goal of marine and terrestrial area protection for 2010 and 2012. This workshop is the first of many to focus on the ecological gap analysis for St. Kitts and Nevis.

Ms Blyther explained that she is the Eastern Caribbean's Partnership Specialist, based in St. Croix, US Virgin Islands. For the past two years she has worked with partner

governments and organizations in the Eastern Caribbean to conserve biodiversity and build regional capacity for sustainable management of the environment, especially in and surrounding protected areas

Ms. Blyther then went on to introduce her two colleagues Ms. Shawn Margles and Mr. John English Knowles. Ms. Margles is the Southeastern Caribbean Conservation Planner for the Nature Conservancy's Insular Caribbean Operation Unit also based in St. Croix. She has worked with partners in St. Croix to develop a spatial database and worked on the Jamaica ecological gap.

Mr. Knowles is the Conservation Information Manager for the Conservancy's Insular Caribbean Operation Unit based in the Florida Keys. He supports the spatial data management, map making, analysis and ecological gap work for the Insular Caribbean. Both Ms Margles and Mr. Knowles have extensive experience with geographic information systems (GIS).

Ms. Blyther then introduced Ms. Sarah George from the OECS and the OPAAL project.

Ms. George expressed the pleasure of the OECS to be partnering with TNC in providing this support to St Kitts and Nevis. She explained that the work complements the systems planning element of the OECS Protected Areas and Associated Livelihoods (OPAAL) project which is designed to enable the Participating Member States to update pre-existing PA systems plans or develop new ones for countries where no such plan has existed before. St. Kitts-Nevis is such a case and the gap analysis is an important means to assess what sites and values exist and determine what factors may affect proposed sites which would be necessary to conserve national biodiversity while providing for sustainable livelihoods for local communities.

OPAAL is a five year regional project which works in all 6 independent Member States of the OECS. It supports policy, legal and institutional reform, PA establishment and management, capacity building and public awareness which allows for improved management of PAs within the region. OECS has a Memorandum of Understanding with TNC to collaborate on the above mentioned areas and this jointly facilitated gap analysis workshop is one demonstration of this partnership.

The development objective of OPAAL for projects is that when implemented, they will contribute to the economic development of the participating member states by:

1. Strengthening existing and creating new protected areas
2. Providing environmentally sustainable economic opportunities for communities living in the surrounding areas.

Participating Member States are St. Kitts and Nevis, Antigua and Barbuda, Dominica, Saint Lucia, St. Vincent and the Grenadines, and Grenada.

Introduction to GAP Analysis Components

Ms. Margles explained that the GAP is a participatory process of stakeholders that identifies important biodiversity targets and the threats that impact them.

Conservation targets represent biodiversity across biological scales (species and ecosystems) and biological realms (terrestrial, freshwater, and marine). The aim of defining conservation targets is to capture the full array of biodiversity in the country. The goal of full representation is to conserve representative samples of all species and ecosystems within the country, at sufficient scale to ensure their long term persistence. These focal biodiversity elements define species, communities, and ecological systems to be evaluated in the gap analysis and are intended to represent the full range of biodiversity (freshwater, marine, and terrestrial).

Environmental risk factors are human activities that apply pressure to or threaten the viability of conservation targets. These may include roads, hotels, anchoring sites, agriculture, tourism, and others. Environmental risk factors and their distance of influence and relative intensity must be defined.

Ms. Margles explained that the gap analysis will use coarse and fine filter conservation targets defined at this two day meeting. Coarse filter elements (e.g. all native/natural ecological systems) represent common and widely distributed species, natural communities, and the ecological processes that support them. Fine filter elements are native species, species, assemblages, and communities that are not well captured by the coarse filter and require individual attention in order to be effectively represented in the conservation plan.

Ms. Margles explained that all data must be:

- Country wide
- Spatial
- Standardized/ collected in a consistent manor
- Directly related to inform this effort

Ms. Margles went on to describe how these data would then be used in a three part analysis. A summary of these calculations are as follows:

Relative Abundance Calculation (RAC): The relative abundance calculation identifies planning units with relative high abundance of the conservation targets. The RAC for each planning unit is directly proportional to the amount of conservation target present in the planning unit (e.g. hectares of habitat, length of stream or number of occurrences). This calculation can be used to identify the best remaining areas, in terms of target abundance, for each target or set of targets at the planning unit or the landscape scale. The RAC calculates the relative uniqueness or rareness of a habitat or species across the landscape.

Impact Analysis: The impact analysis is a modeled surface developed using mapped risk elements identified by the expert group. The impact analysis measures cumulative levels of impacts across the landscape. Each identified impact is given a marine and terrestrial impact and distance score by the expert group. The impact analysis is used to determine mean impact scores for each planning unit.

Irreplaceability Index: The irreplaceability index is determined using MARXAN software. MARXAN uses stochastic optimization routines (Simulated Annealing), which generates spatial reserve systems that achieve particular biodiversity representation goals with reasonable optimality. The simulated annealing algorithm attempts to minimize the total cost of the reserve system, while achieving a set of conservation goals. During the simulated annealing procedure, an initial portfolio of planning units is selected. Planning units are then added and removed in an attempt to improve the efficiency of the portfolio. Early in the procedure, changes in the portfolio that do not improve efficiency can be made in order to allow the possibility of finding a more efficient overall portfolio. The requirement to accept only those changes that improve efficiency becomes stricter as the algorithm progresses through a set of iterations. For any set of conservation targets and goals, there may be many efficient and representative portfolios that meet all conservation goals, but most of these networks would have a number of planning units in common. Many runs of the algorithm are used to find the most efficient portfolio and to calculate a measure of *irreplaceability* (used here to indicate the number of times a particular unit is chosen). In some cases, conservation targets are only found in limited sites—areas of high irreplaceability—that are always chosen in any representative portfolio. Additionally, areas of high irreplaceability also include planning units, whose exclusion would require a proportionally larger conservation area network to achieve the same level of representation, resulting in a loss of portfolio efficiency. The algorithm attempts to minimize portfolio total ‘*cost*’ whilst meeting conservation goals in a spatially compact network of sites.

Defining the Terrestrial Conservation Targets

Ms. Margles and Mr. Knowles then led the group through an exercise to identify terrestrial conservation targets and percentage goals. The group was asked to brain storm conservation targets while Mr. Knowles recorded each on a flip chart. After a list of conservation targets was exhausted, the group proceeded to set conservation goals that would be used to help guide the Irreplaceability Index calculation.

Multiple coarse and fine filter targets were identified, but not all will be used in the assessment. A list of conservation targets and goals to be included and a data layer assessment can be found in Appendix 2. The full list of brainstormed items is as follows:

- Heliconia (rare and endemic)/
- Hummingbird
- Littoral forests
- Dry forests
- Rain forest
- Great salt ponds

- Deer
- Beaches/turtle nesting sites (St. Kitts and Nevis)
- Freshwater system
 - o Wingfield River
 - o Drainage
 - o Freshwater river eel
 - o Rivers
 - o Crawfish in Cayon River
 - o Freshwater ponds
- Sand Dunes in Nevis (need to draw)
- Mangroves
- Bassaterre Valley Watershed
- Catchment areas (in Central Forest Reserve)
- New River watersheds - aquifer
- Nevis peak
- Camps Spring watershed
- Bats, frogs, lizards, snakes (Heritage Society)
- Wetlands
- Pelican sites
- Important Bird Area from Birdlife International or migratory bird stopovers
- Clay Slough
- Endemic bird sites
- Pollinating insects, bees, and butterflies
- Cultural targets

Defining Terrestrial Environmental Risk Surface

After completing the conservation targets exercise, Ms. Margles and Mr. Knowles explained how the Environmental Impact Analysis would be conducted. They then led the group through an exercise to identify both Marine and terrestrial threats. Many threats were identified, but not all will be used in the assessment. The finalized threats can be found in Appendix 3. Below is a list of threats that were brainstormed by participants. The threats in bold were incomplete and participants attempted to map them on paper:

- **Mining/Quarrying**
- **Livestock (cows, goats, sheep)**
- Monkeys
- Cuban frog/cane toad
- Snakes
- Fire ants
- Black widow
- Coconut palms
- Insecticide – Agricultural chemicals (fertilizer intensive crops)
- Mongoose
- Power plants
- **Desalinization plant (St. Kitts)**

- Sugar factory
- Industrial port
- (maybe deer)
- Donkey
- Development (Rail, Residential (High and Low), Industrial (proposed and existing), Airport, Roads)
- Tourism (Hotels by size)
- Golf courses
- Illegal dump sites
- Landfill

Specific marine threats were identified. Many threats were identified, but not all will be used in the assessment. The threats in bold were incomplete and participants attempted to map them on paper:

- **Anchoring**
- **Ghost traps**
- Undersize catches (beach seining)
- Siltation
- **Proposed hotels**
- **Jetties**
- Gray water point sources
- Marinas
- **Boat yards**

After reviewing the existing data and missing data the group agreed that further data collection and digitization would be necessary.

Ms. Margles and Mr. Knowles explained that on the following day distance and intensity values would be assigned to each threat. The meeting adjourned at approximately 3 pm.

Day 2: Completing Defining Terrestrial and Marine Intensity and Distance Values for Environmental Risk Surface

To begin the second day Ms. Margles and Mr. Knowles explained that the intensity and distance values for threat factors needed to be assigned by participants. Participants had a group discussion to determine on a scale of 0-100 how intense the impact of each identified activity was and how far from its point source the influence traveled. The distance and intensity scores that were agreed upon by participants can be found in Appendix 3.

Defining the Marine Conservation Targets

After participants completed assigning intensity and distance values, marine conservation targets were brainstormed. Mangroves, seagrass beds, fringe coral reefs (additions need to be made to Nevis), artificial reefs, SPAG's/nursery (Nags Head), lobster spawning and migratory routes, rocky shore, sea moss, thermal sea vents, underwater sea mounts

(location unsure) and offshore reef were included in the list. Participants then assigned percentage conservation goals in the same fashion as had been done the previous day for terrestrial conservation targets. A complete list of marine conservation targets and percentage goals can be found in Appendix 4.

Set work plan to fill data gaps

Key participants will be contacted over the next couple of months to clarify and help obtain missing data.

Wrap-up

The next steps were outlined. First the data needed for the analysis needs to be collected and organized. The Conservancy will work with Department of Physical Planning & Environment to coordinate this effort. After the data is ready the analysis will be conducted and an initial portfolio of potential protected areas will be generated. This information will be presented to workshop participants at another meeting so they may review the analysis outputs and make any necessary changes. The objective is to have a portfolio ready for review by February 2009.

Participants were thanked for their hard work, time and focus on getting through a lot of material over the two days of the workshop. Their expertise and acceptance of the process is invaluable to the success of a protected areas system plan.

The meeting adjourned at approximately 3 p.m.

Participant's List of Attendees for the National Ecological Gap Assessment Analysis Workshop, 13-14th November, 2008.

| NAMES | ORGANISATION | CONTACT INFORMATION |
|------------------|---|--|
| Randolph Edmead | Department of Physical Planning & Environment | 465-2277 phyplskb@sisterisles.kn |
| Sarah George | OECS | 1-758-455-6327 sgeorge@oeecs.org |
| Shawn Margles | The Nature Conservancy | 1-340-244-6172 Shwan.margles@gmail.com |
| John Knowles | The Nature Conservancy | 1-980-253-7803 jknowles@tnc.org |
| James Greene | Department of Maritime Affairs | 466-4648 maritimeaffairs@yahoo.om |
| Karen Douglas | Department of Economic Affairs | 467-1252 karendouglas.stk@gmail.com |
| Racquel Williams | Ministry of Agriculture | racquelw8@gmail.com |
| Graeme Browne | Department of Physical Planning & Environment | 762-6037 mastergraeme@hotmail.com |
| Eduardo Mattenet | GIS/IT Consultant | ematenet@sisterisles.kn |
| Stuart Laplace | Clarentz Fitzroy Bryant College (Science Dept.) | 667-0778 stuartlaplace@hotmail.com |
| Joe Simmonds | Department of Fisheries (St. Kitts) | 465-8045 msuk@sisterisles.kn |
| Lemuel Pemberton | Department of Fisheries (Nevis) | 469-5522 ext 2088 mugabe@hotmail.com |
| Ronel Browne | Department of Physical Planning & Environment | 663-8341 Kyser56@hotmail.com |
| Andy Blanchette | Department of Physical Planning & Environment | 662-7992, 465-2277 ablanchee@hotmail.com |

| | | |
|----------------|--|---|
| | | |
| Edwin Ible | Water Services Department (St. Kitts) | 466-3070, 665-0455 incontrolll@hotmail.com |
| Kenneth Samuel | Kenneth Dive Center | 465-2670, 667-9186 |
| Elmo Stevens | Water Services Department (St. Kitts) | 466-3070 ext. 231, 663-8781 shaki287@hotmail.com |
| Paul Benjamin | Department of Agriculture (St. Kitts) | 465-2335 doastk@sisterisles.kn |

Terrestrial Conservation Target Goals

| Target Goal (%) | Target |
|-----------------|--|
| 100 | Intake springs |
| 60 | Turtle nesting (St. Kitts and Nevis) |
| 50 | Salt water ponds |
| 100 | Freshwater ponds |
| 90 | Brackish ponds (Nevis) |
| 60 | Bird nesting sites (Nevis) |
| 50 | Bird nesting sites (St. Kitts) |
| 50 | Aquifers |
| 25 | Drought deciduous open woodland (Nevis) |
| 10 | Drought deciduous open woodland (St. Kitts) |
| 20 | Deciduous evergreen coastal & mixed forest succulent (St. Kitts) |
| 25 | Deciduous evergreen coastal & mixed forest succulent (Nevis) |
| 20 | Semi-deciduous forest (includes semi-evergreen forest) (St. Kitts & Nevis) |
| 10 | Evergreen forest w/ coconut palms (St. Kitts and Nevis) |
| 50 | Seasonal evergreen forests (St. Kitts and Nevis) |

Data Layer Assessment

| Include | Data Layer | Additions | Comments |
|---------------|----------------------|---|--|
| Yes | Nesting bird sites | Egrets/trees | Major existing sites, but dwindling. |
| Yes | Turtle nesting sites | | Dc – St. Kitts, Ei – Nevis. Use both in-house and WIDECAS data. Sandy Point has had sand mining. |
| Yes, but edit | Sandy Beach Layer | “Western White House Bay used to have sand, but it is not coming back.” | Some removals |
| Yes | Aquifer layer | | |
| Yes | Pond | Split file. Brackish water ponds in Nevis | Salt and freshwater (2 center ones). |
| Yes, partly | Waterwells | | Intakes – natural and springs in forest areas (*target). Wells and reservoirs are manmade (not targets). Flagging entire watershed system was suggested by Sarah George. |
| Yes | Wingsfield Watershed | | Designated watershed/catchment |
| Maybe | Soils | *Need soil layer | Break out fertile soil. Digitize |

| | | | |
|--|----------------|--|--|
| | | for Nevis | hard copy report that breaks down soil by crop type. |
| | Landcover Data | Mangroves layer needs more, but mostly good. Digitize data from Lemuel on Nevis' mangroves. Management plan has more data. | Dates collected – 2000-2003. This is after the hurricane, which is good. Deciduous, evergreen, coastal and mixed forest includes most of littoral. Combine montane and steep forest. |

Terrestrial and Marine Environmental Impact Factors with Distance & Intensity Scores

| Human Activity | Type or value range | Terrestrial Intensity | Terrestrial Distance (meters) | Marine Intensity | Marine Distance (meters) | Notes |
|----------------------------------|---------------------|--|-------------------------------|------------------|--------------------------|---|
| Power Plant | | 100 | 500 | 100 | 1600 | |
| Rail Road | | 10 | 25 | 0 | 0 | |
| Roads | | 60 | 100 | 80 | 100 | |
| Airport | | 100 | 1000 | 60 | 1600 | |
| Boat Yards | | 90 | 500 | 90 | 1000 | |
| ATV Trails | | 60 | 100 | 80 | 100 | |
| Squatters | | 50 | 500 | 50 | 50 | |
| Sea Ports | | 80 | 800 | 100 | 3200 | |
| Quarries | | 95 | 800 | 0 | 0 | Nevis: Marine intensity= 90 distance=1000 |
| Hotel/Resort: Tourism | 1-6 | 11 | 100 | 11 | 50 | |
| Hotel/Resort: Tourism | rooms 7-14 | 25 | 500 | 25 | 300 | |
| Hotel/Resort: Tourism | 15-24 | 27 | 500 | 27 | 300 | |
| Hotel/Resort: Tourism | 25-49 | 35 | 500 | 35 | 500 | |
| Hotel/Resort: Tourism | 50-149 | 40 | 500 | 60 | 1600 | |
| Hotel/Resort: Tourism | 150+ | 40 | 500 | 80 | 1600 | |
| Anchoring | | 0 | 0 | 75 | 20 | |
| Ghost Traps | | 0 | 0 | 85 | 80 | |
| Point Source Siltation (ghauts) | | 40 | 50 | 80 | 1600 | |
| Overnight Boating | | 0 | 0 | 30 | 5 | |
| Jetties | | 25 | 15 | 50 | 150 | |
| Hospital Grey Water Point Source | | 0 | 0 | 95 | 600 | Nevis: has different impact. |
| Desalination Plant | | 60 | 10 | 70 | 200 | |
| Residential - High | | 40 | 500 | 80 | 1600 | |
| Residential - Medium | | 35 | 500 | 35 | 500 | |
| Residential - Low | | 11 | 100 | 11 | 50 | |
| Illegal Dumping sites | | 85 | 10 | 85 | 50 | |
| Landfills | | 100 | 800 | 30 | 30 | |
| Golf Course | | 40 | 50 | 40 | 100 | Nevis is 50 terrestrial-distance |
| Marinas | | 35 | 300 | 90 | 100 | Nevis Marine Intensity=90//Terrestrial Intensity=90 |
| Livestock Facility | | 90 | 50 | 10 | 25 | Nevis: same as a marina distance//intensity=80 |
| Invasive: Monkey | | Needs to be dealt with in the system plan. | | | | |
| Invasive: Cuban Frog/Cane Toad | | | | | | |
| Invasive: Snakes | | | | | | |
| Invasive: Fire ants | | | | | | |
| Invasive: Black widows | | | | | | |
| Invasive: Mongoose | | | | | | |
| Invasive: Deer | | | | | | |
| Invasive: Coconut Palms | | | | | | |
| Invasive: Donkey | | | | | | |
| Industrial Port | | | | | | |
| Sewage Plant @ Frigate Bay | | 50 | 0 | 50 | 600 | |

Marine Conservation Targets and Conservation Goals

| Target Goal (%) | | Target |
|-----------------|-------|---|
| St. Kitts | Nevis | |
| 100 | 100 | Mangroves |
| 100 | 100 | Seagrass beds |
| 90 | 90 | Fringe coral reefs |
| 100 | 100 | Artificial reefs |
| 100 | | SPAG's/nursery (Nags Head) |
| 60 | | Lobster spawning/ migratory route |
| 40 | 70 | Rocky shore |
| 50 | 80 | Sea moss |
| 50 | 80 | Thermal sea vents |
| | | Underwater sea mounts (location unsure) |
| 100 | 100 | Offshore reef |

National Ecological Gap Assessment Workshop Notes
Monday 22 & 23 June, 2009
Nevis

Notes on Threats

All-terrain-vehicles (ATVs) are on Nevis, but there is no data. The Nevis roads can be split between paved and unpaved. Unpaved roads were determined to have higher intensity levels and paved roads were determined to have less impact. The final road layer used placed main and secondary roads into the paved category and trails and tracks into the unpaved category.

| | Marine Intensity | Distance | Terrestrial Intensity | Distance |
|----------------------|-------------------------|-----------------|------------------------------|-----------------|
| Unpaved roads | 80 | 150 | 70 | 100 |
| Paved roads | 70 | 100 | 60 | 100 |

For boat yards, we have the most current layer for St. Kitts. There are individual boat yards in Nevis, but optioned not to include those in the final analysis.

Hospital gray water – St. Kitts has just the two and this was validated for the final analysis. Nevis has a treatment plant at present, but it is not a problem and wasn't used in the final analysis.

Hotels – the final hotel layer was modified to include room data from the TNC shapefile, verified against the Tourism Development Corporation's record keeping and a list of hotel names used by the Physical Planning Department. Nevis hotels were verified by the manager of the Hermitage Plantation Inn on Nevis.

Point source siltation – There are many ghauts that have significant anthropogenic effects. The ones for St. Kitts were drawn on a map in November 2008 and these were sufficient. Many Nevis ghauts were added, but will keep the same intensity level and distance number as listed for the St. Kitts ghauts. The Nevis ghauts include Kemp's River (point 1), Bath Stream (point 2), Nelson Spring Wetland (point 3), Big Pond (point 4), Paris Point (point 5), golf course sedimentation (point 6), Caye Bay Pond (point 7), Mosquito Bay (point 8), Long Hall Bay (point 9), Fountain Gut (point 10), quarry siltation/Mombo ghaut (point 12), jackass (point 11), Little Bay (point 13), stock pin (point 14), New River Ghaut (point 15), Business Ghaut (point 16), Plantings Ghaut (point 17), Kitt Ghaut (point 18), Fountain Ghaut (point 19), Granden Ghaut (point 20), Bridge Ghaut (point 21), Sulfur Gut (point 22) and two additional ghauts that didn't have names (points 23 and 24).

Landfill – The Nevis landfill was mapped.

Squatters – Squatters in St. Kitts is complete for the coast areas, but points are missing for squatters in the mountains. Nevis does not really have squatters.

Airport – The two airports were correct for St. Kitts and Nevis.

Golf courses – St. Kitts has 3 golf courses. One (1) is established and two (2) are in development. The golf course at Sandy Point was drawn in by the group and the site plans for the new golf courses were also drawn in. Nevis has one (1) golf course.

Anchoring – There were a few modifications for the anchoring sites for St. Kitts. The Northern Bay site was brought closer to shore. The Turtle Bay site was increase. Monkey Shoals was added as an anchoring spot. For Nevis, many anchoring sites were added. The first was off of the Four Seasons property. Second was the Gallows Bay in Charlestown. Third was the official anchoring area off Charlestown (polygon 4). Fourth was Mosquito Bay, fifth was Jones Bay, sixth was New Castle, seventh was Long Horn and last was the Delta Anchorage.

Jetties – Jetties built on pillars were left out. Only solid jetties were included.

Docks and Piers – The sea bridge and ferry terminal were added for Nevis. Groins were not included. For Nevis only, the intensity and distance value are as follows:

| Terrestrial | | Marine | |
|-------------|----------|-----------|----------|
| Intensity | Distance | Intensity | Distance |
| 60 | 100m | 70 | 1 miles |

Seaports and industrial ports – For St. Kitts seaports were considered as tourist facilities and industrial ports were considered as commercial facilities. Nevis has Long Point and it has the same intensity and distance values as Basseterre. In Nevis, it is considered a deep water harbor. The intensity and distance value for these facilities in St. Kitts are as follows:

| | Terrestrial | | Marine | |
|-------------------------------|-------------|----------|-----------|----------|
| | Intensity | Distance | Intensity | Distance |
| Seaports (tourists) | 80 | Same | 80 | Same |
| Industrial Ports (commercial) | 90 | Same | 60 | Same |

Livestock – Unmanaged livestock has a big impact, but is not mapped. For St. Kitts there were some additions. These include Philips Egg Farm, a 200 acre facility and a pig facility by the airport. The historic dairy farm on the east coast was deleted from the threat layer. The Nevis additions include the following: a northeast piggery was added (200 pigs), 2 north end piggeries were added next to the airport, chicken farm in the east, and a 200 pig Blackwell piggery. A northeast end pasture was not added and a big grazing land in the south was deleted.

Power plant – The boundary and location of the St. Kitts power plant was verified. The Nevis power plant was drawn in. However, the marine intensity and distance was changed to zero for all power plants.

Quarries – The quarry in St. Kitts was determined to not be affecting the marine area, however there was some disagreement among some. Four (4) were added for Nevis.

Low Density – For low residential, it was determined that the marine and terrestrial intensity would both be 20.

Desalinization plant – There is one (1) on St. Kitts

Ghost traps – this was omitted from the final analysis, but it should be mentioned in the report.

Illegal dumping sites - this was omitted from the final analysis, but it should be mentioned in the report. Illegal dumping is indiscriminate on land.

Greg from the Nevis Historical Society wanted to include the local drag strip and the horse race trap as a threat. Both of these did not make the final cut.

Notes on Targets

Intake springs – Green hill was in question.

IBA (Important Bird Areas) – For St. Kitts, Nags head was included. It was stated that nesting and foraging sites should be separate, but they were eventually merged into one polygon layer.

Seamounts – present on admiralty maps and need to be mapped.

Sea moss – mapped for Nevis

Thermal sea vents – 3 at least. Kenneth Samuels can tell you where they are, but are likely included in the point data he handed over to Mr. Hobson of Maritime Affairs.

Lobster – a large polygon was drawn along the coast of Nevis and in the Narrows.

Birds – For Nevis, four sites were included.

Turtles – Three sites were added and mapped for Nevis.

Attendees

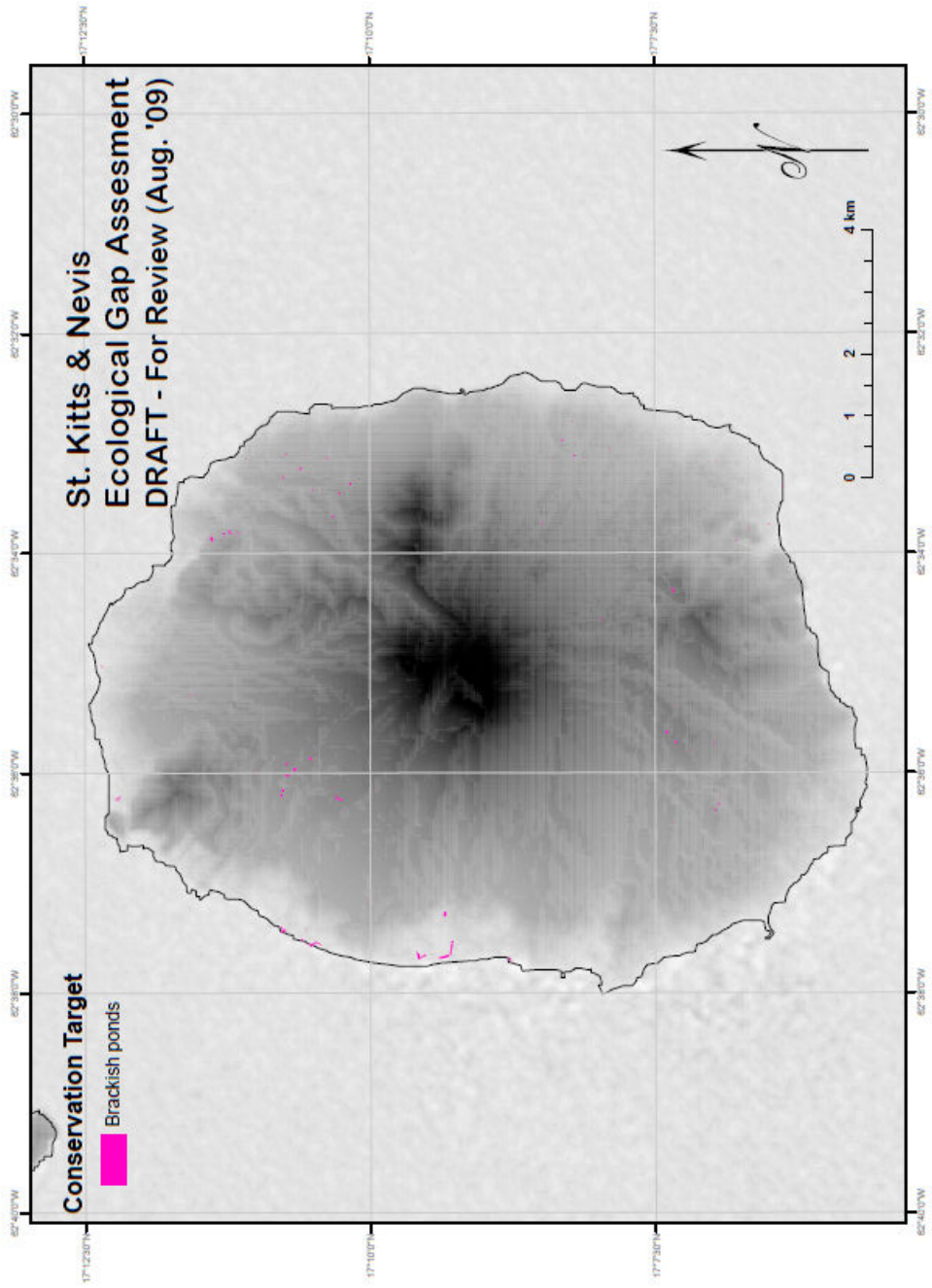
| Ecological GAP Analysis June 22-23, 2009 Nevis (Day 1) | | |
|---|---|--|
| Name | Organization | Contact No. and/or Email |
| D. Reyes | Ecoengineering Consultants Ltd. | 868-645-4420 ecocaribe@mail.tt |
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| Clivin Christmas | Department of Fisheries - Nevis | 663-3301 clivinchristmas@hotmail.com |

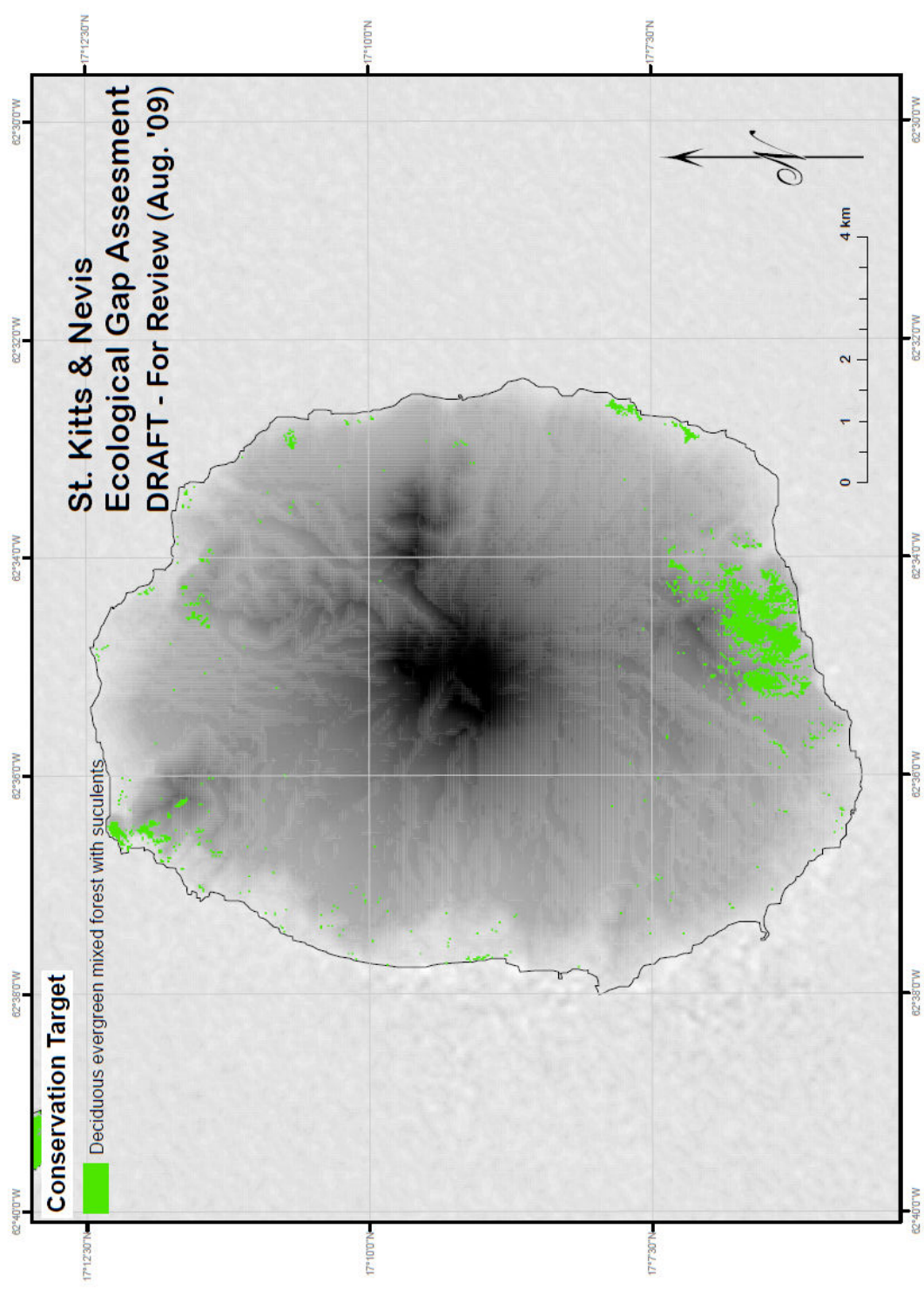
Ecological GAP Analysis
June 22-23, 2009
Nevis (Day 2)

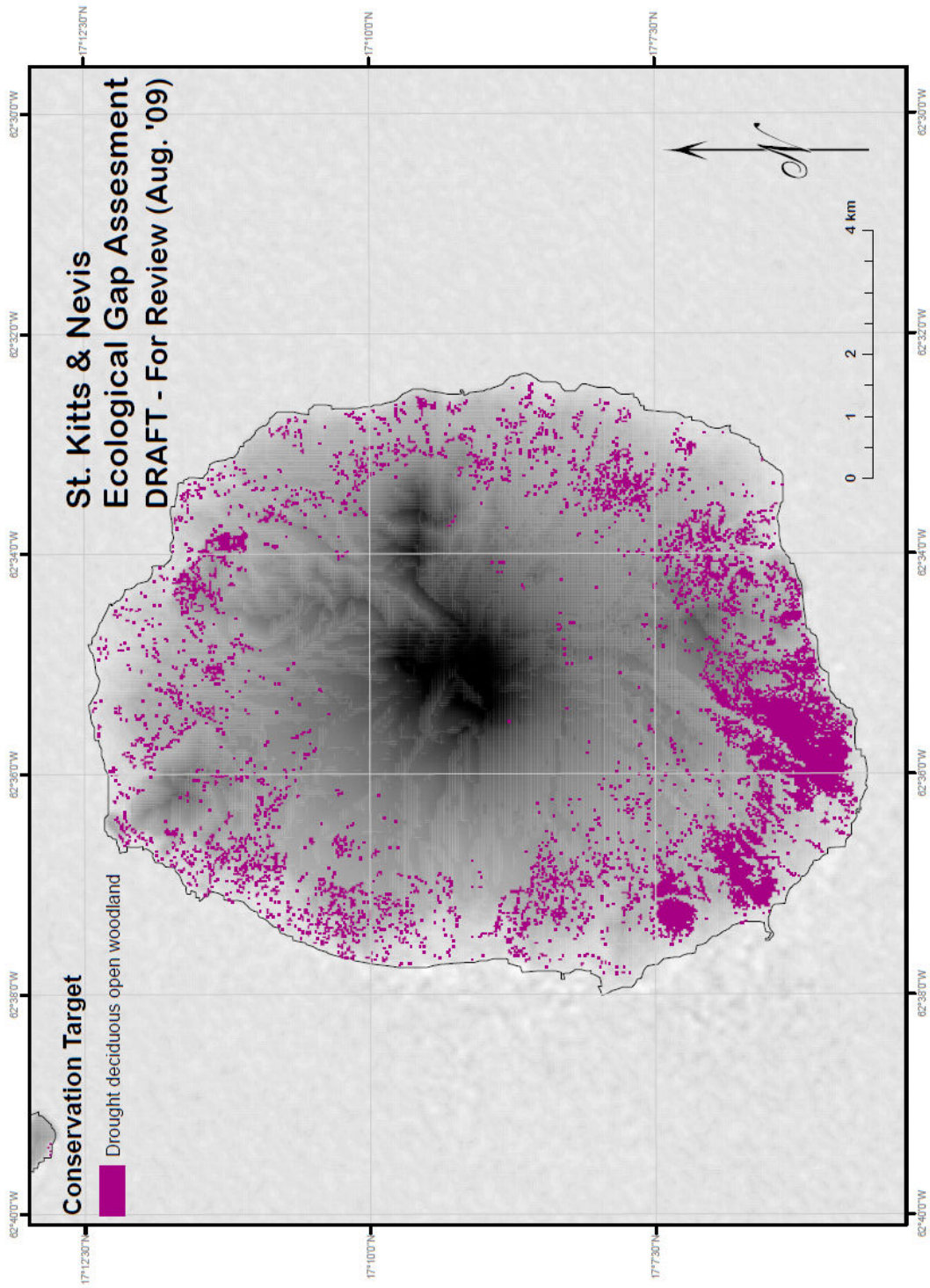
| Name | Organization | Contact No. and/or Email |
|------------------|---|--|
| D. Reyes | Ecoengineering Consultants Ltd. | 868-645-4420 ecocaribe@mail.tt |
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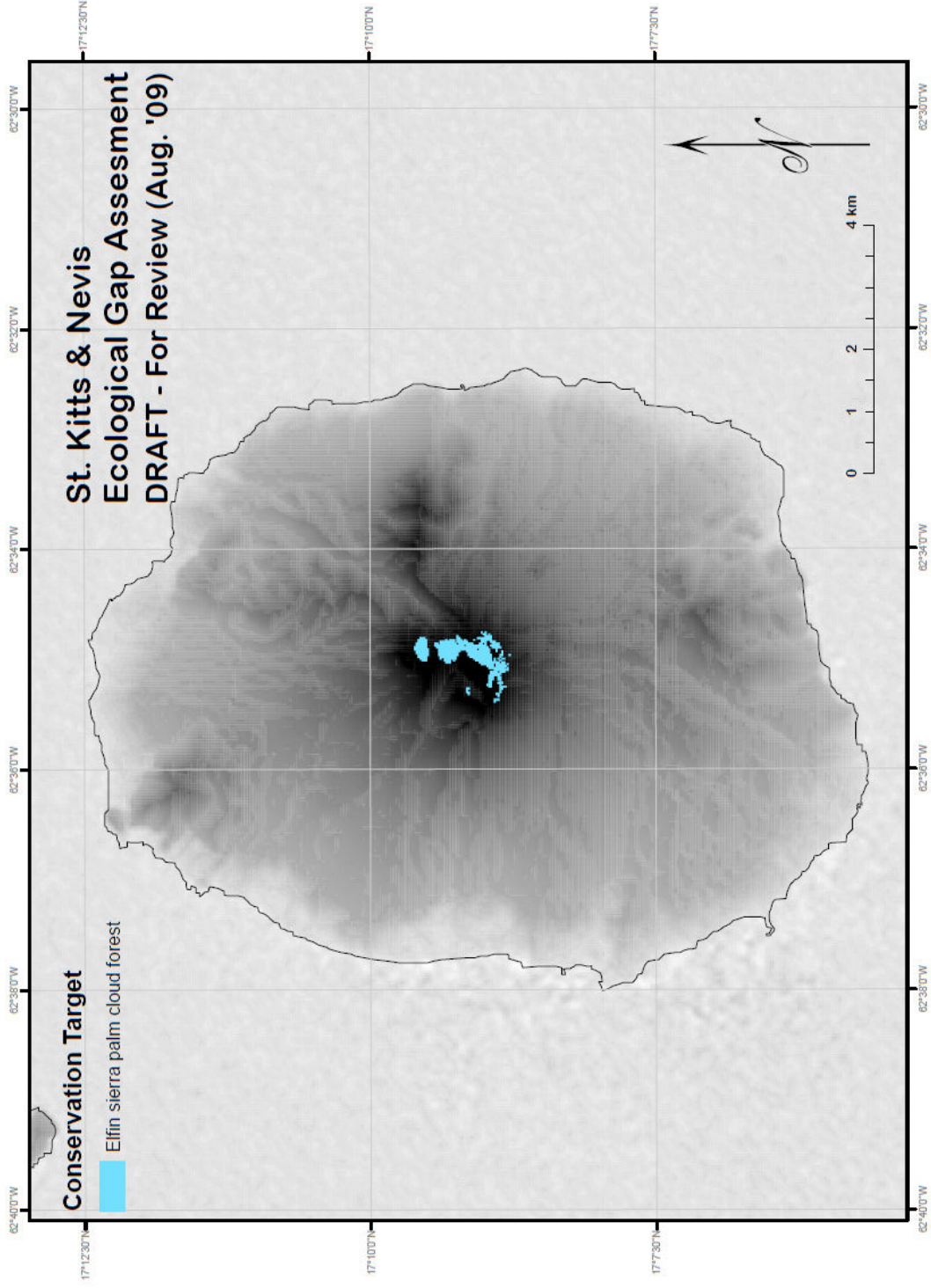
APPENDIX II

