

3.0 EXISTING CONDITIONS AT SARI

3.1 INTRODUCTION

Chapter 3.0 describes the existing environmental conditions of the three sites, which include the East, South, and West Sites at SARI (Figure 3-1). This chapter also describes the overall general existing environmental conditions within the entire SARI boundary prior to more detailed descriptions of the East, South, and West Sites. The information in Chapter 3.0 is organized by the same environmental topics used to organize the impact analysis in Chapters 4.0 and 5.0. The descriptions, data, and analyses focus on the specific conditions or consequences that may result from implementing the alternatives as required by *NPS Director's Order #12 and Handbook: Conservation Planning, Environmental Impact Analysis, and Decision Making*, which sets forth the policy and procedures by which the NPS will comply with NEPA (NPS 2001a). A detailed description of the alternatives can be found in Chapter 2. Existing conditions at the proposed Virgin Grand Hotel, referred to as the “abandoned hotel structure” throughout this document are included within the resource descriptions of the East Site.

The following description of existing environmental conditions provides a better understanding of planning issues and establishes a benchmark by which the magnitude of potential environmental impacts of the alternatives can be compared. The majority of the information used to describe the existing environmental conditions in this chapter was taken from the NOAA Technical Memorandum entitled *An Ecological Characterization of the Salt River Bay National Historical Park and Ecological Preserve, U.S. Virgin Islands* (Kendall et. al 2005), unless otherwise stated. Information presented in the NOAA Technical Memorandum was based on data collected from the early 1980's to 2003. Detailed species information (i.e., fisheries, corals, seagrasses, and vegetation) from this report is included in the Appendices of Kendall et. al 2005. For this chapter, data that were not available or surveyed in the Kendall et. al 2005 report (i.e., avian species and listed species) are included as Appendix B, Ecological Appendix, of this report.

3.2 PHYSICAL FEATURES

The physical environment at SARI, including soils, bathymetry/currents, air quality, noise, and water resources is described in the following sections.

3.2.1 Soils

There are a total of 13 soil types of varying grade (slope) within SARI (Table 3-1), as described by the USDA, National Resources Conservation Service (NRCS). The majority of top soils are approximately 0-9 inches deep, consisting of gravelly, sandy, stony, or clay loam. These include the Arawak, Cramer-Victory, Glynn, Solitude, and Victory-Southgate soil series. Tidal areas around Sugar Bay and Triton Bay are flat (0-2% grade) sections of sandy clay loam and black muck (fine, well decomposed organic soil) from the Sandy Point/Sugar Beach series, and patches of gravelly fine sandy loam from the Solitude series. These are frequently flooded by the waters of the estuary, and typically contain some salt. The Salt River Bay floodplain south of the Sugar Bay tidal region consists of clay loam from the Carib series, frequently flooded by freshwater from the upland watershed. Beaches are located on the northern facing shores, in the mouth of the bay. Most of soils within SARI are not well suited for crops.

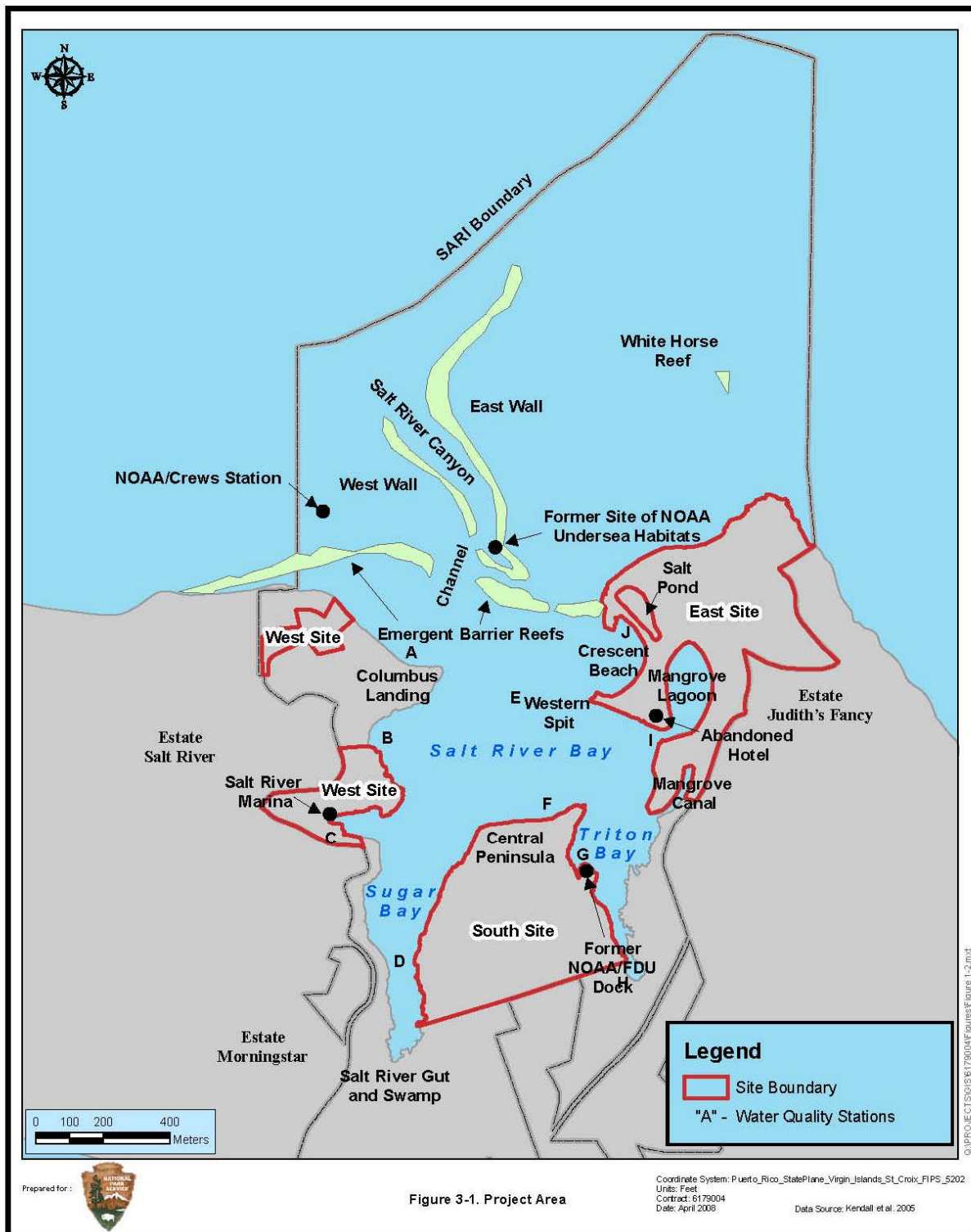


Table 3-1. Characteristics of Soils Present at SARI

Soil Series	Soil Description	Total Area (acres)
Arawak	Gravelly loam, very stony	90.93
Carib	Clay loam, frequently flooded; slightly saline to non-saline	39.78
Cramer-Victory Complex	Gravelly clay loam and loam (patchy)	83.77
Glynn	Gravelly loam, rarely flooded	14.08
Jaucas	Sand on calcareous coastal beaches, rarely flooded	2.47
Pitts, Quarries	Areas where rock, gravel, or sand have been removed by humans	0.25
Redhook*	Extremely stony sand, rubbly, rarely flooded	5.68
Salt Flats*	Flooded, unvegetated areas of saline flats, saline marshes and salt ponds	1.73
Sandy Point and Sugar Beach	Frequently flooded, sandy clay loam and black muck (patchy)	60.29
Solitude*	Gravelly fine sandy loam, frequently flooded; slightly to strongly saline	37.56
Southgate-Rock Outcrop Complex	Gravelly loam, extremely stony surface, exposed bedrock	1.24
Ustorthents	Altered from natural state by human activity	18.78
Victory-Southgate Complex	Very stony loam and gravelly loam (patchy)	51.15

Source: 1998 USDA/NRCS Soil Survey of the US Virgin Islands

*characterized as hydric soils by USDA NRCS 1998

Dredge and fill activities have taken place at SARI since the 1960s in various locations around the bays to create marinas and improve boat access. This dredging resulted in alterations to the natural shape of the shoreline and bathymetry of the bays. Dredged material disposal from these activities was deposited in several locations around the bay perimeter, creating new land and influencing soil characteristics. Therefore, portions of SARI are significantly disturbed with respect to soils. Areas that were either dredged or filled with dredged material include the Salt River Marina (West Site), the southern tip of Triton Bay, a channel through the sand bar at the mouth of Triton Bay, the NOAA dock (South Site), and the Mangrove Canal (abandoned marina) and Mangrove Lagoon (East Site).

The USDA NRCS has mapped hydric soils (one of the required wetland indicators) in the Caribbean (USDA 1998). The definition of a hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USACE 1987). Hydric soils are one of the required criteria for a site to be characterized as a wetland and include soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation. Hydric soils at SARI are noted in Table 3-1 above.

East Site – The eastern northern facing shore consists of fine sand formed from calcareous deposits, classified as the Jaucas series. Spoils from dredging the Mangrove Lagoon (proposed marina for the former hotel/marina development) and bay area were deposited around the Mangrove Lagoon and the soil there contains elevated amounts of salt. Areas that were either dredged or filled with dredged material can also be found on the peninsula between the Western Spit and the Mangrove Lagoon, on the peninsula west of the Mangrove Canal, and east of the salt pond (Figure 3-1). The soils on the peninsula of the East Site are characterized as Ustorthents, or soil altered from natural state by human activity. Three soil series in the vicinity of the East Site are characterized as hydric soils and include Redhook extremely

stony sand, Salt flats, ponded, and Solitude gravelly fine sandy loam (USDA 1998). The soils in the vicinity of the abandoned hotel structure are characterized as Ustorthents (Us), or altered soil (USDA 1998), most likely due to the dredge and fill activities that have taken place at SARI since the 1960's. No hydric soils are located in the vicinity of the abandoned hotel structure.

South Site – The northwestern mouth of Triton Bay and the eastern shore of Sugar Bay is composed of Jaucas series sand.

West Site – Spoils from dredging portions of Salt River Bay were deposited along the western side of the bay just north of the Salt River Marina up to the Columbus Landing Site. The beach located adjacent to the NPS Visitor Contact Station is calcareous, with a surface layer composed of large weathered coral pieces, characteristic of the Redhook series.

3.2.2 Bathymetry

A bathymetry map for the Salt River Bay area was created based on soundings from NOAA hydrographic surveys. The average mapped depth in Salt River Bay (shoreward of the barrier reef) is 2.2 m with a maximum of 5.4 m found in mid-bay. The average depth within SARI boundaries (including Bay and Canyon waters) is 23 m. The deepest part of the Canyon within SARI boundaries is 289 m. Using a tidal range of 0.3 m, the total area of the intertidal zone within the bay is estimated to be 5.9 acres. Salt River, Triton Bay, and Sugar Bay comprise a shallow estuary connected to a deep submarine canyon through a narrow break in the reef crest at the mouth of Salt River Bay. This unique geomorphology has important consequences for the ecology of the Bay-Canyon system and is responsible for the Salt River Bay's value as a small protected harbor or "hurricane hole". The narrow channel between the Bay and the Canyon allows for flux of water, nutrients, and marine organisms between these two areas, while protecting the Bay from waves. Dredge and fill activities, which have altered the natural bathymetry of the Bay, have taken place at SARI as described in Section 3.2.1.

Notable bathymetric features within SARI include the east and west canyon walls of Salt River Canyon, a barrier reef that extends across the mouth of the Bay, and a channel located through the barrier reef system. The east and west canyon walls have contrasting bathymetric profiles resulting from the interplay between longshore currents, sediment transport, and coral growth. The western canyon wall is vertical or overhanging in some places and steeper than the eastern wall. Higher sedimentation rates along the eastern wall discourage extensive coral growth and account for the occurrence of a more gradual slope on that side of the canyon. Lower sedimentation rates along the western wall result in more vigorous coral growth and the formation of steeper, often overhanging slopes. Natural processes responsible for changes in bathymetry due to movement of sediments include sedimentation from runoff and removal of sediment from the bays and canyon during storms. Continuing development of the watershed is likely to increase erosion and sedimentation. Current, detailed bathymetry is not available adjacent to the East, South, and West Sites.

East Site – Three transects for depth profiles were conducted in the Mangrove Lagoon for the 1986 Sugar Bay Land Development, Ltd. Environmental Assessment. The three transects depicted deep, steep dredged slopes near the eastern and western shorelines of the Mangrove Lagoon, with maximum depths of 2.6, 3.4, and 3.1 meters (Sugar Bay Land Development 1986).

3.2.3 Air Quality

The Federal Clean Air Act (CAA) requires all Federal agencies to comply with existing Federal, State, and local air pollution control laws and regulations. The USEPA sets National Ambient Air Quality Standards (NAAQS) required by the CAA for air pollutants that cause health threats. There are two types

of NAAQS: primary and secondary. Primary standards set limits to protect public health and secondary standards set limits to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, buildings and other property and ecological resources. The CAA defines six criteria pollutants that include the following: carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter with size less than 10 µm³ (PM₁₀), nitrogen oxides (NO_x), ozone (O₃), and lead (Pb). Volatile organic compounds (VOCs) are not criteria pollutants, but are of interest since they participate in the formation of ozone. The territories in the U.S. Virgin Islands have adopted, without change, the Federal NAAQS (NPS 2006).

The USVI DPNR/DEP is responsible for managing St. Croix's air resources and implementing programs designed to ensure that St. Croix's air quality meets Federal standards. This includes laws and requirements under Title V of the CAA, as well as Virgin Islands Air Pollution Control Act Rules and Regulations (VR&R). Ambient air quality is monitored at various stations around the Territory for PM₁₀, PM_{2.5}, and SO₂. There are no monitoring stations located within the vicinity of the sites. The regional air quality around the U.S. Virgin Islands is generally considered excellent (NPS 2006) and the Island Resource Foundation (IRF) (1993) reported that air quality within SARI is generally considered to be excellent as well. Some sources of air pollution besides vehicle and boat emissions is from dust generated by boat sanding during construction of boats at Gold Coast Yachts at the Salt River Marina. Various industrial plant sources have also been associated with intermittent increases in air pollution emissions as well (USVI DPNR/DEP 2004). However, the region is in attainment for all six criteria pollutants. The USVI has insignificant regional air quality impacts and is in conformity with the NAAQS.

3.2.4 Noise and Light

Current noise sources in SARI are predominantly the result of human activities such as traffic from the local roadways, recreation, and boating activities (i.e., boat motors, boat construction). A secondary source of sound in SARI is natural and includes birds and wildlife. Existing noise levels at SARI are typical of those normally associated with nearby land uses. There are no constant sources of noise at SARI, except for the Salt River Marina, located at the West Site and described in more detail below.

Current light sources in SARI are predominantly the result of human activities such as residences surrounding the park and from vehicles on the local roadways.

East Site – Current noise distractions at the East Site include unauthorized recreation activities, such as the use of off-road vehicles (ORVs) and all-terrain vehicles (ATVs). There are no known light sources associated with the East Site, except for the nearby residences of Estate Judith's Fancy.

South Site – Light sources associated with the South Site include the current structures associated with the private residence.

West Site – Noise sources at the West Site include activities at the Salt River Marina and human activities at the NPS Visitor Contact Station. Typical noises from the marina include the operation of boats, boat construction noises from the boat yard, Gold Coast Yachts, typical residential noise sources such as lawn mowers and household vehicles, and holiday weekend camping activities which historically have generated extensive noise from loud speaker sound systems. The NPS and the GVI are attempting to control this through recreational camping permits. In the past, music has been known to be heard above the Columbus Landing area. Light sources at the West Site include the Salt River Marina (i.e., boats, restaurant), the NPS Visitor Contact Station, and nearby residences.