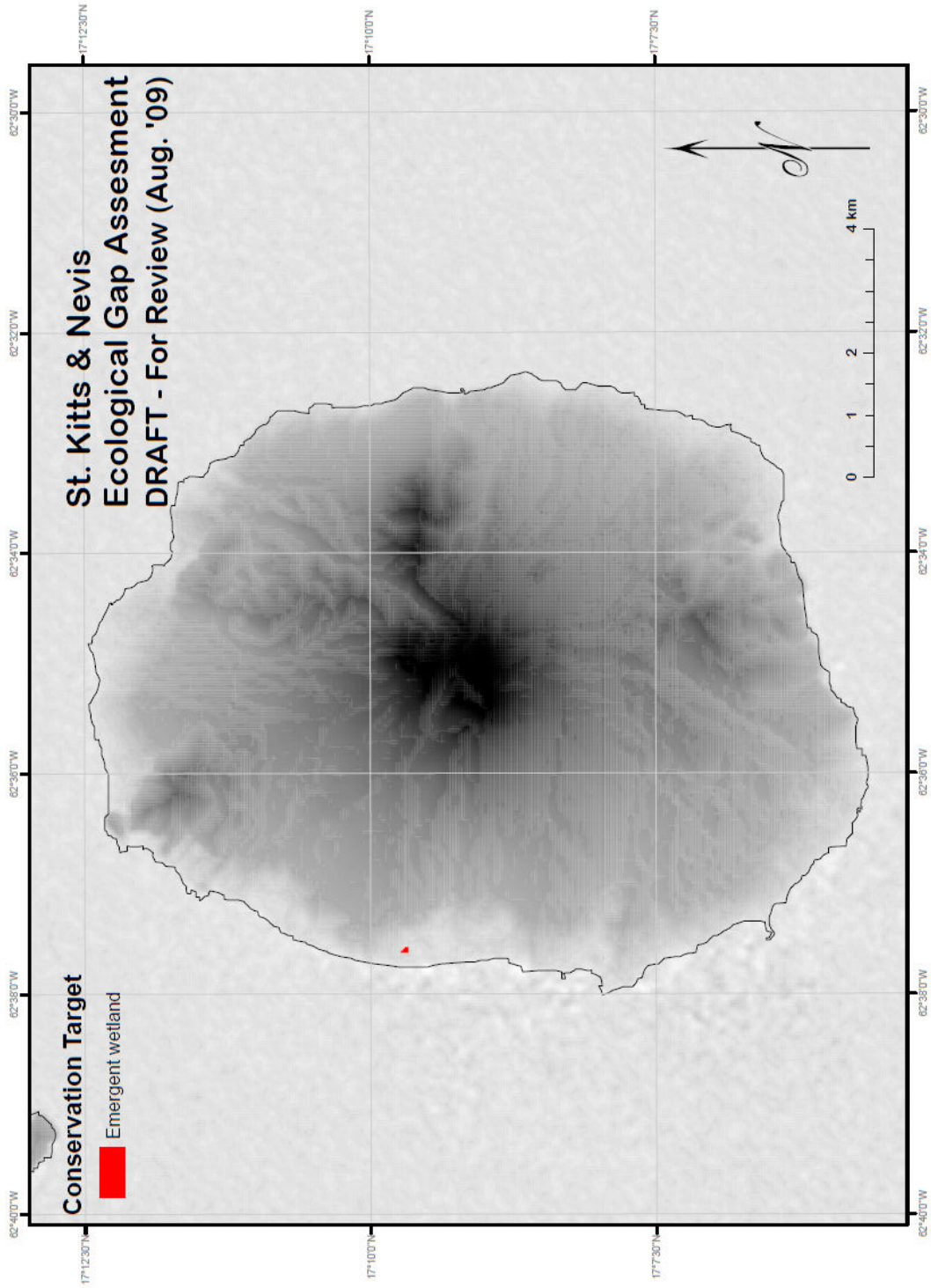
ST. KITTS & NEVIS MARINE & TERRESTRIAL TARGETS

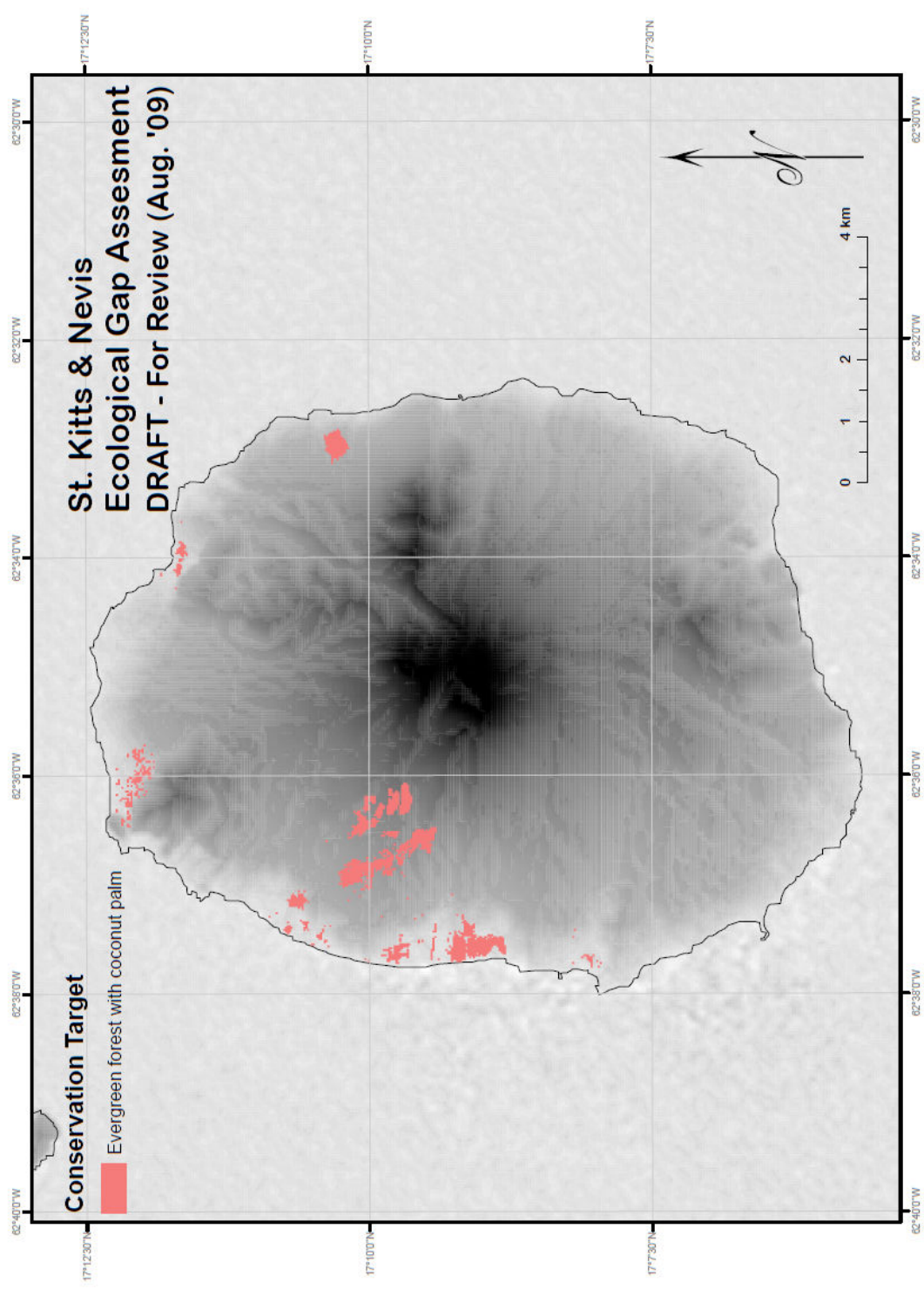


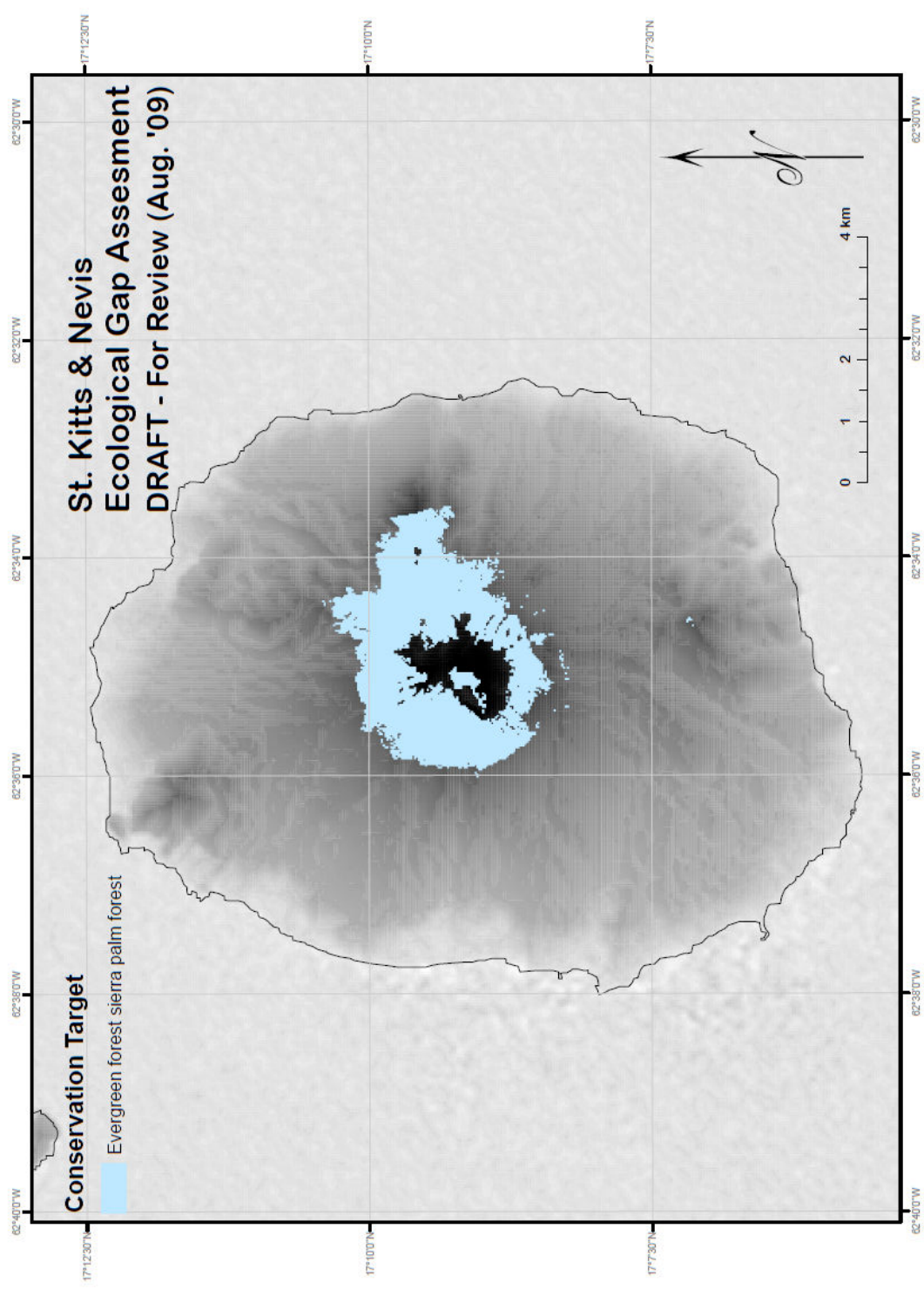


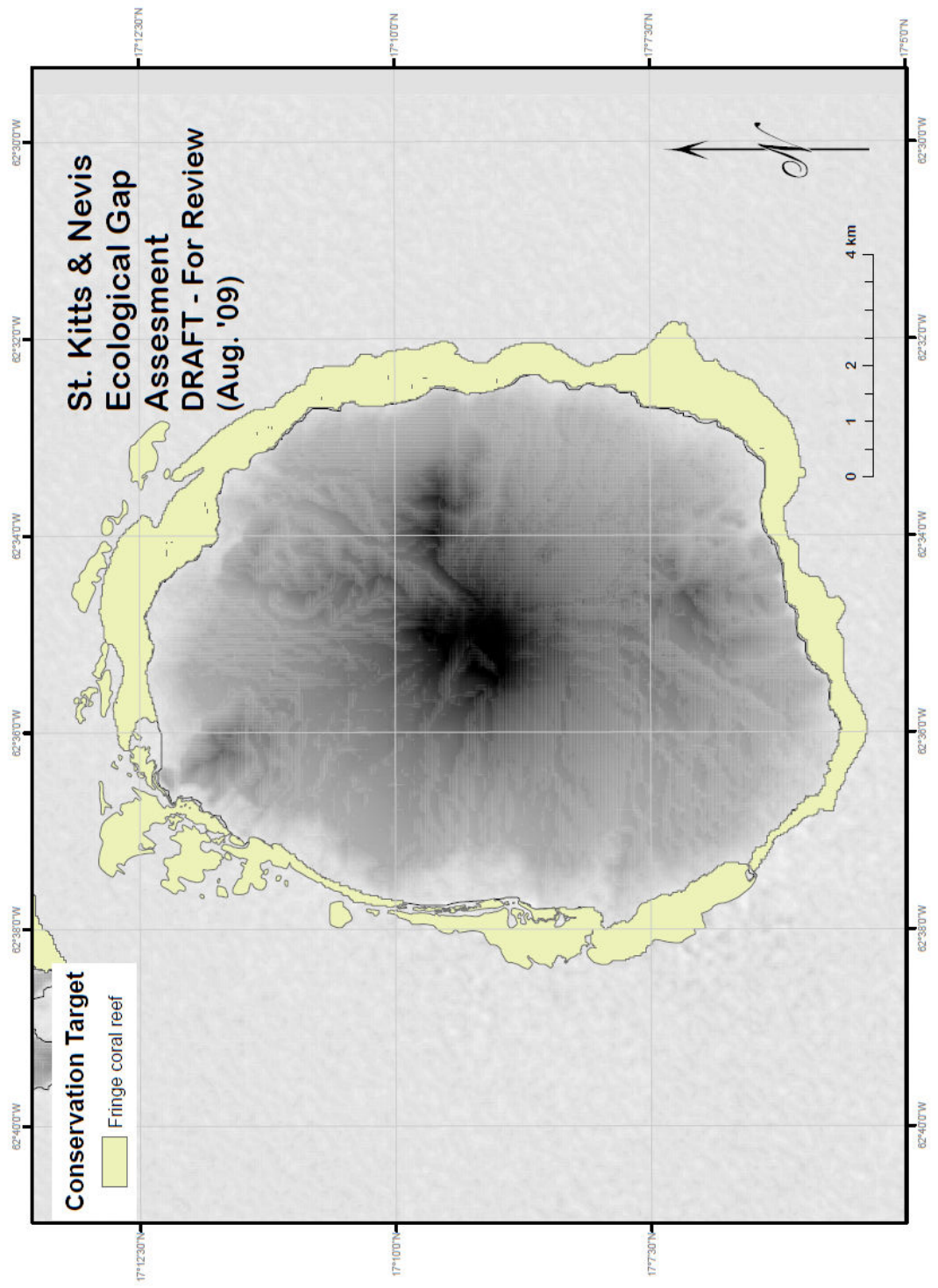


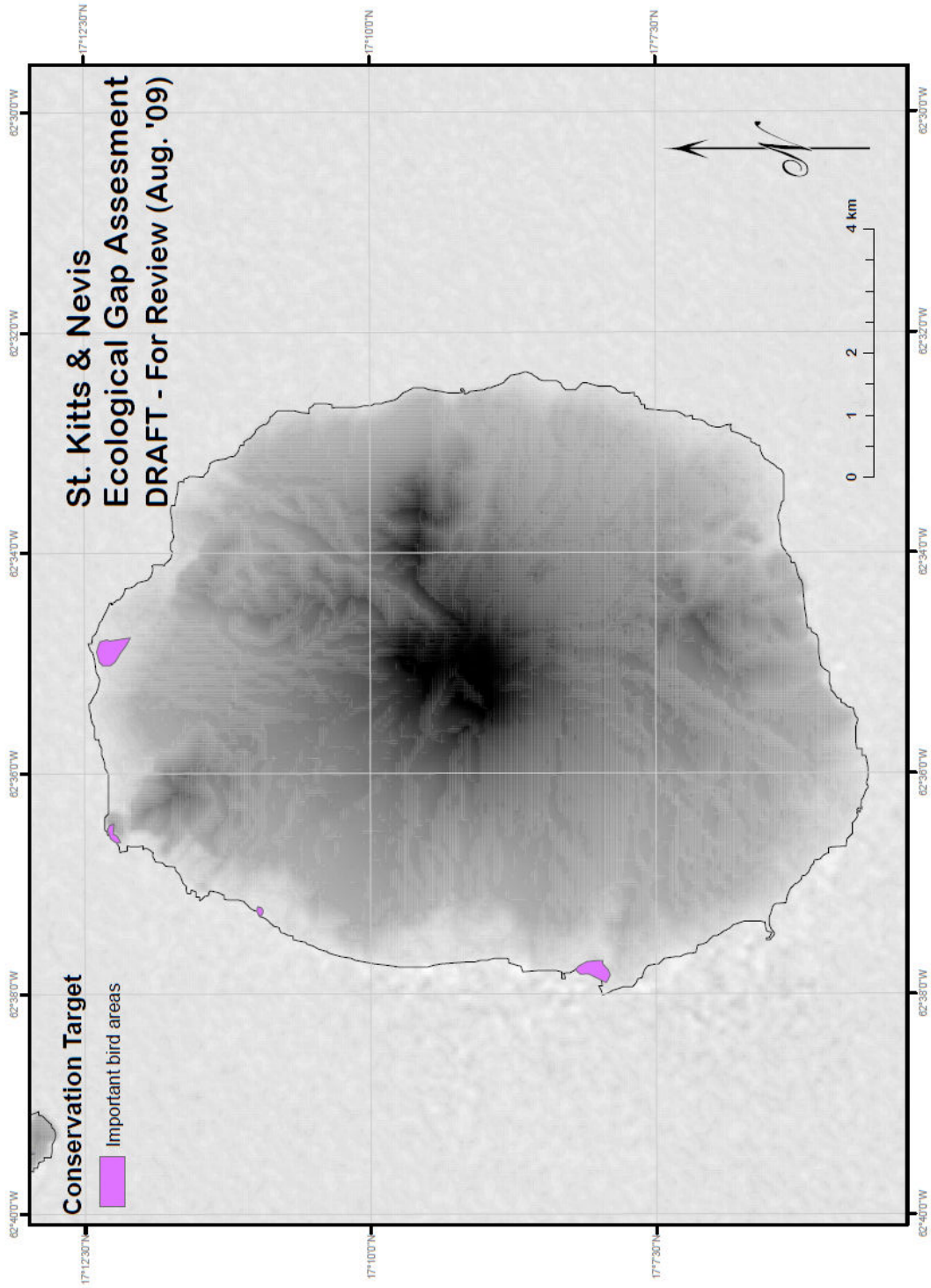


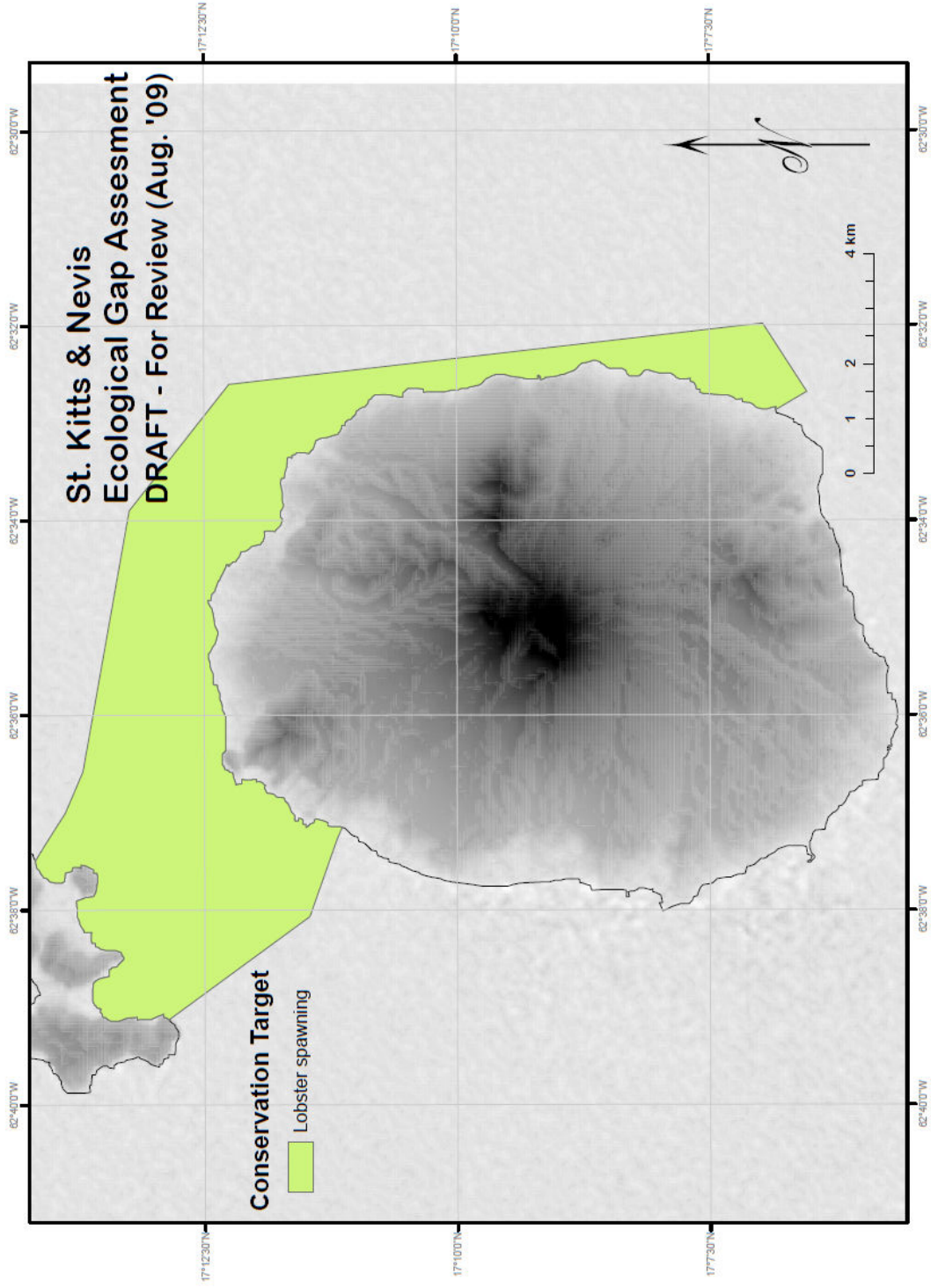


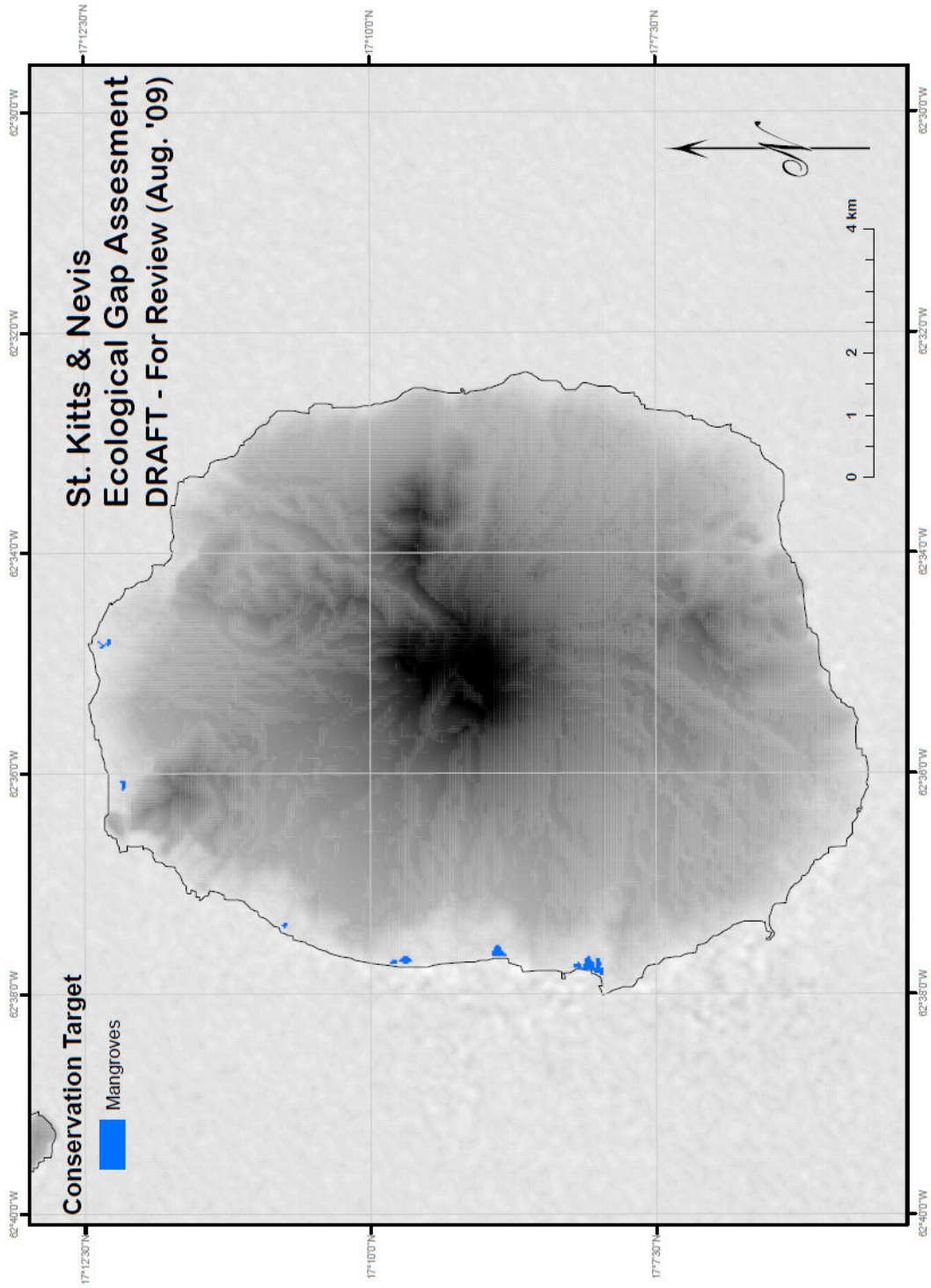


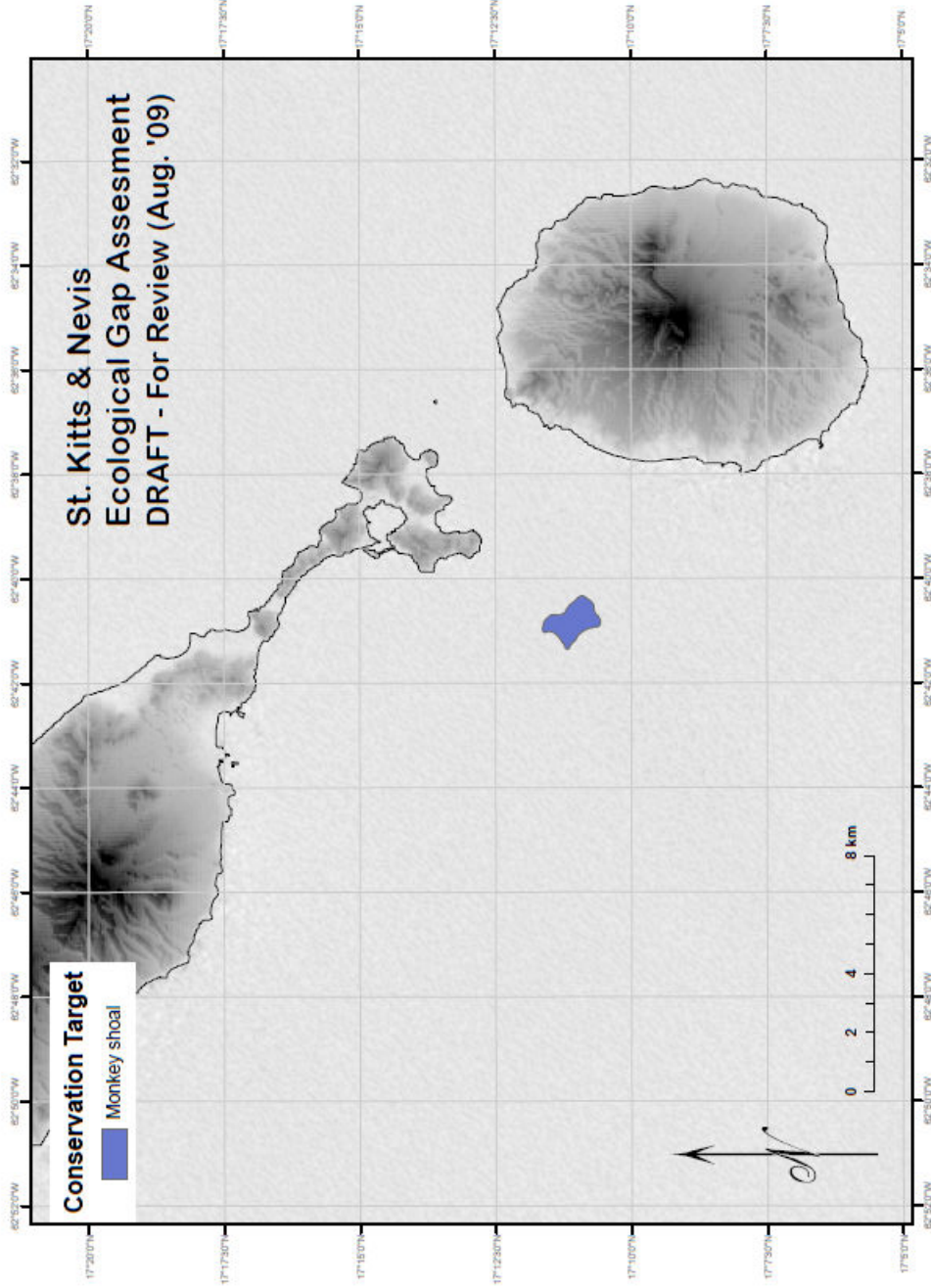


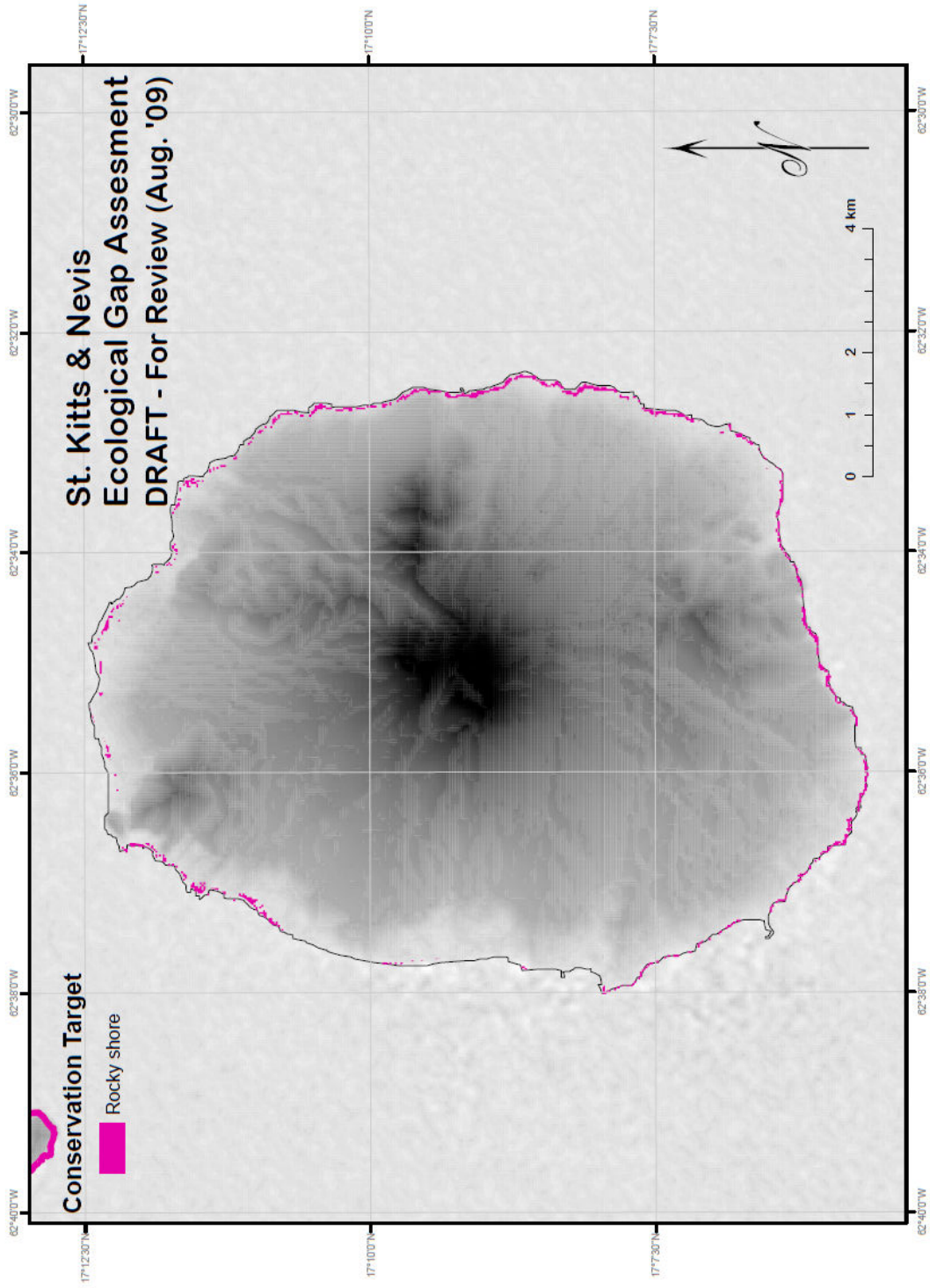


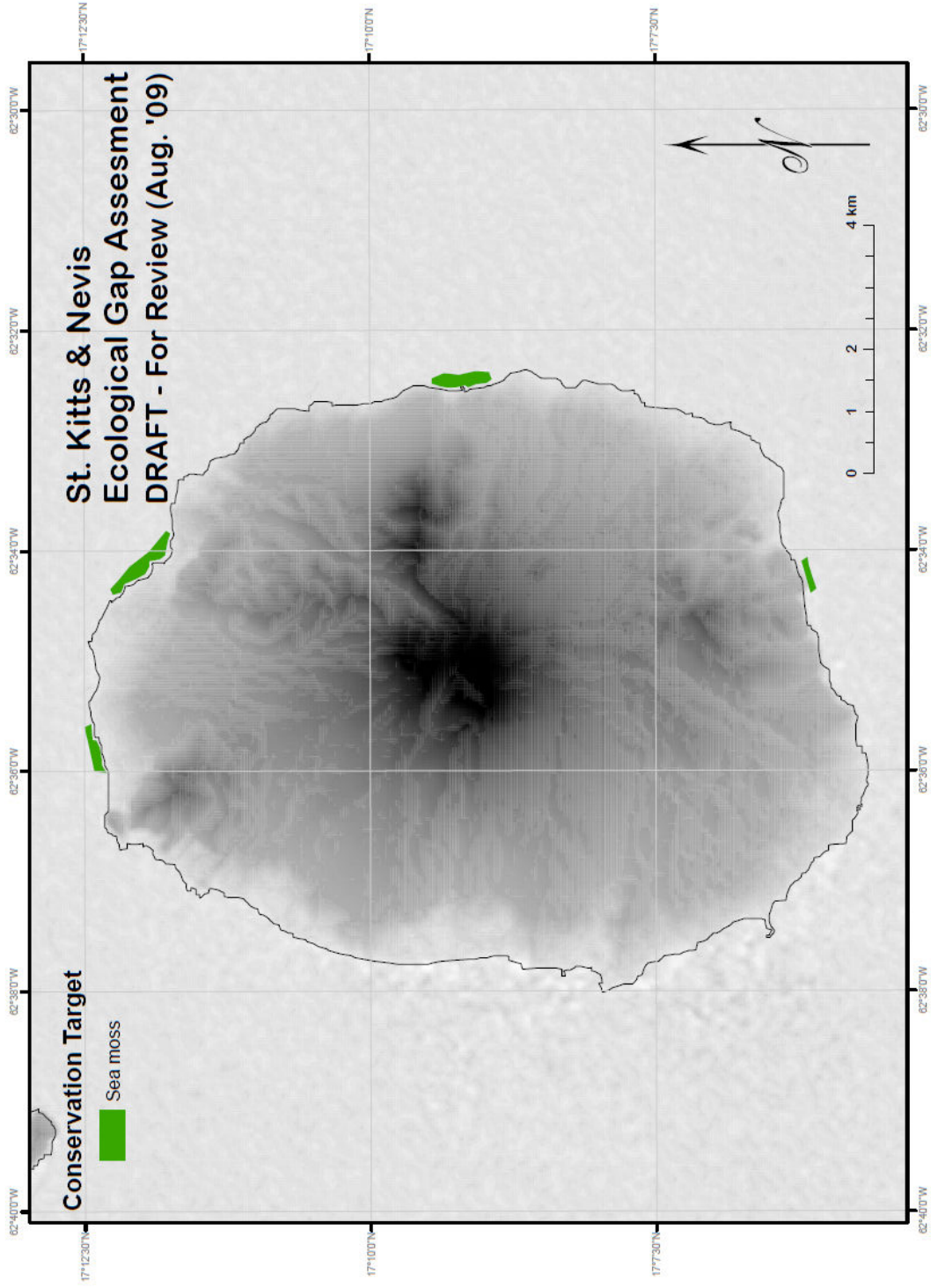


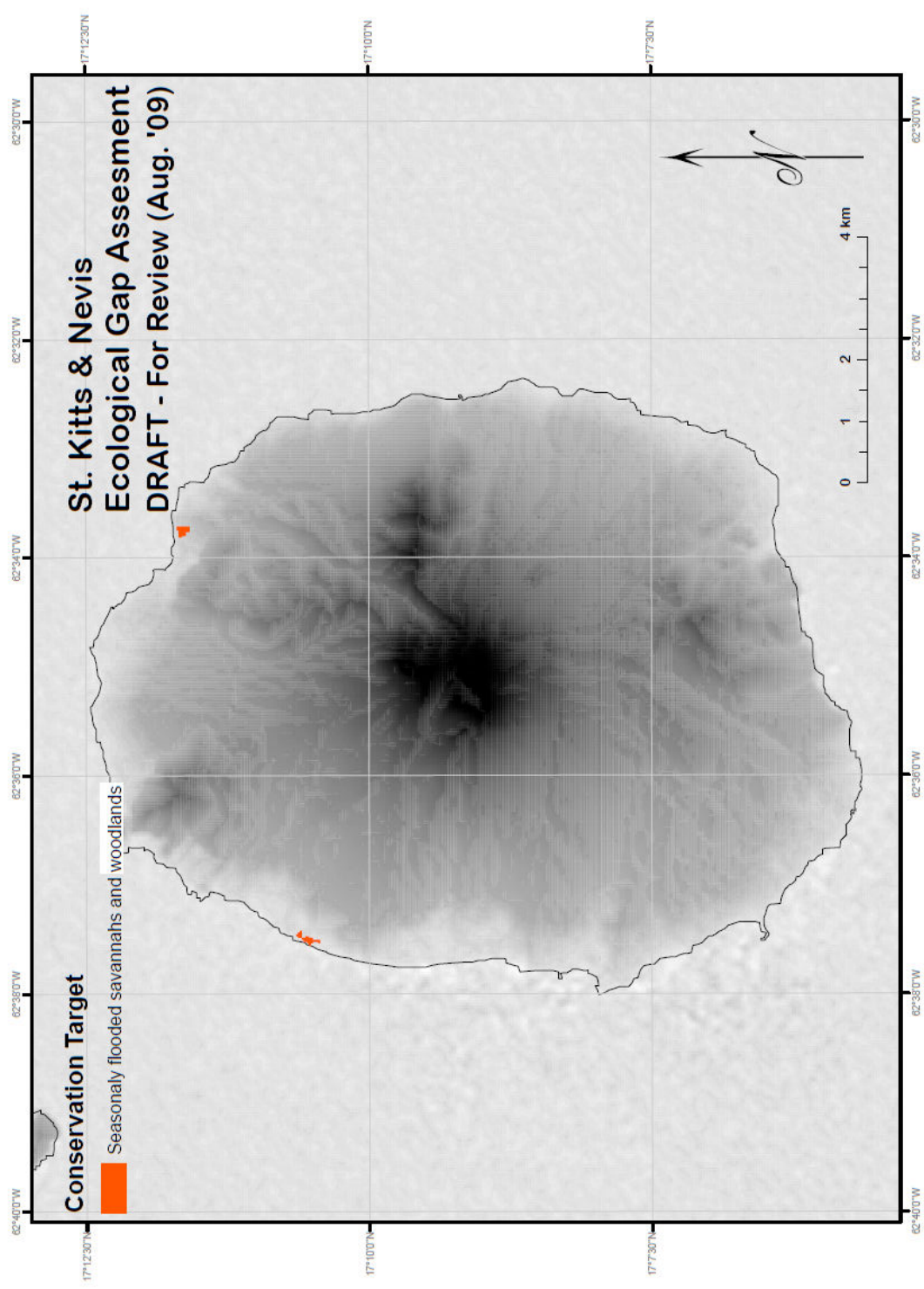


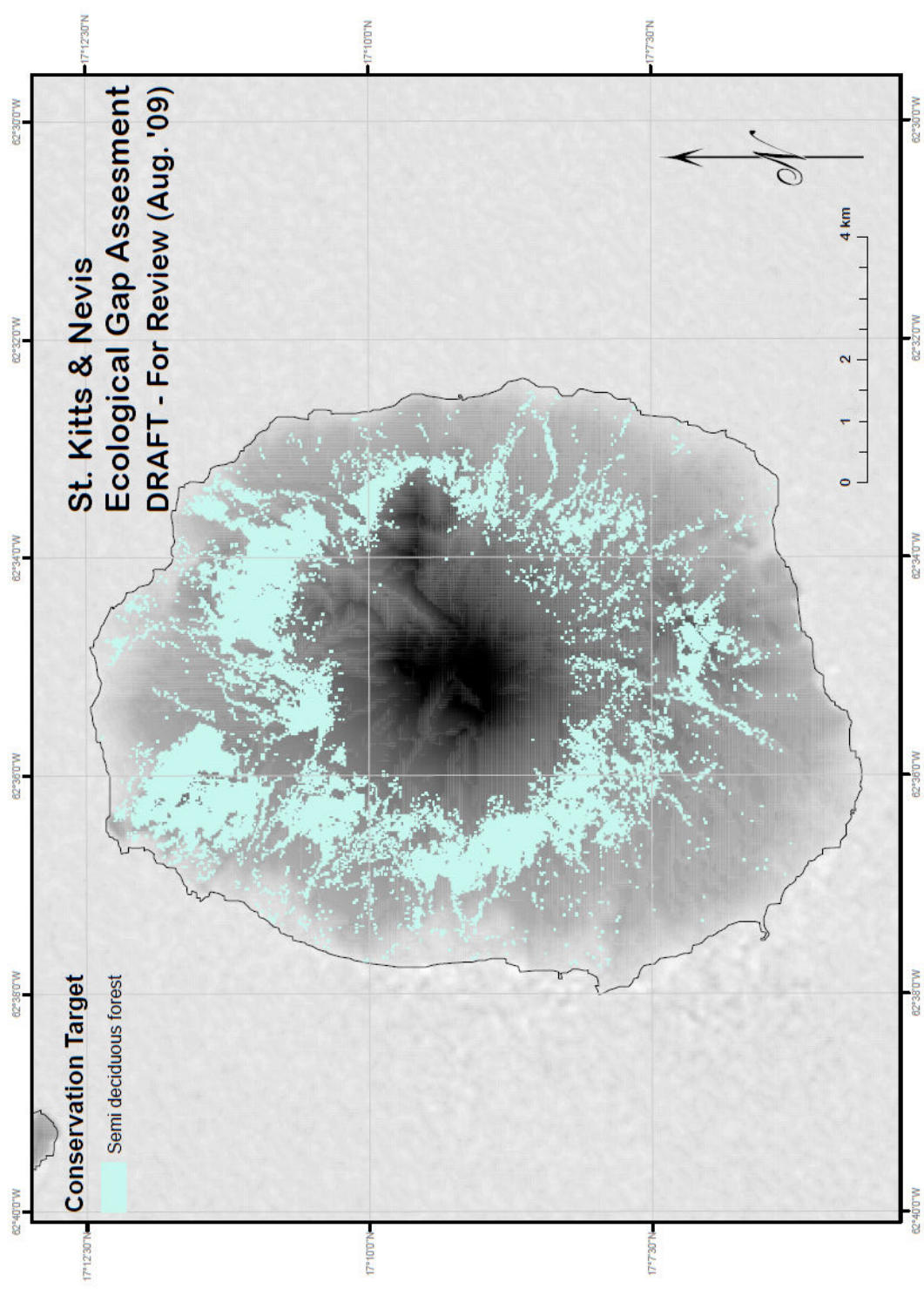


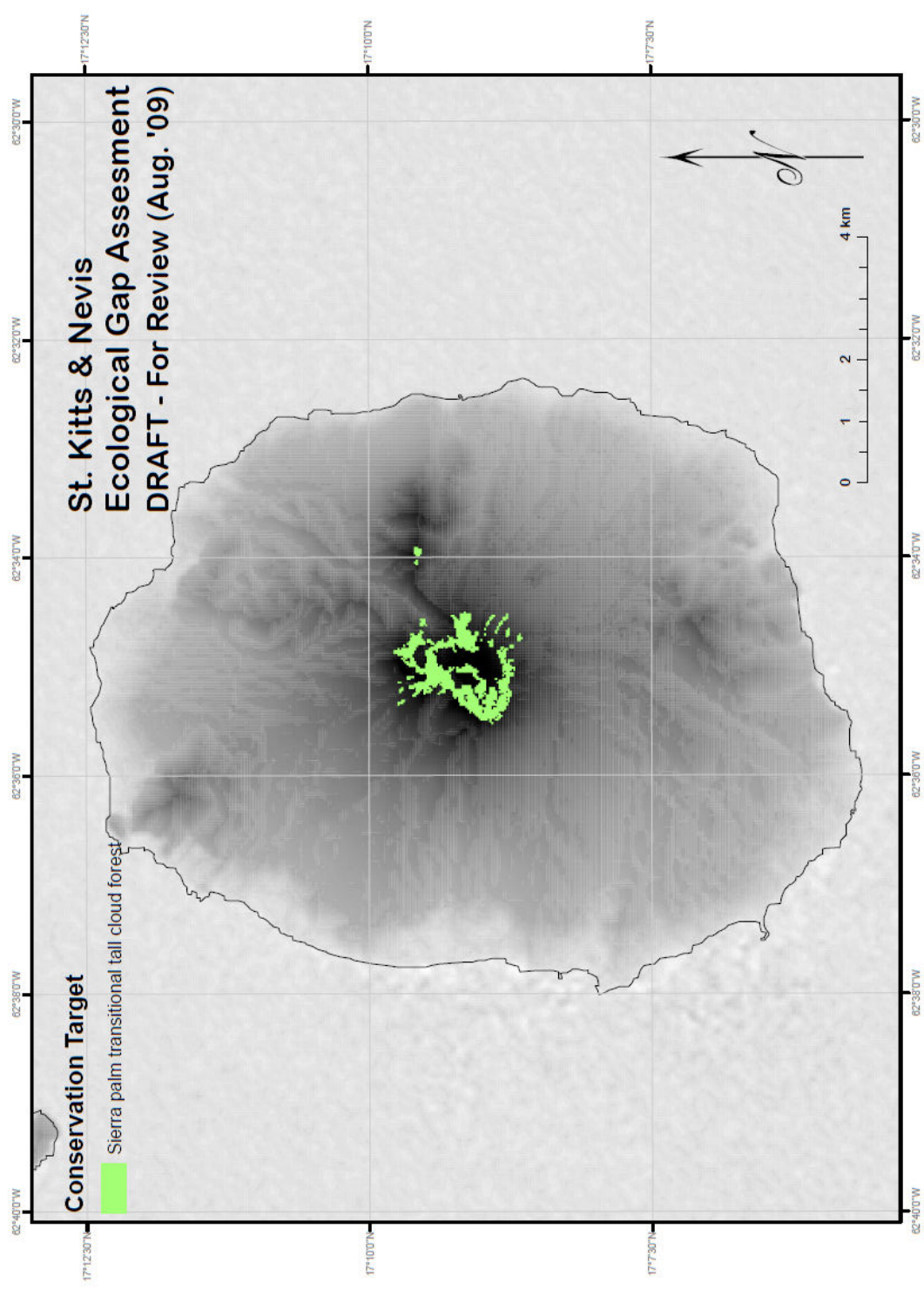


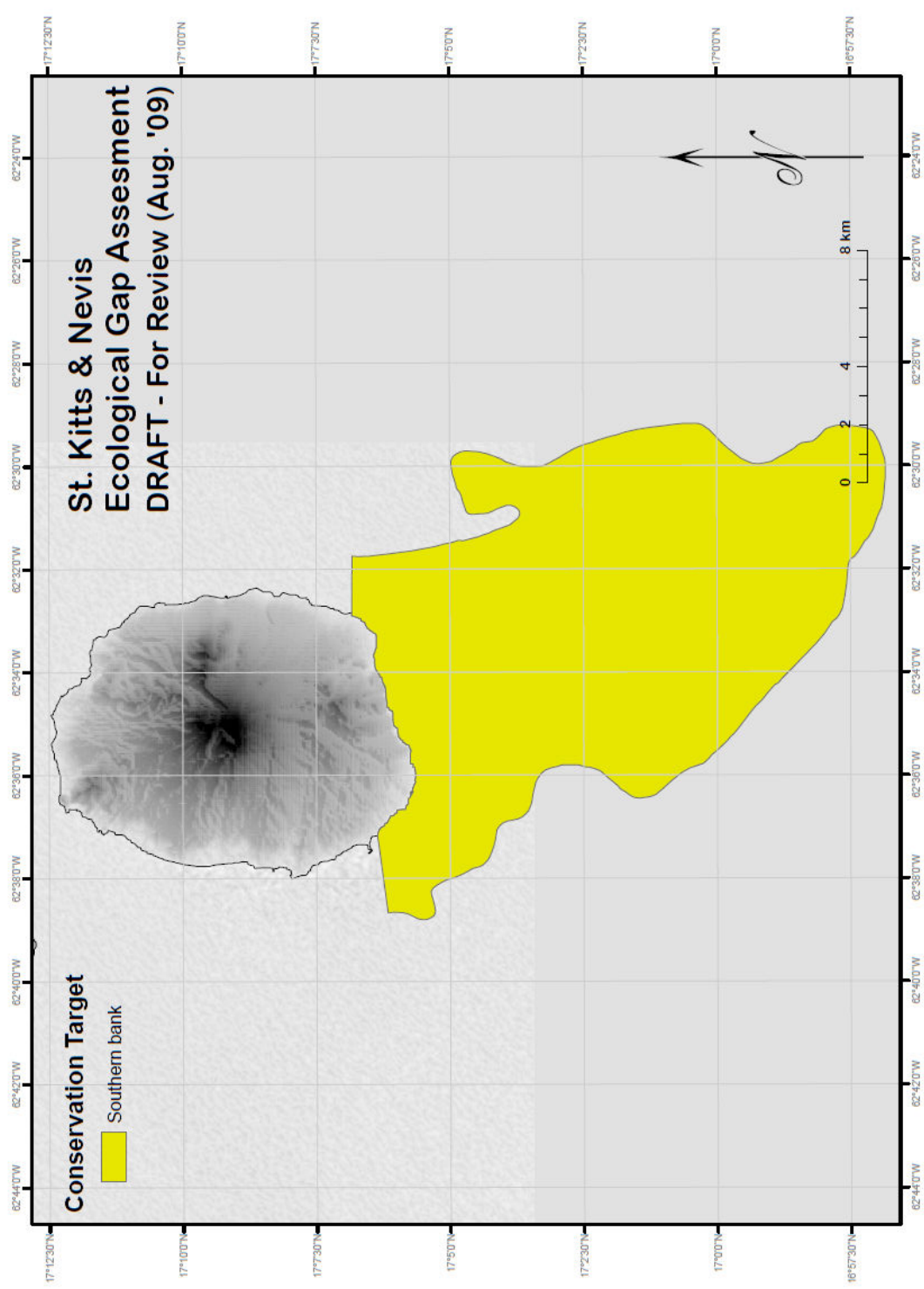


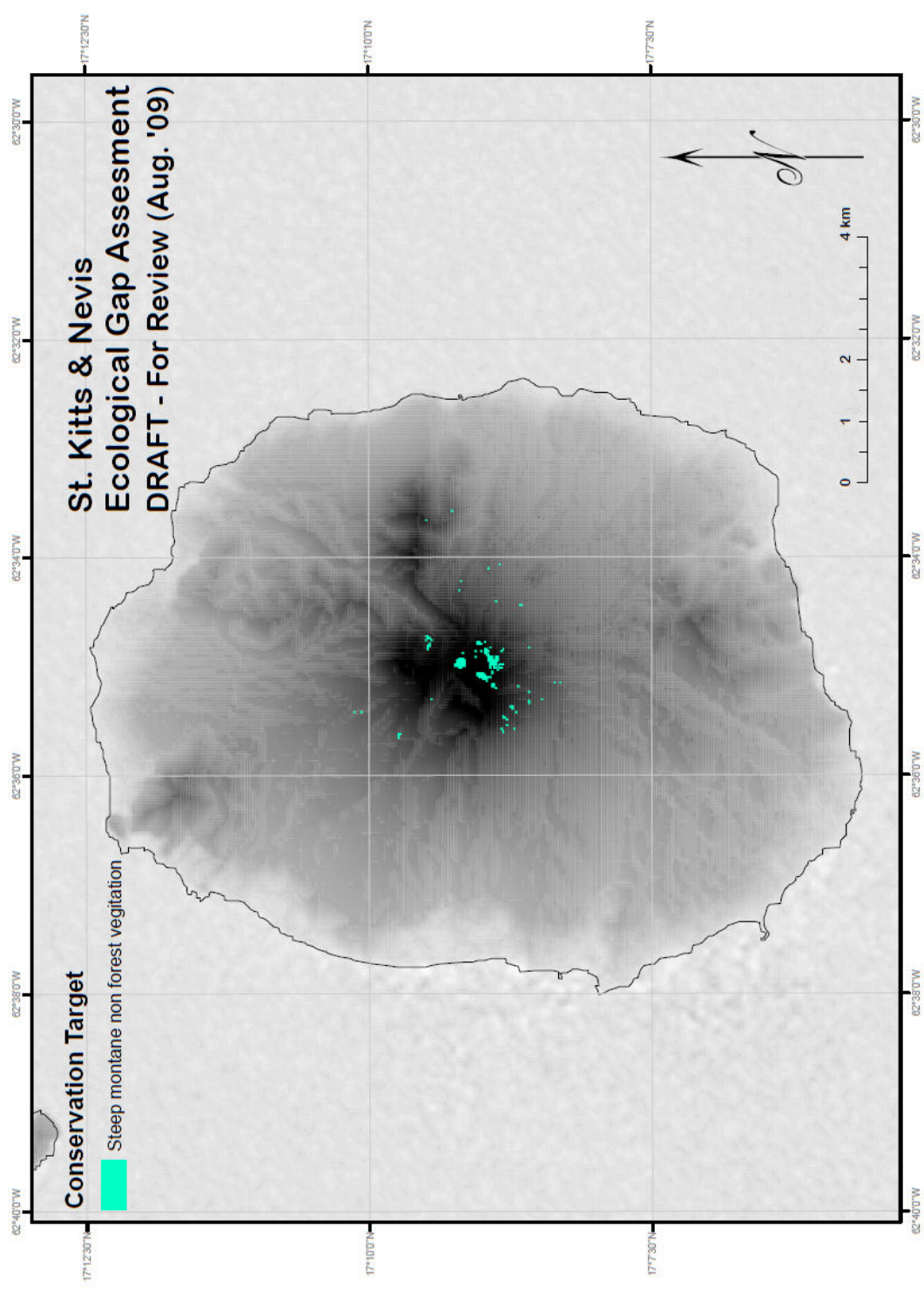


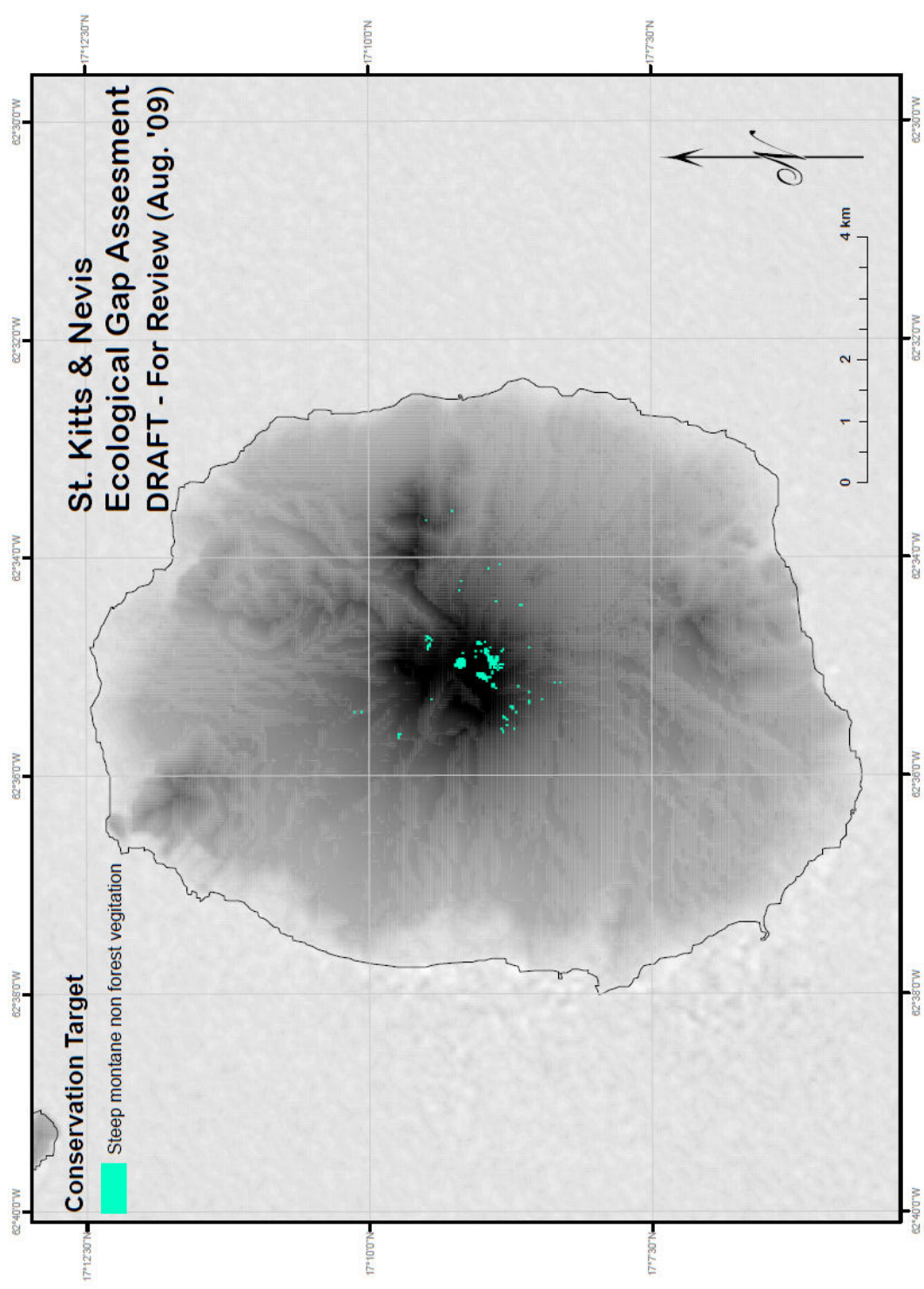


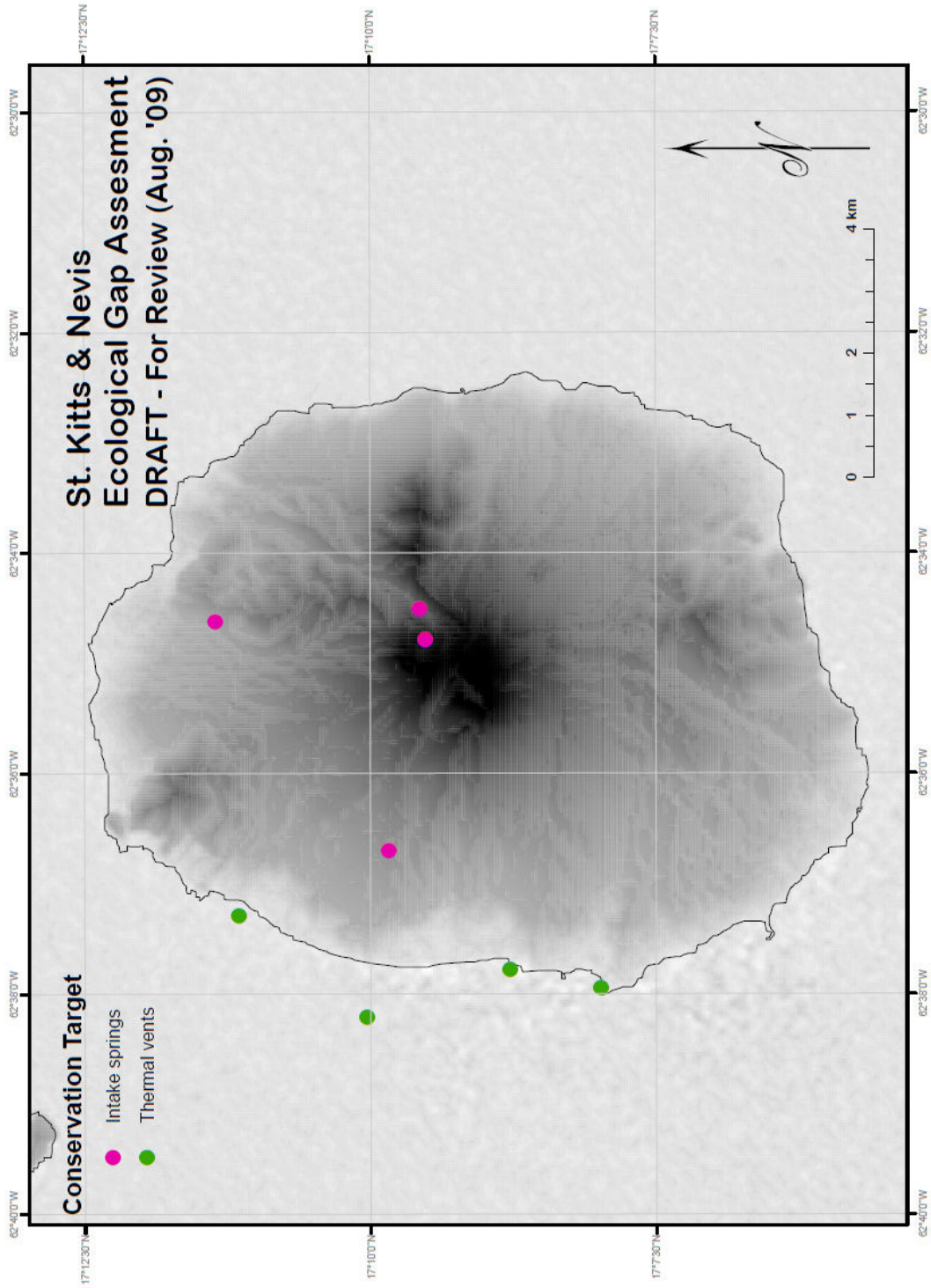


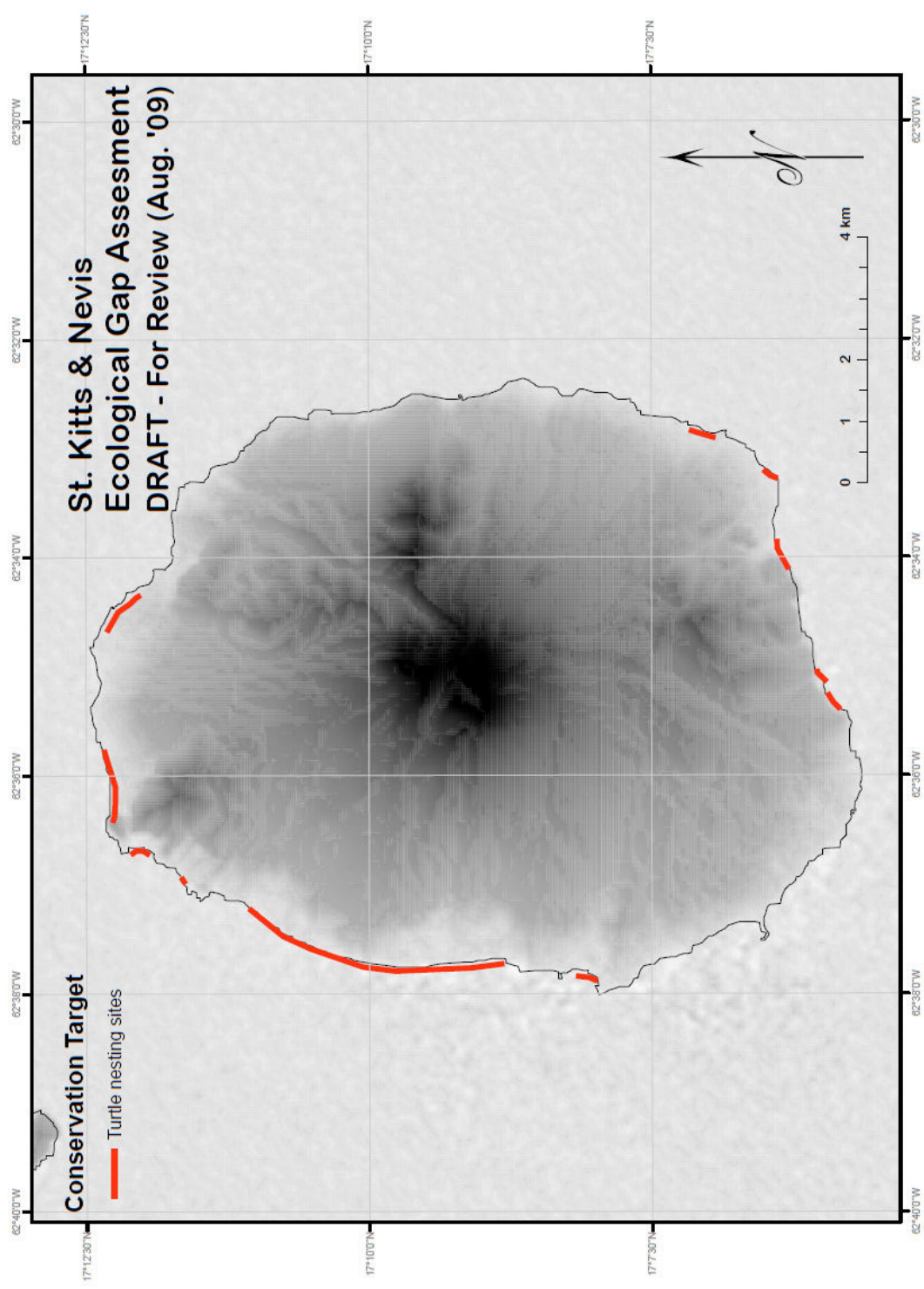


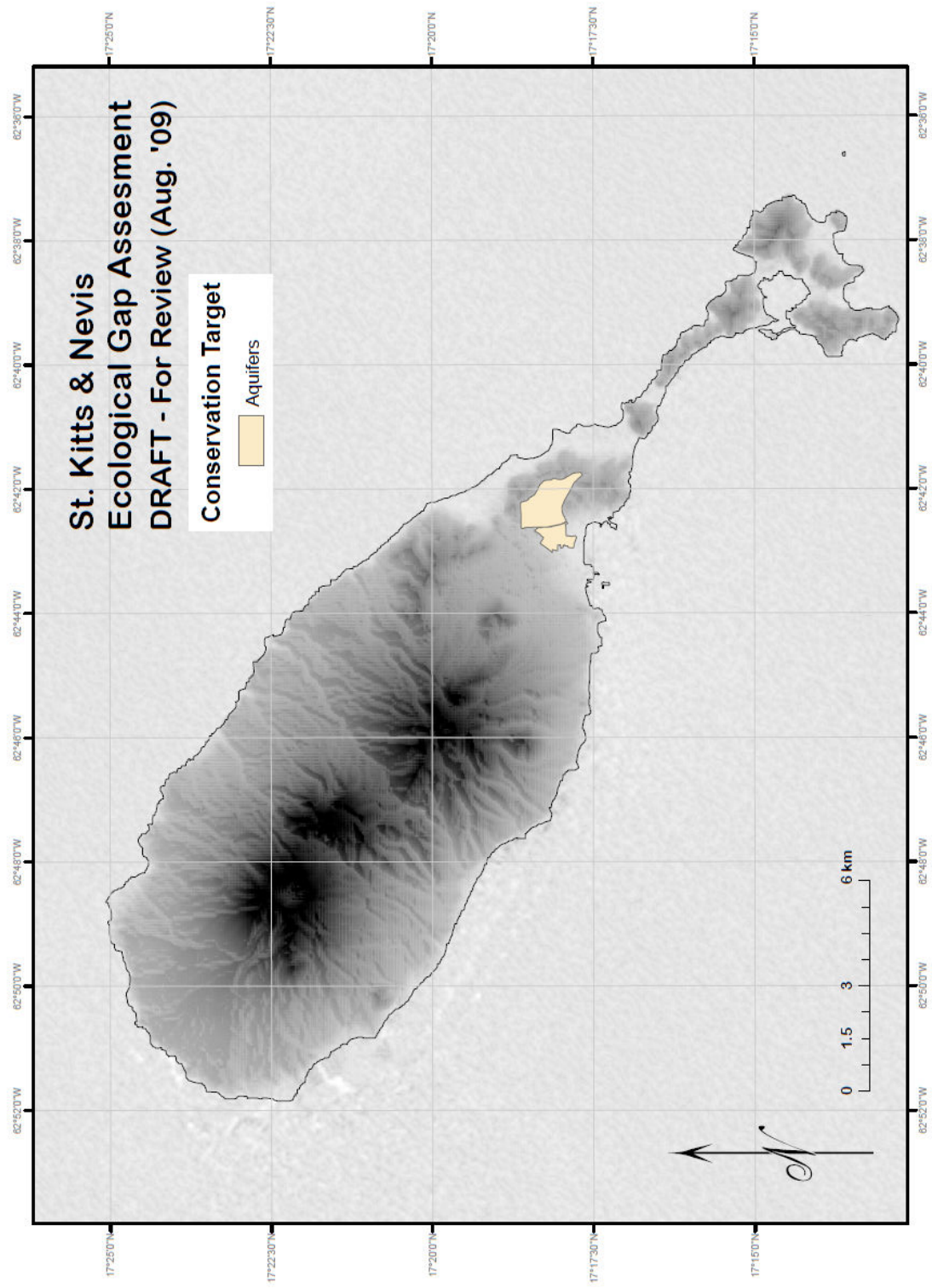


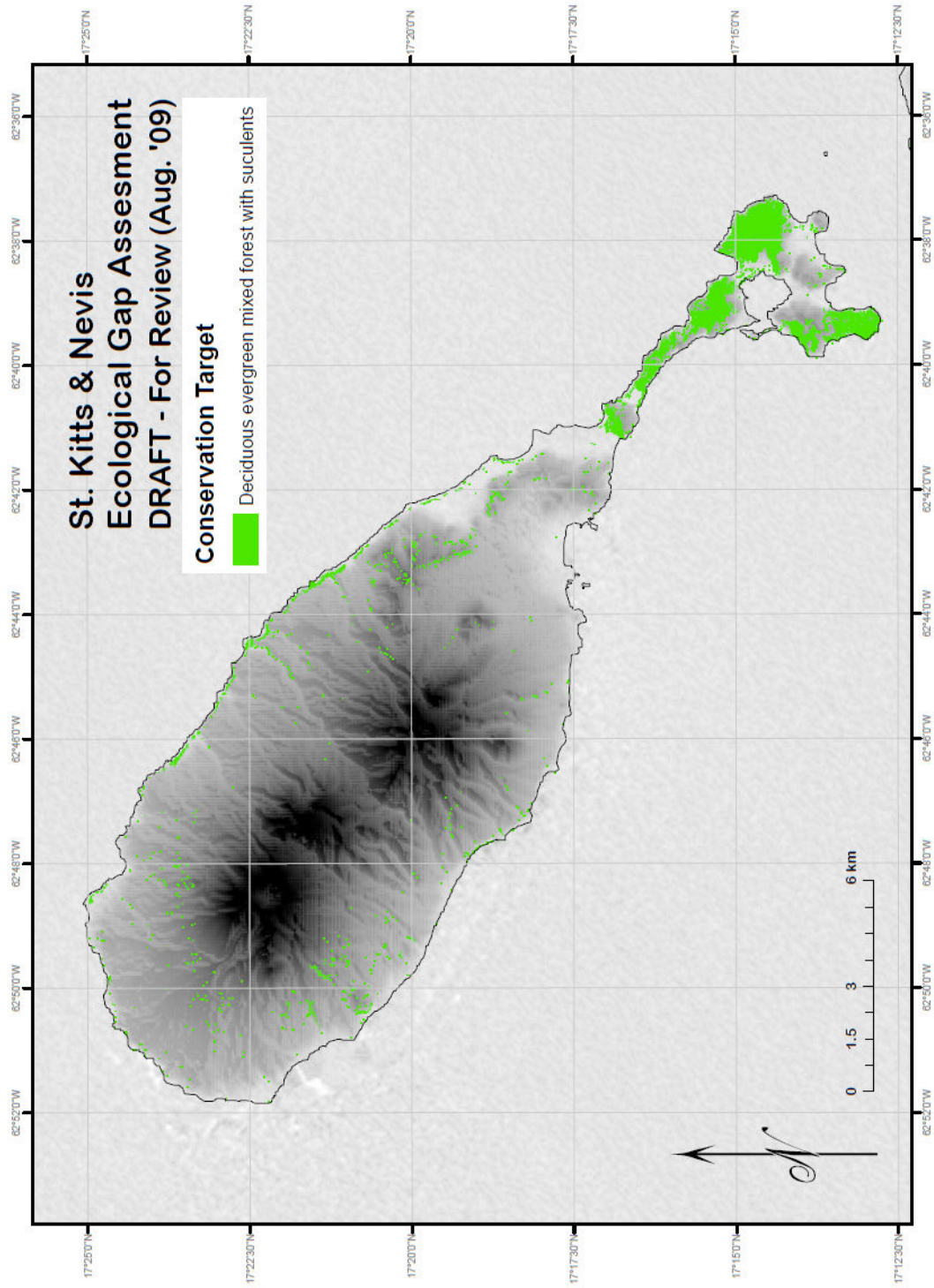


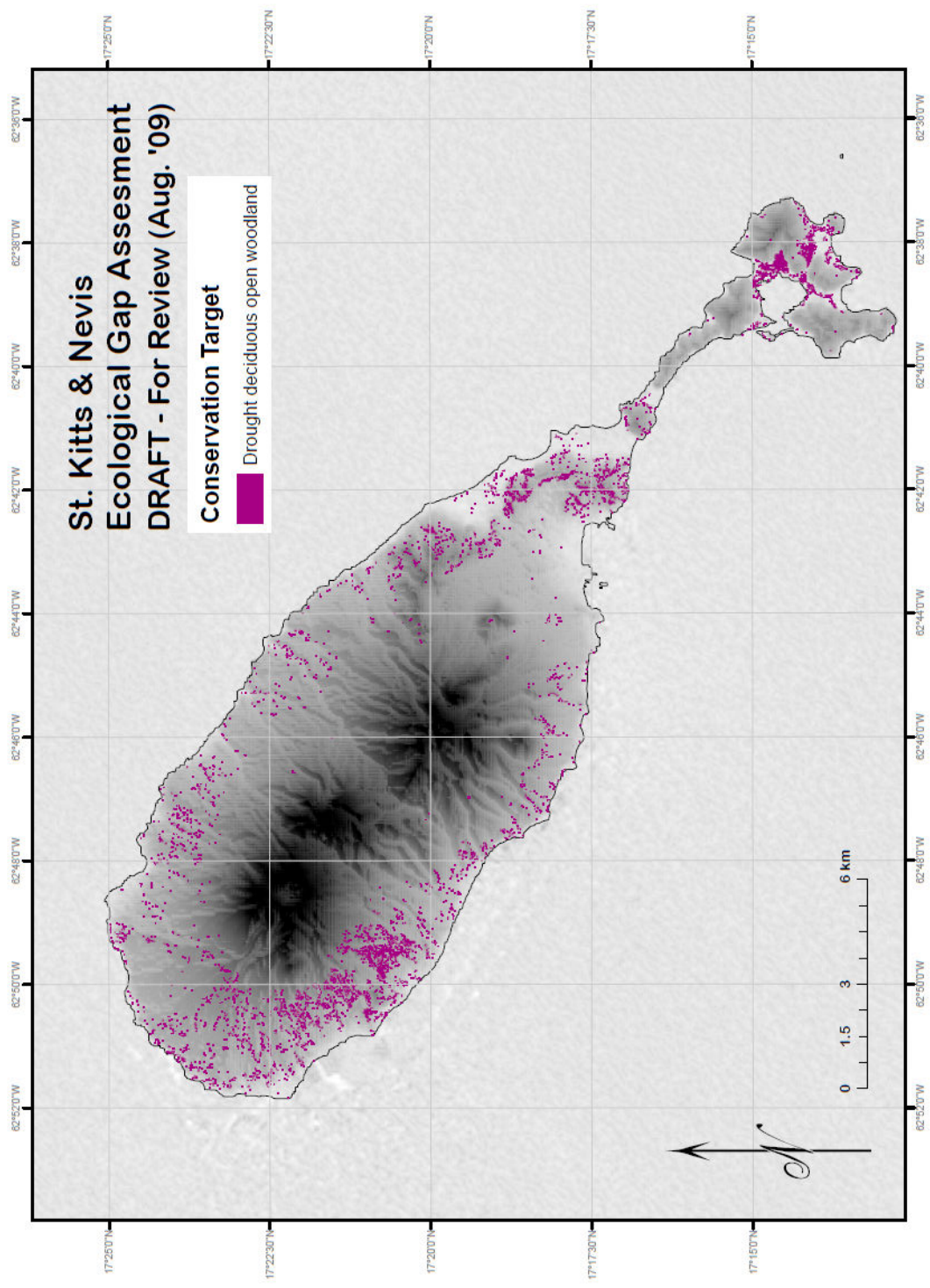


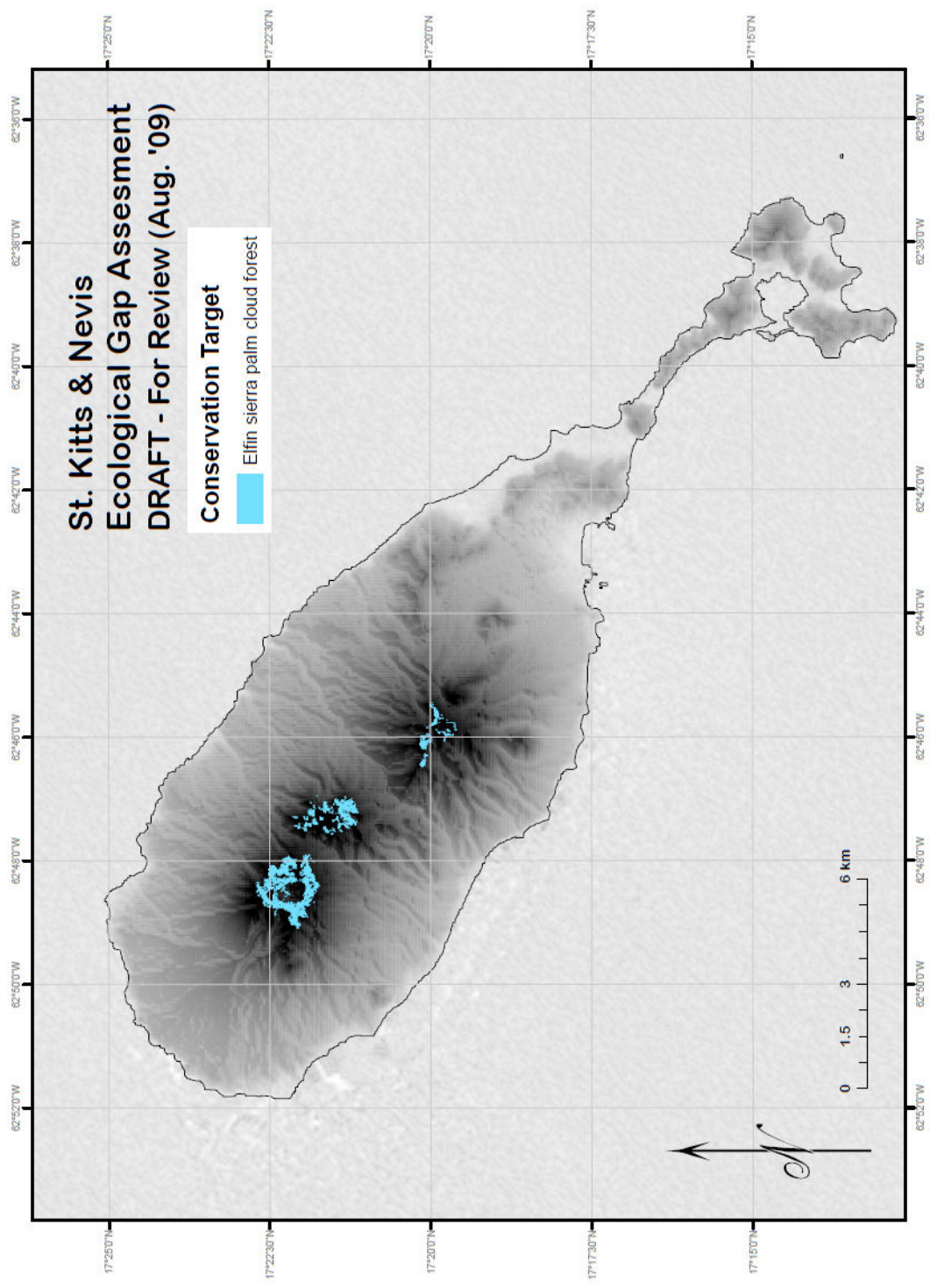


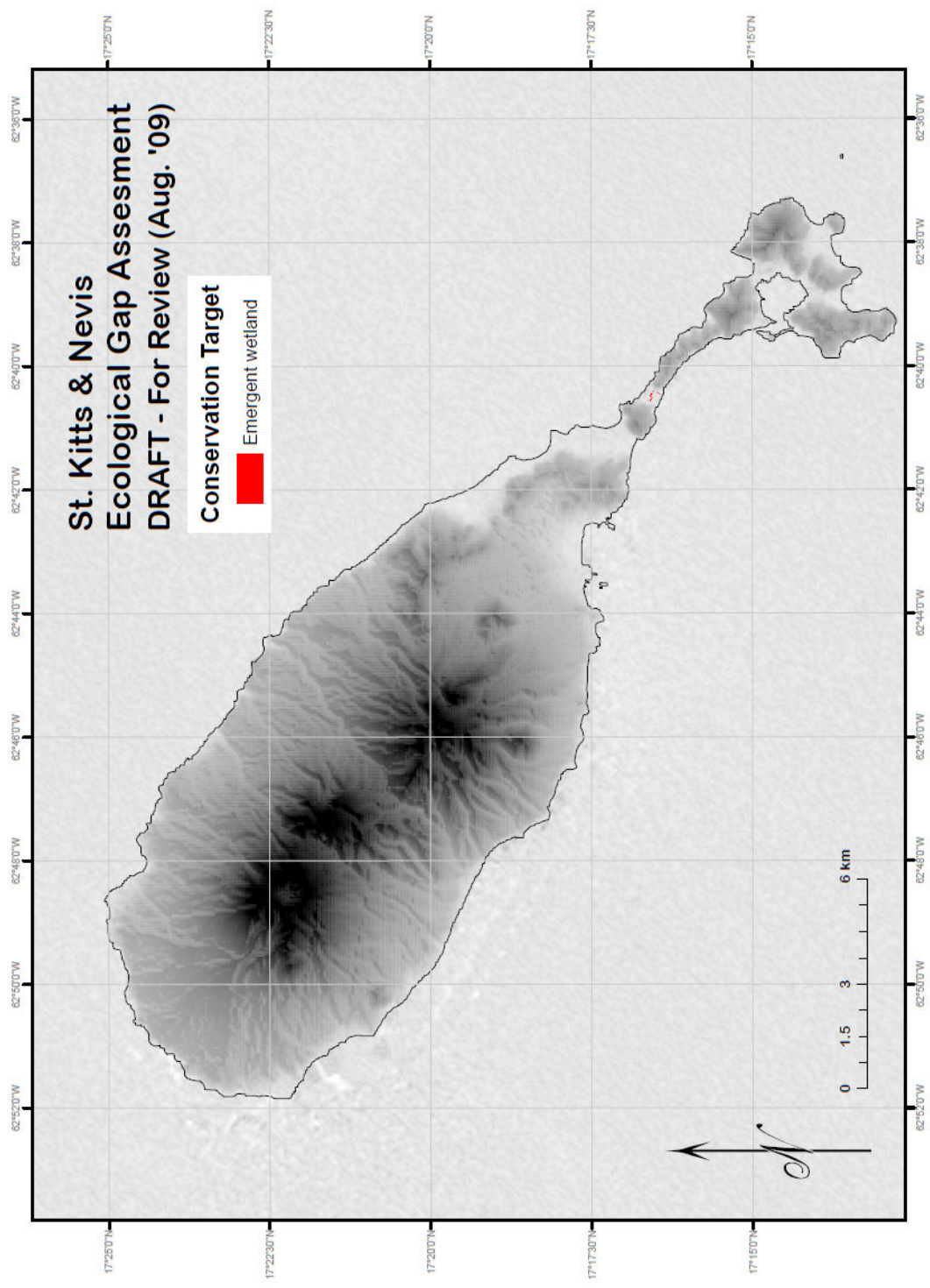


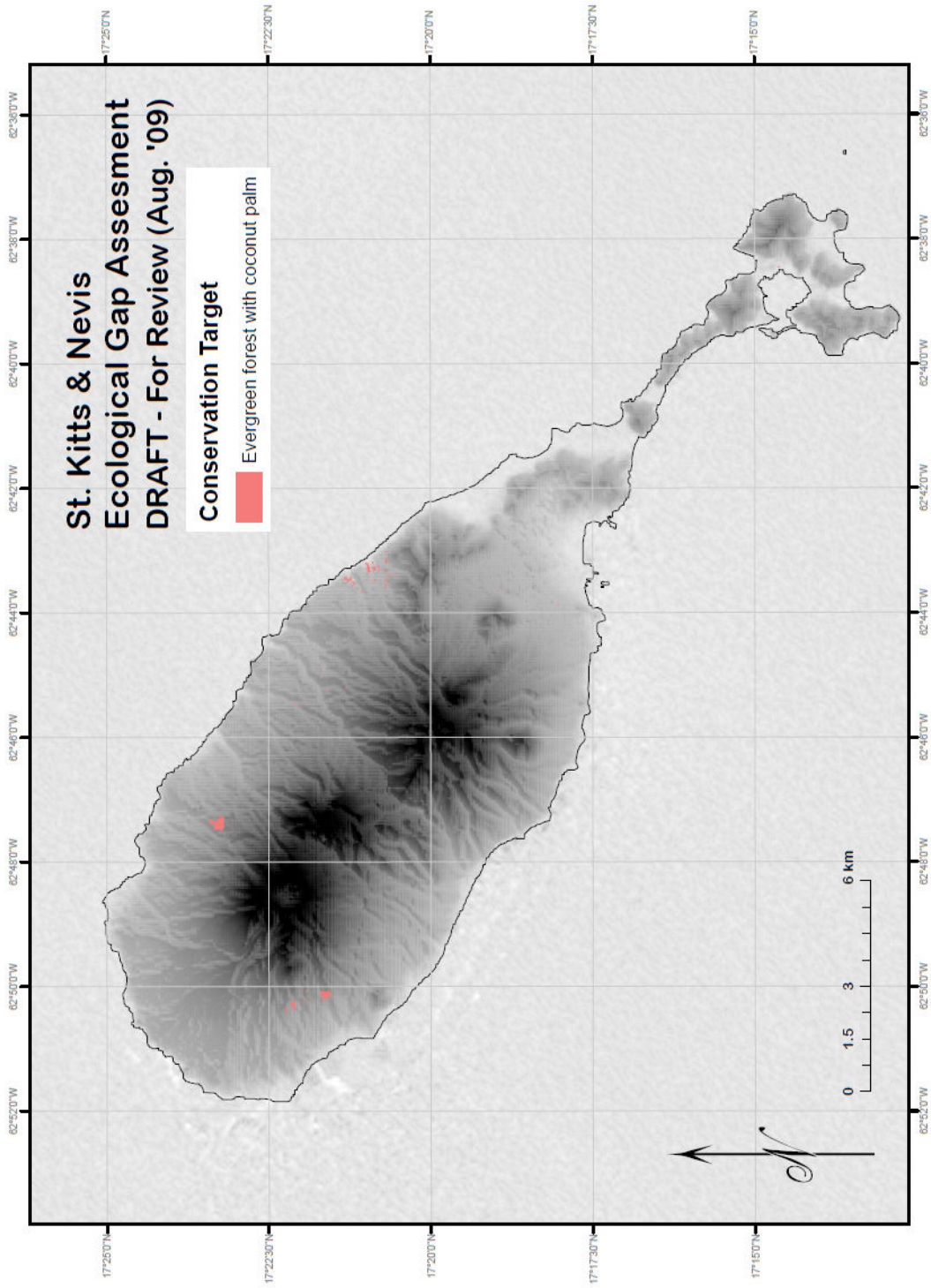


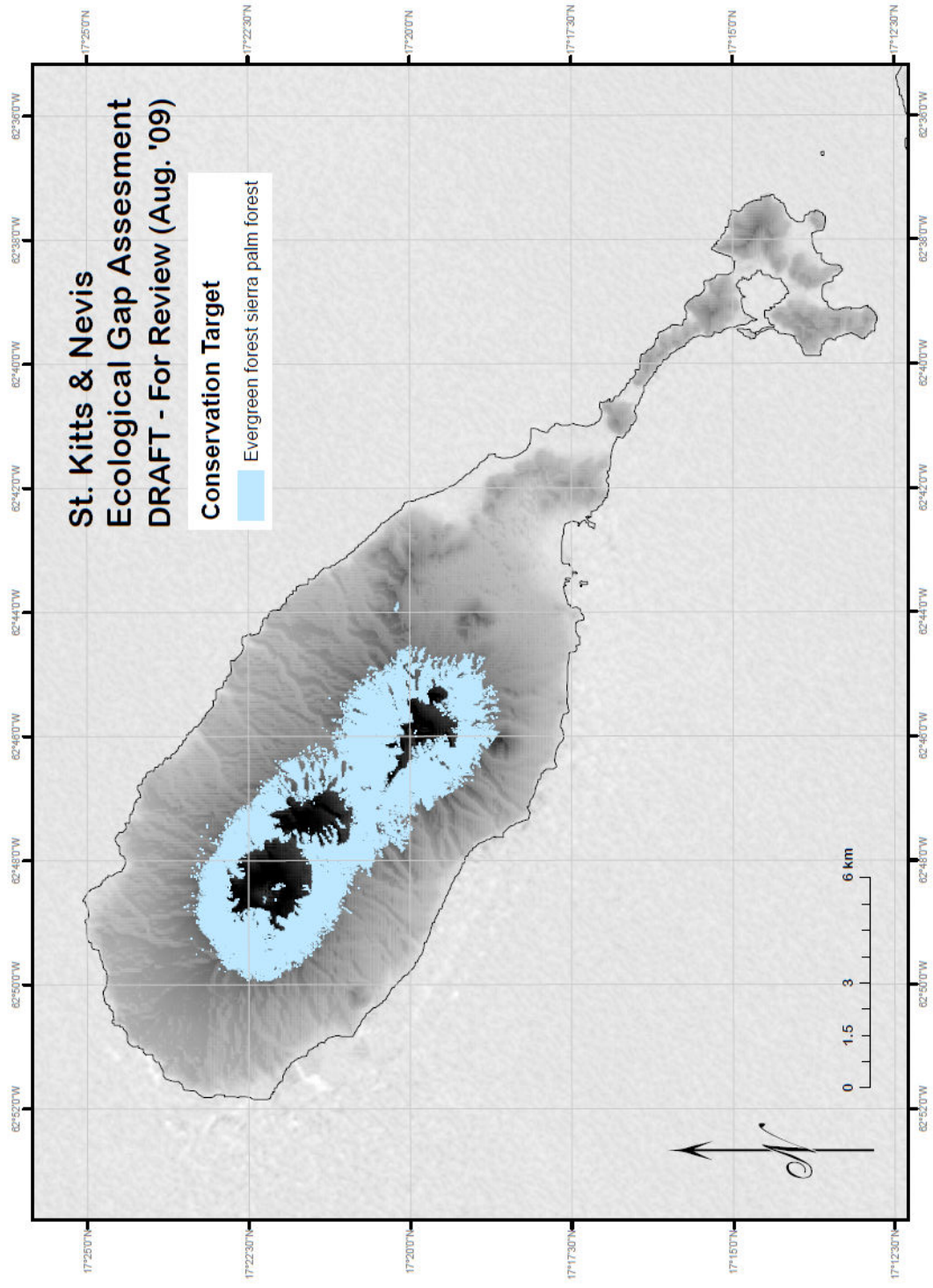










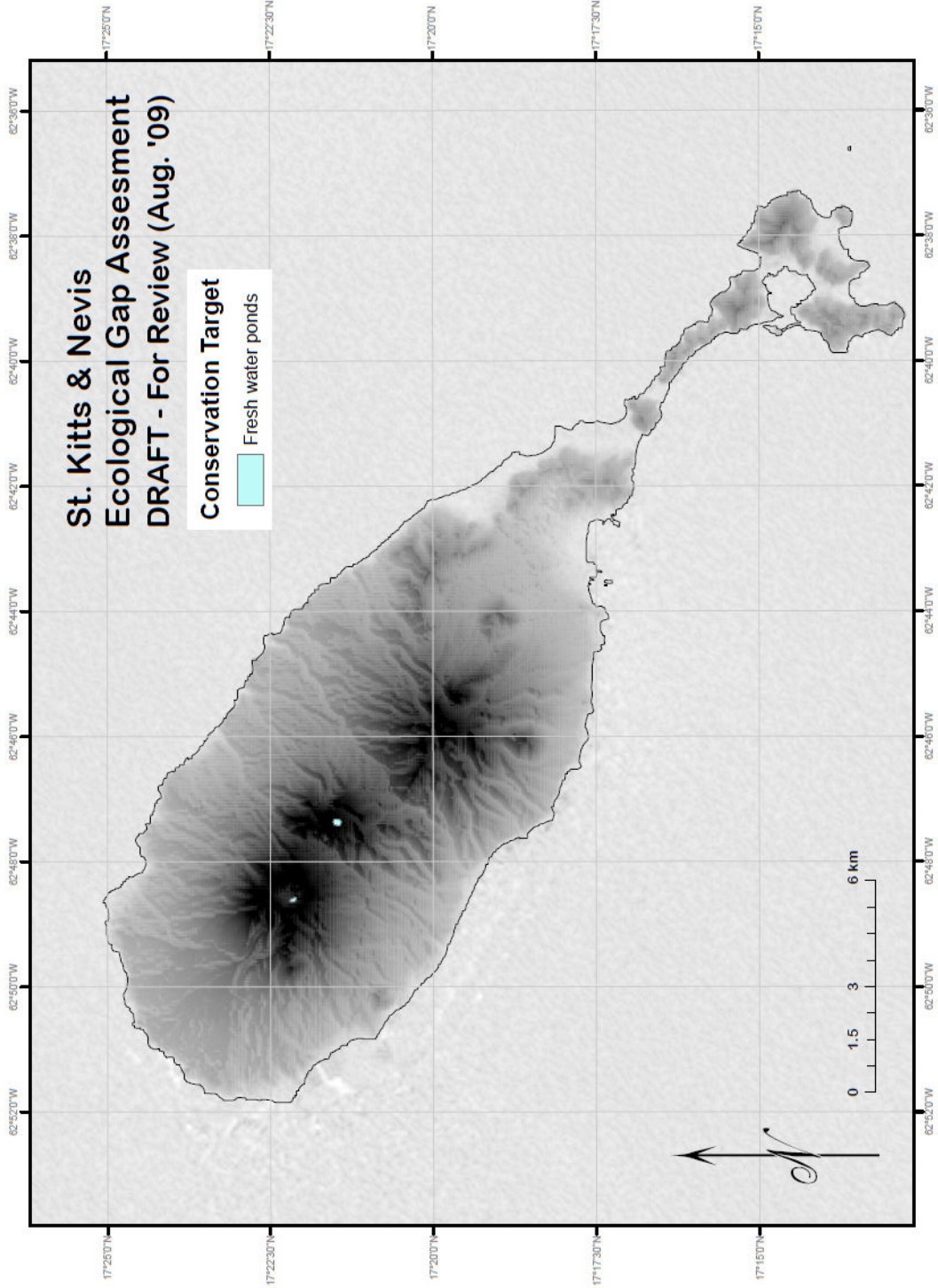


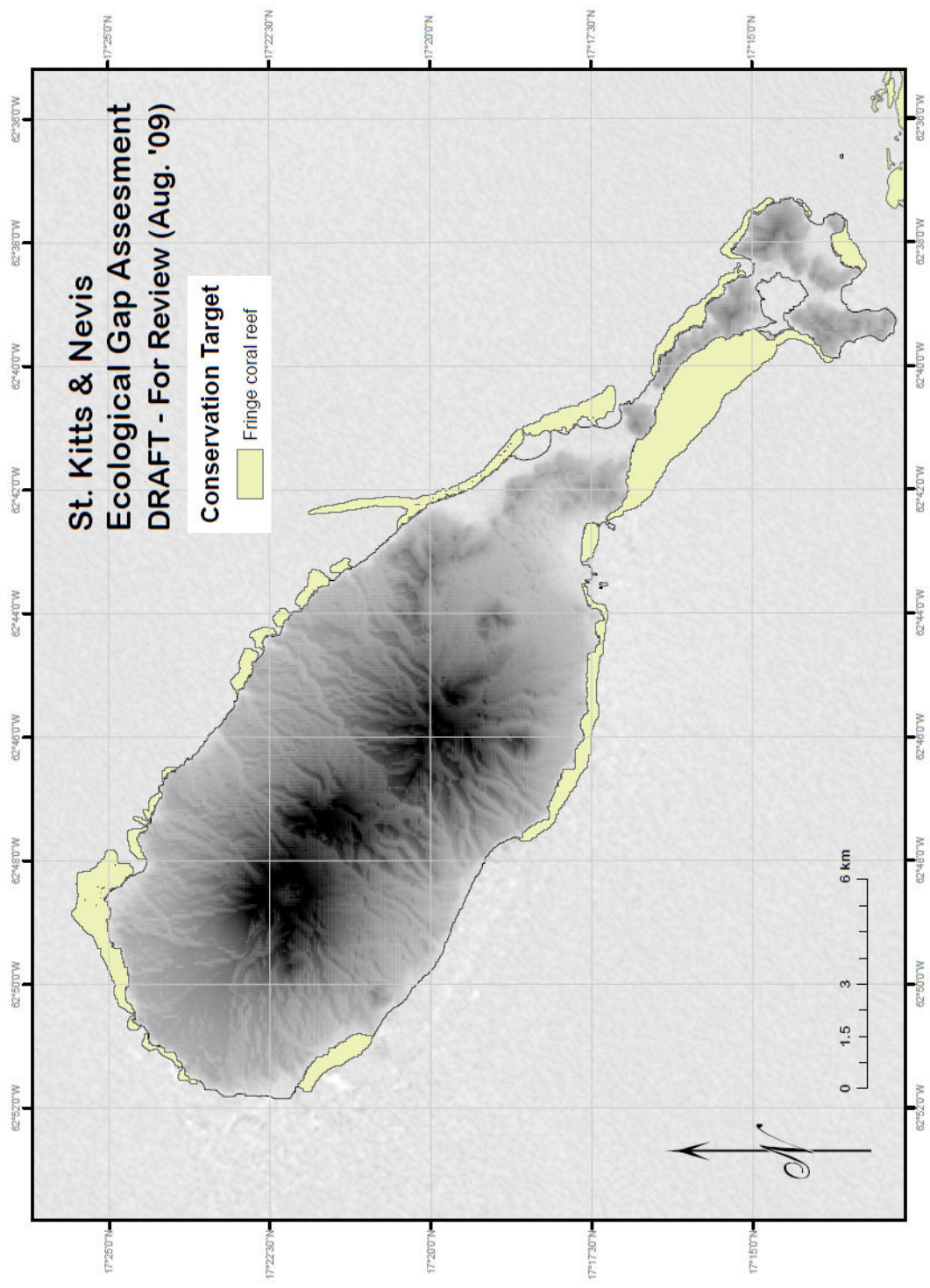
St. Kitts & Nevis Ecological Gap Assessment DRAFT - For Review (Aug. '09)

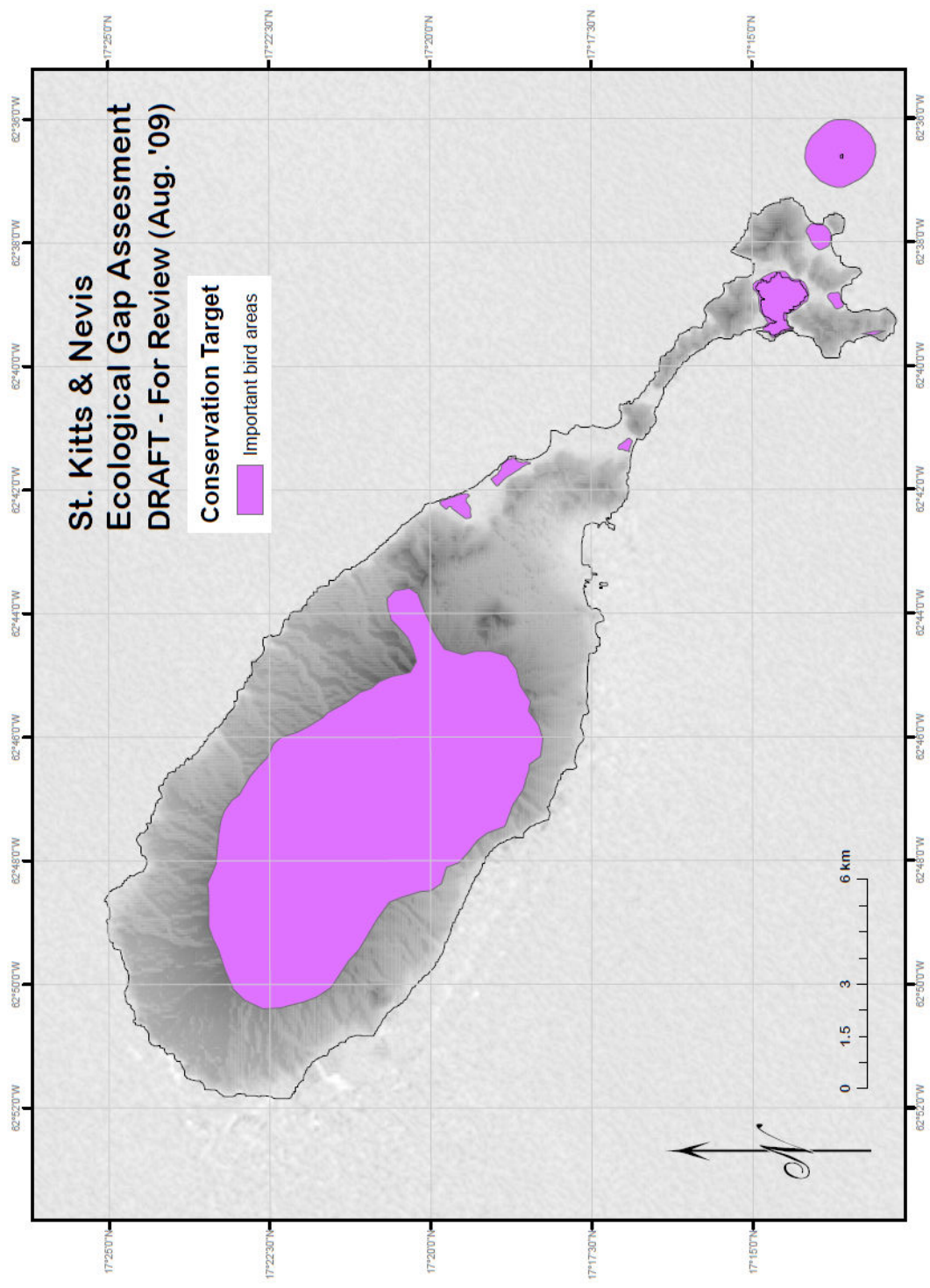
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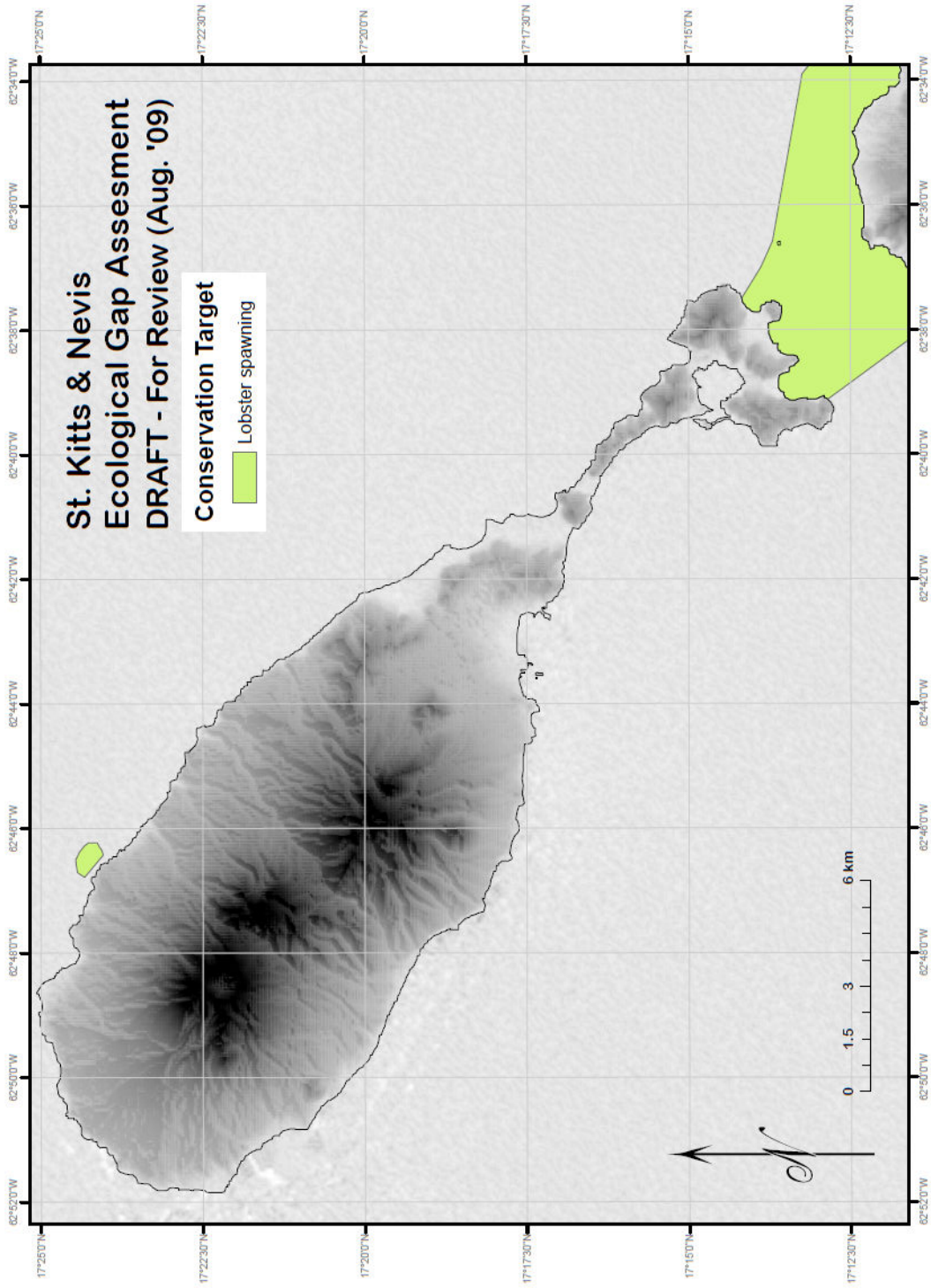


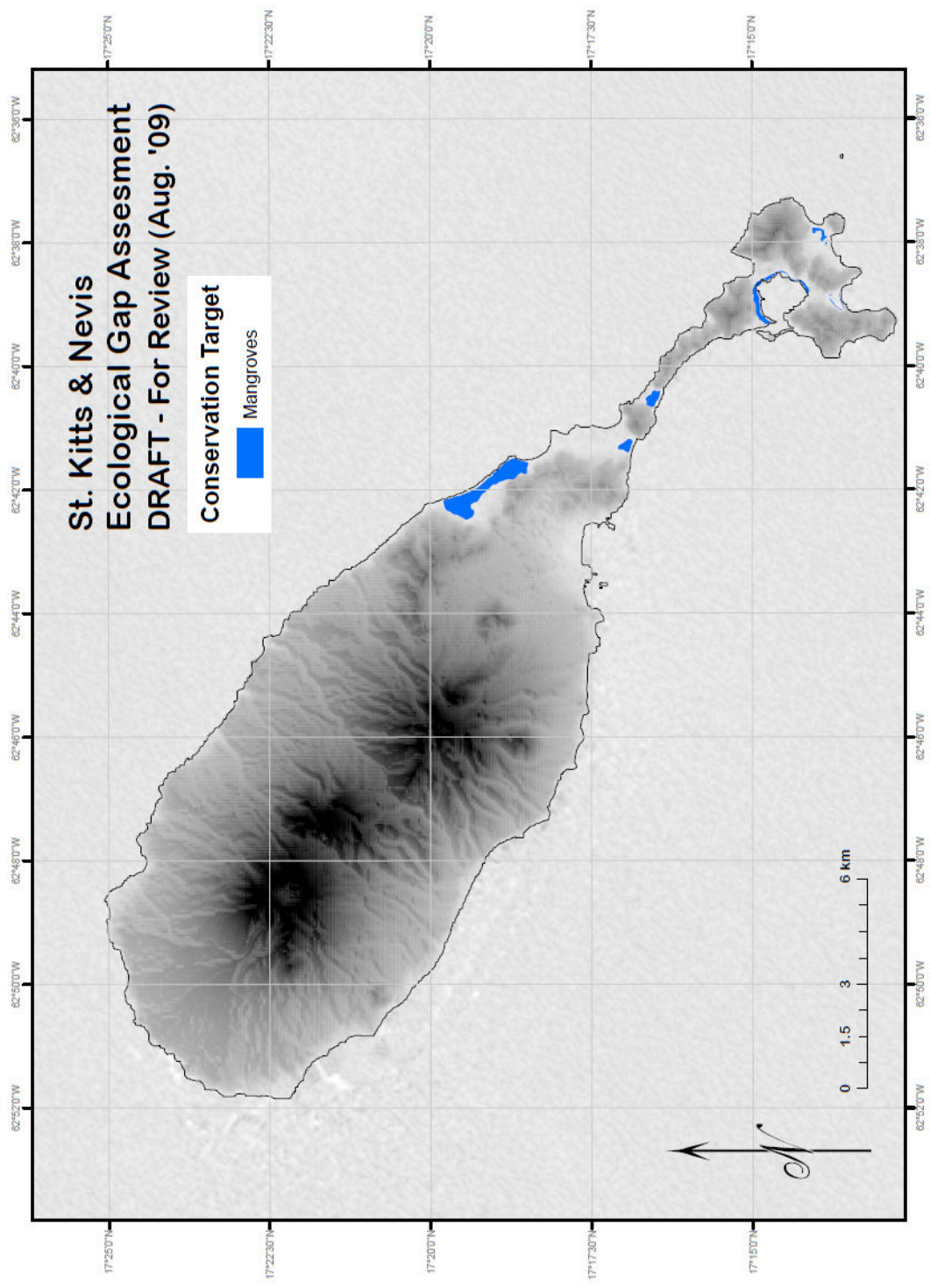
Fresh water ponds

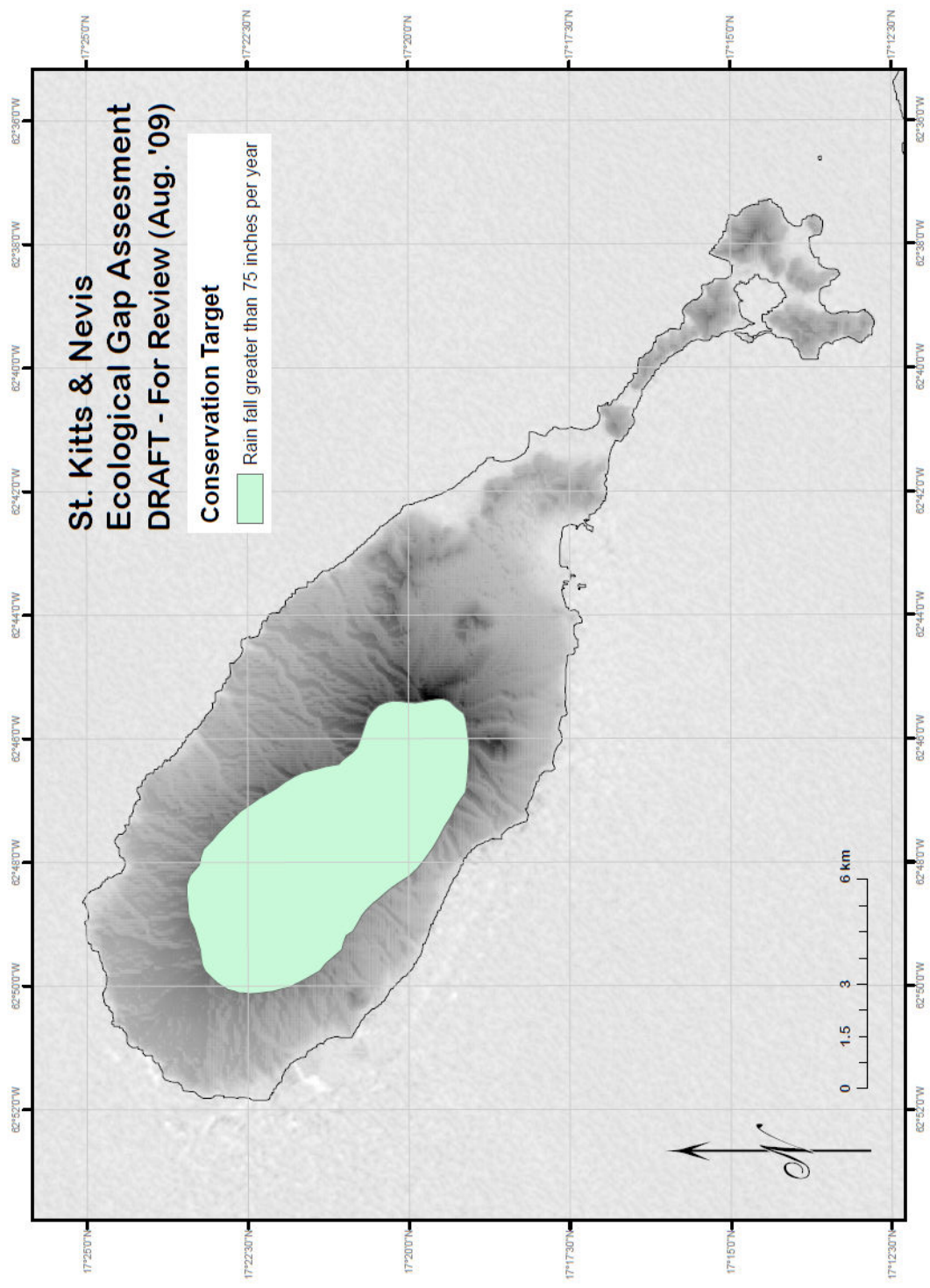


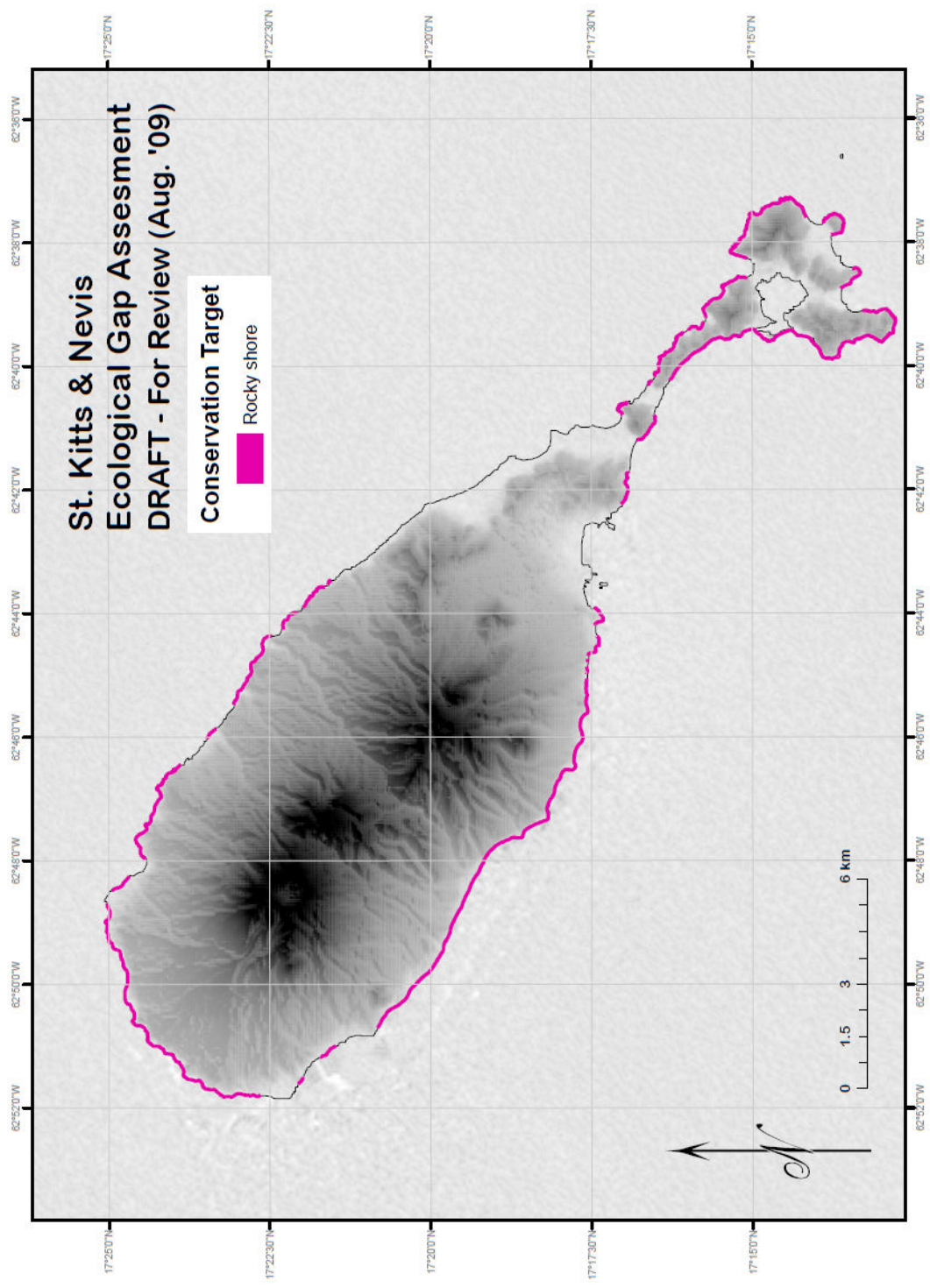






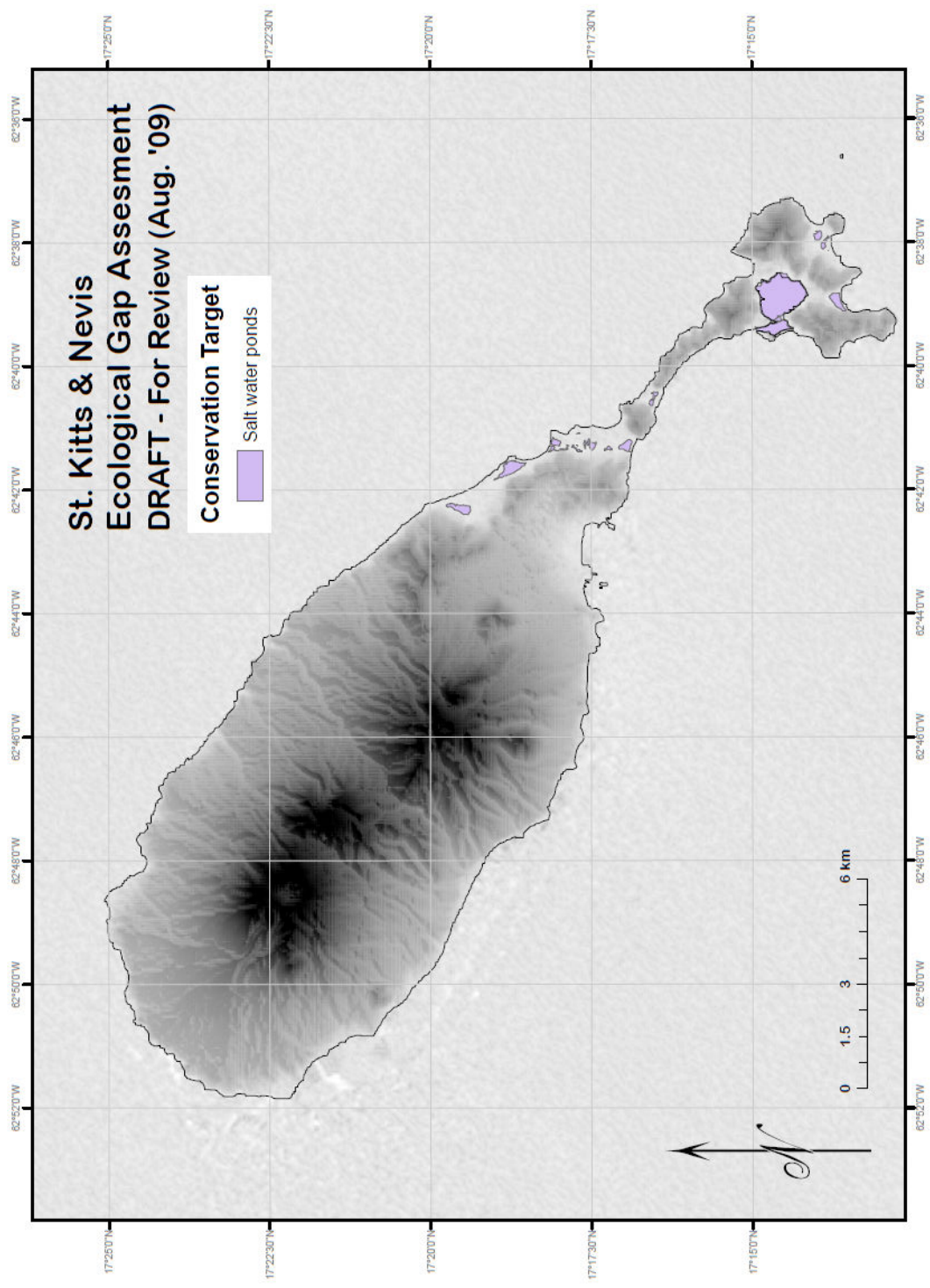


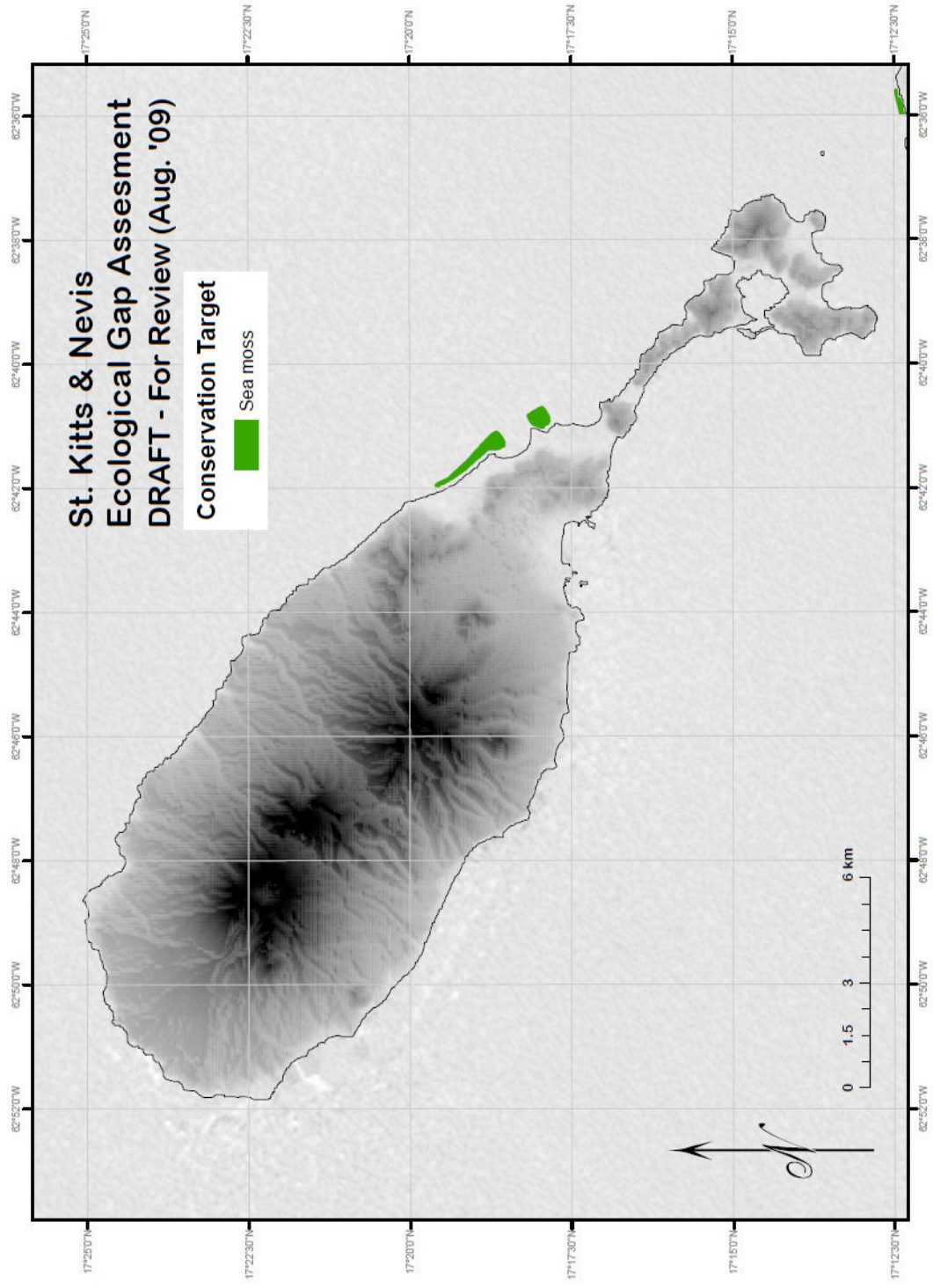




St. Kitts & Nevis Ecological Gap Assessment DRAFT - For Review (Aug. '09)

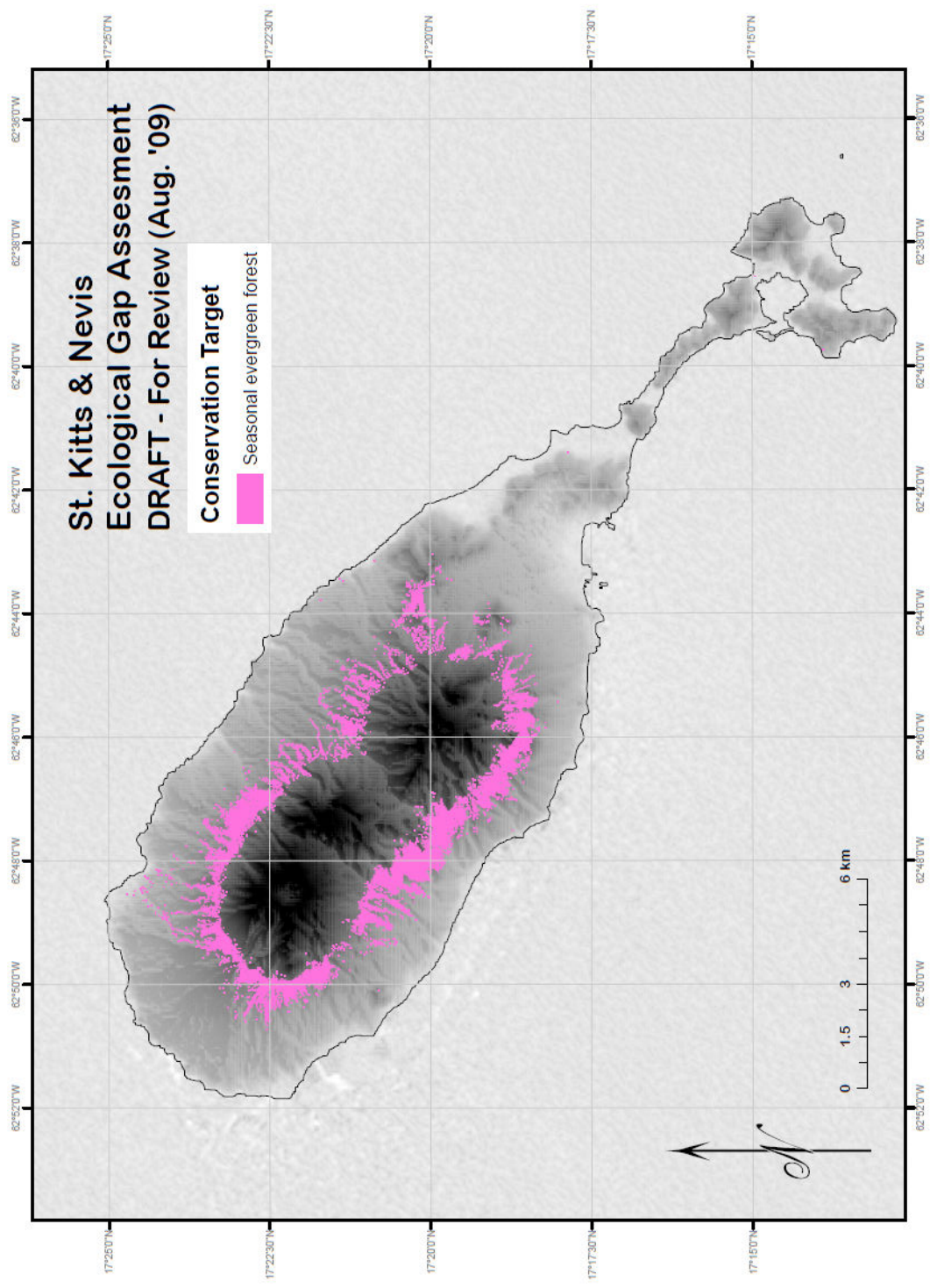
Conservation Target
Salt water ponds

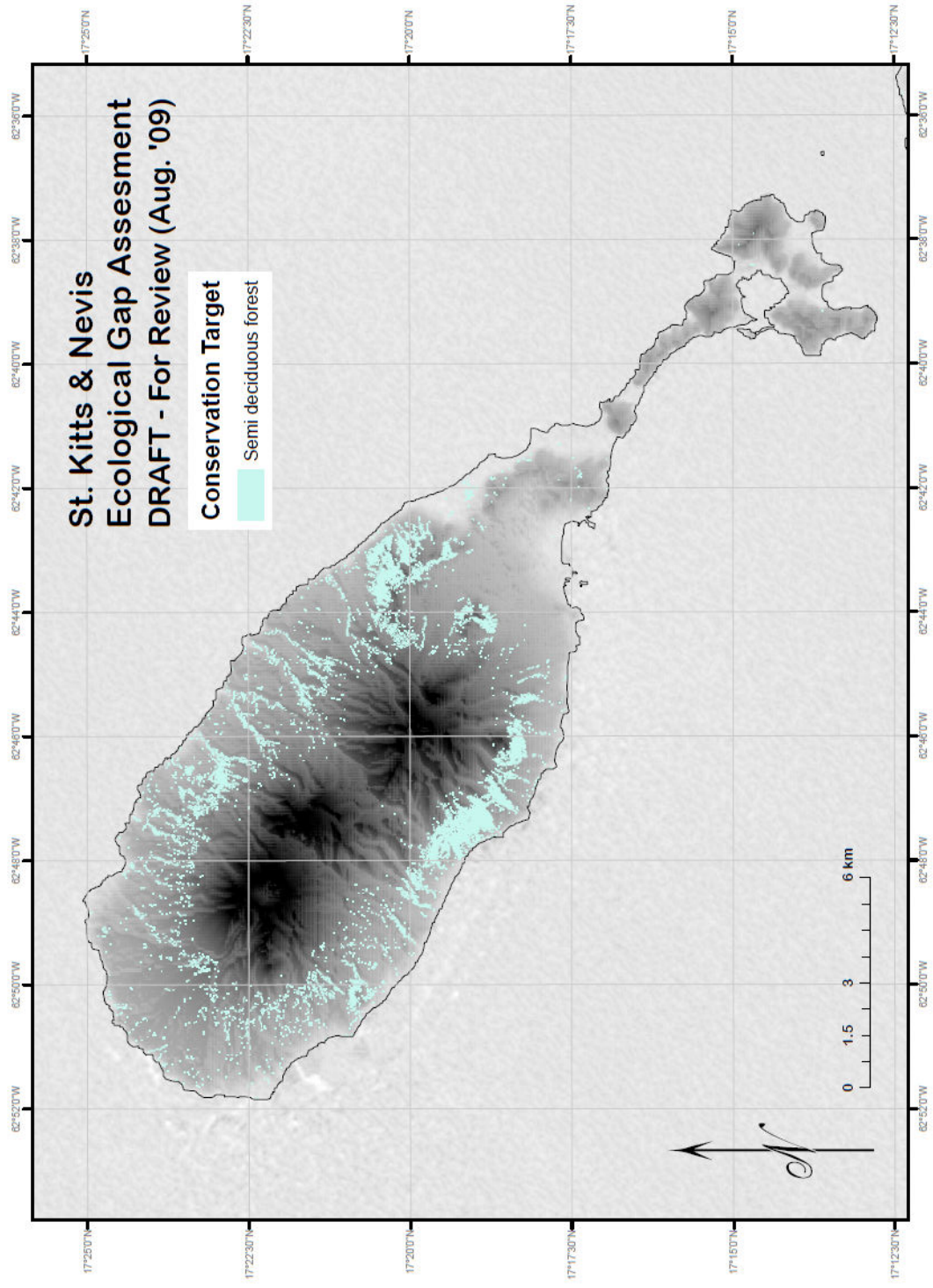


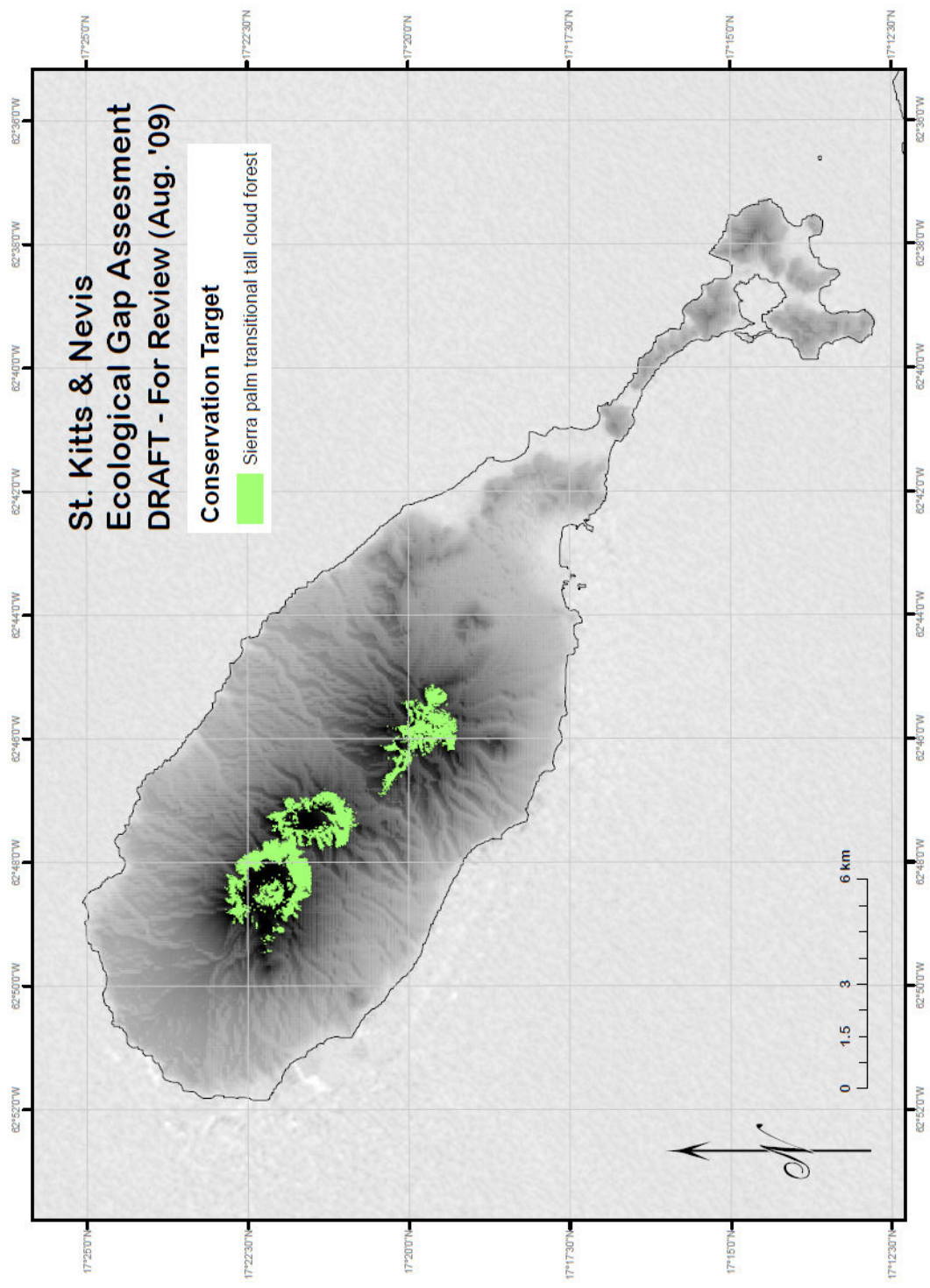


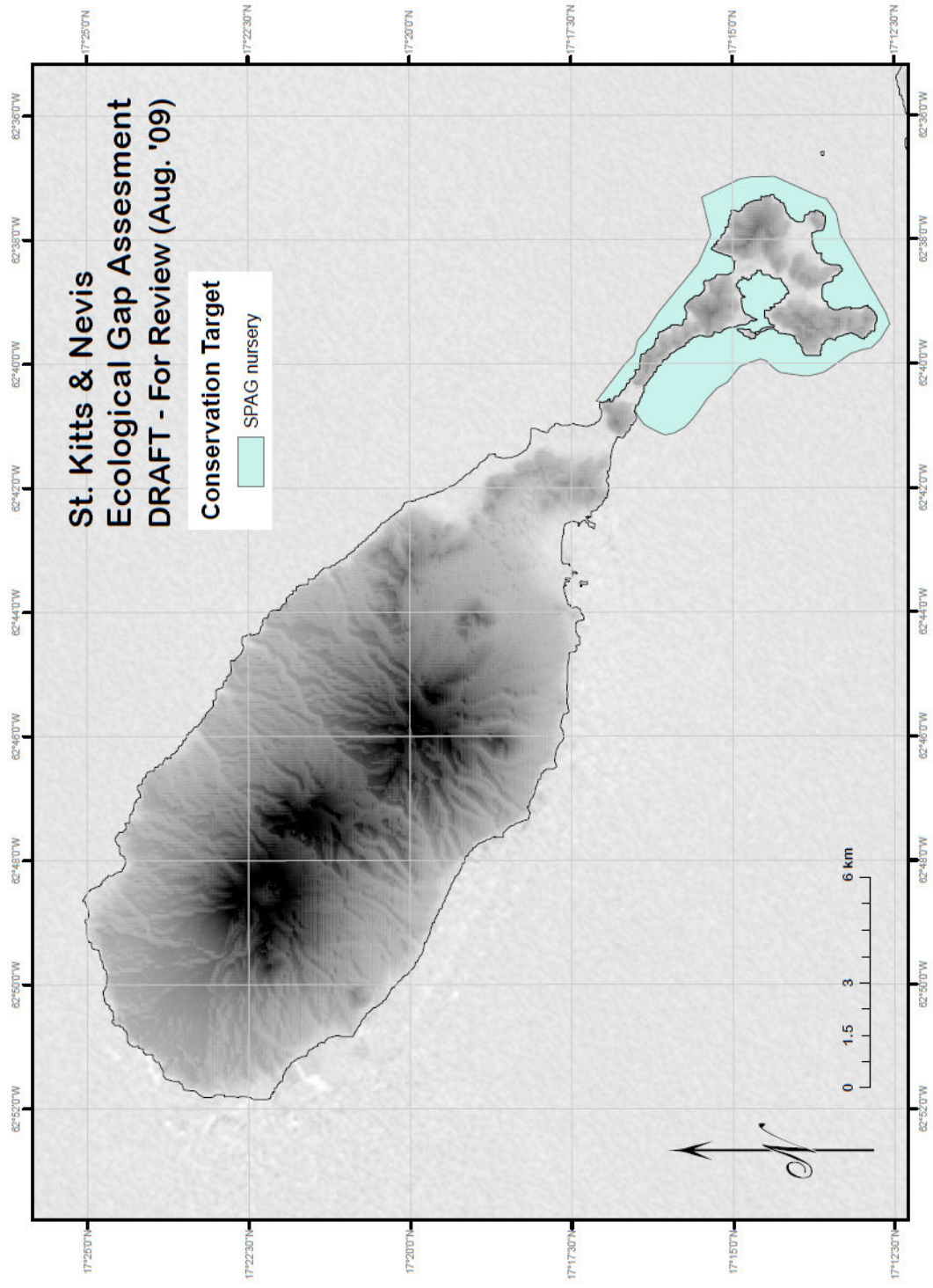
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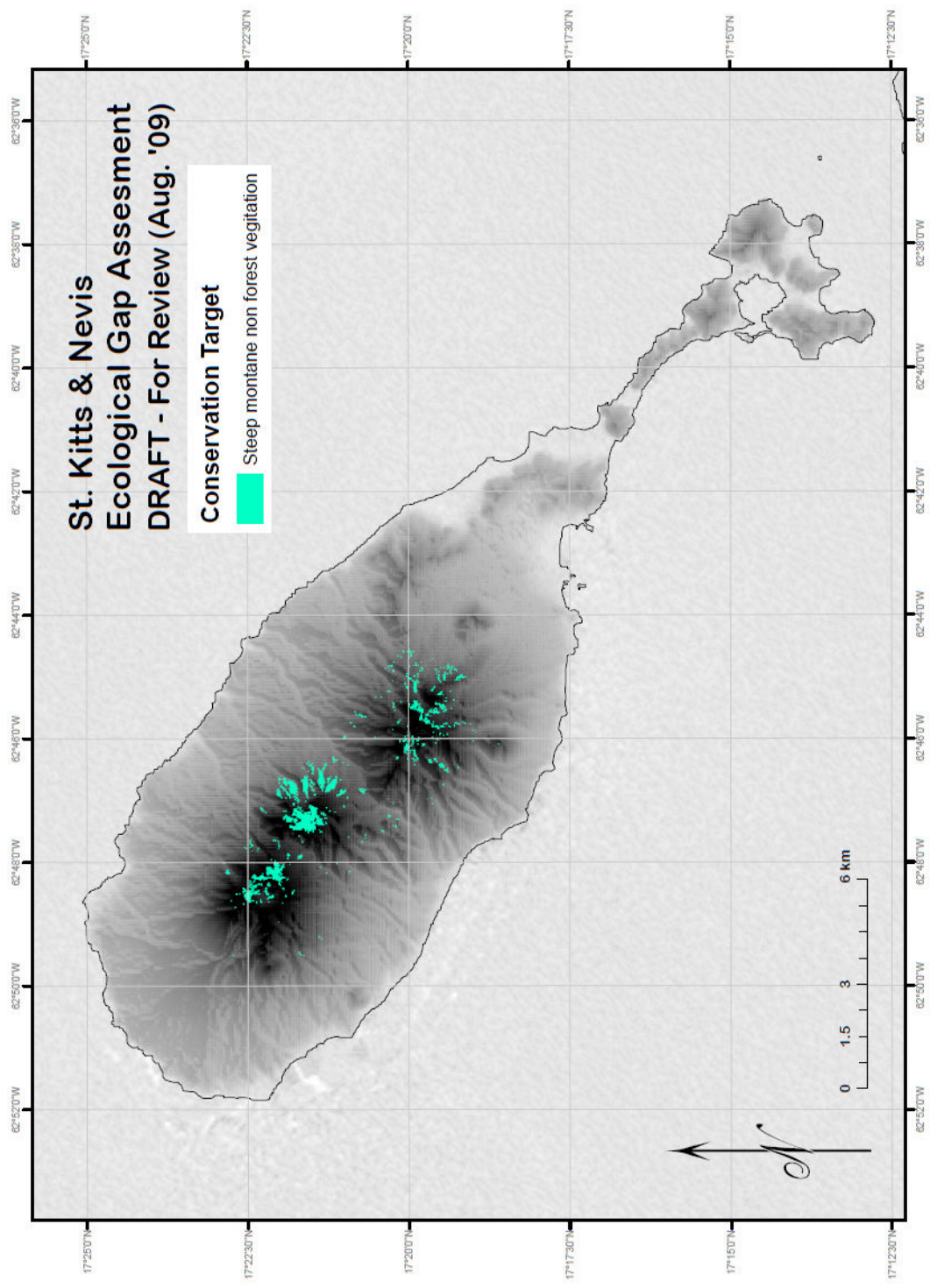
Conservation Target
Seasonal evergreen forest

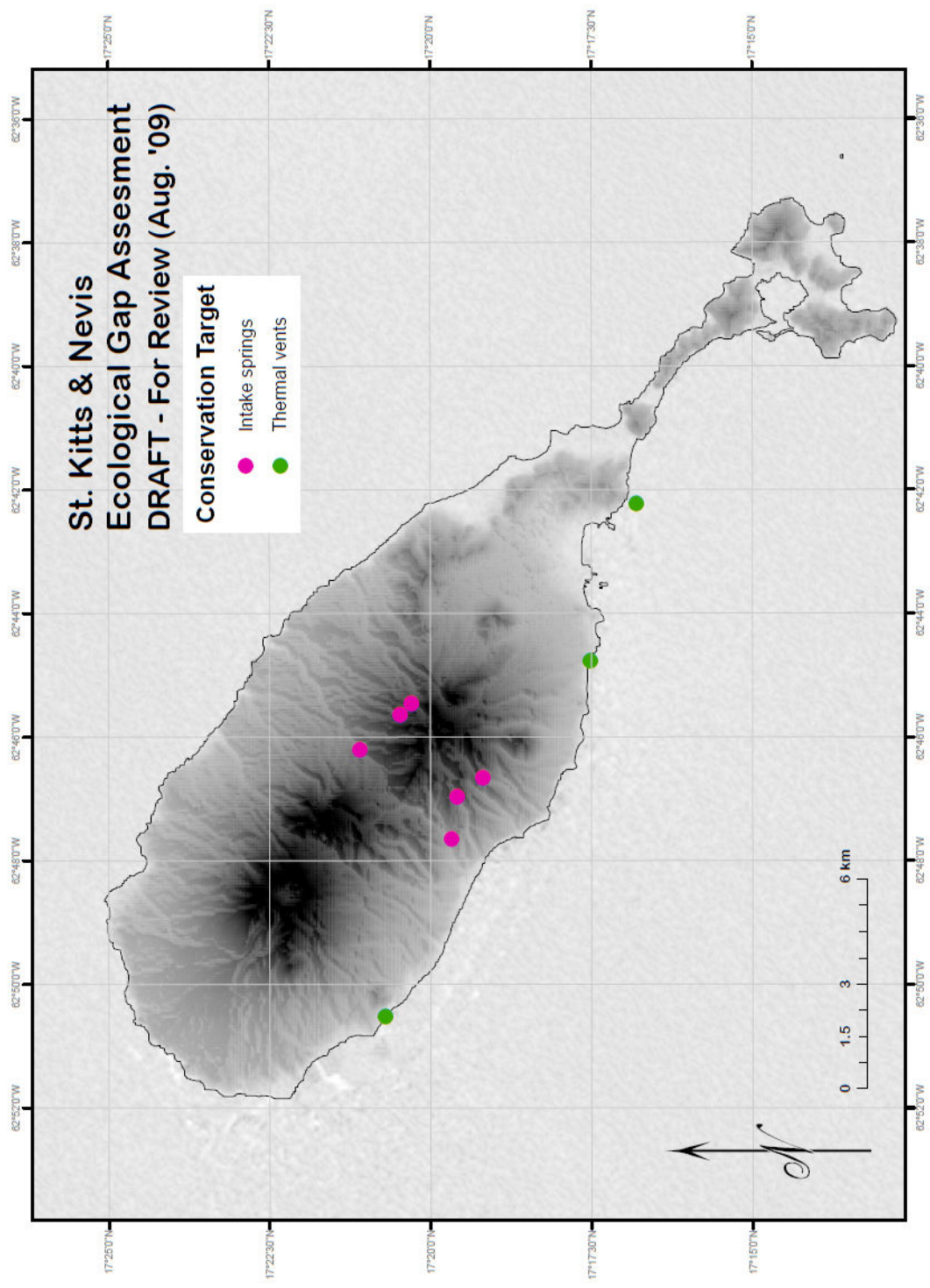


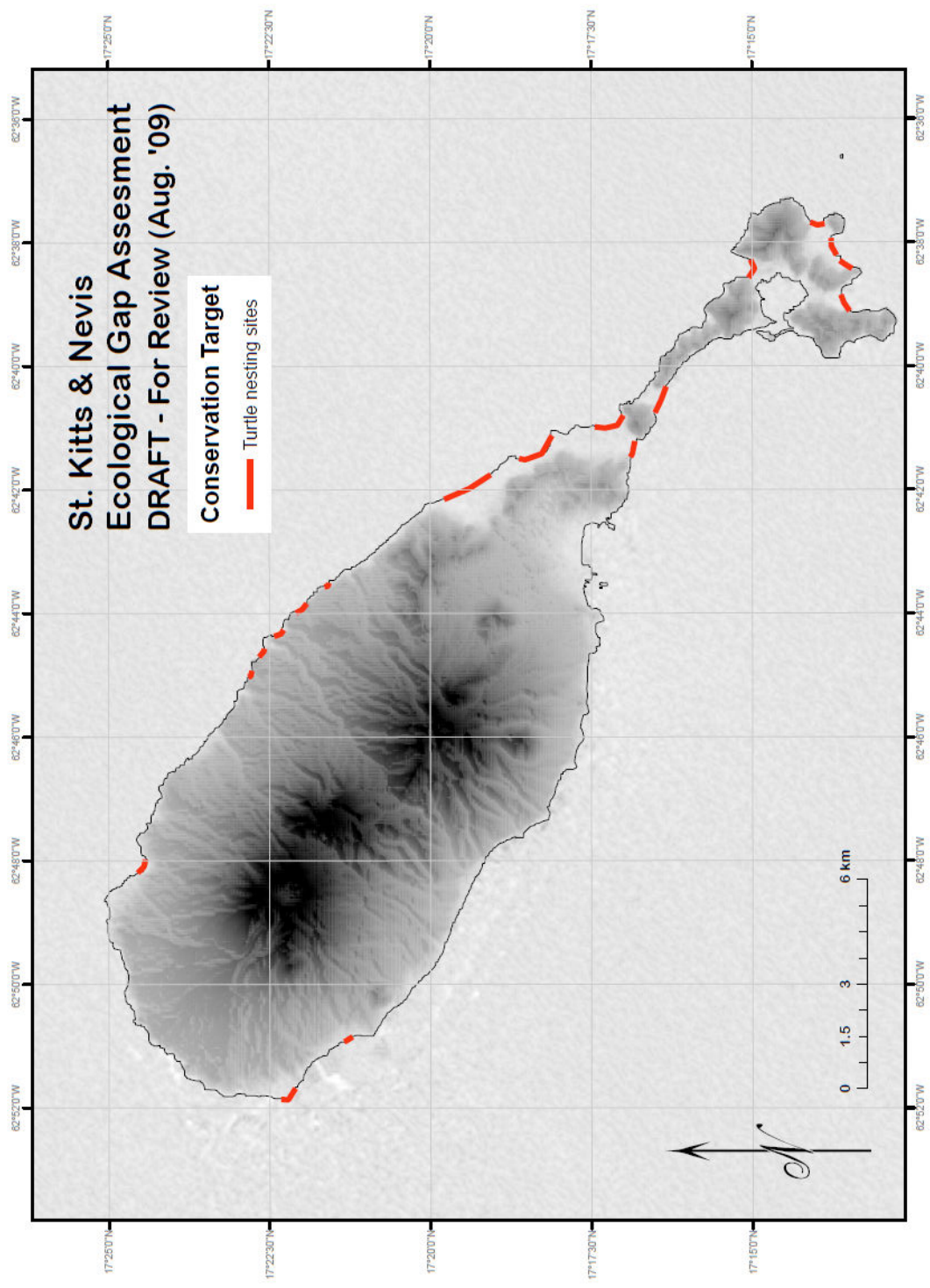












APPENDIX III

ENVIRONMENTAL RISK SURFACE

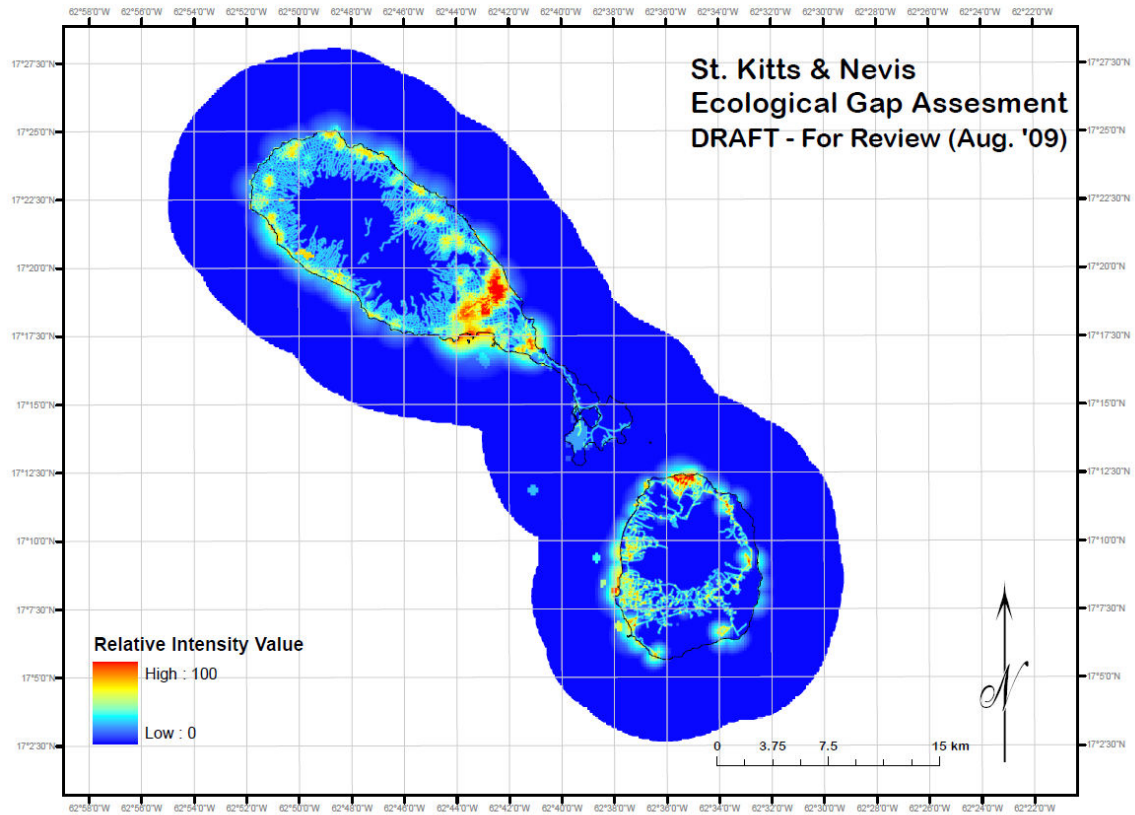


Figure 1. Environmental Risk Surface (ERS) model showing the “human footprint” of St. Kitts & Nevis. This model is the results of several GIS files that represent certain human activities that have been assigned intensity and influence distances (Table 2) and have been aggregated together. The darker red areas indicate higher levels of human activity.

APPENDIX IV

MARXAN RESULTS

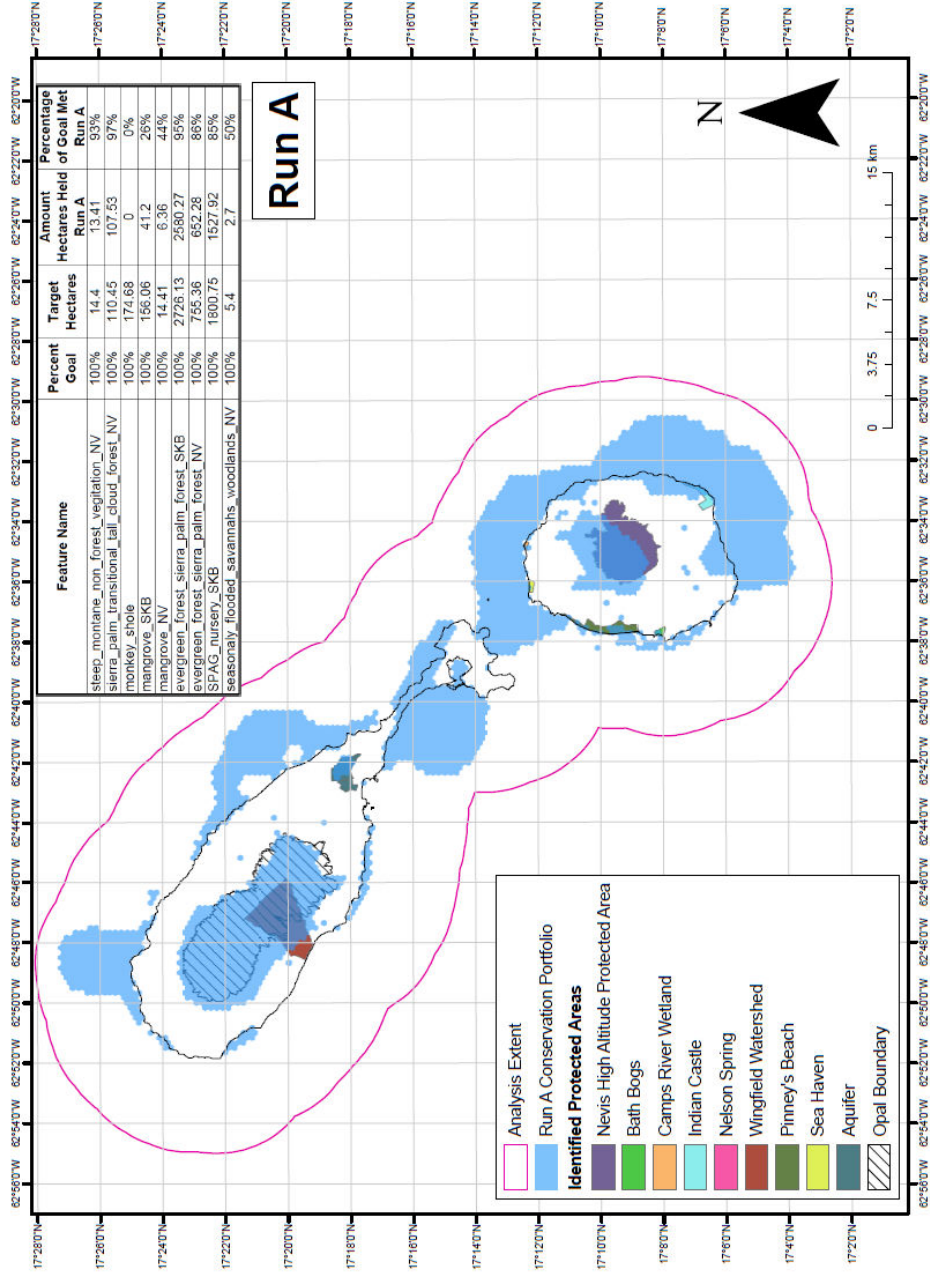


Figure 1. Marxan output showing a solution performed relative to the set goals (Table 1). Inset table shows the target goals that were not met with this solution. Feature Name: Name of the target for which a goal is set; Goal: The desired level of representation for that conservation feature; Amount Held: The amount of that target captured in the reserve system; Percentage Goal Met: Percentage of the goal met.

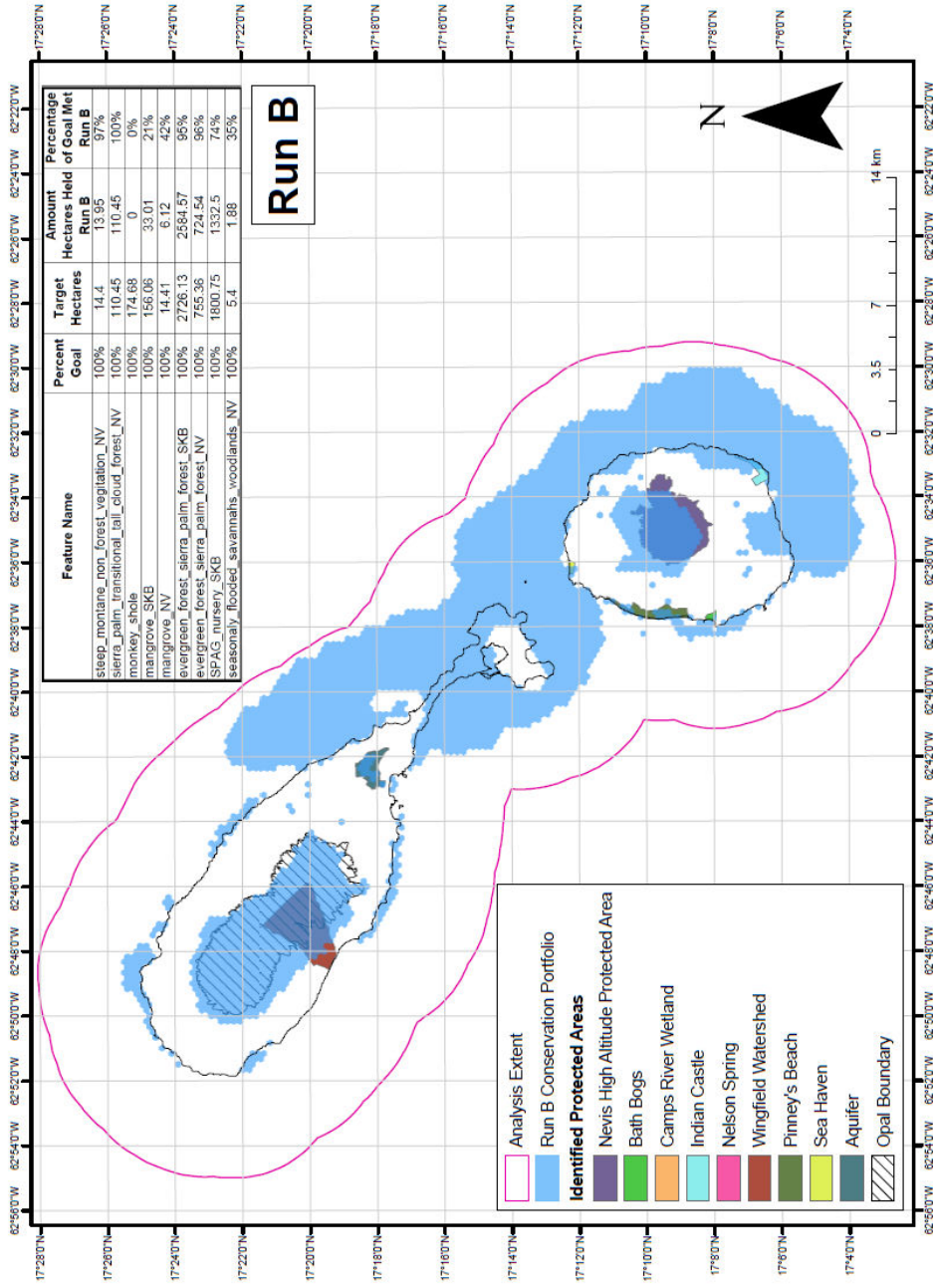


Figure 2 Marxan output showing a solution performed relative to the set goals (Table 1). Inset table shows the target goals that were not met with this solution. Feature Name: Name of the target for which a goal is set; Goal: The desired level of representation for that conservation feature; Amount Held: The amount of that target captured in the reserve system; Percentage Goal Met: Percentage of the goal met.

Nevis Marine Targets: Goals vs. Run A & B goal met

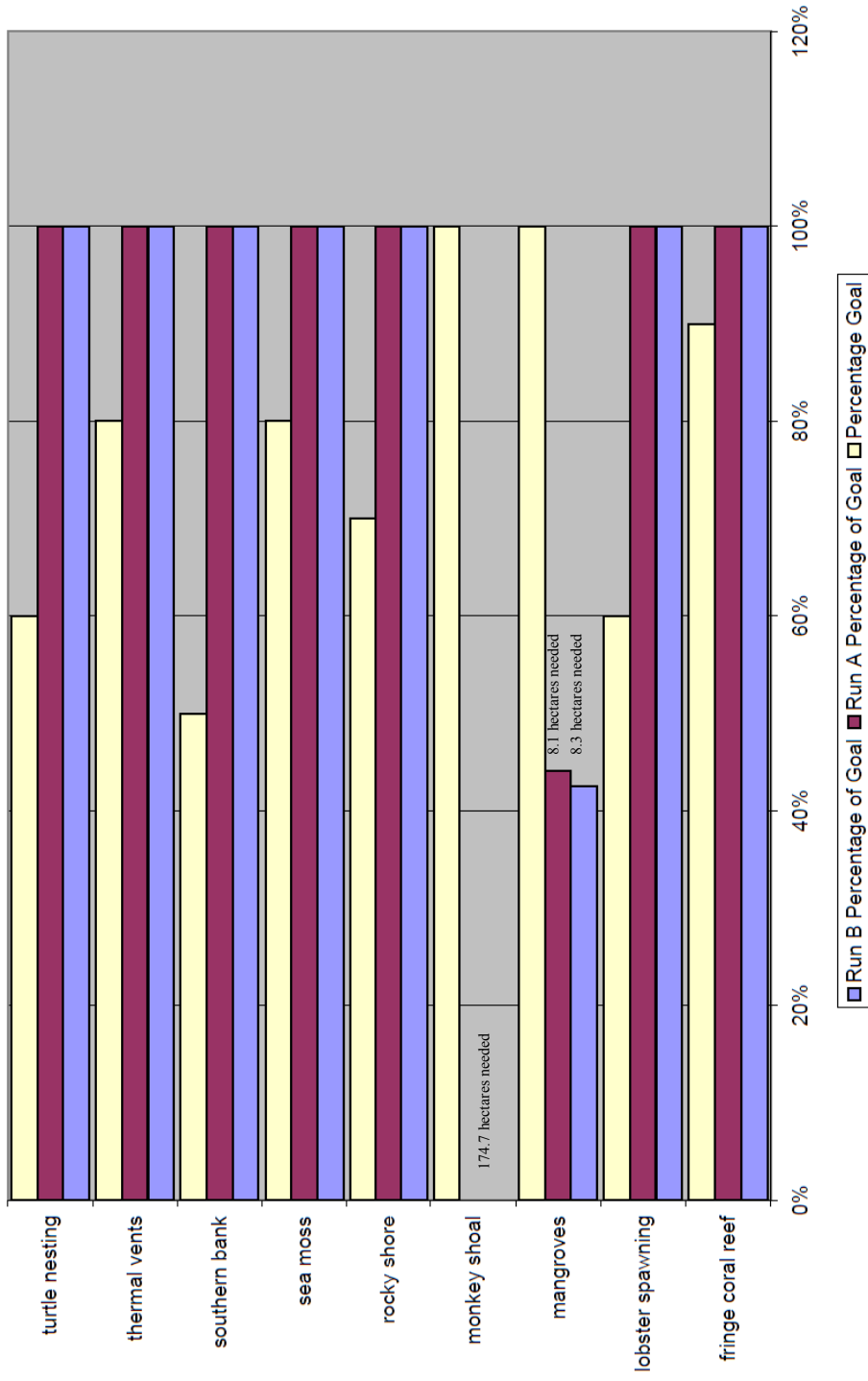


Figure 3. Graph indicating the target goal and the percentage of goal met for Run A and B for each marine target for Nevis. Where target goal was not met the number of hectares needed to reach goal is indicated.

Nevis Terrestrial Targets: Goals vs. Run A & B goal met

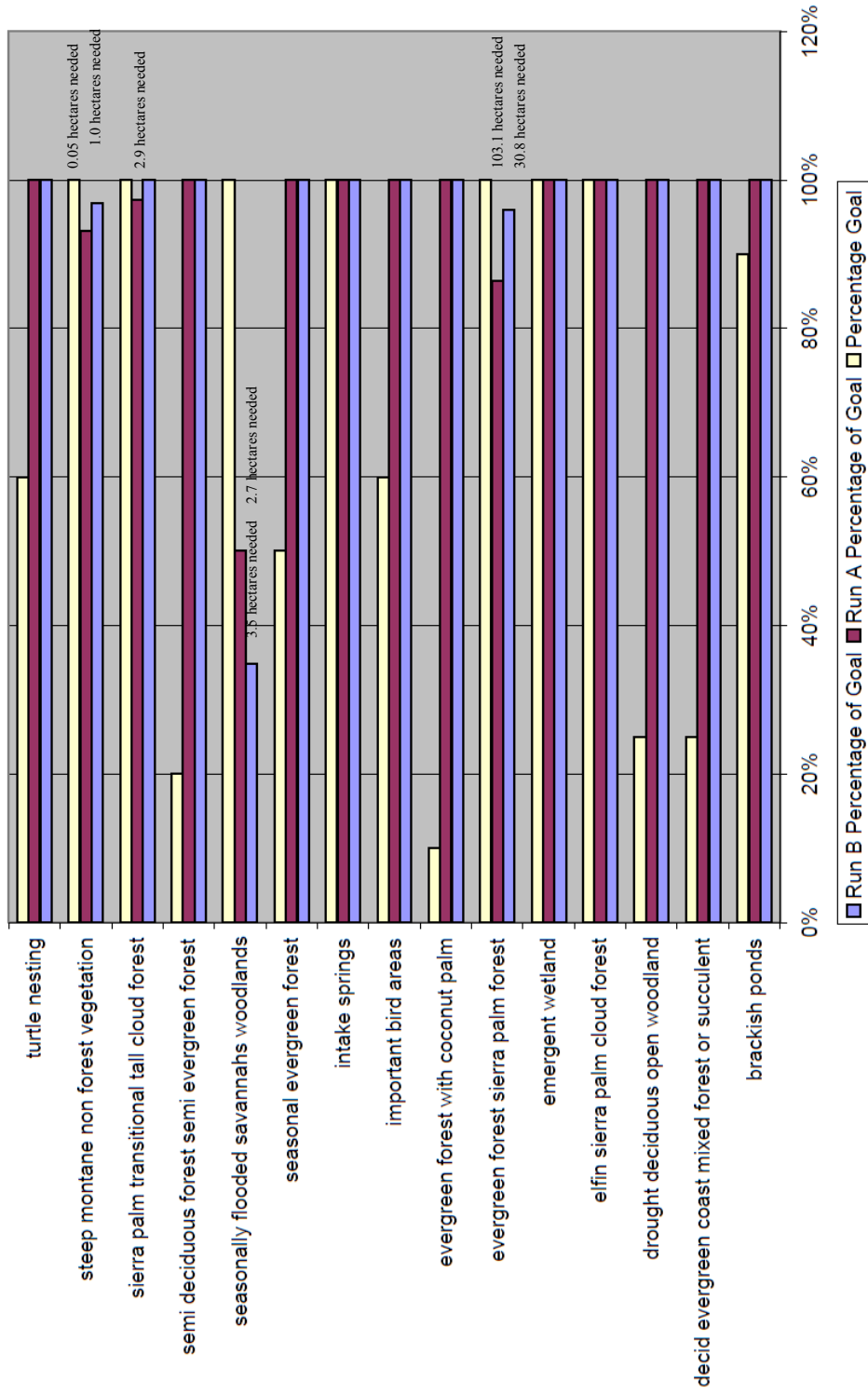


Figure 4. Graph indicating the target goal and the percentage of goal met for Run A and B for each terrestrial target for Nevis. Where target goal was not met the number of hectares needed to reach goal is indicated.

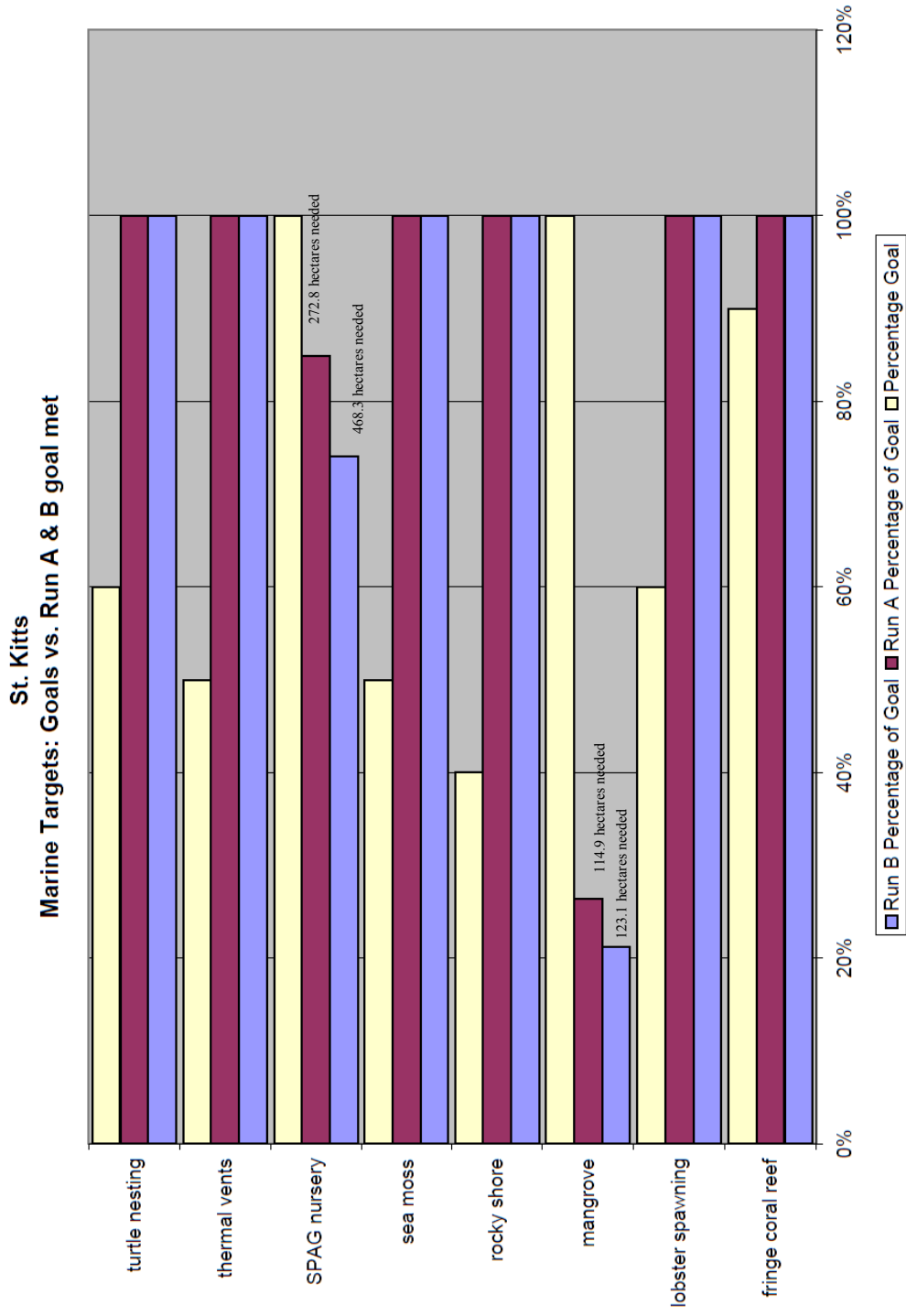


Figure 5. Graph indicating the target goal and the percentage of goal met for Run A and B for each marine target for St. Kitts. Where target goal was not met the number of hectares needed to reach goal is indicated.

St. Kitts

Terrestrial Targets: Goals vs. Run A & B goal met

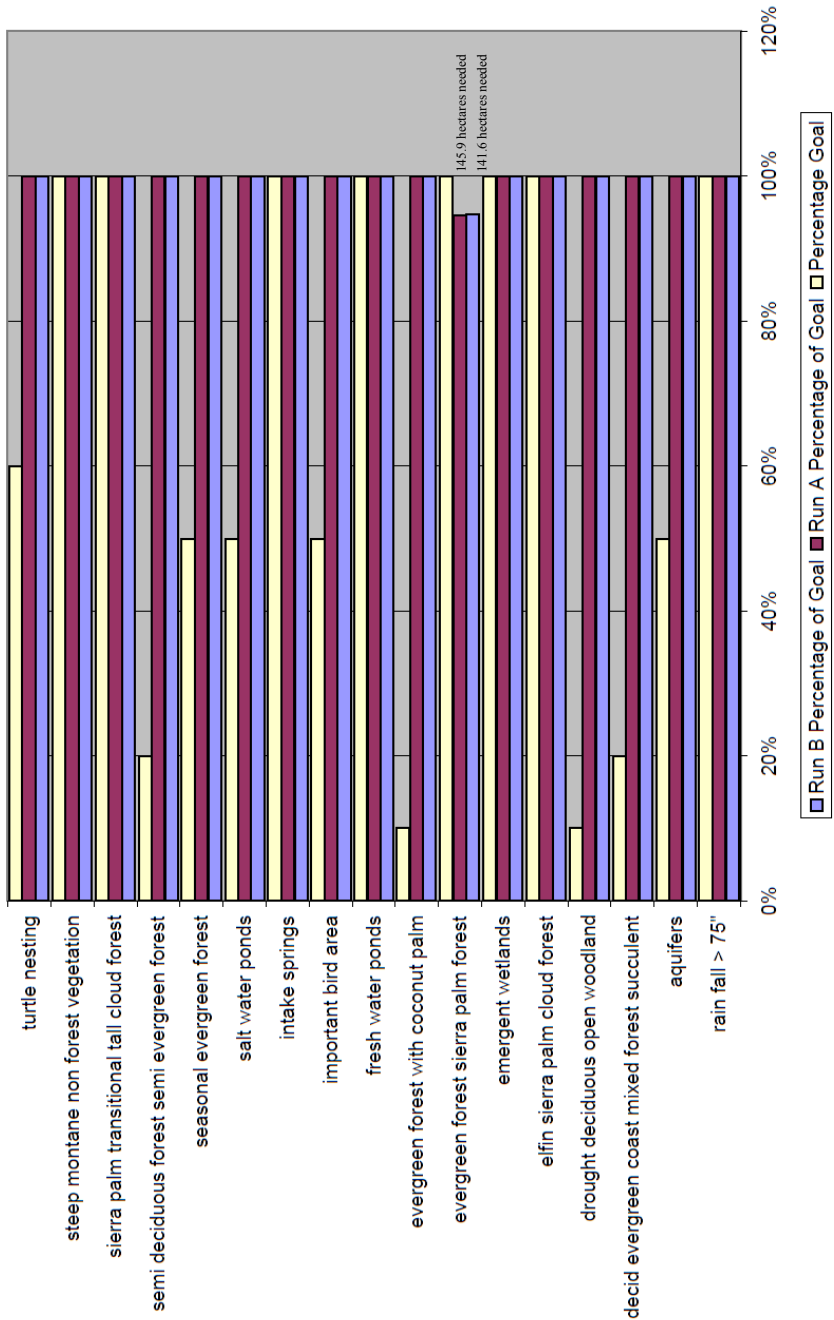


Figure 6. Graph indicating the target goal and the percentage of goal met for Run A and B for each terrestrial target for St. Kitts. Where target goal was not met the number of hectares needed to reach goal is indicated.



APPENDIX C

RESULTS OF RAPPAM WORKSHOP

**ORGANISATION OF EASTERN CARIBBEAN STATES
ENVIRONMENT AND SUSTAINABLE DEVELOPMENT UNIT**

**PROTECTED AREAS SYSTEMS PLAN FOR
ST. KITTS AND NEVIS**

APPENDIX C:

***REPORT ON RESULTS OF RAPPAM WORKSHOP
June 25 & 26, 2009***

April 07, 2010

PREPARED BY

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APPENDIX C

REPORT ON RESULTS OF RAPPAM WORKSHOP

C.1 INTRODUCTION

This appendix documents the findings of the Rapid Assessment and Prioritization of Protected Areas (RAPPAM) workshop conducted on June 25 and 26, 2009 as part of the process of drafting a Protected Areas Systems Plan for the Federation of St. Kitts and Nevis. It begins with a method statement describing the collection of the data and the system used to score and analyze the results followed by a discussion of the findings under the following headings:

- Context,
- Planning,
- Inputs, and
- Processes.

The evaluation of protected areas using the RAPPAM questionnaire can be briefly explained by the following matrix:

| ELEMENTS OF EVALUATION | EXPLANATION | CRITERIA THAT ARE ASSESSED UNDER RAPPAM |
|------------------------|---|---|
| Context | Where are we now? Assessment of importance, threats and policy environment | <ul style="list-style-type: none"> • Threats • Biological Importance • Socio-Economic Importance • Vulnerability • PA Policies • Policy Environment |
| Planning | Where do we want to be? Assessment of protected area design and planning | <ul style="list-style-type: none"> • Protected Area Objectives • Legal Security • Site Design and Planning • Protected Area System Design |
| Inputs | What do we need? Assessment of resources needed to carry out management | <ul style="list-style-type: none"> • Staff • Communication and Information • Infrastructure • Finances |
| Processes | How do we go about it? Assessment of the way in which management is conducted | <ul style="list-style-type: none"> • Management Planning • Management Practices • Research Monitoring and Evaluation |

| ELEMENTS OF EVALUATION | EXPLANATION | CRITERIA THAT ARE ASSESSED UNDER RAPPAM |
|------------------------|--|--|
| Results / Outputs | What are the outputs? Assessment of the implementation of management programmes and actions; delivery of products and services | <ul style="list-style-type: none"> • Threat Prevention • Site Restoration • Wildlife Management • Community Outreach • Visitor Management • Infrastructure Outputs • Planning Outputs • Monitoring • Training • Research |
| Impacts | What did we achieve? Assessment of the outcomes and the extent to which they achieved objectives | <ul style="list-style-type: none"> • Pressures |

Questions on outputs and impacts were excluded from the questionnaire since many of the sites were not yet established and therefore these questions were not considered applicable at this stage.

C.2 METHOD STATEMENT

This description of the method statement will be discussed under the following headings:

- Why RAPPAM;
- Assumptions;
- Workshop Objective;
- Agenda;
- Presentations;
- Amendments to RAPPAM Questionnaire;
- Completion of Questionnaire;
- Follow-up; and
- Scoring of Results.

C.2.1 Why RAPPAM

The RAPPAM methodology is designed for broad-level comparisons among many protected areas. It can answer a number of important questions: What are the threats facing a number of protected areas and how serious are they? How do protected areas compare with one another in terms of infrastructure and management capacity? What is

the urgency for taking actions in each protected area? What is the overall level of integrity and degradation of each protected area? How well do national and local policies support the effective management of protected areas? What are the most strategic interventions to improve the entire system?

RAPPAM can:

- Identify management strengths and weaknesses
- Analyse the scope, severity, prevalence, and distribution of a variety of threats and pressures
- Identify areas of high ecological and social importance and vulnerability
- Indicate the urgency and conservation priority for individual protected areas
- Help to develop and prioritize appropriate policy interventions and follow-up steps to improve protected area management effectiveness

WWF highly recommends the use of a participatory workshop for data collection because such an approach is likely to generate more accurate and thorough data, allow greater stakeholder participation, and be more widely accepted by protected area managers.

Participatory workshops allow workshop participants to negotiate a common interpretation of each question, providing a more consistent and standardized approach to the Rapid Assessment Questionnaire system-wide.

C.2.2 Assumptions

The methodology used is dependent upon a number of assumptions:

- a) The methodology assumes a favourable assessment climate. Since the quality of the data depends on the willingness and participation of protected area managers and administrators, a climate of trust and transparency is essential for obtaining reliable information that will provide meaningful and usable results.
- b) The methodology assumes the definition of a protected area, as agreed at the Fourth World Congress on National Parks and Protected Areas in 1992 (IUCN. 1994): “An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means”.
- c) While the methodology is aimed primarily at publicly managed protected areas rather than private lands, it could be applied to many types of privately owned protected areas.

- d) Some questions may need to be modified, as would the overall approach, to more adequately fit the needs and circumstances of private and community owned protected areas.
- e) This methodology was developed specifically for forest protected areas. However, it has been successfully applied to other biomes, including grassland savannahs and wetlands, by modifying and adapting the interpretations of questions in the Rapid Assessment Questionnaire. To date, it has not been applied specifically to marine protected area systems, although it has been applied to some protected areas that include marine ecosystems. If it were applied to a marine protected area system, the Rapid Assessment Questionnaire would likely require modification.
- f) While the methodology can be applied to all six IUCN categories of protected areas, it is most applicable to categories I to IV. Category V, protected landscapes, extends beyond a single management unit, and would require indicators to measure landscape integrity, as well as a more comprehensive, community-based approach to the assessment process. Category VI, managed resources, would require more detailed indicators to measure forest management practices. The principles and criteria of the Forest Stewardship Council (FSC) could be useful tools in developing indicators for assessing the sustainability of forest management practices within managed protected areas.
- g) The methodology assumes that managers and administrators have adequate knowledge to provide sufficient and reliable data.
- h) The methodology can be applied to any number of protected areas, including a single site. However, when applied to very small numbers (e.g. six or less), the assessment process will focus more on collecting and interpreting more detailed, qualitative data, and less on comparative analyses between protected areas. When applied to large numbers of protected areas (e.g. 50 or more), it may be useful to divide the findings by region, management objective, size, or other defining characteristic.
- i) This methodology may be most useful when comparing protected areas that have similar broad objectives. If the objectives vary dramatically, the assessment team may want to divide the protected areas into groups according to similar objectives, and then analyse the data separately for each category.

C.2.3 Workshop Objective

The objective of the RAPPAM workshop was to receive inputs from key stakeholders concerning present and proposed protected areas in St. Kitts and Nevis by responding to the following categories of questions:

- Context
 - Threats and Pressures to Protected Areas;
 - Vulnerability of Protected Areas;
 - Socio-Economic Context;
- Planning
 - Planning Objectives;
 - Management Decision-Making;
 - Legal Security;
- Management Processes; and
- Inputs
 - Finances;
 - Infrastructure;
 - Staffing; and
 - Communication and Information.

C.2.4 Agenda

The agenda for this RAPPAM Workshop was as follows:

THURSDAY JUNE 25, 2009

| | |
|----------------|--|
| 08:30-09:00 AM | REGISTRATION |
| 09:00 AM | INTRODUCTIONS |
| 09:15 AM | WHY THIS FORMAT AND WHAT IS RAPPAM? |
| 09:30 AM | PRESENTATION OF SITES FOR CONSIDERATION |
| 10:00 AM | LESSONS LEARNT FROM BELIZE EXPERIENCE |
| 11:30 AM | BREAK |
| 12:00 | SEPARATION INTO GROUPS / ADMINISTRATION OF QUESTIONNAIRE |
| 1:00 PM | LUNCH |
| 01:30-04:00 PM | CONTINUATION OF GROUP WORK |

FRIDAY JUNE 26, 2009 (ST. KITTS AND NEVIS SESSIONS)

| | |
|----------|--|
| 09:00 AM | ADMINISTRATION OF QUESTIONNAIRE (CONT'D) |
| 09:30 AM | ADMINISTRATION OF QUESTIONNAIRE (CONT'D) |
| 10:00 AM | BREAK |
| 10:30 AM | CONTINUE ADMINISTRATION OF QUESTIONNAIRE |
| 1:00 PM | LUNCH |
| 01:30 PM | CONTINUE ADMINISTRATION OF QUESTIONNAIRE |
| 03:30 PM | WAY FORWARD / WRAP UP |

A list of attendees to the RAPPAM workshop is included as Annex 1 to this appendix.

C.2.5 Presentations

Ecoengineering began the workshop with a short presentation on the purpose for the workshop, why a workshop was the method chosen to receive the required information and then presented the sites being considered for inclusion in the System of Protected Areas for both St. Kitts and Nevis. A copy of the presentation is included in Annex 2 to this Appendix.

C.2.6 Amendments to RAPPAM Questionnaire

The RAPPAM questionnaire as developed by the World Wildlife Fund in 2009 was amended for use in this workshop. This was due to the fact that the RAPPAM methodology was being used to analyze mainly proposed protected areas which would not have the structure of an existing protected area. Specifically the following questions were removed from the questionnaire for the reasons stated below:

- 1 – Background Information (not applicable)
- 3 – Biological Importance (from Gap Assessment)
- 8 – Site Design and Planning (more applicable to existing PAs)
- 15 – Research, Monitoring and Evaluation (premature)
- 16 – Outputs (premature)

C.2.7 Completion of Questionnaire

The decision had been taken to split the workshop into two on the second day (one in St. Kitts and one in Nevis) in an attempt to encourage greater participation. In this regard, Dr. Sammy (Workshop Facilitator) went to Nevis on June 26, 2009 to facilitate the Nevis participants through the questionnaire. Ms. Reyes and Mr. Meerman undertook the same exercise in St. Kitts.

For a number of reasons, the main one being the extent of the discussion generated on a number of questions, the questionnaire was not completed by the Nevis Participants. However, the St. Kitts participants were able to complete their questionnaire.

C.2.8 Follow-up

Firstly, all the responses received on both days of the workshop were inputted into a document which was circulated to all participants. The objective of this exercise was to allow participants to express their personal opinions which may have been masked by the opinions of the majority. Secondly, as noted in Section C.2.6 above, the Nevis participants were unable to finish their questionnaire in the time allotted on Day two of the workshop. In order to complete the questionnaire and then be able to compare with the results for St. Kitts, the questions that were not completed by the Nevis participants were circulated to those that attended the second day of the workshop in Nevis.

C.2.9 Scoring of Results

In order to be able to analyse and compare the data gathered from the questionnaire, a system of scoring had to be established. Pressures and threats were scored by their extent, impact and permanence as follows:

C-1: SCORING SYSTEM FOR PRESSURES AND THREATS

| TREND | SCORE | EXTENT | SCORE | IMPACT | SCORE | PERMANENCE | SCORE |
|--------------------|-------|------------|-------|----------|-------|-------------|-------|
| Increased Sharply | 2 | Throughout | 4 | Severe | 4 | Permanent | 4 |
| Increased Slightly | 1 | Widespread | 3 | High | 3 | Long Term | 3 |
| Remained Constant | 0 | Scattered | 2 | Moderate | 2 | Medium Term | 2 |
| Decreased Slightly | -1 | Localised | 1 | Mild | 1 | Short Term | 1 |
| Decreased Sharply | -2 | | | | | | |

Scoring for the other questions was as follows:

C-2: SCORING FOR OTHER QUESTIONS

| | | | | |
|----------|-------------------------|------------------------|---------------------|----------|
| Category | High Importance | Moderate importance | Minor Importance | |
| | High Dependence | Moderate Dependence | Minor Dependence | |
| | Important Opportunities | Moderate Opportunities | Minor Opportunities | |
| | High Significance | Moderate Significance | Minor Significance | |
| | High Value | Moderate Value | Minor Value | |
| | Strongly Agree | Somewhat Agree | Agree A Little | Disagree |
| Score | 5 | 3 | 1 | 0 |

C.3 Results of RAPPAM Analysis

C.3.1 Context

Context is evaluated by pressures and threats, vulnerability, socio-economic and biological importance. As noted in Section C.2.4 above, biological importance was assessed separately as part of the Ecological Gap Assessment.

C.3.1.1 Pressures and Threats

According to RAPPAM, pressures are forces, activities, or events that have already had an impact on the integrity of the protected area and threats are potential or impending pressures in which an impact is likely to occur or continue to occur in the future.

Table C-3 shows the pressures and threats identified for individual PAs by workshop participants:

C-3: PRESSURES AND THREATS BY INDIVIDUAL PROTECTED AREA OR PROTECTED AREA CATEGORY

| PROTECTED AREA | PRESSURE |
|-----------------------------|---|
| Brimstone Hill | Inappropriate Development |
| | Rockfalls / Erosion |
| | Potential for Geothermal Energy Power |
| | Livestock Grazing |
| Central Forest Reserve | Erosion |
| | Overcrowding |
| | Extraction of Ornamental and Medicinal Plants |
| | Illegal Farming |
| | Hurricanes / Natural Disasters |
| | Damage to Water Resources |
| | Invasive Species |
| Nevis Peak and Camps River | Charcoal production |
| | Built Development |
| | Over Harvesting of Plants |
| | Clearing for Farming |
| | Livestock Grazing |
| | Water Contamination from Farming |
| | Water Contamination from Wild Monkeys |
| | Water Contamination from Domestic Sources |
| | Dumping of Industrial and Construction Wastes |
| | Landslides |
| | Basseterre Aquifer |
| Stray Animals | |
| Illegal Dumping | |
| Agrochemical Contamination | |
| Industrial Waste | |
| Contaminated Airport Runoff | |
| Illegal Topsoil Removal | |
| Fires | |
| Toilet Waste / Sewage | |
| MPAs | Overfishing |
| | Climate Change |
| | Closure of Sugar Industry |
| | Tourism Development |
| | Theft of Cultural Resources |
| | Sand Mining |
| | Anchor Damage to Reefs and Seagrass beds |
| | Geothermal Pipeline / Cable Construction |
| | Invasive Species |
| | Solid Wastes including International Garbage |

| PROTECTED AREA | PRESSURE |
|------------------------|--|
| Turtle Nesting Beaches | Inappropriate Development |
| | Human Activity (Driving, Horseback Riding, Littering, sand Mining) |
| | Poaching |
| | Light Pollution |
| | Predation |
| Salt Ponds | Development |
| | Garbage |
| | Destruction of Mangrove and Other Plant Life |
| Fresh Water Ponds | Non-native Species |
| | Filling-in |
| | Marinas |
| | Contamination from Residential or Commercial Development |
| | Illegal Dumping |
| | Overfishing |
| | Harvesting of Mangroves |
| The Ghauts | Illegal Dumping |
| | Sand Mining |
| | Unauthorised Development |
| | Agriculture / Grazing |
| Historic Sites | Inappropriate Development |
| | Squatting |
| | Exceeding Carrying Capacity |
| | Property Theft and Destruction |
| | Littering |
| Historic Charlestown | Inappropriate development |
| | Destructive Earthquake / Volcanic Eruption |
| | Hurricanes / Storm Surges and Flooding |
| | Deterioration of Structures |
| | Vandalism |
| | Abandonment of Buildings |
| | Fires |
| | Traffic Congestion and Inadequate Parking |

All the figures referenced in this report are contained in Annex 3 to this appendix. Figures C-1 to C-11 shows the degree of pressure for each protected area or class of protected area. Two protected areas have already been established for St Kitts: Brimstone Hill and Central Forest Reserve (CFR). At Brimstone Hill, the pressure of inappropriate development was thought to have increased sharply in the past 5 years although its extent is described as scattered. At CFR, there were several pressures that were found to have increased slightly over the past 5 years including erosion, overcrowding, extraction of ornamental plants and illegal farming. At Basseterre Aquifer, illegal dumping was also found to have increased sharply over the past 5 years.

The following threats were found to be common over at least three protected areas:

- Development
- Rockfalls / Erosion
- Livestock Grazing
- Contamination of Water Resources
- Invasive Species
- Illegal Dumping
- Theft of cultural Resources

Figure C-12 shows the average score of these pressures across at least three protected areas. Of the pressures represented in this list, two stand out as being of some concern: theft of cultural resources and development (which may be either inappropriate or unauthorized).

Figures C-13 to C-23 show the scores of the threats attributed to individual protected areas. Many of the pressures identified to the individual protected area were not considered to be threats for the next 5 years (which was the period of comparison). For example, at Brimstone Hill, the only pressure which is considered to have a high probability to continue and become a threat is inappropriate development with an extent that is expected to increase from scattered to widespread. Similarly, the only pressure at the CFR that is considered to continue with a high probability as a threat within the next 5 years is erosion with an expected widespread impact. All the other pressures are expected to remain constant and therefore not be considered as increasing threats within the next 5 years. The results for Basseterre Aquifer are an interesting change as well. None of the pressures identified are expected to increase sufficiently to become significant threats within the next 5 years.

The comparison of pressures and threats are shown in Figures C-24 to C-34. At a few of the PAs the degree of threats exceeded the degree of the existing pressure. This occurred at Brimstone Hill, Nevis Peak, Turtle Nesting Beaches, Salt Ponds and the Ghauts. Figure C-35 shows the comparison of pressures and threats across at least 3 protected areas with common pressures and threats. As discussed above, development which is an existing pressure at a number of protected areas is expected to continue as a threat for the next five years. Rockfalls are expected to decrease in both occurrence and severity over the next 5 years. Illegal dumping is expected to continue while theft of cultural resources is expected to only a minor threat in the next 5 years.

In the main this suggests that some measures are being taken at some sites to address pressures and that it is expected that these measures will be successful.

C.3.1.2 Vulnerabilities

Vulnerability is defined as external conditions that make it harder to manage effectively, such as easy access to illegal activities, low law enforcement throughout the region, high market value for PA resources, etc. This part of the RAPPAM questionnaire seeks to find answers to the following questions:

- Are illegal activities difficult to monitor in any of the PAs?
- Is the market value of PA resources high at any of the PAs?
- Is the area of any of these PAs easily accessible for illegal activities?
- Is the manager of any of these PAs under pressure to over exploit resources?
- General vulnerability.

Table C-4 provides a summary of the illegal activities that are considered difficult to monitor across all PAs.

TABLE C-4: SUMMARY OF DIFFICULT TO MONITOR ILLEGAL ACTIVITIES

| PROTECTED AREA | ILLEGAL ACTIVITY |
|------------------------|--|
| Central Forest Reserve | Ganja Cultivation |
| | Littering |
| | Plant Extraction |
| | Agriculture |
| | Unsanctioned Development |
| | Trail Cutting |
| Basseterre Aquifer | Illegal Dumping |
| | Arson |
| MPAs | Harvesting / Juvenile / Undersized Species |
| | Poaching Turtles and Nests |
| | Poaching Booby Eggs and pelicans |
| | Extraction of Marine Artefacts |
| The Ghauts | Sand Mining |
| | Illegal Dumping |
| | Unauthorised Construction |
| | Livestock Grazing / Farming |
| Historic Sites | Removal of Facing Stones |
| | Theft of Artefacts and Equipment |
| Historic Charlestown | Graffiti |
| Turtle Nesting Beaches | Poaching Eggs and Animals |
| | Sand Mining |
| | Unsanctioned Development |
| | Removal of Vegetation |
| Ponds | Removal of Mangrove |
| | Illegal Dumping |

| PROTECTED AREA | ILLEGAL ACTIVITY |
|-----------------|-----------------------|
| Pinney's Estate | Sand Mining |
| | Removal of Vegetation |
| | Extraction |

Figure C-36 shows the illegal activities common over all protected areas and their degree of significance. Two activities which stand out from this comparison (because of the degree to which they occur) are littering / illegal dumping and poaching whether of turtles, birds or nests of either. In terms of occurrence across all PAs Table C-5 below shows the illegal activities and the number of PAs where they occur.

**TABLE C-5: DIFFICULT TO MONITOR ILLEGAL ACTIVITIES AND OCCURRENCE
ACROSS ALL PROTECTED AREAS**

| ILLEGAL ACTIVITY | OCCURRENCE |
|--|------------|
| Ganja Cultivation | 1 |
| Littering / Illegal Dumping | 4 |
| Plant Extraction / Removal of Vegetation / Removal of Mangrove | 4 |
| Agriculture / Livestock Grazing / Farming | 2 |
| Unsanctioned / Unauthorized Development | 2 |
| Trail Cutting | 1 |
| Arson | 1 |
| Harvesting Juvenile / Undersized Species | 1 |
| Poaching Turtles, Nests, Booby Eggs, Pelicans | 3 |
| Extraction / Theft of Marine Artefacts | 2 |
| Sand Mining | 3 |
| Removal / Extraction of Facing Stones | 2 |
| Graffiti | 1 |

The table above shows that littering and plant extraction are difficult to monitor illegal activities that occur at four protected areas or classes of protected areas. Trail cutting, arson, harvesting of juvenile / undersized species and graffiti are only considered threats at individual protected areas.

Related to the previous question is the question of how accessible these PAs are for illegal activity. Figure C-37 shows that the marine protected areas (by virtue of their lack of physical boundaries) are considered particularly vulnerable to illegal activities due to easy accessibility.

Figure C-38 provides a comparison of the various protected areas and the value of their resources. From the figure, the turtle nesting beaches were found to have the highest number of resources with high market value followed by the historic sites. Resources with a high market value at turtle nesting beaches were turtle meat, eggs and shells while at historic sites facing stones and artefacts were considered to have a high market value.

Valuable resources were identified at a number of protected areas. These resources were also felt to be in high demand which therefore increases the vulnerability of the protected area. In the instance of Basseterre Valley, the resource in high demand is the reason for the declaration of the site as a potential protected area. It will therefore be a challenge to manage the resource given the high demand for it. In conjunction with this is the pressure that managers face or undergo to exploit resources. Of all the protected areas considered, Brimstone Hill was identified as a protected area where managers were under pressure to exploit resources such as increasing visitation or modifying structures for vehicular access.

The participants were also asked to make determinations of general vulnerability of the protected areas by responding to statements such as:

- Law enforcement is low;
- Bribery and corruption are common;
- Cultural practices, beliefs and traditional uses conflict with objectives of PAs;
- Recruitment and retention of employees is difficult; and
- Recruitment and retention of managers is difficult.

The evaluation was done on an island basis for St. Kitts versus Nevis. Generally, there was agreement that law enforcement on both islands was low. The draft of the new National Conservation and Environmental Management Act, 2009 proposes significant increases in the fines for certain infringements. However, an increase in fines without proper enforcement will still not be a deterrent to illegal activity. There was some reluctance to comment on the levels of bribery and corruption with St. Kitts participants indicating that they did not know and Nevis participants agreeing a little. Nevis participants somewhat agreed that cultural practices / traditional uses did conflict with objectives of the PA (see Figure C-39).

Curiously there seemed to be little difficulty with recruitment and retention of employees or managers on Nevis. However, St. Kitts participants did agree that it was difficult to recruit and retain managers for their sites.

C.3.1.3 Biological and Socio-Economic Importance

As noted above in Section C.2.6, biological importance was removed from the RAPPAM questionnaire since this data was being sourced elsewhere. In terms of socio-economic importance, the questions were as follows:

- Are any of these PAs an important source of employment for local communities?
- Do local communities depend upon resources in any of these PAs for their subsistence?

- Do any of these PAs provide community development opportunities through sustainable resource use?
- Do any of these PAs have religious or spiritual significance?
- Do any of these PAs have unusual features of aesthetic importance?
- Do any of these PAs contain plant species of high social, cultural or economic importance?
- Do any of these PAs contain animal species of high social, cultural or economic importance?
- Do any of these PAs have a high recreational value?
- Do any of these PAs contribute significant ecosystem services and benefits?
- Do any of these PAs have a high educational and/or scientific value?

These questions were assessed on an individual PA basis as well as on an island basis. There was a clear difference between islands with respect to the protected areas being an important source of local employment. The sites at Nevis were considered to be a more important source than the St. Kitts sites. One feature of the St. Kitts sites was the seasonal nature of the use of the site. For example, there is a defined season for turtle watching, while the Black Rocks site is on a tourism tour and as such local employment is dependent on the highs and lows of the tourist season.

Nevis PAs were considered a more important source of subsistence than their counterpart St. Kitts sites (see Figures C-40A & 40B). Again, in St. Kitts since the resource is mainly employment or sale of craft items etc. this dependence is tied into the seasonality of the site. Community development opportunities were similar for the St. Kitts and Nevis sites.

There were only two sites (or types of sites) for both St. Kitts and Nevis that were considered to have some significant religious / spiritual significance. For example, a number of the historic sites on Nevis are churches which would have obvious spiritual significance. Similarly, the Petroglyphs at Road Town, St. Kitts have both cultural and spiritual significance due to their history.

The participants considered St. Kitts sites to have more unusual features of aesthetic importance than Nevis sites while the Nevis sites were found to have plant and animal species of significant social, cultural and economic importance (see Figures C-41A & 41B). The plant and animals species identified were more of economic importance with a few exceptions. There is some collection of medicinal plants from the forested protected areas on both St. Kitts and Nevis. This opinion ties in with the fact that Nevis participants also felt that cultural practices and traditional beliefs also conflicted with PA objectives. This has implications for the vulnerability of the sites.

Another important indicator of the potential for a threat to the PA is whether the sites have a high recreational value. Again, the majority of sites on Nevis were considered to have a high recreational value over the sites identified for St. Kitts. Similar sites on both islands were considered to have a high recreational value such as the forested PAs and the turtle nesting beaches.

There are a number of protected areas that are considered to contribute significant ecosystem services and benefits on both islands. Table C-6 provides information on some of these services and benefits.

TABLE C-6: ECOSYSTEM SERVICES AND BENEFITS

| ISLAND | PROTECTED AREA | ECOSYSTEM SERVICES / BENEFITS |
|---------------------|---------------------------|-------------------------------|
| St. Kitts | Marine Protected Areas | Marine Resources |
| | Central Forest Reserve | Water Catchment |
| | | Biological Diversity |
| | Keys Turtle Nesting Beach | Nesting Sites |
| | Basseterre Aquifer | Water |
| | Salt Ponds | Bird Stopover Sites |
| | | Surge Protection |
| The Ghauts | Waterways | |
| | Drainage | |
| Nevis | Nevis Peak | Water Source |
| | | Carbon Sequestration |
| | Bath Bogs | Sediment Filter |
| | | Hurricane Buffer |
| | Nelson Spring | Sediment Filter |
| | | Hurricane Buffer |
| | Pinney's Pond | Sediment Filter |
| | | Hurricane Buffer |
| | Parris pond | Sediment Filter |
| | | Hurricane Buffer |
| Camps River Wetland | Sediment Filter | |
| | Hurricane Buffer | |
| New River Estate | Water Source | |

The majority of protected areas considered for both islands were felt to have a high education / scientific value. On St. Kitts the only exception were the Ghauts which are considered to have only a minor educational / scientific value.

C.3.1.4 Summary of Questions on Context

The following trends were noted from the questions asked to determine the context:

- The greatest number of threats and pressures were identified for the Marine protected areas and the Ghauts.
- Development (either unauthorised or illegal) was one pressure that was also considered to continue to be a threat within the next 5 years.
- Theft of cultural resources was identified as a significant pressure that affected all the historical sites. However, it was expected that this pressure would not continue to become a significant threat in the next 5 years. It is unclear why this was so.
- Illegal dumping is also of concern since the pressure while not as significant as development, is also expected to continue as a threat in the next 5 years.
- There is a clear acknowledgement that illegal activities are a problem at all or the majority of protected areas.
- While the most illegal activities identified were in the Central Forest Reserve, the ones considered the most significant such as illegal dumping and poaching do not occur there.
- Some of the illegal activities identified were also identified as pressures.
- The most accessible and therefore the most vulnerable were the marine protected areas.
- The class of protected areas with the most valuable resources were the turtle nesting beaches.
- Nevis sites were found to have more socio-economic importance than the St. Kitts sites and therefore they are more vulnerable.

C.3.2 Planning

Information on planning was assessed under the following headings:

- Planning Objectives; and
- Legal Security.

C.3.2.1 Planning Objectives

This section seeks to discuss the responses to the following questions:

- PA Objectives provide for the protection and maintenance of biodiversity
- Local communities support the overall objectives of the PA
- Management policies and plans are consistent with the PA objectives
- Specific biodiversity-related and cultural heritage-related objectives are clearly stated in the Management Plan
- PA employees and administrators understand the PA objectives and policies

For these series of questions, PAs which had a clear management structure were evaluated including:

- Brimstone Hill
- Bath Hotel
- Historic Charlestown
- Central Forest Reserve
- Nevis Peak

In a couple of instances, the participants were able to rate the response to specific questions to the country as a whole.

With respect to protection and maintenance of biodiversity and cultural heritage, both St. Kitts and Nevis scored the same (see Figure C-42). This was due to the fact that the two established sites: Brimstone Hill and Central Forest Reserve were both designated with specific objectives related to either biodiversity protection and/or cultural heritage.

One of the main objectives of the CFR as stated in the management plan is:

“The Central Forest Reserve National Park will conserve biodiversity, including ecosystem functions, and scenic resources, so that the park remains an intact resource for the sustainable use and enjoyment of future generations of the people of St. Kitts and Nevis”.

The Brimstone Hill Fortress National Park is referred to in the draft NCEMA Act, 2009:

“...in recognition of its national and international significance as an outstanding cultural and historical resource...”

There was only one instance (Bath Hotel) where the protected area was not considered to have been established for the protection and maintenance of biodiversity and cultural heritage. This directly contradicts the wording of the new draft NCEMA Act 2009 which refers to the Bath Hotel as:

“...an outstanding natural and cultural heritage site...”

Both St. Kitts and Nevis showed similar responses to the question on support of local communities and with the exception of Bath Hotel all the other protected areas considered were felt to have management policies and plans that were consistent with PA objectives (see Figures C-43 and C-44).

Again, Bath Hotel, which is presently used to house Government offices, is the only site which was considered to have management plans or policies which did not state biodiversity and cultural objectives. Similarly, Bath Hotel employees and administrators were thought to not understand protected area objectives.

C.3.2.2 Legal Security

Legal security will be discussed under the following headings:

- The PA has long-term legally binding protection.
- There are no unsettled disputes regarding land tenure or use rights.
- Boundary demarcation is adequate to meet the PA objectives.
- Staff and financial resources are adequate to conduct critical law enforcement activities.
- Conflicts with the local community are resolved fairly and effectively.

As before this series of questions was asked for existing PAs as well as classes of PAs. In some instances, it was also easy to compare the two islands together because of the similar classes of PAs.

For the most part, the views expressed with respect to legally binding protection were similar for both St. Kitts and Nevis (see Figure C-45). The only exception was the Ghauts where the St. Kitts Ghauts were felt to have more long term legally binding protection than the Nevis Ghauts. All Ghauts of both St. Kitts and Nevis are designated as “Areas of Special Concern” under the original National Conservation and Environmental Protection Act and in the newly drafted National Conservation and Environmental Management Act of 2009. It is therefore curious that respondents in Nevis rated the legal protection of their Ghauts so poorly.

The Nevis sites were found to be facing more challenges with respect to unsettled disputes regarding land tenure or use rights than St. Kitts (see Figure C-46). In Nevis many of the proposed sites were on private land where there were proposals for conflicting development that could threaten the status of the site and therefore its availability to be included into a Protected Areas Systems Plan. For example, Pinney’s Estate and Camps Wetland and Beach Area are the subject of villa developments, Sea

Haven is being earmarked for a beach resort and marine and there is already an unknown development being constructed within the boundaries for Nevis Peak. There was only one site on Nevis that was felt to have clear land tenure for its purpose and that was the Bath Hotel and nearby stream. The rest of Bath Estate is not as well defined.

Directly related to the issue of tenure is that of boundary demarcation being adequate to meet PA objectives. Once again, the St. Kitts sites were considered to be more adequately demarcated (see Figure C-47). Sites which have already been established or are connected with specific infrastructure or buildings are more likely to be properly demarcated while those sites being considered for biodiversity reasons are obviously not well demarcated.

Table C-7 below provides the proposed protected areas for which objectives for establishment have been provided.

TABLE C-7: GOALS AND OBJECTIVES OF PROPOSED PAS

| PROTECTED AREA | GOALS / OBJECTIVES |
|--|--|
| Central Forest Reserve | <p>The Central Forest Reserve National Park will conserve biodiversity, including ecosystem functions, and scenic resources, so that the park remains an intact resource for the sustainable use and enjoyment of future generations of the people of St. Kitts and Nevis.</p> <p>The Central Forest Reserve National Park will support the sustainable development of St. Kitts and Nevis through the creation of economic opportunities that are compatible with conservation and managed to remain within sustainable levels.</p> |
| Nevis Peak national Park and Camps River Watershed | To protect the biological diversity of Nevis and conserve habitats where consumption is encouraged to promote traditional activities. |
| Basseterre Aquifer National Park | Demonstrate proper management and protection of critical aquifer. |
| Brimstone Hill Fortress National Park | Committed to continuous programme of archival and archaeological investigations to better interpret, document and present the diverse history of the Caribbean for the edification of its people. |
| Bath Bogs, Camps River, Indian Castle Protected Area | Conservation and enhancement of the natural environment should take precedence over development. |

The trend changed when respondents were asked about the staffing and financial resources being adequate to conduct critical law enforcement activities. The Nevis Sites fared better than the St. Kitts sites (see Figure C-48). This of course is expected since the majority of the sites have not yet been designated and therefore there has been no allocation of staff or financial resources.

Both islands have had some conflicts with nearby local communities with respect to activities either on the proposed protected areas or which may have some impact on the protected areas. However, Nevis seems to have had more effective and fair resolution of such conflicts (see Figures C-49).

C.3.2.3 Summary of Planning

The following trends were noted for the questions asked to determine the level of planning associated with the PAs (see Figure C-50):

- Law enforcement was considered to be low on both islands. This coupled with the number of illegal activities identified emphasizes the vulnerability of a number of these sites.
- Although law enforcement is low, there is some hope for the future since there seems to be long term legal protection for the majority of the proposed PAs and this is consistent for both St. Kitts and Nevis.
- Boundary demarcation is better for Nevis than for St. Kitts, however, the question of enforcement of these boundaries is still to be addressed.
- The responses to questions on planning objectives were quite consistent. There seems to be some local support for PA objectives which seem to be clearly stated in existing management plans.

C.3.3 Inputs

The questions on the RAPPAM questionnaire that relate to inputs include:

- Staffing,
- Communication,
- Infrastructure, and
- Finances.

C.3.3.1 Staffing

The following questions were asked to assess the levels of staffing afforded to existing and potential protected areas:

- Level of staffing;
- Adequate skills to conduct critical management activities;
- Training and development opportunities;
- Periodic review of staff performance; and
- Employment conditions.

Generally, staffing levels are considered to be more adequate for the St. Kitts sites than the Nevis sites, even though staff skills are felt to be more adequate in Nevis. Training and development opportunities are considered more appropriate to needs of the staff in St. Kitts. There seems to be little review of staff performance for both islands and staff employment conditions are considered better for Nevis than St. Kitts.

C.3.3.2 Communication

The following questions were asked to assess the existing communication for protected areas:

- There are adequate means of communication between field and office staff.
- Existing ecological and socio-economic data are adequate for management planning.
- There are adequate means of collecting new data.
- There are adequate systems for processing and analyzing data.
- There is effective communication with local communities.

Communication between field and office staff was stronger for the Nevis sites than for the St. Kitts sites. This was all done through cellular telephone and in one case by radio. Nevis respondents were more confident that the existing ecological and socio-economic data available was adequate for management planning than their St. Kitts counterparts (see Figure C-51A & 51B). However, there were two sites in St. Kitts (Keys Turtle Nesting Beach and Basseterre Aquifer) where the confidence in available data was strong. Keys Turtle Nesting Beach is a well organized site where there has been recent funding for research into the target species the leatherback turtle. In addition, the monitoring network set up for monitoring turtles have collected data at this beach since 2003. The Basseterre Aquifer is the subject of a series of reports under the Integrating Watershed and Coastal Areas Management (IWCAM) Project and there is therefore recent data compiled on this site.

Nevis respondents were confident that there was adequate means of collecting new data but they were not so confident in the systems available for analysing and processing this data (see Figures C-52A & 52B and C-53A & 53B). This is an obvious area of weakness since the data is of little use unless it is processed and analysed. Both islands seem deficient in communication between local communities and the protected areas, although there was a slightly more favourable picture painted with the Nevis sites (see Figures C-54A & 54B).

C.3.3.3 Infrastructure

The following questions were asked to assess the adequacy of infrastructure used for protected areas:

- Transportation infrastructure is adequate to perform critical management activities.
- Field equipment is adequate to perform critical management activities.
- Staff facilities are adequate to perform critical management activities.
- Maintenance and care of equipment is adequate to ensure long-term use.
- Visitor facilities are appropriate to the level of visitor use.

In most cases transportation infrastructure was considered adequate to perform critical management activities on both islands. Visit to some of the sites did reveal that the majority of sites were fairly well accessed off public roads and where off-road access was necessary, the available trails and footpaths were (for the most part) easy to navigate.

There was a wide range of views with respect to the adequacy of field equipment on St. Kitts. For the most part, Nevis respondents were somewhat comfortable that the available field equipment was adequate to perform critical management functions. No one disagreed with the statement that staff facilities were adequate to perform critical management activities and there was little difference in the responses between the two islands.

St. Kitts respondents somewhat agreed that maintenance and care of equipment was adequate to ensure long-term use. While no one disagreed with the statement for the Nevis sites, responses varied between somewhat agree and agree a little.

The majority of the St. Kitts sites had no visitor facilities and therefore no score was awarded to these sites. Of the ones that did have facilities only Brimstone Hill was considered to have adequate and appropriate facilities for visitors. In Nevis, the majority of sites were considered to have facilities that were somewhat appropriate for visitor use.

C.3.3.4 Finances

The following questions were asked to assess the adequacy of financing for protected areas:

- Funding in the past 5 years has been adequate to conduct critical management activities.
- Funding in the next 5 years will be adequate to conduct critical management activities.
- Financial management practices enable efficient and effective PA management.
- The allocation of expenditures is appropriate to PA priorities and objectives.
- The long term financial outlook for the PA is stable.

Generally, these series of questions received the poorest results in terms of scores. This was to be expected given the fact that many of the PAs are still being considered and have not been established. Only Brimstone Hill was adjudged to have had adequate funding in the past 5 years (see Figure C-55). Everyone wanted to be conservative in predicting funding for the next 5 years especially in light of the current financial climate and therefore even the established Brimstone Hill only somewhat agreed that the finding in the next 5 years would be adequate. Some of the newly established or those PAs that are the subject of grant funding also expected funding in the next 5 years to be adequate (see Figure C-56). Financial management practices were found to be somewhat efficient and effective in both St. Kitts and Nevis.

There was a wide variation in the responses to whether allocation of expenditures was appropriate to PA priorities and objectives in Nevis with the exception of the Sea haven Turtle Nesting Beach. For St. Kitts, respondents were fairly confident that allocation of expenditures was appropriate with the exception of the Ghauts (see Figure C-57). This can be due to the continued pressure for use of the sand and aggregate within the Ghaut for the construction sector. Long term financial outlook was considered more favourable for Nevis than for St. Kitts except at turtle nesting sites and the Ghauts (see Figure C-58).

C.3.3.5 Summary of Inputs

The following trends were noted for the questions asked to determine the nature of inputs into the PAs (see Figure C-59):

- The lowest scores were in response to the financial status of the PAs.
- St. Kitts, for example had lower expectations related to funding in the next 5 years than Nevis.

- Infrastructure was thought to be adequate for the stated objectives. This response was found to be equal between St. Kitts and Nevis except with respect to visitor facilities where Nevis sites were found to be more visitor friendly than St. Kitts sites.
- Communication between field and office was also found to be very adequate for the stated objectives.
- The staff was considered to be more adequately skilled on Nevis than on St. Kitts. However, staff conditions were thought to need some improvement on both islands.

C.3.4 Processes

Processes within the PAs were assessed by asking questions on the following issues:

- Management Planning / Processes; and
- Decision-Making.

C.3.4.1 Management Processes

The following questions were asked to assess the adequacy of management processes existing for protected areas:

- There is a comprehensive, relatively recent written management plan.
- A detailed work plan identifies specific targets for achieving management objectives.
- There is a comprehensive inventory of cultural resources.
- There is a comprehensive inventory of natural resources.
- There is an analysis of, and strategy for addressing, threats and pressures.
- The results of research and monitoring are routinely incorporated into planning.

Most of the PAs in St. Kitts did not have a management plan or a workplan while the majority of the sites in Nevis did have some kind of management plan or detailed workplan (see Figures C-60A & 60B and C-61A & 61B). Both St. Kitts and Nevis respondents considered there to be a comprehensive inventory of cultural resources (see Figure C-62). This is expected given that both islands had an organization dedicated to cultural / historical / heritage resources. Nevis respondents were more confident that the inventory of natural resources for their sites was comprehensive. Respondents for both islands agreed that there was little analysis of and strategy for addressing threats and pressures. There was some confidence (for both islands) that the results of research and monitoring are routinely incorporated into planning.

C.3.4.2 Decision-Making

The following questions were asked to assess the adequacy of decision-making for protected areas:

- There is clear internal organization.
- Management decision-making is transparent.
- PA staff regularly collaborate with partners, local communities and other organizations.
- Local communities participate in decisions that affect them.
- There is effective communication between all levels of PA staff and administration.

Clear internal organization was a feature of more Nevis sites than St. Kitts (see Figure C-63). However, management decision-making was found to be more transparent in St. Kitts than Nevis (see Figure C-64). There was more collaboration with local communities, partners and other organizations for the Nevis sites than for the St. Kitts sites (see Figure C-65). There was very little collaboration between local communities and any management of protected areas. While this is expected for the PAs that have yet to be established, the established PAs also seem to not have any community participation. The level of communication between all levels of PA staff was more effective for the St. Kitts sites than for the Nevis sites (see Figure C-66).

C.3.4.3 Summary of Management Processes

The following trends were noted for the questions asked to determine the management processes (see Figure C-67):

- The inventory of cultural resources is clearly more than adequately addressed while the natural resources are not so well inventoried. This stems from the fact that for both islands, there is an organization dedicated to the conservation of these sites which due to their independence from Government receive funding and execute projects.
- There seems to be a lack of local participation in decisions about the protected area that may affect them. However, respondents agreed that decision-making is transparent.



ANNEX 1

LIST OF ATTENDEES

AGENCIES AT THE RAPPAM WORKSHOP

| NAME | ORGANIZATION |
|----------------------------|---|
| Day One | |
| G. Challenger Bird | St. Christopher Heritage Society |
| P. Benjamin | Department of Agriculture |
| S. LaPlace | Biology Department C.F.B. College |
| L. Armony | St. Christopher Heritage Society |
| R. Walters | Department of Physical Planning Natural Resources and Environment |
| R. Browne | Department of Physical Planning and Environment |
| A. J. Farier | Department of Physical Planning and Environment |
| A. Blanchette | Department of Physical Planning and Environment |
| J. Hughes | Department of Physical Planning and Environment |
| E. Pemberton | Department of Fisheries (Nevis) |
| E. Stevens | Water Services Department (St. Kitts) |
| J. Simmonds | Department of Fisheries (St. Kitts) |
| R. Hamilton | St. Kitts Tourism Authority |
| G. DeVries | Nevis Historical and Conservation Society |
| E. Haney | Nevis Historical and Conservation Society |
| E. Ible | Water services Department |
| E. Mattenet | Department of Physical Planning and Environment |
| K. Samuel | Kenneth Dive Center (SKT) |
| G. K. Sammy | Ecoengineering Caribbean Limited |
| D. Reyes | Ecoengineering Caribbean Limited |
| J. Meerman | Ecoengineering Caribbean Limited |
| R. Blyther | The Nature Conservancy |
| Day Two (St. Kitts) | |
| L. Armony | St. Christopher Heritage Society |
| G. Challenger Bird | St. Christopher Heritage Society |
| P. Benjamin | Department of Agriculture |
| D. Mottram | Heritage Society |
| A. J. Farier | Department of Physical Planning and Environment |
| J. Hughes | Department of Physical Planning and Environment |
| R. Browne | Department of Physical Planning and Environment |
| A. Blanchette | Department of Physical Planning and Environment |
| E. Haney | Nevis Historical and Conservation Society |
| E. Stevens | Water Services Department (St. Kitts) |
| E. Ible | Water services Department |
| E. Mattenet | Department of Physical Planning and Environment |
| D. Reyes | Ecoengineering Caribbean Limited |
| J. Meerman | Ecoengineering Caribbean Limited |
| R. Blyther | The Nature Conservancy |
| Day 2 (Nevis) | |
| R. Walters | Department of Physical Planning |
| C. Williams | Ministry of Tourism |
| L. Newton | Department of Physical Planning |
| A. Delpeche | Department of Physical Planning |
| E. Pemberton | Department of Fisheries |
| E. Evelyn | Department of Agriculture |
| K. Evelyn | Nevis C.I.C |
| G. de Vries | Nevis Historical and Conservation Society |
| G. K. Sammy | Ecoengineering Caribbean Limited |



ANNEX 2

RAPPAM PRESENTATION

RAPPAM FOR ST. KITTS & NEVIS

MODERATED BY ECOENGINEERING CARIBBEAN LTD.

- Ms. Debbie Reyes-
- Mr. Jan Meerman-
- Dr. George Sammy-

JUNE 25 & 26, 2009

RAPPAM FOR ST. KITTS & NEVIS: INTRODUCTION

THE PURPOSE OF THIS WORKSHOP IS TO RECEIVE INPUTS FROM KEY STAKEHOLDERS CONCERNING PRESENT AND PROPOSED PROTECTED AREAS IN ST. KITTS AND NEVIS. THE INFORMATION TO BE COLLECTED IS SET OUT IN:

THE RAPID ASSESSMENT AND PRIORIZATION OF PROTECTED AREA MANAGEMENT (RAPPAM) METHODOLOGY, PREPARED FOR THE WORLD WILDLIFE FUND IN 2003.

RAPPAM FOR ST. KITTS & NEVIS: INTRODUCTION

WHY THIS FORMAT?:

WWF highly recommends the use of a participatory workshop for data collection because such an approach is likely to generate more accurate and thorough data, allow greater stakeholder participation, and be more widely accepted by protected area managers.

Participatory workshops allow workshop participants to negotiate a common interpretation of each question, providing a more consistent and standardized approach to the Rapid Assessment Questionnaire system-wide.

RAPPAM FOR ST. KITTS & NEVIS: INTRODUCTION

THIS WORKSHOP WILL FOCUS ON THE FOLLOWING PRESENT OR PROPOSED PROTECTED AREAS IN ST. KITTS:

ST. KITTS

- BRIMSTONE HILL FORTRESS NATIONAL PARK
- CENTRAL FOREST RESERVE NATIONAL PARK (incl Interpretation Centre at Wingfield)
- BASSETERRE VALLEY AQUIFER NATIONAL PARK
- SOUTHEAST PENINSULA MARINE PARK (connectivity to Nags Head, Booby Island and Salt Ponds)
- SANDY POINT MARINE PROTECTED AREA
- HALF MOON BAY POND, FRIGATE BAY POND
- BLACK ROCKS
- THE GHAUTS
- PETROGLYPHS AT OLD ROAD TOWN AND STONE FORT
- BELMONT ESTATE AND MANSIONS ESTATE
- SPOONER'S GINNERY
- KEYS TURTLE NESTING BEACH

RAPPAM FOR ST. KITTS & NEVIS: INTRODUCTION

THIS WORKSHOP WILL FOCUS ON THE FOLLOWING
PRESENT OR PROPOSED PROTECTED AREAS IN NEVIS:

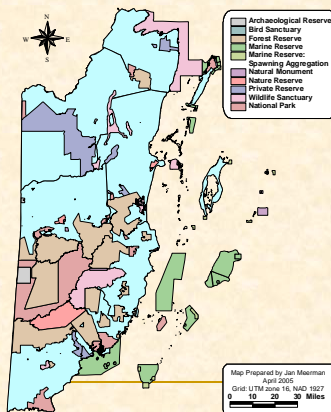
NEVIS

- NEVIS PEAK NATIONAL PARK (with Camps River Valley & Wetland & Marine Protected Area)
- HISTORIC CHARLESTOWN
- BATH HOTEL / BATH BOGS / GALLOWS BAY BOGS
- INDIAN CASTLE PROTECTED AREA (Amerindian Sites, Fort, Dock)
- NEW RIVER ESTATE (Frenchman's Cave, Spring, Amerindian Site, Estate Ruins)
- FORT ASHBY (Historical Site)
- NELSON SPRINGS
- JESSUP POND
- PINNEY'S ESTATE (Pinneys Pond and Parris Pond)
- SEA HAVEN (Turtle Nesting)
- THE GHAUTS

RAPPAM FOR ST. KITTS & NEVIS: INTRODUCTION

SOME LESSONS LEARNED WITH RAPPAM IN BELIZE.

BELIZE - NPAPSP Protected Area Analysis



There exist a total of 94 protected areas in Belize (including archaeological reserves and accepted private reserves). These are managed by 3 Statutory agencies and as much as 15 CBO/NGO's

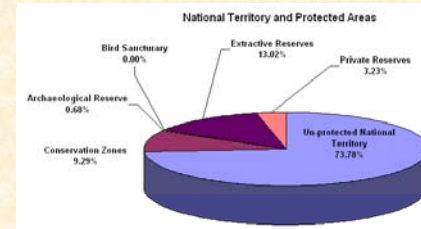
Several of these reserves, particularly in the Marine realm have gazetted management zonation. When these zones are taking into account the number of "management units" increases to 115.

Many of these protected areas are really areas for the management of extractive resources (Forest Reserves and Marine Reserves)

| | Acres | Hectares |
|--------------------------|------------|-----------|
| Land | 5,467,840 | 2,212,760 |
| Territorial Sea | 4,609,230 | 1,865,300 |
| Exclusive Economic Zone | 3,968,190 | 1,605,880 |
| Total National Territory | 14,045,260 | 5,683,940 |

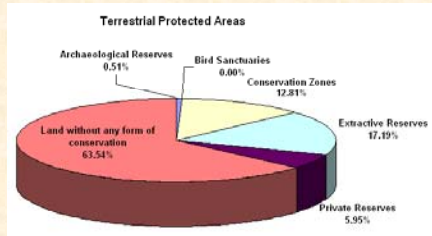
BELIZE - NPAPSP Protected Area Analysis

The amount of the national territory under some form of conservation management is 26 %.



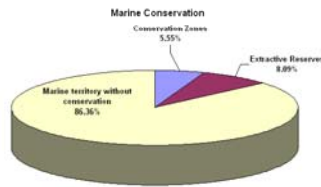
| | Acres | Hectares |
|--------------------------|------------|-----------|
| Land | 5,467,840 | 2,212,760 |
| Territorial Sea | 4,609,230 | 1,865,300 |
| Exclusive Economic Zone | 3,968,190 | 1,605,880 |
| Total National Territory | 14,045,260 | 5,683,940 |

BELIZE - NPAPSP Protected Area Analysis



For the terrestrial part the area under conservation is 36%. Within the terrestrial protected areas, the extractive reserves form the largest component.

The marine realm, compared with the terrestrial realm is largely un-protected. Only 14% is protected and the largest part of that again as extractive reserves.