3.2.5 Climate/Seismicity

3.2.5.1 Climate

The USVI's climate is dominated by the trade winds that vary seasonally in magnitude and direction. During the winter season (December through February) the trade winds are at their maximum intensity of 10 to no more than 20 knots from east-northeast. The trade winds typically are reduced during the spring months (March through May) and fall months (September through November). During the summer months (June through August) winds increase to moderate intensity and blow from the east or east-southeast. Winds play a dominant role in controlling currents in the Bay and along the mouth of the Bay. The easterly direction of winds throughout the year maintains an east to west longshore current that plays a principle role in the gradual process of transporting shelf sediments into Salt River Canyon down the east canyon wall.

Rainfall is seasonably variable in SARI. Typical rainfall for the area is 25 to 45 inches annually and mostly occurs in the late summer and fall wet season. Periods of heavy rain from thunderstorms and tropical storms cause the only occurrences of freshwater flow down Salt River Gut into Sugar Bay. The dry season occurs in late winter and early spring. The average daily temperature ranges from a low of approximately 27 °C in February to a maximum of approximately 29 °C in September.

Tropical storms and hurricanes occur between the months of June through November with a peak in abundance during August and September. The intense rain from tropical storms and hurricanes can cause flash flooding in the Salt River watershed. This can temporarily reduce salinity and aggravate already high turbidity levels in the vicinity of Salt River.

3.2.5.2 Seismicity

IRF (1993) reported that as a result of convergence between the Caribbean and North American tectonic plates, the Virgin Islands are located in one of the most earthquake prone regions of the world. Strong seismic shocks were recorded for the Virgin Islands in 1777, 1843, 1867, and 1918. Destructive tsunamis occurred in the Virgin Islands in 1867 and in 1918; the latter resulted in 116 deaths and economic losses estimated at \$4 million (in 1918 dollars) (US 1984) (IRF 1993). The 1867 tsunami was reported to have a wave height of 27 ft above sea level (Geoscience Associates 1984). Potential human and economic losses for a similar event occurring today would be several orders of magnitude higher (IRF 1993). There is a high seismic potential for a major fault rupture in the Puerto Rico Trench, located north of Puerto Rico and the Virgin Islands (USGS 1984). The Virgin Islands are classified as "Zone 4" for earthquake vulnerability, the highest damage zone and the same classification given to many parts of California (Brower and Beatley 1988).

East Site – Waterfront areas that have undergone construction on filled (reclaimed land) land are vulnerable to impacts from earthquakes (IRF 1993). The peninsula between the East Cove and the Mangrove Lagoon was filled with dredged material from the lagoon to create a marina for the former hotel marina development. These areas have a greater chance of liquefaction and ground settling. Buildings constructed on loose alluvial or man-made fill soils along the waterfront are at risk of destruction should an earthquake occur (Geoscience Associates 1984).

3.2.6 Water Resources

3.2.6.1 Hydrology

The Bethlehem and the Salt River watersheds are the two largest watersheds on St. Croix. The Salt River watershed drains an area of approximately 2,880 acres (4 square miles) via the principal gut, Salt River (IRF 1993). There are no large freshwater lakes or ponds, and no perennial streams on the island, only intermittent streams can be seen after heavy rainfall. The absence of large freshwater resources and perennial streams means the guts form the foundation for watershed management on St. Croix (Torch 2006). Salt River Bay encompasses both Sugar Bay and Triton Bay. Salt River Bay is a partly-closed embayment, protected from the sea by a barrier reef with a natural channel opening (IRF 1993). Topography in the watershed is varied, and ranges from near flat land behind the mouth of Salt River to steep slopes in both the western and eastern portions of the watershed. Today Salt River is an intermittent stream, although there is historical evidence that it was once a greater and more permanent source of freshwater discharge into Salt River Bay (Hubbard 1989).

The hydrology of the watershed has been significantly altered by a combination of clearing, filling, channelization, and road construction (IRF 1993). The cumulative effects of such changes has been both a reduction in the frequency of flushing activity in Salt River, and an increase in stormwater carried sediments which discharge into the bay during episodic, intense rainfall events (IRF 1993). The steep slopes combined with poorly drained soils result in short saturation times and relatively high runoff rates (IRF 1993). Waters within the Salt River Bay are designated by DEP as Class B. Class B waters are designated for Primary Contact Recreation and Aquatic Life Use Support with allowable pollutant levels set according to the Virgin Islands Water Quality Standards (USVI DPNR 2004).

3.2.6.2 Water Quality

The most valuable natural resources within the USVI are the pristine waters and distinctive marine and wildlife habitats. The USVI DPNR/DEP is responsible of planning and implementing Water Quality Management Projects to ensure the protection of the marine waters of the USVI. Projects include ambient monitoring, review, and revision of water quality standards, establishment and support of Total Maximum Daily Load (TMDL) projects, and preparation of water quality inventories.

The DEP has established a Water Pollution Control (WPC) Program that implements and enforces water quality and pollution control laws in the USVI. Under the Clean Water Act, Section 303(d), the WPC Program monitors marine waters and controls discharges into those waters. The major objectives of this program are to ensure compliance with Territorial water quality standards, build and maintain information management systems for ongoing data analysis, develop critical environmental parameters, monitor the health of potentially threatened biological communities, prevent degradation of marine waters by reviewing development proposals, and ensure that discharges to the waters of the USVI meet the requirements established by the CWA and the Territorial Pollutant Discharge Elimination System (TPDES) Permitting Program. The WPC Program also includes programs such as Ambient Monitoring Program, TPDES, and Virgin Islands Beach Monitoring Program.

Under the CWA, Section 303(d), States and Territories are required to develop a list of impaired waters needing TMDLs. An impaired waterbody is one for which technology-based pollution controls are not stringent enough to attain or maintain compliance with applicable water quality standards. A TMDL is a quantitative assessment of the amount of pollution that certain waterbody can assimilate while still meeting water quality standards. A TMDL must be developed and implemented for the waterbody and pollutant(s) of concern. Salt River, including the Mangrove Lagoon, Sugar Bay, Salt River Marina, and Salt River Bay, has been listed on the 2004 303(d) list for only dissolved oxygen (DO) (Squiabro 2004).

The TMDL was completed in 2004 and there were no source(s) of impairment for the low DO levels reported to the USEPA (USEPA 2006).

The DEP has collected several variables on water quality in SARI since 1972. The variables include dissolved oxygen (DO), fecal coliform, nutrients, salinity (collected in practical salinity units, or PSU), temperature, and turbidity (collected in nephelometric turbidity units or NTU). Data collected are provided to the USEPA and archived into the STORET (STORage and RETrieval) system. Average values of the variables measured are listed in Table 3-2 and Figure 3-1 depicts the station locations.

Table 3-2. Average Values of Water Quality Variables Collected at Locations within SARI

Nearest Site Location	Station/ Station Description	DO (mg/l)	Fecal Coliform (#/100ml)	Salinity (PSU)	Temperature (C)	Turbidity (NTU)
East Site	I-Steeple	5.9	2.3	36.4	27.7	4.6
East Site	J-Crescent Beach	6.6	0.2	36.7	27.7	2.1
Middle of Bay	E-Deep Grassbed	6.9	0.2	36.3	27.4	1.3
South Site	F-Beach	6.6	0.0	36.5	27.8	4.2
South Site	G-Old NOAA Dock	5.8	42.8	36.4	28.1	3.6
South Site	H-Triton Bay Wildlife Sanctuary	5.5	0.3	36.2	28.3	3.0
West Site	C-Salt River Marina	5.3	50.5	35.9	28.5	2.6
South Site	D-Sugar Bay	5.4	0.6	36.1	28.2	4.3
West Site	B-Shallow Grassbed	6.7	0.2	36.4	27.5	3.3
West Site	A-Columbus Landing	6.8	4.8	36.3	27.8	1.0

Source: NPS 2001

East Site – Among the lowest levels of fecal coliform detected were at Crescent Beach. In 1986, water quality within the Mangrove Lagoon was tested and reflected conditions typical for estuarine waters, including high turbidities due to poor water exchange, elevated nutrients input and biological productivity (algal populations) (Sugar Bay Land Development 1986). Poor water exchange in the Mangrove Lagoon is most likely due to the small size of the lagoon opening to Salt River Bay. Water circulation within the Mangrove Lagoon was studied in 1986. It was estimated that water would be exchanged in the lagoon over approximately 10 to 12 tidal cycles (Sugar Bay Land Development 1986). However, flushing could also be less vigorous than this estimate, given the damping of the tidal range in the lagoon (Sugar Bay Land Development 1986).

South Site – Stations farthest from the Bay mouth in the vicinity of the South Site, including Sugar Bay, Former NOAA Undersea Research Facility, and the Triton Bay Wildlife Sanctuary showed low levels of DO, high turbidity, poor circulation, and a slightly higher mean temperature. Among the lowest levels of fecal coliform detected were at the beach in the southern portion of the bay, deep and shallow grassbeds, and the Triton Bay Wildlife Sanctuary. Among the highest levels of fecal coliform detected were at the NOAA Undersea Research Facility.

West Site – Stations farthest from the Bay mouth, including the Salt River Marina, showed low levels of DO, high turbidity, poor circulation, and a slightly higher mean temperature. In contrast, stations closest to the Bay mouth, Columbus Landing (close to the West Site, the NPS Visitor Contact Station), had a mean DO of 6.8 mg/l and low levels of turbidity. Parameters with the highest variability were fecal coliform concentration values. Among the highest levels of fecal coliform detected were at the Salt River Marina.

3.2.6.3 Sediment Quality

Delivery of excess sediments to the Salt River Bay is of concern. Eroded sediments from upland and riverine sources enter Salt River Bay in quantities considerably greater than natural levels as a consequence of human activities and landscape alterations. Accumulating sediments could possibly shoal navigation channels. Nutrients adsorbed to fine-grained sediments derived from eroded topsoil contribute to eutrophication. Contaminants harmful or toxic to aquatic life bind to fine-grained sediments in urban and industrial areas. Fine-grained sediments can remain suspended in the water column for extended periods of time. This reduces water clarity, limiting growth of submerged aquatic vegetation (SAV). Wave re-suspension of bottom sediments and shoreline erosion are a major source of suspended sediments in shallow water areas.

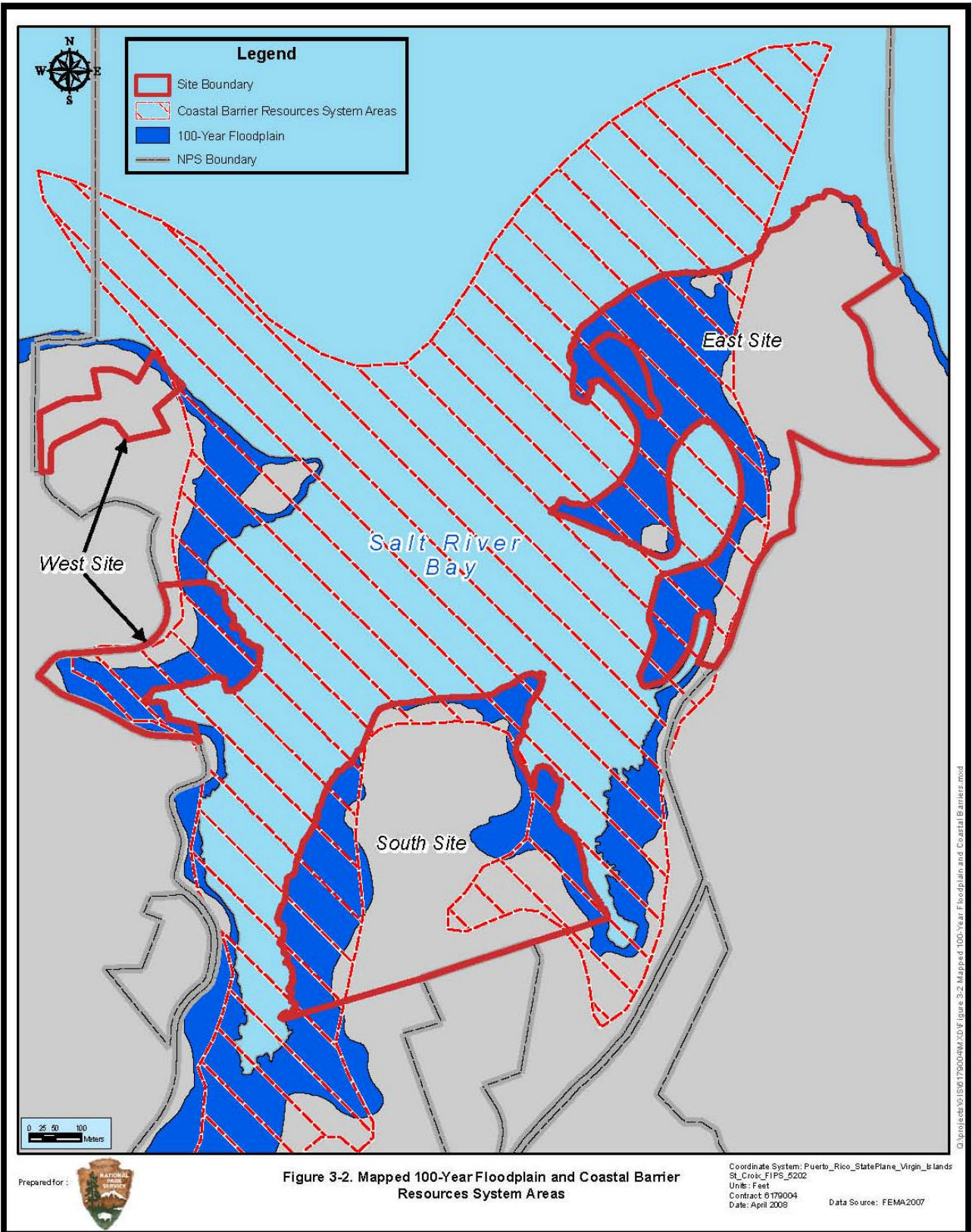
3.3 FLOODPLAINS, COASTAL ZONE, AND COASTAL BARRIER RESOURCES SYSTEM AREAS, AND WETLANDS

3.3.1 Floodplains

Floodplain Management, Executive Order 11988 (Special Directive 93-4) issued May 24, 1977, directs all Federal agencies to avoid both long- and short-term adverse effects associated with occupancy, modification, and development in the 100-year floodplain when possible. Floodplains are defined in this order as “the lowland and relatively flat areas adjoining inland and coastal waters including floodprone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.” Flooding in the 100-year zone is expected to occur once every 100 years on average. All Federal agencies are required to avoid building in a 100-year floodplain, unless no other practical alternative exists. NPS has adopted guidelines pursuant to Executive Order 11998 stating that it is NPS policy to restore and preserve natural floodplain values and avoid environmental impacts associated with the occupation and modification of floodplains.

Additionally, when practicable alternatives exist, Class I actions are required to avoid being located within a 100-year floodplain. Class I actions include the location or construction of administration, residential, warehouse and maintenance buildings, non-excepted parking lots, or other man-made features that by their nature entice or require individuals to occupy the site. Class 2 actions are defined as those that would create an added disastrous dimension to a flood event. These include the location or construction of schools, hospitals, fuel storage facilities, museums, and archaeological artifact storage. Excepted actions include those which are functionally dependent on their proximity to water and those relative to park functions that are often located near water for the enjoyment of visitors but do not involve overnight occupation.

The 100-year floodplain as mapped in April 2007 by the Federal Emergency Management Agency (FEMA) is depicted in Figure 3-2.



East Site – The western portion of the East Site is located within the 100-year flood boundary. However, two small areas within the western portion of the site are not located within the 100-year flood boundary.

South Site – Areas of the South Site that fringe the water are located within the 100-year flood boundary.

West Site – Most of the southern portion of the West Site (Salt River Marina) is located within the 100-year flood boundary whereas most of the northern portion of the West Site (NPS Visitor Contact Station) is not located within the 100-year flood boundary.