RAPPAM FOR ST. KITTS & NEVIS: INTRODUCTION

| Framework | | |
|------------------------|---|---|
| Elements of Evaluation | Explanation | Criteria that are assessed under RAPPAM |
| Context | <i>Where are we now?</i> Assessment of importance, threats and policy environment | <ul style="list-style-type: none"> Threats Biological Importance Socio-Economic Importance Vulnerability PA policies Policy Environment |
| Planning | <i>Where do we want to be?</i> Assessment of protected area design and planning | <ul style="list-style-type: none"> Protected Area Objectives Legal Security Site Design and Planning Protected Area System Design |
| Inputs | <i>What do we need?</i> Assessment of resources needed to carry out management | <ul style="list-style-type: none"> Staff Communication and Information Infrastructure Finances |
| Processes | <i>How do we go about it?</i> Assessment of the way in which management is conducted | <ul style="list-style-type: none"> Management Planning Management Practices Research, Monitoring and Evaluation |

RAPPAM FOR ST. KITTS & NEVIS: INTRODUCTION

| Framework | | |
|------------------------|--|--|
| Elements of Evaluation | Explanation | Criteria that are assessed under RAPPAM |
| Results | <i>What are the outputs?</i> Assessment of the implementation of management programmes and actions; delivery of products and services | <ul style="list-style-type: none"> Threat Prevention Site Restoration Wildlife Management Community Outreach Visitor Management Infrastructure Outputs Planning Outputs Monitoring Training Research |
| Impacts | <i>What did we achieve?</i> Assessment of the outcomes and the extent to which they achieved objectives | <ul style="list-style-type: none"> Pressures <p>May need clarification – let's discuss: surely this is the outcomes resulting from the inputs, therefore where do pressures fit in apart from pressure reduction???</p> |

RAPPAM FOR ST. KITTS & NEVIS: THREATS TO PROTECTED AREAS

THE FIRST TOPIC IS THREATS TO PROTECTED AREAS. QUESTIONS RELATE TO THE TYPES OF THREATS FACED BY SPECIFIC PROTECTED AREAS AND GROUPS OF PROTECTED AREAS:

- Brimstone Hill Fortress National Park,
- Central Forest Reserve National Park,
- Nevis Peak National Park
(plus Camps River, Wetland & Marine Area),
- Basseterre Valley Aquifer National Park,
- Marine Protected Areas,
- Turtle Nesting Beaches
- Salt Ponds,
- Fresh Water Ponds,
- The Ghauts
- Historical Sites.

**RAPPAM FOR ST. KITTS & NEVIS:
THREATS TO PROTECTED AREAS**

FOR EACH THREAT, YOU WILL BE ASKED TO INDICATE:

➤Trend over last 5 years

| TREND | EXTENT | IMPACT | PERMANENCE |
|--------------------|---------------------|----------|---------------------------|
| Increased Sharply | Throughout >50% | Severe | Permanent > 100 years |
| Increased Slightly | Widespread 15% -50% | High | Long Term 20 to 100 years |
| Remained Constant | Scattered 5% to 15% | Moderate | Medium Term 5 to 20 years |
| Decreased Slightly | Localized <5% | Mild | Short Term < 5 years |
| Decreased Sharply | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
THREATS TO PROTECTED AREAS**

FOR EACH THREAT, YOU ALSO WILL BE ASKED TO INDICATE:

➤Expected over the next 5 years

| PROBABILITY | EXTENT | IMPACT | PERMANENCE |
|-------------|---------------------|----------|---------------------------|
| Very High | Throughout >50% | Severe | Permanent > 100 years |
| High | Widespread 15% -50% | High | Long Term 20 to 100 years |
| Medium | Scattered 5% to 15% | Moderate | Medium Term 5 to 20 years |
| Low | Localized <5% | Mild | Short Term < 5 years |
| Very Low | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
THREATS TO BRIMSTONE HILL**

| THREAT | TREND / PROBABILITY | EXTENT | IMPACT | PERMANENCE |
|--------|---------------------|--------|--------|------------|
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
THREATS TO CENTRAL FOREST RES**

| THREAT | TREND / PROBABILITY | EXTENT | IMPACT | PERMANENCE |
|--------|---------------------|--------|--------|------------|
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
THREATS TO NEVIS PEAK**

| THREAT | TREND / PROBABILITY | EXTENT | IMPACT | PERMA-NENCE |
|--------|---------------------|--------|--------|-------------|
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
THREATS TO BASSETERRE VALLEY**

| THREAT | TREND / PROBABILITY | EXTENT | IMPACT | PERMA-NENCE |
|--------|---------------------|--------|--------|-------------|
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
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| | PAST 5 YRS: | | | |
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| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
THREATS TO MARINE PAs**

| THREAT | TREND / PROBABILITY | EXTENT | IMPACT | PERMA-NENCE |
|--------|---------------------|--------|--------|-------------|
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
THREATS TO TURTLE NESTING BEACHES**

| THREAT | TREND / PROBABILITY | EXTENT | IMPACT | PERMA-NENCE |
|--------|---------------------|--------|--------|-------------|
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
THREATS TO SALT PONDS**

| THREAT | TREND / PROBABILITY | EXTENT | IMPACT | PERMA-NENCE |
|--------|---------------------|--------|--------|-------------|
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
THREATS TO FRESH WATER PONDS**

| THREAT | TREND / PROBABILITY | EXTENT | IMPACT | PERMA-NENCE |
|--------|---------------------|--------|--------|-------------|
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
THREATS TO THE GHAUTS**

| THREAT | TREND / PROBABILITY | EXTENT | IMPACT | PERMA-NENCE |
|--------|---------------------|--------|--------|-------------|
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
THREATS TO HISTORIC SITES**

| THREAT | TREND / PROBABILITY | EXTENT | IMPACT | PERMA-NENCE |
|--------|---------------------|--------|--------|-------------|
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |
| | PAST 5 YRS: | | | |
| | NEXT 5 YRS: | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
VULNERABILITY OF PAs**

THE SECOND TOPIC IS VULNERABILITY OF THE PROTECTED AREAS, AND EFFECTIVENESS OF ENFORCEMENT:

- Illegal Activities and Law Enforcement,
- Bribery and Corruption,
- Conflicting Cultural Practices,
- Market Value of PAs,
- Access for Illegal Activities,
- Demand for Valuable PA Resources,
- Pressure to Overexploit Valuable PA Resources,
- Recruitment and Retention of Employees.

**RAPPAM FOR ST. KITTS & NEVIS:
VULNERABILITY OF PAs**

Are Illegal Activities difficult to monitor in any of the PAs?

| PROTECTED AREA | ILLEGAL ACTIVITY | HIGH DIFFICULTY | MODERATE DIFFICULTY | MINOR DIFFICULTY |
|----------------|------------------|-----------------|---------------------|------------------|
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**RAPPAM FOR ST. KITTS & NEVIS:
VULNERABILITY OF PAs**

Is the market value of PA Resources high at any of these PAs?

| PROTECTED AREA | VERY HIGH VALUE | HIGH VALUE | SLIGHTLY HIGH VALUE |
|----------------|-----------------|------------|---------------------|
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**RAPPAM FOR ST. KITTS & NEVIS:
VULNERABILITY OF PAs**

Is the area of any of these PAs easily accessible for illegal activities?

| PROTECTED AREA | ILLEGAL ACTIVITY | HIGHLY ACCESSIBLE | MODERATELY ACCESSIBLE | SLIGHTLY ACCESSIBLE |
|----------------|------------------|-------------------|-----------------------|---------------------|
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**RAPPAM FOR ST. KITTS & NEVIS:
VULNERABILITY OF PAs**

Is there strong demand for vulnerable resources at any of these PAs?

| PROTECTED AREA | RESOURCE | HIGH DEMAND | MODERATE DEMAND | MINOR DEMAND |
|----------------|----------|-------------|-----------------|--------------|
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**RAPPAM FOR ST. KITTS & NEVIS:
VULNERABILITY OF PAs**

Is the Manager of any of these PAs under pressure to over-exploit resources?

| PROTECTED AREA | HIGH DEMAND | MODERATE DEMAND | MINOR DEMAND |
|----------------|-------------|-----------------|--------------|
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**RAPPAM FOR ST. KITTS & NEVIS:
VULNERABILITY OF PAs**

| STATEMENT | ISLAND | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|--|-----------|----------------|----------------|----------------|----------|
| Law enforcement is low | St. Kitts | | | | |
| | Nevis | | | | |
| Bribery and corruption are common | St. Kitts | | | | |
| | Nevis | | | | |
| Cultural practices, beliefs and traditional uses conflict with objectives of PAs | St. Kitts | | | | |
| | Nevis | | | | |
| Recruitment and retention of employees is difficult. | St. Kitts | | | | |
| | Nevis | | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
PLANNING OBJECTIVES**

THE THIRD TOPIC RELATES TO PLANNING OBJECTIVES:

- Protection and Maintenance of Biodiversity and Cultural Heritage,
- Community Support for Protective Areas,
- Clear Statement of Biodiversity and Cultural Heritage Objectives,
- Consistency of Policy / Plans and Objectives,
- Understanding of Objectives by Administrators and Employees.

RAPPAM FOR ST. KITTS & NEVIS: PLANNING OBJECTIVES

PA Objectives provide for the Protection and Maintenance of Biodiversity and Cultural Heritage.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|-------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| | | | | |
| St Kitts, General | | | | |
| Nevis, General | | | | |

RAPPAM FOR ST. KITTS & NEVIS: PLANNING OBJECTIVES

Local Communities support the overall Objectives of the PA.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|-------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| | | | | |
| St Kitts, General | | | | |
| Nevis, General | | | | |

RAPPAM FOR ST. KITTS & NEVIS: PLANNING OBJECTIVES

Management policies and plans are consistent with the PA objectives.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|-------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |

RAPPAM FOR ST. KITTS & NEVIS: PLANNING OBJECTIVES

Specific biodiversity-related and cultural heritage-related objectives are clearly stated in the management plan.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|-------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |

RAPPAM FOR ST. KITTS & NEVIS: PLANNING OBJECTIVES

PA employees and administrators understand the PA objectives and policies.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|-------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |

RAPPAM FOR ST. KITTS & NEVIS: MANAGEMENT DECISION-MAKING

THE FOURTH TOPIC RELATES TO MANAGEMENT PLANNING PROCESSES:

- Internal Organization,
- Transparency,
- Collaboration,
- Community Participation,
- Effective Communication.

RAPPAM FOR ST. KITTS & NEVIS: MANAGEMENT DECISION-MAKING

There is a clear internal organization.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| St. Kitts Heritage Sites | | | | |
| Nevis Heritage Sites | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Nesting | | | | |
| Sea Haven Turtle Nesting | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS: MANAGEMENT DECISION-MAKING

Management decision-making is transparent.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| St. Kitts Heritage Sites | | | | |
| Nevis Heritage Sites | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Nesting | | | | |
| Sea Haven Turtle Nesting | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
MANAGEMENT DECISION-MAKING**

PA staff regularly collaborate with partners, local communities, and other organizations.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| St. Kitts Heritage Sites | | | | |
| Nevis Heritage Sites | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Nesting | | | | |
| Sea Haven Turtle Nesting | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
MANAGEMENT DECISION-MAKING**

Local communities participate in decisions that affect them.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| St. Kitts Heritage Sites | | | | |
| Nevis Heritage Sites | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Nesting | | | | |
| Sea Haven Turtle Nesting | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
MANAGEMENT DECISION-MAKING**

There is effective communication between all levels of PA staff and administration.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| St. Kitts Heritage Sites | | | | |
| Nevis Heritage Sites | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Nesting | | | | |
| Sea Haven Turtle Nesting | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

**RAPPAM FOR ST. KITTS & NEVIS:
FINANCES**

THE FIFTH TOPIC RELATES TO FINANCES:

- Adequacy of Funding over the past 5 years,
- Adequacy of Funding over the next 5 years,
- Financial Management Practices,
- Appropriateness of Allocation of Expenditures,
- Long-term Financial Outlook.

RAPPAM FOR ST. KITTS & NEVIS:

FINANCES

Funding in the past 5 years has been adequate to conduct critical management activities.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Nesting | | | | |
| Sea Haven Turtle Nesting | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:

FINANCES

Funding in the next 5 years has been adequate to conduct critical management activities.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Nesting | | | | |
| Sea Haven Turtle Nesting | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:

FINANCES

Financial management practices enable efficient and effective PA management.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Nesting | | | | |
| Sea Haven Turtle Nesting | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:

FINANCES

The allocation of expenditures is appropriate to PA priorities and objectives.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Nesting | | | | |
| Sea Haven Turtle Nesting | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS: FINANCES

The long-term financial outlook for the PA is stable.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Nesting | | | | |
| Sea Haven Turtle Nesting | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS: LEGAL SECURITY

THE SIXTH TOPIC RELATES TO LEGAL PROTECTION OF PROTECTED AREAS:

- Conflict Resolution,
- Legally-binding Protection,
- Unsettled Land or Use Rights Disputes,
- Boundary Demarcation,
- Adequacy of Resources.

RAPPAM FOR ST. KITTS & NEVIS: LEGAL SECURITY

Conflicts with the local community are resolved fairly and effectively.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|-------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| The Ghauts | | | | |
| Turtle Nesting Sites | | | | |
| St Kitts, General | | | | |
| Nevis, General | | | | |

RAPPAM FOR ST. KITTS & NEVIS: LEGAL SECURITY

The PA has long-term legally binding protection.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|-------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Turtle Nesting Sites | | | | |
| The Ghauts | | | | |

RAPPAM FOR ST. KITTS & NEVIS: LEGAL SECURITY

There are no unsettled disputes regarding land tenure or use rights.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|-------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Turtle Nesting Sites | | | | |
| The Ghauts | | | | |

RAPPAM FOR ST. KITTS & NEVIS: LEGAL SECURITY

Boundary demarcation is adequate to meet the PA objectives.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|-------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Turtle Nesting Sites | | | | |
| The Ghauts | | | | |

RAPPAM FOR ST. KITTS & NEVIS: LEGAL SECURITY

Staff and financial resources are adequate to conduct critical law enforcement activities.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|-------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Turtle Nesting Sites | | | | |
| The Ghauts | | | | |

RAPPAM FOR ST. KITTS & NEVIS: SOCIO-ECONOMIC CONTEXT

THE SEVENTH TOPIC IS SOCIO-ECONOMIC CONTEXT OF THE PROTECTED AREAS. QUESTIONS SEEK TO IDENTIFY WHICH PROTECTED AREAS CONFORM TO SPECIFIC CRITERIA AND DEGREE OF CONFORMANCE:

- Employment for Local Communities,
- Subsistence for Local Communities,
- Community development through Sustainable Resource Use,
- Religious or Spiritual Significance / Aesthetics,
- Socially- or Economically-important Plants and Animals,
- Recreational Value,
- Ecosystem Services,
- Educational or Scientific Value.

**RAPPAM FOR ST. KITTS & NEVIS:
SOCIO-ECONOMIC CONTEXT**

Are any of these PAs an important source of employment for local communities?

| PROTECTED AREA | HIGH IMPORTANCE | MODERATE IMPORTANCE | MINOR IMPORTANCE |
|----------------|-----------------|---------------------|------------------|
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**RAPPAM FOR ST. KITTS & NEVIS:
SOCIO-ECONOMIC CONTEXT**

Do Local Communities depend upon resources in any of these PAs for their subsistence?

| PROTECTED AREA | RESOURCE | HIGH DEPENDANCE | MODERATE DEPENDANCE | MINOR DEPENDANCE |
|----------------|----------|-----------------|---------------------|------------------|
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**RAPPAM FOR ST. KITTS & NEVIS:
SOCIO-ECONOMIC CONTEXT**

Do any of these PAs provide community development opportunities through sustainable resource use?

| PROTECTED AREA | IMPORTANT OPPORTUNITIES | MODERATE OPPORTUNITIES | MINOR OPPORTUNITIES |
|----------------|-------------------------|------------------------|---------------------|
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**RAPPAM FOR ST. KITTS & NEVIS:
SOCIO-ECONOMIC CONTEXT**

Do any of these PAs have religious or spiritual significance?

| PROTECTED AREA | HIGH SIGNIFICANCE | MODERATE SIGNIFICANCE | MINOR SIGNIFICANCE |
|----------------|-------------------|-----------------------|--------------------|
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**RAPPAM FOR ST. KITTS & NEVIS:
SOCIO-ECONOMIC CONTEXT**

Do any of these PAs have unusual features of aesthetic importance?

| PROTECTED AREA | HIGH IMPORTANCE | MODERATE IMPORTANCE | MINOR IMPORTANCE |
|----------------|-----------------|---------------------|------------------|
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**RAPPAM FOR ST. KITTS & NEVIS:
SOCIO-ECONOMIC CONTEXT**

Do any of these PAs contain plant species of high social, cultural, or economic importance?

| PROTECTED AREA | SPECIES | HIGH IMPORTANCE | MODERATE IMPORTANCE | MINOR IMPORTANCE |
|----------------|---------|-----------------|---------------------|------------------|
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**RAPPAM FOR ST. KITTS & NEVIS:
SOCIO-ECONOMIC CONTEXT**

Do any of these PAs contain animal species of high social, cultural, or economic importance?

| PROTECTED AREA | SPECIES | HIGH IMPORTANCE | MODERATE IMPORTANCE | MINOR IMPORTANCE |
|----------------|---------|-----------------|---------------------|------------------|
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**RAPPAM FOR ST. KITTS & NEVIS:
SOCIO-ECONOMIC CONTEXT**

Do any of these PAs have a high recreational value?

| PROTECTED AREA | RECREATIONAL ACTIVITY | HIGH VALUE | MODERATE VALUE | MINOR VALUE |
|----------------|-----------------------|------------|----------------|-------------|
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RAPPAM FOR ST. KITTS & NEVIS:

MANAGEMENT PROCESSES

A detailed work plan identifies specific targets for achieving management objectives.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| St. Kitts Tourism Sites | | | | |
| Nevis Heritage Sites | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:

MANAGEMENT PROCESSES

| STATEMENT | ISLAND | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|--|-----------|----------------|----------------|----------------|----------|
| There is a Comprehensive Inventory of Natural and Cultural Resources | St. Kitts | | | | |
| | Nevis | | | | |
| There is an Analysis of, and Strategy for Addressing, Threats and Pressures | St. Kitts | | | | |
| | Nevis | | | | |
| The results of Research and Monitoring are routinely incorporated into Planning. | St. Kitts | | | | |
| | Nevis | | | | |

RAPPAM FOR ST. KITTS & NEVIS:

INFRASTRUCTURE

THE NINTH TOPIC RELATES TO INFRASTRUCTURE:

- Adequacy of Transportation Infrastructure,
- Adequacy of Field Equipment,
- Adequacy of Staff Facilities,
- Maintenance and Care of Equipment,
- Appropriateness of Visitor Facilities.

RAPPAM FOR ST. KITTS & NEVIS:

INFRASTRUCTURE

Transportation infrastructure is adequate to perform critical management activities.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:
INFRASTRUCTURE

Field equipment is adequate to perform critical management activities.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:
INFRASTRUCTURE

Staff facilities are adequate to perform critical management activities.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:
INFRASTRUCTURE

Maintenance and care of equipment is adequate to ensure long-term use.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:
INFRASTRUCTURE

Visitor facilities are appropriate to the level of visitor use.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS: STAFFING

THE TENTH TOPIC RELATES TO STAFFING OF PROTECTED AREAS:

- Level of Staffing,
- Adequate Skills to conduct Critical Management Activities,
- Training and Development Opportunities,
- Periodic Review of Staff Performance,
- Employment Conditions.

RAPPAM FOR ST. KITTS & NEVIS: STAFFING

The level of staffing is sufficient to effectively manage the area.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS: STAFFING

Staff members have adequate skills to conduct critical management activities.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS: STAFFING

Training and development opportunities are appropriate to the needs of the staff.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:

STAFFING

Staff performance and progress on targets are periodically reviewed.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:

STAFFING

Staff employment conditions are sufficient to retain high-quality staff.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:

COMMUNICATION & INFORMATION

THE ELEVENTH TOPIC RELATES TO COMMUNICATION AND INFORMATION:

- Adequate Communication between Field and Office,
- Adequacy of Ecological and Socio-Economic Data,
- Collection of New Data,
- Processing and Analyzing Data,
- Communication with Local Communities.

RAPPAM FOR ST. KITTS & NEVIS:

COMMUNICATION & INFORMATION

There are adequate means of communication between field and office staff.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:
COMMUNICATION & INFORMATION
 Existing ecological and socio-economic data
 are adequate for management planning.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:
COMMUNICATION & INFORMATION
 There are adequate means of collecting new data.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:
COMMUNICATION & INFORMATION
 There are adequate systems for
 processing and analyzing data

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:
COMMUNICATION & INFORMATION
 There is effective communication with local communities.

| PROTECTED AREA | STRONGLY AGREE | SOMEWHAT AGREE | AGREE A LITTLE | DISAGREE |
|----------------------------------|----------------|----------------|----------------|----------|
| Brimstone Hill Fortress | | | | |
| Bath Hotel | | | | |
| Historic Charlestown | | | | |
| Central Forest Reserve | | | | |
| Nevis Peak | | | | |
| Keys Turtle Monitoring | | | | |
| Sea Haven Turtle Monitoring | | | | |
| The Ghauts | | | | |
| Basseterre Aquifer Water Supply | | | | |
| Camps River Springs Water Supply | | | | |

RAPPAM FOR ST. KITTS & NEVIS:
THE WAY FORWARD

- FOLLOW-UP WITH THOSE WHO DID NOT ATTEND.
 - COMPLETION OF VISIT REPORT.
 - SUBMITTAL OF OUTLINE OF SYSTEM PLAN.
 - COMPLETION OF DRAFT SYSTEM PLAN.
 - COMPLETION OF FINAL SYSTEM PLAN.
-



ANNEX 3

FIGURES

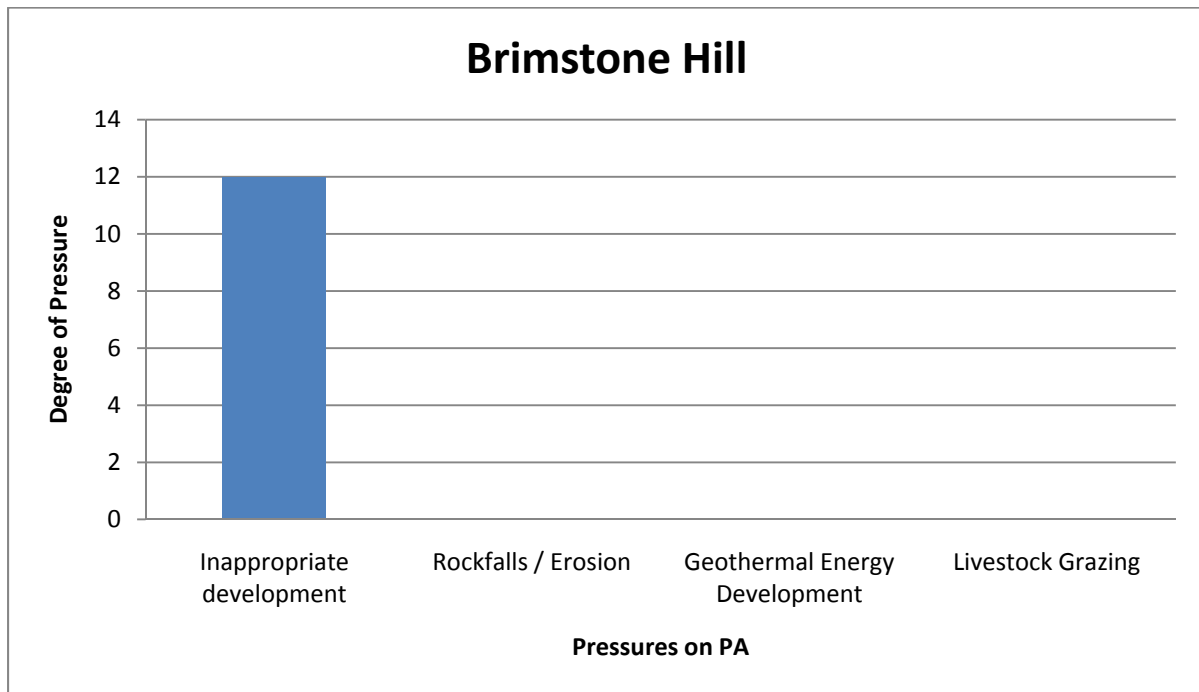


FIGURE C-1 DEGREE OF PRESSURE (BRIMSTONE HILL)

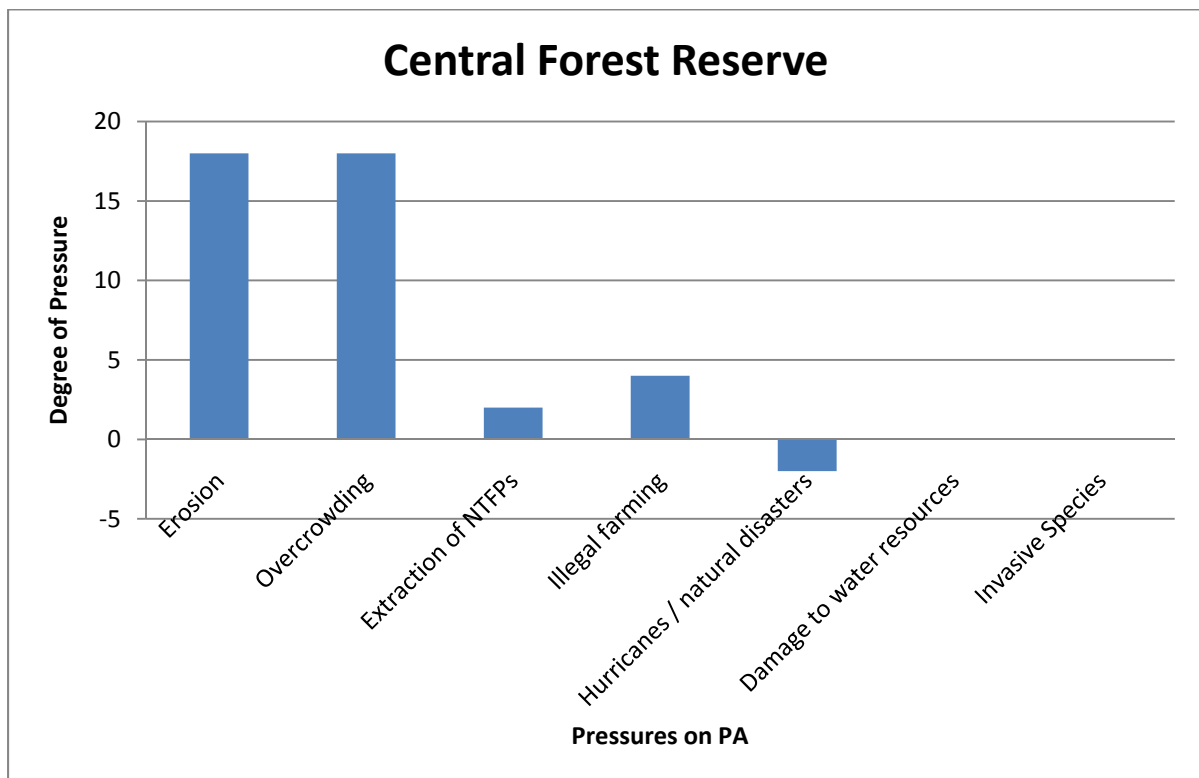


FIGURE C-2: DEGREE OF PRESSURE (CENTRAL FOREST RESERVE)

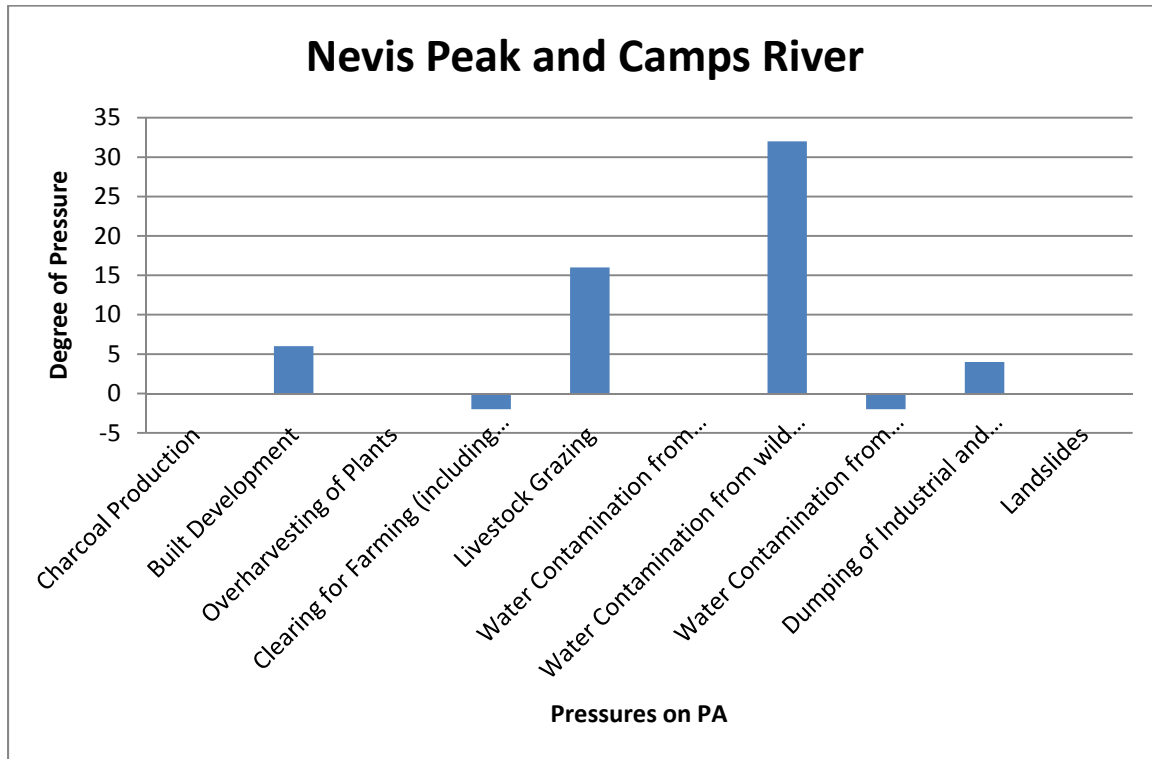


FIGURE C-3: DEGREE OF PRESSURE (NEVIS PEAK)

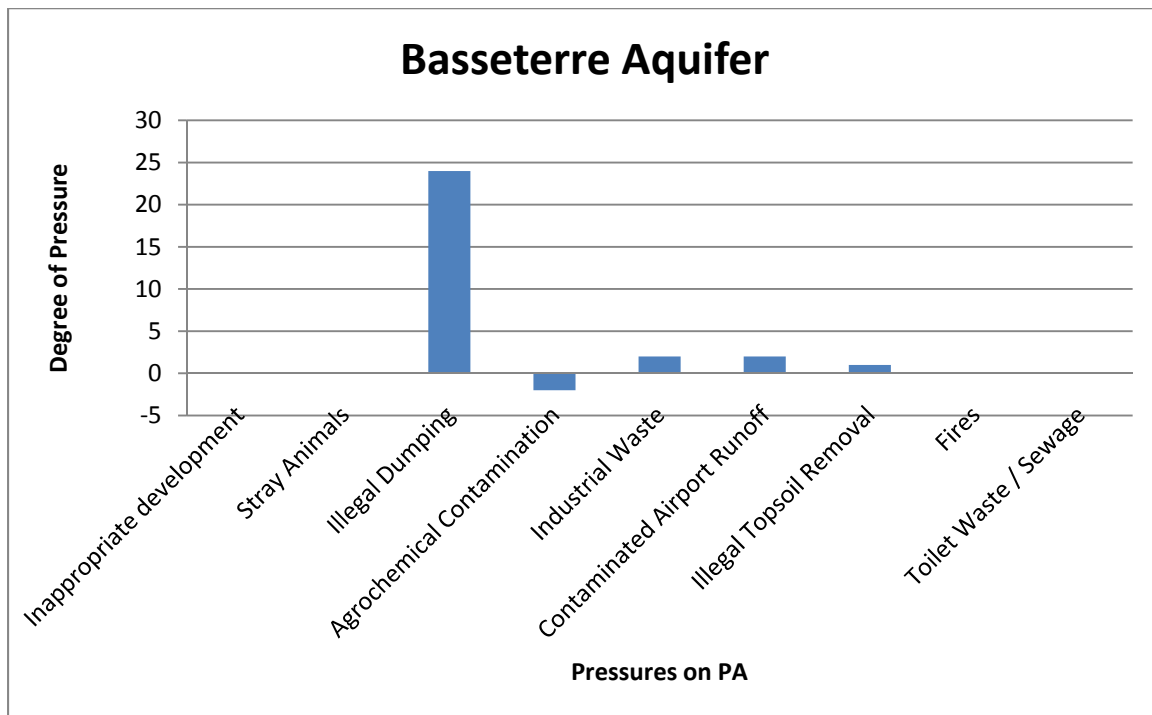


FIGURE C-4: DEGREE OF PRESSURE (BASSETERRE AQUIFER)

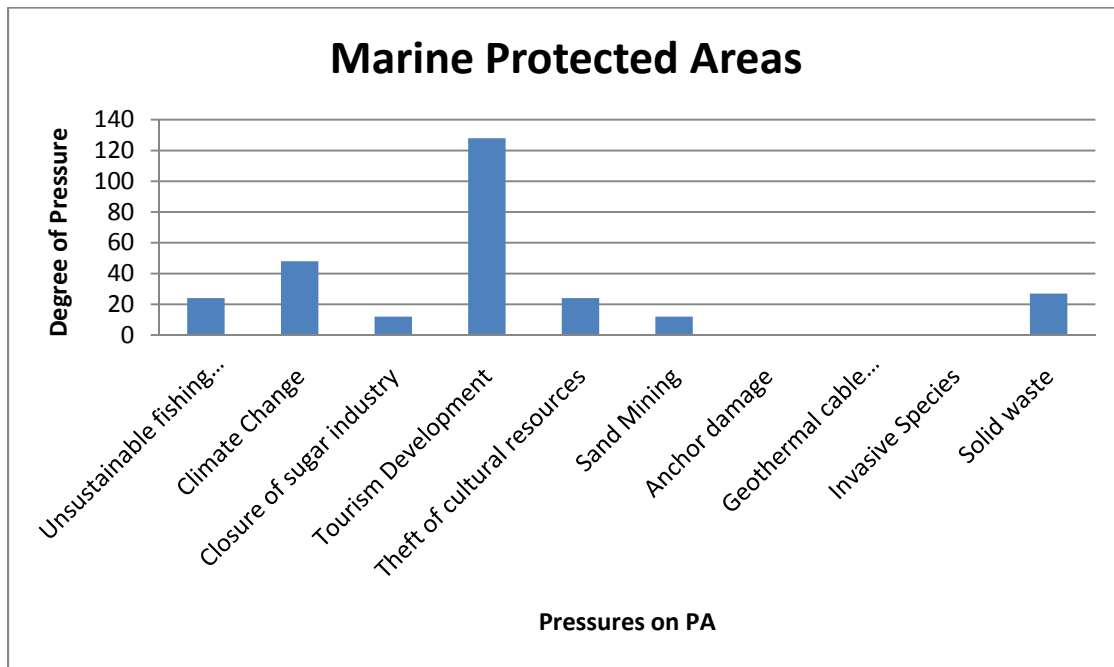


FIGURE C-5: DEGREE OF PRESSURE (MARINE PROTECTED AREAS)

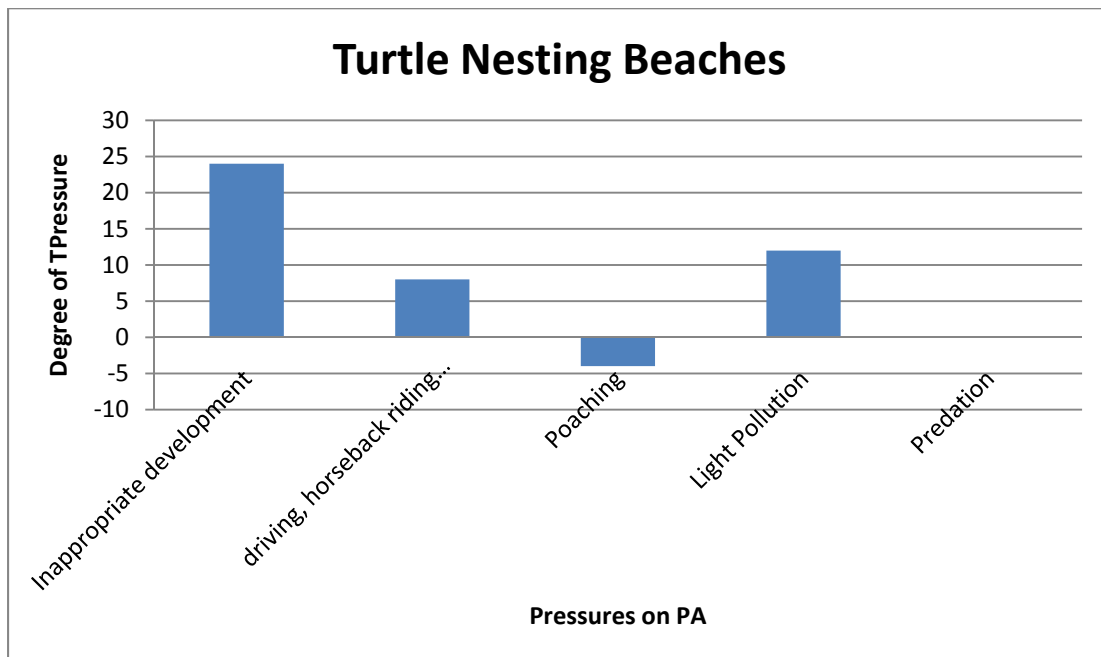


FIGURE C-6: DEGREE OF PRESSURE (TURTLE NESTING BEACHES)

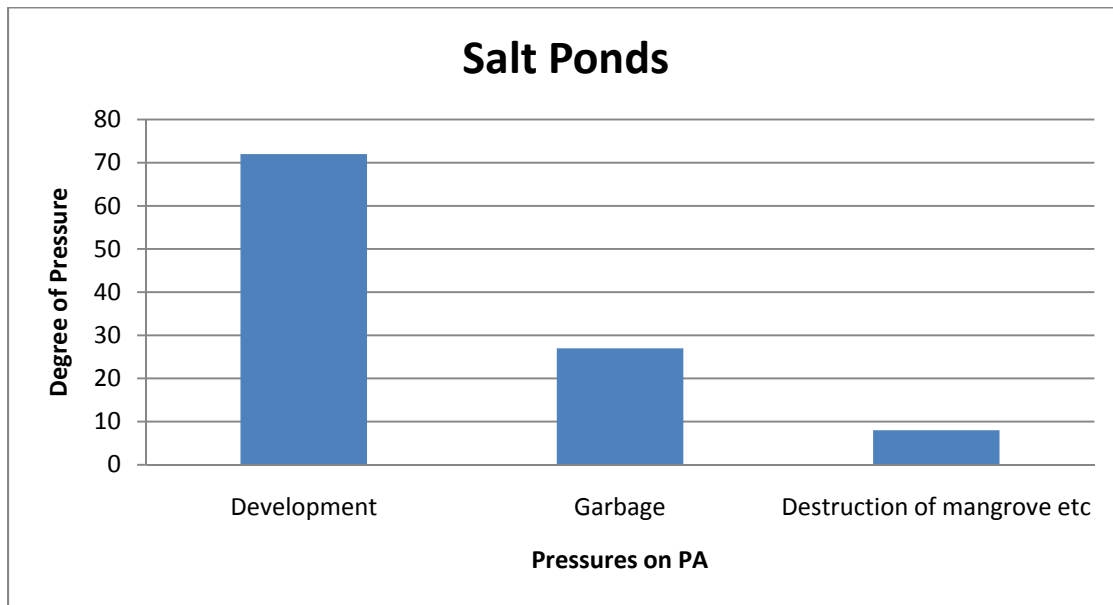


FIGURE C-7: DEGREE OF PRESSURE (SALT PONDS)

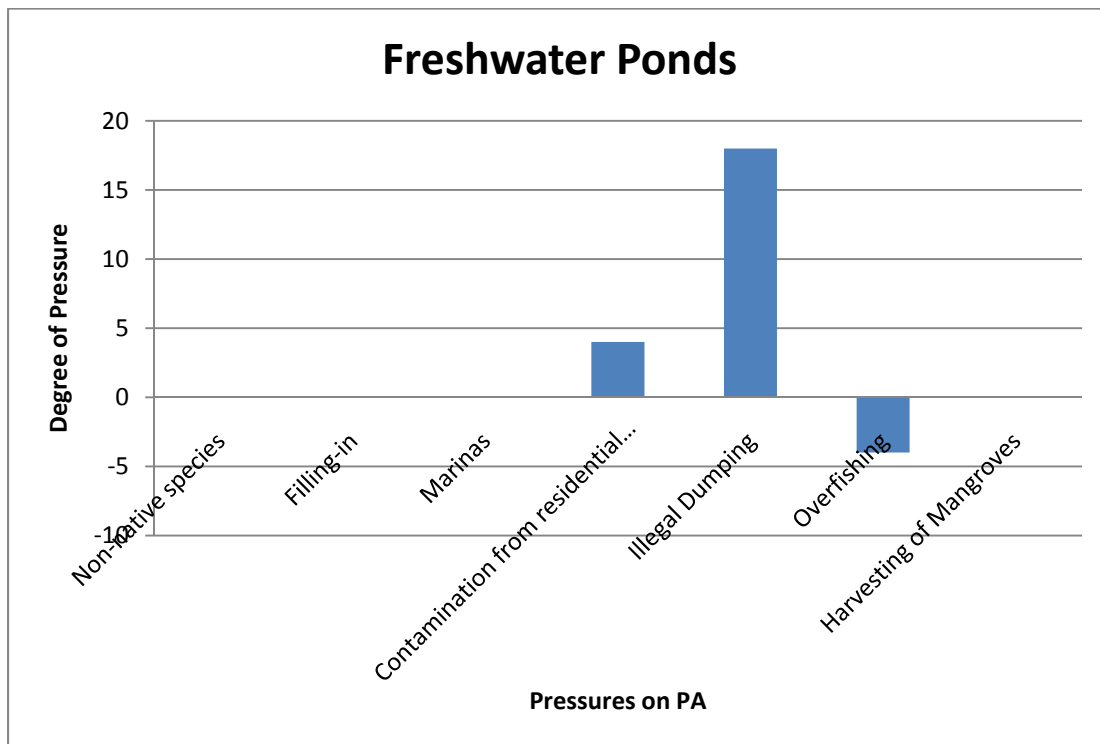


FIGURE C-8: DEGREE OF PRESSURE (FRESHWATER PONDS)

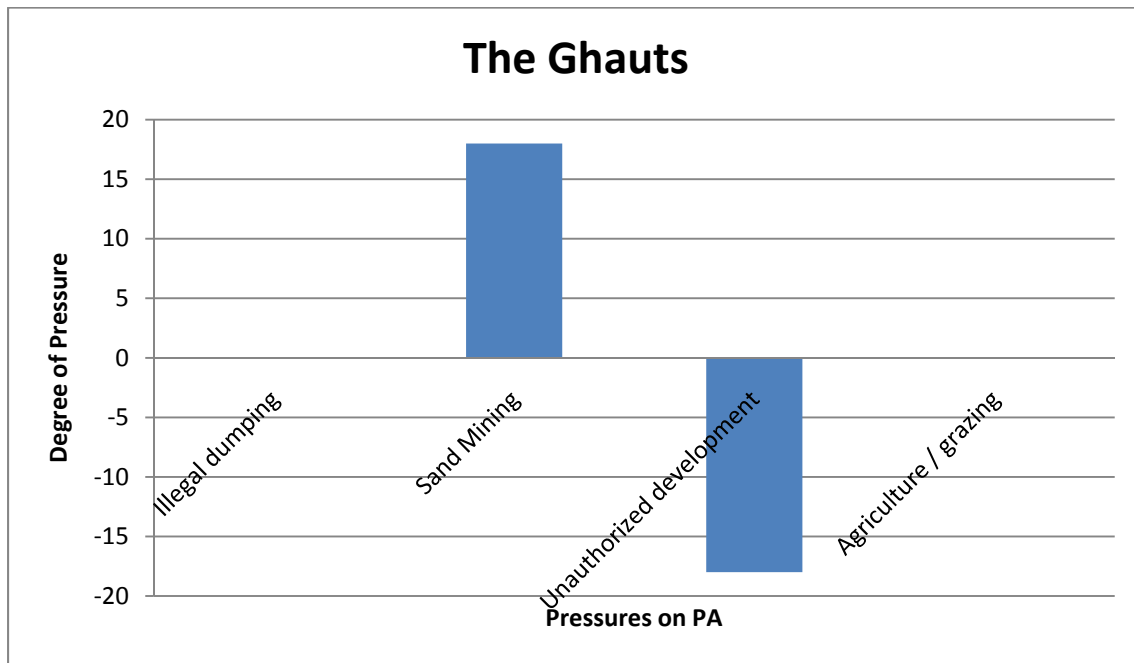


FIGURE C-9: DEGREE OF PRESSURE (THE GHAUTS)

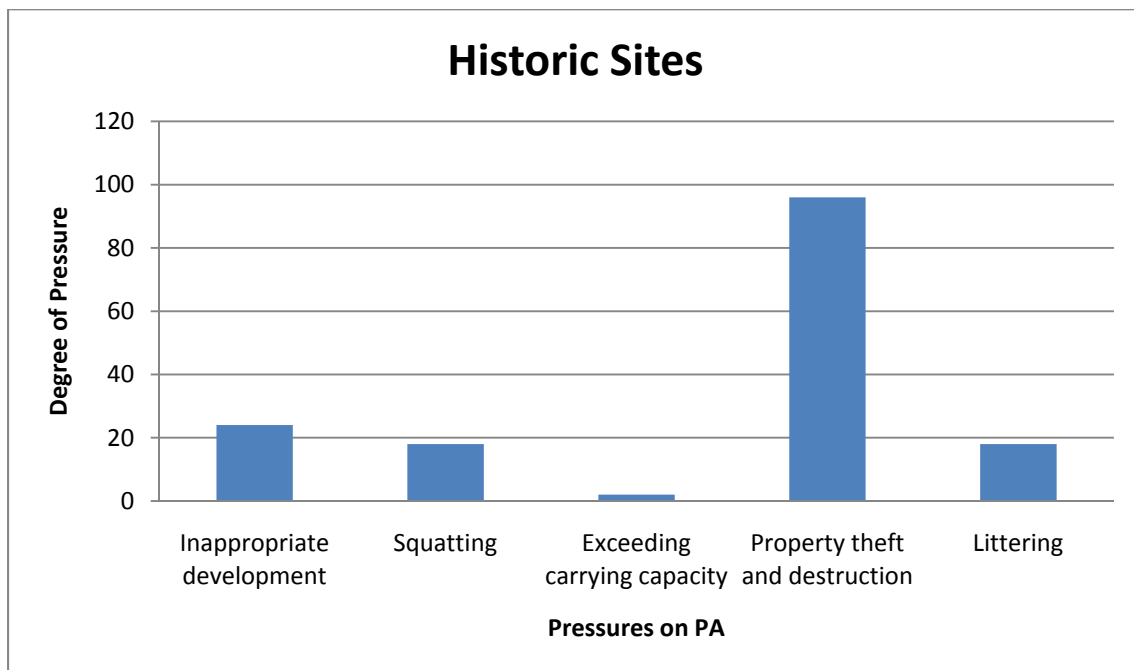


FIGURE C-10: DEGREE OF PRESSURE (HISTORIC SITES)

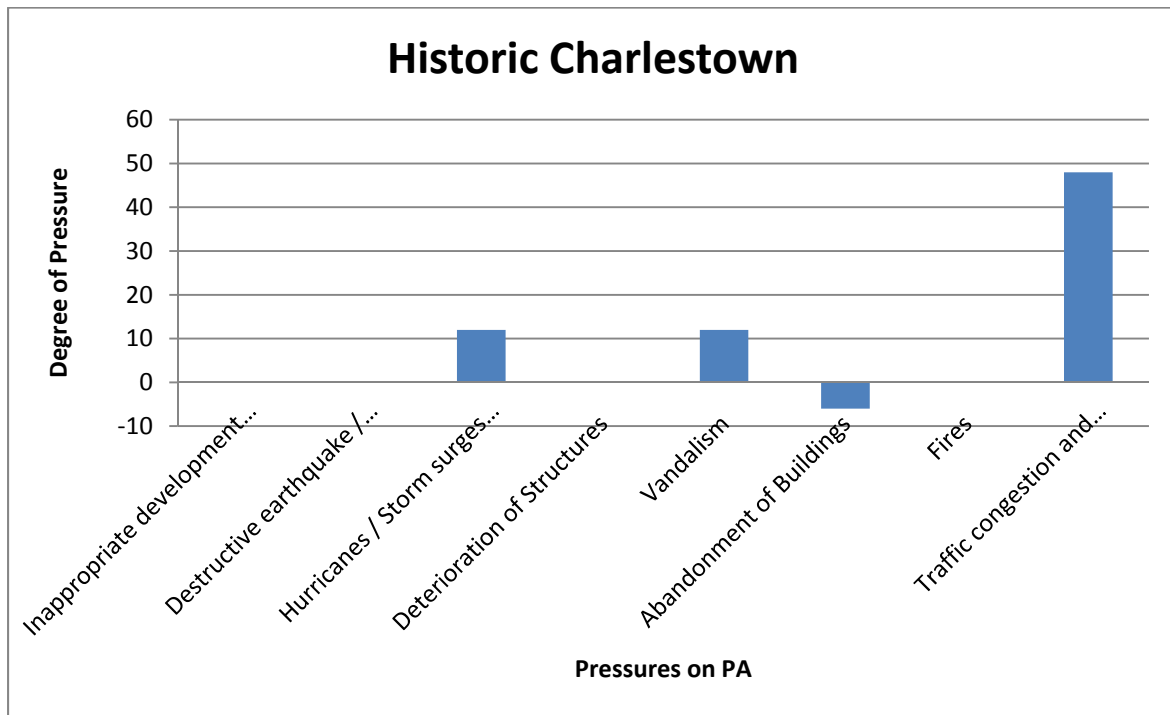


FIGURE C-11: DEGREE OF PRESSURE (HISTORIC CHARLESTOWN)

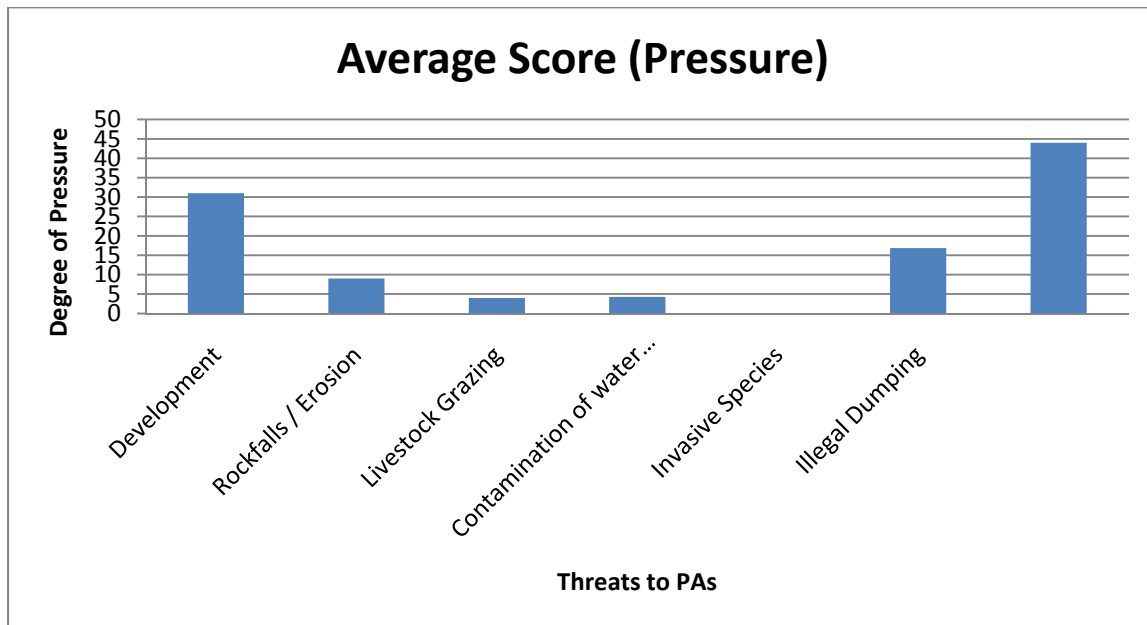


FIGURE C-12: AVERAGE SCORE OF PRESSURES ACROSS THREE PROTECTED AREAS

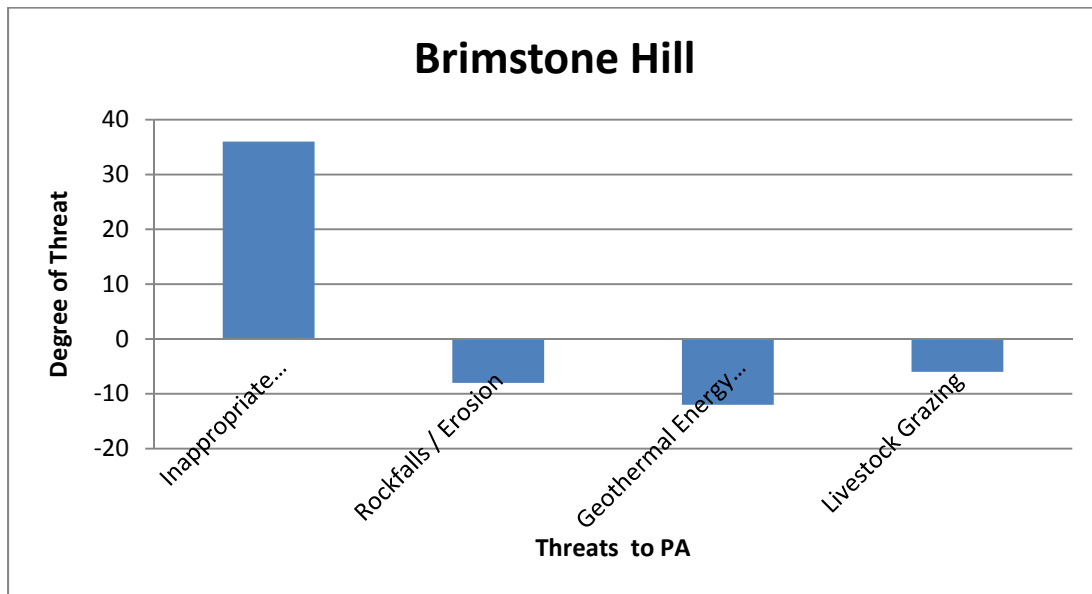


FIGURE C-13: DEGREE OF THREAT (BRIMSTONE HILL)

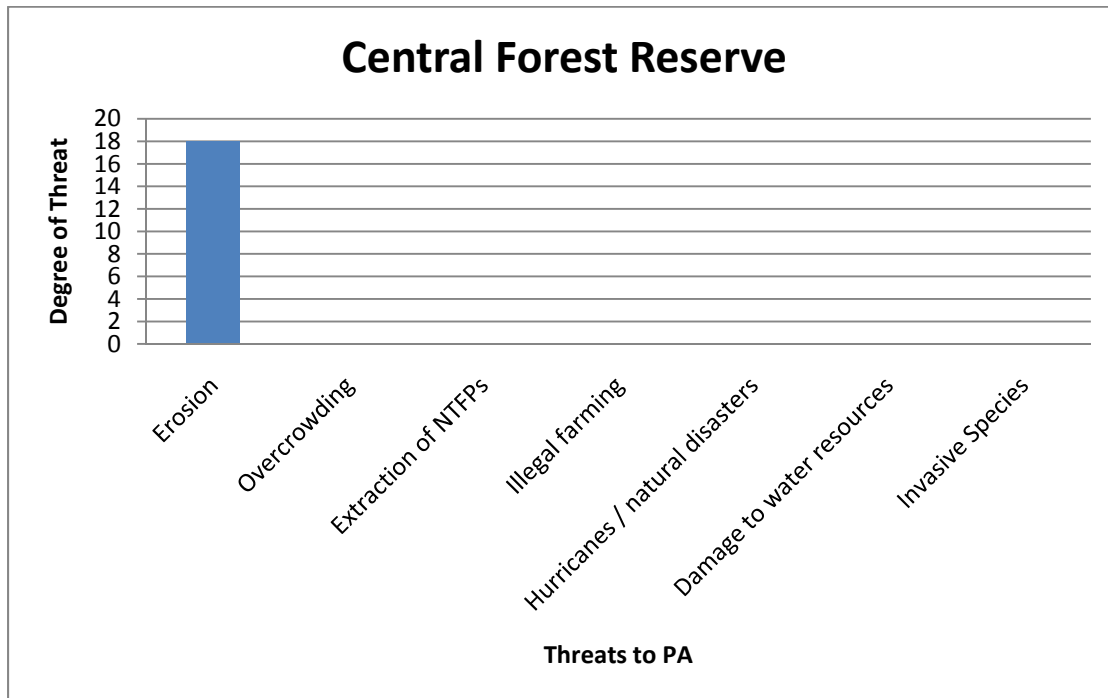


FIGURE C-14: DEGREE OF THREAT (CENTRAL FOREST RESERVE)

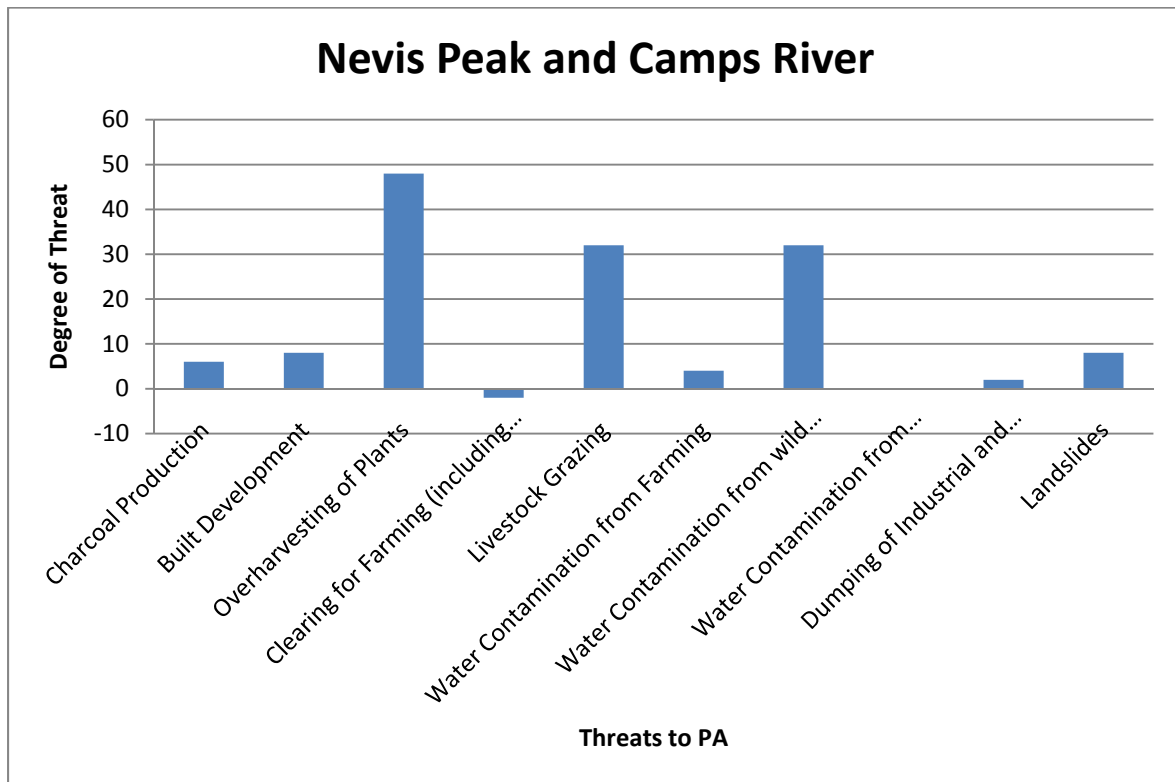


FIGURE C-15: DEGREE OF THREAT (NEVIS PEAK)

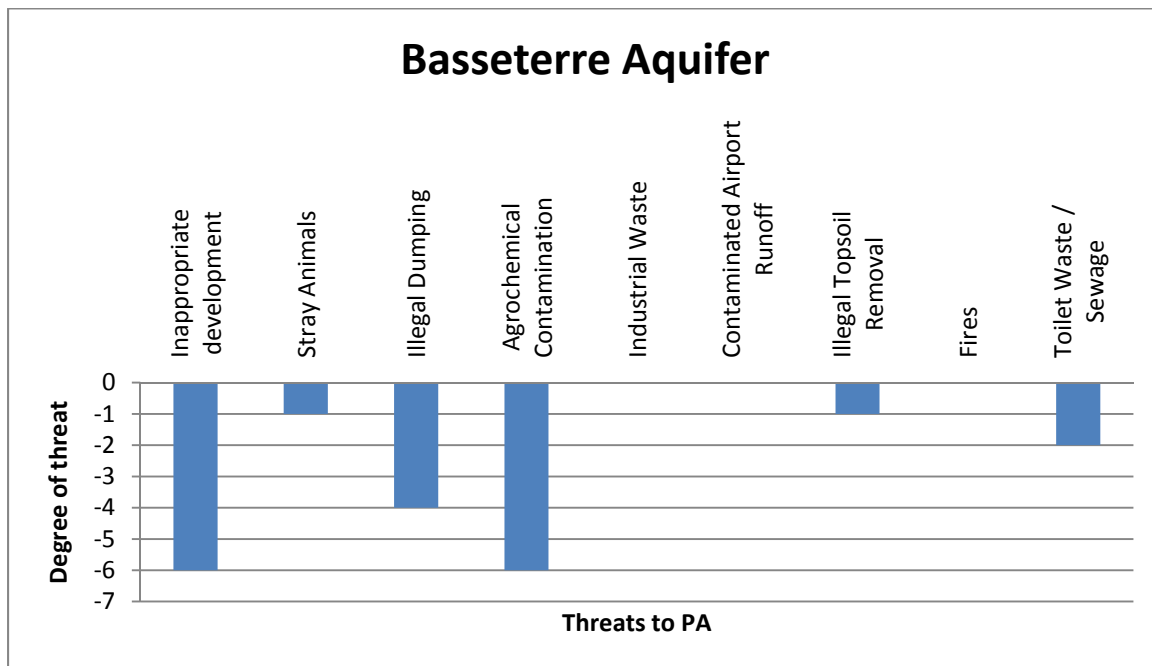


FIGURE C-16: DEGREE OF THREAT (BASSETERRE AQUIFER)

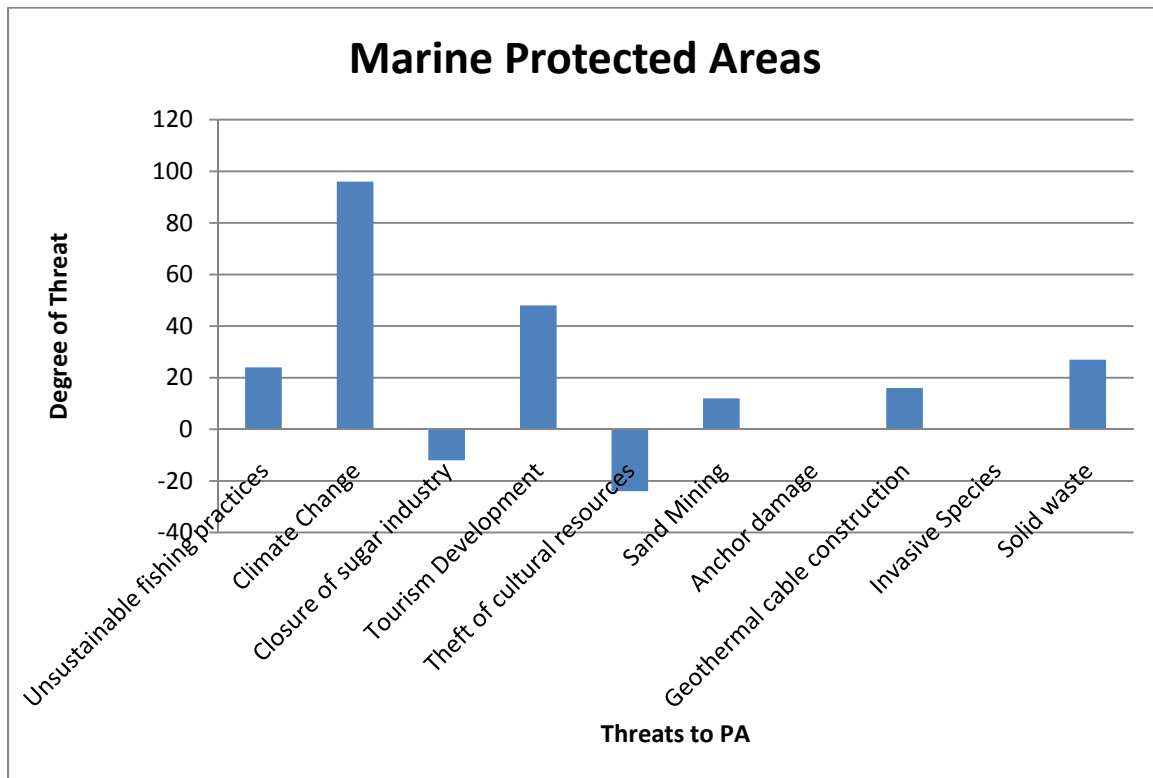


FIGURE C-17: DEGREE OF THREAT (MARINE PROTECTED AREAS)

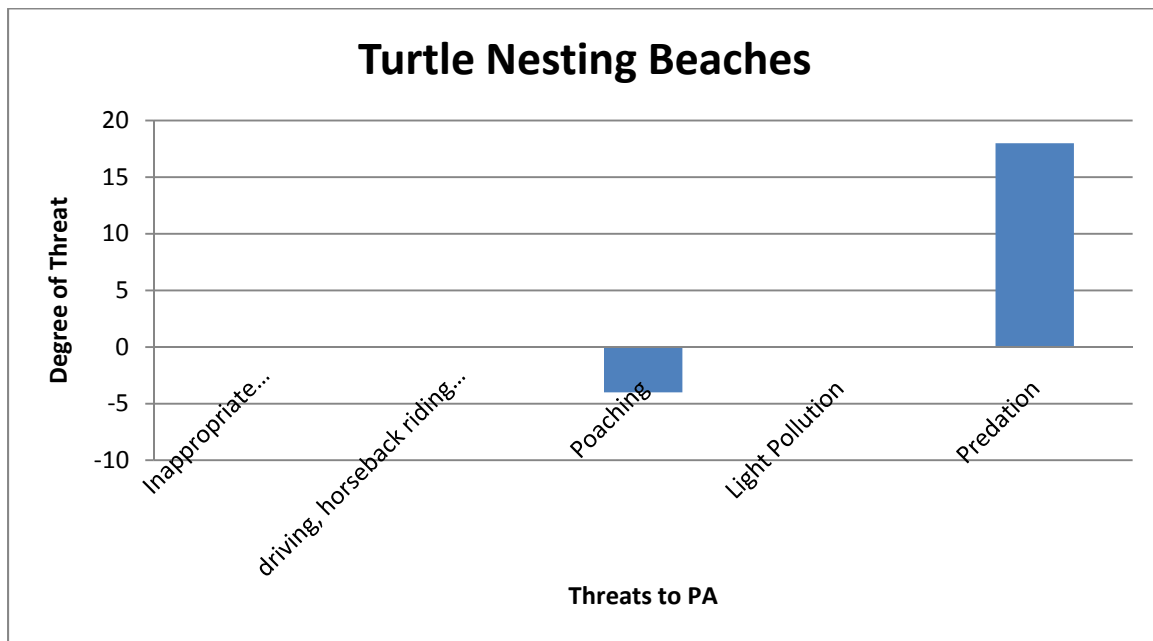


FIGURE C-18: DEGREE OF THREAT (TURTLE NESTING BEACHES)

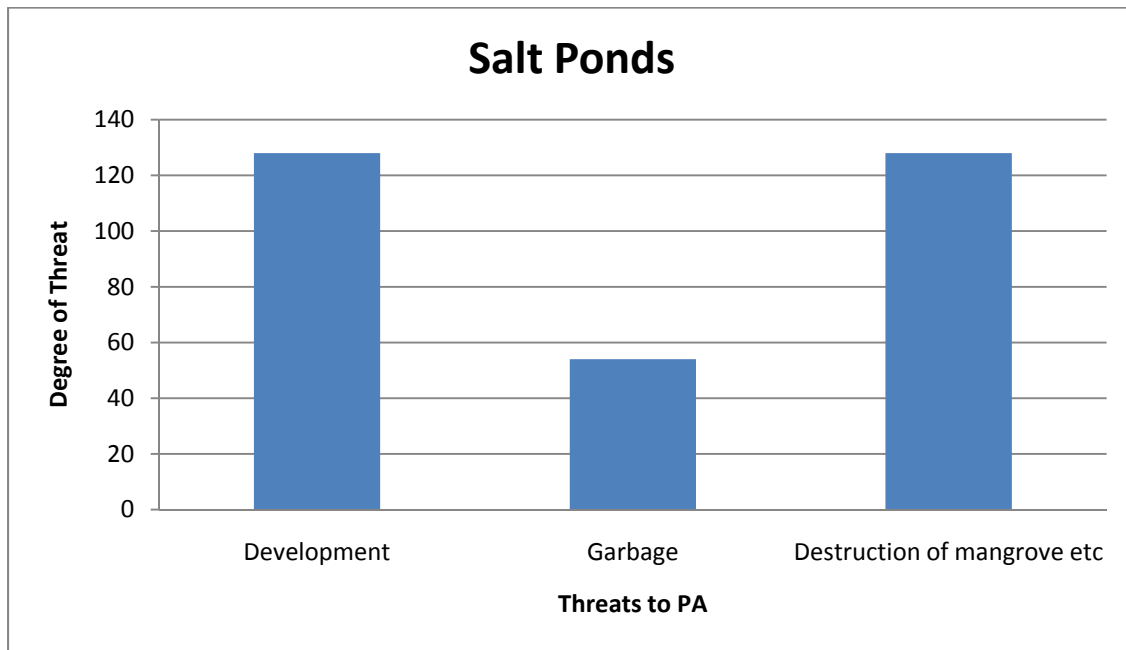


FIGURE C-19: DEGREE OF THREAT (SALT PONDS)

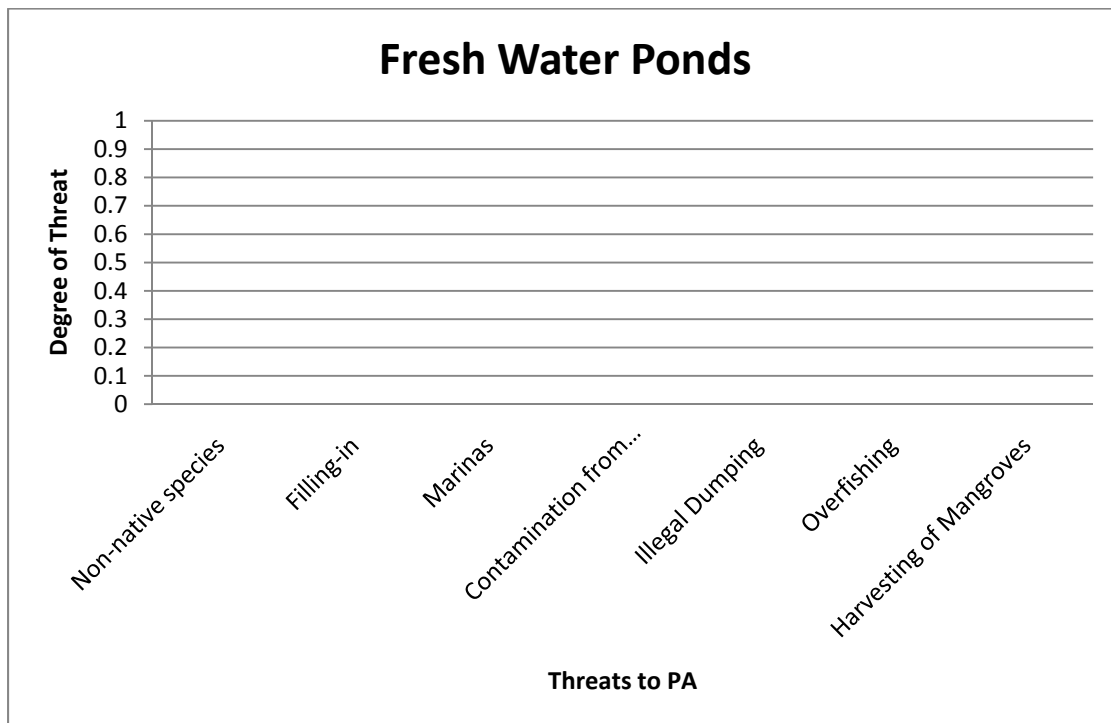


FIGURE C-20: DEGREE OF THREATS (FRESHWATER PONDS)

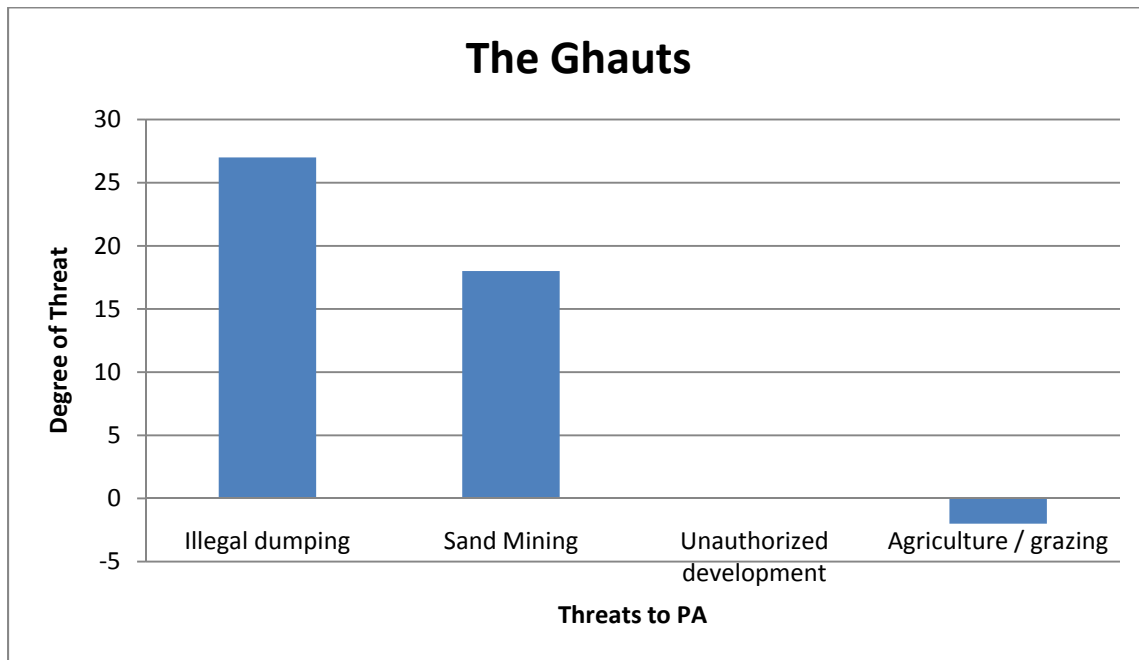


FIGURE C-21: DEGREE OF THREAT (THE GHAUTS)

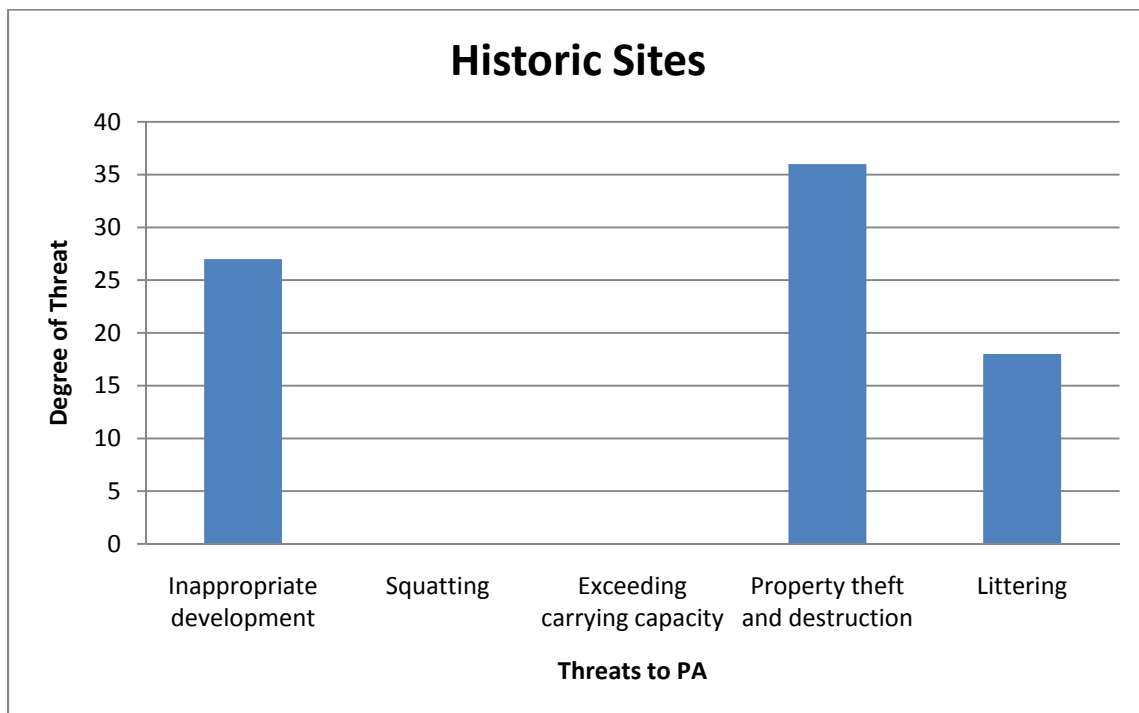


FIGURE C-22: DEGREE OF THREAT (HISTORIC SITES)

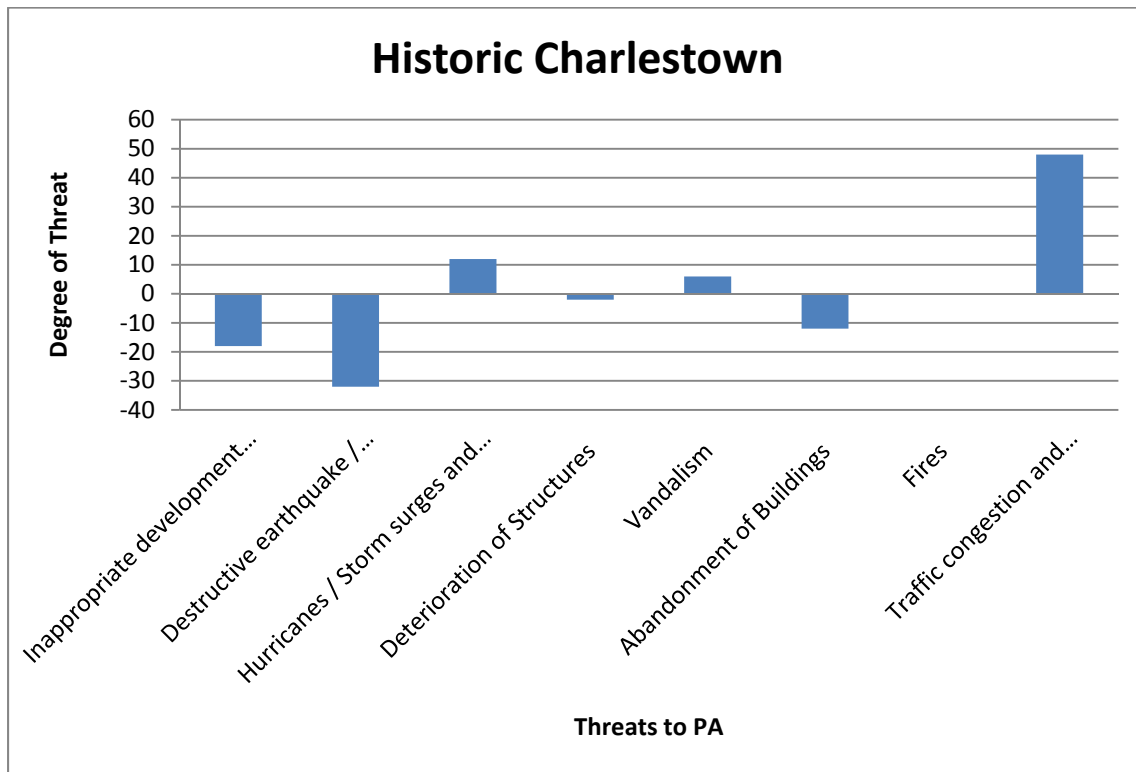


FIGURE C-23: DEGREE OF THREAT (HISTORIC CHARLESTOWN)

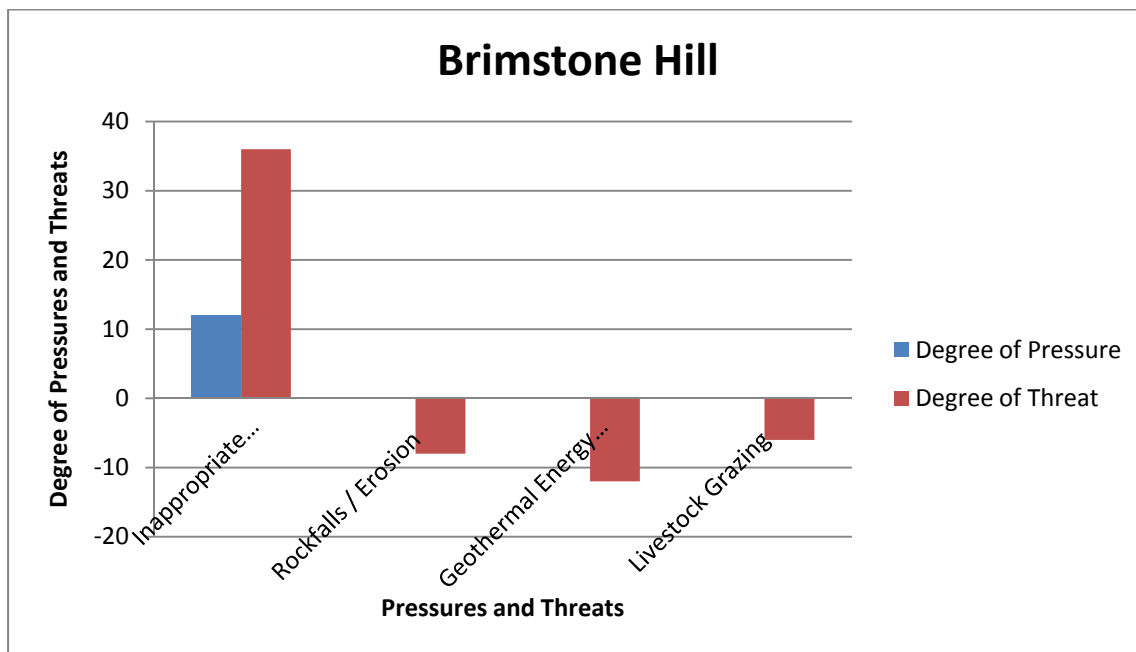


FIGURE C-24: COMPARISON OF PRESSURES AND THREATS (BRIMSTONE HILL)

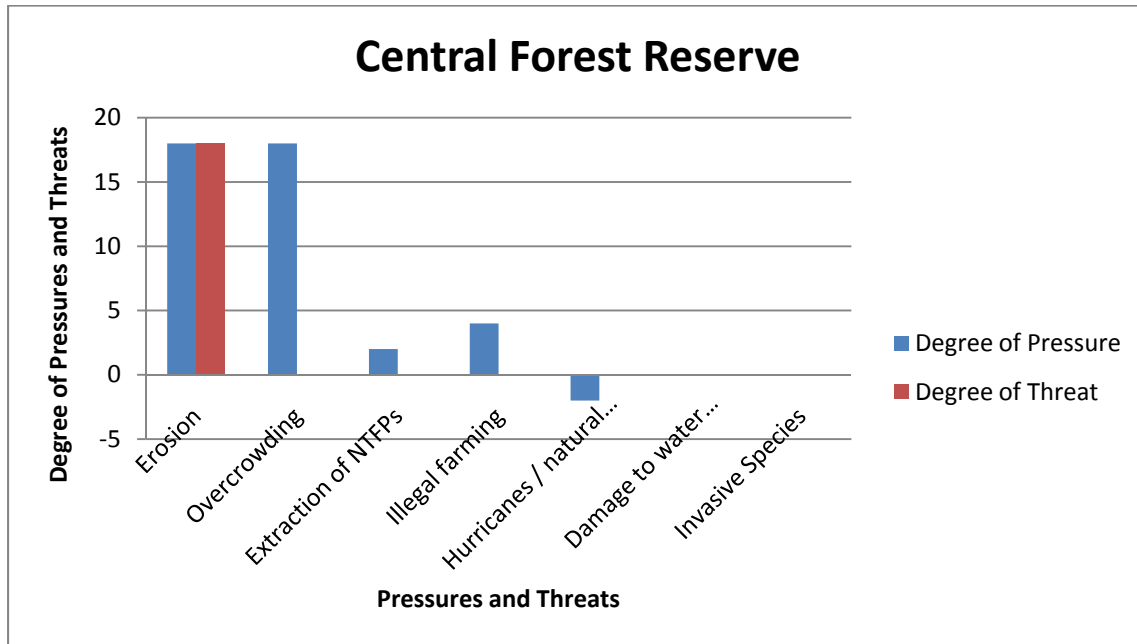


FIGURE C-25: COMPARISON OF PRESSURES AND THREATS (CENTRAL FOREST RESERVE)

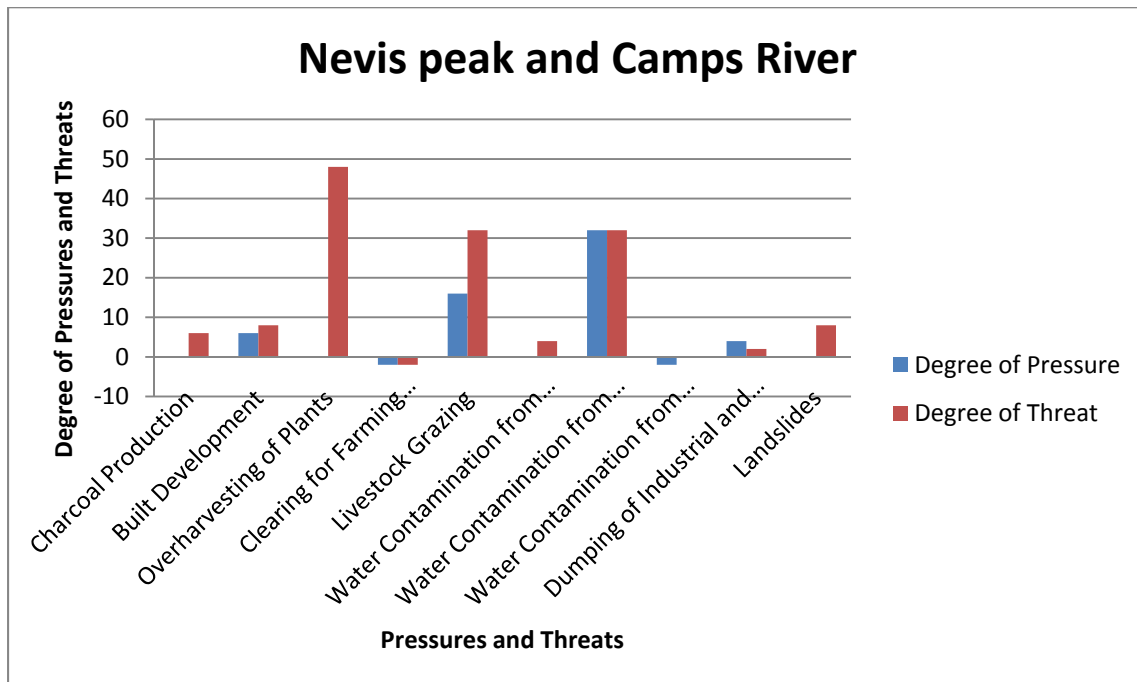


FIGURE C-26: COMPARISON OF PRESSURES AND THREATS (NEVIS PEAK)

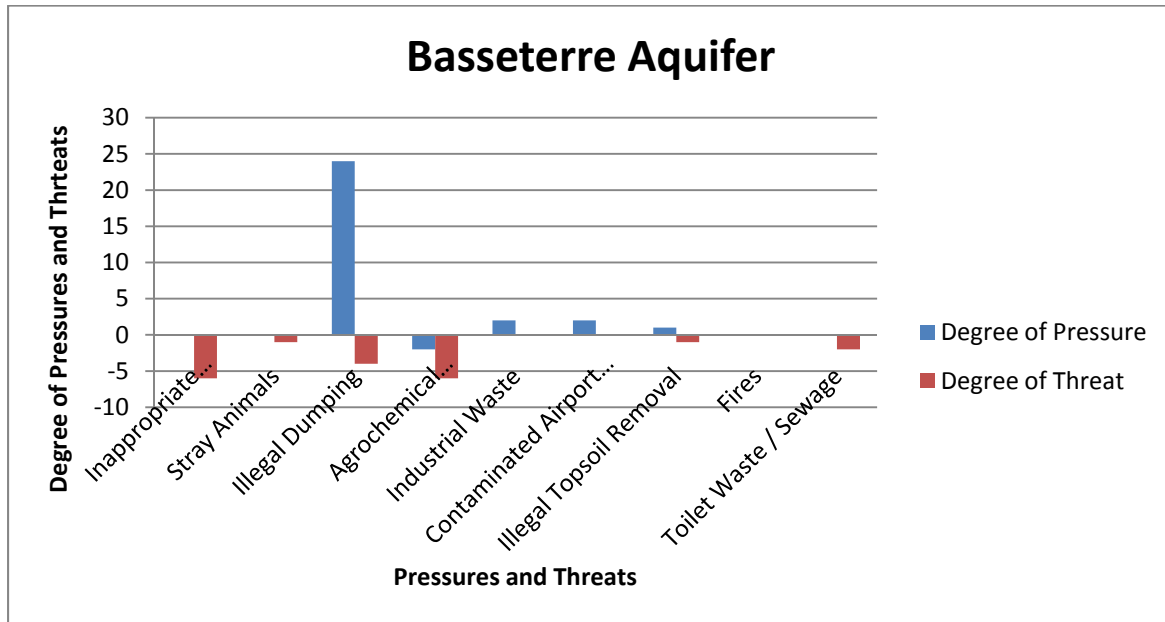


FIGURE C-27: COMPARISON OF PRESSURES AND THREATS (BASSETERRE AQUIFER)