3.3.2 Coastal Zone Management

In 1978, the Virgin Islands Legislature enacted the Virgin Islands Coastal Zone Management Act as a means of regulating development and managing coastal resources in the Territory. The Virgin Islands Coastal Zone Management Program (VICZMP) was established to carry out the mandates and objectives of this Act. The VICZMP was approved by NOAA in 1979. The lead agency is the USVI DPNR. The coastal zone includes the entire Territory of St. Croix and is managed according to the Virgin Islands Coastal Zone Management Act. One of VICZMP's goals is to protect, preserve and, where feasible, enhance and restore the overall quality of the environment in the coastal zone.

Coastal zone means the coastal waters and the adjacent shorelands, strongly influenced by each other and in proximity to the shorelines. The coastal zone also includes islands, transitional and intertidal areas, salt marshes, wetlands and beaches. The coastal zone extends seaward to the outer limits of the United States Territorial Sea. In the Virgin Islands, the coastal zone is composed of two parts, a first tier and a second tier. The VICZMP regulates all development within the first tier of the Virgin Islands coastal zone. The first tier comprises of a relatively narrow strip along the coast, excluding all Federal land, and all off-shore islands and cays. The second tier includes the other portions of the island not included in the first tier. Although all three sites are located in Tier 1 of the Coastal Zone, the East Site is excluded from regulations within the coastal zone because this land is federally owned by the NPS.

3.3.3 Coastal Barrier Resources System Area

Congress passed the Coastal Barrier Resources Act (CBRA) in 1982, and the Coastal Barrier Improvement Act (CBIA) in 1990, defining and establishing a system of protected coastal areas (including the Great Lakes) known as the Coastal Barrier Resources System (CBRS) Areas (FEMA 2005). Coastal barriers are unique landforms that serve as a protective barrier against the forces of wind and tidal actions caused by coastal storms. In addition, coastal barriers provide a protective habitat for a variety of aquatic species.

The CBRA was initially enacted to reduce or restrict Federal actions that were believed to encourage development in certain undeveloped coastal barrier areas, including both islands and mainland property. While the CBRA and CBIA do not prevent private financing and development within the CBRS, they do limit financial assistance by Federal agencies. Any form of expenditure of Federal funds for a loan, grant, guarantee, insurance payment, rebate, subsidy, or any other form of direct or indirect Federal assistance within the CBRS is prohibited, with specific and limited exceptions.

Designated CBRS areas within SARI as mapped by FEMA in April 2007 are depicted in Figure 3-2. Although coastal barriers are described above as “unique land forms,” FEMA has mapped both land and water within SARI as CBRS areas. All three sites have areas designated as CBRS areas.

3.3.4 Wetlands

Wetlands are defined as areas sufficiently inundated or saturated by surface or groundwater to support vegetation adapted for life in saturated soils. Wetlands include swamps, bogs, marshes, and wet meadows. Wetlands filter pollutants, nutrients, and sediment, protect water quality in the ocean, lakes, rivers, and streams; they store runoff from storm events; act as shoreline buffers; provide essential habitat for fish, waterfowl, and other animals; and create recreational opportunities. Anthropogenic activities, including building, road construction, dredging, and vegetation removal, increase the sediment input and turbidity in Salt River Bay. Increased sediment deposits and turbidity influence vegetation growth. The alteration of lands has the potential to alter water flow to the wetland communities located nearby.

Section 404 of the CWA and a number of Territorial laws and provisions regulate activities in wetlands. The USVI DPNR/DEP has a program designated to monitor wetlands in the Territory. The objectives of this program are to update mapping in the Virgin Islands Rapid Environmental Assessment (REA) and design and test monitoring tools for wetland characterization in the USVI. The USVI DPNR/DEP programs work to protect wetlands by creating a wetlands inventory and maps, by limiting construction or clearing of wetlands, by monitoring water quality as part of the WPC Program and by managing discharges into the near-shore and marine environment through the TPDES and NPS Programs. The USVI DPNR/DEP works closely with the USEPA, the United States Fish and Wildlife Service (USFWS) and the USVI DPNR/DFW, the University of Virgin Islands and other agencies to protect wetlands. In addition, the NPS regulates activities in wetlands to comply with the NPS *Director's Order #77-1* (Wetland Protection). Wetland protection is discussed in more detail in Section 4.3.4.

Mangrove wetlands exist at SARI and are considered a significant natural community that is protected by numerous Federal and Territorial organizations, including the USACE and the USVI DPNR. Mangrove wetlands are discussed in more detail in the section below; a general discussion of other wetland resources at SARI follows the discussion of mangroves.

3.3.4.1 Mangroves

Mangroves contribute many benefits to the SARI ecosystem. Mangroves stabilize coastal sediment, buffer harmful effects of terrestrial runoff, regulate water temperature on tidal flats, and provide habitat for a diverse assemblage of terrestrial and aquatic organisms. They also trap various organic materials, distributing important nutrients to nearby marine habitats. Mangroves also serve as nursery grounds for commercially and recreationally important fishes in the USVI. The mangrove wetlands of the USVI have been impacted by natural and anthropogenic forces. Natural stressors include sea level rise and coastal erosion, hypersalinity, and hurricanes. Anthropogenic stressors include filling wetlands, drainage, or alteration for development. In addition, sewage and thermal effluent, oil pollution, fire, excessive harvesting, herbicides and pesticides, and sedimentation are also anthropogenic stressors that impact the mangrove wetlands.

At one time, the mangroves of SARI were considered the best in the U.S. Virgin Islands. The mangroves of SARI represent the only large patch of this forest type along the northwestern quarter of St. Croix. However, the intense winds off Hurricane Hugo damaged much of the old-growth mangrove forests in 1989. In 1992, aerial photographs showed that mangroves only covered 43% of their former spread. More recent aerial photographs taken in 2000 indicate that naturally occurring and restored mangroves now cover 29.7 acres or 54% of the 1988 forest. There are three main species of mangroves observed within SARI which include black mangroves (*Avicennia germanis*), white mangroves (*Laguncularia racemosa*), and red mangroves (*Rhizophora mangle*). The following sections describe the mangrove habitat at the three sites. Distribution of these mangrove areas within SARI are shown in Figure 3-3.

East Site – Approximately 1 acre of mangroves are located at the East Site. Red mangroves populate the shoreline surrounding the inlet and the 1-acre salt pond at the East Site, and just northeast of the inlet there is a patch of mixed white and red mangroves that thrive.

South Site – Wetlands at the South Site include mangrove habitat and an inland saltwater pond, surrounded by mangroves. A total of approximately 26 acres of mangroves are located within this site. The mangrove wetlands of the South Site are composed of Red and black mangroves that dominate the shores of both the east and west sides of the site. Dead mangroves account for 5.6 acres of the 35 acres which are located on the southwestern side of the site. A 3-acre inland salt pond with a fringe of mangroves is also located at the South Site. Red and black mangroves dominate the shores of both the east and west sides of the South Site.

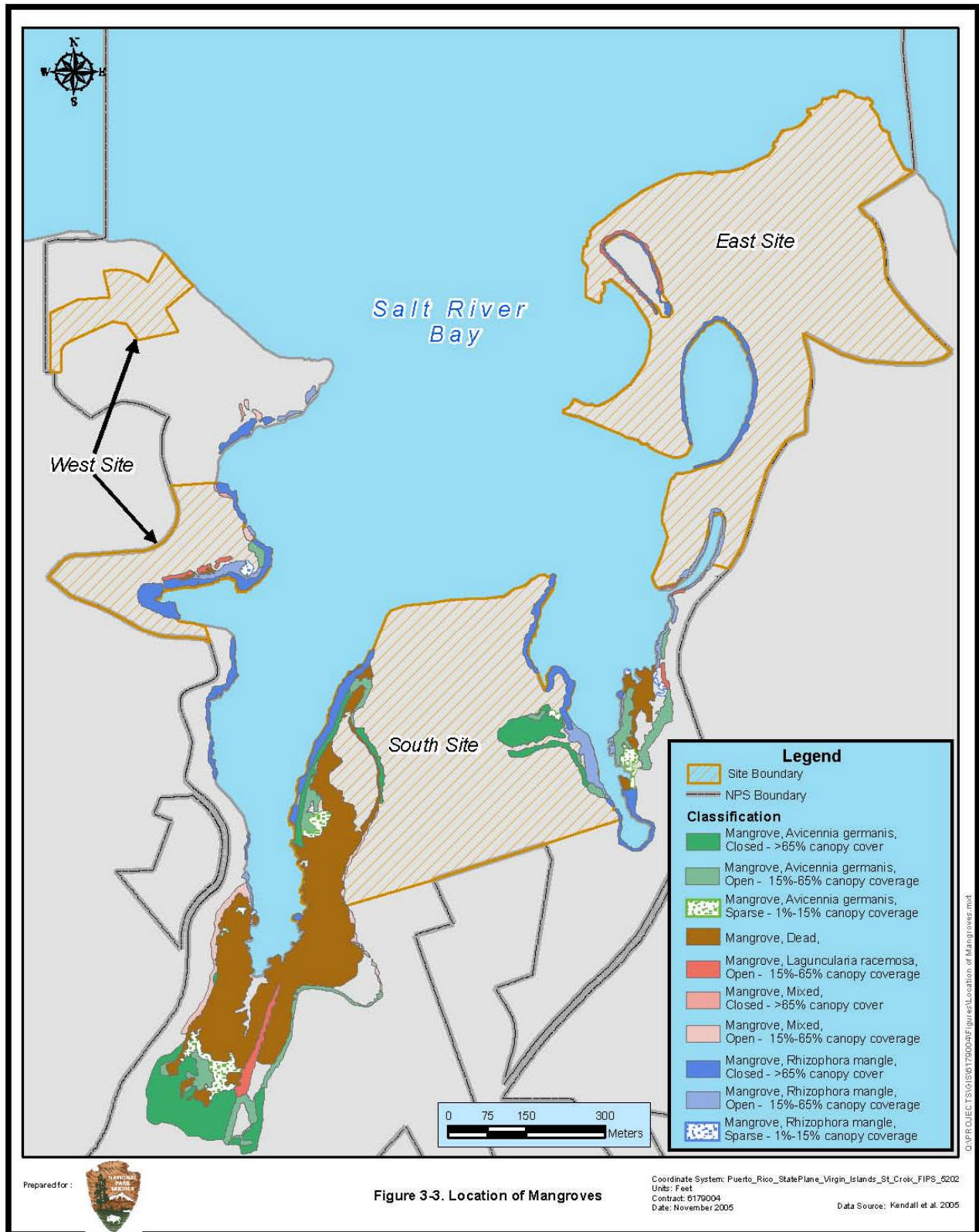
West Site – Wetlands at the Salt River Marina include mangrove habitats. A total of approximately 3 acres of mangroves are located within the marina. Red mangroves are the dominant species found at the marina, which occur along the shoreline with some areas mixed with white mangroves. The Visitor Contact Station is not located in an area populated by wetlands/mangroves.

3.3.4.2 Other Wetland Areas

The NPS defines wetlands as vegetated areas that are flooded or saturated for a duration of time sufficient to allow development of at least one of the three wetland indicators described in the 1987 USACE Wetland Delineation Manual (USACE 1987). The three wetland indicators used include wetland hydrology, hydric soil, or hydrophytic vegetation. Compared to the NPS, the USACE has a less stringent definition of wetlands. Generally, all three wetland criteria are required for an area to be approved as a Federal wetland by the USACE. Therefore, all Federally-defined wetlands are also defined as NPS wetlands. The NPS also uses the Cowardin Classification (Cowardin et al., 1979) to define wetland areas and deepwater habitats. The USACE has a Caribbean Office in Puerto Rico (Antilles Regulatory Office), which permits Federally-defined wetlands on St. Croix. The NPS-defined wetlands within SARI include mangrove swamps, inland salt ponds, estuarine wetlands, and shoreline/coastal wetlands. A general assessment of the existing wetland resources was completed for a portion of the East Site only (Appendix D); a short discussion of these results is included below.

East Site – Five NPS-defined wetlands were observed at SARI within portions of the East Site project boundary at SARI. The wetlands located at the site are located on and surround the western peninsula of the East Site and are bounded by the Mangrove Lagoon, Salt River Bay, the Salt Pond, and the existing “mudflats.” The USACE-defined wetlands at the East Site include 1 acre of mangrove habitat (as described in Section 3.3.4.1 above) and the inland 1-acre salt pond. A minimum of approximately 0.479 acres of NPS-defined wetlands (not including the 1 acres of mangroves) have been assessed and are located at the East Site (see Figure 5 in Appendix D for location of wetlands).

It is important to note that normal circumstances do not exist at the East Site; the entire peninsula could potentially be characterized as dredged material, as the natural shoreline is located inland from the peninsula. One wetland area (W-1) was located in the vicinity of the hotel structure, along the shoreline of the Mangrove Lagoon. Wetland W-1 is a narrow fringe red mangrove shoreline wetland that is characterized as an estuarine, intertidal, forested, broad-leaved evergreen (E2FO3) wetland. The shoreline at the abandoned hotel structure in the vicinity of W-1 is very rocky and sandy, and two species of algae washed up on the shore that were identified as disk alga (*Halimeda incrassate*) and soft fan weed (*Avrainvillea nigricans*). Wetland W-2 is marine, intertidal, unconsolidated shore, sand (M2US2)



wetland located along the entire coastline of the peninsula from adjacent to the hotel (where the mangroves cease to exist), along the western spit and Crescent Beach, to the extent of the survey area at the northern beach (adjacent to the salt pond). Two wetland types were classified in the vicinity of the Salt pond and described as Wetland W-3 and includes a vegetated estuarine, intertidal, forested, broad-leaved evergreen wetland (E2FO3) that fringes the Salt Pond, and an estuarine, subtidal, open water wetland (E1OW) that constitutes the open water portion of the Salt Pond. The peninsula is the area defined as inland from the shoreline from the existing hotel structure and western spit to the southernmost portion of the salt pond. Based upon the hydrophytic vegetation observed, Wetland W-4 is considered a wetland by NPS standards and is characterized as an estuarine, intertidal emergent / scrub-shrub, broad-leaved evergreen (E2EM/SS3). The area located along the Mangrove Lagoon, interior from the fringe of red mangroves is an area referred to as existing “mudflats” or Wetland W-5. Current, public access has impeded vegetation growing on the “mudflats;” the soil is exposed and water often pools following rain events. This area is considered a wetland based upon NPS standards due to the hydric soils and is characterized as an estuarine, intertidal, unconsolidated shore, mud (E2US3).

South Site – The only known wetlands at the South Site are associated with the mangrove wetlands and the inland salt pond discussed in the previous section. A wetland assessment of this site was not completed because access to this land parcel was not granted.

West Site – The only known wetlands at the West Site are associated with the mangrove wetlands discussed in the previous section. A wetland assessment of this site was not completed because access to the Salt River Marina was not granted.

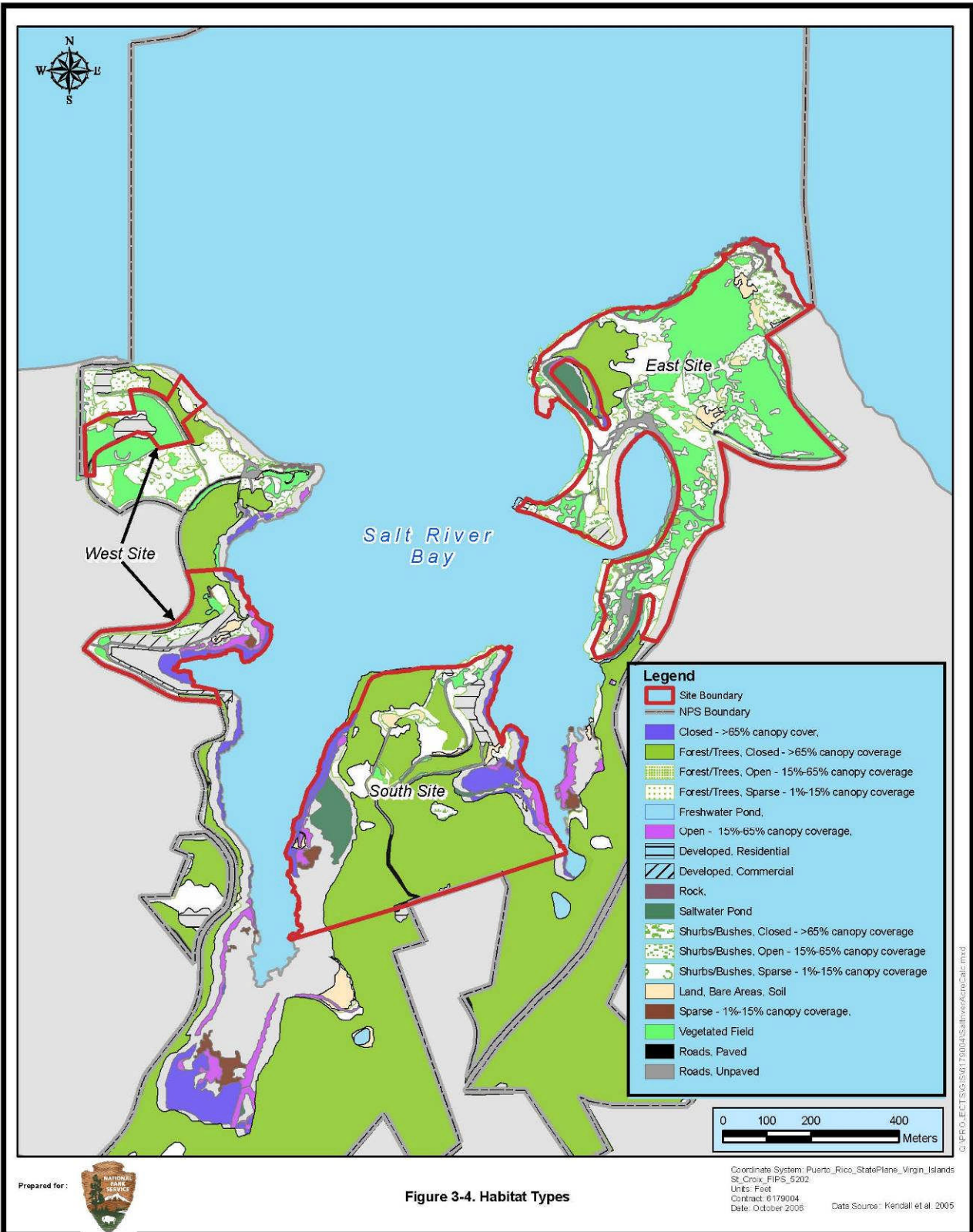
3.4 TERRESTRIAL RESOURCES

3.4.1 Plants

The USVI DPNR/DFW is the responsible agency for inventorying and monitoring plants and wildlife according to the Virgin Islands Indigenous and Endangered Species Act. A list of plant species that have been historically observed in SARI can be found in the report, *An Ecological Characterization of the Salt River Bay National Historical Park and Ecological Preserve, U.S. Virgin Islands* (Kendall et. al 2005).

Approximately 262 acres of SARI consist of forest (not including mangroves, mangroves were discussed previously in Section 3.3.4.1). The bulk of forest (semi-deciduous) cover is located in the southern inland portions of SARI. Smaller patches exist in western portions of SARI, between the Columbus Landing Site and Salt River Marina, and along the northwestern ocean front shores (Figure 3-4). Vegetated fields cover approximately 35 acres. Most of the shrub and field cover is concentrated in the northeastern and northwestern portions of SARI.

Non-native invasive plant species reside in island habitat, including St. Croix and SARI, and threaten the biodiversity of these fragile island ecosystems. “Exotic plants are defined as nonnative, invasive plant species” (NPS 2006). About 25 percent of plant species in the Caribbean national parks, including SARI, are defined as non-native invasive species (NPS 2006). In addition, more than 2.5 million acres of NPS lands are infested with non-native invasive plants (NPS 2006). In response to this problem, the NPS made the decision to integrate non-native invasive plant management into every aspect of planning by developing non-native invasive plant management partnership plans and programs that coordinate resources, funding, and scientific expertise (NPS 2006). A *Draft South Florida and Caribbean Parks Exotic Plant Management Plan (EMP)/Environmental Impact Statement (EIS)* (NPS 2006) was just completed that includes SARI for non-native invasive plant management. Although numerous non-native



invasive plant species have invaded the national parks, including SARI, only seven high-priority species for which information exists concerning the non-native invasive species' effects on other resources were included in the EMP/EIS (NPS 2006). Two of the seven priority species, African guinea grass (*Urochloa maxima*, formerly known as *Panicum maximum*) and tan tan (*Leucaena leucocephala*), currently occur at SARI and are discussed in detail in the Draft EMP/EIS (NPS 2006).

Table 3-3 details the approximate amount (in acres) and type of land cover within each site being considered for the MREC.

East Site – The terrestrial vegetation of the East Site is composed of forested (semi-deciduous) areas, vegetated fields, and shrubs dominated by non-native invasive species including African guinea grass, tan tan, and purple allamanda (*Allamanda blanchetii*) as presented in Table 3-3 and Figure 3-4. During a site visit, portions of SARI were surveyed for plant species. In the immediate vicinity of the abandoned hotel structure, the area is extremely disturbed. Piles of rocks, dirt, and debris were observed adjacent to the existing hotel structure and to the shoreline. Steep slopes existed from the hotel to the shoreline and casha (*Acacia tortuosa*) was observed as the dominant species in this location surrounding the hotel structure. The area located from the Mangrove Lagoon up to Judith's Fancy Estates exists as rolling topography that increases in slope and is dominated by the upland species African guinea grass, tan tan, casha, purple allamanda, giant milkweed (*Calotropis procera*), and bread-and-cheese (*Pithecellobium unguis-cati*). The species tan tan is indicative of disturbed areas and often is a pioneer plant species following areas that have been cleared, such as old roadbeds. The eastern portion of the peninsula, north of the abandoned hotel structure is dominated by upland vegetation species that include casha, bread-and-cheese, and African guinea grass. Discarded debris and concrete were present on the eastern portion of the peninsula, similar to the description above for the western portion of the peninsula.

A May 2006 site visit documented the following non-native plant species at the East Site: coconut palm (*Cocos nucifera*), wild cotton species (*Gossypium* sp.), tan tan, African guinea grass, Mother-in-law's tongue (*Sansevieria trifasciata*), tamarind (*Tamarindus indica*), and Spanish bayonet (*Yucca aloifolia*). Of these species, African guinea grass, tan tan, and purple allamanda have been identified as high-priority species for non-native invasive plant management at SARI (NPS 2006).

South Site – The terrestrial vegetation of the South Site is composed of forest (semi-deciduous) habitat, vegetated fields, and shrubs as described in Table 3-3 and Figure 3-4. A vegetation assessment of this site was not completed because access to this land parcel was not granted.

West Site – The terrestrial vegetation of the Salt River Marina is composed of forest (semi-deciduous) habitat, shrubs, and vegetated fields as described in Table 3-3 and Figure 3-4. The terrestrial vegetation of the Visitor Contact Station consists of forest (semi-deciduous), vegetated fields, and shrubs as described in Table 3-3 and Figure 3-4. A vegetation assessment of the Salt River Marina was not completed because access to the site was not granted. The majority of the West Site in the vicinity of the Visitor Contact Station has been developed and/or landscaped with vegetation.

Table 3-3. Land Cover (in acres) within Each Site Location*

Land Cover	Site Locations			
	East Site	South Site	West Site (Salt River Marina)	West Site (Visitor Contact Station)
Forest (semi-deciduous)	12	23	3	1
Mangroves	1	26	3	---
Shrubs	16	1	1	<1
Vegetated Field	25	1	<1	3
Bare Areas (rock/soil/unpaved roads)	3	2	<1	<1
Inland Waterbodies	1	3	---	---
Developed (paved roads, residential)	4	2	4	1
Total	62	58	11	5

* Acreage calculated for entire site (see Figure 2-1), not the footprint area proposed for the MREC.

3.4.2 Birds

Specific bird species information for SARI is limited; however, species that occur in habitats elsewhere on the island of St. Croix that are similar to those habitats found within the SARI boundaries are likely to occur at SARI. The USVI DPNR recently completed a Comprehensive Wildlife Strategy (USVI-DPNR 2005) and unless otherwise noted, the information regarding the species and status of birds on St. Croix was found within that document. Additional information on bird species found on St. Croix was obtained from National Audubon (National Audubon Society 2005.). A detailed discussion of Federal and Territorially-listed avian species is included in Section 3.6.

Habitats at SARI provide nesting, roosting and foraging for a wide variety of birds including year round residents, overwintering residents, and species that stop briefly at St. Croix during annual migrations. SARI habitats that support avian species include two inland ponds, and approximately 30 acres of sand and mud salt flats, approximately 3 acres of sandy beach and approximately 6 acres of intertidal habitats, including mangroves. The forested (semi-deciduous) areas, shrubs, and vegetated fields also provide habitat for avian species. Mangrove habitat at SARI is important to birds as nesting habitat for resident species and foraging habitat for over wintering and migrant species. Shallow water areas adjacent to the intertidal habitat provide foraging areas of shallow mud, sand, and seagrass areas for wading birds like bitterns, herons, egrets and shorebirds. Colonial waterbirds such as seabirds, herons, egrets and terns of a variety of species nest on cays and offshore islands near St. Croix. Many of these species visit St. Croix, particularly while foraging. One of the most common seabirds to visit SARI is the brown pelican (*Pelecanus occidentalis*), listed as federally endangered in the USVI (USFWS 2005).

Several wading bird species, such as those listed in Table B-1 of Appendix B, may use mangrove, shoreline, and wetland habitats for foraging. Shorebirds, marshbirds, and waterfowl typically use the open water, shoreline and wetland habitats for nesting and foraging. Table B-1 of Appendix B provides a list of the avian species that may utilize these habitats at SARI. Many species of landbirds migrate for the winter from the Arctic and temperate areas of North America to the tropics including the U.S. Virgin Islands and St. Croix. As many as 60 species of migrant Nearctic landbird species have been observed during the winter months in the U.S. Virgin Islands. The common wintering migrants include the

shorebirds listed in Table B-1 of Appendix B. The nearctic migrant passerine species listed in Table B-1 of Appendix B can be found wintering on St. Croix.

East Site – The north end of Crescent cove or East cove is utilized seasonally by the migratory least tern. Fewer than 10 pairs will attempt to nest along the coral cobble shoreline. This nesting area is monitored by USFWS. Based on USFWS monitoring and the poor nesting success that migratory least terns are having on Saint Croix, NPS has proposed to improve nesting area habitat for the species during the demolition of the hotel and restoration of the dredge spoil peninsula. Currently the least tern is in need of coastal areas, with no limited vegetation to protect from mongoose. This can be provided on the peninsula and protected from impacts of recreation during the critical nesting period (April to June) each year.

South Site – Adjacent to the South Site, the nearby low-lying salt flat communities at Triton Bay Wildlife Sanctuary provide habitat and important food source for many of the bird species described above.

West Site – Cattle egrets (*Bubulcus ibis*) and little blue herons (*Egretta caerulea*) currently nest in a 200 square meter rookery within a large patch of red mangroves near the Salt River Marina.

3.4.3 Reptiles and Invertebrates

Several species of terrestrial reptiles have either been recorded or are expected to occur at SARI. These species include anole lizards (*Anolis acutus*), dwarf gecko (*Sphaerodactylus macrolepis*) and woodslaves (*Hemidactylus mabouia* and *Thecadactylus rapicauda*), and green iguana (*Iguana iguana*) (IRF 1993). There are no site-specific reptile data for SARI and no invertebrate data for either the South Site or the West Site.

East Site – Terrestrial invertebrates that were observed on the peninsula near the abandoned hotel site during a site survey included soldier crab and land crab (Sugar Bay Land Development 1986).

3.4.4 Mammals

Bats are the only native terrestrial mammal species that inhabits the USVI, St. Croix. Approximately 10 species of terrestrial mammals have established feral populations, including: domestic cat (*Felis domesticus*), domestic dog (*Canis familiaris*), small Indian mongoose (*Herpestes javanicus*), burro (*Equus asinus*), pig (*Sus scrofa*), white-tailed deer (*Odocoileus virginianus*), goat (*Capra hircus*), roof rat (*Rattus rattus*), Norway rat (*Rattus norvegicus*), and house mouse (*Mus musculus*) (DPNR/DFW 2005). Within SARI, there are several habitats including beaches, wetlands, shrubland/grassland, and forest (Figure 3-4) that provide habitat for terrestrial mammals as described for each site below.

East Site – The habitats at the East Site include all four habitat types listed above and shown on Figure 3-4. Mammals that occupy these habitats and have the potential to be observed at the East Site include the white-tailed deer, red fruit bat (*Stenoderma rufum*), cave bat (*Brachyphylla cavernarum*), mice (*Mus musculus*), dogs (*Canis domesticus*), and cats (*Felis catus*), and rat species (*Rattus* spp.). A small Indian mongoose was observed at the East Site during a site visit conducted in May 2005. In addition, a bat survey of the East Site was conducted on July 14 -17, 2007 and velvety free-tailed bats (*Molossus molossus*) were observed living in the abandoned hotel (Fly by Night 2007). The velvety free-tailed bat is an insectivore that is widely distributed in the Caribbean and is not on the list of Endangered Species for the Territory (Appendix B). However, it is one of only five (all five are bats) extant native terrestrial mammal fauna in St. Croix (St. Croix Environmental Information Repository 2006).

South Site – The habitats located within the South Site include beaches, wetlands, and forest (Figure 3-4). The mammals that occupy these habitats and have the potential to be observed at the South Site include the small Indian mongoose, donkey (burro), white-tailed deer, red fruit bat, cave bat, and rat species.

West Site – The area within the Salt River Marina is primarily developed. Surrounding the developed area of the marina includes a small portion of shrubs/bushes, bare areas, and small patches of mangrove wetland habitat (Figure 3-4). Within these habitats, the small Indian mongoose, donkey (burro), white-tailed deer, red fruit bat, cave bat, and rat species thrive. The habitat types within the Visitor Contact Station is dominated by shrubland and grassland surrounded by sparse forest (semi-deciduous) (Figure 3-4). The terrestrial mammals that occupy this habitat include the red fruit bat, cave bat, small Indian mongoose, white-tailed deer, and rat species.

3.5 AQUATIC RESOURCES

This section discusses the aquatic resources at SARI, including coral reefs, seagrasses, fisheries (including commercially important finfish species), benthic macroinvertebrates, essential fish habitat, aquatic reptiles, and marine mammals.

3.5.1 Coral Reefs

Coral reefs are the most complex, species-rich marine ecosystems. Reefs are formed by corals, which are animals that secrete a calcium carbonate skeleton. Coral reefs provide essential fish habitat, support threatened and endangered species, and protect marine mammals and turtles. In addition, coral reefs reduce wave action and protect the coastline from erosion and flooding. Coral reefs are being threatened mainly from human activity, including coastal development, over-fishing, over exploitation of marine resources, marine pollution, and increased terrestrial runoff. Sedimentation is a major control on reef characteristics at SARI. Transport of sediments serves to limit coral growth in the area.

Within SARI, a submerged barrier reef extends west of Buck Island, along the length of the north coast narrow shelf, broken only by the Christiansted submarine canyon off Christiansted, and the Salt River submarine canyon off Salt River. The Salt River canyon walls differ in coral cover. The east wall ranged from less than 1% coral cover within the inner portion to 25% coral cover near the shelf. The most common species included *Mycetophillia* spp., *M. annularis*, *D. strigosa*, *Agaricia* spp., and *M. cavernosa*. The west wall is steeper with solid substrate that ranged from 22% to 59% coral cover with the most common species including *M. cavernosa*, *Agaricia* sp., *Porites* spp., and *S. sidera* (USVI DPNR/DFW 2005).