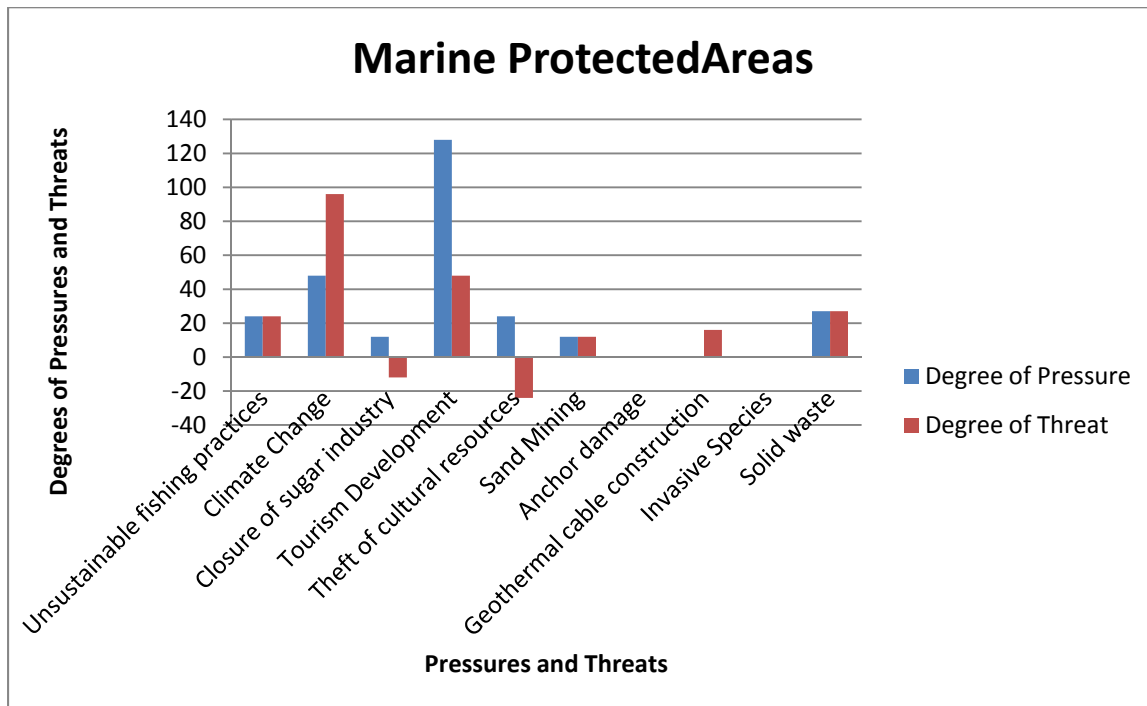


FIGURE C-28: COMPARISON OF PRESSURES AND THREATS (MARINE PROTECTED AREAS)

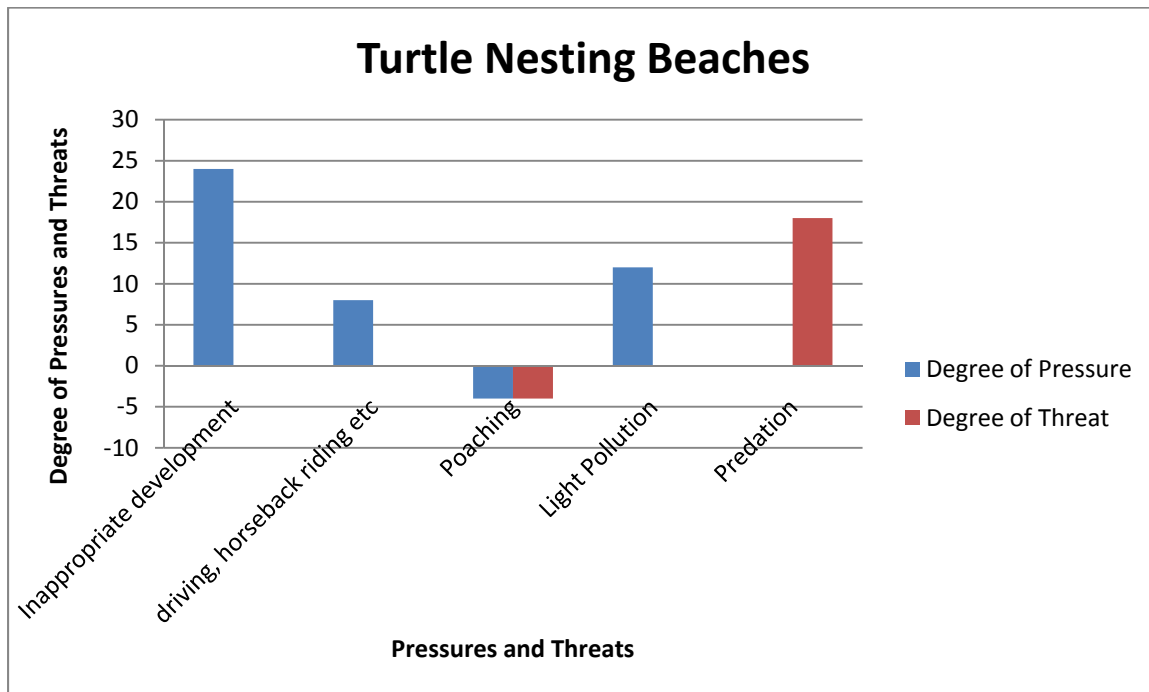


FIGURE C-29: COMPARISON OF PRESSURES AND THREATS (TURTLE NESTING BEACHES)

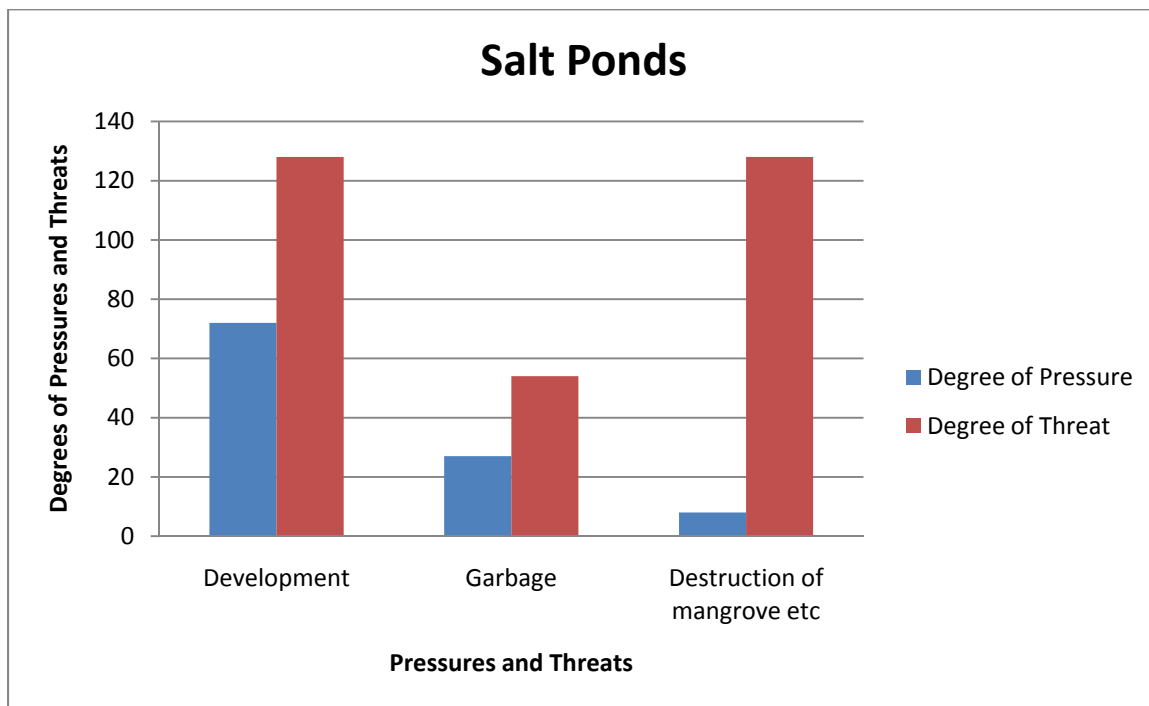


FIGURE C-30: COMPARISON OF PRESSURES AND THREATS (SALT PONDS)

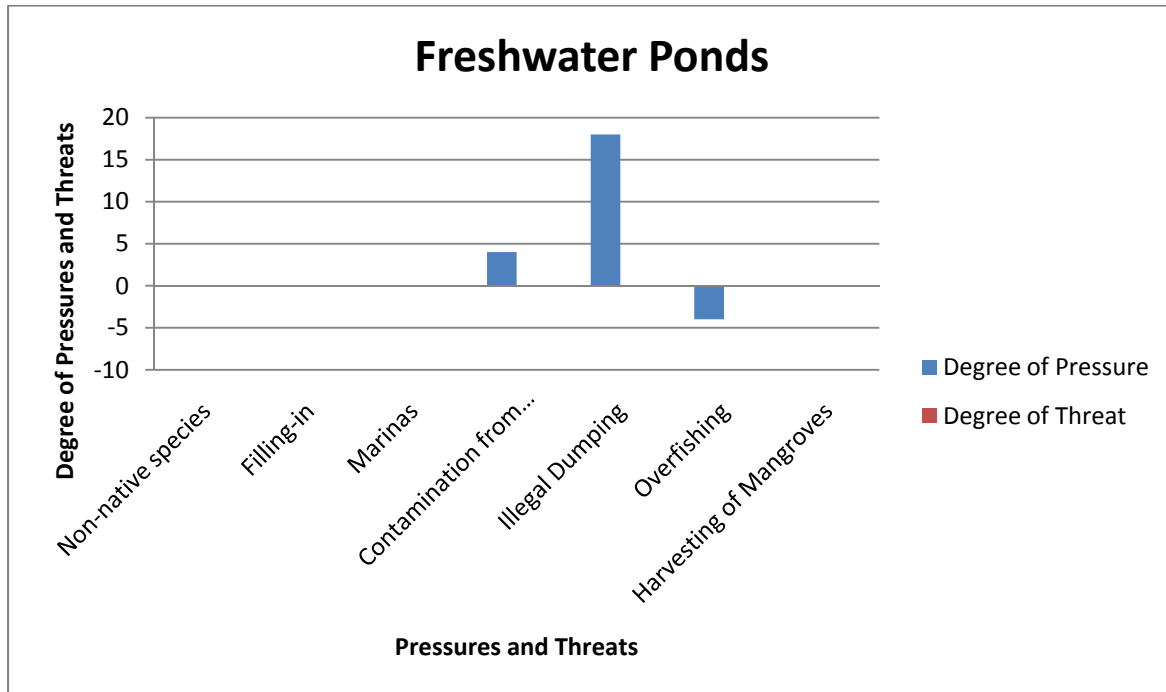


FIGURE C-31: COMPARISON OF PRESSURES AND THREATS (FRESHWATER PONDS)

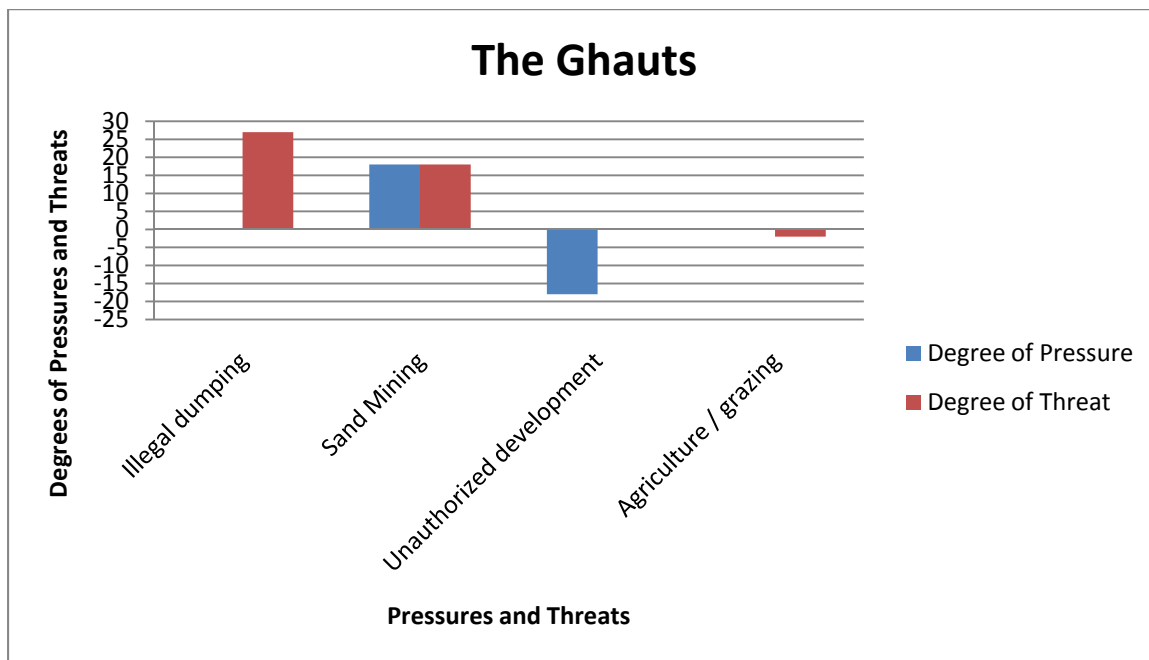


FIGURE C-32: COMPARISON OF PRESSURES AND THREATS (THE GHAUTS)

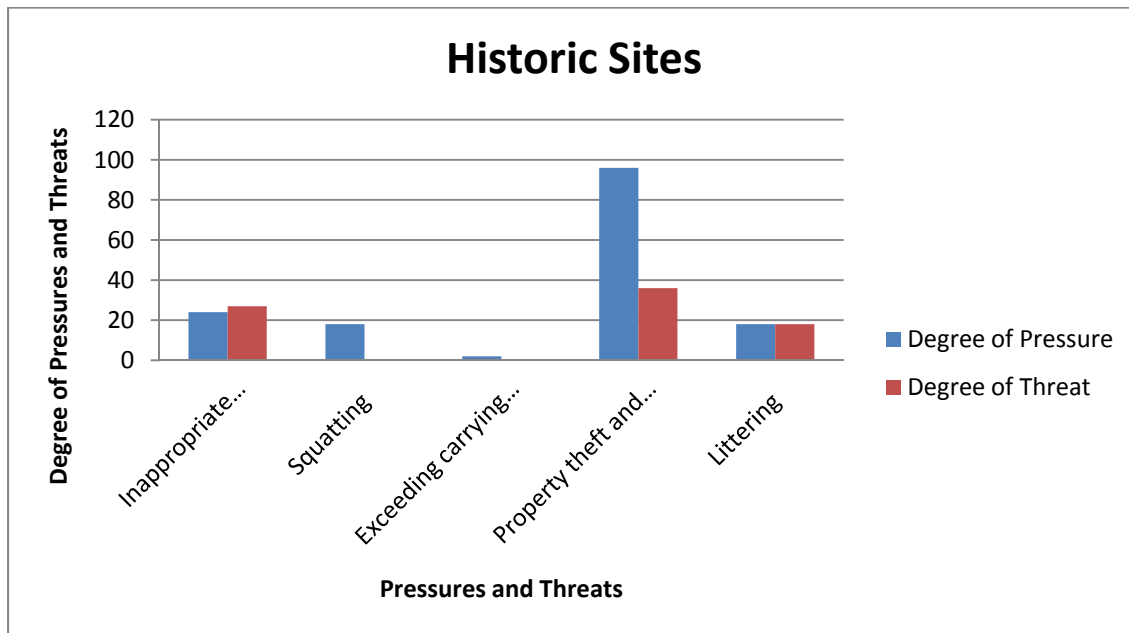


FIGURE C-33: COMPARISON OF PRESSURES AND THREATS (HISTORIC SITES)

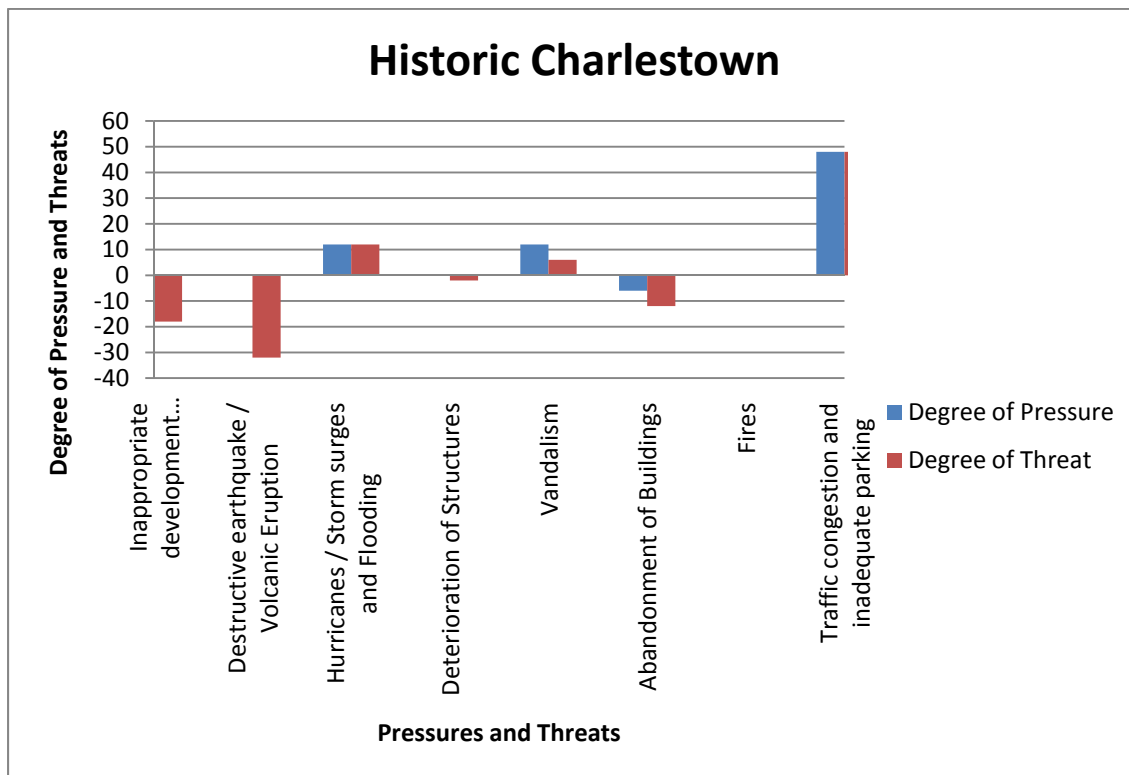


FIGURE C-34: COMPARISON OF PRESSURES AND THREATS (HISTORIC CHARLESTOWN)

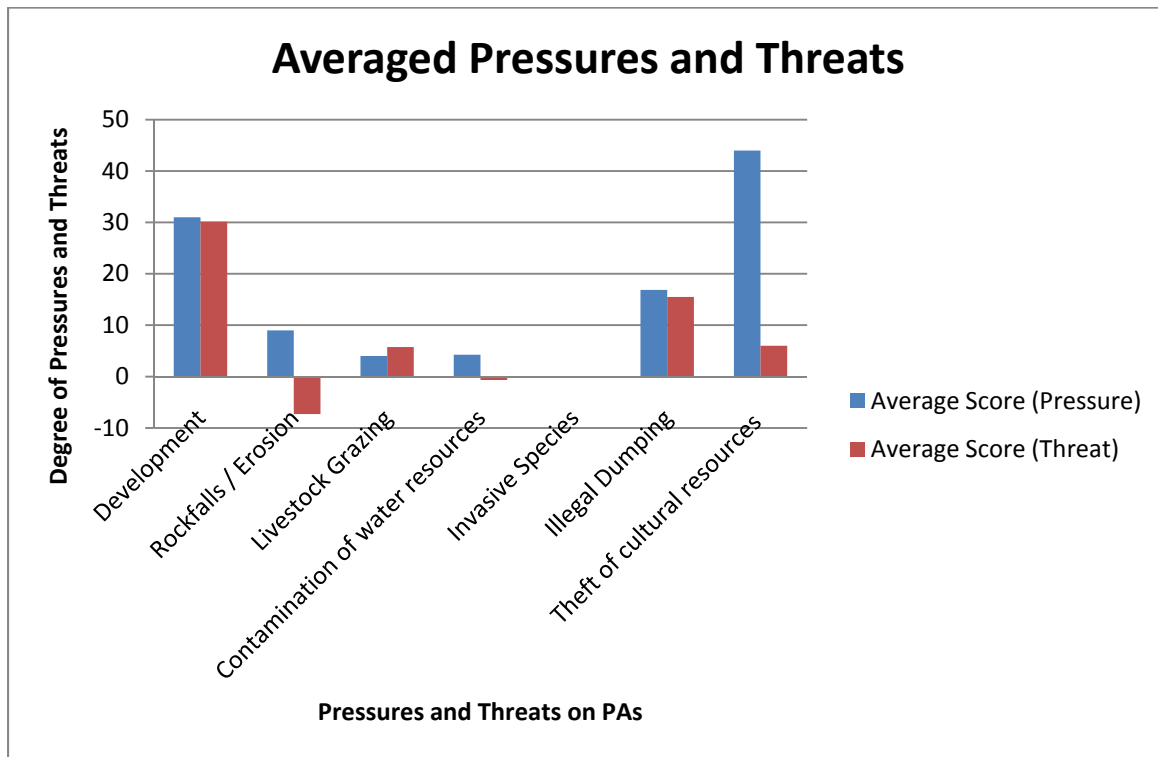


FIGURE C-35: COMPARISON OF PRESSURES AND THREATS ACROSS THREE PROTECTED AREAS

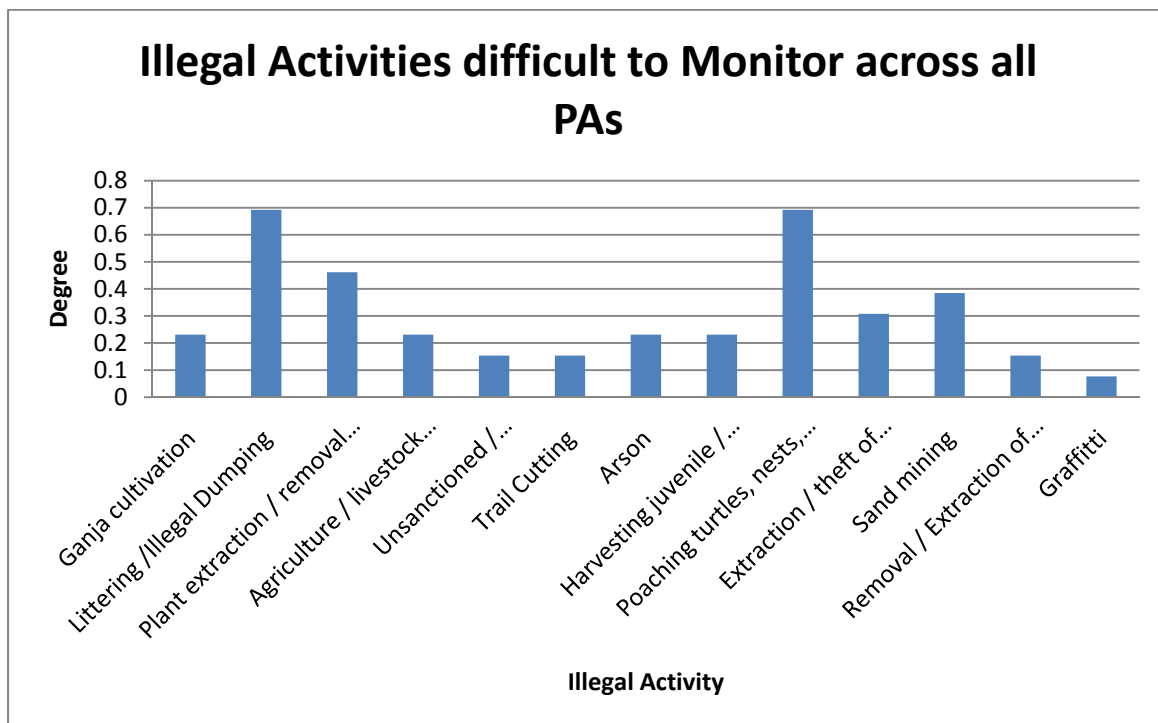


FIGURE C-36: ILLEGAL ACTIVITIES AND OCCURRENCE ACROSS ALL PAS

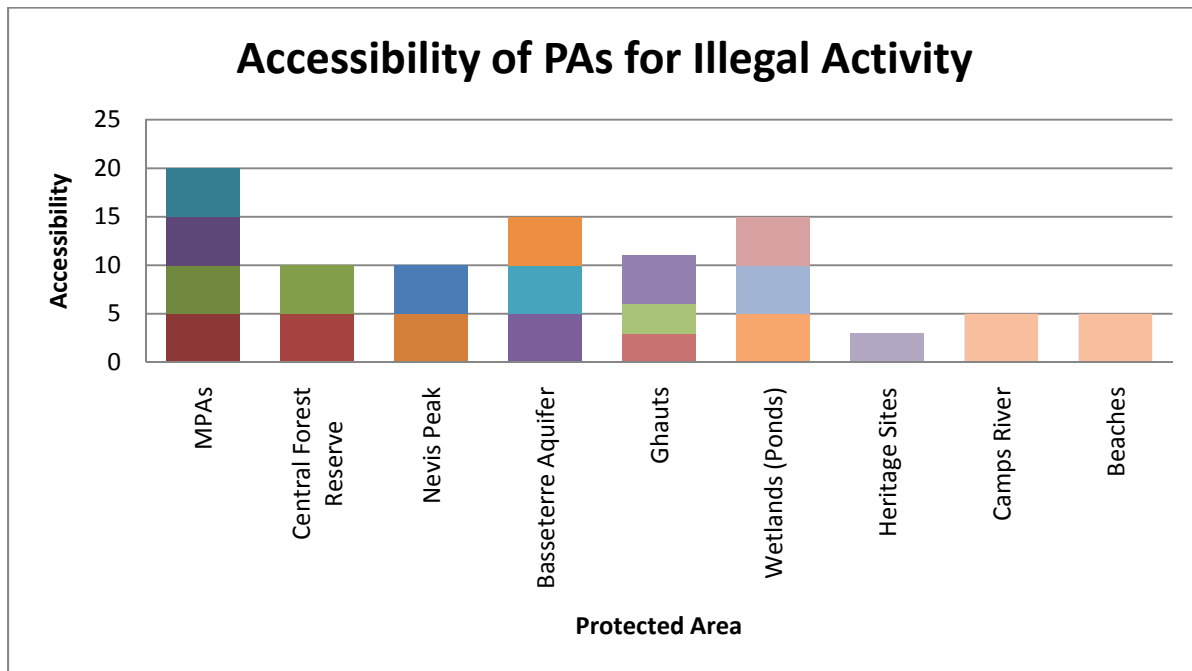


FIGURE C-37: ACCESSIBILITY OF PAS FOR ILLEGAL ACTIVITY

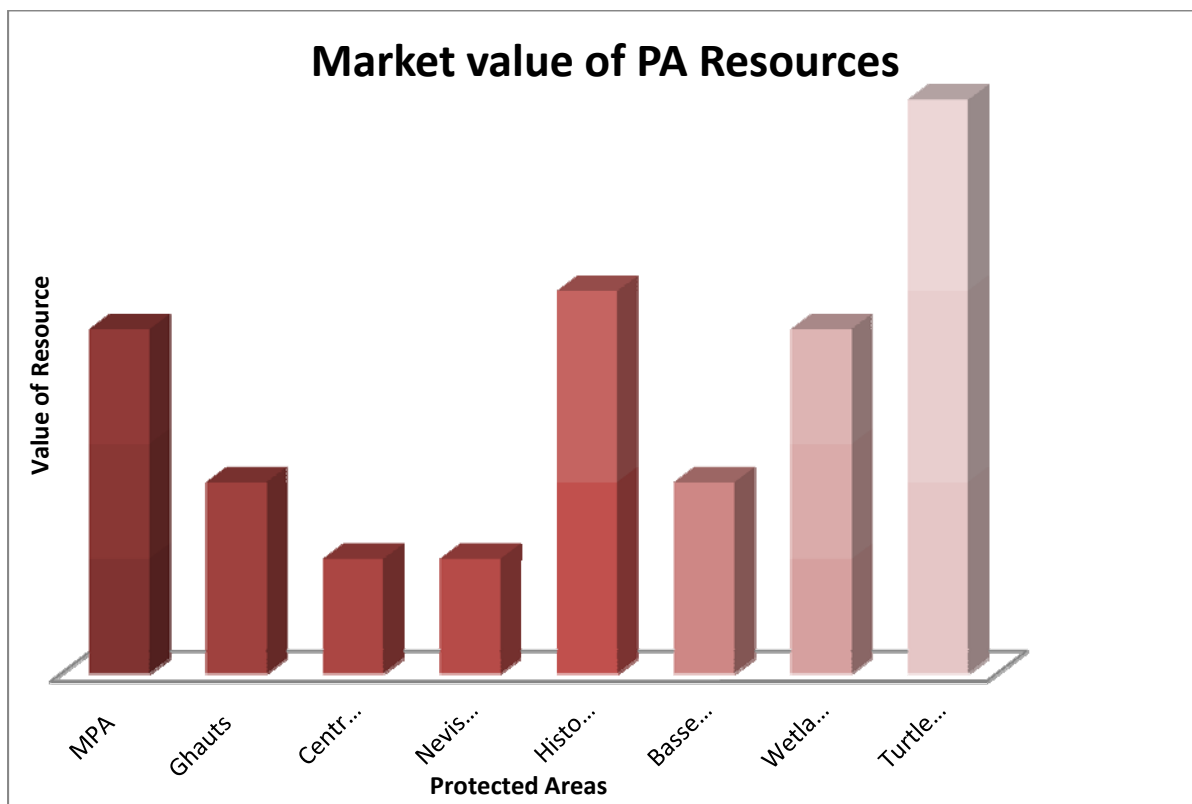


FIGURE C-38: MARKET VALUE OF PA RESOURCES

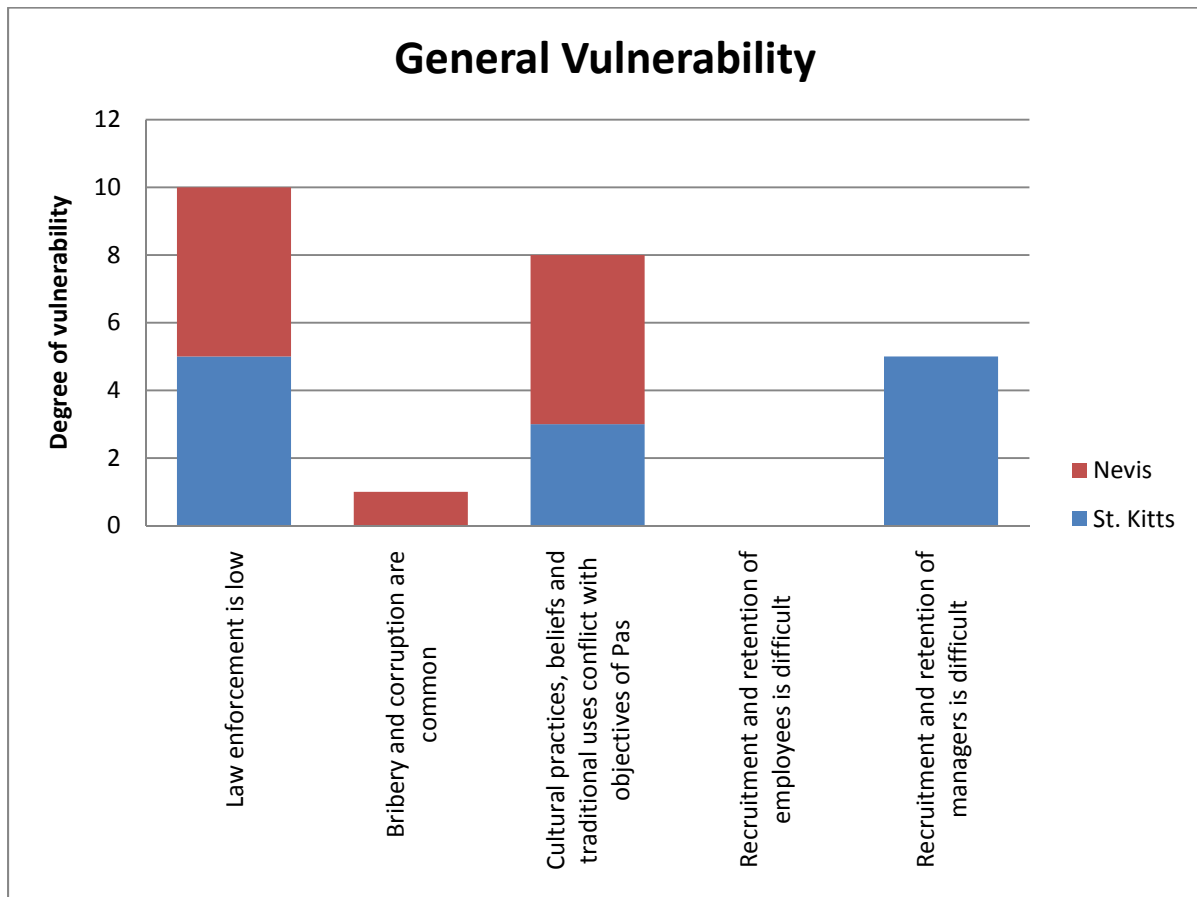


FIGURE C-39: GENERAL VULNERABILITY OF PAS

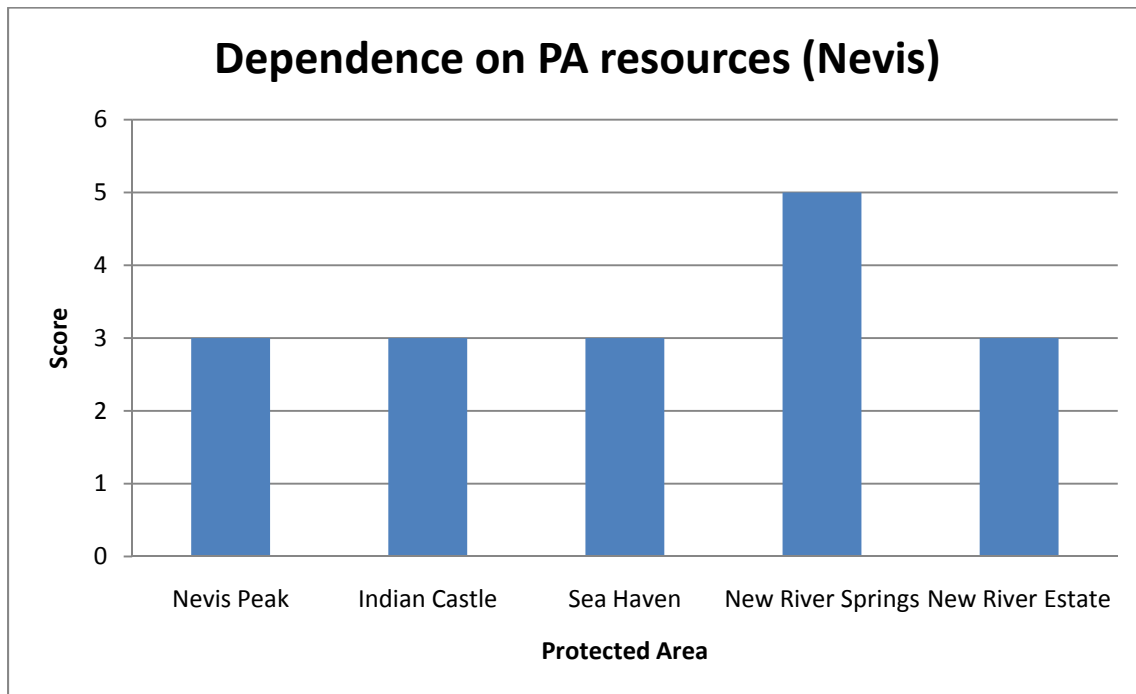


FIGURE C-40A: DEPENDENCE ON PA RESOURCES (NEVIS)

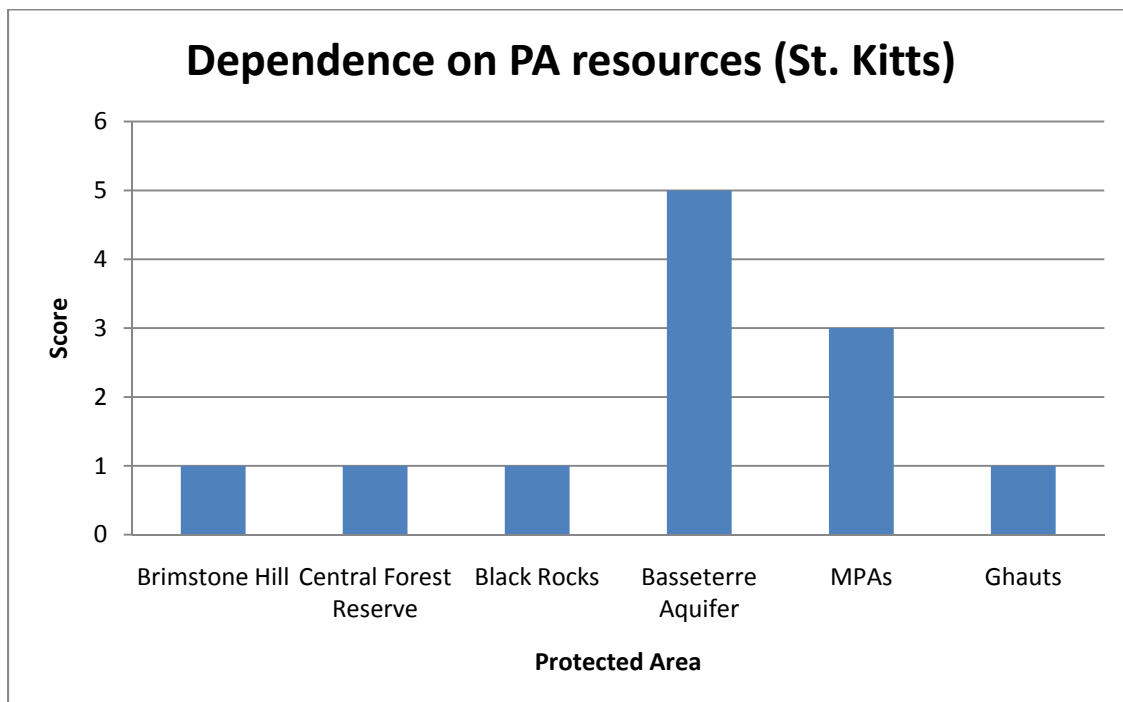


FIGURE C-40B: DEPENDENCE ON PA RESOURCES (ST. KITTS)

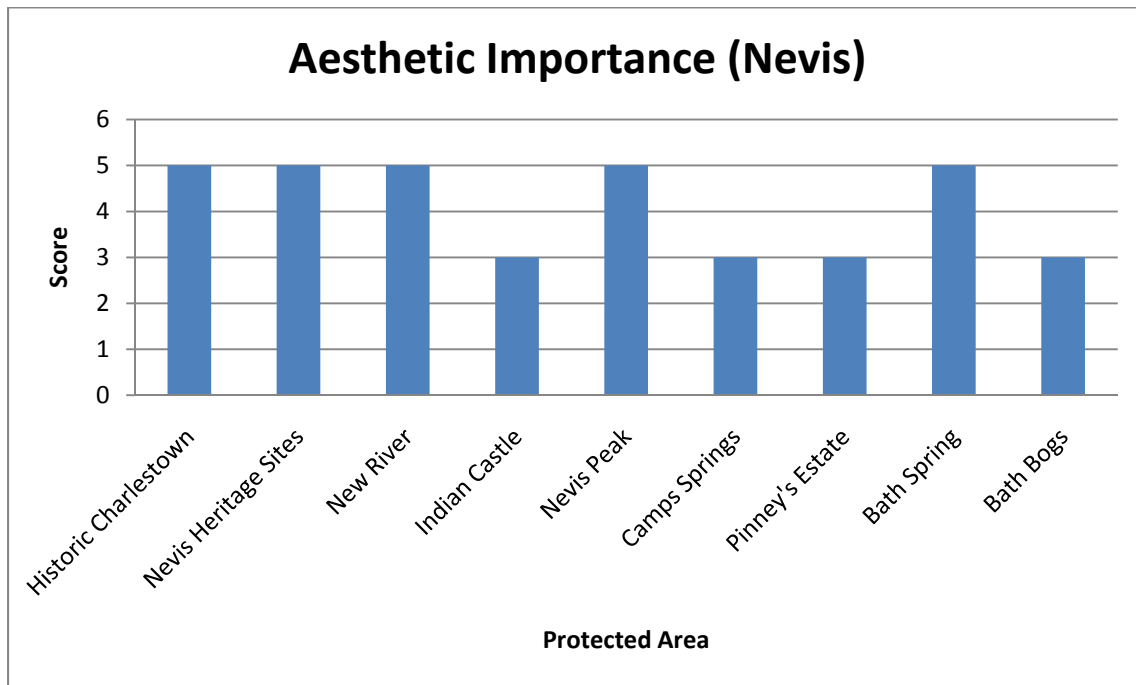


FIGURE C-41A: AESTHETIC IMPORTANCE (NEVIS)

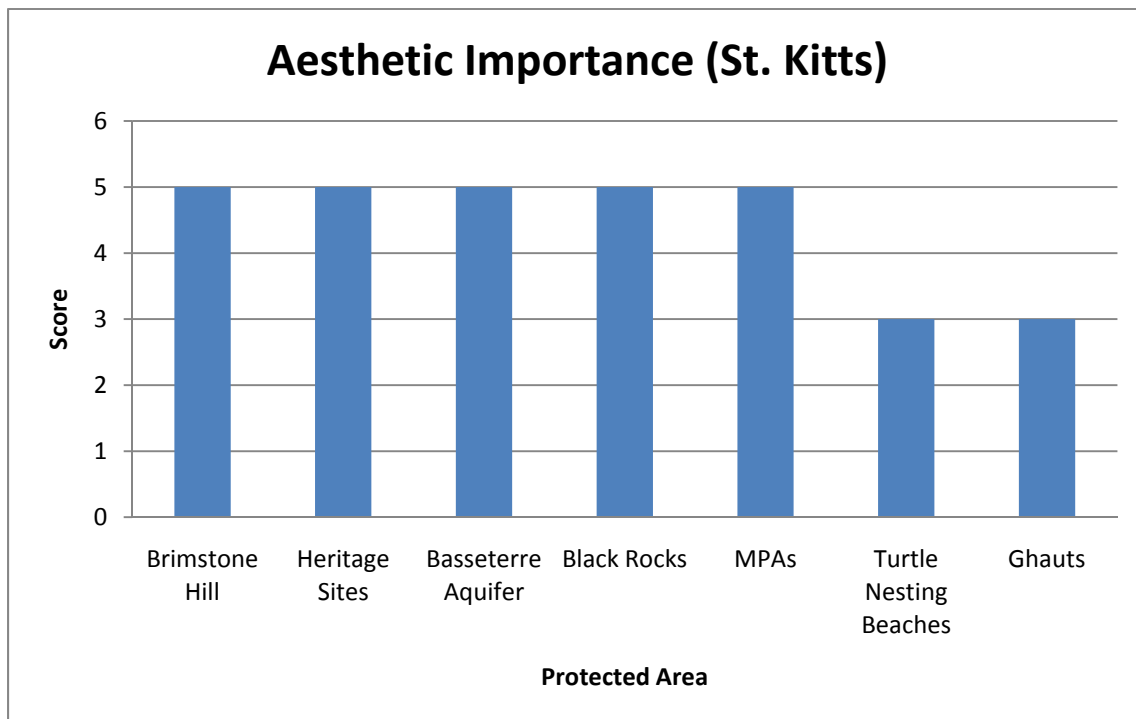


FIGURE C-41B: AESTHETIC IMPORTANCE (ST. KITTS)

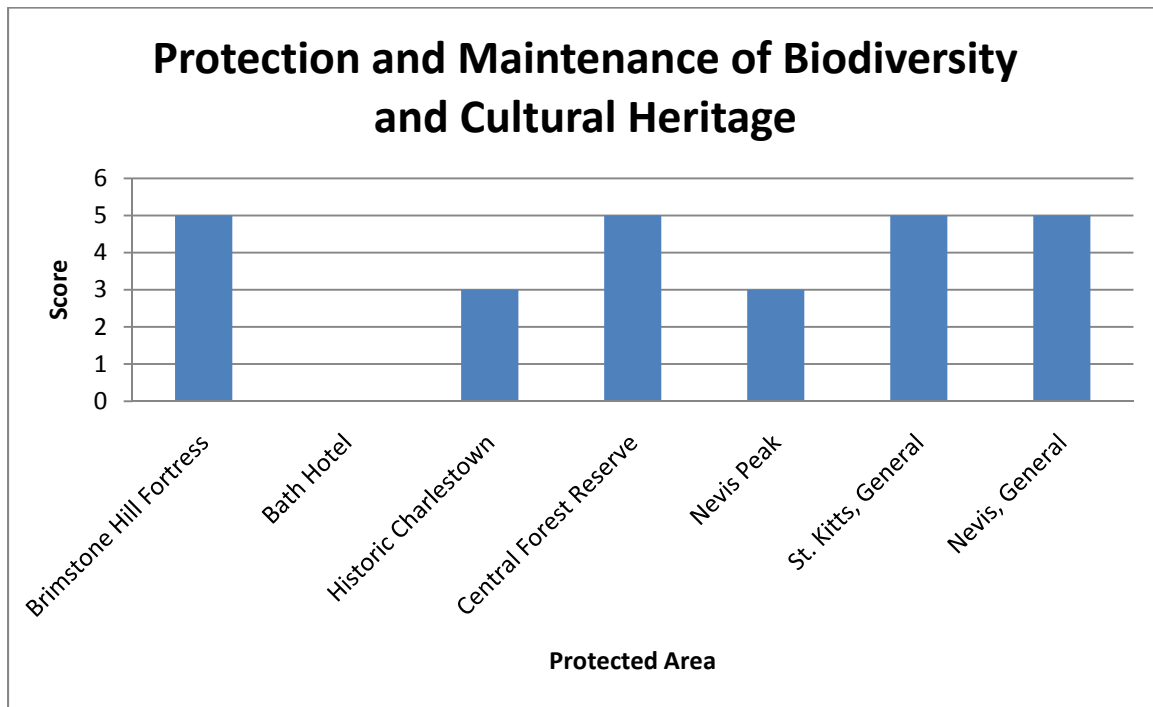


FIGURE C-42: PROTECTION AND MAINTENANCE OF BIODIVERSITY AND CULTURAL HERITAGE

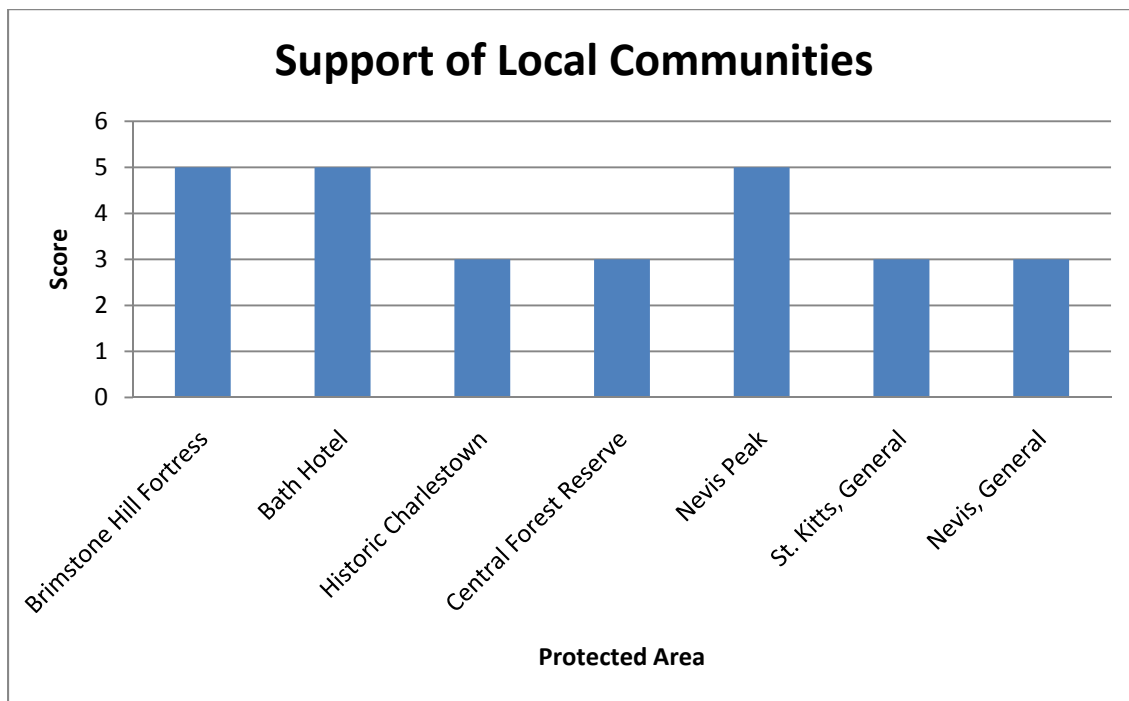


FIGURE C-43: SUPPORT OF LOCAL COMMUNITIES

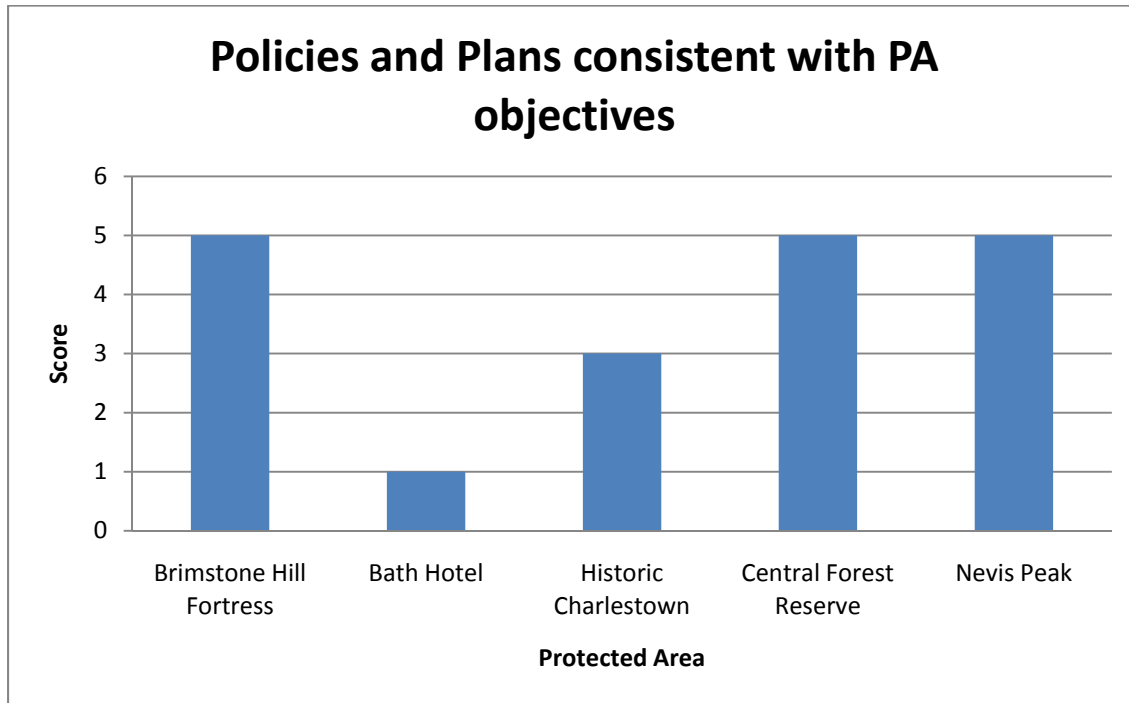


FIGURE C-44: POLICIES AND PLANS CONSISTENT WITH PA OBJECTIVES

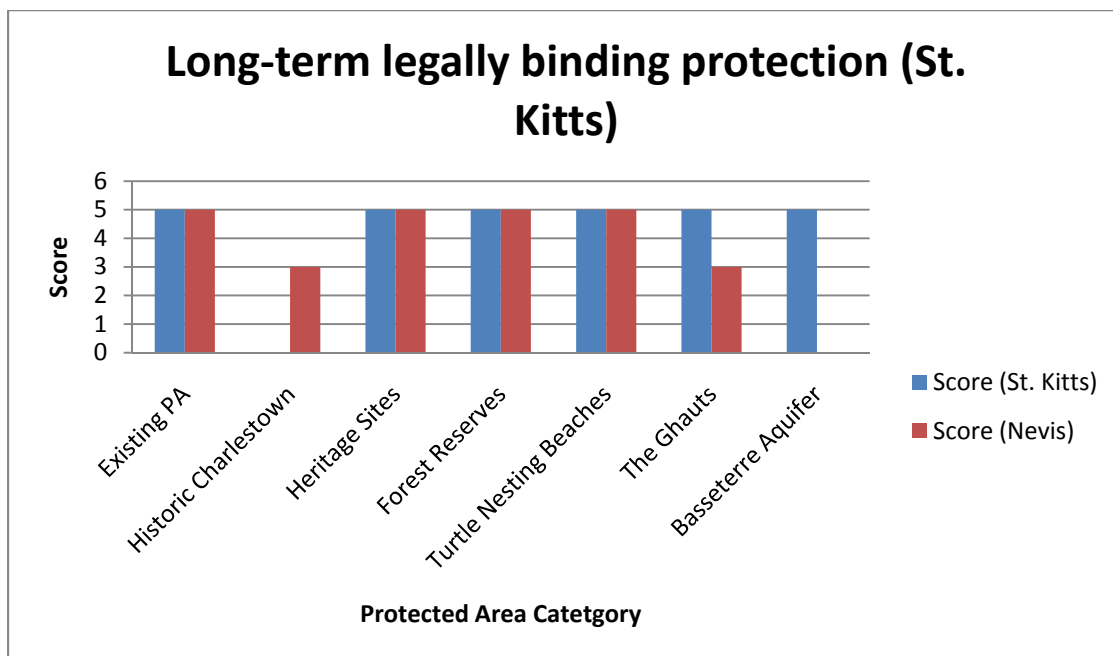


FIGURE C-45: LONG-TERM LEGALL BINDING PROTECTION

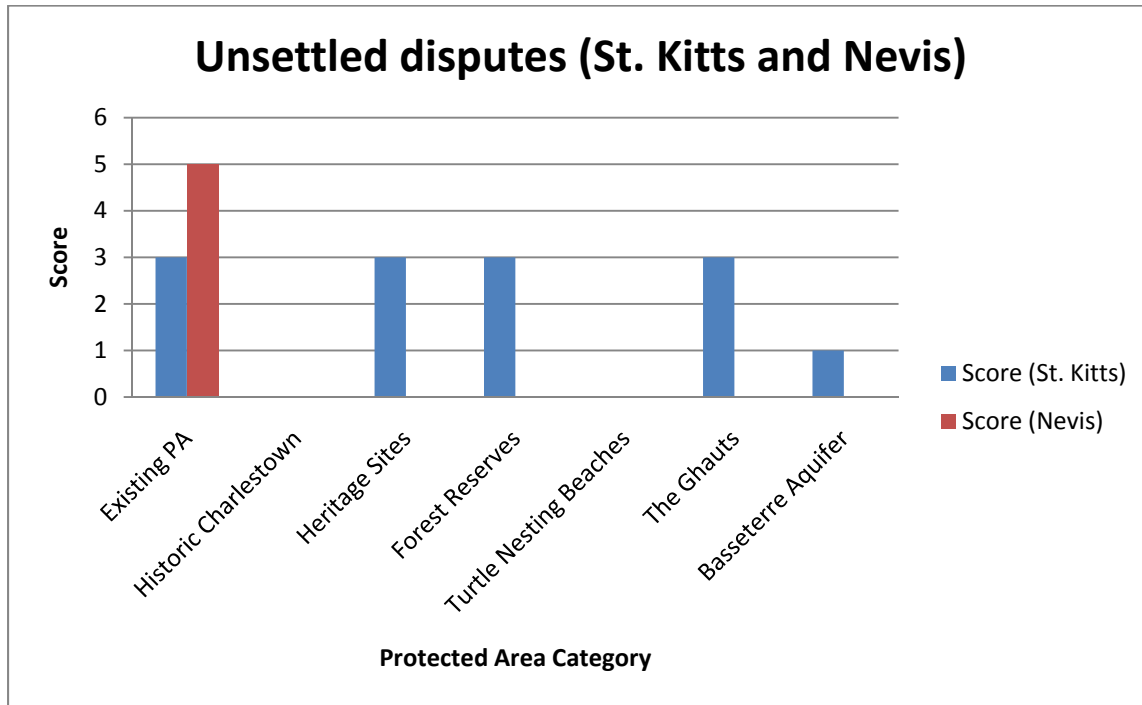


FIGURE C-46: UNSETTLED DISPUTES (ST. KITTS AND NEVIS)

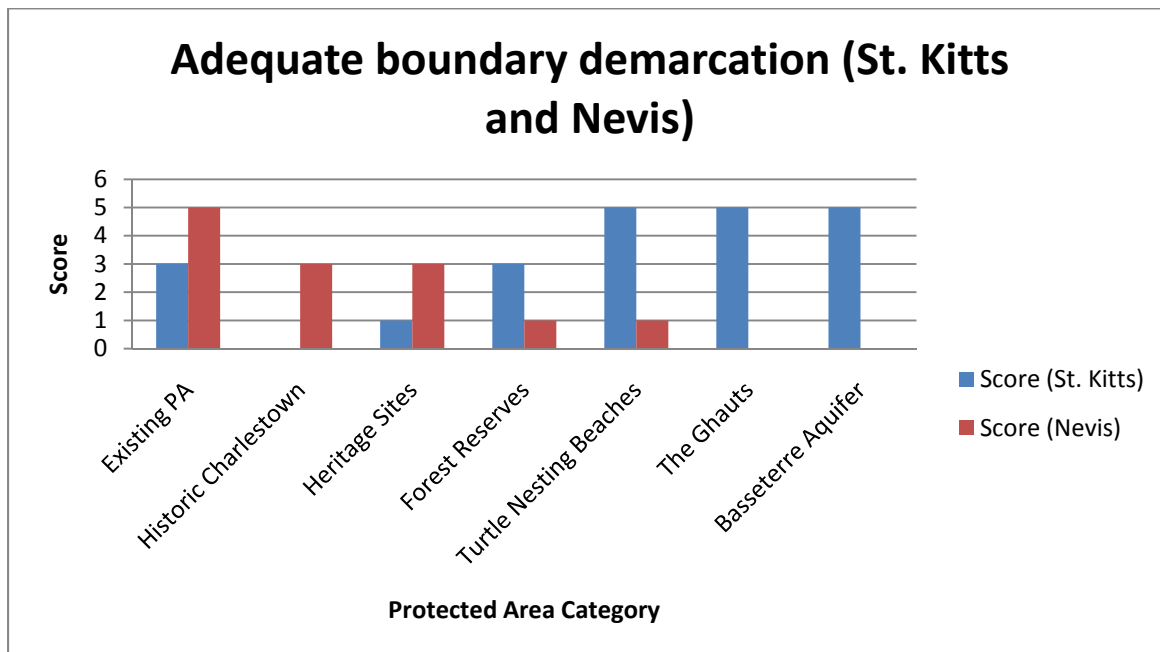


FIGURE C-47: ADEQUATE BOUNDARY DEMARCATION (ST. KITTS AND NEVIS)

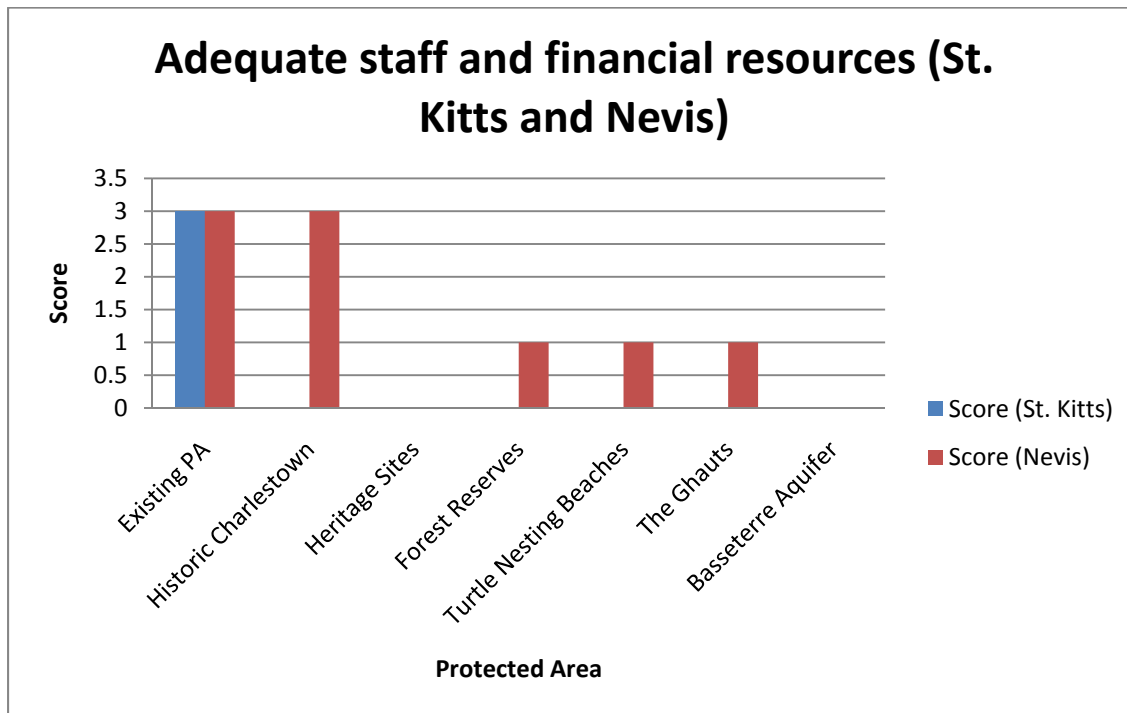


FIGURE C-48: ADEQUATE STAFF AND FINANCIAL RESOURCES (ST. KITTS AND NEVIS)

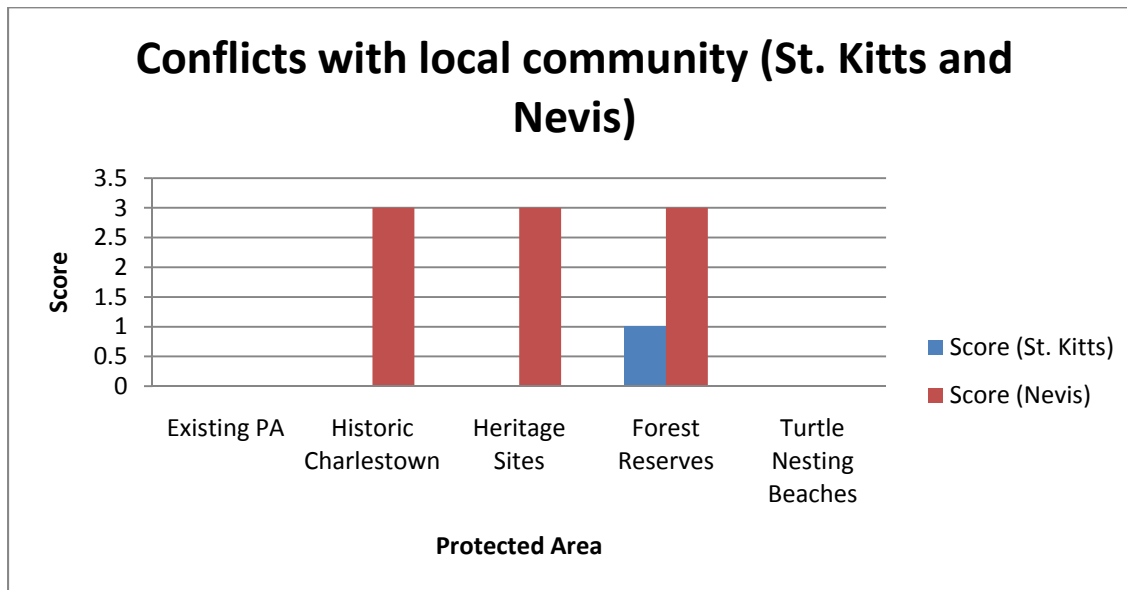
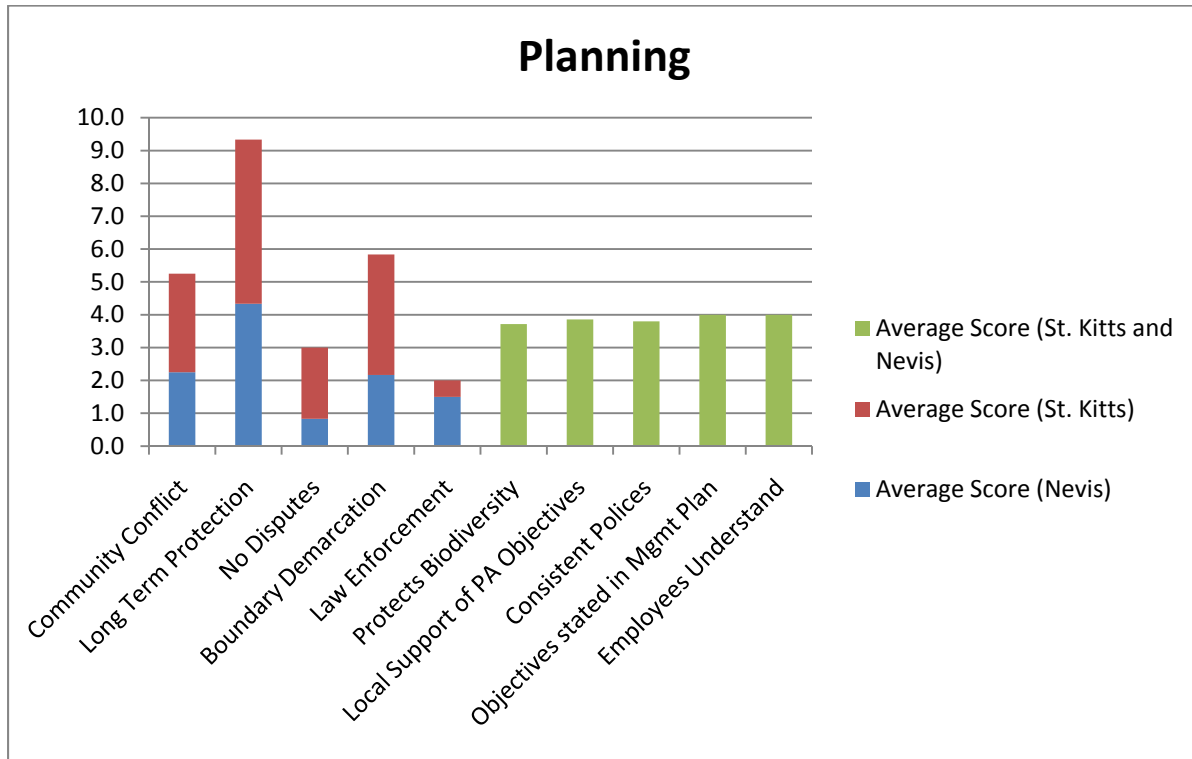


FIGURE C-49: CONFLICTS WITH LOCAL COMMUNITY (ST. KITTS AND NEVIS)



C-50: SUMMARY OF PLANNING

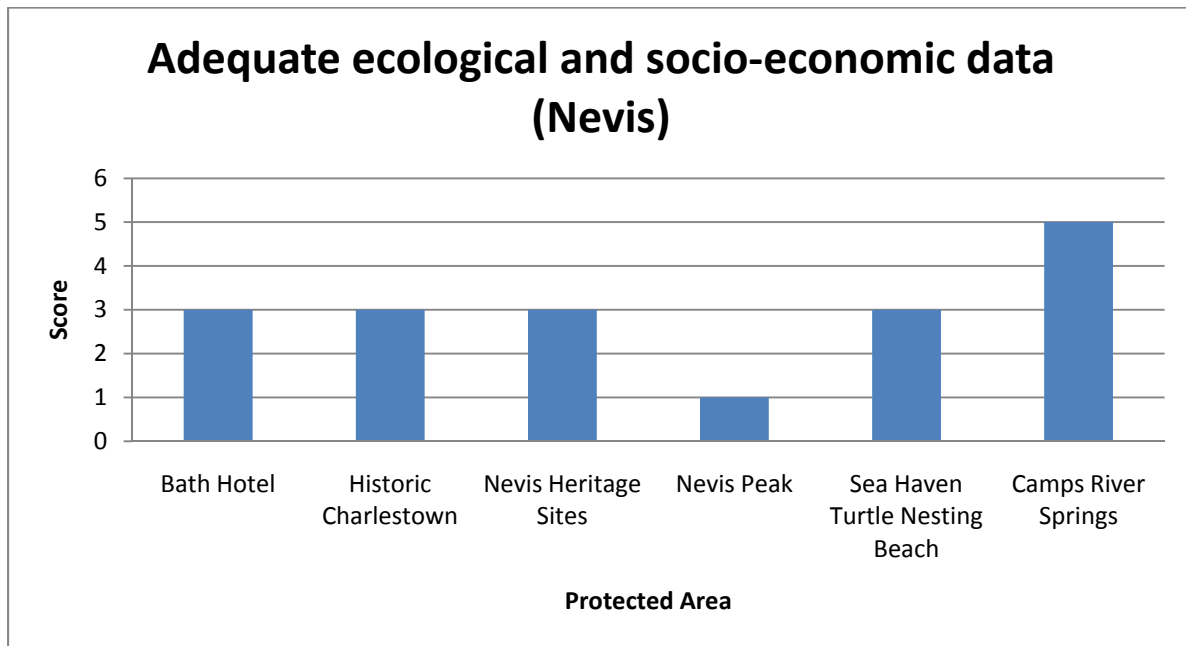


FIGURE C-51A: ADEQUATE ECOLOGICAL AND SOCIO-ECONOMIC DATA (NEVIS)

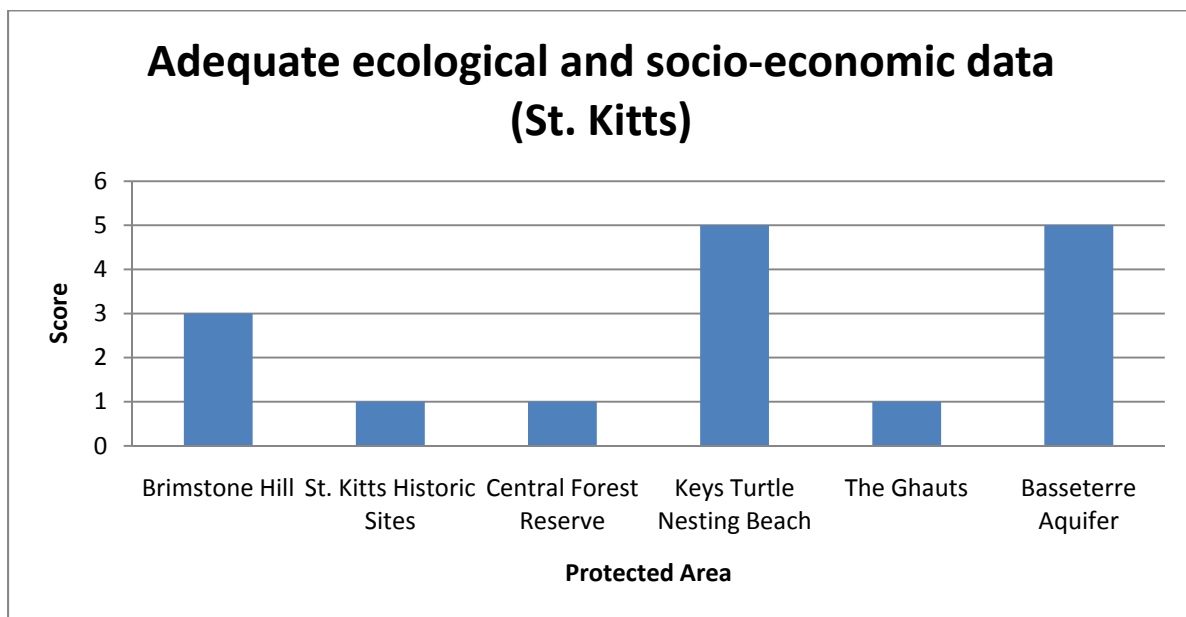


FIGURE C-51B: ADEQUATE WCOLOGICAL AND SOCIO-ECONOMIC DATA (ST. KITTS)

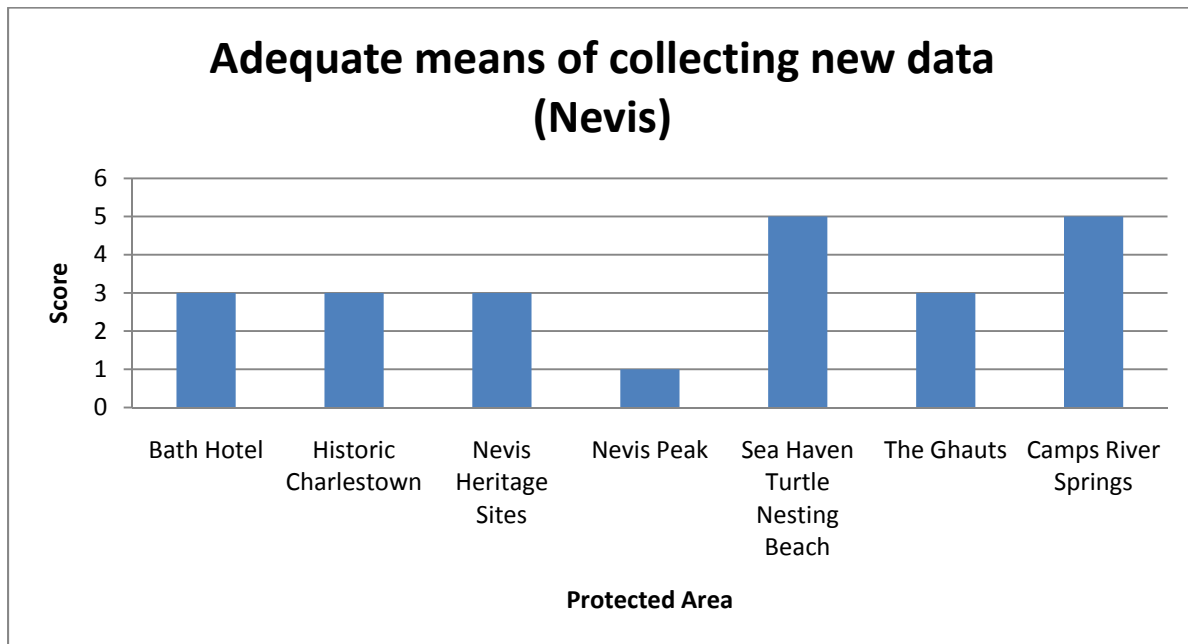


FIGURE C-52A: ADEQUATE MEANS OF COLLECTING NEW DATA (NEVIS)

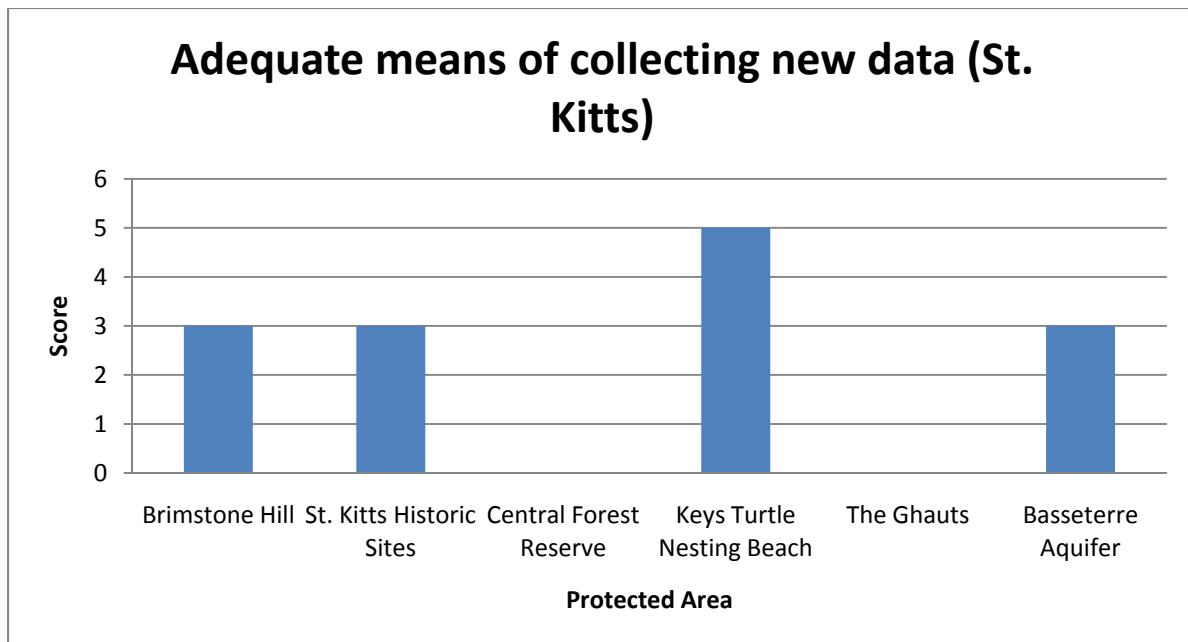


FIGURE C-52B: ADEQUATE MEANS OF COLLECTING NEW DATA (ST. KITTS)

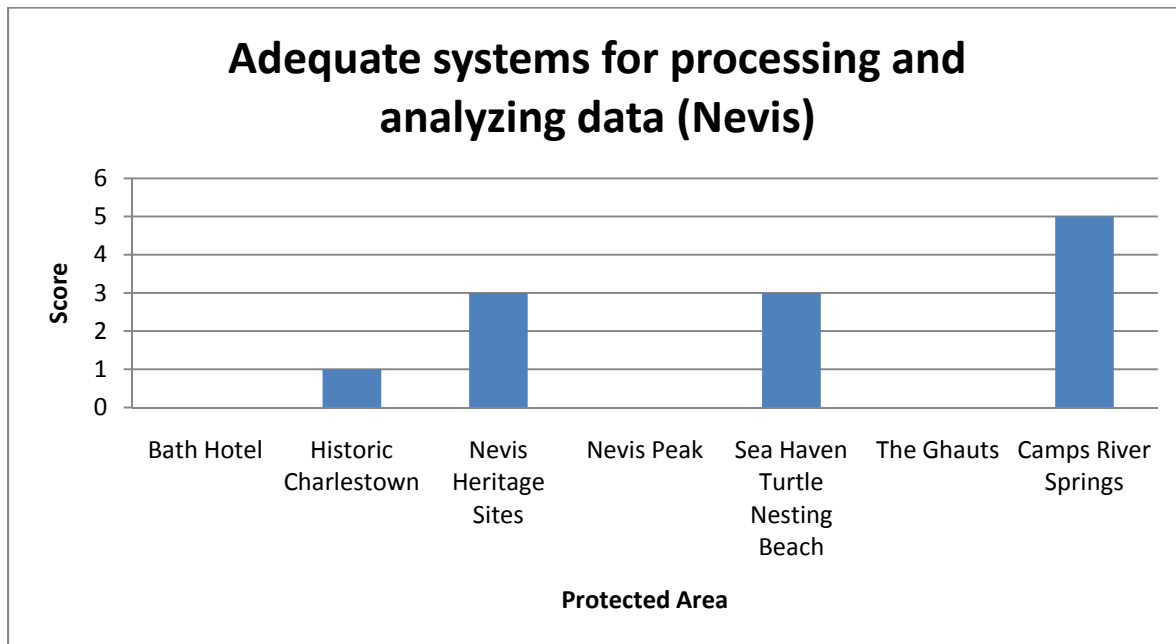


FIGURE C-53A: ADEQUATE SYSTEMS FOR PROCESSING AND ANALYZING DATA (NEVIS)

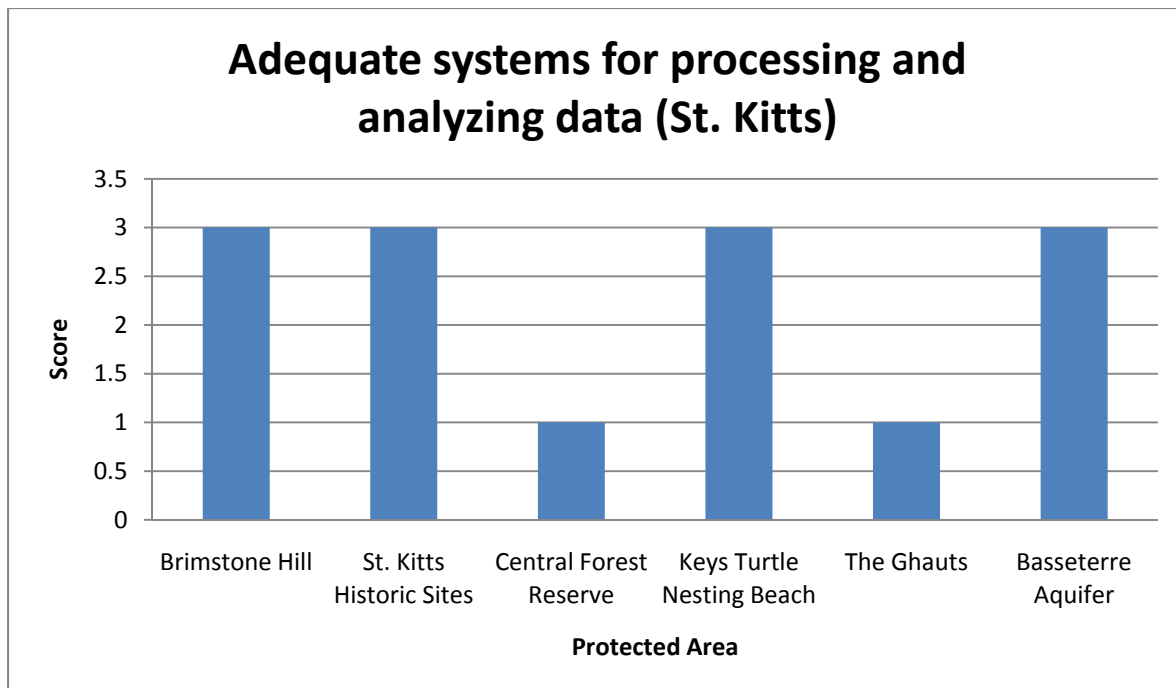


FIGURE C-53B: ADEQUATE SYSTEMS FOR PROCESSING AND ANALYZING DATA (ST KITTS)

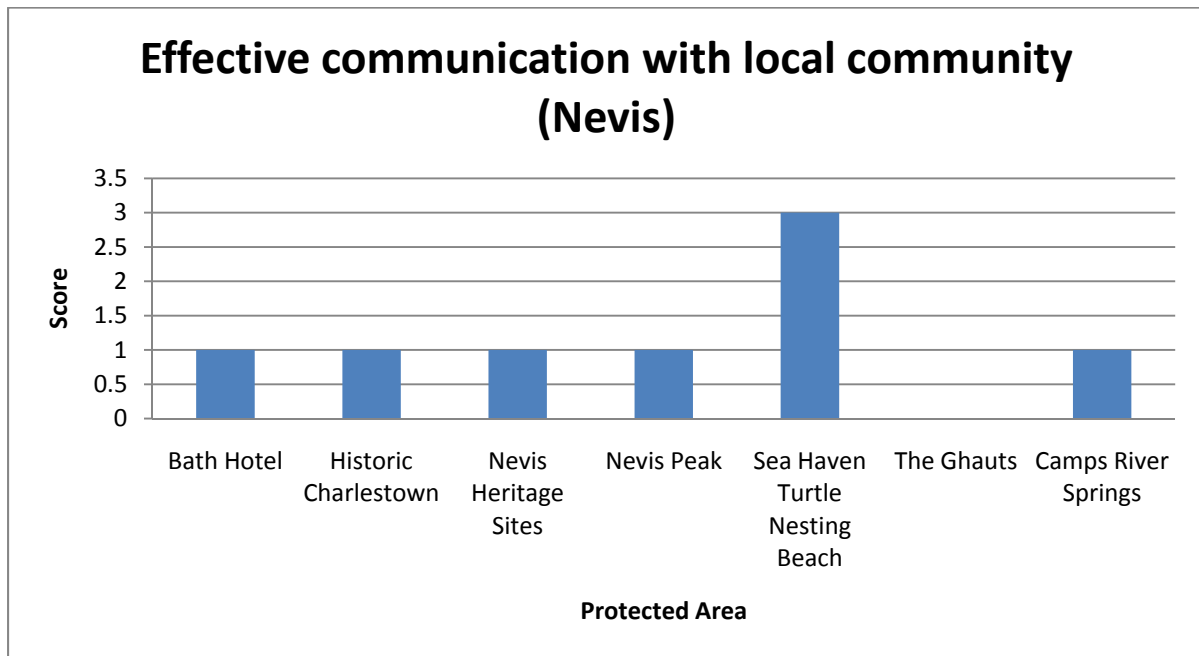


FIGURE C-54A: EFFECTIVE COMMUNICATION WITH LOCAL COMMUNITY (NEVIS)

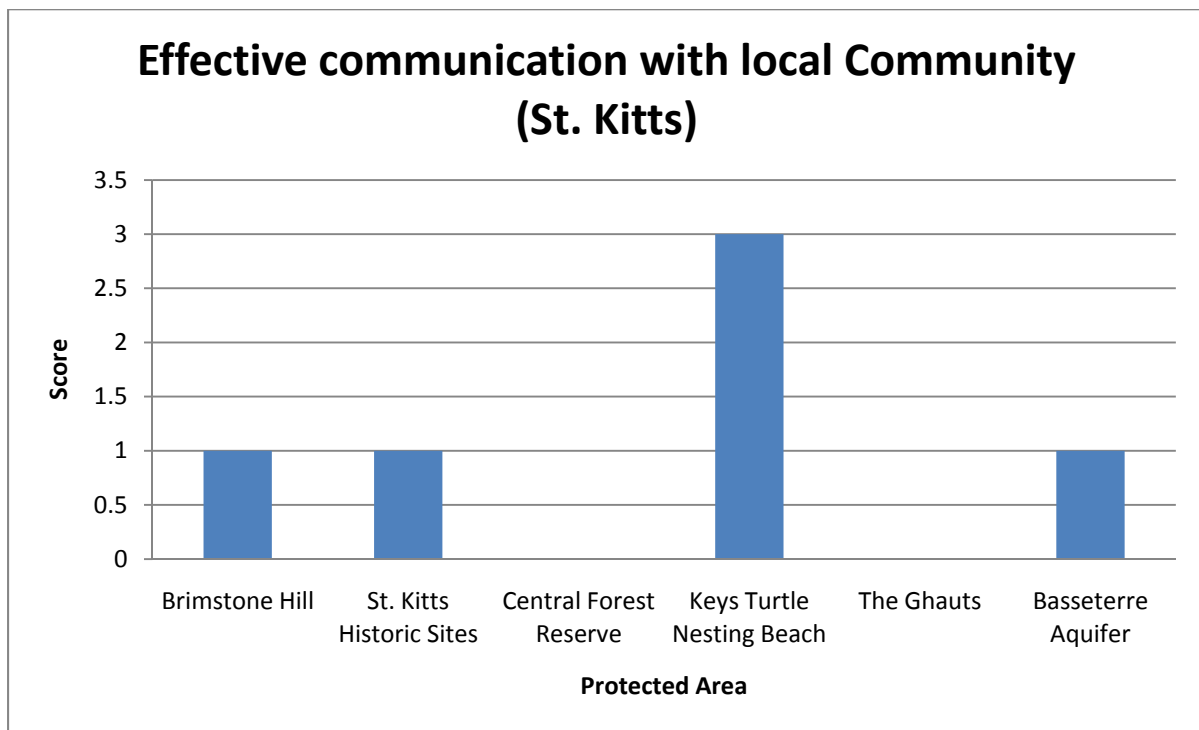


FIGURE C-54B; EFFECTIVE COMMUNICATION WITH LOCAL COMMUNITY (ST. KITTS)

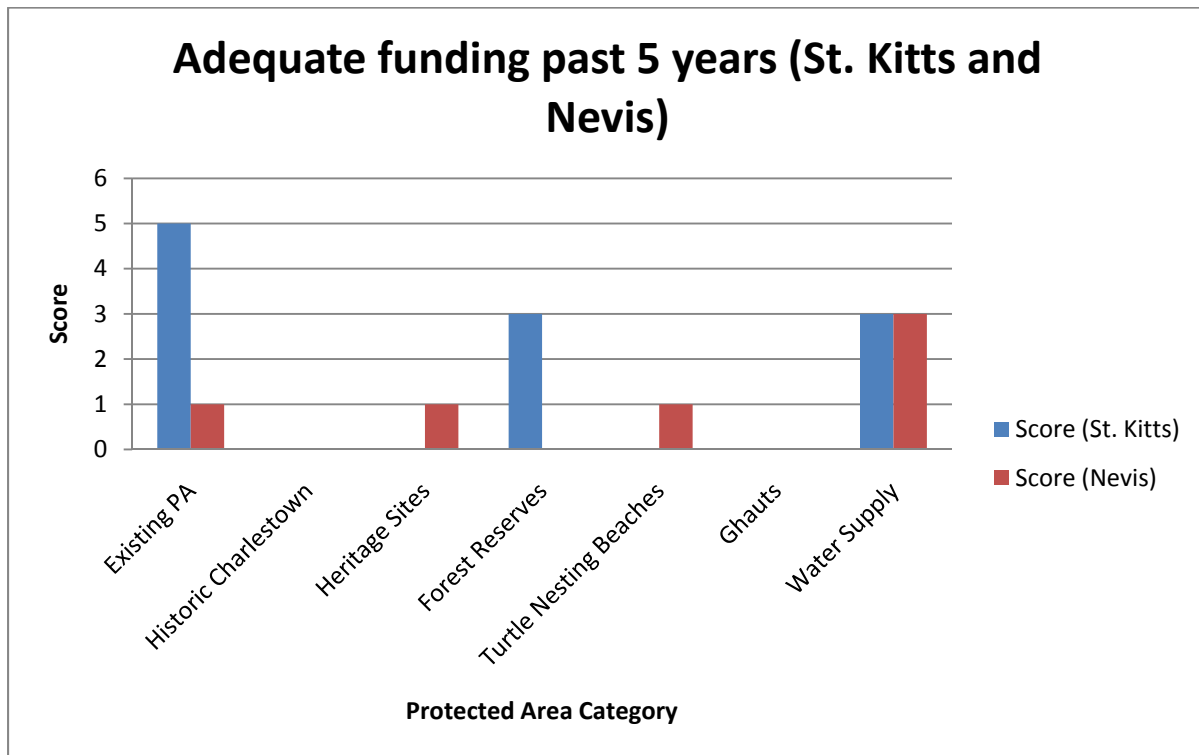


FIGURE C-55: ADEQUATE FUNDING PAST 5 YEARS (ST. KITTS AND NEVIS)

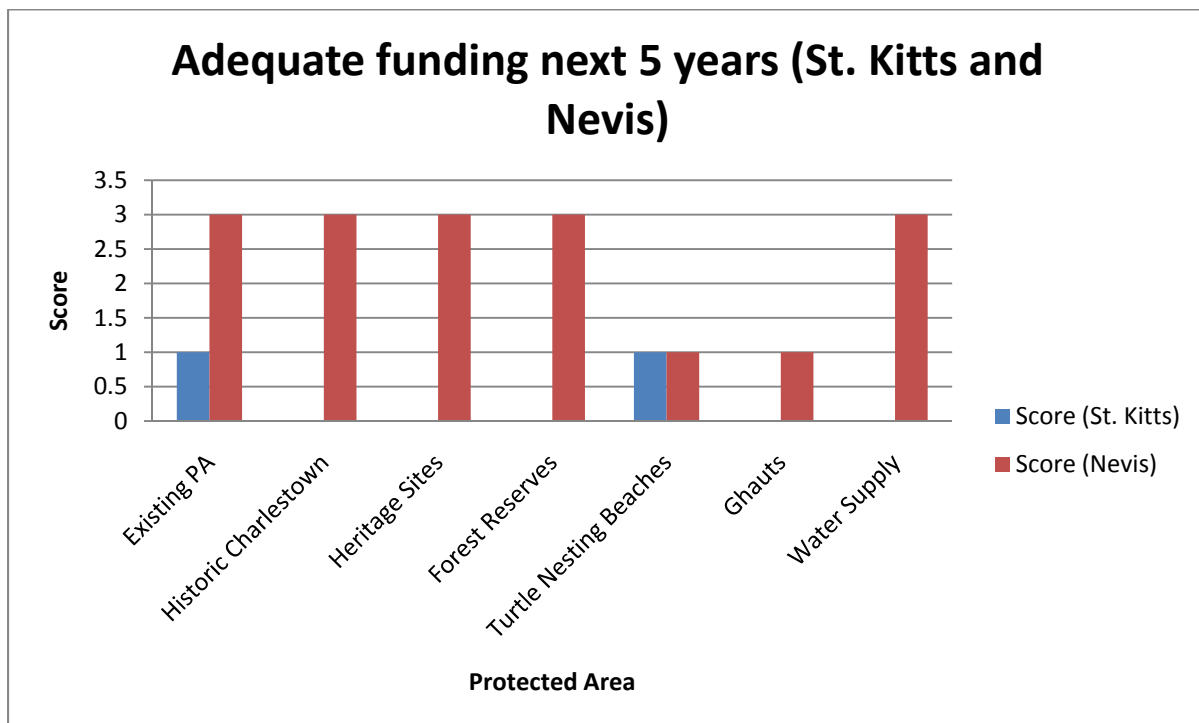


FIGURE C-56: ADEQUATE FUNDING NEXT 5 YEARS (ST. KITTS AND NEVIS)