There have been approximately 287 acres of reef and hardbottom mapped at SARI; however this is an underestimate of the total area. In the northern portion of SARI, the deepest waters were mapped as “unknown” as the extreme depth did not allow for visual classification. These deep waters most likely contain large areas of reef/hard bottom. There are ten different coral reef and hard bottom types identified within SARI, however there may be other varieties that can be found within the deep “unknown” waters. Approximately 41 species of corals have been observed during the studies at submarine canyon within SARI, 33 on the east wall and 38 on the west wall. A coral reef species list for Salt River Canyon found during previous research and monitoring activities can be found the report *An Ecological Characterization of the Salt River Bay National Historical Park and Ecological Preserve, U.S. Virgin Islands* (Kendall et al 2005). Two species of coral, elkhorn coral (*Acropora palmata*) and staghorn coral (*Acropora cervicornis*) that are listed as Federally threatened have been observed at SARI (Kendall et al 2005) and are discussed in more detail in Section 3.6.

East Site – Uncolonized hardbottom reef rubble and uncolonized bedrock can be found in the northern facing shores of the East Site (Figure 3-5). The East Wall of the Salt River Canyon is located approximately 0.12 nautical miles from the East Site.

South Site – There are no coral reefs located near the South Site (Figure 3-5). The East Wall of the Salt River Canyon is located approximately 0.37 nautical miles from the South Site.

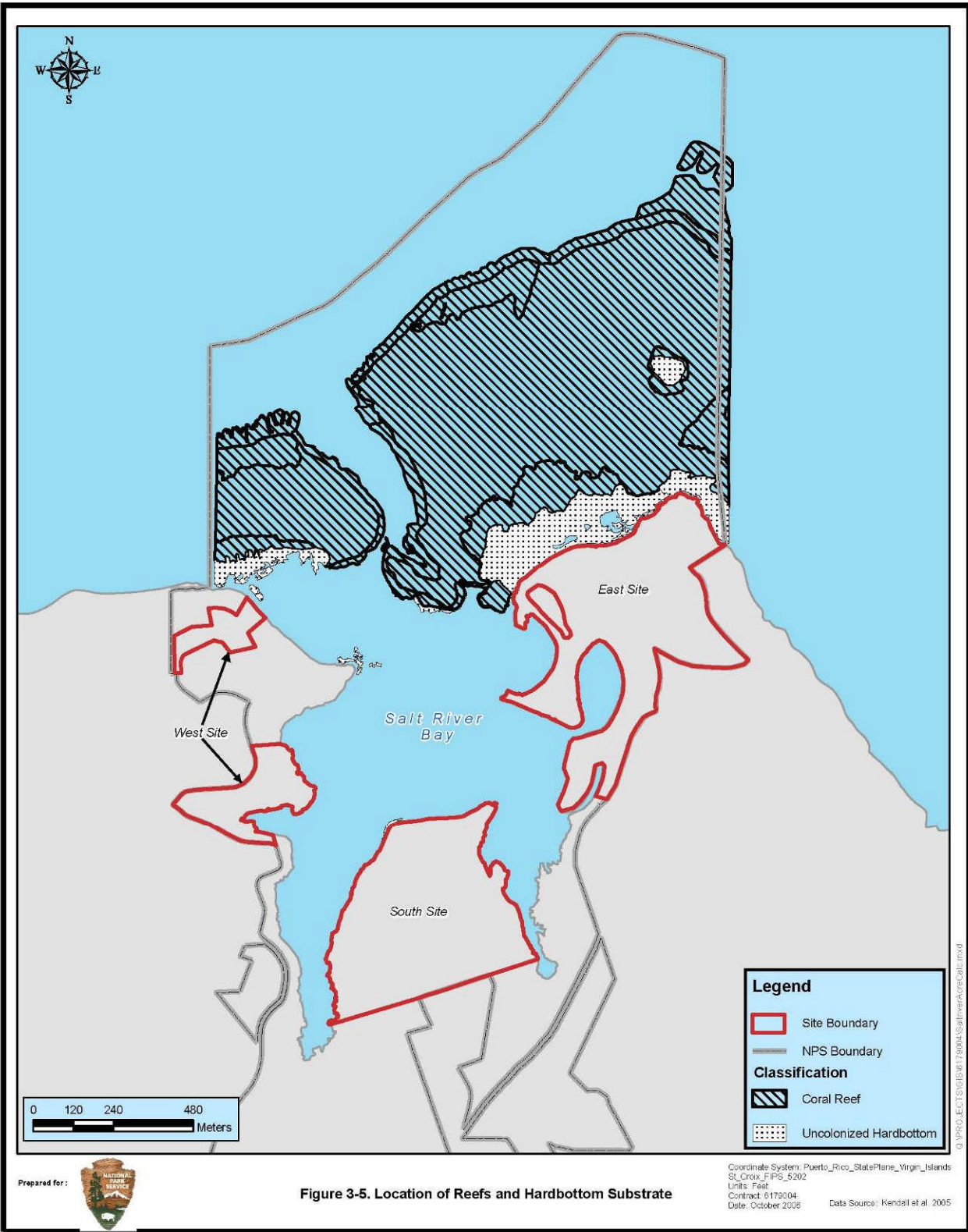
West Site – There are no coral reefs located near the Salt River Marina, but uncolonized hardbottom with uncolonized pavement can be found in the northern facing shores of the NPS Visitor Contact Station (Figure 3-5). The West Wall of the Salt River Canyon is located approximately 0.23 nautical miles from the West Site.

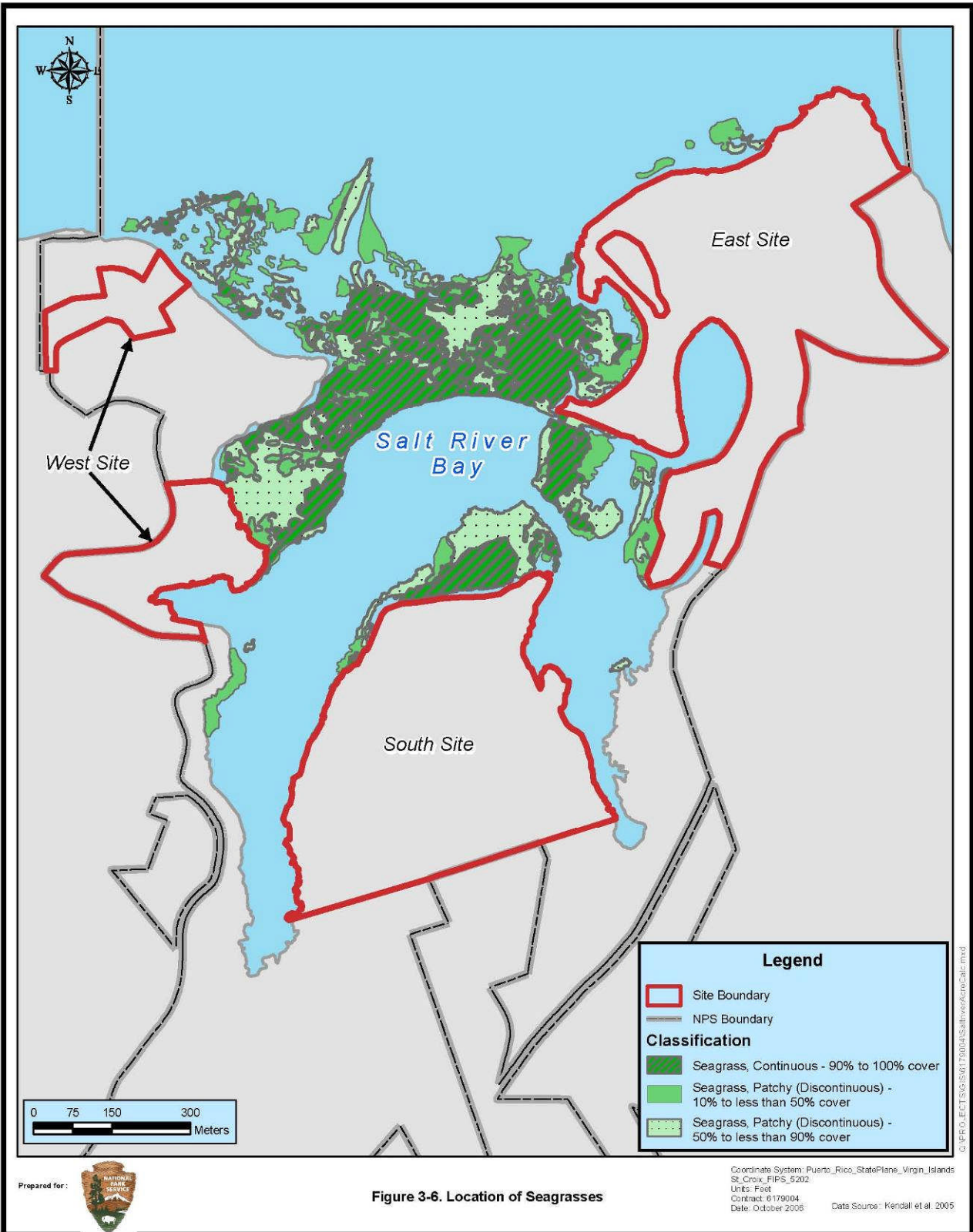
3.5.2 Seagrasses

Seagrasses are seed-producing, flowering marine plants that occur in shallow, nearshore, temperate, and tropical waters. Seagrasses also require circulation of the overlying water, which delivers nutrient and substrate material and removes waste products. They spread annually by dispersal of seeds. Seagrasses provide habitat and a source of food for a variety of small fishes and invertebrates such as shrimp and crabs. Seagrasses also trap sediment, which helps prevent erosion of the shallow sediments. Major problems that affect seagrasses include dredge and fill activities, soil erosion, and increased levels of water pollution. Excessive nutrients from residential septic tanks have caused short-term eutrophic conditions as well. Natural stressors include tropical storms and hurricanes and grazing by herbivores (natural exploitation of resource). Anthropogenic sources of stresses include dredging and filling, oil pollution, physical disturbance (i.e., boat propeller and anchor damage), and chemical pollutants from industry and non-point source pollution.

In the year 2000, seagrasses were mapped by NOAA using a hierarchical classification scheme, using digitized orthorectified aerial photos to delineate areas of seagrass coverage in the Bay (Kendall et. al. 2005). The seagrass classification system included 10% to less than 50% cover, 50% to less than 90% cover, and 90% to 100% cover. Seagrass coverage observed in 2000 was slightly higher than the last survey in 1992. Most of the seagrass in the bays of SARI consists of two species, turtle grass (*Thalassia testudinum*) and manatee grass (*Syringodium filiforme*), with lesser areas of shoal grass (*Halodule wrightii*). Figure 3-6 shows the distribution of seagrasses within the SARI boundary.

East Site – Patchy and continuous seagrasses are located within the East Cove and in the Bay south of the abandoned hotel structure. It is unknown if seagrasses currently occur within the Mangrove Lagoon. The flushing rate of the Mangrove Lagoon is lower than that of Salt River Bay, due to the narrow inlet that currently exists. Due to historic dredging activities that have occurred, the silt character of the material in the vicinity of the East Site, and the low flushing rate within the Mangrove Lagoon, seagrasses would not be expected to thrive in this type of habitat. A silt-laden bottom largely devoid of seagrass or algae dominates a large area in the center portion of the Bay, owing to past dredging, continued sediment loading, and low light penetration (NPS 1990). High water turbidities have been observed in the Mangrove Lagoon due to poor water exchanges, elevated nutrient input, and biological productivity (Sugar Bay Land Development 1986). In 1986, five transects in the Mangrove Lagoon were conducted for depth profiles and distribution of seagrasses; recovery at these transects yielded a majority of algae and some patchy areas of seagrasses (Sugar Bay Land Development 1986). The following algae species were identified in the Mangrove Lagoon: *Halimeda opuntia*, *Halimeda incrassata*, *Caulerpa mexicana*, *Penniculus capitatus*, *Hypnea musciformis*, *Caulerpa sertularioides*, *Caulerpa verticillata*, *Acanthophora spicifera*, *Dictyota* species, *Thalassia* species, *Syringodium* species and *Ceramium* species. The only true seagrasses, turtle grass, was recovered at two shallow transects, located on the eastern and western shorelines of the Mangrove Lagoon and the seagrass *Halodule wrightii* was recovered at one transect





(Sugar Bay Land Development 1986). Turtle grass is the most common seagrass in the Caribbean Sea. During the May 2006 site visit, two species of algae, *Halimeda incrassata* and *Avrainvillea nigricans* were observed washed up on shore of the Mangrove Lagoon at the abandoned hotel site.

South Site – Continuous seagrasses can be found north of the South Site. Patchy seagrasses are located along the mouth of Sugar Bay and Triton Bay.

West Site – No seagrasses are located within the Salt River Marina; however, patchy seagrasses are located northeast of the Visitor Contact Station, and northeast of the Salt River Marina. The majority of seagrasses are located within the mouth of the Bay due to the water quality, turbidity, and the solar irradiance in that area.

Seagrasses are protected under the VICZMA which stimulates state and Territorial leadership in planning and managing the use of coastal areas. Territorial regulations include designation of Areas of Particular Concern (APCs) that would provide conservation guidelines and site protection strategies for valuable resources. Section 3.7.2 includes a more detailed discussion of APCs.

3.5.3 Fish

The USVI contains many natural resources that provide food and shelter for a variety of marine and terrestrial life. There are residential populations of fish and a variety of fish that migrate through the USVI annually. The marine waters are heavily fished by both recreational and commercial fisherman. In addition, tourist and economic development (i.e., housing development and hotel construction) continues to infringe on the coastal environment. The USVI DPNR/DFW manages fisheries and marine resources by advising and supporting the Local Fisheries Advisory Committees, conducts research to assess the fisheries and marine resources, reviews scientific literature and provides guidance when needed, and advise the USVI DPNR Commissioner on issues relating to fisheries and marine resources. The USVI DPNR/DFW began monitoring programs using a variety of fish census techniques to survey fish communities around St. Croix, including a site at the west canyon wall at SARI.

In order for marine fish to complete their life cycles, marine fish need a variety of benthic habitats such as mangroves, seagrass meadows, and reefs, all which SARI has in close proximity to each other. Larval fish need seagrass and sand areas for initial settlement sites when they transition from ocean drifting forms to bottom dwelling forms. During their juvenile stage, fish may use the prop roots of red mangroves for structural refuge and foraging. A recent case study of fishery use found that 57 different species of fish utilize mangrove habitat at SARI (Kendall et. al. 2005). The most abundant families were snappers (Lutjanidae), grunts (Haemulidae), and mojarras (Gerreidae), which accounted for 82% of the fish observed on transects and 72% of fish caught in traps. Most fish caught during these studies were juveniles. Species richness was greater close to the Bay mouth relative to sites farther in Triton and Sugar Bay. The study revealed the importance of Salt River mangroves as a nursery ground to many recreational and commercial fish species. A list of fish species observed within SARI at the mangrove habitats, canyon walls habitat, and in water column as pelagic fishes can be found in the report *An Ecological Characterization of the Salt River Bay National Historical Park and Ecological Preserve, U.S. Virgin Islands* (Kendall et. al 2005).

All three site locations contain mangrove habitat (see Figure 3-3). A diverse number of fish can find suitable combination of habitats for larval settlement, juvenile growth, and adult life stages within the small boundaries of SARI. Inshore mangroves and seagrass beds provide important nursery areas for fish that ultimately migrate to the reefs. In addition, mangroves have been shown to enhance biomass of commercially important fish.

There have been 200 species of fish observed in SARI reefs so far (Kendall et. al 2005), and this despite nearly all sampling efforts expended only on the canyon walls. During the monitoring program at the west canyon wall lead by USVI DPNR/DFW, a total of 91 species have been observed and are included in the report *An Ecological Characterization of the Salt River Bay National Historical Park and Ecological Preserve, U.S. Virgin Islands* (Kendall et. al 2005). None of the 91 fish species were listed because there are no federally listed or territorially listed fish species for SARI. However, the Caribbean Fisheries Management Council (CFMC) maintains a list of fish species that currently require protecting, which are discussed in more detail in Section 3.7.12.

Larval or juvenile stages of the commercially important fish species have been recorded at SARI. These fish species include white mullet (*Mugil curema*), dwarf herring (*Jenkinsia lamprotaenia*), snook (*Centropomus undecimalis*), bonefish (*Albula vulpes*), schoolmaster snapper (*Lutjanus apodus*), and gray snapper (*Lutjanus griseus*) (IRF 1993).

East Site – A fish survey was conducted in the Mangrove Lagoon in 1986 that recovered the following species: chestnut moray (*Enchelycore* sp.), white mullet (*Mugil curema*), and yellowfin mojarra (*Gerres cinereus*) (Sugar Bay Land Development 1986).

South Site – No site-specific fish surveys have been conducted in the vicinity of the South Site.

West Site – No site-specific fish surveys have been conducted in the vicinity of the West Site.

3.5.4 Benthic Macroinvertebrates

Larval or juvenile stages of commercially important crustacean have been recorded for Salt River Bay. These macroinvertebrates include queen conch (*Strombus gigas*) and Caribbean spiny lobster (*Panulirus argus*). Other macroinvertebrates that have been observed at SARI include the mangrove cupped oyster (*Crassostrea rhizophora*), flat tree oyster (*Isognomen allatus*), and jellyfish (*Cassiopeia* sp.) (IRF 1993). Macroinvertebrates that would potentially utilize the mangrove root as substrate for attachment include sponges, tunicates, mollusks, anemones, and tube worms (IRF 1993). Other invertebrates that are partially dependent upon aquatic habitats that would be expected to utilize habitat at SARI include the large land crab (*Cardisoma guanhumi*), ghost crab (*Ocypode* spp.), fiddler crab (*Uca pugnax rapax*), rock crab (*Grapsus* sp.), and the soldier crab (*Coenobita clypeatus*) (IRF 1993).

East Site – Three transects for depth profiles were conducted in the Mangrove Lagoon for the 1986 EA (Sugar Bay Land Development 1986). The three transects depicted similar benthic communities developed near the shallow shorelines (approximately 2.1 meters or less in depth). The most common invertebrates recovered were tunicates and mangrove oysters (*Isognomon alatus*). Beyond approximately 2.1 meters in depth, fine muds were present in the Mangrove Lagoon. Two additional shallow transects approximately 0.25 meters in depth were conducted along the eastern and western shorelines of the Mangrove Lagoon. These sediments consisted of fine muds and small “reefs” with sabellid tubeworms (*Sabella melanostigma*) and hard substrates with mangrove oysters.

3.5.5 Aquatic Reptiles

Four sea turtles are expected to potentially occur, or have a reasonable probability of occurring in Salt River Bay and include the Federally listed endangered hawksbill turtle (*Eretmochelys imbricata*) and leatherback turtle (*Dermochelys coriacea*) and the Federally listed threatened green sea turtle (*Chelonia mydas*) and the loggerhead sea turtle (*Caretta caretta*) (IRF 1993). Because the four sea turtles are Federally listed, these species are discussed in more detail with threatened and endangered species in Section 3.6.

3.5.6 Marine Mammals

Numerous species of whales have been historically and recently documented within the waters and offshore of Salt River Bay. The humpback whale (*Megaptera novaengliae*), listed as Federally endangered, was sighted at the Salt River site on February 17, 1989 (VI Government 1990). Other whale species that were observed at the Salt River site documented in the 1990 EA (VI Government) included three Federally endangered whale species: the sperm whale (*Physeter catodon*), the finback whale (*Balaenoptera physalus*), and the sei whale (*Balaenoptera borealis*). The four whales listed above are discussed in more detail with threatened and endangered species in Section 3.6. Additional sightings of non-listed whales include the pilot whale (*Globicephala* sp.) – observed in waters offshore from SARI, the rarely seen Cuvier's beaked whale, also known as the goosebeak whale (*Ziphius cavirostris*) – documentation of a stranding in Salt River Bay, and the pygmy sperm whale (*Kogia breviceps*) – observed in vicinity of SARI (Hillis-Starr 2007). In addition to the whales observed and discussed above, the common dolphin (*Delphinus* sp.) is regularly observed by divers in the vicinity of Salt River Bay (Hillis-Starr 2007) and the bottlenose dolphin (*Tursiops truncatus*) has also been observed (Hillis-Starr 2008).

3.6 THREATENED AND ENDANGERED SPECIES

3.6.1 General Discussion

The Endangered Species Act (ESA) of 1973 was enacted to protect plant and animal species considered to be in danger of extinction. The Act affords legal protection to species listed as endangered and threatened, including protection of their habitats. The Act requires Federal agencies to undertake affirmative actions to protect and restore populations of listed threatened and endangered species, and to prevent proposed and candidate species from being listed. Two additional Federal regulations protect endangered and threatened wildlife species, these include the Fish and Wildlife Coordination Act of 1934 (as amended), which includes provisions for the protection of bald and golden eagles and endangered species of fish and wildlife, and the Bald and Golden Eagle Protection Act, which prohibits pursuing, wounding, killing, or capturing of bald and golden eagles.

An endangered species is defined as any species that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Due to habitat loss and species fluctuations, the lists of protected species are constantly changing. In addition to Federal protection from the ESA of 1973, the Legislature of the U.S. Virgin Islands enacted the Indigenous and Endangered Species Act (Title 12 Chapter 2) in 1990 "to protect, conserve, and manage indigenous fish, wildlife, and plants, and endangered or threatened species for the ultimate benefit of all Virgin Islanders, now and in the future" (Government of the U.S. Virgin Islands et al 1991). The institution responsible for the management of marine resources in the U.S. Virgin Islands is the USVI DPNR. Within USVI DPNR, there are other divisions that have responsibilities relating to the marine environment, including the Division of Fish and Wildlife. The DFW cooperates with both the USFWS and NMFS to monitor and protect endangered and protected species. The USVI currently contains ten species with Federal endangered or threatened status (five reptiles, three birds, two plants). Territorially endangered species include 28 animals (one reptile, 22 birds, three mammals, one fish, and one coral) and 49 plant species. Tables B-2 and B-3 of Appendix B provide a list of all Federally and Territorially threatened and endangered (T&E) species potentially found within the USVI.

All Federally and Territorially listed species require protection and in some cases, monitoring. Direct impacts on listed species include introduction of non-native species (including the non-native hogs, goats,

donkeys, and the West Indian mongoose), boats speeding through SARI waters and upland development that results in people, lights, and dogs.

3.6.2 Site-Specific Listed Species

Detailed T&E species surveys have not been conducted for this study at SARI to date. However, detailed terrestrial and aquatic surveys have been conducted for previous projects proposed at SARI, including an Environmental Assessment (EA) for the Columbus Landing Site (Coastal Consultants 1987), an EA and alternatives analysis for the Columbus Landing Site (Government of the U.S. Virgin Islands 1990), an EA for the East Site in 1986 (Sugar Bay Land Development, Ltd 1986), and a comprehensive analytical study for SARI conducted by the USVI DPNR (IRF 1993). Other sitings and recordings of listed species have been documented by the NPS. The results of the above mentioned studies and the documentation by the NPS are discussed below in more detail for the entire SARI Site and for the East, South, and West Site (if species information was available).

Four Federally listed sea turtles could potentially occur or have been observed in Salt River Bay based upon historic and recent observations (IRF 1993 and Hillis-Starr 2007). Two of the four Federally listed sea turtles that could potentially occur in the bay: the Federally listed leatherback turtle and the Federally listed threatened loggerhead sea turtle (IRF 1993). The remaining two the four Federally listed sea turtles are known to reside inside and outside the bay: the Federally listed endangered hawksbill turtle and the Federally listed threatened green sea turtle (Hillis-Starr 2007). In the past, the loggerhead turtle was rarely sited in the Virgin Islands, but recently has been discovered nesting at Buck Island Reef; juveniles loggerheads have also been observed foraging in the area adjacent to Frederiksted (Hillis-Starr 2007). Leatherback sea turtles have been caught in gillnets located outside of the bay as recently as 2006, but are not expected to regularly occur inside the bay (Hillis-Starr 2007). Additionally, observations of hawksbill sea turtles have been documented by scuba divers on the east and west walls of the submarine canyon (Hillis-Starr 2007). Green sea turtles and hawksbill sea turtles have also been documented nesting at the Columbus Landing site. These observations are discussed by site in the paragraphs below and in Agency Correspondence (Section 3.6.3). Juvenile hawksbill sea turtles can forage in the bay on seagrasses and juvenile green sea turtles can forage on a variety of zooxanthids, salps, tunicates, and other marine invertebrates (Hillis-Starr 2007). Hawksbill turtles are omnivores and will therefore consume a variety of food sources found on the reef and along mangrove prop roots.

In addition to listed sea turtles, the following Federally endangered whale species could potentially occur in Salt River Bay: the humpback whale, the sperm whale, the finback whale, and the sei whale. Although the humpback whale was sited at the Salt River site in 1989 (VI Government 1990), it is currently thought that humpback whales migrate past SARI (Hillis-Starr 2007). Other whale species observed in the vicinity of Salt River Bay documented in the 1990 EA (VI Government) include the sperm whale, the finback whale, and the sei whale.

The following Territorially-listed bird species currently or once used the habitat at SARI: snowy egret, bahama duck, Caribbean coot, least tern, and white-crowned pigeon (Government of the U.S. Virgin Islands 1990). The following Territorially-listed bird species that use SARI for feeding/roosting include: brown pelican, great blue heron, black-crowned night heron, Federally-listed peregrine falcon (*Falco peregrinus*), willet, and bridled quail-dove (Government of the U.S. Virgin Islands 1990). The following Territorially listed plant species have been observed at SARI: egger's agave (*Agave eggersiana*), olive psychilis (*Epidendrum bifidum*), Christmas orchid (*Epidendrum ciliare*), lignum vitae (*Guaiaecum officinale*), stinging brush (*Malpighia infestissima*), cowage cherry (*Malpighia woodburyana*), and wooly nipple (*Mammillaria nivosa*) (Coastal Consultants 1987, IRF 1993, and Government of the U.S. Virgin Islands 1990). The white-crowned pigeon and bridled quail dove are proposed for downlisting from Territorially endangered to threatened.

Based upon a review of avian habitat requisites for the three Federally-listed species and results of prior surveys, all three federally listed avian species may utilize the habitats within SARI, including the three sites. The federally listed endangered brown pelican is one of the most common seabirds to visit SARI. The USFWS is currently evaluating the brown pelicans nesting success and is considering this species for delisting. The Federally listed endangered peregrine falcon is a winter migrant within St. Croix and the Federally listed threatened roseate tern (*Sterna dougallii*) is a summer resident within St. Croix.

East Site – Previous avian surveys, conducted in 1986, resulted in the observation of the following Territorially-listed species at the East Site: snowy egret (roosting near the Salt pond and tracks found on the peninsula and surrounding areas), least tern (*Sterna antillarum antillarum* - observed on Crescent beach), white-crowned pigeon (observed flying over peninsula), brown pelican, great blue heron, black-crowned night heron, bahama duck, and peregrine falcon (Sugar Bay Land Development, Ltd 1986). The following listed bats may feed, rest, or nest on the East Site, based upon previous site investigations: fisherman bat (*Noctilio leporinus*) and the cave bat (*Brachyphylla cavernarum*) (Sugar Bay Land Development, Ltd 1986). The USVI DPNR/DFW marked a least tern nesting site that covers approximately 4,000 square meters on the northeast side of SARI west of Estate Judith's Fancy within the location of the East Site. Least terns have been documented nesting at 26 sites on St. Croix in various habitat types, including Crescent Beach at the East Site. Although the Caribbean race of least tern is not Federally listed, it is listed as endangered in the U.S. Virgin Islands Territory. Populations of least tern have declined on St. Croix due to predation by dogs, cats, and mongoose as well as human disturbance.

South Site –No site-specific T&E data are available for the South Site.

West Site – As stated previously, leatherback sea turtles have been caught in gillnets located outside of the bay as recently as 2006, and although the leatherback sea turtle would rarely nest near the West Site, a female recently (summer 2006) tried to nest at the Columbus Landing Site (Hillis-Starr 2007). A reference letter from W. Tobias dated 27 July 1993 stated that “occasionally a leatherback turtle nests at the sandy beach at the Columbus Landing Site (IRF 1993).” In addition, the West Site also provides nesting habitat for hawksbill and green sea turtles (Hillis-Starr 2007). In addition, the following Territorially-listed avian species have been observed at the West Site: snowy egret, brown pelican, and great blue heron (Ecosystems 1983). The Territorially-listed plant species stinging bush (*Malphigia infestissima*) has been observed along the western shoreline of SARI, near the Columbus Landing site; this plant has only been found on the north shore of St. Croix and Buck Island (Government of the U.S. Virgin Islands 1990).

3.6.3 Agency Correspondence

In a September 8, 2006 agency response coordination letter, NMFS stated that the ranges of four listed sea turtles (hawksbill, leatherback, loggerhead, and green sea turtles) occur in the vicinity of the three sites (See Appendix C for Agency Coordination Letters). Two Federally listed endangered sea turtles, hawksbill turtle and leatherback sea turtles, and two Federally listed threatened sea turtles, green turtle and loggerhead sea turtle, have the potential to be found within SARI. The hawksbill sea turtle requires coral reefs for food and refuge and has a peak nesting season that ranges from July through November. The leatherback sea turtles live in oceanic waters and come ashore to nest on beaches during the summer months. The green sea turtle feed in seagrass beds and comes ashore on beaches from June through July to nest. Juvenile green sea turtles can be found in coastal bays, inlets, lagoons, and offshore warm reefs. IRF (1993) reported that green and hawksbill sea turtles have been observed nesting on beaches on both sides of the bay and occasionally, a leatherback turtle nests at the sandy beach at Columbus Landing. Sea turtle refuge and forage habitat is discussed in more detail in Section 3.7.1.1.

Also in the September 8, 2006 agency coordination letter, NMFS stated that the ranges of two Federally-listed (threatened) species of coral, including elkhorn coral and staghorn coral, occur in the vicinity of the three sites (See Appendix C for Agency Coordination Letters). These species of coral have been observed in Salt River Canyon (Kendall et al 2005). Staghorn coral was observed on both the east and west wall; elkhorn coral was observed on the west wall only (Kendall et al 2005). The east wall is located approximately 0.12 nautical miles from the mainland of St. Croix.

An agency coordination letter requesting T&E information at SARI was sent to the USFWS on July 21, 2006 and no response has been received to date. In addition, a similar letter requesting T&E information at SARI was sent to the Commissioner of the USVI DPNR and to contacts at both the USVI DPNR/DEP and the USVI DPNR/DFW on July 21, 2006. No responses have been received to date from the USVI DPNR.

3.7 UNIQUE NATURAL RESOURCES

3.7.1 Ecologically Critical Areas

Ecologically critical areas include habitat designated as critical habitat for listed T&E species, essential fish habitat and habitat areas of particular concern, and other habitats that are protected by the DPNR, the CFMC in association with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), or other Executive Orders. These critical areas are discussed in more detail in the sections below.

3.7.1.1 Designated Critical Habitat for T&E Species

Public Law 95-632 (92 Stat. 375), signed in 1978, made extensive revisions to the Endangered Species Act of 1973. It requires consideration of the economic impact of designating critical habitat and review of the list of Federally endangered and threatened species every five years. Critical habitat is defined in the ESA as a specific geographic area that contains habitat features essential for the conservation of a threatened or endangered species (USFWS 2004). Designated critical habitat areas are necessary for the recovery of endangered or threatened species, even though the species of concern may not be documented in these areas.