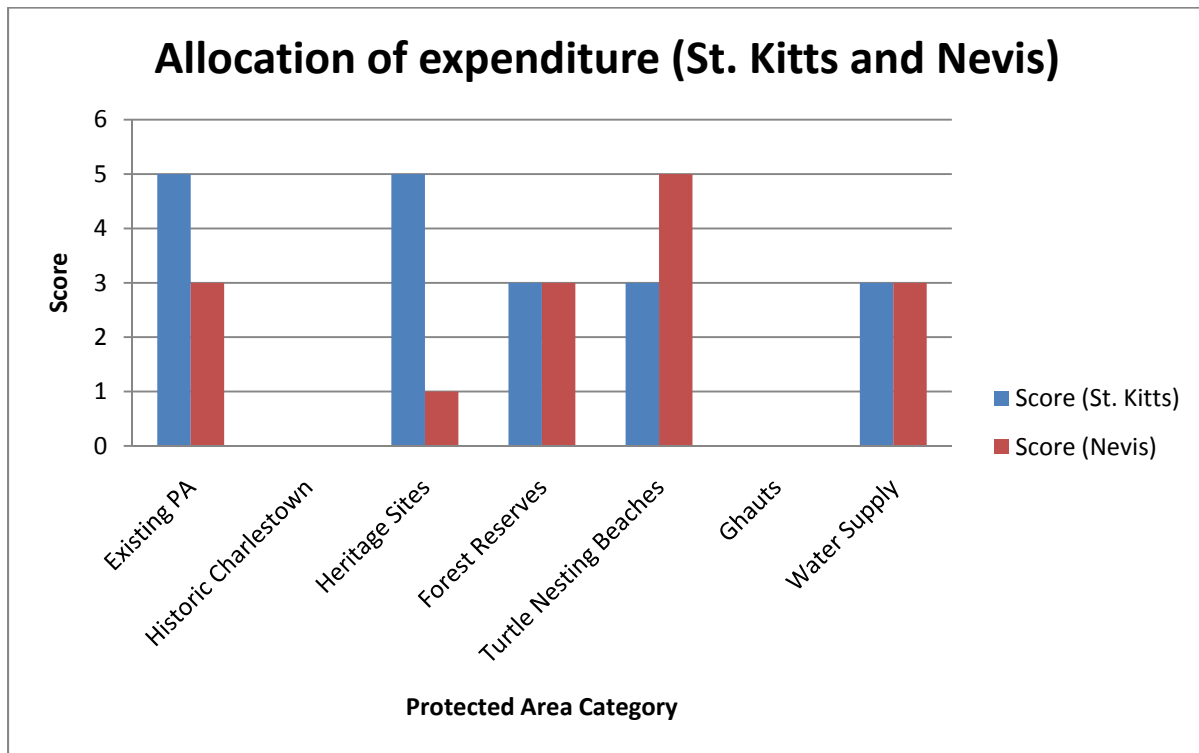


FIGURE C-57: ALLOCATION OF EXPENDITURE (ST. KITTS AND NEVIS)

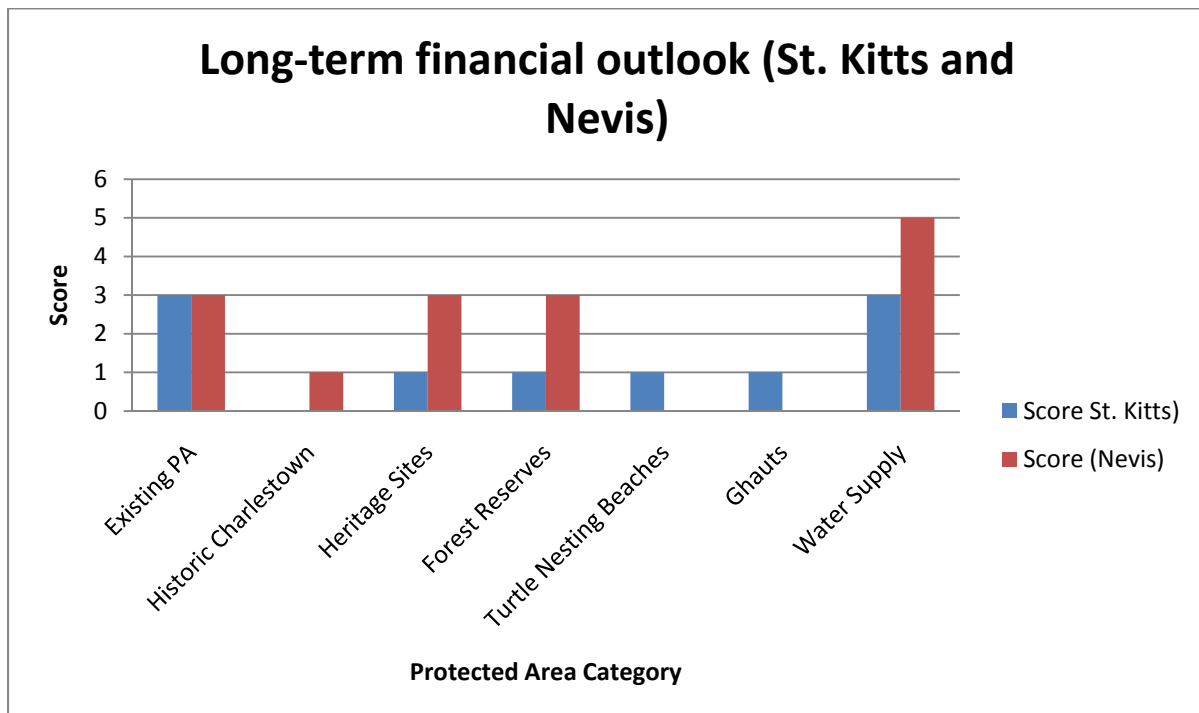
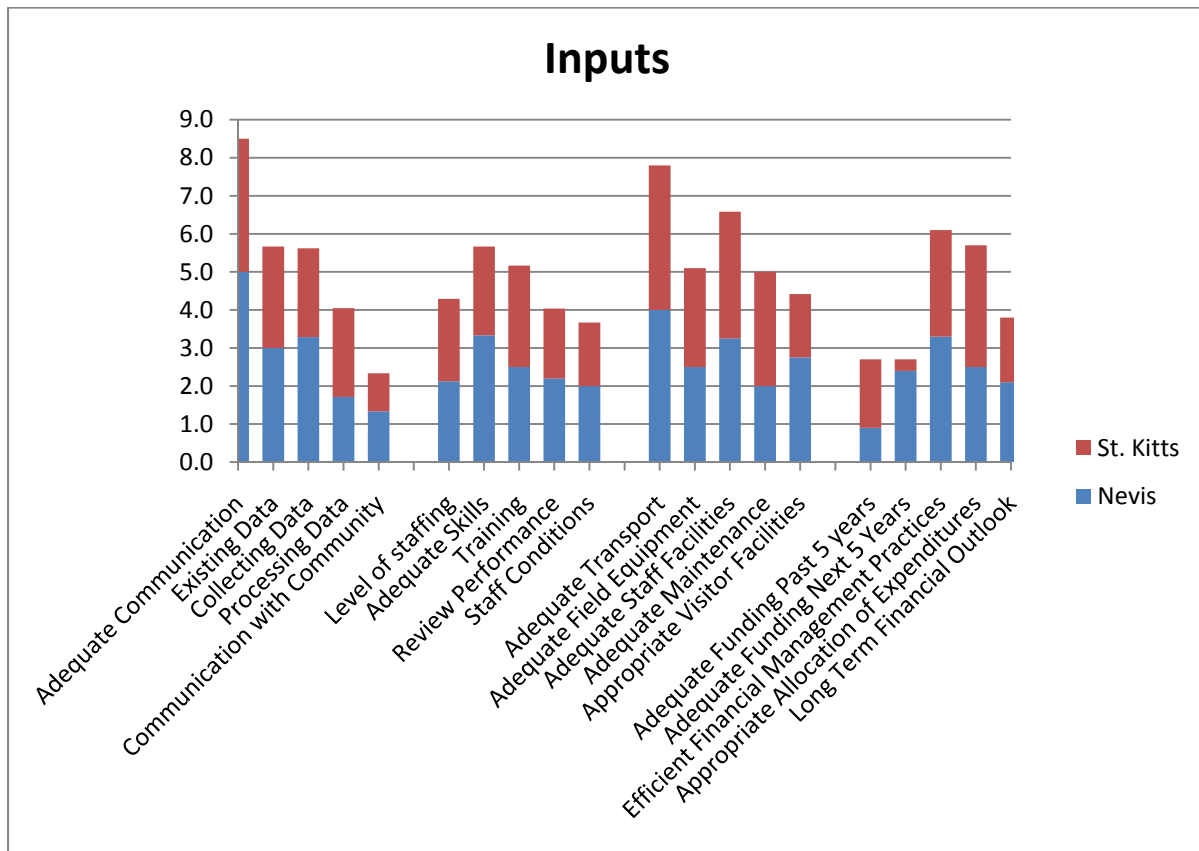


FIGURE C-58: LONG TERM FINANCIAL OUTLOOK (ST. KITTS AND NEVIS)



C-59: SUMMARY OF INPUTS

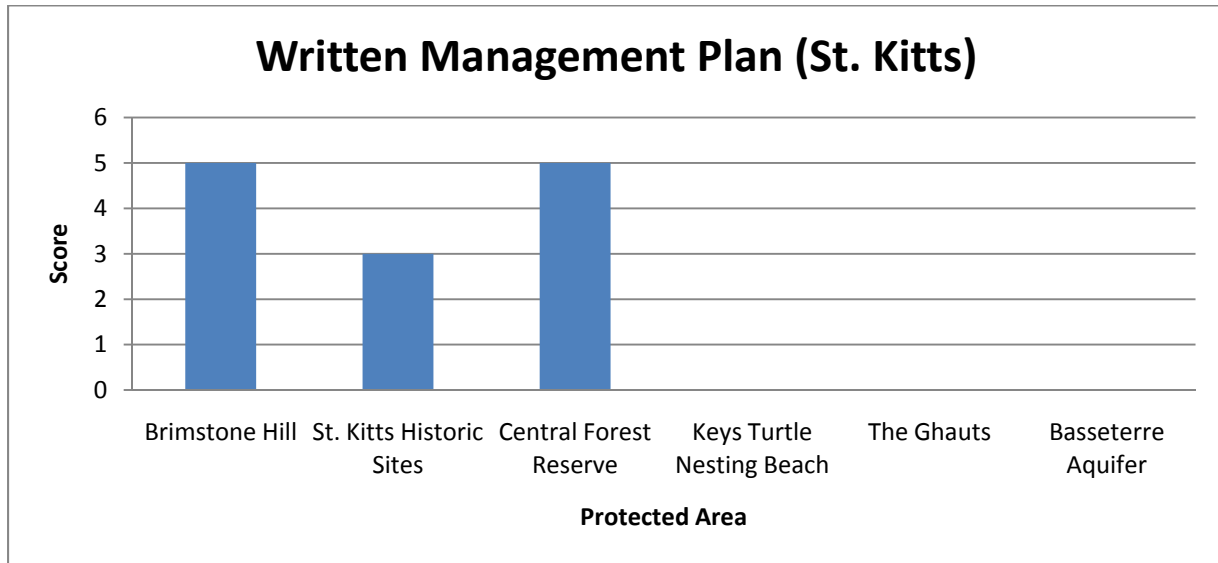


FIGURE C-60A: WRITTEN MANAGEMENT PLAN (ST. KITTS)

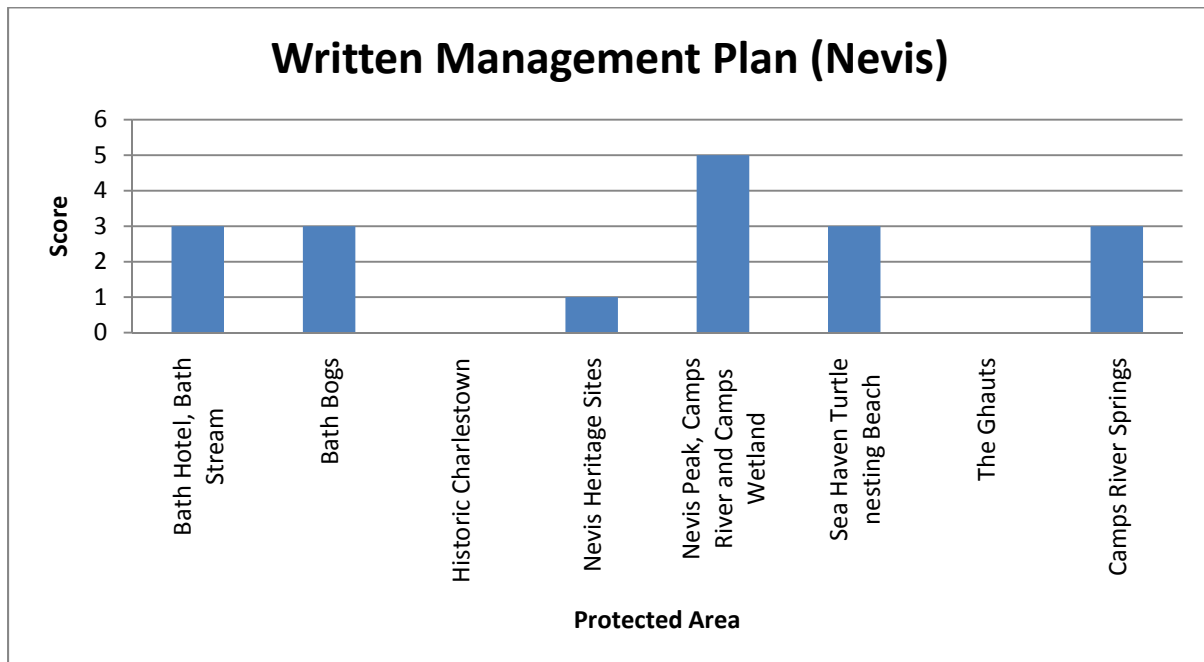


FIGURE C-60B: WRITTEN MANAGEMENT PLAN (NEVIS)

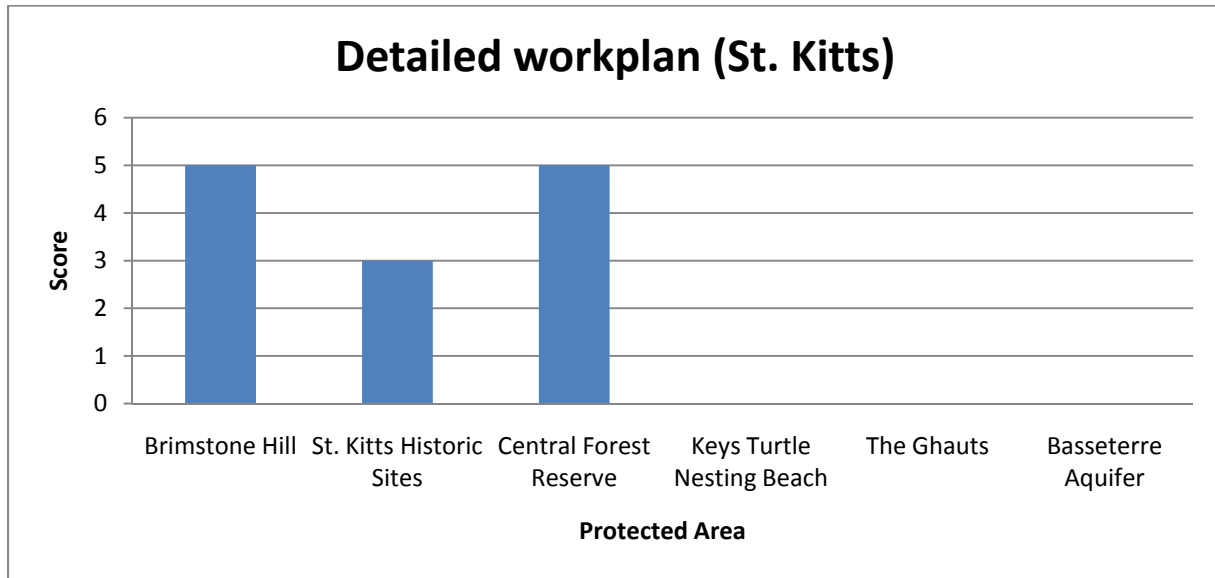


FIGURE C-61A: DETAILED WORKPLAN (ST. KITTS)

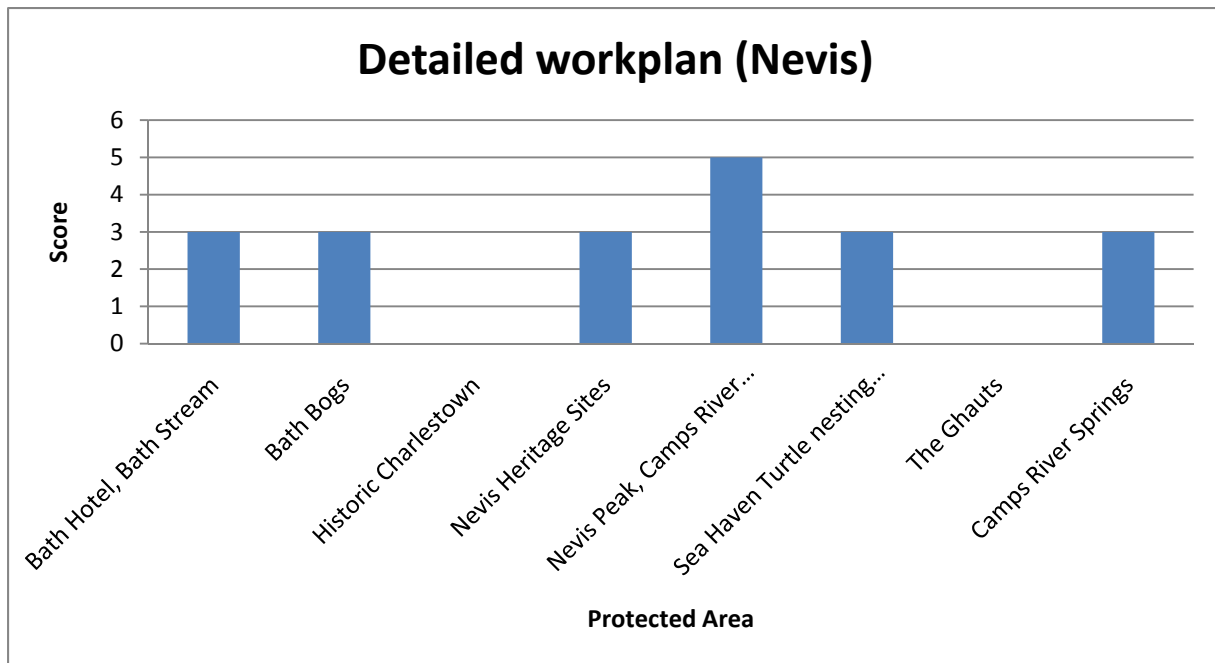


FIGURE C-61B: DETAILED WORKPLAN (NEVIS)

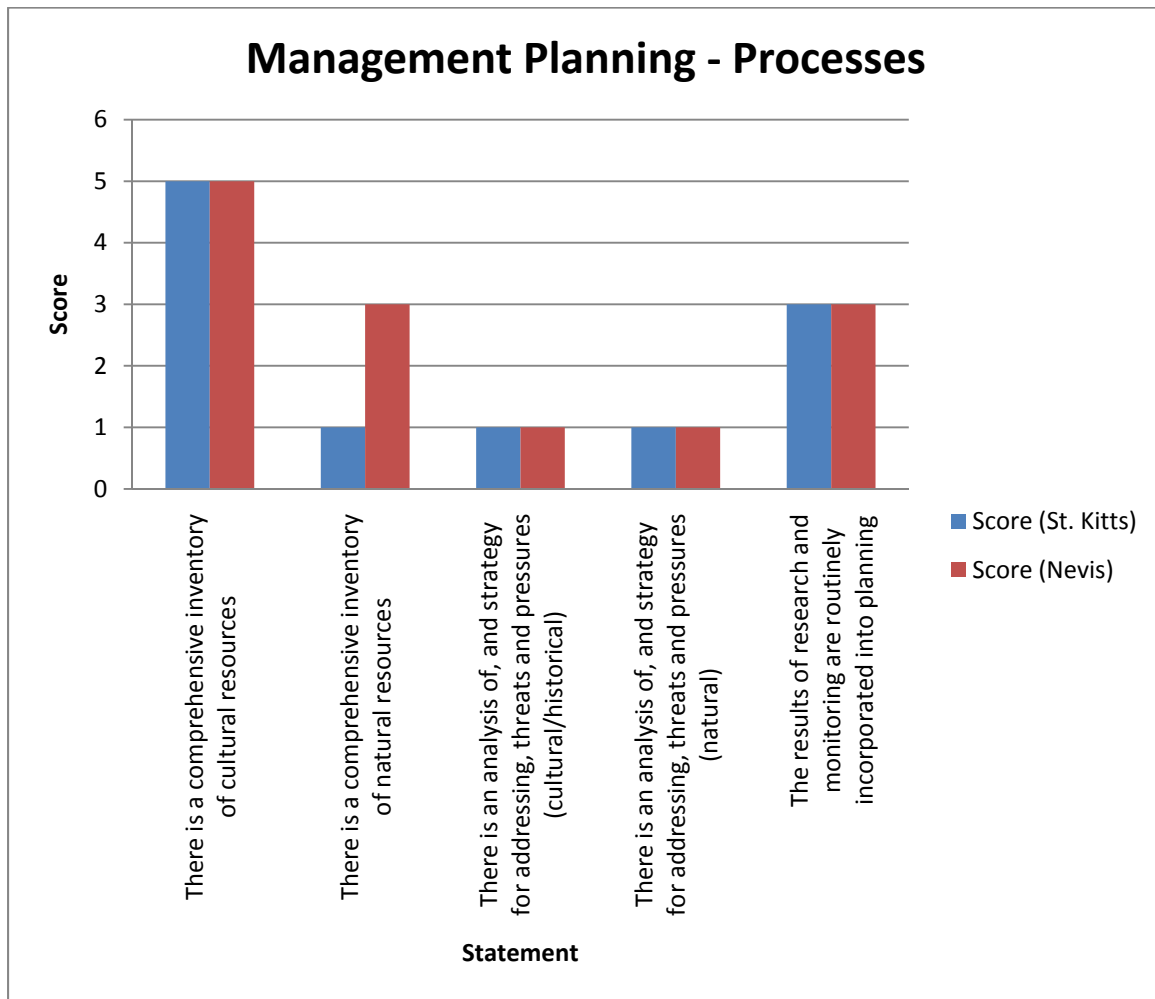


FIGURE C-62: MANAGEMENT PLANNING PROCESSES (ST. KITTS AND NEVIS)

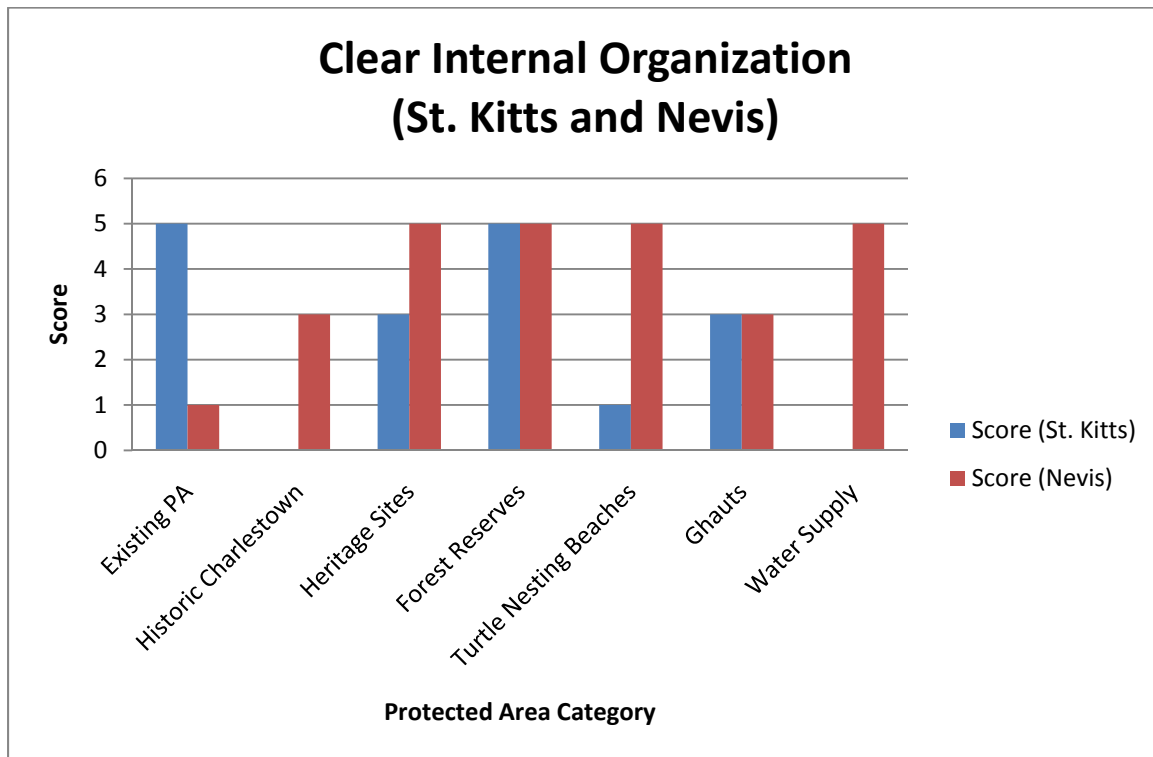


FIGURE C-63: CLEAR INTERNAL ORGANIZATION (ST. KITTS AND NEVIS)

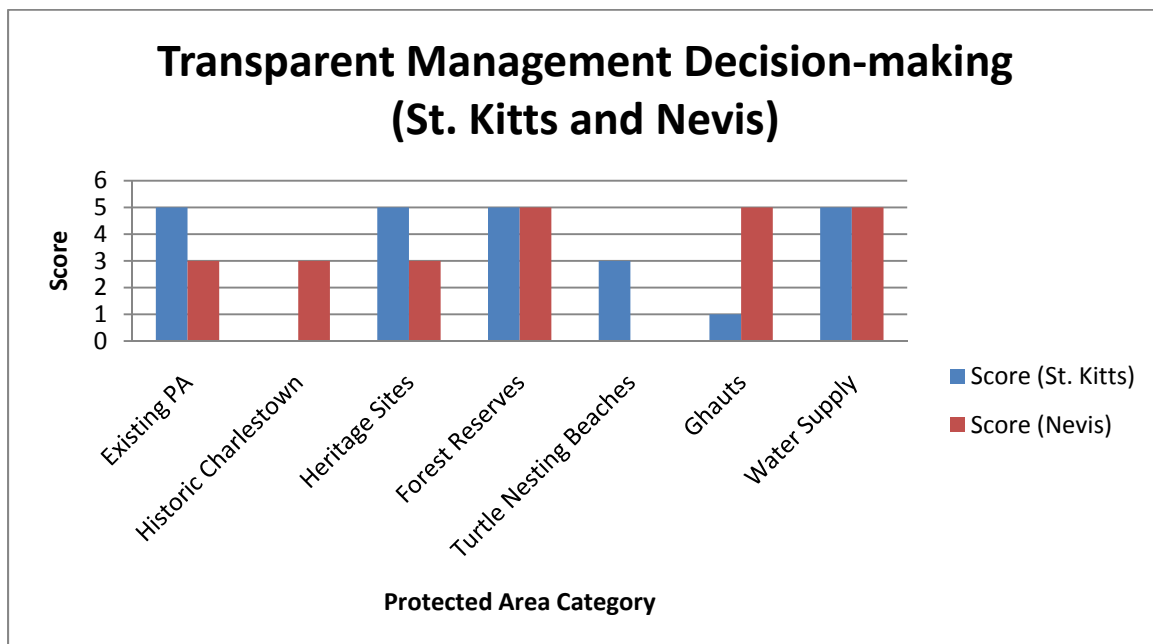


FIGURE C-64: TRANSPARENT DECISION MAKING (ST. KITTS AND NEVIS)

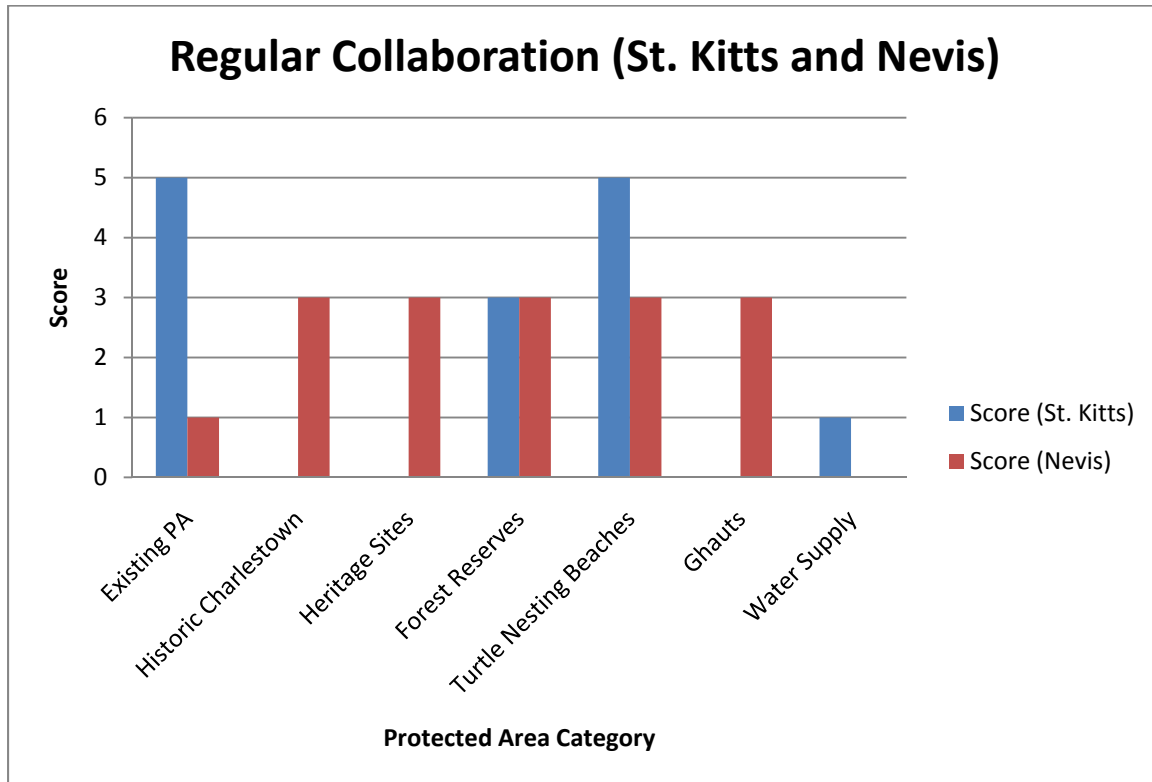


FIGURE C-65: REGULAR COLLABORATION (ST. KITTS AND NEVIS)

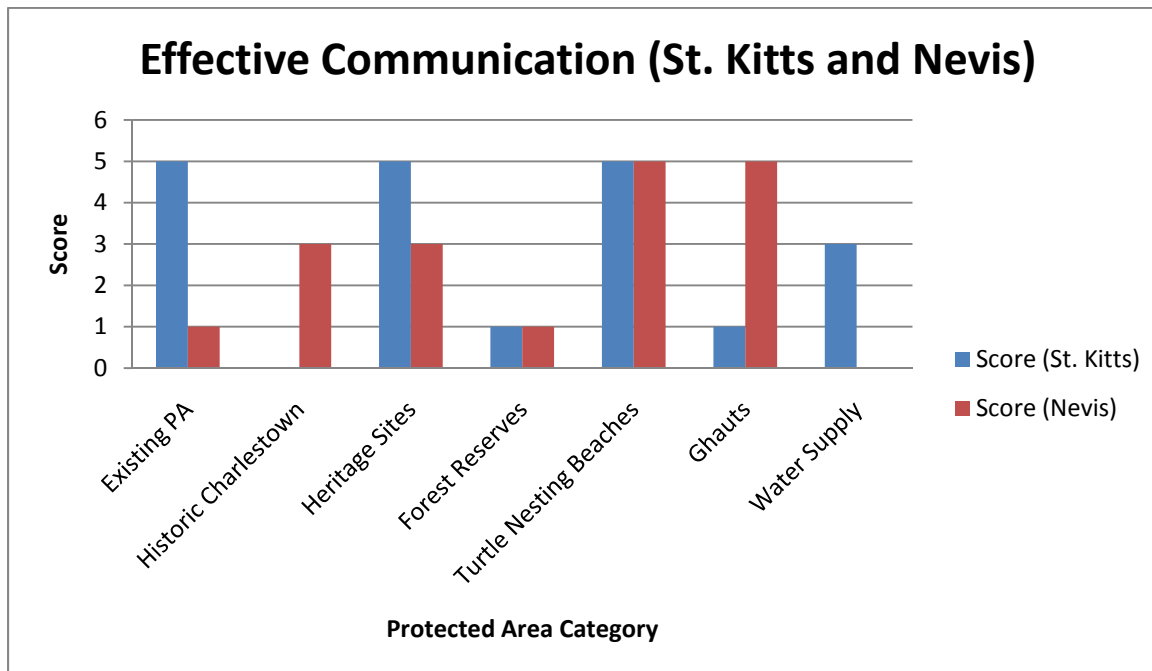
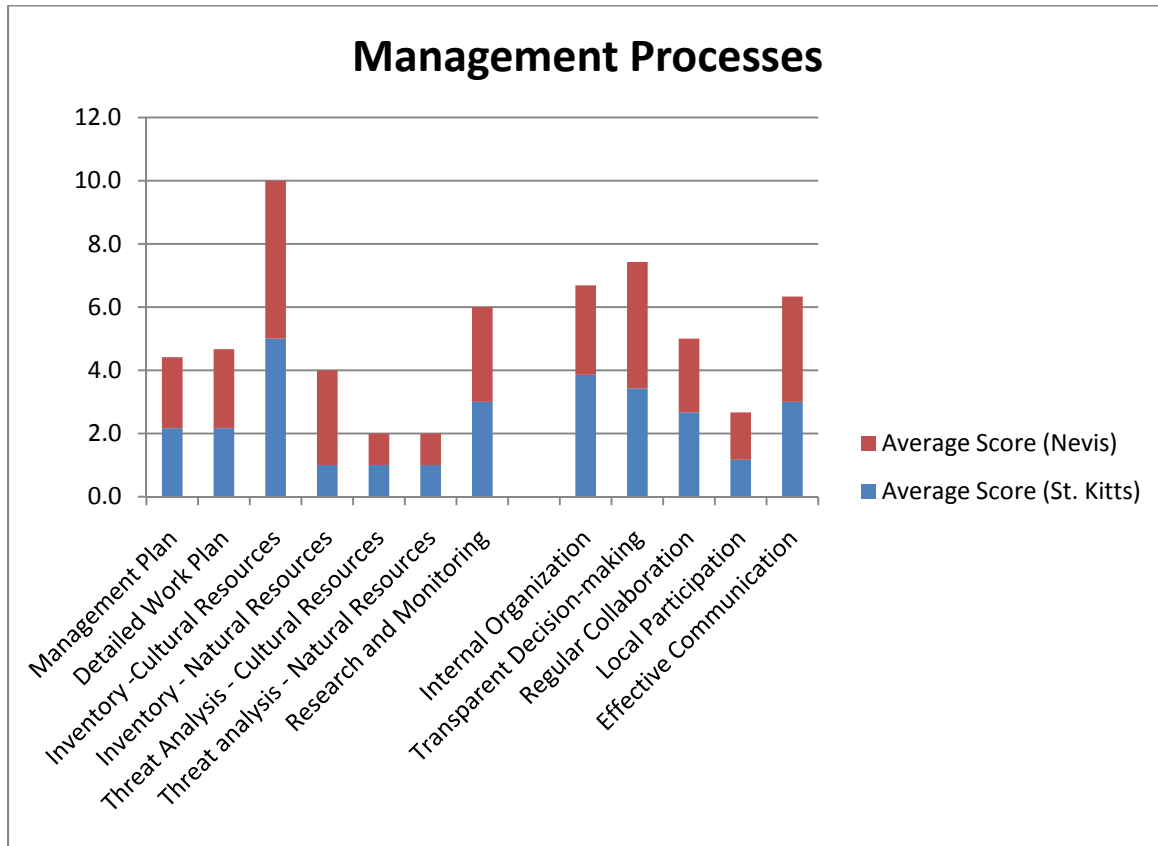


FIGURE C-66: EFFECTIVE COMMUNICATION (ST. KITTS AND NEVIS)



C-67: SUMMARY OF MANAGEMENT PROCESSES



APPENDIX D

NOTES OF FINAL CONSULTATION MEETINGS

APPENDIX D:

NOTES OF FINAL CONSULTATION MEETINGS

CONSULTATION MEETING WITH NICE / ST. KITTS STAKEHOLDERS

MARCH 01, 2010

Present were:

The attendance register for this meeting is included as an attachment to these notes.

Ecoengineering Consultants Limited:

Ms. Debbie Reyes, Study Manager

Dr. George Sammy, Study Director

Presentation:

Ecoengineering presented the draft Systems Plan report in the form of a Power Point Presentation (attached).

Discussion:

The following were the comments and questions asked during the discussion session of the meeting:

1. There is a development proposed for Cockleshell Bay which includes a marina. The EIA for this development is before the Development Control Committee. Ecoengineering can take a look at this document at Physical Planning Department.
2. Great Salt Pond will also be opened to the sea since the connection between Little Salt Pond and Great Salt Pond will be permanently opened and there is the marina proposed for Little Salt Pond.
3. There is the potential for some of the sites located on private land to be operated as Private Protected Areas such as at Spooner's Ginnery.
4. Sky Safaris has a Zip Lining facility just below the Central Forest Reserve (CFR). A portion of their fees will be set aside for protected areas. The owners/operators of Sky Safaris are waiting on the management agency for the CFR to be formed for these funds to be disbursed.

5. It was agreed that one of the critical actions for the CFR is the demarcation of the boundaries. In the first instance, it was suggested that main access ways such as roadways and trails should be clearly marked where they enter the CFR. Areas where private lands abut the CFR should also be demarcated.
6. The area around Nag's Head is private land so it will be difficult to enforce a buffer beyond what already exists for developments close to cliffs.
7. There are areas of dry woodland on the S. E. Peninsula that should be protected as "dry forest".
8. Keys Turtle Nesting Beach will also be afforded some protection if the application under the "Man and the Biosphere" project is approved.
9. There is an attempt to make the beach "ecotourist friendly" by the construction of boardwalks etc. An EIA for these infrastructure works is required.
10. The horseback riding on the beach is still occurring. The beach has also been identified as a nesting site for the Least Tern.
11. Ghauts are still being used for illegal agriculture as well as for illegal dumping.
12. There is also some mention of the use of a couple of Ghauts for dams.
13. Some suggestions for businesses willing to invest in protected areas included a 5 cent return on investment and a levy on businesses as a source of funding for the Environmental Trust Fund.
14. At present St. Kitts and Nevis has three levies which can be considered environmental:
 - a. Environmental Levy (airport)
 - b. Levy on the importation of used cars
 - c. Levy on the importation of plastic bottles and cans

CONSULTATION MEETING WITH NEVIS STAKEHOLDERS

MARCH 02, 2010 (AM)

Present were:

The attendance register for this meeting is included as an attachment to these notes.

Ecoengineering Consultants Limited:

Ms. Debbie Reyes, Study Manager

Dr. George Sammy, Study Director

Presentation:

Ecoengineering presented the draft Systems Plan report in the form of a Power Point Presentation (attached).

Discussion:

The following were the comments and questions asked during the discussion session of the meeting:

1. The Nevis Peak Management Plan has already been finalized.
2. A comment was made that Government constantly over rules the decisions of the Planning Department. All tourism and communication projects are sent to Cabinet for a decision.
3. Fort Charles at Bath should be included in the Protected Areas System. It was suggested that the site be taken back from the existing owners and given to the Crown.
4. The following new developments may have some bearing on the Protected Areas Systems Plan:
 - a. Indian Castle – Hotel and Golf Course excluding Amerindian sites
 - b. Jones Bay, Tamarind Bay area – Breakwater type marina
 - c. Charlestown – lease of Government lands which will affect the Custom's House
 - d. Madden's – Wind farm with 3 turbines
 - e. Sea Bridge – pier being extended
 - f. Sea haven – marina
 - g. Camps River – Villa Development (80 rooms on 16 acres)
5. It was suggested that the Agriculture Department be included as one of the management agencies for Nevis Peak and New River.
6. An impact assessment on the Nevis quarries has been conducted. This document can be provided to Ecoengineering by the Planning Department.
7. It was noted that sedimentation from quarries near Eden Ground and New River Ghauts has resulted in negative impacts on the nearshore marine environment.

8. Mention was made of the Marine Protected Areas study being conducted by The Nature Conservancy.
9. It was suggested that the NHCS be responsible for historic sites only and that the Government manage environmental sites.
10. There is existing construction of houses above the 1000 foot contour on Nevis Peak.
11. It was also noted that trees have been cleared at the Nelson's Springs.
12. It was acknowledged that there was a lack of enforcement of development laws.

CONSULTATION MEETING WITH ST. KITTS STAKEHOLDERS

MARCH 02, 2010 (PM)

Present were:

The attendance register for this meeting is included as an attachment to these notes.

Ecoengineering Consultants Limited:

Ms. Debbie Reyes, Study Manager

Dr. George Sammy, Study Director

Presentation:

Ecoengineering presented the draft Systems Plan report in the form of a Power Point Presentation (attached).

Discussion:

The following were the comments and questions asked during the discussion session of the meeting:

1. The St. Christopher Heritage Society is now the St. Christopher National Trust.
2. It is recommended that any “dry forest” identified on the S. E. Peninsula should be incorporated into the management structure on the S. E. peninsula and not with the Central Forest Reserve as recommended in the Protected Areas Systems Plan Report.
3. It is recommended that establishing the boundaries of the sites vested in the National Trust be given the highest priority and not just high priority as recommended in the Protected Areas Systems Plan Report.
4. It was noted that the draft NCEMA Act should become law soon.

CONSULTATION MEETING WITH DECISION MAKERS

MARCH 04, 2010

Present were:

The attendance register for this meeting is included as an attachment to these notes.

Ecoengineering Consultants Limited:

Ms. Debbie Reyes, Study Manager

Dr. George Sammy, Study Director

Presentation:

Ecoengineering presented the draft Systems Plan report in the form of a Power Point Presentation (attached).

Discussion:

The following were the comments and questions asked during the discussion session of the meeting:

1. It was noted that St. Kitts and Nevis along with 4 other OECS territories were involved in a Sustainable Financing Mechanism for Marine Protected Areas.
2. The remaining money from the existing GEF FAF allocation will be used to establish a Caribbean biodiversity Fund. TNC is also expected to contribute to the fund.
3. It was also noted that each country would have to set up a National Trust Fund. It was also stated that returns from investment will be used to finance MPAs. The project is now at the Preparation Grant Stage.
4. The main requirement for the countries to access this funding is to declare Marine Management areas.
5. The Basseterre Aquifer project also has a Trust Fund component. It is recommended that these two Trust Fund initiatives be merged with what is proposed for NCEMA.
6. Government is in the process of setting up a Compliance Unit to look at such issues as squatting, illegal dumping, sand mining, deforestation etc. This Unit is being headquartered at the Department of Agriculture.
7. There are a number of residential areas around ghauts that are threatened by illegal sand mining.

8. There should be a project to document the history and significance of historic sites throughout St. Kitts even if these sites are not immediately able to be included in the Protected Areas System.
9. The Sugar Factory should be considered for inclusion. It is presently used for storage but a recommendation that it be set up as a museum has been made in the past. There are some issues related to use such as asbestos in the roofing materials.



ANNEX

**LISTS OF ATTENDEES &
POWERPOINT PRESENTATIONS**

MARCH 01 (PM) ST. KITTS STAKEHOLDERS

CONSULTATION ON DRAFT PROTECTED AREAS SYSTEMS PLAN

ECOENGINEERING CARIBBEAN LIMITED
MARCH 01 & 02, 2010



RATIONALE

- Recognition of importance of establishing protected areas as the primary method of preserving biodiversity
- Puts St. Kitts and Nevis in line with other OECS member states which also have Systems Plans in place
- As a means to integrate conservation and sustainable use of biological diversity and cultural heritage into relevant sectoral plans, programmes and policies

OBJECTIVES OF PA PLAN

- Present a practical time-frame specific phased approach to implementation of PA System
- Provide full range of required resources and capacity building for establishing and managing system
- Recommend means of financing the implementation of plan
- Indicate level of priority for each proposed system component
- Provide proposed boundaries of sites being proposed

STUDY TEAM

- Dr. George Sammy, Study Director / Environmental Engineer
- Ms. Debbie Reyes, Study Manager / Environmental Scientist
- Mr. Jan Meerman, Protected Areas Specialist

LIMITATIONS

- Unavailability of data on biological diversity
- Limitation of site visits
- Unclear rationale for consideration of specific sites
- Timing of parallel OECS studies

Notwithstanding the above, the available information provides a basis for preparing an Initial Systems Plan.

HOW DID WE GET HERE?

- Contracted by OECS in December 2008
- Inception Report and Workplan
- Review of data
- Site visits
- Workshops
- Data analysis
- Consultation

FRAMEWORK

- Laws – mainly NCEPA, 1987 & NCEMA, 2009
- International conventions - mainly CBD
- OPAAL
- Basis for consideration
 - IUCN classification System
 - NCEMA classification system
 - Tourism Masterplan classification system for historic sites
- Linkage with other national planning initiatives

A GENTLE REMINDER

NCEMA does not envisage a single level of protection for all sites. It offers a range of conservation levels, as follows:

- **Category I: National Parks** (managed to protect resources, with use permitted on a controlled basis)
- **Category II: Historic Sites** (managed to preserve historic, cultural and archaeological sites, with use permitted on a controlled basis)
- **Category III: Nature Reserves** (protect resources in an undisturbed state, with only scientific research and educational studies permitted)
- **Category IV: Marine Reserves** (managed for protection of flora and fauna, preservation of breeding grounds, etc; scientific research permitted, but exploitive use is not)
- **Category V: Areas of Special Concern** (special protection to stabilize or restore ecological features or functions, with controlled use permitted)
- **Category VI: Scenic Sites** (scenic feature of national or local importance)
- **Category VII: Botanic Gardens** (for preservation, display and propagation of national botanical resources).

SITES OR CLASSES OF SITES CONSIDERED

- Brimstone Hill Fortress National Park
- Central Forest Reserve National Park
- Nevis Peak National Park and Camps River Watershed
- Basseterre Valley Aquifer National Park
- Marine Areas
- Turtle Nesting Beaches
- Salt Ponds
- Freshwater Lagoons
- The Ghauts
- Dry Forest
- Historic Charlestown
- Other Historic Sites

PROPOSED COORDINATING BODY

Chairman - NICE (National Implementation Coordinating Entity)
 Deputy Chairman - NICE (National Implementation Coordinating Entity)
 Co-Ordinator - Ex Officio

Members

- Department of Physical Planning and Environment (St. Kitts)
- Physical Planning Department (Nevis)
- Water Department (St. Kitts)
- Water Department (Nevis)
- Department of Tourism (St. Kitts)
- Nevis Tourism Authority (Nevis)
- Nevis Historical and Conservation Society
- St. Christopher Heritage Society

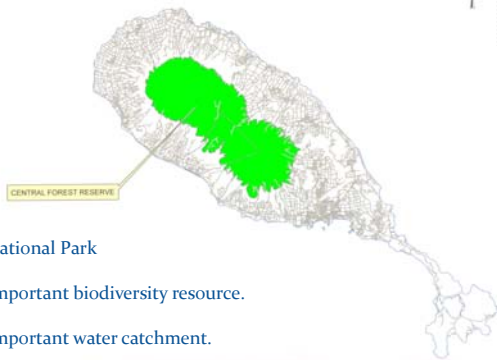
BRIMSTONE HILL



SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|--|---|
| BRIMSTONE HILL FORTRESS NATIONAL PARK | |
| Area / Layout | The hill and a quarter-mile buffer |
| NCEMA categories | National Park (Category I) |
| Management Agency | Brimstone Hill Fortress National Park Society |
| Financial Strategies | User fees, Gov't Subvention Grants from int'l Donor Agencies Environmental Trust Fund |

CENTRAL FOREST RESERVE




National Park

- Important biodiversity resource.
- Important water catchment.
- Potentially an important tourism asset.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|---|--|
| CENTRAL FOREST RESERVE NATIONAL PARK | |
| Area / Layout | Areas over 1,000 ft above msl |
| NCEMA categories | National Park (Category I) |
| Management Agency | Department of Physical Planning and Environment, Water Dep't & Dep't of Tourism |
| Financial Strategies | Public service salaries, user fees and Gov't subventions Environmental Trust Fund |

NEVIS PEAK AND CAMPS RIVER



National Park

- Important biodiversity resource.
- Important water catchment.
- Potentially an important tourism asset.

Note: This Study recommends amalgamation of this Marine Area with Southeast Peninsula Marine Area.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|---|--|
| NEVIS PEAK AND CAMPS RIVER NATIONAL PARK | |
| Area / Layout | Areas over 1,000 ft above msl and extending down the Camps River to the coast. |
| NCEMA categories | National Park (Category I) |
| Management Agency | Nevis Planning Dep't, Nevis Water Dep't and Nevis Tourism Authority |
| Financial Strategies | Public service salaries, user fees and Gov't subventions Environmental Trust Fund |

BASSETERRE VALLEY AQUIFER




National Park / Botanic Garden
 Potential biodiversity resource.
 Important water catchment.
 Potentially an important tourism asset.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|---|--|
| BASSETERRE VALLEY AQUIFER NATIONAL PARK | |
| Area / Layout | 197 ha east of Basseterre and west of Conaree Hills |
| NCEMA categories | National Park (Category I), Botanic Gardens (Category VII) |
| Management Agency | Proposed Basseterre Project Steering Committee |
| Financial Strategies | User fees, grants from donor agencies and Gov't subventions Environmental Trust Fund |

SE PENINSULA AND THE NARROWS

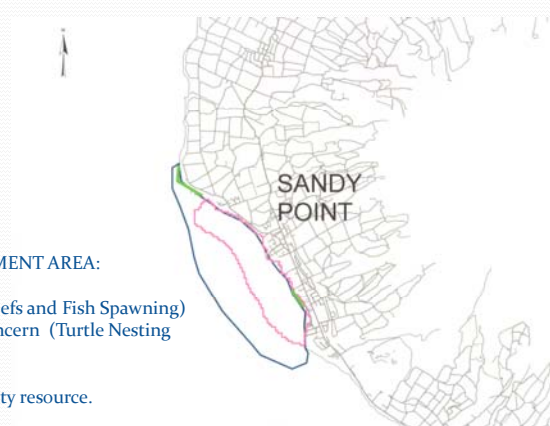


MARINE MANAGEMENT AREA:

- Marine Reserve (lobster spawning grounds)
- Nature Reserve (Nags Head & Booby Island)
- Areas of Special Concern (Turtle Nesting Beaches)

Important biodiversity resource.
 Important tourism asset.

SANDY POINT MARINE AREA



MARINE MANAGEMENT AREA:

- Marine Reserve (Reefs and Fish Spawning)
- Areas of Special Concern (Turtle Nesting Beaches)

Important biodiversity resource.
 Important tourism asset.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|------------------------|--|
| MARINE PROTECTED AREAS | |
| Area / Layout | S. E. Peninsula and The Narrows Sandy Point Marine Management Area |
| NCEMA categories | Marine Reserves (Category IV) Nature Reserves (Category III) Areas of Special Concern (Category V) |
| Management Agency | Fisheries Departments of both islands |
| Financial Strategies | Public service salaries, User fees , Grants from donor agencies and Environmental Trust Fund |

KEYS TURTLE NESTING BEACH



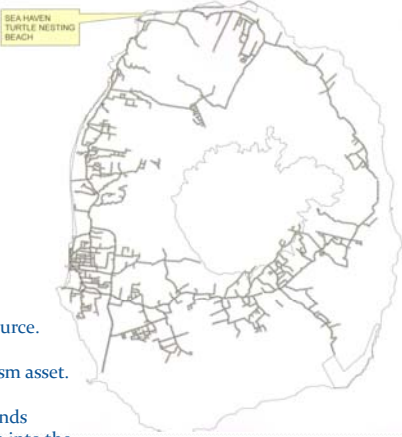
KEYS TURTLE NESTING BEACH

Areas of Special Concern
(Turtle Nesting Beaches)

Important biodiversity resource.

Potentially important tourism asset.

SEA HAVEN TURTLE NESTING BEACH



SEA HAVEN TURTLE NESTING BEACH

Areas of Special Concern
(Turtle Nesting Beaches)

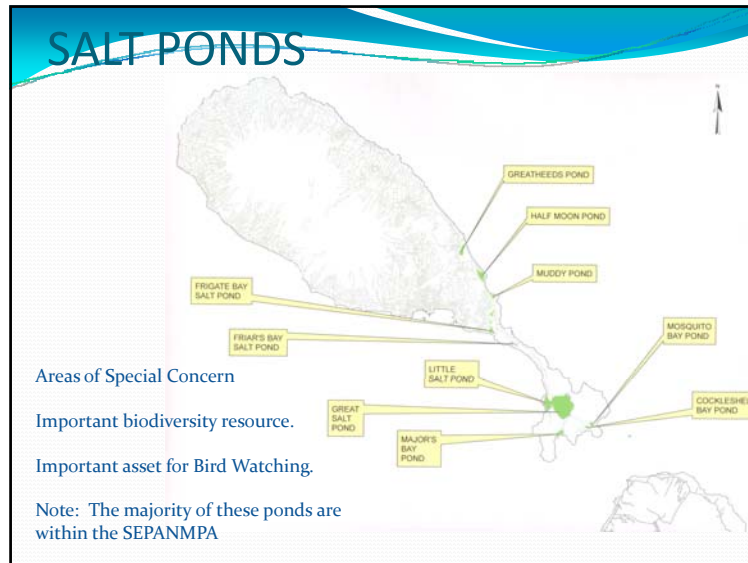
Important biodiversity resource.

Potentially important tourism asset.

Note: This Study recommends amalgamation of this Beach into the SEPANMPA

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|------------------------|---|
| TURTLE NESTING BEACHES | |
| Area / Layout | Included in S. E. Peninsula and Sandy Point MPAs Keys Turtle Nesting Beach |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Fisheries Departments of both islands |
| Financial Strategies | Public service salaries, User fees |



RECOMMENDATIONS FOR SALT PONDS

This study recommends different strategies for different Salt Ponds:

- **Frigate Bay Pond and Half Moon Pond** are recommended for clean-up and enhancement.
- **Other Ponds on the Southeast Peninsula** should be preserved as salt ponds (development controls).
- **Greatheeds Pond and Muddy Pond** should be preserved as sediment sinks (development controls).
- **Little Salt Pond, Great Salt Pond and Major's Bay Pond** were not included in the study, as they have already been granted Permission for alternative development.

SYSTEMS PLAN PROPOSALS


| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| SALT PONDS | |
| Area / Layout | Included in S. E. Peninsula MPA, other locations in St. Kitts |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Dep't of Physical Planning and Environment, St. Kitts |
| Financial Strategies | Public service salaries, Grants from donor agencies and Environmental Trust Fund |



SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| FRESHWATER LAGOONS | |
| Area / Layout | Included in Nevis Peak and Camps River National Park, other locations in Nevis |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Nevis Dep't of Physical Planning and Environment and Nevis Water Department |
| Financial Strategies | Public service salaries |

ST. KITTS GHAUTS



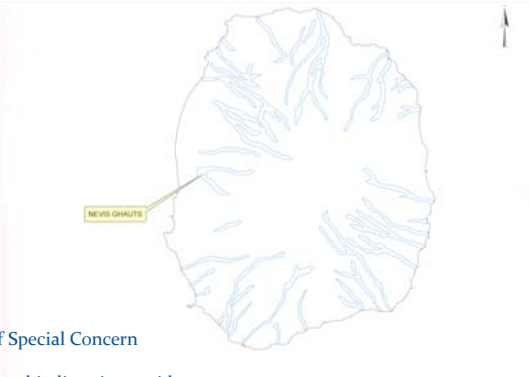
Areas of Special Concern

Important biodiversity corridors.

Important source of sand for construction.

Note: Strategic Impact Assessment is recommended.

NEVIS GHAUTS

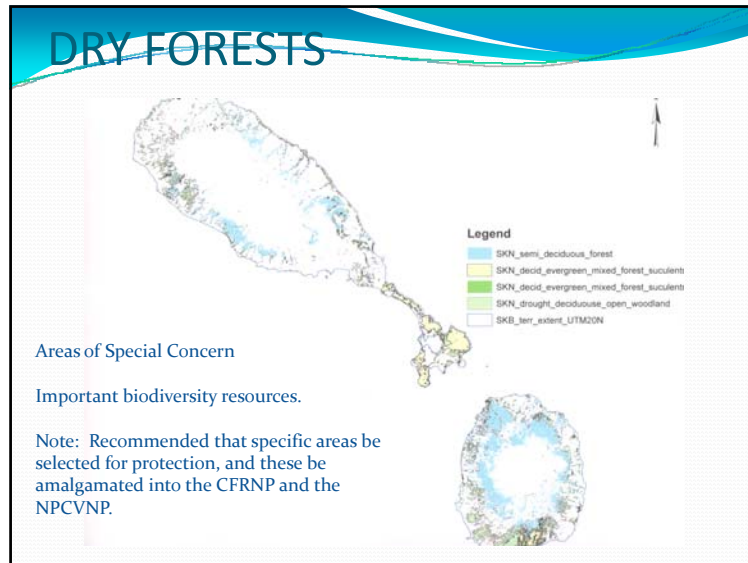


Areas of Special Concern

Important biodiversity corridors.

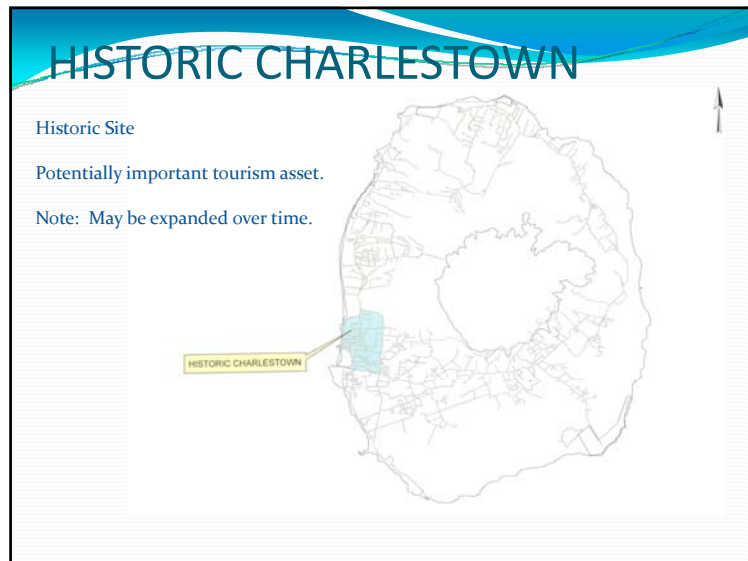
SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|---|
| THE GHAUTS | |
| Area / Layout | Throughout St. Kitts and Nevis |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Department of Physical Planning (both islands) Ministry of works (St. Kitts) for legal sand mining |
| Financial Strategies | Public service salaries, Gov't subvention, International donor agencies |



SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| DRY FORESTS | |
| Area / Layout | Included in Brimstone Hill Fortress National Park, A new area on the S. E. Peninsula of St. Kitts to be included in CFRNP, Included in Nevis Peak and Camps River National Park. |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Brimstone Hill Fortress National Park Society Nevis Planning Department Department of Physical Planning and Environment (St. Kitts) |
| Financial Strategies | Public service salaries, User fees and Gov't subventions, Grants from donor agencies and Environmental Trust Fund |



SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| HISTORIC CHARLESTOWN | |
| Area / Layout | Within Town of Charlestown |
| NCEMA categories | Historic site (Category II) |
| Management Agency | Nevis Planning department, NHCS |
| Financial Strategies | Public service salaries, Gov't subventions, Grants from donor agencies and Environmental Trust Fund User fees may be considered |

OTHER HISTORIC SITES

Historic Sites / Scenic Site (Black Rocks)

Potentially important tourism assets.

Note: More detailed evaluation is needed on each specific site.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| OTHER HISTORIC SITES | |
| Area / Layout | Throughout both islands |
| NCEMA categories | Historic Sites (Category II) Scenic Sites (Category VI) |
| Management Agency | St. Kitts Tourism Dep't Nevis Tourism Authority SCHC (later SCNT) and NHCS |
| Financial Strategies | Public service salaries, Gov't subventions, Grants from donor agencies and Environmental Trust Fund (User fees may be considered) |

HIGHEST PRIORITY ITEMS

As soon as practical:

- Accept Systems Plan.
- Declare Nevis Peak and Basseterre Aquifer as National Parks.
- Revise the Management Plan for the Central Forest Reserve.
- Revise the Management Plan for the Nevis Peak and Camps River Watershed.
- Complete the Management Plan for the Basseterre Valley Aquifer National Park.

HIGHEST PRIORITY ITEMS (CONT'D)

As soon as practical:

- Declare Booby Island as a Nature Reserve.
- Determine extent of Nag's Head Nesting Site.
- Determine the boundaries of fish and shellfish propagation areas to be included in the SEP NMPA.
- Declare Keys Turtle Nesting Beach (St. Kitts) as a beach of "Special Concern".
- Declare Sea Haven Turtle Nesting Beach (Nevis) as a beach of "Special Concern".

HIGHPRIORITY ITEMS

Within 3 years:

- Adjust the Admission Fees for the BHFNP.
- Declare Nag's Head as a Nature Reserve.
- Clean up and enhance Frigate Bay and Half Moon Pond
- Determine the extent of a suitable area of dry forest on the S. E. Peninsula.
- Establish the boundaries of fish and shellfish propagation areas to be included in the SPMMA.

HIGHPRIORITY ITEMS (CONT'D)

- Declare the SEPMPA and SPMMA as Marine Protected Areas.
- Review regulations on closed season for turtle harvesting (moratorium on all harvesting of turtles and eggs).
- Declare Muddy Point Salt Pond and Greatheeds Pond as protected areas (no additional development).
- Assess structures at Spooner's Ginnery, Mansions Estate, Belmont Estate, Indian Castle and Fort Ashby.

MEDIUMPRIORITY ITEMS

Within 5 years:

- Conduct a Strategic Environmental Impact Assessment to identify specific locations for legal sand mining.
- Amalgamate areas of dry forest into the CFRNP.
- Restore New River Estate (trails and associated infrastructure).
- Vest Spooners Estate and Ginnery, Mansion Estate Yard, Belmont Estate Yard and Stone Fort Petroglyphs in the National Trust of St. Kitts.

WHERE DO WE GO FROM HERE?

- Receive comments on Draft Plan from:
 - NICE
 - Stakeholders
- Clarification regarding "A Management Plan for the Proposed National Park in the Basseterre Valley"
- Finalize the Systems Plan
- Seek Cabinet approval of Plan

WHERE DO WE GO FROM HERE?

Once Cabinet has approved the Systems Plan:

- Implement Organizational Arrangements
- Fine tune the Prioritization of Individual Sites
- Train Staff
- Conduct Further Studies
- Periodically update the Systems Plan (3 years then every 5 years)

OPEN FLOOR DISCUSSION

- Please state your name and organization

MARCH 02 (AM) NEVIS STAKEHOLDERS

CONSULTATION MEETING ON
SKN SYSTEMS PLAN MARCH 02, 2010

| NAME | ORGANISATION | EMAIL CONTACT |
|-------------------------|---|---|
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| Tilton Douglas | Department of Physical Planning | tiltondouglas@yahoo.com |
| CARL Williams | Ministry of Tourism | mike@Niagara.com |
| Angela Watters-Delpeche | Dept of Planning | nevplan@yahoo.com |
| (Rene) Walters | Dept of Physical Planning Natural Res. & Env. | renewalters@gmail.com |
| ES. Anboston | DEPT. OF FISHERIES | mugabe@hotmail.com |
| Althea L. ARTHUR | Ministry of Agriculture, NERS | miu@niagsr.com or econplanning@yahoo.com |
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CONSULTATION ON DRAFT PROTECTED AREAS SYSTEMS PLAN

ECOENGINEERING CARIBBEAN LIMITED
MARCH 01 & 02, 2010



RATIONALE

- Recognition of importance of establishing protected areas as the primary method of preserving biodiversity
- Puts St. Kitts and Nevis in line with other OECS member states which also have Systems Plans in place
- As a means to integrate conservation and sustainable use of biological diversity and cultural heritage into relevant sectoral plans, programmes and policies

OBJECTIVES OF PA PLAN

- Present a practical time-frame specific phased approach to implementation of PA System
- Provide full range of required resources and capacity building for establishing and managing system
- Recommend means of financing the implementation of plan
- Indicate level of priority for each proposed system component
- Provide proposed boundaries of sites being proposed

STUDY TEAM

- Dr. George Sammy, Study Director / Environmental Engineer
- Ms. Debbie Reyes, Study Manager / Environmental Scientist
- Mr. Jan Meerman, Protected Areas Specialist

LIMITATIONS

- Unavailability of data on biological diversity
- Limitation of site visits
- Unclear rationale for consideration of specific sites
- Timing of parallel OECS studies

Notwithstanding the above, the available information provides a basis for preparing an Initial Systems Plan.

HOW DID WE GET HERE?

- Contracted by OECS in December 2008
- Inception Report and Workplan
- Review of data
- Site visits
- Workshops
- Data analysis
- Consultation

FRAMEWORK

- Laws – mainly NCEPA, 1987 & NCEMA, 2009
- International conventions - mainly CBD
- OPAAL
- Basis for consideration
 - IUCN classification System
 - NCEMA classification system
 - Tourism Masterplan classification system for historic sites
- Linkage with other national planning initiatives

A GENTLE REMINDER

NCEMA does not envisage a single level of protection for all sites. It offers a range of conservation levels, as follows:

- **Category I: National Parks** (managed to protect resources, with use permitted on a controlled basis)
- **Category II: Historic Sites** (managed to preserve historic, cultural and archaeological sites, with use permitted on a controlled basis)
- **Category III: Nature Reserves** (protect resources in an undisturbed state, with only scientific research and educational studies permitted)
- **Category IV: Marine Reserves** (managed for protection of flora and fauna, preservation of breeding grounds, etc; scientific research permitted, but exploitive use is not)
- **Category V: Areas of Special Concern** (special protection to stabilize or restore ecological features or functions, with controlled use permitted)
- **Category VI: Scenic Sites** (scenic feature of national or local importance)
- **Category VII: Botanic Gardens** (for preservation, display and propagation of national botanical resources).

SITES OR CLASSES OF SITES CONSIDERED

- Brimstone Hill Fortress National Park
- Central Forest Reserve National Park
- Nevis Peak National Park and Camps River Watershed
- Basseterre Valley Aquifer National Park
- Marine Areas
- Turtle Nesting Beaches
- Salt Ponds
- Freshwater Lagoons
- The Ghauts
- Dry Forest
- Historic Charlestown
- Other Historic Sites

PROPOSED COORDINATING BODY

Chairman - NICE (National Implementation Coordinating Entity)
 Deputy Chairman - NICE (National Implementation Coordinating Entity)
 Co-Ordinator - Ex Officio

Members

- Department of Physical Planning and Environment (St. Kitts)
- Physical Planning Department (Nevis)
- Water Department (St. Kitts)
- Water Department (Nevis)
- Department of Tourism (St. Kitts)
- Nevis Tourism Authority (Nevis)
- Nevis Historical and Conservation Society
- St. Christopher Heritage Society

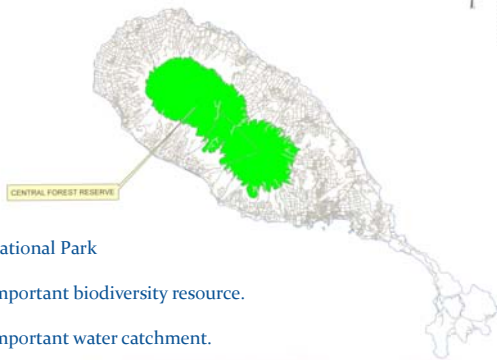
BRIMSTONE HILL



SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|--|---|
| BRIMSTONE HILL FORTRESS NATIONAL PARK | |
| Area / Layout | The hill and a quarter-mile buffer |
| NCEMA categories | National Park (Category I) |
| Management Agency | Brimstone Hill Fortress National Park Society |
| Financial Strategies | User fees, Gov't Subvention Grants from int'l Donor Agencies Environmental Trust Fund |

CENTRAL FOREST RESERVE



CENTRAL FOREST RESERVE

National Park

Important biodiversity resource.


Important water catchment.

Potentially an important tourism asset.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|---|--|
| CENTRAL FOREST RESERVE NATIONAL PARK | |
| Area / Layout | Areas over 1,000 ft above msl |
| NCEMA categories | National Park (Category I) |
| Management Agency | Department of Physical Planning and Environment, Water Dep't & Dep't of Tourism |
| Financial Strategies | Public service salaries, user fees and Gov't subventions Environmental Trust Fund |

NEVIS PEAK AND CAMPS RIVER



National Park

Important biodiversity resource.

Important water catchment.

Potentially an important tourism asset.

Note: This Study recommends amalgamation of this Marine Area with Southeast Peninsula Marine Area.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|---|--|
| NEVIS PEAK AND CAMPS RIVER NATIONAL PARK | |
| Area / Layout | Areas over 1,000 ft above msl and extending down the Camps River to the coast. |
| NCEMA categories | National Park (Category I) |
| Management Agency | Nevis Planning Dep't, Nevis Water Dep't and Nevis Tourism Authority |
| Financial Strategies | Public service salaries, user fees and Gov't subventions Environmental Trust Fund |

BASSETERRE VALLEY AQUIFER




National Park / Botanic Garden
 Potential biodiversity resource.
 Important water catchment.
 Potentially an important tourism asset.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|---|--|
| BASSETERRE VALLEY AQUIFER NATIONAL PARK | |
| Area / Layout | 197 ha east of Basseterre and west of Conaree Hills |
| NCEMA categories | National Park (Category I), Botanic Gardens (Category VII) |
| Management Agency | Proposed Basseterre Project Steering Committee |
| Financial Strategies | User fees, grants from donor agencies and Gov't subventions Environmental Trust Fund |

SE PENINSULA AND THE NARROWS

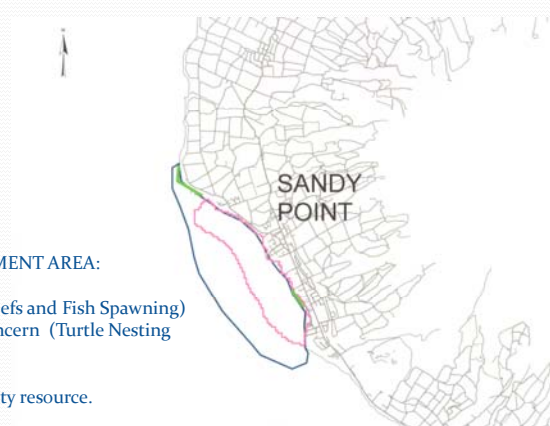


MARINE MANAGEMENT AREA:

- Marine Reserve (lobster spawning grounds)
- Nature Reserve (Nags Head & Booby Island)
- Areas of Special Concern (Turtle Nesting Beaches)

Important biodiversity resource.
 Important tourism asset.

SANDY POINT MARINE AREA



MARINE MANAGEMENT AREA:

- Marine Reserve (Reefs and Fish Spawning)
- Areas of Special Concern (Turtle Nesting Beaches)

Important biodiversity resource.
 Important tourism asset.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|------------------------|--|
| MARINE PROTECTED AREAS | |
| Area / Layout | S. E. Peninsula and The Narrows Sandy Point Marine Management Area |
| NCEMA categories | Marine Reserves (Category IV) Nature Reserves (Category III) Areas of Special Concern (Category V) |
| Management Agency | Fisheries Departments of both islands |
| Financial Strategies | Public service salaries, User fees , Grants from donor agencies and Environmental Trust Fund |

KEYS TURTLE NESTING BEACH

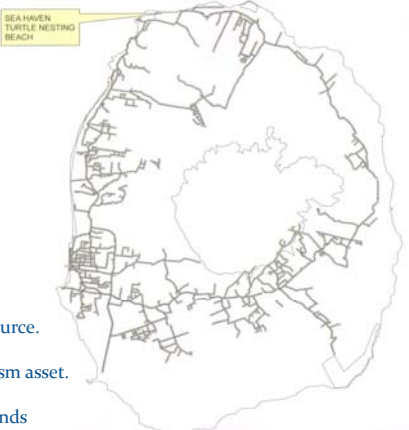


Areas of Special Concern
(Turtle Nesting Beaches)

Important biodiversity resource.

Potentially important tourism asset.

SEA HAVEN TURTLE NESTING BEACH



Areas of Special Concern
(Turtle Nesting Beaches)

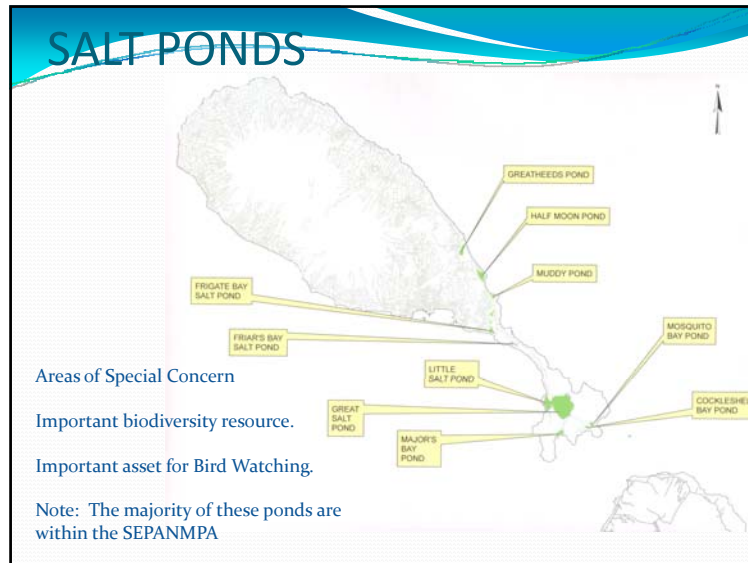
Important biodiversity resource.

Potentially important tourism asset.

Note: This Study recommends amalgamation of this Beach into the SEPANMPA

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|------------------------|---|
| TURTLE NESTING BEACHES | |
| Area / Layout | Included in S. E. Peninsula and Sandy Point MPAs Keys Turtle Nesting Beach |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Fisheries Departments of both islands |
| Financial Strategies | Public service salaries, User fees |



RECOMMENDATIONS FOR SALT PONDS

This study recommends different strategies for different Salt Ponds:

- **Frigate Bay Pond and Half Moon Pond** are recommended for clean-up and enhancement.
- **Other Ponds on the Southeast Peninsula** should be preserved as salt ponds (development controls).
- **Greatheeds Pond and Muddy Pond** should be preserved as sediment sinks (development controls).
- **Little Salt Pond, Great Salt Pond and Major's Bay Pond** were not included in the study, as they have already been granted Permission for alternative development.

SYSTEMS PLAN PROPOSALS


| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| SALT PONDS | |
| Area / Layout | Included in S. E. Peninsula MPA, other locations in St. Kitts |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Dep't of Physical Planning and Environment, St. Kitts |
| Financial Strategies | Public service salaries, Grants from donor agencies and Environmental Trust Fund |



SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| FRESHWATER LAGOONS | |
| Area / Layout | Included in Nevis Peak and Camps River National Park, other locations in Nevis |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Nevis Dep't of Physical Planning and Environment and Nevis Water Department |
| Financial Strategies | Public service salaries |

ST. KITTS GHAUTS



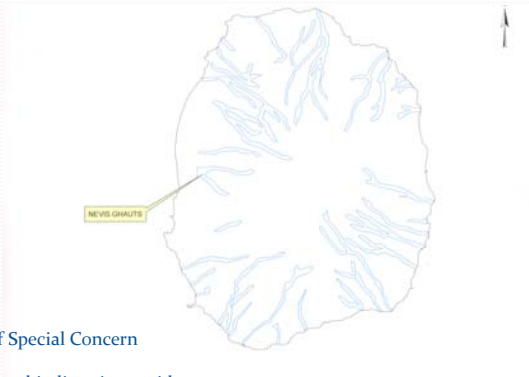
Areas of Special Concern

Important biodiversity corridors.

Important source of sand for construction.

Note: Strategic Impact Assessment is recommended.

NEVIS GHAUTS

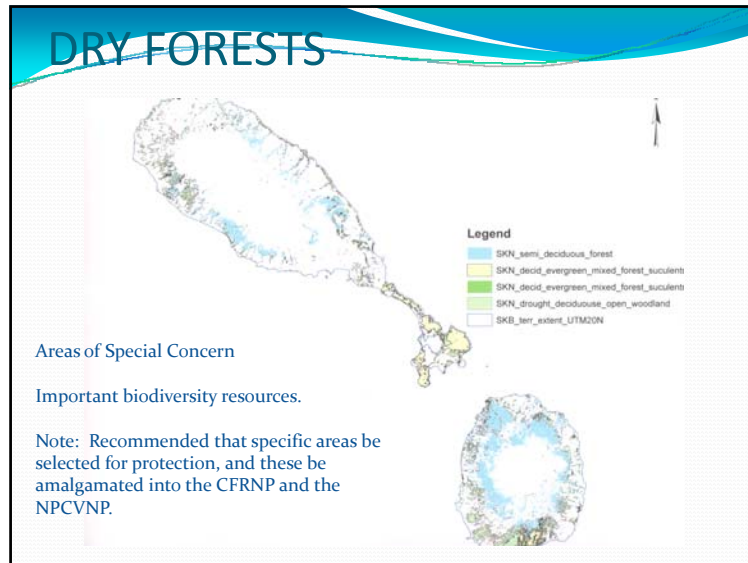


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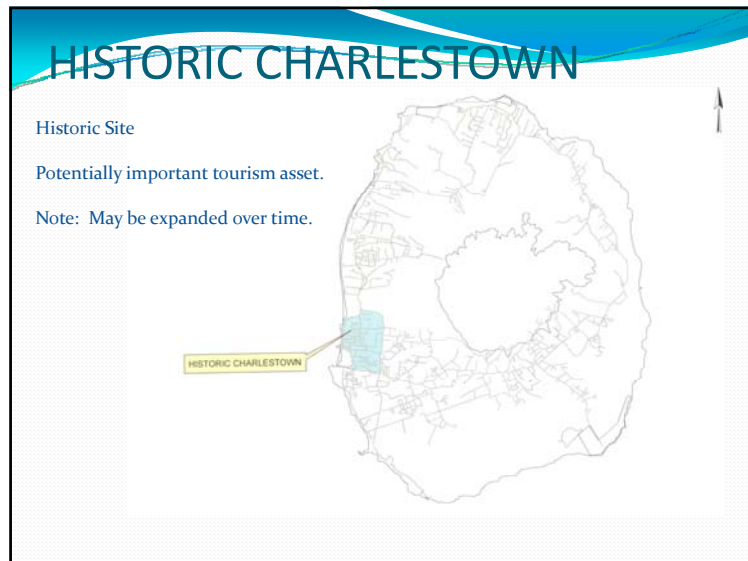
SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|---|
| THE GHAUTS | |
| Area / Layout | Throughout St. Kitts and Nevis |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Department of Physical Planning (both islands) Ministry of works (St. Kitts) for legal sand mining |
| Financial Strategies | Public service salaries, Gov't subvention, International donor agencies |



SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| DRY FORESTS | |
| Area / Layout | Included in Brimstone Hill Fortress National Park, A new area on the S. E. Peninsula of St. Kitts to be included in CFRNP, Included in Nevis Peak and Camps River National Park. |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Brimstone Hill Fortress National Park Society Nevis Planning Department Department of Physical Planning and Environment (St. Kitts) |
| Financial Strategies | Public service salaries, User fees and Gov't subventions, Grants from donor agencies and Environmental Trust Fund |



SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| HISTORIC CHARLESTOWN | |
| Area / Layout | Within Town of Charlestown |
| NCEMA categories | Historic site (Category II) |
| Management Agency | Nevis Planning department, NHCS |
| Financial Strategies | Public service salaries, Gov't subventions, Grants from donor agencies and Environmental Trust Fund User fees may be considered |

OTHER HISTORIC SITES

Historic Sites / Scenic Site (Black Rocks)

Potentially important tourism assets.

Note: More detailed evaluation is needed on each specific site.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| OTHER HISTORIC SITES | |
| Area / Layout | Throughout both islands |
| NCEMA categories | Historic Sites (Category II) Scenic Sites (Category VI) |
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HIGHEST PRIORITY ITEMS

As soon as practical:

- Accept Systems Plan.
- Declare Nevis Peak and Basseterre Aquifer as National Parks.
- Revise the Management Plan for the Central Forest Reserve.
- Revise the Management Plan for the Nevis Peak and Camps River Watershed.
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HIGHEST PRIORITY ITEMS (CONT'D)

As soon as practical:

- Declare Booby Island as a Nature Reserve.
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- Declare Keys Turtle Nesting Beach (St. Kitts) as a beach of "Special Concern".
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HIGHPRIORITY ITEMS

Within 3 years:

- Adjust the Admission Fees for the BHFNP.
- Declare Nag's Head as a Nature Reserve.
- Clean up and enhance Frigate Bay and Half Moon Pond
- Determine the extent of a suitable area of dry forest on the S. E. Peninsula.
- Establish the boundaries of fish and shellfish propagation areas to be included in the SPMMA.

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- Declare the SEPMPA and SPMMA as Marine Protected Areas.
- Review regulations on closed season for turtle harvesting (moratorium on all harvesting of turtles and eggs).
- Declare Muddy Point Salt Pond and Greatheeds Pond as protected areas (no additional development).
- Assess structures at Spooner's Ginnery, Mansions Estate, Belmont Estate, Indian Castle and Fort Ashby.

MEDIUMPRIORITY ITEMS

Within 5 years:

- Conduct a Strategic Environmental Impact Assessment to identify specific locations for legal sand mining.
- Amalgamate areas of dry forest into the CFRNP.
- Restore New River Estate (trails and associated infrastructure).
- Vest Spooners Estate and Ginnery, Mansion Estate Yard, Belmont Estate Yard and Stone Fort Petroglyphs in the National Trust of St. Kitts.

WHERE DO WE GO FROM HERE?

- Receive comments on Draft Plan from:
 - NICE
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- Clarification regarding "A Management Plan for the Proposed National Park in the Basseterre Valley"
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Once Cabinet has approved the Systems Plan:

- Implement Organizational Arrangements
- Fine tune the Prioritization of Individual Sites
- Train Staff
- Conduct Further Studies
- Periodically update the Systems Plan (3 years then every 5 years)

OPEN FLOOR DISCUSSION

- Please state your name and organization

MARCH 02 (PM) ST. KITTS STAKEHOLDERS

| PROTECTED AREAS SYSTEMS PLAN | | MARCH 02 ST. KITTS |
|------------------------------|----------------------------------|---------------------------------|
| NAME | ORGANISATION | EMAIL CONTACT |
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| Stuart Laplace | CLARENCE FITZROY BRYANT COLLEGE | STUARTLAPLACE@GMAIL.COM |
| Goldha Franks | St. Kitts Tourism Authority | goldha.franks@stkittstourism.kn |
| Kate Orchard | St. Christopher National Trust * | orchards@sistersisles.kn |
| Jacqueline Armony | ST. Christopher National Trust | schs@sistersisles.kn |
| | Old Treasury Building | Jackie@jalatuka.com |
| | National Museum | |
| | Bay Road | |
| | 465 5584 | |

CONSULTATION ON DRAFT PROTECTED AREAS SYSTEMS PLAN

ECOENGINEERING CARIBBEAN LIMITED
MARCH 01 & 02, 2010



RATIONALE

- Recognition of importance of establishing protected areas as the primary method of preserving biodiversity
- Puts St. Kitts and Nevis in line with other OECS member states which also have Systems Plans in place
- As a means to integrate conservation and sustainable use of biological diversity and cultural heritage into relevant sectoral plans, programmes and policies

OBJECTIVES OF PA PLAN

- Present a practical time-frame specific phased approach to implementation of PA System
- Provide full range of required resources and capacity building for establishing and managing system
- Recommend means of financing the implementation of plan
- Indicate level of priority for each proposed system component
- Provide proposed boundaries of sites being proposed

STUDY TEAM

- Dr. George Sammy, Study Director / Environmental Engineer
- Ms. Debbie Reyes, Study Manager / Environmental Scientist
- Mr. Jan Meerman, Protected Areas Specialist

LIMITATIONS

- Unavailability of data on biological diversity
- Limitation of site visits
- Unclear rationale for consideration of specific sites
- Timing of parallel OECS studies

Notwithstanding the above, the available information provides a basis for preparing an Initial Systems Plan.

HOW DID WE GET HERE?

- Contracted by OECS in December 2008
- Inception Report and Workplan
- Review of data
- Site visits
- Workshops
- Data analysis
- Consultation

FRAMEWORK

- Laws – mainly NCEPA, 1987 & NCEMA, 2009
- International conventions - mainly CBD
- OPAAL
- Basis for consideration
 - IUCN classification System
 - NCEMA classification system
 - Tourism Masterplan classification system for historic sites
- Linkage with other national planning initiatives

A GENTLE REMINDER

NCEMA does not envisage a single level of protection for all sites. It offers a range of conservation levels, as follows:

- **Category I: National Parks** (managed to protect resources, with use permitted on a controlled basis)
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SITES OR CLASSES OF SITES CONSIDERED

- Brimstone Hill Fortress National Park
- Central Forest Reserve National Park
- Nevis Peak National Park and Camps River Watershed
- Basseterre Valley Aquifer National Park
- Marine Areas
- Turtle Nesting Beaches
- Salt Ponds
- Freshwater Lagoons
- The Ghauts
- Dry Forest
- Historic Charlestown
- Other Historic Sites

PROPOSED COORDINATING BODY

Chairman - NICE (National Implementation Coordinating Entity)
 Deputy Chairman - NICE (National Implementation Coordinating Entity)
 Co-Ordinator - Ex Officio

Members

- Department of Physical Planning and Environment (St. Kitts)
- Physical Planning Department (Nevis)
- Water Department (St. Kitts)
- Water Department (Nevis)
- Department of Tourism (St. Kitts)
- Nevis Tourism Authority (Nevis)
- Nevis Historical and Conservation Society
- St. Christopher Heritage Society

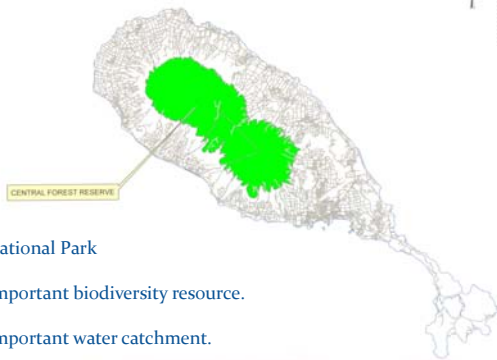
BRIMSTONE HILL



SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|---------------------------------------|---|
| BRIMSTONE HILL FORTRESS NATIONAL PARK | |
| Area / Layout | The hill and a quarter-mile buffer |
| NCEMA categories | National Park (Category I) |
| Management Agency | Brimstone Hill Fortress National Park Society |
| Financial Strategies | User fees, Gov't Subvention Grants from int'l Donor Agencies Environmental Trust Fund |

CENTRAL FOREST RESERVE



CENTRAL FOREST RESERVE

National Park

Important biodiversity resource.


Important water catchment.

Potentially an important tourism asset.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|--------------------------------------|--|
| CENTRAL FOREST RESERVE NATIONAL PARK | |
| Area / Layout | Areas over 1,000 ft above msl |
| NCEMA categories | National Park (Category I) |
| Management Agency | Department of Physical Planning and Environment, Water Dep't & Dep't of Tourism |
| Financial Strategies | Public service salaries, user fees and Gov't subventions Environmental Trust Fund |

NEVIS PEAK AND CAMPS RIVER



National Park

Important biodiversity resource.

Important water catchment.


Potentially an important tourism asset.

Note: This Study recommends amalgamation of this Marine Area with Southeast Peninsula Marine Area.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|--|--|
| NEVIS PEAK AND CAMPS RIVER NATIONAL PARK | |
| Area / Layout | Areas over 1,000 ft above msl and extending down the Camps River to the coast. |
| NCEMA categories | National Park (Category I) |
| Management Agency | Nevis Planning Dep't, Nevis Water Dep't and Nevis Tourism Authority |
| Financial Strategies | Public service salaries, user fees and Gov't subventions Environmental Trust Fund |

BASSETERRE VALLEY AQUIFER




National Park / Botanic Garden
 Potential biodiversity resource.
 Important water catchment.
 Potentially an important tourism asset.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|---|--|
| BASSETERRE VALLEY AQUIFER NATIONAL PARK | |
| Area / Layout | 197 ha east of Basseterre and west of Conaree Hills |
| NCEMA categories | National Park (Category I), Botanic Gardens (Category VII) |
| Management Agency | Proposed Basseterre Project Steering Committee |
| Financial Strategies | User fees, grants from donor agencies and Gov't subventions Environmental Trust Fund |

SE PENINSULA AND THE NARROWS

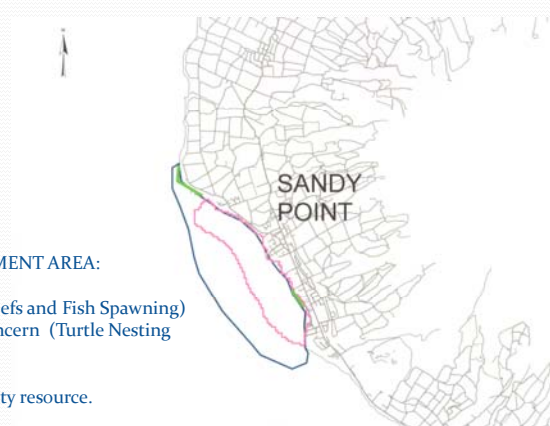


MARINE MANAGEMENT AREA:

- Marine Reserve (lobster spawning grounds)
- Nature Reserve (Nags Head & Booby Island)
- Areas of Special Concern (Turtle Nesting Beaches)

Important biodiversity resource.
 Important tourism asset.

SANDY POINT MARINE AREA



MARINE MANAGEMENT AREA:

- Marine Reserve (Reefs and Fish Spawning)
- Areas of Special Concern (Turtle Nesting Beaches)

Important biodiversity resource.
 Important tourism asset.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|------------------------|--|
| MARINE PROTECTED AREAS | |
| Area / Layout | S. E. Peninsula and The Narrows Sandy Point Marine Management Area |
| NCEMA categories | Marine Reserves (Category IV) Nature Reserves (Category III) Areas of Special Concern (Category V) |
| Management Agency | Fisheries Departments of both islands |
| Financial Strategies | Public service salaries, User fees , Grants from donor agencies and Environmental Trust Fund |

KEYS TURTLE NESTING BEACH



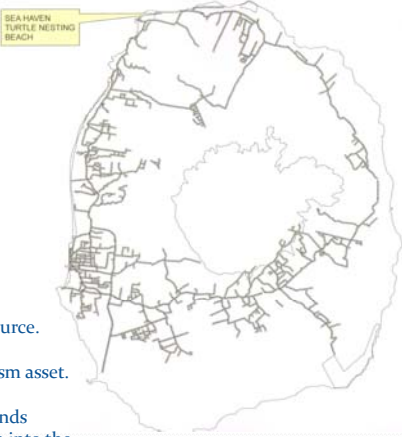
KEYS TURTLE NESTING BEACH

Areas of Special Concern
(Turtle Nesting Beaches)

Important biodiversity resource.

Potentially important tourism asset.

SEA HAVEN TURTLE NESTING BEACH



SEA HAVEN TURTLE NESTING BEACH

Areas of Special Concern
(Turtle Nesting Beaches)

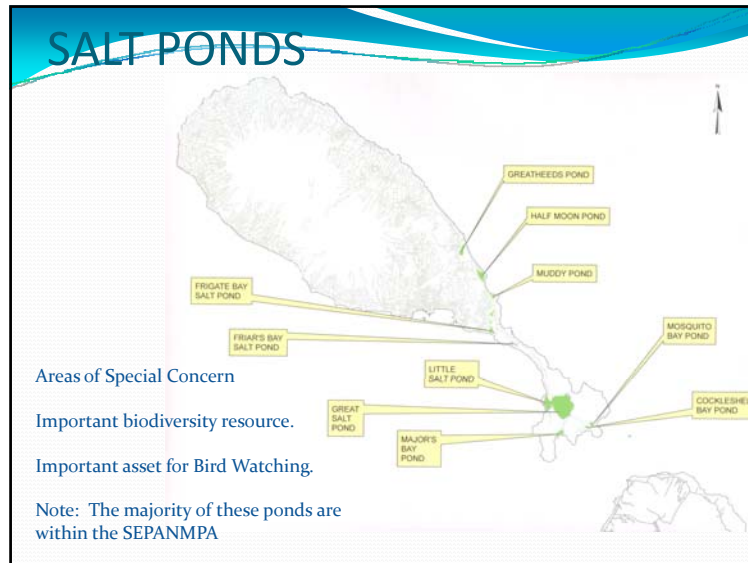
Important biodiversity resource.

Potentially important tourism asset.

Note: This Study recommends amalgamation of this Beach into the SEPANMPA

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|------------------------|---|
| TURTLE NESTING BEACHES | |
| Area / Layout | Included in S. E. Peninsula and Sandy Point MPAs Keys Turtle Nesting Beach |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Fisheries Departments of both islands |
| Financial Strategies | Public service salaries, User fees |



RECOMMENDATIONS FOR SALT PONDS

This study recommends different strategies for different Salt Ponds:

- **Frigate Bay Pond and Half Moon Pond** are recommended for clean-up and enhancement.
- **Other Ponds on the Southeast Peninsula** should be preserved as salt ponds (development controls).
- **Greatheeds Pond and Muddy Pond** should be preserved as sediment sinks (development controls).
- **Little Salt Pond, Great Salt Pond and Major's Bay Pond** were not included in the study, as they have already been granted Permission for alternative development.

SYSTEMS PLAN PROPOSALS


| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| SALT PONDS | |
| Area / Layout | Included in S. E. Peninsula MPA, other locations in St. Kitts |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Dep't of Physical Planning and Environment, St. Kitts |
| Financial Strategies | Public service salaries, Grants from donor agencies and Environmental Trust Fund |



SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| FRESHWATER LAGOONS | |
| Area / Layout | Included in Nevis Peak and Camps River National Park, other locations in Nevis |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Nevis Dep't of Physical Planning and Environment and Nevis Water Department |
| Financial Strategies | Public service salaries |

ST. KITTS GHAUTS



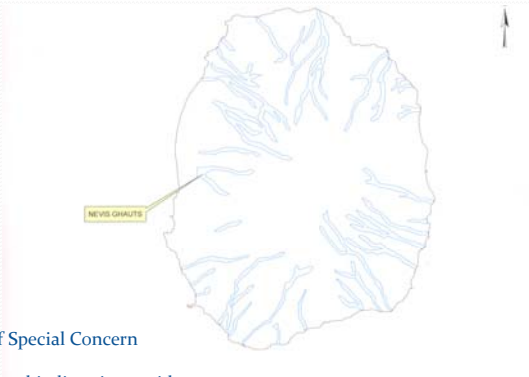
Areas of Special Concern

Important biodiversity corridors.

Important source of sand for construction.

Note: Strategic Impact Assessment is recommended.

NEVIS GHAUTS

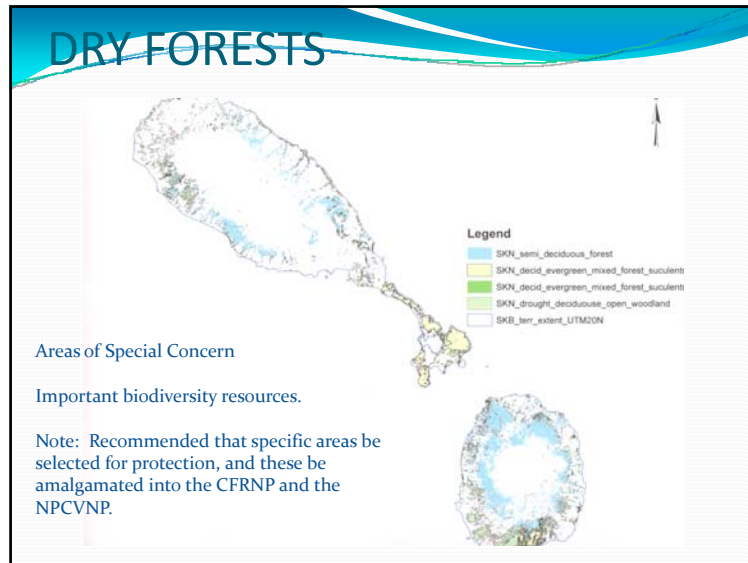


Areas of Special Concern

Important biodiversity corridors.

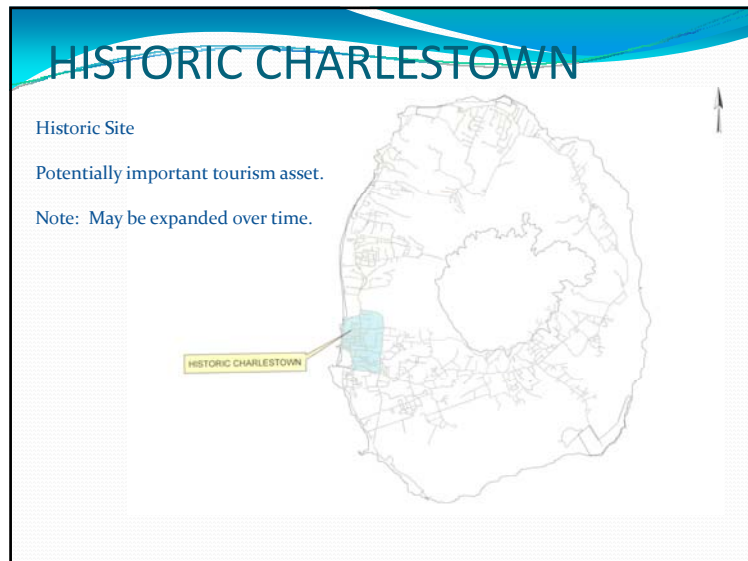
SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|---|
| THE GHAUTS | |
| Area / Layout | Throughout St. Kitts and Nevis |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Department of Physical Planning (both islands) Ministry of works (St. Kitts) for legal sand mining |
| Financial Strategies | Public service salaries, Gov't subvention, International donor agencies |



SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| DRY FORESTS | |
| Area / Layout | Included in Brimstone Hill Fortress National Park, A new area on the S. E. Peninsula of St. Kitts to be included in CFRNP, Included in Nevis Peak and Camps River National Park. |
| NCEMA categories | Areas of Special Concern (Category V) |
| Management Agency | Brimstone Hill Fortress National Park Society Nevis Planning Department Department of Physical Planning and Environment (St. Kitts) |
| Financial Strategies | Public service salaries, User fees and Gov't subventions, Grants from donor agencies and Environmental Trust Fund |



SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| HISTORIC CHARLESTOWN | |
| Area / Layout | Within Town of Charlestown |
| NCEMA categories | Historic site (Category II) |
| Management Agency | Nevis Planning department, NHCS |
| Financial Strategies | Public service salaries, Gov't subventions, Grants from donor agencies and Environmental Trust Fund User fees may be considered |

OTHER HISTORIC SITES

Historic Sites / Scenic Site (Black Rocks)

Potentially important tourism assets.

Note: More detailed evaluation is needed on each specific site.

SYSTEMS PLAN PROPOSALS

| ITEM | ACTUAL / SUGGESTED |
|----------------------|--|
| OTHER HISTORIC SITES | |
| Area / Layout | Throughout both islands |
| NCEMA categories | Historic Sites (Category II) Scenic Sites (Category VI) |
| Management Agency | St. Kitts Tourism Dep't Nevis Tourism Authority SCHC (later SCNT) and NHCS |
| Financial Strategies | Public service salaries, Gov't subventions, Grants from donor agencies and Environmental Trust Fund (User fees may be considered) |

HIGHEST PRIORITY ITEMS

As soon as practical:

- Accept Systems Plan.
- Declare Nevis Peak and Basseterre Aquifer as National Parks.
- Revise the Management Plan for the Central Forest Reserve.
- Revise the Management Plan for the Nevis Peak and Camps River Watershed.
- Complete the Management Plan for the Basseterre Valley Aquifer National Park.

HIGHEST PRIORITY ITEMS (CONT'D)

As soon as practical:

- Declare Booby Island as a Nature Reserve.
- Determine extent of Nag's Head Nesting Site.
- Determine the boundaries of fish and shellfish propagation areas to be included in the SEP NMPA.
- Declare Keys Turtle Nesting Beach (St. Kitts) as a beach of "Special Concern".
- Declare Sea Haven Turtle Nesting Beach (Nevis) as a beach of "Special Concern".

HIGHPRIORITY ITEMS

Within 3 years:

- Adjust the Admission Fees for the BHFNP.
- Declare Nag's Head as a Nature Reserve.
- Clean up and enhance Frigate Bay and Half Moon Pond
- Determine the extent of a suitable area of dry forest on the S. E. Peninsula.
- Establish the boundaries of fish and shellfish propagation areas to be included in the SPMMA.

HIGHPRIORITY ITEMS (CONT'D)

- Declare the SEPMPA and SPMMA as Marine Protected Areas.
- Review regulations on closed season for turtle harvesting (moratorium on all harvesting of turtles and eggs).
- Declare Muddy Point Salt Pond and Greatheeds Pond as protected areas (no additional development).
- Assess structures at Spooner's Ginnery, Mansions Estate, Belmont Estate, Indian Castle and Fort Ashby.

MEDIUMPRIORITY ITEMS

Within 5 years:

- Conduct a Strategic Environmental Impact Assessment to identify specific locations for legal sand mining.
- Amalgamate areas of dry forest into the CFRNP.
- Restore New River Estate (trails and associated infrastructure).
- Vest Spooners Estate and Ginnery, Mansion Estate Yard, Belmont Estate Yard and Stone Fort Petroglyphs in the National Trust of St. Kitts.

WHERE DO WE GO FROM HERE?

- Receive comments on Draft Plan from:
 - NICE
 - Stakeholders
- Clarification regarding "A Management Plan for the Proposed National Park in the Basseterre Valley"
- Finalize the Systems Plan
- Seek Cabinet approval of Plan

WHERE DO WE GO FROM HERE?

Once Cabinet has approved the Systems Plan:

- Implement Organizational Arrangements
- Fine tune the Prioritization of Individual Sites
- Train Staff
- Conduct Further Studies
- Periodically update the Systems Plan (3 years then every 5 years)

OPEN FLOOR DISCUSSION

- Please state your name and organization

MARCH 04 (AM) DECISION MAKERS

CONSULTATION ON DRAFT PROTECTED AREAS SYSTEMS PLAN

ECOENGINEERING CARIBBEAN LIMITED
MARCH 04, 2010



RATIONALE

- Recognition of importance of establishing protected areas as the primary method of preserving biodiversity
- Puts St. Kitts and Nevis in line with other OECS member states which also have Systems Plans in place
- As a means to integrate conservation and sustainable use of biological diversity and cultural heritage into relevant sectoral plans, programmes and policies

OBJECTIVES OF PA PLAN

- Present a practical time-frame specific phased approach to implementation of PA System
- Provide full range of required resources and capacity building for establishing and managing system
- Recommend means of financing the implementation of plan
- Indicate level of priority for each proposed system component
- Provide proposed boundaries of sites being proposed

STUDY TEAM

- Dr. George Sammy, Study Director / Environmental Engineer
- Ms. Debbie Reyes, Study Manager / Environmental Scientist
- Mr. Jan Meerman, Protected Areas Specialist

LIMITATIONS

- Unavailability of data on biological diversity
- Limitation of site visits
- Unclear rationale for consideration of specific sites
- Timing of parallel OECS studies

Notwithstanding the above, the available information provides a basis for preparing an Initial Systems Plan.

TWO-TIER MANAGEMENT APPROACH

Tier One – Coordinating Body (multi-sectoral, multi-disciplinary)

- Policy decision making
- Coordination of Individual Site Management Bodies
- Harmonization of activities
- Recommendations for disbursements under the Trust Fund
- Ensuring accountability by Individual Site Management Bodies

This task may be assigned to the National Conservation Commission.

TWO-TIER MANAGEMENT APPROACH

Tier Two – Individual Management Bodies (for specific sites or groups of sites)

- Formulation and Implementation of Management Plan
- Day-to-Day Management
- Hiring of staff
- Setting and Collection of Fees (if applicable)
- Formulation of projects

Modeled on Brimstone Hill Fortress National Park Society.
Important to minimize the number of individual bodies by grouping sites.

A GENTLE REMINDER

NCEMA does not envisage a single level of protection for all sites. It offers a range of conservation levels, as follows:

- **Category I: National Parks** (managed to protect resources, with use permitted on a controlled basis)
- **Category II: Historic Sites** (managed to preserve historic, cultural and archaeological sites, with use permitted on a controlled basis)
- **Category III: Nature Reserves** (protect resources in an undisturbed state, with only scientific research and educational studies permitted)
- **Category IV: Marine Reserves** (managed for protection of flora and fauna, preservation of breeding grounds, etc; scientific research permitted, but exploitive use is not)
- **Category V: Areas of Special Concern** (special protection to stabilize or restore ecological features or functions, with controlled use permitted)
- **Category VI: Scenic Sites** (scenic feature of national or local importance)
- **Category VII: Botanic Gardens** (for preservation, display and propagation of national botanical resources).

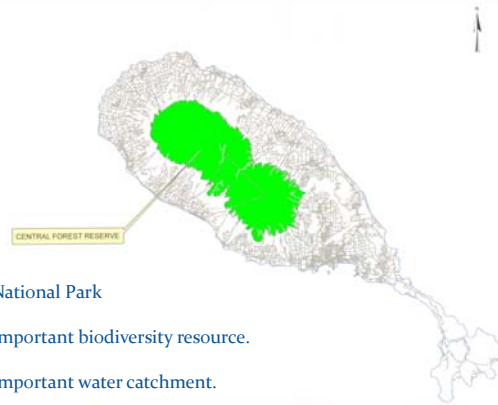
SITES OR CLASSES OF SITES CONSIDERED

- Brimstone Hill Fortress National Park
- Central Forest Reserve National Park
- Nevis Peak National Park and Camps River Watershed
- Basseterre Valley Aquifer National Park
- Marine Management Areas
- Turtle Nesting Beaches
- Salt Ponds
- Freshwater Lagoons
- The Ghauts
- Dry Forest
- Historic Charlestown
- Other Historic Sites

BRIMSTONE HILL



CENTRAL FOREST RESERVE



NEVIS PEAK AND CAMPS RIVER

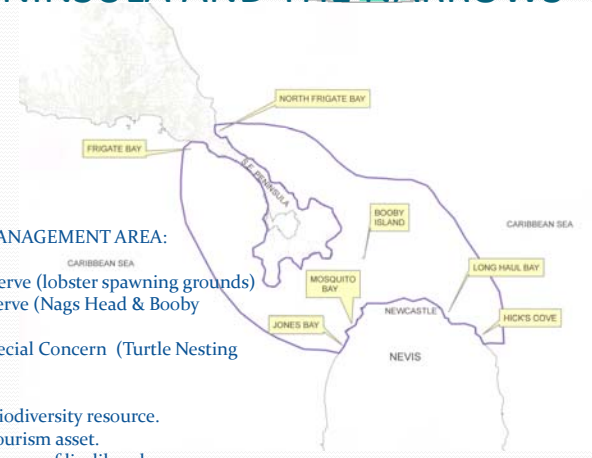


BASSETERRE VALLEY AQUIFER



National Park / Botanic Garden
 Potential biodiversity resource.
 Important water catchment.
 Potentially an important tourism asset.

SE PENINSULA AND THE NARROWS




MARINE MANAGEMENT AREA:

- Marine Reserve (lobster spawning grounds)
- Nature Reserve (Nags Head & Booby Island)
- Areas of Special Concern (Turtle Nesting Beaches)

Important biodiversity resource.
 Important tourism asset.
 Important source of livelihood.

SANDY POINT MARINE AREA



MARINE MANAGEMENT AREA:

- Marine Reserve (Reefs and Fish Spawning)
- Areas of Special Concern (Turtle Nesting Beaches)

Important biodiversity resource.
 Important tourism asset.
 Important source of livelihood.


KEYS TURTLE NESTING BEACH



Areas of Special Concern (Turtle Nesting Beaches)

Important biodiversity resource.
 Potentially important tourism asset.

SEA HAVEN TURTLE NESTING BEACH



SEA HAVEN TURTLE NESTING BEACH

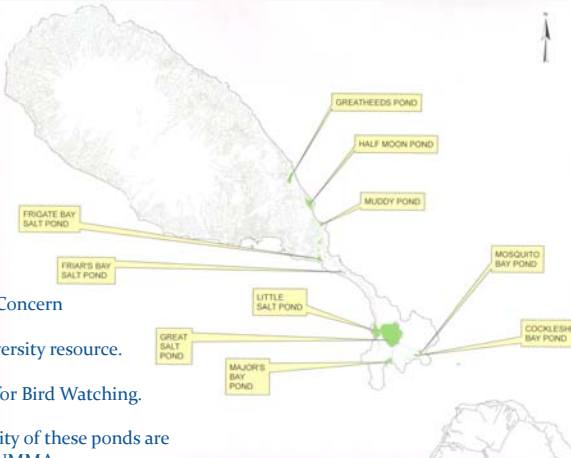
Areas of Special Concern
(Turtle Nesting Beaches)

Important biodiversity resource.

Potentially important tourism asset.

Note: This Study recommends amalgamation of this Beach into the SEPANMMA

SALT PONDS



GREATHEADS POND
HALF MOON POND
MUDDY POND
FRIGATE BAY SALT POND
FRIAR'S BAY SALT POND
LITTLE SALT POND
GREAT SALT POND
MAJORS BAY POND
MOSQUITO BAY POND
COCKLESHELL BAY POND

Areas of Special Concern

Important biodiversity resource.

Important asset for Bird Watching.

Note: The majority of these ponds are within the SEPANMMA

RECOMMENDATIONS FOR SALT PONDS

This study recommends different strategies for different Salt Ponds:

- **Frigate Bay Pond, Friar's Bay Pond and Half Moon Bay Pond** are recommended for enhancement and use as scientific and educational resources.
- **Greatheads Pond and Muddy Pond** should be preserved in their present condition as sediment sinks and bird roosting / nesting sites (development controls).
- **Little Salt Pond, Great Salt Pond, Majors Bay Pond, Cockleshell Bay Pond and Mosquito Bay Pond** were not included in the study, as they have already been granted Permission or approval in principle for alternative development.

FRESHWATER LAGOONS



NELSONS SPRING
JESSUPS POND
FARRIS AND PINNEY'S PONDS
BATH BOGS
NEW RIVER SPRINGS

Areas of Special Concern

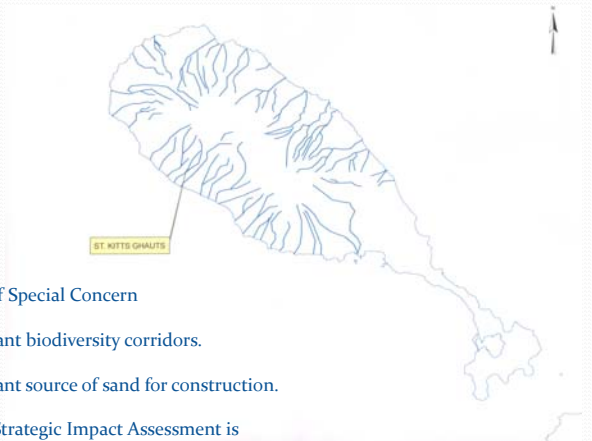
Important biodiversity resource.

Important asset for Bird Watching.

Important sources of water supply.

Note: All are part of larger areas being considered for protection.

ST. KITTS GHAUTS



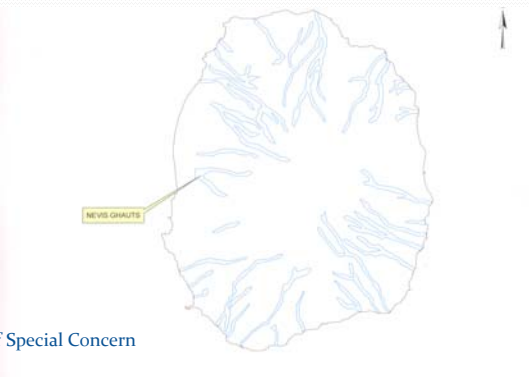
Areas of Special Concern

Important biodiversity corridors.

Important source of sand for construction.

Note: Strategic Impact Assessment is recommended.

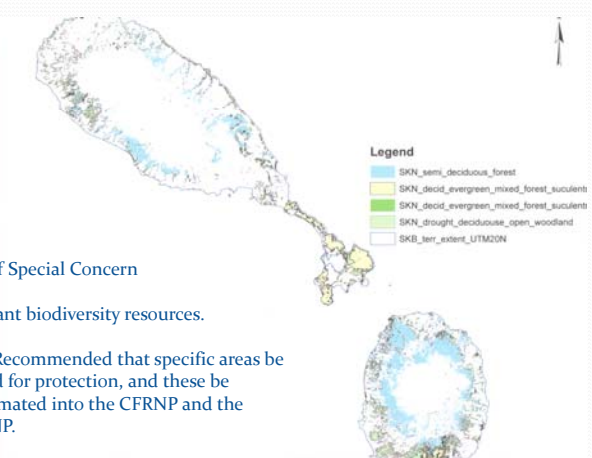
NEVIS GHAUTES



Areas of Special Concern

Important biodiversity corridors.

DRY FORESTS




Areas of Special Concern

Important biodiversity resources.

Note: Recommended that specific areas be selected for protection, and these be amalgamated into the CFRNP and the NPCVNP.

HISTORIC CHARLESTOWN



Historic Site (Historic District)

Potentially important tourism asset.

Note: May be expanded over time.

OTHER HISTORIC SITES

Historic Sites / Scenic Site (Black Rocks)
Potentially important tourism assets.

Note: More detailed evaluation is needed on each specific site (some evaluations already in progress).

SUMMARY

- Management Approaches
 - The agencies listed should be represented on the site level management bodies.

| PROTECTED AREA | KEY MANAGEMENT INTERESTS |
|--|---|
| Brimstone Hill Fortress National Park | Brimstone Hill Fortress National Park Society |
| Central Forest Reserve National Park | St. Kitts Physical Planning and Environment, Water, Agriculture, and Tourism Departments, Neighbouring Farmers, Tour Operators etc. |
| Nevis Peak and Camps River National Park | Nevis Planning Department, Water Department, Agricultural Department and Tourism Authority |
| Basseterre Valley Aquifer National Park | St. Kitts Water Department, Agriculture Department, Physical Planning and Environment, Tourism Department and Private Investors |

SUMMARY

- Management Approaches (continued)

| PROTECTED AREA | KEY MANAGEMENT INTERESTS |
|--|---|
| Southeast Peninsula and The Narrows Sandy Point Marine Management Area | Fisheries Departments in St. Kitts and Nevis, Frigate Bay Development Corporation, Dive Operators, Fishers Organizations, Port Authority etc. |
| Keys Turtle Nesting Beach | Fisheries Departments in St. Kitts and Nevis |
| Sea Haven Turtle Nesting Beach | |
| Salt Ponds | St. Kitts Department of Physical Planning and Environment, Private Landowners |
| Freshwater Lagoons | Nevis Department of Physical Planning and Nevis Water Departments, Private Landowners |

SUMMARY

- Management Approaches (continued)

| PROTECTED AREA | KEY MANAGEMENT INTERESTS |
|----------------------|---|
| The Ghauts | Department of Physical Planning on both islands Ministry of Works for legal sand mining in St. Kitts |
| Dry Forests | Physical Planning and Environment, Water, Agriculture, and Tourism Departments, Private Landowners, Tour Operators etc. |
| Historic Charlestown | Nevis Physical Planning and Tourism Departments and Nevis Historical and Conservation Society |
| Other Historic Sites | St. Kitts Tourism Department Nevis Tourism Department St. Christopher National Trust Nevis Historical and Conservation Society |

SUMMARY

- Financing Options
 - User Fees (Brimstone Hill, Basseterre Aquifer)
- Government Subvention
- Grants from International Donor Agencies
- Environmental Trust Fund
- Public Service Salaries
- Private Investment

HIGHEST PRIORITY ITEMS

As soon as practical:

- Accept Systems Plan.
- Enact and Assent to the NCEMA, 2009.
- Declare Nevis Peak and Basseterre Aquifer as National Parks.
- Finalize the Management Plan for the Central Forest Reserve.
- Revise the Management Plan for the Nevis Peak and Camps River Watershed.
- Finalize the Management Plan for the Basseterre Valley Aquifer National Park.

HIGHEST PRIORITY ITEMS (CONT'D)

As soon as practical:

- Declare Booby Island as a Nature Reserve.
- Determine extent of Nag's Head Nesting Site.
- Determine the boundaries of fish and shellfish propagation areas to be included in the SEPNMMA.
- Declare Keys Turtle Nesting Beach (St. Kitts) as a beach of "Special Concern".
- Declare Sea Haven Turtle Nesting Beach (Nevis) as a beach of "Special Concern".

HIGHPRIORITY ITEMS

Within 3 years:

- Adjust the Admission Fees for the BHFNP.
- Declare Nag's Head as a Nature Reserve.
- Enhance Frigate Bay, Friar's Bay and Half Moon Ponds.
- Determine the extent of a suitable area of dry forest on the S. E. Peninsula.
- Establish the boundaries of fish and shellfish propagation areas to be included in the SPMMA.

HIGHPRIORITY ITEMS (CONT'D)

- Declare Marine Reserves within the SEPNMMA and SPMMA.
- Review regulations on closed season for turtle harvesting (moratorium on all harvesting of turtles and eggs).
- Declare Muddy Point Salt Pond and Greatheeds Pond as Areas of Special Concern (no additional development).
- Complete assessment of structures at Spooner's Ginney, Mansions Estate, Belmont Estate, Indian Castle, Fort Ashby, Charles Fort (St. Kitts) and Fort Charles (Nevis).

MEDIUMPRIORITY ITEMS

Within 5 years:

- Conduct a Strategic Environmental Impact Assessment to identify specific locations for legal sand mining.
- Amalgamate areas of dry forest into the CFRNP.
- Restore New River Estate (trails and associated infrastructure).

WHERE DO WE GO FROM HERE?

- Finalize the Systems Plan
- Seek Cabinet approval of Plan

Once Cabinet has approved the Systems Plan:

- Implement Organizational Arrangements
- Fine tune the Prioritization of Individual Sites
- Train Staff
- Conduct Further Studies
- Periodically update the Systems Plan



APPENDIX E

FRAMEWORK OF THE PA SYSTEM

APPENDIX E:

FRAMEWORK FOR THE PA SYSTEM

This appendix will highlight the context within which this Protected Areas System will exist on a number of levels: local, national, regional and international. The existing legal basis for environmental protection and management will be discussed with special reference to the need for a Protected Areas System. Other initiatives such as the one that led to this project will also be discussed. This appendix will be framed under the following headings:

- Legal Framework;
- International Obligations;
- OECS Protected Areas and Associated Livelihoods Project (OPAAL);
- Basis for Consideration of Proposed PAs;
- Linkage with other National Planning Initiatives; and
- Fees, Levies and Taxes.

The penultimate sub-section will make a few statements on the way in which the Protected Areas Systems Plan is expected to relate to and harmonize with other national planning initiatives such as:

- National Biodiversity Strategy and Action Plan (NBSAP);
- National Environmental Management Strategy and Action Plan (NEMS);
- St. Christopher Physical Development Plan; and
- Nevis Physical Development Plan.

The final sub-section provides a brief overview of the existing fees, levies and taxes which are presently collected in St. Kitts and Nevis and summarizes the proposals described under the Environmental Trust Fund.

E.1 Legal Framework

The following existing and draft laws contain requirements for either the establishment or the management of protected areas:

- National Conservation and Environmental Protection Act, 1987;
- The National Conservation and Environmental Management Act, 2009 (Draft);
- Fisheries Act, 1984

- South-East Peninsula Land Development and Conservation Act, 1986; and
- Development Control and Planning Act, 2000.

E.1.1 National Conservation and Environmental Protection Act (1987)

This Act was first enacted in 1987 *“to provide for better management and development of the natural and historic resources of Saint Christopher and Nevis for purposes of conservation; the establishment of national parks, historic and archaeological sites and other protected areas of natural and cultural importance including the Brimstone Hill Fortress National Park; the establishment of a Conservation Commission; and for other matters connected thereto.”*

The Act is divided into the following sections:

- Establishment of Protected Areas;
- Administration of Protected Areas;
- Establishment of Brimstone Hill Fortress National Park;
- Recognition of Bath Hotel as an Historical Site;
- Coast Conservation and Beach Protection;
- Forestry, Soil and Water Conservation;
- Protection of Wild Animals and Birds;
- Antiquities and Historic Buildings; and
- Miscellaneous.

Relevant sections are described below, and the final two sub-sections list schedules and amendments to the Act respectively.

E.1.1.1 Establishment of Protected Areas

This section indicates that the Minister of Physical Planning may designate any land or marine area as a protected area based on the six IUCN classifications (see Section E.4.1). It also speaks about the purposes and objectives of protected areas and stipulates that any land or sea area designated as a protected area must be gazetted. The section ends with an indication that private lands can either be acquired for the designation as a protected area (in accordance with the Land Acquisition Act) or the Minister can enter into a written agreement with the private land owner to gain right of access or control of the land as a protected area.

E.1.1.2 Administration of Protected Areas

This section names the Minister or anyone he / she may designate as having general responsibility for the selection, management and administration of any protected area. It also describes the composition and functions of the National Conservation Commission. The Act also provides for funding of the work of the Conservation Commission and indicates that the Commission is also responsible for the preparation of a management plan for each protected area. The section then sets out the contents of the management plan and details the designation and functions of a competent authority to be responsible for the management and administration of each protected area.

E.1.1.3 Establishment of Brimstone Hill Fortress National Park

This section designates the Brimstone Hill Fortress as a National Park. It also designates the Brimstone Hill Fortress National Park Society as the body responsible for management and administration of the national park.

E.1.1.4 Recognition of Bath Hotel as an Historical Site

This section declares Bath Hotel in Nevis as an historic site.

E.1.1.5 Antiquities and Historic Buildings

This section details the need for a licence before digging or searching for an antiquity even on private property. It states that the licence may come with conditions attached. The next few sub-sections deal with division of antiquities, discovery of antiquities by accident and the export of antiquities. There is also reference to a list of special buildings which shall be preserved for purposes of historic and cultural value. The section also provides incentives for owners of buildings deemed to be historic to restore such buildings.

E.1.1.6 Schedules

The Act ends with a number of Schedules as follows:

- Constitution of the Conservation Commission;
- Legal Description of the Brimstone Hill Fortress National Park;
- Wild Animals and Wild Birds;
- Description of Bath Hotel.

E.1.1.7 Amendments

There have been two amendments to the Act, in 1996 and 2001. The 1996 amendment introduces the Department of the Environment and a Fifth Schedule to deal with International Conventions. These conventions have the force of law and regulations can be made to give effect to these conventions.

The 2001 amendment makes changes to the provision of public beach access, acquisition of private land for public beach access, preservation of beaches, pollution of the coastal zone, offences related to beach protection and offences related to damage or destruction to a historic building, site or monument.

E.1.2 The National Conservation and Environmental Management Bill, 2009

This bill represents a revision of the NCEPA Act and amendments. The following sections highlight the key features of the Bill and notes specific additions not found in the earlier legislation. The Bill is divided into the following sections:

- Establishment of Protected Areas;
- Administration of Protected Areas;
- Management of Protected Areas;
- Establishment of Brimstone Hill Fortress National Park;
- Establishment of Bath Estate as a National Park ;
- Establishment of Booby Island as a Nature Reserve;
- Conservation of Biological Diversity;
- Coastal Zone Management;
- Soil and Water Conservation;
- Antiquities;
- Pollution Control;
- Establishment of an Environmental Trust Fund; and
- Miscellaneous.

This new listing includes sections not previously found in the Act such as:

- Management of Protected Areas;
- Establishment of Bath Estate as a National Park;
- Establishment of Booby Island as a Nature Reserve;
- Conservation of Biological Diversity;
- Coastal Zone Management;
- Pollution Control; and
- Establishment of an Environmental Trust Fund.

One section found in the original Act was removed from this revision, namely: Protected of Wild Animals and Birds. Historic Buildings (which was originally listed with Antiquities in the original Act) has been removed and Soil and Water Conservation was previously Forestry, Soil and Water Conservation.

Relevant sections are described below, and the final sub-section list schedules to the Bill.

E.1.2.1 Progress of the Act

This Act was first enacted in 1987 *“to provide for better management and development of the natural and historic resources of Saint Christopher and Nevis for purposes of conservation; the establishment of national parks, historic and archaeological sites and other protected areas of natural and cultural importance including the Brimstone Hill Fortress National Park; the establishment of a Conservation Commission; and for other matters connected thereto.”*

In 2009 it was changed to The National Conservation and Environmental Management Act *“to provide for the conservation of the natural and cultural heritage of St. Christopher and Nevis, the prevention of pollution and the management of the environment, for the purpose of ensuring that the development of the country is sustainable, and for other connected matters.”*

E.1.2.2 Objectives of the Act

The objectives of the Act are:

- a) the conservation and sustainable use of the natural heritage of Saint Christopher and Nevis, including the conservation of biological diversity, the protection of threatened and endangered species and their habitats, soil conservation and watershed management, the conservation of significant terrestrial and marine ecosystems, including wetlands, and the management of the coastal zone;
- b) the designation and management of National Parks and other protected areas, including the continuation in being of the existing Brimstone Hill Fortress National Park and the arrangements for its management;
- c) the prevention and mitigation of pollution of the environment, including the control of hazardous substances, the management of wastes and response to environmental accidents, for the purposes of protecting human health and maintaining the quality of the environment;

- d) the allocation of administrative responsibilities for environmental management within the Federation, including specific arrangements with respect to the administration of this Act in Saint Christopher and Nevis respectively;
- e) the implementation of multilateral environmental agreements mentioned in Schedule 1;
- f) the regulation of the trade in indigenous biological resources;
- g) the provision of stable, adequate, secure and sustainable funding to finance the conservation and management of the environment in Saint Christopher and Nevis; and
- h) any other matter related or ancillary to the foregoing purposes.

E.1.2.3 Establishment of Protected Areas

This section maintains the same wording as the original Act (see Section E.1.1.1). The only exception is reference to the categories of Protected Areas which forms Schedule I to the Bill.

E.1.2.4 Administration of Protected Areas

This section stipulates that the Minister is to coordinate with other ministers and the Nevis Island Administration to secure consistency in the implementation of this Bill. The Minister is also responsible for protecting and promoting interests in environmental treaties and meeting international obligations. As in the original Act, it describes the composition and functions of the National Conservation Commission as well as funding of the work of the Conservation Commission. The Bill also states that the Commission is responsible for the preparation of a management plan for each protected area. The Bill also acknowledges the Department of the Environment and the Nevis Island Administration and lists the functions of these Departments.

E.1.2.5 Management of Protected Areas

This new section indicates that the Minister in collaboration with the Commission is responsible for the management of protected areas. It is indicated that the Minister may delegate, by order published in the Gazette, a competent authority which may include a non-governmental organisation such as the Saint Christopher National Trust or The Nevis National Trust to be responsible for the management of any protected area. The section also provides information on the responsibilities which may be delegated to the respective entity. The Bill also states the need for a Management Plan for each

protected area which will be designed to further the specific purposes for which the area is established and guide any activities that may be prohibited or permitted in the area. The management plan should be prepared by the Department upon consultation with competent authorities and reviewed and revised if necessary at least once in every 10 years. This section of the Act also provides the required contents of management plans.

E.1.2.6 Establishment of Brimstone Hill Fortress National Park

This section acknowledges and preserves the Brimstone Hill Fortress as a National Park. It also acknowledges and continues the Brimstone Hill Fortress National Park Society as the body responsible for management and administration of the national park and outlines the powers and duties of the Society.

E.1.2.7 Establishment of Bath Estate National Park

This section establishes the Bath Estate National Park which includes the Bath Bogs and the Bath Hotel which was declared as a historic site in the previous Act. This section also discusses the designation of a competent authority to manage the Bath Estate National Park and prohibits any engineering works other than those needed for the implementation of the management plan for the area.

E.1.2.8 Establishment of Booby Island Nature Reserve

This section establishes the Booby Island Nature Reserve. It also addresses the appointment of a competent authority to manage the Booby Island Nature Reserve

E.1.2.9 Conservation of Biological Diversity

This new section designates the Department of Environment as responsible for the development of a national strategy, plan and programme for the conservation of biological diversity. The Department is responsible for the identification of the components of biological diversity and sustainable use and for monitoring these through sampling and other techniques. The Department is also to identify those requiring urgent conservation measures and those which offer the greatest potential for sustainable use and processes and activities which may have adverse impacts on biological diversity.

This section also addresses protected species and threatened and endangered species, the penalties associated with interference of these species and the conservation of ecosystems and habitats. Under this section permission must be obtained from the Department for the conduct of scientific research. Regulations for hunting, fishing and

the eradication of pest are also addressed in this section. Forest management through the establishment of forest reserves, management of land within forest reserves, reforestation and timber stand improvement is also addressed in this section.

E.1.2.10 Coastal Zone Management

This new section begins with a statement that all beaches are vested in the crown and that the public has a right to use the beaches for recreational purposes. It goes on to speak about the need for at least one public access to all beaches and then highlights the duties of the Conservation Commission with regard to coastal conservation. The Bill identifies the Department as being responsible for the development of a Coastal Zone Management Plan and the requirements to be fulfilled in the preparation of the plan. It is required that the plan be reviewed and revised once in every ten years. The Bill also:

- provides restrictions to construction on the seashore;
- identifies activities that are prohibited and
- indicates the need for a permit to take away any sand, stone or gravel.

The section then prohibits the pollution of any beach and provides for the declaration of protected beaches. The remaining sub-sections apply penalties for the contravention of various sections of the Act.

E.1.2.11 Antiquities

The main difference between this section and the one contained in the original Act is the removal of the words “...and Historic Buildings” from the name. The wording of the section is virtually unchanged.

E.1.2.12 Pollution Control

This section provides for the Minister to designate substances as pollutants. Under this Act the Department is responsible for compiling a Register of Sources of Pollutants and for allowing its inspection by the public upon payment of a search fee. The Minister may under this Act prescribe allowable standards of pollution and authorise the deposit or release of a pollutant in quantities in excess of the allowable standards by granting a Discharge Control Permit. This section also addresses the time allowed for upgrades to be made in order for compliance to these regulations to be achieved, liability for pollution prior to commencement of the Act and the power to set technology standards.

Under this section the Minister may designate hazardous substances and provide directions for use, storage, handling and disposal of these substances. The Minister may also establish standards and procedures for handling, re-cycling and re-using, treatment and disposal of waste into the environment. There is also a statement in the section requiring a Contingency Plan for areas where any pollutant or hazardous substance is stored, used or transported. Finally, the section addresses the Department's role with respect to response to spills or accidental release of pollutants and environmental auditing.

E.1.2.13 Environmental Trust Fund

Under this section of the Bill the Environmental Trust Fund will be established to provide stable, adequate, secure and sustainable funding to finance the conservation and management of the environment. This section of the act provides for the appointment of a Board of trustees of the fund and discusses the components and the status, functions and powers of the Board. The requirements for meetings of the Board and the staff of the board are also discussed. This section also discusses:

- the resources of the fund;
- the use of the fund monies;
- investment of funds;
- exemption from taxes; and
- the rules for operating the fund; accounts, audits and annual reports.

E.1.2.13.1 Board of Trustees

The Fund is to be administered by a Board of Trustees appointed by the Governor General. The Chairman shall be an outstanding person with qualifications and experience in financial management and having an interest in the environment. Two members shall be representatives of Environmental NGOs (one each from St. Kitts and Nevis), and two members shall be appointed after consultation with the Governor of the Eastern Caribbean Central Bank.

E.1.2.13.2 Resources

The resources of the fund will include the following:

- Amounts allocated either annually or for special projects by Parliament;

- Amounts collected as a result of a written law which provides for the imposition and collection of a tax, charge or fees payable into the Fund;
- Amounts provided to the Fund by foreign states, or regional or international organisations or lending agencies;
- Amounts earned or accrued from any investments made by the Governor of the Eastern Caribbean Central Bank (in accordance with the Act); and
- Any other sums or amounts to which the Fund may make a lawful claim.

E.1.2.13.3 Use of the Fund

The fund may be used to make grants for environmental programs or projects, and also to defray expenses of the Board.

E.1.2.13.4 Investments

Monies comprising the fund which are not used immediately as set out in Section E.1.2.13.3 (above) may be invested in securities approved generally by the Governor of the Eastern Caribbean Central Bank.

E.1.2.13.5 Exemption from Taxes

The Fund is exempt from all taxes, duties, fees levies, etc.

E.1.2.13.6 Rules

The Board is empowered to make rules for operating the Fund. The Fund must be audited annually, and an Annual Report must be prepared not later than 3 months after the end of each financial year. This report must be laid before the National Assembly and the Nevis Island Assembly.

E.1.2.14 Miscellaneous

This section addresses power of entry and search by authorised officers for the purpose of carrying out any provisions or requirements of this Act. This section also addresses the service of documents, offences and regulations concerning the Act. There are also details on the penalties to be assigned for contravention of any of the provisions of the Act, the provisions made to special laws, the limitations of personal liability and amendment, repeals and savings.

E.1.2.15 Schedules

The Act ends with a number of Schedules as follows:

- Categories of Protected areas;
- Description of the Brimstone Hill Fortress National Park;
- Description of Bath Estate National Park;
- Threatened or Endangered Species;
- Game Animals;
- Pests;
- Purpose For Which Trust Funds May/ May Not Be Used;
- Amendments and Repeals;
- National Conservation Commission - membership and procedures;
- Wild Animals and Wild Birds;
- Multilateral Environmental Agreement to which St. Christopher and Nevis is a party.

Of these the following Schedules were not found in the previous Act:

- Categories of Protected areas;
- Threatened or Endangered Species;
- Game Animals;
- Pests;
- Purpose For Which Trust Funds May/ May Not Be Used;
- Amendments and Repeals;
- Wild Animals and Wild Birds;
- Multilateral Environmental Agreement to which St. Christopher and Nevis is a party.

E.1.3 Fisheries Act, 1984

The Act provides for the management of the fishery resources of St. Kitts and Nevis, including the licensing of local and foreign fishing vessels. The Act also makes provision for the declaration of marine reserves (Section 23) with the following objectives:

- To provide protection to flora and fauna;
- To protect natural breeding grounds and habitats of aquatic life with particular regard to flora and fauna in danger of extinction;
- To allow for natural regeneration of aquatic life;
- To promote scientific study; or

- To preserve and enhance the natural beauty of these areas.

E.1.4 South-East Peninsula Land Development and Conservation Act, 1986

The law requires that land use planning include an environmental protection plan (Section 4). Section 5 of the Act requires that the development and land use management plan for the development area include proposals for the “preservation and management of the scenic and other natural resources” in the area. Section 7(1) of the Act goes even further to designate the entire South-East Peninsula a conservation area, to focus on the protection of wildlife and its habitat.

A review of the legal framework of St. Kitts and Nevis including this Act was conducted by Environmental Support Services in 2006. In this review the author suggests that the Act meant for protected areas planning and management to be a central part of the development of the South-East Peninsula. He goes on further to state that there is no evidence to suggest that the South-East Peninsula Land Development and Conservation Board has ever undertaken any serious planning for protected areas, coastal conservation, or the maintenance of environmental quality, as required by the Act. As such, critical natural resources and fragile wildlife habitat continues to be threatened (Environmental Support Services, 2006).

E.1.5 Development Control and Planning Act, 2000

This Act provides for the orderly development of land through land use planning and development control purposes. As such, this Act focuses more on allocating land for conservation and protected areas. The Act supports the National Conservation and Environmental Protection Act (1987), in that it utilizes the mechanism of interim preservation orders to protect sites and immovable assets and plant protection orders to protect a group of plants, sites, or landscapes. The provision for environmental protection areas under the Act implies that specially demarcated areas require special treatment, even though such areas may not require the level of management intervention customary in the protected area. This provision appears to be similar to the designation of the South-East Peninsula as a Conservation Area, within which certain levels of development are permitted.

E.2 International Obligations

The Government of St. Kitts and Nevis has several obligations under a number of multilateral environmental agreements (MEAs). These include:

- The United Nations Convention on Biological Diversity (CBD),
- The United Nation Framework Convention on Climate Change (UNFCCC),
- The Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), and
- The Convention for the Prevention of Pollution from Ships (MARPOL).

E.2.1 The United Nations Convention on Biological Diversity (CBD)

The CBD aims to make the best use of and mitigate threats to biological diversity. The following list highlights the obligations of the SKN government as a party to the CBD.

- The conservation and sustainable use of the products of biodiversity should be integrated into national planning;
- Guidelines, tools and processes should be used as necessary for identifying, monitoring, regulating and conserving biological diversity, including the establishment and management of a system of protected areas;
- Principles of conservation and sustainability should be put in to practice both within and outside of protected areas;
- Measures should be taken to rehabilitate endangered species, to prevent the introduction of alien species and to control or eliminate those which threaten ecosystems or species;
- Local knowledge and practices relevant to sustainable use of biodiversity should be maintained; and
- The legal and regulatory framework to protect endangered species should be maintained as well as the development of programs for their recovery.

The St. Kitts and Nevis Government, through the National Biodiversity Strategy and Action Plan has emphasized the provisions of the CBD in two crucial articles:

- Article 1: Which sets out the Convention’s objectives and the sustainable use of its components; and
- Article 6: This requires each Party to develop national strategies, plans or programs for convention of biodiversity and sustainable use of biological resources.

This is discussed further in Section E.5.1 below.

E.2.2 The United Nation Framework Convention on Climate Change

The UNFCCC aims to control and reduce the effects on the environment of greenhouse gas emissions. This summary highlights the obligations and responsibilities of the SKN government as a party to this agreement:

- Make available national inventories of emissions by sources and removals by sinks of greenhouse gases;
- Take issues of climate change into consideration in overall national planning;
- Enact national programmes to mitigate the effects of or adapt to, climate change,
- Co-operate and share information on processes and practices to deal with the mitigations of, or adaptation to, climate change, including research across disciplines and sectors;
- Promote sustainable management and conservation; and
- Encourage public awareness and participation, access to information and appropriate training of personnel.

E.2.3 The Convention on International Trade in Endangered Species (CITES)

The Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) is an international agreement between Governments which aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. It now accords varying degrees of protection to more than 30,000 species of animals and plants, whether they are traded as live specimens, fur coats, or dried herbs. CITES provides a framework to be respected by each Party (country) which has to adopt its own domestic legislation to make sure that CITES is implemented at the national level.

Appendix I of CITES includes all species threatened with extinction which are or may be affected by trade. Of the species listed in Appendix I, the following are found in St. Kitts and Nevis:

Reptiles: *Chelonia mydas* (Green Turtle)
 Eretmochelys imbricata (Hawksbill Turtle)
 Dermochelys coriacea (Leatherback Turtle)

Appendix II lists species that are not necessarily now threatened with extinction, but that may become so unless trade is closely controlled.

Relevant to this System Plan are the Leatherback Turtle which are known to nest particularly on the Northern Beaches such as Cayon River, Friars Bay Beach and North Frigate Bay; the Hawksbill Turtle which nests primarily on the Southeast Peninsula on beaches such as Major's Bay, Banana Beach and Cockleshell Bay and the Green Turtle which usually nest at North Frigate Bay, Half Moon Bay and around Conaree.

E.2.4 The Convention for the Prevention of Pollution from Ships (MARPOL).

The MARPOL Convention is the main international convention covering prevention or pollution of the marine environment by ships from operational or accidental causes. The Convention includes regulations aimed at preventing and minimizing pollution from ships, both accidental pollution and that from routine operations, and currently includes six technical Annexes.

| | |
|-----------|---|
| Annex I | Regulations for the Prevention of Pollution by Oil |
| Annex II | Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk |
| Annex III | Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form |
| Annex IV | Prevention of Pollution by Sewage from Ships |
| Annex V | Prevention of Pollution by Garbage from Ships |
| Annex VI | Prevention of Air Pollution from Ships |

In Annex 1, Operational discharges of oil from tankers are allowed only when all of the following conditions are met:

- The total quantity of oil which a tanker may discharge in any ballast voyage whilst under way must not exceed 1/15,000 of the total cargo carrying capacity of the vessel;

- The rate at which oil may be discharged must not exceed 60 litres per mile travelled by the ship; and
- No discharge of any oil whatsoever must be made from the cargo spaces of a tanker within 50 miles of the nearest land.

Annex II details the discharge criteria and measures for the control of pollution by noxious liquid substances carried in bulk. It states that no discharge of residues containing noxious substances is permitted within 12 miles of the nearest land.

Annex IV states that the discharge of sewage into the sea will be prohibited, except when the ship has in operation an approved sewage treatment plant; or is discharging comminuted and disinfected sewage using an approved system at a distance of more than three nautical miles from the nearest land; or is discharging sewage which is not comminuted or disinfected at a distance of more than 12 nautical miles from the nearest land.

One of the main problems associated with marine protected areas throughout the region is that of pollution by users as well as from land-based sources. The enforcement of this convention will go some way toward reducing marine pollution.

E.3 OECS Protected Areas and Associated Livelihoods Project (OPAAL)

The OECS OPAAL Project consists of three main components:

- Protected Areas, Policy, Legal and Institutional Arrangements Reform;
- Protected Areas Management and associated Alternative Livelihoods; and
- Building Capacity for Biodiversity Conservation.

This section discusses each of these components and then summarizes the OECS Policy on Protected Areas and the OECS Model Protected Areas System Act.

E.3.1 Regulatory Reforms

The first component seeks to establish more effective institutional frameworks for conservation management through providing a critical focus on the legal and institutional frameworks to facilitate protected area establishment and management. This first component seeks to adopt a harmonized approach to the creation and management of protected areas (PA) in the OECS Region Protected Area. There are three sub-components within this first project component:

- (i) policy, legal and institutional arrangements reform;
- (ii) updating/preparing new national protected areas system plans; and
- (iii) supporting studies

E.3.2 Alternative Livelihoods

The second component of the OPAAL Project focuses on establishing and enhancing protected areas. Six sites have been selected and designated as OPAAL Sites for which support is given to conduct baseline studies of environmental and socioeconomic resources of sites as well as sustainable livelihoods, development of management plans, and micro-financing at the early stage. The OPAAL demonstration site for St. Kitts and Nevis is the Central Forest Reserve on the island of St. Kitts.

E.3.3 Capacity Building

The third component focuses on training, capacity-building and awareness. Training will be conducted not only at the OPAAL sites but elsewhere in all countries; training modules will be developed for protected areas management and livelihoods support; and plans will be developed for each country in the areas of knowledge, awareness and capacity.

E.3.4 OECS Policy on Protected Areas Systems

The purpose of the OECS Policy on Protected Areas Systems is to provide member states with a policy document outlining the international obligations, vision, goals, objectives and principles of a common policy regarding the management of protected areas. It is a precursor to adopting a Protected Areas System Act and as such, provides the overall direction for the Act.

The following fundamental principles will guide the application of the OECS Policy on Protected Areas Systems:

1. The process of developing and implementing a protected areas system should be consultative, representative, and participatory. Stakeholders at all levels should be identified and included.
2. Underlying the development of the OECS Protected Areas Policy are an integrated approach to system design, a collaborative and transparent approach to management, and science-based decision-making.

3. Because biological systems are best managed as a whole, management of an integrated Protected Area system within a Member State will streamline process and improve the results of management actions. Decisions will be made in a coordinated and rational way as part of a national system.
4. Management of protected areas requires harmonization of protected areas systems beyond national borders. Ecosystems do not follow political boundaries and thus impacts of management decisions in one Member State frequently can impact other States.
5. A collaborative approach to management is particularly relevant for small, developing island countries where many pressures compete for limited natural, human, and financial resources.
6. Successful implementation of the Policy for protected areas management depends on cooperation and collaboration among institutions and individuals. Collaboration and participation is required so that the various entities feel ownership and responsibility for the success of the system.
7. Public participation fulfils unmet management goals, resolves conflicts, and aids in recognizing and meeting a wide range of needs. Community participation helps to address the challenges presented by “paper parks” for which no real management system exists.
8. Transparency is a crucial element for the good governance of protected areas. Government decision-making process and the information relied-upon is to be available to the public in order to build trust in the institutions and encourage cooperation and compliance.
9. While the coordination of a range of government and public actors is necessary for the success of the system, specific management decisions require technical considerations determined by those with the appropriate technical background.
10. Maintaining management authority with resource agencies reflects the capacity and effective structures that these agencies already have for Protected Area management. The coordinating body will serve to support existing capacities and further enhance capacities of agencies and other entities responsible for aspects of protected area management.
11. Decisions made by the resource agencies regarding protected areas must be based on sound science and reflect appropriate international standards in effective protected areas management.

12. In cases where all scientific information is not available, the precautionary principle should be applied. When there is an unknown but potentially large and irreversible risk associated with a proposed action, the proponent of the action has the burden of proof to show that the action is in the public interest. The absence of adequate scientific information should not be used as a reason for postponing or failing to take management measures to conserve and protect protected areas and the resources they harbour including target species and habitat, and ecosystem services.
13. Protection of wilderness is especially important in light of the multitude of pressures facing the limited natural areas on the small islands of the OECS nations. While the system protects a range of types of protected areas, undisturbed areas have a particular value for existing biodiversity needs and for unforeseeable future ecological or social needs.
14. The management of Protected Areas and the Protected Areas System is integrated into and informed by the national development planning process. Protected Areas Systems also perform an integral role in national sustainable development.
15. Conservation is an indispensable requirement for equitable and sustainable development. Natural and cultural resources are the capital upon which a country's development can be built, and this is particularly true in the context of OECS countries where economies are largely based on the use of natural resources. Maintenance and enhancement of that capital – soils, forests, and landscapes—are indispensable if development is to be achieved and sustained.
16. Natural features such as forests, wetlands, and coral reefs are crucial to buffering land from storm damage which can be particularly damaging to small islands.
17. It is the obligation of human society to respect life in all its forms, to appreciate the cultural legacy of earlier ages, and to assume its responsibility toward future generations. The onus is on present generations who aspire to a higher quality of life and seek to sustainably meet a number of needs, beginning with the essential requirements of food, shelter, health, and education.

E.3.5 The OECS Model Protected Areas System Act

The objects and purposes of this model Act are to:

- Support the long-term growth and sustainable development of [Country] in business, tourism, recreation, education, and scientific research;
- Provide for the sustainability of biodiversity, culture, livelihoods, heritage, watershed protection and other ecosystem services;
- Protect wilderness areas;
- Facilitate the implementation of the requirements, goals, and aims of applicable international agreements;
- Assist in the mitigation of natural and anthropogenic disasters; and
- Prepare for and respond to the impacts of climate change.

Under this Act a Protected Areas Coordinating Body is appointed. The Body shall establish procedures and standards governing the protected areas system in St. Kitts and Nevis, as listed in Table E-1.

TABLE E-1: FUNCTIONS OF THE PROTECTED AREAS CO-ORDINATING BODY

- | | |
|---|---|
| <ul style="list-style-type: none"> ▶ Administration of the Body; ▶ Establishment of the protected areas system; ▶ Selection criteria and management objectives for the categories of protected areas described in the Second Schedule; ▶ Establishment of new protected areas; ▶ Reclassification of protected areas; ▶ Amending the boundaries of protected areas; ▶ Declassification of protected areas; | <ul style="list-style-type: none"> ▶ Ten-year system planning process; ▶ Protected areas management planning process; ▶ Collaborative management; ▶ Cooperative protected areas; ▶ Compliance and enforcement; ▶ Financial management; and ▶ Consultation and reporting. |
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A Management Authority is also initiated under this model Act. The responsibilities of this Authority include:

- Proposing classification, reclassification, declassification, and revision of boundaries of specific protected areas;
- Management planning for the protected areas within its jurisdiction including development of collaborative management arrangements;
- Implementation of management plans for the protected areas within its jurisdiction;
- Compliance and enforcement for the protected areas within its jurisdiction;
- Annual reporting to the Body on progress and evaluation of implementation of annual operating plans, financial operations, the status of compliance and enforcement, and any other matters the Body requires; and
- Other tasks as are necessary to effectively manage a particular protected area.

The model Act identifies the need for management planning and indicated that:

- Each Management Authority shall draft a management plan for each protected area subject to its jurisdiction, including buffer zones and corridors, where applicable, following the approval of the national ten-year plan. Management Authorities that share jurisdiction for a protected area shall share responsibility for developing the management plan.
- The Management Authority shall initiate planning by conducting a stakeholder analysis, conducting public scoping through meetings and solicitation of information seeking consensus regarding concerns with and priorities for management of protected areas from the public, local communities, community-based organizations, and stakeholders.
- The Management Authority shall draft a management plan and give notice of it and solicit comments by placing an announcement in the Gazette, at least one national newspaper of general circulation, and at least one national radio and one national television station.
- The Management Authority shall circulate the draft and solicit comments from the Body, all institutions represented on the Body, and any other party upon request.

- The Management Authority shall hold meetings to present the draft to the public and shall accept comments in written and oral form.
- The Management Authority shall consider all comments, shall change the draft management plan as appropriate, and shall prepare a response to all comments that shall be included with the release of the final plan.
- The Management Authority shall submit the draft management plan to the Minister with jurisdiction over that Management Authority, for approval.
- Management plans shall be approved or sent back for revisions by the Minister with jurisdiction over that Management Authority, within 60 days of receipt.
- Management plans shall be revised as occasion requires, with notice to the Body and the Minister with jurisdiction over that Management Authority.
- If the Minister with jurisdiction over that Management Authority deems revisions sufficiently substantial, he or she shall require that the revisions follow the procedures provided for preparation of a new management plan.

The Model Act also addresses coordination with other entities, provides the criteria for Management Plans and addresses the implementation of management plans by means of annual operational plans. The act also provides the following:

- First Schedule- Protected Areas Coordinating Body Meeting and Voting Requirements;
- Second Schedule - Protected Area Categories; and
- Third Schedule – Cooperative Protected Areas.

E.4 Basis for Consideration of Proposed PAs

The proposed protected areas can be divided into two main categories:

- Biological / Natural Heritage Sites; and
- Historical / Cultural Sites.

E.4.1 Biological / Natural Heritage

The basis for the consideration of proposed Protected Areas in St. Kitts and Nevis stem from the IUCN's international guidance on the categorization of protected areas. Based on the Commission on National Parks and Protected Areas (CNPPA), the IUCN, in 1978 developed ten categories of protected areas. However, it was agreed that the list needed a revision. As such, from 1984, the tasks of reviewing and updating the list began. Following the Fourth World Congress held in February 1992, the initial list was reduced from ten categories to six. The categories and their definitions are presented in Table E-2 below.

The central principle upon which the IUCN's guidelines for Protected Areas are based is that categories should be defined by the objectives of management and not by the title of the area or by the effectiveness of management in meeting those objectives. For example, the areas should be managed mainly for:

- Strict Protection;
- Ecosystem Conservation and Recreation;
- Conservation of Natural Features;
- Conservation through Active Management;
- Landscape / Seascape Conservation and Recreation; and
- Sustainable use of Natural Ecosystems.

When applying categories, it is recommended that categories be assigned on the basis of the primary management objective as contained in the legal definitions (see Table E-3 below) on which it was established. In other words, emphasis must be placed on clarifying the objectives for management and ensuring that the right conditions exist for their achievement. Therefore, national legislation will need to be examined to identify these primary objectives for which the area is to be managed. This approach ensures a solid basis to the system and is more practical.

The island of St. Kitts and Nevis has prepared a National Conservation and Environmental Management Act, 2009 (Draft) {see Section E.1.2} which, under its first Schedule, has implemented categories of protected areas. These categories are based on IUCN's list and are presented in Table E-4 below.

TABLE E-2: IUCN LIST OF PROTECTED AREAS

| IUCN CATEGORY | DEFINITION |
|--|--|
| Ia – Strict Nature Reserve: Protected area managed mainly for science | Area of land and/or sea possessing some outstanding or representative ecosystem, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring. |
| Ib – Wilderness Area: Protected area managed mainly for wilderness protection | Large area of unmodified land and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition. |
| II – National Park: Protected Area Managed Mainly for Ecosystem Protection and Recreation | Natural area of land and/or sea, designated to: (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area, and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible. |
| III – Natural Monument: Protected Area Managed Mainly for Conservation of Specific Natural Features | Area containing one, or more, specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance. |
| IV – Habitat/Species Management Area: Protected Area Managed Mainly for Conservation through Management Intervention | Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species |
| V – Protected Landscape/Seascape: Protected Area Managed Mainly for Landscape/Seascape Conservation and Recreation | Area of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. |
| VI – Managed Resource Protected Area: Protected Area Managed Mainly for the Sustainable Use of Natural Ecosystems | Area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs. |

TABLE E-3: GUIDANCE FOR THE SELECTION OF PAs AND THE RELEVANT OBJECTIVES OF MANAGEMENT

| IUCN | OBJECTIVES OF MANAGEMENT | GUIDANCE FOR SELECTION |
|-------------|--|---|
| la | <ul style="list-style-type: none"> ▸ To preserve habitats, ecosystems and species in as undisturbed state as possible; ▸ To maintain genetic resources in a dynamic and evolutionary state; ▸ To maintain established ecological processes; ▸ To safeguard structural landscape features or rock exposure; ▸ To secure examples of the natural environment for scientific studies, environmental monitoring and education; ▸ To minimize disturbance by careful planning and execution of research; and ▸ To limit public access. | <ul style="list-style-type: none"> ▸ The area should be large enough to ensure the integrity of its ecosystems and to accomplish the management objective for which it is protected. ▸ The area should be significantly free of direct human intervention and capable of remaining so. ▸ The conservation of the area's biodiversity should be achievable through protection and not require substantial active management or habitat manipulation. |
| lb | <ul style="list-style-type: none"> ▸ To ensure that future generations have the opportunity to experience understanding and enjoyment of areas that have been largely undisturbed by human action over a long period of time; | <ul style="list-style-type: none"> ▸ The area should possess high natural quality, be governed primarily by the forces of nature, with human disturbance substantially absent, and be likely to continue to display those attributes if managed as proposed. |
| lb (cont'd) | <ul style="list-style-type: none"> ▸ To maintain the essential natural attributes and qualities of the environment over the long term; ▸ To provide for public access at levels and of a type which will serve best the physical and spiritual well-being of visitors and maintain the wilderness qualities of the area for present and future generations; and ▸ To enable indigenous human communities living at low density and in balance with the available resources to maintain their lifestyle. | <ul style="list-style-type: none"> ▸ The area should contain significant ecological, geological, physiographic, or other features of scientific, educational, scenic or historic value. ▸ The area should offer outstanding opportunities for solitude, enjoyed once the area has been reached by simple, quiet, non-polluting and non-intrusive means of travel. ▸ The area should be of sufficient size to make practical such preservation and use. |

| IUCN | OBJECTIVES OF MANAGEMENT | GUIDANCE FOR SELECTION |
|----------------|--|---|
| II | <ul style="list-style-type: none"> ▸ To protect natural and scenic areas of national and international significance for spiritual, scientific, educational, recreational or tourist purposes; ▸ To perpetuate, in as natural a state as possible, representative examples of physiographic regions, biotic communities, genetic resources and species to provide ecological stability and diversity; | <ul style="list-style-type: none"> ▸ There should contain a representative sample of major regions, features or scenery, where plant and animal species, habitats and geomorphological sites are of special spiritual, scientific, educational, recreational and tourist significance. |
| II (cont'd) | <ul style="list-style-type: none"> ▸ To manage visitor use for inspirational, educational, cultural and recreational purposes at a level which will maintain the area in a natural or near natural state; ▸ To eliminate and thereafter prevent exploitation or occupation inimical to the purposes of designation; ▸ To maintain respect for the ecological, geomorphologic, sacred or aesthetic attributes which warranted designation; and ▸ To take into account the needs of indigenous people, including subsistence resource use, in so far as these will not adversely affect the other objective of management. | <ul style="list-style-type: none"> ▸ The area should be large enough to contain one or more entire ecosystems not materially altered by current human occupation. |
| III | <ul style="list-style-type: none"> ▸ To protect or preserve in perpetuity specific outstanding natural features because of their natural significance, unique or representational quality, and/or spiritual connotations; ▸ To an extent consistent with the foregoing objective, to provide opportunities for research, education, interpretation and public appreciation; ▸ To eliminate and thereafter prevent exploitation or occupation inimical to the purpose of designation; and ▸ To deliver to any resident population such benefits as are consistent with other objectives of management. | <ul style="list-style-type: none"> ▸ The area should contain one or more features of outstanding significance (appropriate natural features, unique or representative flora and fauna, associated cultural features, archaeological sites, or natural sites which have heritage significance to indigenous peoples). ▸ There area should be large enough to protect the integrity of the features and its immediately related surroundings. |

| IUCN | OBJECTIVES OF MANAGEMENT | GUIDANCE FOR SELECTION |
|------|---|---|
| IV | <ul style="list-style-type: none"> ▸ To secure and maintain the habitat conditions necessary to protect significant species, groups of species, biotic communities or physical features of the environment where these require specific human manipulation for optimum management; ▸ To facilitate scientific research and environmental monitoring as primary activities associated with sustainable resource management; ▸ To develop limited areas for public education and appreciation of the characteristics of the habitats concerned and of the work of wildlife management; ▸ To eliminate and thereafter prevent exploitation or occupation inimical to the purposes of designation; and ▸ To deliver such benefits to people living within the designated area as are consistent with the other objectives of management. | <ul style="list-style-type: none"> ▸ The area should play an important role in the protection of nature and the survival of species. ▸ The area should be one where the protection of the habitat is essential to the well-being of nationally or locally-important flora, or to resident or migratory fauna. ▸ Conservation of these habitats and species should depend upon active intervention by the management authority, if necessary through habitat manipulation. ▸ The size of the area should depend on the habitat requirement of the species to be protected and may range from relatively small to very extensive. |
| V | <ul style="list-style-type: none"> ▸ To maintain the harmonious interaction of nature and culture through the protection of landscape and/or seascape and the continuation of traditional land uses, building practices and social and cultural manifestations; ▸ To support lifestyles and economic activities which are in harmony with nature and the preservation of the social and cultural fabric of the communities concerned; | <ul style="list-style-type: none"> ▸ The area should possess a landscape and/or coastal and island seascape of high scenic quality, with diverse associated habitats, flora and fauna along with manifestations of unique or traditional land-use patterns and social organizations as evidenced in human settlements and local customs, livelihoods and beliefs. |

| IUCN | OBJECTIVES OF MANAGEMENT | GUIDANCE FOR SELECTION |
|---------------|---|---|
| V (cont'd) | <ul style="list-style-type: none"> ▶ To maintain the diversity of landscape and habitat, and of associated species and ecosystems; ▶ To eliminate where necessary, and thereafter prevent, land uses and activities which are inappropriate in scale and/or character; ▶ To provide opportunities for public enjoyment through recreation and tourism appropriate in type and scale to the essential qualities of the area; ▶ To encourage scientific and educational activities which will contribute to the long term well-being of resident populations and to the development of public support for the environmental protection of such areas; and ▶ To bring benefits to, and to contribute to the welfare of, the local community through the provision of natural products and services. | <ul style="list-style-type: none"> ▶ The area should provide opportunities for public enjoyment through recreation and tourism within its normal lifestyle and economic activities. |
| VI | <ul style="list-style-type: none"> ▶ To protect and maintain the biological diversity and other natural values of the area in the long term; ▶ To promote sound management practices for sustainable production purposes; ▶ To protect the natural resource base from being alienated for other land-use purposes that would be detrimental to the area's biological diversity; and ▶ To contribute to regional and national development. | <ul style="list-style-type: none"> ▶ The area should be at least two-thirds in a natural condition, although it may contain limited areas of modified ecosystems; large commercial plantations would not be appropriate for inclusion. ▶ The area should be large enough to absorb sustainable resource uses without detriment to the overall long-term natural values. |

TABLE E-4: ST. KITTS AND NEVIS CATEGORIES OF PROTECTED AREAS

| CATEGORY | DEFINITION |
|-----------------------------|---|
| I – NATIONAL PARK | An area consisting of a relatively large land or marine area or some combination of land or sea, containing natural and cultural features or scenery of national or international significance and managed in a manner to protect such resources and sustain scientific, recreational and educational activities on a controlled basis. |
| II – HISTORIC SITE | A place or site which is historic by reason of an association with the past and its part of the cultural or historical heritage of Saint Christopher and Nevis, and such a classification may include archaeological sites, historic landmarks, and areas of special historic or cultural interest. |
| III – NATURE RESERVE | An area containing outstanding or fragile natural features or life forms of national importance that need protection in an undisturbed state where the only permitted activities are management measures, controlled scientific research and educational study. |
| IV – MARINE RESERVE | An area as provided in Section 23 of the Fisheries Act, 1984. |
| V – AREA OF SPECIAL CONCERN | A place or site needing special protection and controlled use in order to stabilize or restore important ecological features or functions. |
| VI – SCENIC SITE | An area containing a scenic feature of national or local importance. |
| VII – BOTANIC GARDEN | A garden established for the preservation display and propagation of the national botanical resources. |

E.4.2 Historical / Cultural

The Tourism Master Plan (1993) separates heritage sites into four categories described as follows:

- ▶ Table 3.17 in that plan lists sites or complexes of exceptional historical and/or architectural value (Category 1). The sites in this category are presently or potentially essential to the tourism activity and must be preserved and treated with great sensitivity.
- ▶ Table 3.18 in that plan identifies sites of considerable historical and/or architectural merit, with high potential for enhancing the tourism product (Category 2). These sites should be protected but could be renovated for an adaptive use consistent with their use in tourism. The table includes descriptions of the estate buildings listed. The category contains the major plantation inns and important historic church, Government, and commercial buildings in current use.
- ▶ Table 3.19 in that plan lists windmills and chimneys; which represent two different technological eras in the history of plantation sugar production (Category 3). These stone structures dot the countryside of St. Kitts and should be protected, stabilized and maintained. In addition, to chimneys and mills, this category includes other important landmarks.
- ▶ Table 3.20 in that plan lists other cultural and historical sites with limited importance and/or integrity that should be preserved with appropriate development. The sites in this category could be used to enhance the tourism program (Category 4).

Furthermore, the Tourism Master Plan recommends that all category 1 sites should be designated as “protected areas” by the National Conservation Commission in accordance with the National Conservation and Environmental Act; and that protected area designation should also be considered for all Category 2 sites. It further states that the sites located at Bloody Point, Palmetto Point, and Black Rocks are priorities in terms of conservation and research for scientific and educational purposes and as tourist attractions; and that archaeological sites on the southeast peninsula should be protected and incorporated into the development and tourism planning for that region.

E.5 Linkage with other National Planning Initiatives

This Protected Areas System Plan cannot exist in isolation. Instead, it must be in harmony with other national planning initiatives to ensure that resources and capacity are allocated toward the same or similar national goals. Some of those are discussed below.

E.5.1 National Biodiversity Strategy and Action Plan (NBSAP)

The St. Kitts and Nevis National Biodiversity Strategy and Action Plan (NBSAP) seeks to present a focused and dynamic report on strategies for the conservation of the biological resources of the country through:

- The specification of goals and objectives;
- Defining the current known range and status of biodiversity;
- Describing the probable sources of biodiversity losses;
- Analysis of gaps between current reality and aspirations; and
- Identification of actions that can address these gaps;

The objectives of the NBSAP aim to fulfil the requirements of its obligation to the CBD (see Section E.2.3), which is Article 6: General Measures for Conservation and Sustainable Use. It is stated under this Article that each Party, in accordance with its particular conditions and capabilities shall:

- (a) Develop national strategies, plans or programs for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programs which shall reflect, *inter alia*, the measures set out in this convention relevant to the Contracting Party concerned, and
- (b) Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programs and policies.

Since ratifying the CBD Convention, the compilation of a National Biodiversity Strategy and Action Plan (NBSAP) constitutes the first of a set of actions by St. Kitts and Nevis to fulfil its obligations under the Convention.

The NBSAP document outlines a total of twenty three (23) projects to be executed in a time frame of eleven (11) months to five (5) years. Government agencies, NGO’s and research groups will undertake these projects.

E.5.2 National Environmental Management Strategy and Action Plan (NEMS)

The preparation of this plan for St. Kitts and Nevis (SKN) is a requirement of the government due to obligations made under the St. Georges Declaration (SGD) of Principles for Environmental Sustainability in the Organization of Eastern Caribbean States (OECS). Under the SGD there are 21 Principles which have been prescribed and like all other OECS members the government of SKN have agreed to utilize these in the governance of national affairs.

The NEMS adequately covers these obligations in Principle 11: Ensure the Sustainable Use of Natural Resources. This principle involves five (5) strategies which are summarized in Table E-5 below.

TABLE E-5: STRATEGIES OF THE NEMS UNDER PRINCIPLE 11

| ST. | DESCRIPTION | ACTIVITIES |
|-----|--|--|
| 32 | Manage terrestrial, marine and atmospheric resources, organisms and ecosystems in an appropriate manner to obtain the optimum sustainable productivity, while maintaining the integrity of natural and ecological processes and inter relationships. | <ul style="list-style-type: none"> ▸ Assess threats to sustainable use of natural resources; quantify rates of decline of resources, devise recommendations to counteract rates of decline. ▸ Develop and implement management plans for marine and terrestrial protected areas. |
| 33 | Design, promote and implement measures to prevent, mitigate and control degradation of aquatic, terrestrial and atmospheric environmental quality and processes conducive to desertification. | <ul style="list-style-type: none"> ▸ Adopt and implement the measures contained in the National Biodiversity Strategy Action Plan for St. Kitts and Nevis. ▸ Identify critical areas for erosion control, and develop and implement remediation projects with community participation. |
| 34 | Work together, with Civil Society Organization to promote and facilitate improved national capability for the management of natural resources. | <ul style="list-style-type: none"> ▸ Provide short-term in-house training for Civil Society Organization to resources management projects. |

| ST. | DESCRIPTION | ACTIVITIES |
|-----|--|---|
| 35 | Take all necessary measures within its legal and policy framework, including enactment of new legislation where appropriate, to ensure that conservation and management of natural resources are treated as an integral part of development planning at all stages and levels. | <ul style="list-style-type: none"> ▸ Identify and implement a mechanism to incorporate environmental considerations, especially natural resources accounting into development planning. ▸ Adopt and implement the measures contained in the National Environmental Management Strategy and Action Plan for St. Kitts and Nevis. ▸ Conduct a review of the current environmental documentation, information, programs and projects and prepare an updated version of the Country Environmental Profile. |
| 36 | Develop a schedule of development activities for which environmental impact assessment will be required as part of project definition and design, and the results of which will be considered in determining whether how a project will proceed. | <ul style="list-style-type: none"> ▸ Disseminate widely the requirements for and availability of guidelines on environmental impact assessments. ▸ Ensure that Public Sector Investment Projects are subject to EIAs. |

E.5.3 St. Christopher Physical Development Plan

The 2006 National Physical Development Plan (NPDP) is intended to usher the island of St. Kitts into a new era of economic and social growth and development. This Plan provides a framework to guide activities that are aimed at achieving strategic goals through the concrete implementation of projects that further economic growth and social progress on the island of St. Kitts. This Plan addresses the management of protected areas as it states that the Government of St. Kitts and Nevis holds the strong conviction that conservation policies seek to protect and enhance landscapes as natural assets for recreational, aesthetics, economic and ecological reasons. The facets of the natural landscape that are of main conservation interest include national parks, special landscape features, trees and other sites of scenic value.

Specific to this project and arising out of this Plan are the following:

- Coastal Area Management;
- Watershed Management;
- Management of Protected Areas; and
- Conservation of the Built Development.

E.5.3.1 Coastal Area Management

The coastal areas of St. Kitts are considered a valuable asset to the island's tourism sector and are a major part of their overall revenue. Beaches, coral reefs, sea grass beds and other endangered species found in the nearshore waters of St. Kitts are a major attraction to tourists, and these must be preserved if their contribution to tourism is to continue. Development and natural disasters (primarily storms) are the main factors that threaten these resources. Vulnerable sites include Conyers, Parsons, Frigate Bay, Irish Town Bay Road and Fortlands which require coastal protection works.

The Plan therefore proposes to:

- Prepare a comprehensive Coastal Zone Management Plan;
- Implement long-term coastal water quality and marine biological monitoring program;
- Enforce the requirement of a minimum setback from mean high tide for all forms of development;
- Support the establishment and enforcement of effective standards to control the discharge of effluents into drainage systems, sensitive potable water zones and marine areas;
- Protect and sustain long term use of mangroves, sea grass beds, coral reefs, ponds and beaches;
- Adapt strategies that control oil spillages;
- Designate the Southeast Peninsula and Sandy Shoal coral reefs as Marine Protected Areas; and
- Designate mooring areas for dive boats, yachts and cruise vessels.

E.5.3.2 Watershed Management

Key watershed areas and coastal aquifers are of vital importance to sustainable development, particularly in relation to water supply, fuel wood and the prevention of erosion and landslides. However, these areas are being threatened by development activities and unsustainable use of the resources which they have to offer.

To protect these valuable resources, the Plan proposes to:

- Implement a comprehensive reforestation program;
- Ensure that development is NOT permitted within or in the vicinity of any forest reserve;
- Enforce laws prohibiting unauthorized nature tours in forest reserves and water catchment areas;
- Develop public awareness programs;
- Manage existing forested areas including sensitive thinning of dense areas;
- Establish suitable tree crop plantations (silviculture) to supply products to the agro-processing industry;
- Develop forest fire prevention and control measures; and
- Declare the Wingfield, Frankland, Stonefort, Greenhill, Phillips and Lodge catchment areas as Protected Areas.

E.5.3.3 Management of Protected Areas

The environmental strategies proposed by the NPDP seek to protect and enhance landscapes as natural assets for recreation, aesthetic, economic and ecological reasons. Unique terrestrial habitats such as forests, ponds, mangroves, sand dunes, coral reefs, seagrass beds and beaches need to be designated for preservation. The NPDP therefore proposes to:

- Develop a Park and Protected Areas System Plan to ensure that all critical natural and cultural resources receive adequate protection and management (which is part of NCEMA 2009 – see Section E.1.2);
- Restrict development on the Basseterre Valley Aquifer;
- Declare areas with unique terrain, flora and fauna and high recreational potential as National Parks;
- Adopt measures to restore environmental degraded areas and ensure the sustainable use of natural resources;
- Establish marine reserves to protect coastal resources (Southeast Peninsula and Sandy Shoal); and

- Exercise control over the siting of buildings on ridges and escarpments and where appropriate, prohibit building forms that will decrease the aesthetic value of these physical features.

E.5.3.4 Conservation of the Built Development

The NPDP recognises the value of using the country's heritage resources as tourist attractions and educational tools. In this regard, some of the objectives of the NPDP in the conservation of build development include:

- Institute appropriate measures (including legislation) to provide for the researching, documenting, protecting, conserving, rehabilitating and management of the cultural, historic and natural monuments, buildings and symbols, as well as areas of outstanding scientific, cultural, spiritual, scenic or aesthetic significance;
- Establish a National Trust and enact legislation to protect heritage resources;
- Prepare an Urban Revitalization Master Plan to protect the historic, architectural and archaeological resources of the city of Basseterre;
- Expedite existing projects for the development of Spooner's Estate Yard, The De Poincy Chateau and Old Road Town as Heritage Tourism Attractions;
- Seek UNESCO World Heritage designation for Fort Charles; and
- Complete and finalise the National List of Historical Places, Buildings and Landmarks.

E.5.4 Nevis Physical Development Plan

The Nevis Physical Planning and Development Control Ordinance 2005 which became operative in March 2006, has clearly identified the requirement for a Physical Development Plan for Nevis to be prepared. The main purpose for preparing an Island Physical Development Plan is to improve spatial planning for the enhancement of economic, social and environmental conditions for residents and for visitors to Nevis, and to sustain the Island for future generations.

Under this Plan four areas have been identified where conservation and enhancement of the natural environment should take precedence over development, these are also included on the Island Plan Zoning Plan. Within these protected areas there is a strong presumption against any form of development. The following are the main areas that are to be designated as Protection Areas:

- Nevis Peak Protected Area;
- Bath Bogs Protected Area;
- Camps River Wetland Protected Area; and
- Indian Castle Protected Area.

In addition to the four Protected Areas mentioned above, two Coastal Conservation Areas have been identified. These are:

- Pinney’s Beach Conservation Area; and
- Sea Haven Conservation Area.

While within these areas development may be possible, any development must respect the natural quality of the area in its design, scale and type of use.

E.6 Fees, Levies and Taxes

Other environmental taxes, fees and levies presently collected in St. Kitts and Nevis are:

- ▶ Environmental Levy for Solid Waste,
- ▶ Environmental Levy on Used Motor Vehicles,
- ▶ Bottles and Cans Deposit Levy, and
- ▶ Fee for Tours.

An Environmental Levy of \$EC 5.00 is charged on departure from the Federation. This is intended to defray the cost of disposing of solid waste generated by visitors, and is deposited to the Solid Waste Management Company. An Environmental Levy is also charged on the importation of used motor vehicles. This is also intended to defray the eventual cost of disposing of these vehicles, but is deposited to the Consolidated Fund. The levy is \$EC 5,000.00 for vehicles more than 5 years old, \$EC 3,000.00 for vehicles between 3 and 5 years old, and \$EC 1,000.00 for vehicles between 1 and 3 years old.

The Bottles and Cans Deposit Levy is paid on importation of non-returnable bottles and cans of beer, stout, malt and other drinks. Finally, information received during one of the consultation meetings is that an Environmental Tax Levy of \$1.50 is charged on all tourism related activities. Efforts to get further information on this levy proved futile.



APPENDIX F

SPECIES LISTS

**APPENDIX F:
LISTS OF SPECIES**

TABLE F-1: PLANT SPECIES KNOWN TO BE ENDEMIC IN ST. KITTS AND NEVIS

(Source: Horwith, B. and Lindsay, K., 1999)

| | |
|--|--|
| <i>Acrocomia aculeate</i> , LA | <i>Thelypteris clypeolutata</i> , LA |
| <i>Asplenium malcom-smithii</i> (Believed to represent a Hybrid endemic to St. Kitts) | <i>Tibouchina ornata</i> , LA |
| <i>Begonia retusa</i> , LA | <i>Agave dussiana</i> , LA |
| <i>Charianthus purpureus</i> , LA | <i>Ayenia insulaecola</i> , WI |
| <i>Clidemia umbrosa</i> , LA | <i>Cestrum laurifolium</i> , WI |
| <i>Cybianthus parasiticus</i> , LA | <i>Chrysobalanus cuspidatus</i> , LA |
| <i>Eugenia chrysobalanoides</i> , LA | <i>Clusia major</i> , LA |
| <i>E. trigonscarpum</i> , LA | <i>Epidendrum patens</i> , LA |
| <i>Freziera undulata</i> , LA | <i>E. macranthum</i> , LA |
| <i>Galactia longifolia</i> , LA | <i>Eupatorium integrifolium</i> , LA |
| <i>Hymenophyllum hirtellum</i> var. <i>gratum</i> , LA | <i>Furcrea tuberosa</i> , LA |
| <i>Labelia cirsiifolia</i> , LA | <i>Galactia rubra</i> , LA |
| <i>Macgravia umbrellata</i> , LA | <i>Ilex dioica</i> , LA |
| <i>Marila racemosa</i> , LA | <i>Malpighia linearis</i> , LA |
| <i>Peperomia dussii</i> , LA | <i>Oncidium urophyllum</i> , LA |
| <i>Prunus pleuradenia</i> , LA | <i>Peperomia pellucida</i> , LA |
| <i>Sapium caribeum</i> , LA | <i>Schefflera attenuata</i> , LA |
| <i>Selaginella flabellata</i> , LA | <i>Stelis cabrida</i> , LA |
| <i>Sloanea dentata</i> , LA | <i>Ternstroemia elliptica</i> , LA |
| <i>Sloanea massoni</i> , LA | <i>Thelypteris antillana</i> , LA |
| <i>S. berteriana</i> , WI | <i>Thelypteris muscicola</i> , Endemic to Nevis |
| <i>Styrax glaber</i> , LA | <i>Vriesia guadelupensis</i> , LA |
| <i>Tetrazygia discolor</i> , LA | |

**The species in the table above are those listed as endemic by Howard (1974; 1977; 1979; 1988; 1989)

LA – Lesser Antilles

WI – West Indies

TABLE F-2: INVERTEBRATES: GLOBAL AND CARIBBEAN ESTIMATES

(Source:: Horwith and Lindsay, 1999)

| TAXA | CARIBBEAN ESTIMATE |
|---|---|
| Porifera (Sponges) | 56 (Humann, 1993) |
| Cnidaria (Corals, hydroids, jellyfish and anemones) | 148 corals plus another 62 Cnidarians in various other taxa (Humann, 1993) |
| Ctenophora (Comb-jellies or sea walnuts) | 9 (Humann, 1993) |
| Platyhelminthes (Flatworm) | 5 (Humann, 1993) |
| Nemertea (Ribbon Worms) | 1 (Humann, 1993) |
| Pseudocoelomates (10 phyla: Rotifera, Gastrotricha, Kinorhyncha, Nematoda, Nematomorpha, Acanthocephala, Entoprocta, Pripula, Gnathostomulida and Loricifera) | -- |
| Annelida (Segmented worms, earthworms, fireworms, feather duster worms, calcareous tube worms, spaghetti worms) | 23 (Humann, 1993) |
| Coelomate Worms (4 phyla: Sipuncula, Echiura, Pogonophora, Vestimentifera) | -- |
| Arthropods (4 subphyla, 1 of which Trilobitomorpha is extinct) | -- |
| Cheliceriformes (this sub-phylum includes the horseshoe crabs, spiders, scorpions, mites) | -- |
| Arachnida (Subclass containing 10 orders, including spiders [35,000 spp], scorpion [1,200 spp], mites and ticks) | Kohls (1969) lists 17 species of ticks in the Lesser Antilles |
| Uniramia | -- |
| Myriapoda | -- |
| Chilopoda (centipedes) and Diplopoda (millipedes) | -- |
| Insecta (class containing 32 orders, only some of which are included below) | -- |
| <i>Odonata</i> (Dragonflies and Damselflies) | 86 species of dragonflies and 44 species of damselflies are recorded for Florida (Dunkle, 1989) |

| TAXA | CARIBBEAN ESTIMATE |
|--|---|
| <i>Isoptera</i> (Termites) | 94 species recorded for the Caribbean (Collins, unpublished) |
| <i>Orthoptera</i> (Grasshoppers, crickets, and locusts) | -- |
| <i>Hemiptera</i> | -- |
| <i>Homoptera</i> | -- |
| <i>Coleoptera</i> (Beetles) | >1,200 species recorded in the USVI, which has been relatively well-studied (Ivie, reported by Chadwick, 1998) |
| <i>Hymenoptera</i> (ants, bees, wasps) | -- |
| <i>Diptera</i> (flies, mosquitoes) | -- |
| <i>Lepidoptera</i> (Butterflies and Moths) | 292 species of butterflies in the West Indies (Stiling, 1986), over half endemic (following Miller and Miller's (1989) inclusion of the southern tip of Florida and the Keys as Antillean); 69 in the Lesser Antilles; 9 of which occur in the Leeward Island but not the Windward Islands and 19 that occur in the Windwards but not in the Leewards (Riley, 1975) Barnes' (1996) identification guide lists just over 500 moth species for the Lesser Antilles |
| Crustacea (includes crayfish, lobster, crab, shrimp, barnacles) | 64 marine (Humann, 1993) |
| Mollusca (chitons, clams, oysters, mussels, snails, slugs, whelks, tooth shell, squid, octopus) | 100 marine (Humann, 1993) |
| Lophophorates (3 phyla: Phoronida, Ectoprocta and Brachiopoda) | 13 (Humann, 1993) |
| Echinodermata (starfish, brittle stars, sea urchins, sea cucumbers and feather stars) | 14 starfish, 9 brittle stars, 11 sea urchins, 7 sea cucumbers, 4 feather stars (Humann, 1993) |
| Invertebrate Chordates and kin: 3 phyla – Chaetognatha, Hemichordata and some Chordata | Humann, 1993) |

-- No estimate available

TABLE F-3: BATS OF ST. KITTS AND NEVIS

(Source: Horwith and Lindsay, 1999)

| SPECIES | NOTES |
|---|--|
| Common Fruit bat or Leaf nosed bat (<i>Artibeus jamaicensis</i>) | Recorded for St. Kitts & Nevis, but uncommon on both islands. Widespread in the Caribbean & Tropics |
| Pig-faced Bat or Brown Flower Bat (<i>Brachyphylla cavernarum</i>) | Antillean endemic, primarily Lesser Antilles, but also Puerto Rico and the Virgin Islands. Common on both St. Kitts & Nevis. Vulnerable at their few roosting sites. |
| Long-Tongued Fruit Bat (<i>Monophyllus plethodon</i>) | Lesser Antillean endemic. |
| Brazilian Free-tailed Bat (<i>Tadarida brasiliensis</i>) | Widely distributed in Neo and Tropical America, but low numbers in the country. Did not find any on St. Kitts but seen on Nevis. |
| Fishing Bat (<i>Noctilio leporinus</i>) | Believed to exist on both islands based on descriptions from residents. |
| Lesser Antillean Tree Bat (<i>Ardrops nichollsi</i>) | Endemic to the Lesser Antilles. Found on St. Kitts during a 1999 survey, although its status is unknown. Never recorded from Nevis. |
| Dominican Myotis (<i>Myotis dominicensis</i>) | Recorded for both St. Kitts and Nevis. Commonly found under roofing of houses. Can be seen early at dusk and dawn hawking for insects over residential areas. |

TABLE F-4: LIST OF FRESHWATER FISHES FOR ST. KITTS AND NEVIS

(Source: Fishbase.org, 2008)

| COMMON NAME | SCIENTIFIC NAME | STATUS |
|------------------|-------------------------------|--------------|
| Bull Shark* | <i>Carcharhinus leucas</i> | Native |
| Swordspine Snook | <i>Centropomus ensiferus</i> | Native |
| Fat Snook | <i>Centropomus parallelus</i> | Native |
| Tarpon Snook | <i>Cetnropomus pectinatus</i> | Native |
| Bobo Mullet | <i>Joturus pichardi</i> | Native |
| Tarpon (Bass) | <i>Megalops atlanticus</i> | Native |
| Flathead Mullet | <i>Mugil cephalus</i> | Questionable |
| Liza | <i>Mugil liza</i> | Native |

* Note: The Bull Shark is a marine species but has a wide range of tolerance for fresh water.