The Endangered Species Act Amendments of 1978 define the term “critical habitat” as follows: (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of this Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management consideration or protection; and (ii) specific areas outside the geographical area. Not all Federally listed species have designated Critical Habitat. The following species applicable to the project area have Federally designated Critical Habitat:

Leatherback Turtle Critical Habitat

The National Marine Fisheries Service (NMFS) has determined Critical Habitat for the leatherback sea turtle (*Dermochelys coriacea*) in waters adjacent to Sandy Point Beach, St. Croix, U.S. Virgin Islands. Sandy Point Beach is located within the Sandy Point National Wildlife Refuge, located on the southwestern tip of St. Croix, over 15 miles south west of Columbus Landing site, on the other side of the island. The action is being taken under Section 7 of the Endangered Species Act of 1973, as amended. 16 U.S.C. 1531 et. seq. (the “Act”) to provide protection to sea turtles using these waters for courting, breeding, and access to and from their nesting areas on Sandy Point Beach. All Federal departments and agencies are required to insure that actions authorized, funded, or carried out by them do not result in the

destruction or adverse modification of the critical habitat. In an September 8, 2006 agency coordination letter, NMFS stated that the waters adjacent to Sandy Point on the southwest corner of St. Croix, up to and including the waters from the hundred fathom curve shoreward are designated as critical habitat for the leatherback sea turtle (50 CFR 226.207) (See Appendix C for Agency Coordination Letters).

3.7.1.2 Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC)

The Magnuson-Stevens Fishery Conservation and Management Act, (16 United States Code (USC) 1801 et seq. Public Law 104-208) authorizes responsibilities for the protection of Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPCs). The Act specified that each Federal agency shall consult with the Secretary with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by such agency that may adversely affect any EFH identified under this act. EFH is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Within SARI, ecologically critical areas include EFH, as identified by the CFMC (CFMC 2004), and HAPCs, as defined by the NOAA (NPS 2006).

The CFMC is responsible for the management of fisheries in Federal waters off the coasts of Puerto Rico and the USVI, including St. Croix, and specifies areas for protection in association with the MSFCMA (NOAA 1999). The CFMC has identified the following marine habitats as EFH within SARI: coral reefs, hard and soft bottoms, sand/shell bottoms, pelagic habitat (water column), benthic algae, and seagrass (CFMC 2004). In addition, mangroves are identified as estuarine EFH within SARI. EFH includes virtually all marine waters, substrates (mud, shell, rock, coral reefs), and associated biological communities within the defined exclusive economic zone, which includes SARI. These habitats provide forage and nesting areas for species that are included in detailed Fishery Management Plans (FMPs), including 15 species of reef fish, the spiny lobster, the queen conch, and corals/coral reefs. FMPs describe and identify EFH for a fishery, minimize to the extent practicable adverse effects on that EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of that EFH. The EFH for 15 species of reef fish by the CFMC has been described in a Reef FMP. Of the 15 fish species included in the Reef FMP, 12 of these fish species have been observed utilizing mangrove habitat and/or the reef canyon walls at SARI (Kendall et. al 2005). The following fish species were observed utilizing mangrove habitat and/or the reef canyon walls at SARI and are part of the Reef FMP: banded butterfly fish (*Chaetodon striatus*), gray snapper (*Lutjanus griseus*), queen triggerfish (*Balistes vetula*), mutton snapper (*Lutjanus analis*), nassau grouper (*Epinephelus striatus*), red hind (*Epinephelus guttatus*), redbtail parrotfish (*Sparisoma chrysotermum*), schoolmaster (*Lutjanus apodus*), squirrelfish (*Holocentrus ascensionis*), sand tilefish (*Malacanthus plumieri*), yellowtail snapper (*Ocyurus chrysurus*), and white grunt (*Haemulon plumieri*) (CFMC 2004).

Within the U.S. Virgin Islands, for each category of fishery, all waters, from mean high water to the outer boundary of the exclusive economic zone, are protected for eggs and/or larvae. For other life stages, the following EFH are defined:

Designated Species with Fishery Management Plans (FMPs)	Defined Essential Fish Habitat (EFH)
Reef fish (15 species)	All substrates from mean high water to 100 fathoms depth
Spiny Lobster	Seagrass, benthic algae, mangrove, coral, and live/hard bottom substrates from mean high water to 100 fathoms depth
Queen Conch	Seagrass, benthic algae, coral, live/hard bottom and sand/shell substrates from mean high water to 100 fathoms depth
Coral Fishery	Coral and hard bottom substrates from mean low water to 100 fathoms depth

In addition to EFH, SARI (and the entire estuary of Salt River Bay) has also been designated as a HAPC for reef fisheries because of the ecological importance, sensitivity to human-induced degradation, and undergoing development activities that stress the habitat (CFMC 2004). Barrier reefs, deep reefs, patch reefs, extensive hard-bottom communities of gorgonid corals and sponges, unique elkhorn coral formations, and extensive seagrass beds, characterize the area. Salt River estuary is a nursery area for many commercially and recreationally important finfish and shellfish species, including spiny lobsters. Because all three sites (West Site, South Site, and East Site) are located adjacent to Salt River Bay, the three sites contain habitats designated as EFH and HAPC in association with the Bay, including mangrove wetlands, intertidal flats/salt ponds, soft bottom lagoons, mud flats, sandy beaches, rocky shores, the water column, seagrass beds, non-vegetated bottoms, coral reefs, algal plains, geologic features, and live bottoms.

3.7.1.3 Other Critical Areas

In addition to Federally designated Critical Habitat, other habitats exist in the vicinity of SARI that are protected by the VIPDNR, the CFMC in association with the MSFCMA, or other Executive Orders. These habitats are discussed in more detail in the following paragraphs.

Least Tern Habitat

Least terns have been documented nesting at 26 sites on St. Croix in various habitat types including beaches, salt flats, dredge spoil piles, and at the HOVENSA oil refinery. Although, the Caribbean race of least tern is not Federally listed, it is listed as endangered in the U.S. Virgin Islands Territory. Populations of least tern have declined on St. Croix due to predation by dogs, cats, and mongoose as well as human disturbance. At the East Site, the USVI DPNR/DFW marked a least tern nesting site that covers approximately 4,000 square meters on the northeast side of SARI west of Estate Judith's Fancy. Although protected by the USVI DPNR/DFW, this nesting site is not Federally recognized as Critical Habitat.

Mangrove Habitat

Salt River Bay has been characterized as supporting one of the largest remaining areas of mangrove forest in the Territory. Mangroves are considered both EFH and critical habitats. The fringing red mangrove prop roots provide critical habitat for juvenile reef fish species and provides critical nursery habitat for a variety of commercially and recreationally important marine organisms, including fish and crustacea (IRF 1993). The mangroves are critical habitats for winter migrating birds and numerous endangered species.

Coral Reef Habitat and Submarine Canyon

Coral reefs are the most complex, species-rich marine ecosystems. Coral reefs are considered both EFH and critical habitats and support T&E species, protect marine mammals, and sea turtles. Within the SARI property, a submerged barrier reef extends west of Buck Island, along the length of the north coast narrow shelf, broken only by the Christiansted submarine canyon off Christiansted, and the Salt River submarine canyon off Salt River. Approximately 41 species of corals have been observed during the studies at the SARI submarine canyon, two species that are listed as Federally threatened have been observed at SARI (Kendall et al 2005) and are discussed in more detail in Section 3.6. Executive Order 138090, *Preserve and Protect Coral Reef Ecosystems*, recognizes the significant ecological, social, and economic values provided by the Nation's coral reefs and the critical need to ensure that Federal agencies are implementing their authorities to protect these valuable ecosystems. In addition, NOAA established a Coral Reef Conservation Program (CRCP) as part of the national effort to conserve coral reefs.

3.7.2 Designated Natural Areas

Executive Order 13158, Marine Protected Areas (MPAs), helps to protect the significant natural and cultural resources within the marine environment for the benefit of present and future generations by strengthening and expanding the Nation's system of MPA. An MPA is defined as an area of the marine environment that has been reserved by Federal, state, Territorial, tribal or local laws or regulations to provide lasting protection to part or all of the existing natural or cultural resources. In addition to MPA, the VICZMA of 1978 stipulates that certain areas in the USVI are of greater significance, whether for economic, cultural, or environmental reasons, and are nominated as APC. As part of the VICZMP, the USVI government has developed the criteria for areas that are nominated as being of particular concern. MPAs also include areas designated at APCs. The following MPAs have been described in the vicinity of and including SARI:

Salt River Bay Marine Reserve and Wildlife Sanctuary – This MPA encompasses the water acreage of SARI. Within the defined area, there are various types of marine/wetland ecosystems within small and manageable units, maximizing biodiversity within minimum areas. In February 1980, this MPA was designated a *National Natural Landmark* by the Secretary of the Department of the Interior.

Salt River Bay and Watershed APC – The Salt River Bay and watershed is one of 18 APCs designated by the USVI DPNR (IRF 1993). The Bay was selected as an APC due to its unique mix of resources. There are a total of 27 T&E plants and animals that reside within the Salt River Bay Area. This area is home to the largest remaining mangrove forest in the USVI, which supports many algae and invertebrates, including the valuable Mangrove and Flat Tree Oysters. This site also supports extensive seagrass beds, coral gardens, and the reef beyond. It is also the only known land area in the United States visited by Christopher Columbus. This 690-acre portion of Salt River Bay is also included in the National Registry of Natural Landmarks.

Salt River Bay National Historical Park and Ecological Preserve – The Salt River system is located along the north-central coast of St. Croix, and contains the most significant historical and natural resources known in the Virgin Islands. Prehistoric and colonial-era archeological sites and ruins are found in a dynamic, tropical ecosystem that supports T&E species.

St. Croix Coral Reef System APC – This APC is located offshore of St. Croix; it is a 3 mile Territorial sea portion of a geological platform which extends from Point Udall and parallels the shoreline from Coakley Bay to the area of Great Pond Bay. The coral reef is of great scientific interest for the variety of reef types and forms it supports. Of 60 species of stony corals in the Western Atlantic Ocean, 3 species of fire corals and 34 species of hard corals are found in this APC. Because the east wall and west wall of the submarine canyon at SARI are located within the St. Croix Coral Reef System APC, both elkhorn coral and staghorn coral have been observed in this APC.

St. Croix Natural Heritage Area – The entire island of St. Croix was recently and officially designated as Heritage Area 1594 by the U.S. Congress.

3.8 CULTURAL RESOURCES

This section describes the cultural resources within SARI. Cultural resources include archaeological sites; historic resources, which are defined as buildings and structures that are 50 years old or older; and cultural landscapes.

3.8.1 Background

Salt River Bay is the only known location on U.S.-owned land where Columbus landed. On November 14, 1493, during his second voyage to the New World, Columbus anchored off-shore at Salt River Bay and sent a boatload of more than two dozen armed men to a Carib Indian village located on the Bay's western shore. Returning from their reconnaissance with several enslaved Taino women and children whom they had "liberated," this party encountered a canoe of villagers who briefly skirmished with Columbus' party, resulting in a fatality on each side. Columbus would name this location Cabo de las Flechas or Cape of the Arrows, in memory of this encounter. The village where the Spaniards landed is known as the Columbus Landing site and is the only prehistoric village in the USVI that is known to have had a stone-lined ball court with petroglyphs, and associated social and religious significance. Salt River Bay was subsequently home to seventeenth-century English (1641, 1645-50), Dutch (1642-1645), and French (1650-1696) settlements, and the triangular fortification (known as Fort Flamand or Fort Salé) begun by the English in 1641 and subsequently completed by the Dutch in 1642 remains in SARI. SARI is thus home to several known historically significant sites and the Salt River Bay itself is a significant historic landscape.

The archaeological resources of SARI have been the subject of investigations, excavations, and collection since the 1880s. A number of archaeological surveys and site investigations occurred prior to SARI's establishment in 1992, and the NPS has conducted additional investigations since SARI's establishment. All of the land and waters within SARI's boundaries have yet to be investigated for archaeological resources, and there is the potential for the identification of sites and resources in areas that have yet to be inventoried.

National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966, as amended (36 CFR Part 800), requires Federal agencies to consider the effects of their undertakings on historic properties and affords the Advisory Council on Historic Preservation a reasonable opportunity to comment. The purpose of the NHPA is to ensure that Federal agencies consult with state and local groups before non-renewable cultural resources are impacted or destroyed and ensures that preservation values are factored into Federal agency planning and decisions.

3.8.2 Archaeological Resources

Information on identified archaeological resources at SARI is taken from the draft *Archaeological Overview and Assessment of Salt River Bay National Historical Park and Ecological Preserve* (Hardy In review) by Archaeologist Meredith Hardy of the NPS' Southeast Archaeological Center (SEAC), and should not be cited without the permission of SEAC. Several terrestrial and underwater archaeological surveys have taken place on SARI prior to the creation of the park, and in some instances information on sites is missing and/or contradictory. This listing of sites is taken from the Appendix: Description of Archaeological Sites, from the draft *Overview and Assessment*, and employs the site numbers assigned by the NPS. Several of these sites are complexes of one or more resources, which are described separately. Table 3-4 describes the recorded archaeological sites within the boundaries of SARI. All sites described in this table are located within SARI.

Table 3-4. Recorded Archaeological Sites at SARI

Site #	Site Name	Location	Description
SARI-1	Salt River Point	Western mouth of Salt River Bay	Site complex containing two sites
SARI-1.01 (12VAm1-6)	Columbus Landing Site	Salt River Point	Prehistoric village site where Columbus Landing occurred; location of a prehistoric ball court; subject of archaeological investigations since the 1880s, with major excavations by Gudmond Hatt in the early 1920s; related to other prehistoric sites in the region, possibly including those in Estate Judith's Fancy in SARI
SARI-1.02	Fort Salé	Salt River Point	English-Dutch triangular fortification built in 1641-1642. Overlies Columbus Landing Site. Unreported excavations in late 1970s by OSA
SARI-2 (12VAm1-5)	Judith's Fancy	Hemer's Peninsula, East Side of Bay	Site complex consisting of satellite prehistoric occupations associated with SARI-1.01 as well as possible historic occupations
SARI-2.01	Lignum Vitae Site	West of Judith's Fancy	Prehistoric midden with burials located on the ocean front on the east side of the bay; reported as FS 4 in Joseph 1989
SARI 2.02	Spiceberry Site	West of Judith's Fancy	Site consisting of plain earthenwares, lithics and one lead shot. Possible Danish/English period slave occupation; reported as FS 3 in Joseph 1989
SARI-2.03	Button-wood Site	West of Judith's Fancy	Prehistoric/historic artifact scatter; recorded by Vescelius as Site 5
FS 1	Torchwood Site	West of Judith's Fancy	Prehistoric lithic scatter on hillslope, possibly displaced; reported as FS 4 in Joseph 1989
SARI-2.05	Oysterwood Site	West of Judith's Fancy	Prehistoric scatter; reported by Hatt
SARI-2.06	Soldierwood Site	West of Judith's Fancy	Prehistoric lithic/ceramic site; recorded as FS 2 in Joseph 1989
SARI-3	English Village	Eastern Shore of Salt River Bay	Location of four or five English house sites from the late 1640s. Scattered brick concentrations reports along the eastern shore of the bay. Site boundaries not defined
SARI-4	Machineel Site	Estate Morningstar	Danish windmill/water tower site, not field identified, most likely located in Estate Morningstar
SARI-5	Whitehorse Reef	East of the entrance to Salt River Bay	Reef containing several known shipwrecks; managed by the VI government

The Columbus Landing Site (SARI-1.01) and Fort Salé (SARI-1.02) are listed on the National Register of Historic Places (NRHP) as a National Historic Landmark, the highest designation of significance offered by the NHPA. The Lignum Vitae site (SARI-2.01) has been determined eligible for listing on the NRHP by the VI SHPO. The NRHP eligibilities of the Spiceberry Site (SARI-2.02), Buttonwood Site (SARI-

2.03), Torchwood Site (SARI-2.04), Oysterwood Site (SARI-2.05), and Soldierwood Site (SARI-2.06) are presently unknown. The locations of the English Village (SARI-3) and Machineel Sites (SARI-4) are unknown as is their NRHP status. The NRHP eligibility of shipwrecks on Whitehorse Reef (SARI-5) is also unknown

MREC Alternative Sites

Preferred Alternative (East Site) – The East Site has been surveyed on several occasions, most recently by Meredith Hardy during the summer of 2005. Gudmond Hatt visited this side of the Salt River Bay in 1924, while he was conducting excavations of the Columbus Landing Site (SARI-1.01); the site was identified as a small archaeological site on the basis of surface deposits (SARI-2.05). Gary Vescelius conducted a survey in the area in the early 1950s as part of an island-wide survey of St. Croix by Yale University, and recorded a site with prehistoric components that he thought was Hatt's site, although it was recorded at a different location and hence is given its own subsite number (SARI-2.03). Alfredo Figueredo conducted a survey along Salt River Bay's eastern shore in 1986 for a proposed development by the Sugar Bay Land Development Company, and identified a large prehistoric site on the oceanfront (SARI-2.01). Both Figueredo and later New South Associates conducted testing of this site (SARI-2.01); New South Associates' (Joseph 1989) survey of the area (1989) was for a planned development that never came to fruition. Testing at SARI-2.01 revealed a dense dispersed midden deposit with human remains, suggesting the presence of multiple households. The 1989 survey also identified the locations of three more archaeological sites in Estate Judith's Fancy (SARI-2.02, 2.04, and 2.06) (Joseph 1989).