TABLE F-5: LIST OF BIRDS DOCUMENTED IN ST. KITTS

| BIRD SPECIES | Mar-April, 1982 | November, 2009 | STATUS/NOTES |
|---|--------------------|-------------------|---|
| Brown Booby (<i>Sula leucogaster</i>) | X | X | Year Round Resident (CCA, 1991) |
| Brown Pelican (<i>Pelecanus occidentalis</i>) | X | X | Uncommon, vulnerable (Horwith and Lindsay, 1999) Fairly common (Vittery, 2006) |
| Magnificent Frigatebird (<i>Fregata magnificens</i>) | X | X | Rare Nester in St. Kitts (Horwith and Lindsay, 1999) Common (Vittery, 2006) |
| Great Blue Heron (<i>Ardea herodias</i>) | X | X | Small numbers in most wetlands (Vittery, 2006) |
| Grey Heron (<i>A. cinerea</i>) | - | X | First Record at Frigate Bay (Vittery, 2006) |
| American Great Egret (<i>A. alba</i>) | - | X | Small Numbers mainly on Frigate Bay (Vittery, 2006) |

| BIRD SPECIES | Mar-April, 1982 | November, 2009 | STATUS/NOTES |
|---|--------------------|-------------------|---|
| Little Blue Heron (<i>Egretta caerulea</i>) | X | X | Common on most wetlands (Vittery, 2006) |
| Tricolored Heron (<i>E. tricolour</i>) | - | X | One immature at Frigate Bay (Vittery, 2006) |
| Snowy Egret (<i>E. thula</i>) | X | X | Common (Vittery, 2006) |
| Cattle Egret (<i>Bubulcus ibis</i>) | X | X | Common (Vittery, 2006) |
| Black-crowned Night Heron (<i>Nycticorax nycticorax</i>) | - | X | Small numbers (Vittery, 2006) |
| Yellow-crowned Night Heron (<i>Nyctanassa violacea</i>) | X | X | Present at most wetlands (Vittery, 2006) |
| Green Heron (<i>Butorides virescens</i>) | X | X | Only seen in Frigate Bay (Vittery, 2006) |
| Blue-winged Teal (<i>Anas discors</i>) | X | X | Fairly common (Vittery, 2006) |
| White-cheeked Pintail (<i>A. bahamensis</i>) | - | X | Uncommon, Vulnerable (Horwith and Lindsay, 1999) Up to 22 seen in Cockleshell Bay, 2 in Friars Bay (Vittery, 2006) |
| Lesser Scaup (<i>Aythya affinis</i>) | X | X | 2 seen at Cockleshell Bay, (Vittery, 2006) |
| Red-tailed Hawk (<i>Buteo jamaicensis</i>) | X | X | Fairly common (Vittery, 2006) |
| Osprey (<i>Pandion haliaetus</i>) | X | X | Rare Winter Visitor (Horwith and Lindsay, 1999) Migratory, common (Vittery, 2006) |
| American Kestrel (<i>Falco sparverius</i>) | X | X | Widespread in small numbers (Vittery, 2006) |
| Merlin (<i>F. columbarius</i>) | - | X | Several sightings (Vittery, 2006) |

| BIRD SPECIES | Mar-April, 1982 | November, 2009 | STATUS/NOTES |
|--|--------------------|-------------------|---|
| Peregrine Falcon (<i>F. peregrinus</i>) | X | X | Rare, endangered, globally (Horwith and Lindsay, 1999) One large female of the migratory race present throughout (Vittery, 2006) |
| Lanner (<i>F. biarmicus</i>) | - | X | Juvenile female seen. Natural occurrence unthinkable, so presumably falconry escape (Vittery, 2006) |
| Common Moorhen (<i>Gallinula chloropus</i>) | X | X | Common on wetlands with fringing vegetation (Vittery, 2006) |
| Clapper Rail (<i>Rallus longirostris</i>) | - | X | Rare, vulnerable (Horwith and Lindsay, 1999) One seen at Frigate Bay and a pair heard calling at Friars Bay (Vittery, 2006) |
| Sora (<i>Porzana Carolina</i>) | - | X | Seen at Frigate Bay and Muddy Point (Vittery, 2006) |
| Helmeted Guinea fowl (<i>Numida meleagris</i>) | X | X | Fairly common (Vittery, 2006) |
| Black-necked Stilt (<i>Himantopus mexicanus</i>) | - | X | Very common (Vittery, 2006) |
| American Avocet (<i>Recurvirostra americana</i>) | - | X | First record (Vittery, 2006) |
| Black-bellied Plover (<i>Pluvialis squatarola</i>) | X | X | Small numbers on most wetlands, (Vittery, 2006) |
| American Golden Plover (<i>P. dominica</i>) | - | X | Small numbers (Vittery, 2006) |
| Pacific Golden Plover (<i>P. fulva</i>) | - | X | First record of one in partial summer plumage (Vittery, 2006) |
| Killdeer (<i>Charadrius vociferous</i>) | - | X | Small numbers (Vittery, 2006) |
| Wilson's (Thick-Billed) Plover (<i>C. wilsonia</i>) | X | X | Small numbers on quieter beaches (Vittery, 2006) |

| BIRD SPECIES | Mar-April, 1982 | November, 2009 | STATUS/NOTES |
|--|--------------------|-------------------|--|
| Semi-palmated Plover (<i>C. semipalmatus</i>) | X | X | Small numbers most wetlands (Vittery, 2006) |
| Snowy (Kentish) Plover (<i>C. alexandrinus</i>) | X | X | 2 sighted (Vittery, 2006) |
| Sanderling (<i>Calidris alba</i>) | X | X | 5 sighted (Vittery, 2006) |
| Western Sandpiper (<i>C. mauri</i>) | - | X | Uncommon, only three seen (Vittery, 2006) |
| Semi-palmated Sandpiper (<i>C. pusilla</i>) | X | X | Common (Vittery, 2006) |
| Least Sandpiper (<i>C. minutilla</i>) | X | X | Fairly common (Vittery, 2006) |
| Baird's Sandpiper (<i>C. bairdii</i>) | - | X | Caribbean rarity. 2 juveniles seen. First record (Vittery, 2006) |
| Pectoral Sandpiper (<i>C. melanotus</i>) | - | X | Small numbers (Vittery, 2006) |
| Stilt Sandpiper (<i>Micropalama himantopus</i>) | - | X | Most numerous shorebird (600-800) (Vittery, 2006) |
| Short-billed Dowitcher (<i>Limnodromus griseus</i>) | - | X | Seen only at Frigate Bay (Vittery, 2006) |
| Wilson's Snipe (<i>Gallinago delicata</i>) | - | X | Small numbers on most wetlands (Vittery, 2006) |
| Hudsonian Godwit (<i>Limosa haemastica</i>) | - | X | Caribbean rarity. One seen. First record (Vittery, 2006) |
| Willet (<i>Catoptrophorus semipalmatus</i>) | X | X | Lesser Antilles rarity. One seen. Second Record. (Vittery, 2006) |
| Greater Yellowlegs (<i>Tringa melanoleuca</i>) | X | X | Small numbers on most wetlands (Vitter, 2006) |
| Lesser Yellowlegs (<i>T. flavipes</i>) | X | X | Common (Vittery, 2006) |
| Spotted Sandpiper (<i>T. macularia</i>) | X | X | Common on all wetlands (Vittery, 2006) |
| Ruddy Turnstone (<i>Arenaria interpres</i>) | X | X | Small flocks on most wetlands (Vittery, 2006) |

| BIRD SPECIES | Mar-April, 1982 | November, 2009 | STATUS/NOTES |
|--|--------------------|-------------------|--|
| Laughing Gull (<i>Larus atricilla</i>) | X | X | Present in Basseterre (Vittery, 2006) Year round resident breeding in St. Kitts ((CCA, 1991) |
| Royal Tern (<i>Sterna maxima</i>) | X | X | Fairly common (Caribbean Only) (Vitter, 2006) |
| Common Tern (<i>S. hirundo</i>) | - | X | Small numbers in Basseterre (Vittery, 2006) |
| Scaly-naped Pigeon (<i>Columba squamosa</i>) | X | X | Small numbers seen (Vittery, 2006) |
| Rock Dove (feral) (<i>C. livia</i>) | X | X | Common in urban areas (Vittery, 2006) |
| Collared Dove (<i>Streptopelia decaocto</i>) | - | X | Recent introduction from Bahamas, common in Basseterre and Conaree (Vittery, 2006) |
| White-winged Dove (<i>Zenaida asiatica</i>) | - | X | Recent (natural) colonist from west/central Caribbean (Vittery, 2006) |
| Zenaida Dove (<i>Z. aurita</i>) | X | X | Endemic to WI and Yucatan Peninsula (Horwith and Lindsay, 1999) Common and widespread, except in dense forest (Vittery, 2006) |
| Common Ground Dove (<i>Columbina passerine</i>) | X | X | Common in lowland scrub and gardens (Vittery, 2006) |
| Ruddy Quail-Dove (<i>Geotrygon Montana</i>) | - | X | Occurs in neighbouring islands. First Record (Vittery, 2006) |
| Yellow-billed Cuckoo (<i>Coccyzus americanus</i>) | - | X | Small numbers (Vittery, 2006) |

| BIRD SPECIES | Mar-April, 1982 | November, 2009 | STATUS/NOTES |
|--|--------------------|-------------------|--|
| Mangrove Cuckoo (<i>C. minor</i>) | - | X | Lesser Antillean endemic sub-species (Horwith and Lindsay, 1999) Probable sighting at Friars Bay and one sighting at Muddy Point (Vittery, 2006) |
| Belted Kingfisher (<i>Megaceryle alcyon</i>) | X | X | Wintering birds, widely scattered. (Vittery, 2006) |
| American Barn Swallow (<i>Hirundo rustica</i>) | X | X | Large flocks seen on most days with evidence of southerly movement (Vittery, 2006) |
| Cliff Swallow (<i>H. pyrrhonota</i>) | X | X | Caribbean rarity. First record (Vittery, 2006) |
| Purple-throated Carib (<i>Eulampis jugularis</i>) | X | X | Lesser Antillean (Saba to Grenada) Endemic (Horwith and Lindsay, 1999) Singles seen (Vittery, 2006) |
| Green-throated Carib (<i>E. holosericeus</i>) | X | X | Lesser Antilles (Virgin Islands and Puerto Rico) endemic (Horwith and Lindsay, 1999) One seen (Vittery, 2006) |
| Antillean Crested Hummingbird (<i>Orthorhyncus cristatus</i>) | X | X | Lesser Antilles (Virgin Islands and Puerto Rico) endemic (Horwith and Lindsay, 1999) Fairly common on forest fringes and southern peninsula (Vittery, 2006) |
| Grey Kingbird (<i>Tyrannus dominicensis</i>) | X | X | Very common in all open habitats (Vittery, 2006) |
| Lesser Antillean Flycatcher (<i>Myiarchus oberi</i>) | - | X | Lesser Antillean (St. Kitts to St. Lucia) endemic (Horwith and Lindsay, 1999) Several in rain forest above Romney Manor (Vittery, 2006) |

| BIRD SPECIES | Mar-April, 1982 | November, 2009 | STATUS/NOTES |
|---|--------------------|-------------------|--|
| Caribbean Elaenia (<i>Elaenia martinica</i>) | X | X | West Indies Endemic (Horwith and Lindsay, 1999) Fairly common in mangroves and scrub (Vittery, 2006) |
| Eastern Phoebe (<i>Sayornis phoebe</i>) | | X | Vagrant 'overshooter' from North America. First Record (Vittery, 2006) |
| Veery (<i>Catharus fuscescens</i>) | X | X | West Indian Vagrant. First Record (Vittery, 2006) |
| Brown Trembler (<i>Cinlocerthia ruficauda</i>) | X | X | Lesser Antillean (Saba to St. Vincent) endemic (Horwith and Lindsay, 1999) Two seen (Vittery, 2006) |
| Pearly-eyed Thrasher (<i>Margarops fuscatus</i>) | X | X | Fairly common in Romney Manor (Vittery, 2006) |
| Scaly-breasted Thrasher (<i>M. fuscus</i>) | X | X | Lesser Antillean (Saba to St. Vincent) endemic (Horwith and Lindsay, 1999) At least 2 seen (Vitter, 2006) |
| Brown Thrasher (<i>Toxostoma rufum</i>) | - | X | Vagrant 'overshooter' from North America. First Record (Vittery, 2006) |
| Yellow-throated Vireo (<i>Vireo flavifrons</i>) | - | X | Vagrant 'overshooter' from N. America. First record. (Vittery, 2006) |
| Black-whiskered Vireo (<i>V. altiloquus</i>) | X | X | Well distributed in small numbers in small numbers in mangroves, scrub and woodland edges (Vittery, 2006) |
| Yellow Warbler (<i>Dendroica petechia</i>) | X | X | Lesser Antillean (Anguilla to Montserrat) endemic subspecies (Horwith and Lindsay, 1999) Fairly common in mangroves and lowland scrub (Vittery, 2006) |
| Blackpoll Warbler (<i>D. striata</i>) | - | X | One sighting (Vittery, 2006) |

| BIRD SPECIES | Mar-April, 1982 | November, 2009 | STATUS/NOTES |
|--|--------------------|-------------------|---|
| Pine Warbler (<i>D. pinus</i>) | - | X | West Indian Vagrant. First Record (Vittery, 2006) |
| Northern Waterthrush (<i>Seiurus novaboracensis</i>) | X | X | Small numbers widespread in mangroves. (Vittery, 2006) |
| Louisiana Waterthrush (<i>S. motacilla</i>) | X | X | Small numbers seen (Vittery, 2006) |
| Bananaquit (<i>Coereba flaveola</i>) | X | X | Widespread in lowlands (Vittery, 2006) |
| House Sparrow (<i>Passer domesticus</i>) | - | X | Recent colonist. Fairly large numbers (Vittery, 2006) |
| Black-faced Grassquit (<i>Tiaris bicolor</i>) | X | X | Common in open areas such as scrub and woodland fringes at all levels (Vittery, 2006) |
| Lesser Antillean Bullfinch (<i>Loxigilla noctis</i>) | X | X | Lesser Antillean endemic (Horwith and Lindsay, 1999) Very common and tame around settlements (Vittery, 2006) |
| Rose-breasted Grosbeak (<i>Pheucticus ludovicianus</i>) | - | X | Lesser Antillean vagrant. First Record (Vittery, 2006) |
| Sooty Tern (<i>Sterna fuscata</i>) | X | - | UN (CCA, 1991) Rare Nester in St. Kitts/Nevis, restricted to Booby Island (Horwith and Lindsay, 1999) |
| Least Tern (<i>Sterna albifrons</i>) | X | - | RO (CCA, 1991) Rare nester in St. Kitts/Nevis. Considered endangered by SCO (Horwith and Lindsay, 1999) |
| Roseate Tern (<i>Sterna dougalli</i>) | X | - | UN (CCA, 1991) Rare nester in St. Kitts/Nevis, restricted to Booby Island (Horwith and Lindsay, 1999) |

| BIRD SPECIES | Mar-April, 1982 | November, 2009 | STATUS/NOTES |
|---|--------------------|-------------------|---|
| Brown Noddy (<i>Anous stolidus</i>) | X | - | UN (CCA, 1991) Rare nester in St. Kitts/Nevis. Restricted to Booby Island (Horwith and Lindsay, 1999) |
| Common Stilt (<i>Himantopus himantopus</i>) | X | - | RO (CCA, 1991) |
| Caribbean Coot (<i>Fulica caribaea</i>) | X | - | UN (CCA, 1991) West Indies and Northwestern Venezuela (Horwith and Lindsay, 1999) |
| Ruddy Turnstone (<i>Arenaria interpres</i>) | X | - | UO (CCA, 1991) |
| Thick-billed Plover (<i>Charadrius wilsonia</i>) | X | - | RO (CCA, 1991) |
| Rufous-naped Plover (<i>Pagolia wilsonia</i>) | X | - | MN (CCA, 1991) |
| Tree Duck (<i>Dendrocygna spp.</i>) | X | - | MN (CCA, 1991) |
| Bridled Quail Dove (<i>Geotrygon mustacea</i>) | X | - | RN (CCA, 1991) |
| White-crowned Pigeon (<i>Columba leucocephala</i>) | X | - | UN (CCA, 1991) West Indies and Florida Keys Endemic (Horwith and Lindsay, 1999) |
| Black and White Warbler (<i>Mniotilta varia</i>) | X | - | MN (CCA, 1991) |
| Parula Warbler (<i>Parula Americana</i>) | X | - | MO (CCA, 1991) |
| Prairie Warbler (<i>Dendroica discolor</i>) | X | - | MN (CCA, 1991) |
| Hooded Warbler (<i>Wilsonia citrine</i>) | X | - | MN (CCA, 1991) |
| American Redstart (<i>Setophaga ruticilla</i>) | X | - | MN (CCA, 1991) |
| Scarlet Tanager (<i>Piranga olivacea</i>) | X | - | MN (CCA, 1991) |

| BIRD SPECIES | Mar-April, 1982 | November, 2009 | STATUS/NOTES |
|---|--------------------|-------------------|----------------|
| Northern Oriole (<i>Icterus galbula</i>) | X | - | MO (CCA, 1991) |
| Stolid Flycatcher (<i>Myiarchus stolidus</i>) | X | - | RO (CCA, 1991) |
| Lesser Antillean Peewee (<i>Contopus latirostris</i>) | X | - | RO (CCA, 1991) |
| Purple Martin (<i>Progne subis</i>) | X | - | RO (CCA, 1991) |
| Collared Swift (<i>Streptoprocne zonaris</i>) | X | - | MN (CCA, 1991) |
| Black Swift (<i>Cypseloides niger</i>) | X | - | UN (CCA, 1991) |
| Peacock (<i>Pavo sp.</i>) | X | - | UN (CCA, 1991) |

Notes: X Observed

- Not Observed

RO – Species observed by Morris & Lemon (1982); presumed to be year-round resident breeding on St. Kitts

MO – Species observed by Morris & Lemon (1982); presumed to be migrant or transient

UO - Species observed by Morris & Lemon (1982); status unknown

RN - Species not observed by Morris & Lemon (1982); but on basis of published accounts presumed to be a resident

MN - Species not observed by Morris & Lemon (1982); but on basis of published accounts presumed to be a migrant

UN - Species not observed by Morris & Lemon (1982); but previously reported, current status unknown

TABLE F-6: LIST OF THREATENED FISHES FOR ST. KITTS AND NEVIS

(Source: Fishbase.org, 2008)

| COMMON NAME | SCIENTIFIC NAME | STATUS |
|------------------------|------------------------------------|--------|
| Queen Triggerfish | <i>Balistes vetula</i> | Native |
| Oceanic Whitetip Shark | <i>Carcharhinus longimanus</i> | Native |
| Great White Shark | <i>Carcharodon carcharias</i> | Native |
| Marbled Grouper * | <i>Dermatolepis inermis</i> | Native |
| Yellowedge Grouper * | <i>Epinephelus flavolimbatus</i> | Native |
| Itajara | <i>Epinephelus itajara</i> | Native |
| Nassau Grouper* | <i>Epinephelus striatus</i> | Native |
| Lined Seahorse | <i>Hippocampus erectus</i> | Native |
| Hogfish | <i>Lachnolaimus maximus</i> | Native |
| Mutton Snapper* | <i>Lutjanus analis</i> | Native |
| Cubera Snapper* | <i>Lutjanus cyanopterus</i> | Native |
| Yellowmouth Grouper* | <i>Mycteroperca interstitialis</i> | Native |
| Whale Shark | <i>Rhinocodon typus</i> | Native |
| Rainbow Parrotfish | <i>Scarus guacamaia</i> | Native |
| Great Hammerhead | <i>Sphyma mokarran</i> | Native |
| Bigeye Tuna | <i>Thunnus obesus</i> | Native |

* - The Snappers and Groupers are can be found in Brackish to Saline Waters.

TABLE F-7: LIST OF INVASIVE SPECIES IN ST. KITTS AND NEVIS

Source: Global Invasive Species Database, 2009

| SCIENTIFIC NAME | COMMON NAME | DESCRIPTION | DISTRIBUTION |
|--------------------------------|-----------------------------------|--|---|
| FLORA | | | |
| <i>Adenanthera pavonina</i> | Bead tree, red sandalwood tree | A medium-sized tree up to 15m high. Native to India and Malaysia. Planted throughout the tropics as an ornamental. It invades intact, undisturbed hardwood forests as well as disturbed sites. | |
| <i>Casuarina equisetifolia</i> | Casuarina, ironwood | It is a deciduous tree with a pine-like appearance. Introduced for coastal landscaping but has become unpopular because of its invasive growth habit and aggressive choking of indigenous vegetation. It colonizes disturbed sites, is extremely resistant to salt spray and grows rapidly during hot weather. | |
| <i>Leucaena leucocephala</i> | Wild mimosa, wild tamarind | This thornless tree can form dense monospecific thickets and is difficult to eradicate once established. | On St. Kitts, found on the Southeast Peninsula and at Brimstone Hill. On Nevis, found on the lower slopes of Nevis Peak, Butlers Mountain and parts of Camps Ridge. |
| <i>Melaleuca quinquenervia</i> | Paper bark tree | Tall tree native to eastern Australia, New Guinea and Caledonia. It can reach 20-25 metres in height. | |
| <i>Cedrela odorata</i> | Barbados Cedar, West Indian Cedar | It is a native of the West Indies and from Central and South America. This fast growing timber tree has become invasive in some areas, especially those disturbed by cutting. | In St. Kitts, at lower elevations in areas such as the lower Wingfields River, above the village; along the stream above Molineux and in many areas at the lower reaches of the slopes. This system is most common on the southern and the southwestern sides of St. Kitts. |

| SCIENTIFIC NAME | COMMON NAME | DESCRIPTION | DISTRIBUTION |
|-------------------------------|--|--|---|
| <i>Acacia farnesiana</i> | Mimosa, cashier, needle bush | This tree was introduced to many tropical countries for its bark, gum, seed and wood. It is often planted as an ornamental to check erosion and it is used in the perfume industry because of its scented flowers. It is thorny and grows to a height of 4m. | |
| <i>Bidens pilosa</i> | Black jack, broom stick | An annual herb which originates from tropical and central America. | |
| <i>Chromolaena odorata</i> | Bitter bush, jack in the bush | It is a fast-growing perennial shrub, native to South America and Central America. | |
| <i>Macfadyena unguis-cati</i> | Cat claw creeper, yellow trumpet vine | It is a perennial, climbing liana found primarily in tropical forests. Native to Central and south America and the West Indies. This species can affect all layers of an ecosystem by rapidly spreading both vertically and horizontally. | |
| <i>Psidium guajava</i> | Guava | This is a tropical tree that is native to Central America Pastures and fields are overrun and native plants are outcompeted by this species which has the ability to form dense thickets. | On St. Kitts, found on the Southeast Peninsula and at Brimstone Hill. On Nevis, found on the lower slopes of Nevis Peak, Butlers Mountain and parts of Camps Ridge. |
| <i>Tabebuia heterophylla</i> | White cedar, whitewood | This is a small to medium sized deciduous tree that can attain heights of 18 m. It is an extremely fast growing species and can out-compete native and other exotic trees. | West coast of Nevis, north Charlestown; also on the western lower slopes of Nevis Peak. On St. Kitts, at Conaree, Dieppe Bay, and above Olivees Mountain. |
| FAUNA | | | |
| <i>Bemisia tabaci</i> | Cotton whitefly, sweet potato whitefly | This insect reportedly transmits 111 virus species. It is believed that this species has been spread through the transport of plant products that were infested with whiteflies. | |
| <i>Bufo marinus</i> | Cane toad, crapaud | This amphibian was introduced to many countries as biological control agents for various insect pests of sugarcane and other crops. They will feed on almost any terrestrial animal and compete with native amphibians for food and breeding habitats. | |

| SCIENTIFIC NAME | COMMON NAME | DESCRIPTION | DISTRIBUTION |
|------------------------------|---------------------------------|---|--------------|
| <i>Cactoblastis cactorum</i> | Cactus moth, prickly pear moth | This moth preys specifically on cacti species. It was introduced to provide biological control of invasive cacti species. | |
| <i>Columba livia</i> | Carrier pigeon, domestic pigeon | This species is a native to Europe and has been introduced worldwide as a food source. They cause considerable damage to buildings and monuments because of their corrosive droppings. They also pose a health hazard since they are capable of transmitting a variety of diseases to humans and domestic poultry and wildlife. | |
| <i>Herpestes javanicus</i> | Indian mongoose | This is a small, slim-bodied predator native to areas from Iran, through India to Myanmar and the Malay Peninsula. It was introduced to control rats, particularly in sugarcane fields. Unfortunately, native mammals, birds, reptiles, amphibians and invertebrates were found to be easier prey. The mongoose has been responsible for at least three total species extinctions and many other local extinctions. It is also a vector for rabies. | |
| <i>Streptopelia decaocto</i> | Eurasian collared dove | This is an extremely successful invader. This species was believed to have been introduced to the West Indies by accidental release of a pet trader in 1974. Negative impacts include competition with endemic birds and potential disease transmission. | |
| <i>Solenopsis geminata</i> | Fire ant | This species usually invades open area but can easily colonize human infrastructure and agricultural systems such as sugarcane plantations. Its greatest known threats are its painful sting and the economic losses due to crop damage due to its tending of honeydew producing insects. The species is known to reduce populations of native butterfly eggs and larvae | |



APPENDIX G

**STATUS OF THE ECOLOGICAL AND
HISTORICAL / CULTURAL BASE**

APPENDIX G:

STATUS OF THE ECOLOGICAL AND HISTORICAL / CULTURAL BASE

This appendix documents the present status of the ecological and historical-cultural base in St. Kitts and Nevis. It first discusses four sites which have already been assigned (or will shortly be assigned) protected area status:

- ▶ Brimstone Hill Fortress National Park,
- ▶ Central Forest Reserve National Park,
- ▶ Nevis Peak National Park and Camps River Watershed, and
- ▶ Basseterre Valley Aquifer National Park.

The remaining discussion focuses on groups of sites which may not presently be protected but should be considered for inclusion in a wider protected areas system:

- ▶ Marine Areas,
- ▶ Turtle Nesting Beaches,
- ▶ Salt Ponds,
- ▶ Freshwater Lagoons,
- ▶ The Ghauts,
- ▶ Dry Forest,
- ▶ Historic Charlestown, and
- ▶ Historic Sites.

Rain forest is not discussed as a separate group since there are significant areas of this forest type in the Central Forest Reserve National Park and Nevis Peak National Park and Camps River Watershed

Under the Nevis Physical Development Plan, the following protected and conservation areas are listed:

- Nevis Peak Protected Area;
- Bath Bogs Protected Area;
- Camps River Wetland Protected Area;
- Indian Castle Protected Area;

- Pinney’s Beach Conservation Area; and
- Sea Haven Conservation Area.

Nevis Peak and Camps River are discussed in a separate section as listed above. Similarly, Sea Haven is discussed in Turtle Nesting Beaches as listed above. The other sites include a combination of ecological and historical features, and those will be discussed in the sections on Freshwater Lagoons and Historic Sites (as applicable).

In each case, information is provided on:

- ▶ Location and Extent,
- ▶ Legal Status,
- ▶ Features,
- ▶ Pressures and Threats, and
- ▶ Management Structure and Challenges

Each section ends with a summary.

G.1 Brimstone Hill Fortress National Park

Brimstone Hill Fortress is internationally the best-known heritage site in St. Kitts and Nevis, and has been managed for more than 40 years by the Brimstone Hill Fortress National Park Society and its predecessor, the Society for the Restoration of Brimstone Hill.

G.1.1 Location and Extent

Brimstone Hill Fortress National Park (BHFNP) is situated on the West Coast of St. Kitts, between Half Way Tree and Sandy Point Town. It occupies an area of approximately 15 ha; that is, Brimstone Hill and a buffer zone extending approximately 400 m around it.

G.1.2 Legal Status

BHFNP is a National Park under both the NCEPA and draft NCEMA Acts of St. Kitts and Nevis and a World Heritage Site listed by UNESCO. The Government of the Federation of St. Christopher and Nevis originally declared Brimstone Hill and its Fortress as a National Park within the terms of the National Conservation and Environmental Protection Act, 1987. The Fortress was inscribed as a World Heritage Site on December 04, 1999.

G.1.3 Features

The key feature of the BHFNP is its historical significance. This is well-documented in the criteria under which this area was inscribed as a World Heritage Site:

- ▶ Criterion (iii): Brimstone Hill is an outstanding British fortress, built by slave labour to exact standards during a peak period of European colonial expansion in the Caribbean.
- ▶ Criterion (iv): Because of the strategic layout and construction Brimstone Hill Fortress is an exceptional example of 17th and 18th century British Military architecture.

In addition to its obvious heritage importance, BHFNP also has a more limited ecological significance. There are a number of bird species that nest within the vegetation at the National Park, and there is also an area of dry forest on the slopes of Brimstone Hill. Bird species that have been observed on Brimstone Hill include:

- Lesser Antillean Bullfinch (*Loxigilla noctis coryi*),
- American Kestrel (*Falco sparverius caribaeorum*),
- Purple Throated (*Carib Eulampis jugularis*),
- Green Throated Carib (*Eulampis holosericeus holosericeus*),
- Antillean Crested Hummingbird (*Orthorhynchus cristatus exilis*),
- Caribbean Martin (*Progne caribaea*),
- Cape May Warbler (*Dendroica tigrina*), and
- Bananaquit (*Coereba flaveola dominicana*).

There have also been reports that Red-Tailed Hawks (*Buteo jamaicensis*) are an important species on Brimstone Hill. Finally, Brimstone Hill has geological significance since it emerged as a result of underlying volcanic activity some 6000 years ago, and sulphur-derived gases (from which the Hill got its name) periodically escape via underwater vents just off the nearby coast.

G.1.4 Pressures and Threats

Information on pressures and threats was obtained from the WHC Nomination Documentation: “The nomination of the Brimstone Hill Fortress National Park for Inclusion of the World Heritage List of Cultural Properties” and from the RAPPAM Workshop. According to the former source, there are currently no development pressures affecting the BHFNP. There are no inhabitants within the site, and the settlements within a two-mile radius (mainly along the Island Main Road) pose no threat to the integrity of the National Park.

Within recent years, it has become apparent that intense periods of visitation can produce pressures, not only on the infrastructure but also on the aesthetic enjoyment of some visitors and on the integrity of the Fortress as a historical monument. The Society and the Ministry of Tourism, Culture and the Environment are in discussion to find ways to ameliorate this potential problem. It has already been decided that a waiting station with parking area, shelter, toilets, and eventually a Visitors Centre and Canteen, will be established at the base of the Hill and next to the access road. Meanwhile, management has instituted a monitoring programme to determine the carrying capacity of the National Park.

Other threats noted in this source include:

- ▶ An immediate pressure from fires, which originate in the surrounding cane fields and grassland. This threat should diminish once these areas are developed for livestock farming as proposed.
- ▶ Hurricanes have weathered walls in this Century, even though precautions are always taken.
- ▶ Heavy and prolonged rainfall can produce rock and landslides, but little can be done to improve upon the engineering works of the designers and builders of the Fortress.
- ▶ A slight concern about dirt and grime affecting external walls over time.
- ▶ Earthquake and volcanic eruption are potential dangers in these Caribbean islands.

Other threats and pressures identified during the RAPPAM Workshop include:

- ▶ Inappropriate Development;
- ▶ Potential for Geothermal Energy Power; and
- ▶ Livestock Grazing.

G.1.5 Management Structure and Challenges

As noted at the start of this section, Brimstone Fortress has been under management as a historical site for more than 40 years. The Society for the Restoration of Brimstone Hill was founded in 1965 as a voluntary organisation. Brimstone Hill and its Fortress were declared a National Park under the National Conservation and Environmental Protection Act, 1987, which gives management authority to the Brimstone Hill Fortress National Park Society (successor to the Society for the Restoration of Brimstone Hill).

Under the law, the Brimstone Hill Fortress National Park Society has the power:

- ▶ to make and enforce regulations for management and administration, and
- ▶ to collect and retain admission fees for management and restoration.

The Society has instituted regulations against littering, defacement, removal of any living or non-living thing, etc.

Disaster preparedness at the BHFNP is co-ordinated with the Museums Association of the Caribbean, as well as national and regional agencies. On a more regular basis, there is periodic monitoring by senior Park staff, assisted by two full-time security personnel. At peak visitations, security is reinforced by regular police.

Routine monitoring involves inspecting the infrastructure in the Park, such as:

- ▶ the condition of masonry joints and vegetative growth within such joints;
- ▶ erosion of walls, particularly limestone;
- ▶ seepage of organic bonding agents (employed in the construction of the Fortress) through to ceilings;
- ▶ cracks in masonry structures; and
- ▶ peeling and blistered paint on woodwork.

Management challenges listed during the RAPPAM Workshop include:

- ▶ Challenges in managing the increase in the number of visitors to the site and;
- ▶ Difficulty in modifying structures for vehicular access.

G.1.6 Summary

The Brimstone Hill Fortress National Park is an important heritage site which must form a key element of the St. Kitts and Nevis Protected Area System Plan. In addition to its heritage significance, it also offers the opportunity to protect a small area of dry forest. Finally, the geologic significance of the site also makes it worthy of protection.

G.2 Central Forest Reserve National Park

The Central Forest Reserve National Park is the second National Park to be created in St. Kitts and Nevis, but the first to be designated for the purposes of biodiversity conservation and sustainable development.

G.2.1 Location and Extent

The Central Forest Reserve National Park (CFRNP) is situated in the centre of the island of St. Christopher, and occupies all lands above the 1,000ft contour. The CFRNP occupies approximately 50 km² of land, or 12,500 acres. It extends from Mount Liamigua in the North-East through Verchild's Mountain in the Middle Range to the Olivees' Mountain in the South-East.

G.2.2 Legal Status

The Central Forest Reserve was designated a National Park by the Government of St. Kitts and Nevis on 23 October 2006, and officially gazetted on 29 March 2007. National Park status was declared under Sections 3(1) and 3(4) (a)-(d) of the National Conservation and Environmental Protection Act (NCEPA) of 1987.

Part of the impetus to designate the CFRNP came from a project undertaken by the Organization of Eastern Caribbean States (OECS): the OECS Protected Areas and Associated Livelihoods Project (OPAAL). The Central Forest Reserve National Park was selected as the OPAAL demonstration project for the Federation of Saint Kitts and Nevis. Although the OPAAL project is a limited term project, scheduled to end in 2010, its influence is expected to extend beyond this time period.

G.2.3 Features

As noted at the start of this section, the focus of the CFRNP is biodiversity conservation and sustainable development. The Park contains the last remaining area of rainforest on the island of St. Kitts, making its protection a significant step in regional conservation. Specifically, the following vegetation types can be found within the boundaries of the CFRNP:

- Elfin Sierra Palm Cloud Forest,
- Evergreen Forest Sierra Palm Forest,
- Sierra Palm Transitional Tall Cloud Forest, and
- Steep Montane Non-Forest Vegetation.

Apart from these vegetation types, the lower slopes of the CFRNP are also characterized by monospecific stands of introduced species such as mango (*mangifera indica*). These stands may have been created through the dispersal of seeds by the locally abundant Vervet monkeys (as noted below).

The CFRNP is rich in faunal and floral biodiversity. A total of 926 plant species have been identified here, of which 45 are endemic to the country and the Lesser Antilles (Beard, 1949). Plants species found in the forest include orchids, giant ferns, bromeliads, palms, a variety of vines and insect eating plants just to name a few. The presence of an introduced animal species - the African Green Vervet Monkey - is notable within the forest. Brought to the Caribbean over 300 years ago, the Green Vervet Monkey has multiplied in numbers. Estimates of the numbers of green monkeys on St. Kitts varies significantly with numbers as low as 1,500 and as high as 35,000 (Sun St. Kitts Nevis, 2007).

Another important feature of the CFRNP is that it represents the primary source of water for human consumption on the island of St. Christopher. Six primary water sources and two water catchments (Phillip's in the north and Wingfield in the south) can be found in the surrounding area. A substantial proportion of the island's potable water is harvested from these water sources and catchments. The thickly vegetated area collects and stores rainfall, and the protection of this healthy watershed will continue to be a priority.

Finally, the CFRNP houses a series of nature and scenic trails which support eco-tourism ventures as well as recreational and educational programmes. The Mount Liamigua Crater Trail, Old Military Trail and the Dos D'Ane Pond Trail are three of the most prominent of these trails. These trails are used by the majority of ecotourism ventures on the island, as well as local recreational and educational programmes. They are therefore an important asset which is expected to play an expanding role in the island's economic future. The CFRNP also provides opportunities for research and environmental education.

G.2.4 Pressures and Threats

Pressures and threats at the CFRNP identified during the RAPPAM Workshop include:

- ▶ Erosion;
- ▶ Overcrowding;
- ▶ Extraction of Ornamental and Medicinal Plants;
- ▶ Illegal Farming;
- ▶ Hurricanes / Natural Disasters;
- ▶ Damage to Water Resources; and
- ▶ Invasive Species.

G.2.5 Management Structure and Challenges

Management responsibility for the CFRNP is vested in the Department of Physical Planning and the Environment (DPPE). A Management Plan has been prepared for the CFRNP, which was to be implemented from January 01, 2008. The Department does not currently use a standard protected areas planning format in the development of its projects, but intends to adopt such procedures.

In addition to the management role of the DPPE, St. Kitts and Nevis Defence Forces have provided search and rescue services for lost and injured persons (both local residents and foreign visitors) {Federation of St. Kitts and Nevis, 2007}. The Defence Forces receive first aid training and also have medics available when needed. In addition, the Defence Forces and Police Department have historically been assigned to control illegal crops cultivated within the area that is now the CFRNP.

The lack of capacity and practical experience presently impedes the proper management of the CFRNP (Management Plan for the Central Forest Reserve National Park). This hinders the ability to make good decisions, successfully obtain funding, communicate and collaborate with stakeholders etc. This affects all areas of management and will continue to do so in the future if not improved. The area also has several funding and infrastructural issues which need to be addressed for the proper management of the park.

Unfortunately, there is also currently a poor relationship between the stakeholders involved in CFRNP and the DPPE. For example, it is reported that tour operators sometimes fail to report and pay fees, depriving the CFRNP of valuable revenue. There is also an overall lack of citizen involvement due to fear of reprisals and disinterest from government officials. These issues need to be addressed for the proper management of the area.

Another management challenge that must be addressed with some urgency is the lack of a defined (on the ground) boundary for the CFRNP. As noted in the Management Plan prepared for the newly established National Park, the boundary of the CFRNP, as determined by the 1000 foot contour level, has not yet been marked on the ground. This therefore makes management of the park difficult especially when it comes to enforcement of non-sustainable activities such as the aforementioned illegal crop cultivation.

Other management challenges listed during the RAPPAM Workshop include:

- ▶ High difficulty in monitoring of illegal activities such as illegal growth of marijuana, plant extraction and littering;
- ▶ Difficulty in monitoring or preventing agricultural encroachment, unsanctioned development and trail cutting;
- ▶ Law enforcement is low; and
- ▶ Recruitment and retention of managers is difficult.

G.2.6 Summary

The Central Forest Reserve National Park is a large and important ecological site which must form a key element of the St. Kitts and Nevis Protected Area System Plan. Its present functions of protecting biodiversity, watershed protection and supporting ecotourism and recreation will continue to be important into the future.

G.3 Nevis Peak National Park

There are many similarities between the concept of Nevis Peak National Park (NPNP) and Camps River Watershed in Nevis and the Central Forest Reserve National Park in St. Christopher. Specifically, both have a focus on the conservation of biodiversity and both are important catchments for water supply. However, unlike CFRNP, the NPNP / Camps River Watershed project includes a coastal and marine component.

G.3.1 Location and Extent

The Nevis Peak National Park includes all land on the island above the 1,000 foot contour, ascending to the top of the 3,232 foot tall Mount Nevis. This protected area links the Camps River Watershed to the north north-east, via Camps Ghaut and wetlands to the coast. Just offshore this coast is the largest living reef system around the island of Nevis. The total area of land ear-marked for the Nevis Peak / Camps River Watershed project is 2,330 ha.

G.3.2 Legal Status

The NPNP is earmarked under the Draft Nevis Physical Development Plan as a protected area. Under that Plan, this is one of four areas in Nevis where conservation and enhancement of the natural environment will take priority. The creation of the NPNP is also supported under the OECS Protecting the Eastern Caribbean Region's Biodiversity (PERB) Project. The purpose of this project is to aid in the development, adaptation and implementation of comprehensive national policies and strategies consistent with strategies and frameworks for sustainable development and backed by appropriate legislation.

Nevis Peak is close to being declared a protected area. However, this declaration is just for Nevis Peak and not for the Camps Watershed and associated marine area.

G.3.3 Features

The NPNP / CRW Project encompass a wide range of features, including:

- ▶ volcanic formations,
- ▶ rainforest,
- ▶ the island's major watershed and springs
- ▶ a freshwater lagoon, and
- ▶ the largest living reef system around Nevis.

The National Park includes flora and fauna that are both naturalized and native species. Invasive species include the African Green Vervet Monkey, *Antigonan leptopus* and Mango (*Mangifera indica*).

Major vegetation zones are:

- a) Elfin Woodland,
- b) Rainforest,
- c) Montane Thicket,
- d) Palm Brake, and
- e) Riparian Forests.

The Riparian Forest extends from the source of the Camps River to the sea where it empties into the second largest wetland on the island and into the sea. This mangrove swamp has three types of mangrove: red, white and buttonwood. The last indigenous red mangrove tree is found in this area, but it is under threat by coastal development and charcoal burners. A number of herons, egrets and moorhens among other birds occupy this wetland and the odd osprey (*Pandion haliateus*) is seen when this bird migrates through the area (Island Resources Foundation, 2009).

In addition to the ecological features of this site, the Camps River Watershed is the largest source of potable water for the Nevis Public Water Supply, mainly from springs, but also from pumped wells.

Apart from its significance as an important source of potable water, the springs, nature trails and hikes through the virgin forests with lush green vegetation provide a form of tourism to the island. Ecologically, this forest provides a habitat for various animals.

G.3.4 Pressures and Threats

The Nevis Peak and Camps River Watershed area is under threat because it is seen by real estate developers as a prime area for residential development. Other pressures and threats on the CFRNP identified during the RAPPAM Workshop include:

- ▶ Charcoal Production;
- ▶ Built Development;
- ▶ Overharvesting of Plants;
- ▶ Clearing for Farming;
- ▶ Livestock Grazing;
- ▶ Water Contamination from Farming;
- ▶ Water Contamination from Wild Monkeys;
- ▶ Water Contamination from Domestic Sources; and
- ▶ Dumping of Industrial and Construction Wastes.

The lack of proper (on the ground) boundary demarcation is also a management challenge especially as it relates to the regulation of non-sustainable activities. Finally, there has been some indication that houses are being constructed above the 1000 foot contour.

G.3.5 Management Structure and Challenges

The institutional arrangement associated with the management of the Nevis Peak National Park is proposed as follows:

- ▶ The Ministry of the Environment (Physical Planning Department) has the overall responsibility for the management of the Nevis Peak National Park;
- ▶ The Nevis National Trust has been created as a statutory corporation under the draft Nevis National Trust Ordinance, 2007 to administer its affairs; and
- ▶ The Nevis Peak National Park Advisory Committee is responsible for advising the National Trust Council on matters specifically pertaining to the proposed park.

Information received during the consultation meetings indicates that the Nevis National Trust has not yet been formed.

Management of the Camps River Watershed is the responsibility of the Water Department, which operates the spring intakes and wells in this area and pipes the water to population centres on the north and east sides of the island.

Management challenges at the NPNP / CRW Project listed during the RAPPAM Workshop include:

- ▶ Difficulty in monitoring or preventing agricultural encroachment,
- ▶ Unsanctioned development;
- ▶ Trail cutting;
- ▶ Low enforcement is low; and
- ▶ Difficulty in securing the sites.

G.3.6 Summary

The Nevis Peak National Park / Camps River Watershed is a large and important ecological site which must form a key element of the St. Kitts and Nevis Protected Area System Plan. Its present functions of protecting biodiversity, watershed protection and supporting ecotourism and recreation will continue to be important into the future.

G.4 Basseterre Valley Aquifer National Park

The Basseterre Valley Aquifer National Park represents an interesting conversion of land formerly under sugar cane plantation into a recreation and tourism facility. The park is also intended to preserve the Basseterre Aquifer, an important source of public water supply for the island of St. Christopher.

G.4.1 Location and Extent

The Basseterre Valley Aquifer National Park (BVANP) is situated generally to the east of the town of Basseterre, occupying an area of approximately 197 ha. Other prominent features around this site (but not all abutting it) are the Conaree Hills to the east, the airport to the north-west and the Bird Rock Developed Area to the south.

G.4.2 Legal Status

The St. Kitts National Physical Development Plan, 2006 lists the BVANP as a proposed Protected Area. The objectives of this proposal include:

- ▶ To protect the water resources of the Basseterre Valley aquifer from future degradation,
- ▶ To establish a botanical garden with endemic species of flora and fauna that are representative of unique biological communities on the island,

- ▶ To sustain economic livelihoods in the Basseterre Valley for the long-term development of the island's limited natural resources,
- ▶ To identify / reconfirm the major threats, which are likely to impact on the groundwater resource base of the coastal portion of the Basseterre Valley aquifer, and
- ▶ To develop a Model so as to assess present and future threats to the Groundwater system.

G.4.3 Features

The primary feature of the BVANP at present is its importance for water supply. A significant portion of the public supply of potable water in St. Kitts comes from this aquifer, and to protect this source, development on Basseterre Valley Aquifer is prohibited under the Physical Development Plan, 2006. As noted in Section G.2.3, the majority of the island's watersheds (including the watershed that supplies water for the Basseterre Valley Aquifer) originate in the Central Forest Reserve. The establishment of the Central Forest Reserve National Park will go a long way toward protecting all downstream catchments.

The other feature has not yet been developed. This is the proposed development of a botanical garden with endemic species of flora and fauna. This and other projects within the BVANP are all geared toward the use of the area for conservation as part of the resource endowment to the country's tourism industry.

G.4.4 Pressures and Threats

When the sugar industry ceased in St. Kitts, there were a number of proposals to develop the Basseterre Valley for tourism, housing and infrastructure (Caribbean Waterways Newsletter, 2008). These proposals were resisted by the Government in order to protect the aquifer, and as stated earlier, development on Basseterre Valley Aquifer is prohibited under the Physical Development Plan. Notwithstanding this, the aquifer is currently being stressed by a combination of natural factors and human interventions. The natural factors include increasing climate variability and the recurrence of drought. Human-induced threats include the effects of previous fertilizer application to cane fields, sewage treatment and disposal associated with recent commercial, industrial and housing programmes, and storm water runoff along major roads which cross the aquifer.

Other pressures and threats at the BVANP identified during the RAPPAM Workshop include:

- ▶ Inappropriate Development;
- ▶ Stray Animals;
- ▶ Illegal Dumping;
- ▶ Agrochemical Contamination;
- ▶ Industrial Waste;
- ▶ Contaminated Airport Runoff;
- ▶ Illegal Topsoil Removal;
- ▶ Fires; and
- ▶ Toilet Waste / Sewage.

G.4.5 Management Structure and Challenges

The Basseterre Valley Aquifer Protected Area project falls under the jurisdiction of the Basseterre Valley Advisory Committee which is expected to evolve into the Project Steering Committee. This Committee is chaired by a representative of the Department of Physical Planning and Environment, and includes representatives from Government (Public Sector) Agencies, the Private Sector and NGOs. One of the objectives of the Committee was the development of a Management Plan for the BVANP. This Management Plan was finalized in September 2009. It is our understanding that the next step is the declaration of the site as a national park. It is expected that once the Management Plan is accepted by Government, the existing Project Steering Committee will evolve into the Park Management Unit.

During the RAPPAM Workshop, the following Management challenges were identified at the BVANP:

- ▶ Challenges in managing the resources (water) given the high demand for it; and
- ▶ Difficulty in managing illegal activities such as arson and illegal dumping.

G.4.6 Summary

The proposed BVANP is a novel approach to protecting a very important ground water resource, increasing the resource endowment to the country's tourism industry, and showcasing native plants as a means of enhancing conservation awareness.

G.5 Marine Management Areas

Proposals include the Southeast Peninsula Marine Management Area (SEPMMA) and Sandy Point Marine Management Area (SPMMA) as protected areas. As noted in Section G.3.3, the NPNP / CRW Project includes the largest living coral reef around the island of Nevis, situated at the northeast side of that island.

G.5.1 Location and Extent

The largest proposed Marine Management Area is the SEPMMA, which wraps around the South-East Peninsula of St. Kitts. The South-east Peninsula is approximately one-tenth of the total area of St. Kitts and has one quarter of the island's coastline (16.325 miles or 26.2 km). The proposed SEPMMA will extend seaward from the coastline from North Friar's Bay on the north coast and extends out from the peninsula to the north east coast of Nevis. The SEPMMA then extend along the north coast of Nevis to the northwest coast of Nevis before extending north and moving along the coastline to South Friar's Bay on the south coast of St. Kitts.

Sandy Shoal Coral Reef can be found on the north-west corner and leeward side of the island at the town of Sandy Point. It starts at about 300 meters from the shore at a depth of 50ft and descends to 100 feet.

G.5.2 Legal Status

The Southeast Peninsula Marine Management Area and Sandy Point Marine Management Area are designated as protected areas in the St. Kitts National Physical Development Plan, 2006. The rationale for the establishment of these areas is to act as reserves to protect biodiversity and coastal habitats, especially those that serve as fish nurseries, turtle nesting areas and habitats for rare/ valuable species of flora and fauna. The primary objectives of this designation are:

- ▶ to enhance the island's fisheries resources;
- ▶ to maintain and improve coastal water quality and to protect the ecosystem which support marine life;
- ▶ to provide opportunities for marine-oriented recreational activities; and
- ▶ to resolve anticipated user-conflicts of the resource base.

G.5.3 Features

In the area of the SEPMMA, there is a predominance of sea grass and calcareous algae in the nearshore reaches of the channel and the leeward coast and many of the salt ponds possess a mangrove fringe. These support the productivity of very important local fisheries such as finfish, conch and lobster. Three species of endangered sea turtles, the green, hawksbill and leatherback turtle, nest at the South-east Peninsula beaches.

Beaches and bays in the area include:

- ▶ North Friars Bay
- ▶ Turtle Bay
- ▶ Canes Bay
- ▶ Manchineel Bay
- ▶ Sand Bank Bay
- ▶ Mosquito Bay
- ▶ Cockleshell Bay
- ▶ Banana Bay
- ▶ Major's Bay
- ▶ Ballast Bay
- ▶ White House Bay
- ▶ South Friars Bay

Most of the wetlands on St. Christopher are located on the Southeast Peninsula, and many support mangrove communities. Numerous shorebirds and other waterbirds are associated with the wetlands and beaches on the Southeast Peninsula. Some of these are considered endemic to the Lesser Antilles, while others are endangered or rare nesters on the island. Two sites of particular interest are Booby Island and Nag's Head.

Booby Island is uninhabited and is a mix of dense, brushy vegetation and rocky outcroppings. This island is the only recorded breeding location within St. Kitts and Nevis for a number of species such as:

- ▶ Red-billed Tropicbird (*Phaethon aethereus*);
- ▶ Laughing Gull (*Larus atricilla*);
- ▶ Roseate Tern (*Sterna dougallii*);
- ▶ Bridled Tern (*Sterna anaethetus*);
- ▶ Sooty Tern (*Sterna fuscata*); and
- ▶ Brown Noddy (*Anous stolidus*).

In addition, Booby Island meets the Caribbean Important Bird Area Criteria for Bridled Tern and Laughing Gull.

Nag's Head is also known to support nesting of various species of birds such as the Brown Booby, Brown Pelican and the Magnificent Frigate Bird (*Fregata magnificens*).

Sandy Shoal Coral Reef has an extensive and diverse coral reef system with many large barrel sponges and a large variety of fish and invertebrates. The area attracts fishermen, scuba divers, swimmers and snorkelers.

G.5.4 Pressures and Threats

According to Horwith and Lindsay, 1999), the once isolated Southeast Peninsula has over the years suffered from impacts as a result of development. The construction of the Southeast Peninsula Road has opened this area to development activity and other human intervention. Most of the golden sand beaches in this area have been earmarked for tourism, and unfortunately many of these beaches are adjacent to wetlands. The major effects associated with development include:

- ▶ Loss of biodiversity and vegetative cover as a result of land clearing activities for buildings, roadways and other infrastructure. Shorebirds and other waterbirds may be in danger of losing their roosting or nesting areas. Endangered Sea Turtles may also lose their nesting areas.
- ▶ Clearing of critical habitats such as mangroves can lead to the loss of various species of fish and shellfish. In addition, there is a greater potential of water induced erosion and the potential for flooding in the absence of mangrove systems.
- ▶ Erosion and sedimentation from newly cleared land can have deleterious impacts on coral reefs and seagrass beds.
- ▶ Building of roadways can cause fragmentation of habitats. Air and noise pollution can disturb habitats.

The reef and seagrass beds at SPMMA face increasing threats from uncontrolled diving and from the indiscriminate anchoring of boats.

Other pressures and threats to marine management areas identified during the RAPPAM Workshop include:

- ▶ Overfishing;
- ▶ Climate Change;
- ▶ Closure of Sugar Industry;
- ▶ Tourism Development;
- ▶ Theft of Cultural Resources;
- ▶ Sand Mining;
- ▶ Anchor Damage to Reefs and Seagrass Beds;
- ▶ Geothermal Pipeline / Cable Construction;
- ▶ Invasive Species; and
- ▶ Solid Waste including International Garbage.

G.5.5 Management Structure and Challenges

The St. Christopher National Physical Development Plan states that the SEPMMA will be under the responsibility of the Ministry of Sustainable Development. Management will be in the form of a Management Committee comprising of Fisheries Management Unit, Dive operators, fishers organizations, Port Authority, Coast Guard, the St. Christopher Heritage Society and the Department of Physical Planning and Environment.

According to the National Physical Development Plan, 2006, a Management Plan for the SEPMMA will be developed as follows:

- ▶ Nursery area for fin and shell fish will be designated as marine reserves in Cockleshell Bay, Banana Bay, Mosquito Bay and Major's Bay where only snorkelling will be allowed.
- ▶ Scuba diving will be allowed in all other parts of the marine management area.
- ▶ Fishing priority areas will be zoned outside the marine reserves.
- ▶ There will also be yacht mooring areas and day charter boat areas. Mooring of yachts will be facilitated at Shitten and White House Bays.

Also according to the National Physical Development Plan, 2006, a Management Plan for the SPMMA will be developed as follows:

- A zoning system which makes provision for the designation of specific areas for such activities as fishing, boating, diving, swimming etc.
- In order to reduce the risk of pollution and destruction of important marine habitats, specific routes and moorings should also be designated for yachts and dive-boats.

During the RAPPAM Workshop, the following Management challenges were identified for marine management area:

- ▶ Difficulty in monitoring the harvesting of juvenile / undersized species,
- ▶ Poaching of turtles and their eggs,
- ▶ Poaching of Bobby eggs and
- ▶ The extraction of marine artefacts.

G.5.6 Summary

Given the status of St. Kitts and Nevis as a Small Island Developing State (SIDS) in the Caribbean, it is expected that marine management areas will form an integral and important part of the System of Protected Areas. The SEPMMA, in particular, provides an opportunity to establish a protected area which spans the narrows and is harmonized between the two islands.

G.6 Turtle Nesting Beaches

Several species of marine turtles are found in the West Indies, and they are classified as rare, endangered or threatened. Some of these turtle species nest on beaches in St. Kitts and Nevis.

G.6.1 Location and Extent

Sea Haven Turtle Nesting Beach, situated on the north coast of Nevis overlooking The Narrows, is considered to be the most significant turtle nesting beach in the Federation. Records on this beach show nesting by Hawksbill, Leatherback and Green Turtles, Turtle nesting has also been recorded on the following beaches in Nevis:

- ▶ Jones Bay, Cades Bay, Pinney's Beach, Gallows Bay, Beach Lands, Long Haul Beach, Black Bay and Dog Bay.

Keys Turtle Nesting Beach, considered the most important turtle nesting beach in St. Kitts, is situated on the windward coast, between Barker's Point and Cayon. Leatherback Turtles are the most prominent nesting species on this beach. Other turtle nesting beaches on St. Kitts are:

- ▶ Friar's Bay Beach;
- ▶ North Frigate Bay;
- ▶ Major's Beach;
- ▶ Banana Beach;
- ▶ Cockleshell Bay;
- ▶ Halfmoon Bay; and
- ▶ Conaree

The area of any beach which is available for turtle nesting is related to the length of the beach, the condition of the beach, and the part of the beach used by the specific turtle species. These factors will be discussed in Section G.6.3, below.

G.6.2 Legal Status

Sea Haven Beach and Pinney’s Beach are both identified as Coastal Conservation Areas under the Nevis Physical Development Plan, 2008, while Keys Turtle Nesting Beach is a proposed protected area. Additionally, the NCEPA and NCEMA Acts provide for the declaration of “protected beaches” even though these two beaches have not been so declared.

G.6.3 Features

This section describes general conditions related to turtle nesting beaches. Information on specific beaches (including nesting records where these exist) will be provided in Chapter 6. Nesting sites for sea turtles serve a very important function in the propagation of these endangered or threatened species. This in turn is related to the preservation of biodiversity.

Different species of turtles nest on different parts of the beach and at different times of year:

- ▶ Leatherback Turtles nest between the high water mark and the vegetation line, on the dry sandy part of the beach, between May and September;
- ▶ Hawksbill Turtles nest within the beachside vegetation, between April and November; and
- ▶ Green Turtles nest on sandy beaches above the high water mark between June and September, with peak nesting times occurring in the months of June and July.

The remainder of this section provides background information on the factors which make any particular beach suitable for turtle nesting: beach profile, beach condition, backbeach vegetation, sand stability and human factors.

The profile of the beach is a critical factor in its use for nesting by turtles, particularly the Leatherback. Flatter slopes make it easier for the turtles to cross the beach, and the sand must also be firm enough for the flippers to gain “purchase” to drag the turtle up the beach. On some high-energy beaches, a “ledge” develops along the high water mark, and this is a strong deterrent to the movement of the turtles. Experience in Trinidad suggests that Leatherbacks are unable to cross an obstruction of about 100 mm (4-inches) due to their great weight.

Allied to the significance of the beach profile is the condition of the beach. Rock-strewn beaches and beaches with relatively close rocky outcrops are not suitable for turtle nesting. The presence of driftwood and tree trunks, etc are also deterrents. In addition, garbage strewn on the beach also creates problems. Flippers have been cut by broken bottles and open cans, and plastic can be caught on the flippers and make it difficult to dig the nests.

Species like the Hawksbill nest high up on the beach under or in the beach / dune vegetation on both calm and turbulent beaches. The stability of the sand on the beach in the respective nesting areas is important after the nests have been dug, the eggs laid and the nests covered up. For successful hatching, the area of the nest must be stable for the entire incubation period. The eggs would be destroyed if the sand shifts and they are exposed.

Finally, there are human factors which would affect successful turtle nesting. The problems associated with garbage were discussed above. Sand mining will render the beach unsuitable by removing the nesting medium and also altering the beach profile. Artificial light (from buildings etc.) shining on the beach deters turtles from approaching to nest, as does loud noise. Interfering with the turtles as they cross the beach will also cause them to turn back.

In addition to the biodiversity function listed at the start of this section, “turtle watching” has become an important facet of ecotourism in several places in the West Indies. There are organized tours by locals and visitors to view turtle nesting at Sea Haven Beach in Nevis and at Keys Beach in St. Kitts. This also has an educational / research component, as data on numbers of animals nesting each night for the season is recorded by the turtle patrols.

G.6.4 Pressures and Threats

Pressures and threats to turtle nesting beaches identified during the RAPPAM Workshop include:

- ▶ Inappropriate Development;
- ▶ Human Activity (Driving, Horseback Riding, Littering and Sand Mining);
- ▶ Poaching;
- ▶ Light Pollution; and
- ▶ Predation.

G.6.5 Management Structure and Challenges

Sea Haven Beach is currently monitored by the Nevis Turtle Group. Keys Beach is monitored by the St. Kitts Sea Turtle Monitoring Network. Both monitoring groups were started in support of the regional Wider Caribbean Sea Turtle Network (WIDECAST) Initiative.

During the RAPPAM Workshop, the following Management challenges were identified for turtle nesting areas:

- ▶ Difficulty in controlling the poaching of eggs and animals,
- ▶ Monitoring and controlling sand mining (legal and illegal),
- ▶ Unsanctioned development (creating light sources), and
- ▶ The removal of vegetation.

G.6.6 Summary

Turtle nesting is important for the preservation of biodiversity and the propagation of endangered or threatened species of marine turtles. Sea Haven Beach is the most important turtle nesting beach in the Federation, and Keys Beach is the most important in St. Christopher. These and other turtle nesting beaches may be considered for inclusion in the Protected Areas System.

G.7 Salt Ponds

Saltwater ponds are bodies of water of varying surface area with characteristic high salinity as a result of high evaporation of runoff waters from catchment basins. This section discusses a number of the salt ponds found on St. Christopher.

G.7.1 Location and Extent

On the island of St. Kitts there are a number of saltwater ponds, many of which are concentrated on the Southeast Peninsula. The largest of these natural salt ponds is The Great Salt Pond, and other ponds on the Peninsula include The Little Salt Pond, Friars Bay Salt Pond, Half Moon Pond, Muddy Point Pond, as well as the ponds at Major's Bay, Mosquito Bay and Cockleshell Bay. Greatheed's Pond, once a freshwater pond, has been so disturbed that it is now more saline than fresh.

The size of individual ponds varies considerably. The Great Salt Pond is the largest of these ponds and covers an area of 200 ha (1.6 km is diameter), while Friars Bay salt pond is a mangrove and scrub habitat which is approximately 20 acres of which approximately 10 acres is actual pond.

G.7.2 Legal Status

Discussions with the Department of Physical Planning revealed that Salt Ponds are considered owned by the person that owns the surrounding lands. Half Moon Pond is a proposed Protected Area, but other ponds (including some on the Southeast Peninsula) are treated as privately owned land. Not unexpectedly, private owners contest the right of the state to impose any conditions on their use of the ponds.

G.7.3 Features

Before describing the features of the various salt ponds in St. Christopher, it is worthwhile to discuss how a salt pond functions. Salt ponds are usually located close to the sea, just landward of the beach berm (dunes). They function as part of the surface drainage system, with some surface water entering the ponds from the landward side before being discharged to the sea. During the rainy season, this surface runoff is normally the primary source of water into the salt ponds, and as a result the water becomes lightly brackish due to this influx of fresh water. The ponds fill up with water, some of which percolates to the sea through the beach berm and some of which flows out to the sea when the pond overtops its seaward bank.

As the rainy season ends and the dry season progresses, the hydrology of the pond is markedly different. The inflow of fresh water from runoff is significantly reduced as rainfall ceases. Instead, there is an amount of sea water inflow by infiltration through the beach berm and by wave overtopping at high tides. The water becomes saline, and this salinity increases due to evaporation.

As the dry season progresses the water in the ponds can become hypersaline, supporting a specialized fauna and microfauna. In fact, there was previously salt production at both the Little and Great Salt Ponds (but this has been discontinued as a result of a number of economic factors). During this season parts of some ponds may dry out and become dusty. This drying out is often accompanied by an unpleasant smell.

As part of their hydrological cycle, ponds act as settling basins for runoff containing minerals and sediment from the surrounding lands. Thus, the presence of ponds safeguards the nearshore waters from pollution from sedimentation.

Notwithstanding the annual hydrological changes at the ponds, they are important to biodiversity as they support a varied plant and animal life (this will be demonstrated by the description of individual ponds in Section 6.4). In addition to the specialized salt-tolerant species described above, many ponds are surrounded by healthy screens of mangrove trees and host a varied bird life (both resident and migratory) over the course of the year. The food resources and nutrient recharge of pond systems make them common resting and nesting sites for various migratory, shorebird and seabird species. Increased freshwater (during the rainy season) and adequate sunlight sets off blooms of phytoplankton and zooplankton, which provides food resources for these bird species.

It is during this drying-out period (at the height of the dry season) that there is usually a clamour that ponds are “unsightly and unsanitary”, accompanied by calls for them to be “improved”. The more benign forms of improvement are to open the ponds up to the sea, while the more extreme forms involve filling in the ponds and allocating the land to other uses. In fact, both approaches have their drawbacks. Filling-in the pond inevitably destroys the fringing mangrove and drives away the bird life. It also removes the sediment “sink” described above, so potentially releasing more silt into the nearshore marine environment where it is particularly harmful to coral communities.

On the other hand, when ponds are permanently opened up to the sea they cease to function as salt ponds. Instead, they become protected arms of the sea. Thus, while they will continue to support the mangrove fringe and bird life, they will not become hypersaline at the height of the dry season.

Despite the threats to the salt ponds which will be discussed in the next sub-section, some of these systems still support a rich biodiversity. A survey conducted by Alan Vittery in 2006 confirmed the numbers of birds found in these wetland areas and stressed the biodiversity these areas still support. Specific information on individual salt ponds is provided in Section 6.4 of Chapter 6.

G.7.4 Pressures and Threats

The Salt Ponds in St. Kitts are under significant threat from development activities (particularly on the Southeast Peninsula) and the associated pollution. Permission has been granted for the following developments at salt ponds on the S. E. Peninsula:

- Little Salt Pond, Major’s Bay Salt Pond, Cockleshell Bay Salt Pond and Mosquito Bay Salt Pond into marinas; and
- Great Salt Pond into residential developments.

Other ponds have been affected by:

- cutting of the dune barrier,
- dumping of rubble and garbage,
- removal of the vegetative screen, and
- eutrophication as a result of continuous run-off from the golf course.

These will be discussed in more detail for individual ponds in Section 6.4 of Chapter 6. These pressures and threats were also identified during the RAPPAM Workshop.

G.7.5 Management Structure and Challenges

As with the legal status, the management structure related to the Salt Ponds is unclear at this time. The DPPE appears to exercise some control on the modification of these ponds under the planning approvals process. However, it appears that there is some reluctance to assume a “hard and fast” position in this respect. As noted above, for example, permission has been granted to convert several salt ponds into marinas and other incompatible developments, after which they will no longer function as a salt ponds.

During the RAPPAM Workshop, issues in monitoring illegal dumping at the ponds as well as the removal of mangrove vegetation were identified as being management challenges for the salt pond.

G.7.6 Summary

Salt ponds are important to biodiversity, and (at minimum) a number of carefully-selected examples would form an important part of the Protected Areas Systems Plan.

G.8 Freshwater Lagoons

Nevis has a system of freshwater lagoons (ponds and wetlands) located throughout the island, some of which are along the coast. These lagoons form an integral part of the drainage system on the island, each being associated with a river, ghaut or spring.

G.8.1 Location and Extent

The freshwater lagoons of interest on the island of Nevis are:

- ▶ Bath Bogs;
- ▶ Gallows Bay Bog;
- ▶ Camps Springs and Wetland Area;
- ▶ Nelson Springs;
- ▶ Jessup’s Pond;
- ▶ Pinney’s Pond;
- ▶ Parris Pond; and
- ▶ New River Springs.

G.8.2 Legal Status

The legal status of the freshwater lagoons on Nevis is as follows:

- Camps Springs and the Associated Wetland are part of the overall Nevis Peak National Park / Camps Watershed Protected Area (see Section G.3.3). These springs are also called up in the draft Nevis Physical Development Plan as the Camps River Wetland Protected Area.
- Bath Bogs and Gallows Bay Bog are part of the Bath Bogs Protected Area (see Section 6.5.3.1.3 in Chapter 6) situated south of Charlestown.
- Pinney’s Pond, Parris Pond and Nelson Spring are all part of a proposed protected area, Pinney’s Beach Conservation Area in the draft Nevis Physical Development Plan.
- Jessup’s Pond is located within the proposed Pinney’s Beach Conservation Area according to the map attached to the Nevis Development Plan although it is not identified as a part of the Conservation Area in the actual plan.
- New River Springs (which is part of a larger area being proposed as a protected area) has no legal designation at this time.

G.8.3 Features

Like the saline ponds found on St. Kitts, the primary reason for selecting these freshwater areas for protection are to safeguard the biodiversity they still support. Although these lagoons are predominantly fresh water bodies, some are situated along the coast and are therefore subject to saltwater intrusion (US Army Corps, 2004). In addition Nelson Springs, Camps Springs and New River Springs are known to provide water to their respective Parishes.

The size of these lagoons varies and so too does the vegetation surrounding the ponds. There is predominantly coconut plantation in the vicinity of some lagoons, but there are also areas of mangrove around others. Within some of the smaller, shallower lagoons there are prominent reeds and sedges. These lagoons provide habitats for many migratory seabirds and shorebirds in the Northern Autumn and Spring seasons. Other waterbirds use these as wintering habitats (Planning Unit, 2004). Specific information on individual fresh water lagoons will be provided in Section 6.5 in Chapter 6.

G.8.4 Pressures and Threats

The Freshwater Lagoons in Nevis are under threat from various sources. Coconut palms show signs of disease at several locations (a problem which is island-wide and not localized to the lagoons). At Bath Bogs and Gallows Bay Bog there has been significant die-off of mangrove and other tree species. At these two locations pollution from nearby restaurants and built up areas was also evident as grease and oil from the restaurants, silty runoff from the built up areas and sewage from businesses and residents. There has also been some clearing of trees at Nelson Springs.

Other pressures and threats to fresh water ponds identified during the RAPPAM Workshop include:

- ▶ Non-native species;
- ▶ Filling-in;
- ▶ Marinas;
- ▶ Illegal dumping;
- ▶ Overfishing; and
- ▶ Harvesting of Mangroves.

G.8.5 Management Structure and Challenges

The management structure related to the Freshwater Lagoons is unclear at this time. The Physical Planning Department of the Nevis Island Administration appears to exercise some control on built development around and filling-in of these lagoons under the planning approvals process. However, as with the Salt Ponds in St. Kitts, a position has been adopted that some of these lagoons are privately owned (since they are entirely surrounded by private lands), and there is resistance from private owners to controls on the use of the lagoons and the lands on which they are situated. During the RAPPAM Workshop, the following Management challenges were identified for freshwater lagoons:

- ▶ Controlling the ease of access to these freshwater lagoons;
- ▶ Preventing the overexploitation of these resources; and
- ▶ Challenges in preventing the development of land in these areas.

G.8.6 Summary

Freshwater Lagoons are important to biodiversity, and a few are also important sources of potable water. A number of carefully-selected examples would form an important part of the Protected Areas Systems Plan.

G.9 The Ghauts

On both St. Kitts and Nevis ghauts form an integral part of the island-wide surface drainage system, conveying rainfall runoff from the heights of the mountains to the sea. Some of the ghauts flow directly into the sea, while others flow via salt ponds (St. Kitts) or fresh water lagoons (Nevis). In some built-up areas (for example, Basseterre and Sandy Point Town), ghauts have been modified to integrate them into the urban drainage systems.

G.9.1 Location and Extent

Ghauts are distributed around both islands. The size of each ghaut depends on the area which it drains.

G.9.2 Legal Status

Ghauts on St. Kitts and Nevis are listed as areas of special concern in the NCEPA and NCEMA Acts. This designation means that these ghauts should be managed in the public interest as stable and productive natural drainage channels. The Act prohibits activities such as:

- ▶ Cultivation, cutting, burning or clearing of land or vegetation;
- ▶ Grazing of livestock;
- ▶ Construction of any structure;
- ▶ Mining of sand; and
- ▶ Pollution or illegal dumping.

G.9.3 Features

The primary importance of ghauts is effective drainage, and consequently the reduction in the potential for localized flooding. In addition, ghauts serve as vegetated corridors which host several species of plants and animals.

The final resource provided by Ghauts is sand mining in St. Kitts. There is legal and regulated sand mining in some of the ghauts (Wash, Tabernacle and Mansion Ghauts, according to Mr. Tony Griffith, Quarry Manager on June 24, 2009), usually in areas closer to the coast. There is also illegal sand mining (Shadwell, Keyes and Holland Ghauts), but the Ghauts should not be considered a resource for this type of use.

G.9.4 Pressures and Threats

In St. Kitts, illegal sand mining in selected ghauts (see above) is a significant threat. In addition, there are residences located in close proximity to the Ghauts, as well as agricultural encroachment and some squatting. Indiscriminate dumping of garbage and other types of solid waste is also observed in some of the ghauts.

In Nevis, illegal sand mining in the ghauts is not a problem. Instead, the greatest threat is unauthorized construction close to the banks of or even within the ghauts. Indiscriminate dumping of garbage and other types of solid waste is also observed in some of the ghauts.

One other threat to Ghauts identified during the RAPPAM Workshop was Agriculture / Grazing.

G.9.5 Management Structure and Challenges

The management of sand mining in the Ghauts in St. Kitts is the responsibility of the Ministry of Public Works. On both islands, the control of built development very close to or within the ghauts is the responsibility of the respective Physical Planning agency.

During the RAPPAM Workshop, the following Management challenges were identified for the Ghauts:

- ▶ Difficulty in monitoring illegal activities such as sand mining, illegal dumping, unauthorized construction and livestock grazing/farming;
- ▶ Controlling the ease of access to these ghauts; and
- ▶ Managing the sustainable use of the resources which ghauts have to offer.

G.9.6 Summary

Ghats are recognized as areas of special concern in the NCEPA and NCEMA. They play a key role in effective drainage (and hence the prevention of localized flooding). They also serve as vegetated corridors and (when done legally) as a resource for construction sand. The System Plan must therefore address the type of protection that is to be afforded to these features.

G.10 Dry Forests

The majority of the forest in the Central Forest Reserve and on Nevis Peak would be classified as Tropical Rain Forest, thriving in areas of significant annual rainfall. Such forests were discussed in Sections G.2 and G.3. The second type of forest found in the Federation is loosely termed 'dry forest' but are actually classified as drought deciduous open woodland, semi-deciduous forest or deciduous evergreen mixed forest succulents. This type of forest is discussed in this section.

G.10.1 Location and Extent

Small areas of dry forest are found at the following locations:

- ▶ The slopes of Brimstone Hill in St. Kitts;
- ▶ On selected peaks on the Southeast Peninsula of St. Kitts; and
- ▶ The northernmost, southeast and south west slopes of Nevis Peak.

G.10.2 Legal Status

The dry forest on the slopes of Brimstone Hill is protected as part of the BHFNP, while the dry forests on the slopes of Nevis Peak are protected as part of the Nevis Peak National Park. The status of the dry forest on the small peaks on the Southeast Peninsula is subject to some question. The wording of the designation of the Central Forest Reserve appears to include all areas above elevation 1,000 feet amsl in St. Kitts, but in practice this designation appears to be applied only to the central hills and not to the Southeast Peninsula.

G.10.3 Features

Described as seasonal forests that experience wet and dry periods, dry forests are a diverse system consisting mainly of deciduous trees which shed their foliage in the dry season. Air temperatures are usually high and relative humidities low. The result is that dry forest plants have multiple adaptations to dry conditions, including drought avoidance and resistance through a variety of morphological and behavioural characteristics. Characteristic of tropical dry forests are their ability to root and stem sprout. This characteristic can be used to rehabilitate forests and restore biomass. Dry forests are highly sensitive to excessive burning and deforestation; overgrazing and exotic species can also quickly alter natural communities. Restoration is possible but challenging, particularly if degradation has been intense and persistent.

Beard described this forest type as a secondary forest, consisting mainly of tolerant pioneer species occupying the lands below the rainforest. On the island of St. Kitts, common species include Silk Cotton (*Ceiba pentandra*) and the shrub *Bourreria succulenta*. On the island of Nevis common species include White Cedar (*Tebuia heterophylla*), Black Mast (*Diosyros ebenaster*) and Loblolly (*Pisconia fragrans*).

These forests are considered to be one of the most threatened in the Neotropics (Oatham and Boodram, 2006). Indeed, the Lesser Antillean Dry Forests Ecoregion is classified as Critical/Endangered by Olson et al. (2001).

G.10.4 Pressures and Threats

On the Southeast Peninsula, the main threat to dry forest is built development. Given the interpretation that the protection of land above 1,000 feet amsl does not apply to the Southeast Peninsula, planning permission is being sought and granted for development in areas presently occupied by dry forest.

Other pressures and threats to forested areas in general (but not specifically dry forest) identified during the RAPPAM Workshop include:

- ▶ Erosion / Landslides;
- ▶ Extraction of Ornamental and Medicinal Plants;
- ▶ Illegal Farming;
- ▶ Invasive Species;
- ▶ Charcoal Production;
- ▶ Livestock Grazing; and
- ▶ Illegal dumping of waste.

G.10.5 Management Structure and Challenges

The management structure for the BHFNP was described in Section G.1.5 and for Nevis Peak in Section G.3.5. Formal management structures do not exist for other areas of dry forest. During the RAPPAM Workshop, the following Management challenges were identified for forested areas at CFRNP and NPNP. It is likely that at least some of them will apply to any areas of dry forest which are designated for protection under the System Plan:

- ▶ Difficulty in monitoring illegal activities;
- ▶ Controlling overexploitation of the valuable resources found in the area; and
- ▶ Controlling the ease of access to these forested areas;

G.10.6 Summary

Dry Forest is a distinct forest type from tropical rain forest and therefore makes a different contribution to the overall biodiversity of the Federation. Consideration must therefore be given to protecting selected areas of dry forest within the overall Protected Areas System Plan.

G.11 Historic Charlestown

The largest of the historic sites is Historic Charlestown, Nevis. This includes a number of buildings that are the best examples of the historic architecture of the town. These include the Austin Hotel, Library Building, The Alexander Hamilton Museum, St. Theresa's Catholic Church, Slave Market, Wesleyan Holiness Church and Manse, Treasury Building and Customs House and Old Great House.

G.11.1 Location and Extent

The town of Charlestown is the capital of the island of Nevis and is located on the west coast of the island. The town functions as the island's commercial and administrative centre. The town has Mount Nevis as its backdrop and the sea provides a grand approach. The town has an information layout which reflects its origins. At present the town is approximately 490 acres in extent.

G.11.2 Legal Status

As noted above, the town of Charlestown is the capital of the island of Nevis. The draft Nevis Physical Development Plan identifies Charlestown as a Priority Area and recommended the development of a Physical Action Plan. A draft of this plan was prepared in March 2008. This Action Plan highlights two areas of Charlestown: the Historic Core and Low Street Area.

The legal status of individual units is not as clear cut. Information that is available is provided below:

| BUILDING | TENURE |
|------------------------------------|---|
| Austin Hotel | Unknown |
| Library Building | Nevis Island Administration |
| The Alexander Hamilton Museum | Nevis Historical and Conservation Society |
| St. Theresa’s Catholic Church | Unknown |
| Slave Market | Tourism Authority |
| Wesleyan Holiness Church and Manse | Unknown |
| Treasury Building | Nevis Island Administration |
| Customs House | Nevis Island Administration |
| Old Great House | Unknown |

G.11.3 Features

The main attraction and features of Historic Charlestown are:

- It is compact and easily walkable,
- Its historic urban structure is largely intact and suffers few alien changes,
- Its historic buildings are both charming and, for the most part, pleasant and comfortable with several ‘special spaces’, many fine trees and old stonewalls,
- It enjoys views out to sea and, inland, dramatic glimpses of Mount Nevis.
- There is also architectural display of the ‘skirt and blouse’ style, timber balconies, gingerbread or scrollwork, jalousie windows and hurricane shutters, lapped wood or shingled walls, hipped roofs largely in corrugated steel, distinctive paintwork and signboards, and arches, breezeways and courtyards.

Many of the fine stone and timber buildings being offered for initial consideration were constructed in the 19th Century. There has also been some excellent restoration of a number of these building styles including the Post Office, Nevis Tourism Authority and the Longstone Building.

G.11.4 Pressures and Threats

The main threat to Historic Charlestown arises from its dual use as the administrative and commercial centre of the island. These threats include the following:

- Neglect of sites and buildings,
- Poor repairs and restoration,
- Ill-considered redevelopment;
- Exceeding carrying capacity;
- Property Theft and Destruction;
- Littering; and
- Graffiti.

It is also our understanding that Government has leased some land in Charlestown which impacts a number of buildings proposed for inclusion in the Protected Areas Systems Plan. No information was available on who this land has been leased to or for what purpose.

G.11.5 Management Structure and Challenges

At present there is no formal management structure associated with Historic Charlestown. Instead, there is some protection of historic sites through the system of planning permission administered by the Physical Planning Department. There is also some input into this process by the Nevis Historical and Conservation Society as will be described in Section 7.12.2 of Chapter 7.

Some of the management challenges identified during the RAPPAM workshop included:

- Monitoring of illegal activities such as graffiti;
- Lack of clear internal organization;
- Lack of transparency in decision-making;
- Lack of communication with the community in decision-making;
- Ongoing disputes due to land tenure or use rights; and
- Lack of adequate financial resources to conduct critical law enforcement.

G.11.6 Summary

The historic core of Charlestown is an important resource that can be managed as part of the tourism thrust of the island of Nevis. It provides recreational, educational and cultural opportunities. The restoration of select buildings in the past and the inclusion of this initial list of buildings for preservation will ensure that this historic centre continues to contribute to the character of the town of Charlestown.

G.12 Other Historic Sites

The best known historic site in the Federation is the Brimstone Hill Fortress, which was discussed in Section G.1. On the island of Nevis, the Historic Core of Charlestown is also a very well known attraction and this was discussed in Section G.11 above. This section discusses other historic sites which may be included in the Systems Plan.

G.12.1 Location and Extent

The following are a number of individual sites which have been identified as worthy of consideration for protection and rehabilitation under the Systems Plan:

- ▶ Petroglyphs at Old Road Town, St. Kitts;
- ▶ Stonefort, St. Kitts;
- ▶ Belmont Estate, St. Kitts;
- ▶ Mansions Estate, St. Kitts;
- ▶ Spooner’s Ginnery, St. Kitts;
- ▶ Black Rocks, St. Kitts;
- ▶ Charles Fort, St. Kitts;
- ▶ Indian Castle Protected Area, Nevis;
- ▶ Fort Ashby, Nevis;
- ▶ Bath Hotel, Nevis;
- ▶ New River Estate, Nevis; and
- ▶ Fort Charles, Nevis.

Of the sites listed above a few have well defined boundaries either because they are part of a larger area being considered or they are managed as part of a tour organized by the Department of Tourism. These are listed in Table G-1.

TABLE G-1: EXTENT OF SELECTED SITES

| SITE | COMMENT ON EXTENT |
|---|---|
| Petroglyphs at Old Road Town, St. Kitts | This site is managed as part of a tour organized by the Ministry of Tourism. The site is fenced and is approximately the size of a household lot. |
| Stonefort Petroglyphs, St. Kitts | These petroglyphs extend 200 m on both sides of the ravine and extend 500 m from the Island Main Road. |

| SITE | COMMENT ON EXTENT |
|-------------------------------------|--|
| Black Rocks, St. Kitts | This site is also managed as part of a tour organized by the Ministry of Tourism. The extent of the rock area is clear as the formation is in the sea and is distinct from the surrounding environment. During the site visit, a small strip of land (approximately 30 m) along the bluff above the rocks was being used to construct small huts for local entrepreneurs to sell craft items to tourist. |
| Charles Fort, St. Kitts | This site is approximately 7 acres (28,200m ²) in size. |
| Manson's Estate, St. Kitts | The estate yard is approximately 3 acres. |
| Belmont Estate, St. Kitts | The estate yard is approximately 3 acres. |
| Spooner's Ginnery, St. Kitts | This site is approximately 1.8 acres. |
| Indian Castle Protected Area, Nevis | The Indian Castle site contains some Amerindian artefacts as well as the ruins of Fort George. The site is approximately 15 acres. |
| Fort Charles, Nevis | This site is approximately 3 acres (11,706 m ²) in size. |
| Fort Ashby, Nevis | This site is part of a larger protected area, the Pinney's Beach Conservation Area. The Fort itself is fenced and is the size of a household lot. |
| Bath Hotel, Nevis | Bath Hotel is also part of a larger protected area being proposed, the Bath Estate Protected area which is approximately 57 acres in extent. The Hotel itself is fenced. |

The extents of the remaining sites are not clearly defined.

G.12.2 Legal Status

The legal status of these historic sites varies as shown in Table G-2:

TABLE G-2: LEGAL STATUS OF HISTORIC SITES

| SITE | LEGAL STATUS |
|--|--|
| Petroglyphs at Old Road Town, St. Kitts; | Presently managed by the Ministry of Tourism. |
| Stonefort, St. Kitts | Listed as a site to be vested in / owned by the St. Christopher National Trust when it is established. |
| Belmont Estate, St. Kitts | Listed as a site to be vested in / owned by the St. Christopher National Trust when it is established. |
| Mansions Estate, St. Kitts | Listed as a site to be vested in / owned by the St. Christopher National Trust when it is established. |

| SITE | LEGAL STATUS |
|-------------------------------------|--|
| Spooner's Ginnery, St. Kitts | Listed as a site to be vested in / owned by the St. Christopher National Trust when it is established. |
| Black Rocks, St. Kitts | Presently managed by the Ministry of Tourism. |
| Charles Fort, St. Kitts | This fort is presently on Crown lands. |
| Indian Castle Protected Area, Nevis | The site has been identified as a conservation area in the draft Nevis Physical Development Plan, 2008. Ruins of Fort George previously used as a Police Station. The lands under use by the Ministry of agriculture for animal rearing. |
| Fort Ashby, Nevis | Presently managed by the Ministry of Tourism. |
| Bath Hotel, Nevis | Bath Estate (which includes Bath Hotel) is included in draft NCEMA, 2009. Presently managed by the Ministry of Tourism. The Hotel has been used as office by various Government Departments in the past. |
| New River Estate, Nevis | Presently managed by the Ministry of Tourism. |
| Fort Charles, Nevis | This fort is on private land. |

On both islands there are established societies which assume overall management of historic sites:

- St. Kitts – St. Christopher National Trust; and
- Nevis – Nevis Historical and Conservation Society.

G.12.3 Features

The sites listed above, along with Brimstone Hill Fortress and Historic Charlestown, are all important to the history and cultural context in the Federation. Such sites provide recreational, educational and cultural opportunities for citizens of St. Kitts and Nevis and also enhance the attractions on which the Tourist Industry depends. Specific attractions of each site are listed in Table G-3 below.

TABLE G-3: FEATURES OF HISTORIC SITES

| SITE | FEATURE |
|--|---|
| Petroglyphs at Old Road Town, St. Kitts; | Amerindian rock carvings |
| Petroglyphs at Stonefort, St. Kitts | Amerindian rock carvings amounting to 115 numbered inscriptions. |
| Belmont Estate, St. Kitts | Remnants of 18 th and 19 th sugar plantation including chimneys, Great House, windmill, factory and old plantation buildings. |

| SITE | FEATURE |
|-------------------------------------|---|
| Mansions Estate, St. Kitts | Remnants of 18 th and 19 th sugar plantation including chimneys and old plantation buildings such as the Manager's House, Overseer's House, windmill, factory, cistern, pen, stables and privy. |
| Spooner's Ginnery, St. Kitts | Remnants of cotton ginnery including equipment as well as 19 th century Great House, 19 th century stone factory and chimney, 18 th century mill and factory and 1940's manager's house. |
| Black Rocks, St. Kitts | Volcanic rocks in a scenic setting. |
| Charles Fort, St. Kitts | Remnants of old fort including cistern, guard room, prison, magazine and cannons. Part of the fort was used as a leper asylum. |
| Indian Castle Protected Area, Nevis | Amerindian artefacts and remnants of Fort George. |
| Fort Ashby, Nevis | Remnants of Old Fort including cannons, building. |
| Bath Hotel, Nevis | Bath Hotel which has been maintained, original bath house, thermal springs, newly constructed bath houses. |
| New River Estate, Nevis | Amerindian artefacts, springs, water wheel. |
| Fort Charles, Nevis | Certain local stone walls remain and a dug stone-lined cistern, as do a number of cannons. |

G.12.4 Pressures and Threats

Pressures and threats to Historical Sites (including Historic Charlestown) identified during the RAPPAM Workshop include:

- ▶ Inappropriate Development;
- ▶ Squatting;
- ▶ Exceeding Carrying Capacity;
- ▶ Property Theft and Destruction;
- ▶ Littering;
- ▶ Destructive Earthquake / Volcanic Eruption;
- ▶ Hurricanes / Storm Surges and Flooding;
- ▶ Deterioration of Structures;
- ▶ Vandalism;
- ▶ Abandonment of Buildings;
- ▶ Fires;
- ▶ Erosion;
- ▶ Undercutting by sea; and
- ▶ Traffic Congestion and Inadequate Parking.

G.12.5 Management Structure and Challenges

The present management of the historic sites is listed in Section G.12.2 above. There is no organized management structure although there is some management under the Physical Planning department as part of the planning approvals process. Also as noted above, the sites are loosely managed by the Nevis Historical and Conservation Society and the St. Christopher National Trust and various Government ministries such as the Ministry of Tourism and the Ministry of Agriculture.

During the RAPPAM Workshop, the following Management Challenges were identified for Historical Sites:

- ▶ Difficulty in monitoring illegal activities such as the removal of facing stone and theft of artefacts and equipment;
- ▶ Difficulty in managing the use of the resources.

G.12.6 Summary

Historical Sites are important to both citizens of St. Kitts and Nevis and the Tourist Industry. Such sites provide recreational, educational and cultural opportunities, and selected examples should therefore be included under the System Plan.