Meredith Hardy of the NPS Southeast Archaeological Center surveyed NPS portions of the MREC alternatives in 2005, with the most intensive survey directed on the East Site. The results of Hardy's survey (2007) in this area confirmed the findings of prior surveys and suggest that three of the sites on the East location, SARI-2.03, SARI-2.05 and SARI-2.06, may be connected. Hardy's survey consisted of two transects of shovel tests along the eastern shore of the marina that were dug for the proposed Virgin Grand hotel. Cultural materials (artifacts) were found in shovel tests conducted between SARI-2.03 and SARI-2.05, suggesting that these sites and SARI-2.06 between them may be part of the same occupation. However, Hardy found that the area had been heavily disturbed and the deposits from both sites may have been scattered. Hardy's shovel tests in this area revealed a scatter of shell, possibly indicative of a prehistoric midden, although also possibly reflecting the excavation of the marina from the salt pond that was once present in this location. Hardy's efforts were not sufficient to determine the National Register of Historic Places (NRHP) eligibility of archaeological deposits in this location.

Hardy's shovel tests A29, A30, and A31, located near the base of the hill that is located in the northeast corner of SARI's boundaries, encountered a small earthen mound covered with a scatter of burned and fire-cracked rocks. Shovel tests A30 and A31 encountered prehistoric sherds as well as shell. Hardy suggested that these deposits were likely associated with SARI-2.01 and are present within that site's western boundaries. She further indicated that time constraints precluded further testing of this location (Hardy 2007).

Testing of SARI-2.01 completed by Hardy as well as prior investigations indicates that this is a potentially NRHP eligible site. Hardy (2007:49) recovered C14 dates from the site between AD 540 and 890, and human remains have been uncovered during excavations by Hardy and others. The relationship of SARI-2.01 to the contemporary Columbus Landing Site (SARI 1) is unknown, but it is assumed that SARI-2.01 is either a satellite domestic occupation or a special activity locus. Next to the Columbus Landing Site, SARI-2.01 is the second most significant prehistoric site in SARI and should be protected.

South Site Alternative – No archaeological survey has been completed for the South Site. This property is located on a knoll and small projections in the upper reaches of the bay and should also be considered to have moderate to high site potential, with impacts where the existing structures are located.

West Site Alternative – Historically, Grieg Hill, which overlooks the Columbus Landing Site, was reportedly a sacred site associated with the ball courts and village of the Columbus Landing Site. However, this site was bulldozed and distributed by modern construction, including the building of the 5,600 square-foot Kumpitch House, the current SARI Visitors Center. Meredith Hardy conducted an intensive archaeological survey of the former Kumpitch House grounds, located within the West Site (Hardy 2007). Hardy noted that "the area around the Kumpitch House has been terraced and landscaped" and no sites were found on Greig Hill, on which the Kumpitch House sits. Alfredo Figueredo et al. (1989) conducted a reconnaissance on Salt River Marina portion of this alternative in 1989. Only limited shovel testing was conducted during this reconnaissance, which did not identify any archaeological remains on the marina site proper but which did recover prehistoric pottery due north of the marina that was attributed to the Columbus Landing Site (SARI-1.01). This reconnaissance was not of sufficient intensity to assess the presence of archaeological remains on the Salt River Marina site. As the Salt River Marina is not on NPS property, this location was not surveyed by Hardy (2007). The Salt River Marina site is partially mangrove swamp with low archaeological potential. Elevated portions of this location would appear to have a moderate to high site potential; however, these are also the locations of the existing buildings of the Marina that may have impacted any archaeological resources that might be present.

Abandoned Hotel and Haul Road Site

Abandoned Hotel – There are no known archaeological resources on the location of the abandoned hotel site. One-half to one-third of the landform on which this hotel rests is largely land created with dredged spoil acquired from the Mangrove Lagoon located behind the hotel.

Haul Road Site – As previously stated under the East Site Alternative, Gudmond Hatt visited the east side of the Salt River Bay in 1924 and located a small archaeological site on the basis of surface deposits (SARI-2.05). Hardy found that the area had been disturbed and the deposits from the site may have been scattered. Hardy's efforts were not sufficient to determine the National Register of Historic Places (NRHP) eligibility of archaeological deposits in this location.

Meredith Hardy conducted a site visit along the route of the proposed Haul Road on the 12th and 13th of June 2007. The site visit consisted of a field walk along the existing overgrown road bed, which is primarily a bulldozed road approximately 20 feet wide. She observed no standing ruins, although there is some potential for buried historic deposits at the site. Previous lay down areas and "road intersections" were also observed.

Underwater Archaeology

An underwater archaeological reconnaissance of Salt River Bay was conducted in 1989 by the Interagency Archaeological Services Division (IASD) of the NPS. The following description of this reconnaissance survey is taken from Hardy (In review).

The first element of this survey was a magnetometer remote sensing survey of the bay. This survey identified six large anomalies possibly representing historic shipwrecks, however, it was noted that the presence of dredge lines and spoil made the interpretation of the remote sensing results difficult.

Snorkel reconnaissance was conducted of near-shore locations adjacent to known archaeological sites in the bay and of the reefs outside the bay. Five areas were examined: Area 1 – a small cove south of Fort Salé, Area 2 – an area on the eastern shore south of the abandoned hotel, Area 3 – the beach north of the Columbus Landing Site, Area 4 – Whitehorse Reef (east of Salt River Bay Canyon) and Area 5 – the reefs west of the canyon.

This reconnaissance identified four clusters of brick in Area 2, which were interpreted as off-shore evidence of the English Village (SARI-3). Brick included bright-red high-fired examples found elsewhere on 17th century English sites and yellow to buff colored Flemish examples. However, an English-style glass wine bottle and a piece of historic ceramic known as Willowware (pearlware) encountered with the bricks both dated to the first quarter of the nineteenth century, too late to have been part of the seventeenth century settlement. A historic ceramic sherd, a metal rod, and a chain were also found in Area 2. Additional scatters of brick were found in Area 1. Artifacts in Area 3 included ballast stone scatters, a rudder brace, more bricks, a piece of Willow Ware transfer-printed earthenware, and an intact English wine bottle. The survey in Area 4 identified a "snub-nosed" cannon – conversations with personnel from the NOAA facility revealed that four additional pieces of ordnance, including two more "snub-nosed" cannons had been observed by NOAA staff in this area. The IASD survey also identified a 1970s era freighter wreck in this area. Finally, NOAA personnel reported an anchor in Area 5, but that was not identified in the IASD survey.

3.8.3 Historic Resources

There are two historic resources in SARI: Fort Salé, which is recorded as archaeological site SARI-1.02; and a Danish well tower located on the edge of the mangrove swamp whose NRHP eligibility is also unknown. The ruins of a Danish Customs House are located on lands adjacent to the park that either the NPS or Virgin Islands Government may acquire in the future. None of the alternatives would have an effect on these historic resources.

There is a possibility that the road bed that the proposed Haul Road would follow is the same one illustrated on historic maps (ca. 1647). On the historic map there are historic structures located nearby (on the land/east and upland side of the road).

3.8.4 Cultural Landscape

Given the historical significance of the Columbus Landing Site and the association between this site and the natural landscape of Salt River Bay, SARI must be considered as a cultural landscape. The elements of this landscape should include, at a minimum, the Columbus Landing Site, Fort Salé, and the Bay itself.

There are various modern intrusions visible on the slopes surrounding the bay and in the vicinity of the Columbus Landing Site itself. Notable among these are the unfinished building and tower of the abandoned hotel structure, opposite the Columbus Landing Site. Over the last five years development in SARI watershed has greatly increased, and most of the ridgeline to the southeast and south are scarred with new land clearing or recently completed large homes in excess of 3000 sq ft. This development has taken place without consideration of its impact on SARI's viewshed. Recently, with the creation of the SARI Task Force (an informal group of agency representatives, homeowners, and business parties working together to improve compliance in the Salt River Bay), the Virgin Islands Government has provided copies of building permits to NPS for review, especially those adjacent to NPS owned property. However the viewshed today has been altered dramatically from the way it was almost 25 years ago when the bay was first proposed as a NP unit and is significantly different from its appearance at the time the park was created in 1993.

3.9 HUMAN ENVIRONMENT

This section discusses the human environment at SARI, including recreation, socioeconomic conditions, environmental justice, aesthetics, public health and safety, energy requirements and conservation, and infrastructure.

3.9.1 Recreation

Salt River Bay offers visitors a variety of recreational activities. Guided land tours, scuba diving, snorkeling, kayaking, hiking tours, beach going, picnicking, swimming, and camping by permit for special occasions along the Columbus Landing beach. Tours can be arranged through the Virgin Islands Department of Tourism and the St. Croix Chamber of Commerce has information on various tours. There are no campsites at Salt River Bay; however, St. Croix has one private campground at Mount Victory on the island's west end. The St. Croix Coral Reef System provides recreational resources that include recreational activities such as water skiing, scuba diving, pleasure boating and jet skiing. Salt River Bay also provides opportunities for avian and other wildlife viewing.

The USVI DPNR/DFW is responsible for the conservation and management of fisheries and enforcement of boating and fisheries regulations (authority: V.I. Code Title 12 Conservation, Title 25 Navigation, and the Boating Safety Act of 1972). Currently, Salt River Marine and Wildlife Sanctuary Regulations prohibit fishing or harvesting of fisheries resources within the Sanctuary (VIDPNR 2004)

3.9.2 Socioeconomic Conditions

The Region of Influence (ROI) is a geographic area selected as the basis on which demographic and economic impacts of project alternatives are analyzed. The ROI for socioeconomic conditions is considered to be the census tracts within SARI. The census tracts are 9706 and 9707 within SARI.

Demographics

Population demographics to the census block level are available from the U.S. Census Bureau for SARI from the 2000 census. Census blocks are the smallest geographic entity for which the Census Bureau collects and tabulates decennial census information. The U.S. Census Bureau provides data for these areas and their subareas in hierarchical sequences down to the census tract, block group, and block. SARI is located within the census tract 9706 (block groups 1 and 4) and census tract 9707 (block group 2). Data for the block groups are located on Table 3-5.

Table 3-5. Population Demographic Data within the ROI for SARI

Area	Total Population	% White	% Non-white	% Multi-racial
Census Tract 9606				
Block Group 1	360	55	34	11
Block Group 4	130	34	51	15
Census Tract 9707				
Block Group 2	283	68	30	2

Source: 2000 US Census

According to the 2000 census, the total population in the vicinity of SARI is 773 persons and is 55 percent white; 31 percent black; 1.6 percent Asian; 3.4 percent "other," which includes American Indians, Native Alaskans, Native Hawaiians, and Pacific Islanders; and 9 percent multi-racial, which includes

persons reporting two or more races (U.S. Census Bureau 2005). In addition, out of the 773 persons within the vicinity of SARI, 5.8 percent were children under the age of 5, and 19.9 percent were school age (5-19 years).

East Site

The East Site falls within Block Group 1, Blocks 1000, 1003, 1007, 1008, and 1009. The 2000 census did not provide data on Blocks 1007 and 1009. Within Blocks 1000, 1003, and 1008, the total population is 40 persons and is 70 percent white, 22.5 percent black, 5 percent “other,” and 2.5 percent multi-racial. Out of the 40 persons within Blocks 1000, 1003, and 1008, 2.5 percent were children under the age of 5, and 20 percent were of school age (5-19 years). Census Blocks 1000, 1003, and 1008 are located within SARI as well as outside the SARI boundary. The population within these blocks lives within the Estate Judith’s Fancy community. No persons currently live within the East Site.

South Site

The South Site falls within Block Group 4, Block 4000 and 4001. The 2000 census did not provide data on Block 4000 and 4001.

West Site

The West Site falls within Block Group 2, Block 2000. The total population within Block 2000 is six people. Three people are white and 3 people are black. There are no children under the age of 20 within this Block (U.S. Census Bureau 2005).

3.9.3 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, is designed to focus the attention of Federal agencies on the human health and environmental conditions in minority communities and low-income communities. It requires Federal agencies to adopt strategies to address environmental justice concerns within the context of agency operations. In an accompanying Presidential memorandum, the President emphasized that existing laws, including NEPA, provide opportunities for Federal agencies to address environmental hazards in minority communities and low-income communities.

Table 3-6 shows the racial and income distribution of the resident population of the census tracts in the Salt River Bay area. The minority population is defined as the non-white and multi-racial population of a given area and includes black, Asian, American Indian, Native Alaskan, Native Hawaiian, Pacific Islander, persons reporting some other race, and persons reporting two or more races.

Table 3-6. Race, Income and Poverty Data for the Salt River Bay Area

Census Tract Block Group	Site Location	Total Population	Total Minority Population	Medium Household Income in 1999 (US Dollars)	Persons Living Below Poverty Level
Block Group 1	East Site	360	162 (45%)	77,500	134 (37%)
Block Group 4	South Site	130	85 (65%)	37,500	120 (92%)
Block Group 2	West Site	283	90 (32%)	38,750	113 (40%)

Source: 2000 US Census

For the purpose of evaluating environmental justice for the MREC, low income populations were defined as people living in poverty, according to the 2000 census data. The U.S. Census Bureau uses a set of

money income thresholds that vary by family size and composition to determine who is poor. If a family's total income is less than that family's threshold, then that family, and every individual in it is considered poor. The poverty thresholds do not vary geographically, but they are updated annually for inflation using the Consumer Price Index.

3.9.4 Aesthetics

The aesthetic nature of SARI's surrounding area is well preserved as most of the surrounding lands have been set aside for conservation due to the outstanding historic and natural resources that exist at the sites. Human influences at the sites can be seen from the water and include previously developed residential parcels of land, existing roadways, and other existing structures.

East Site – The site is currently accessed by private paved roads that traverse a residential gated neighborhood to the south and east of the NPS-owned property. The 70-acre East Site was previously graded and re-sculpted by heavy machinery for the 1960 development project. Figure 3-7 depicts the historic shoreline of the east side of Salt River Bay before the area was re-sculpted. The only area that was not disturbed is an archeological area located on the north side of the site. The site features a large vegetated hill about 130 feet above sea level that provides a panoramic view of the ocean and the bay. However, this hill was flattened and several roads cut into contours along its southwest slope during the 1960 development project. This site also has a 10-foot-deep manmade lagoon (Mangrove Lagoon) that opens into Salt River Bay and is about 300 meters from the primary Bay inlet and the open ocean. The Mangrove Lagoon was dredged and the shoreline repositioned to support the proposed 230 cottages for the hotel/yacht marina development. The site has been neglected for the last 40 years. The majority of the landscape other than adjacent to the Mangrove Lagoon and the Salt Pond is dominated by non-native invasive plants. Mangrove wetlands fringe the Salt Pond, Mangrove Lagoon, and Mangrove Canal. The mud flat area adjacent to the Mangrove Lagoon is regularly used for ORV sport which inhibits vegetation growth. Undeveloped roads also exist at the East Site, due to visitor access for recreation along the beach areas.

There are many developed residences located in Estate Judith's Fancy, located to the east of the East Site on Jefferson Way, Bacuba Lane, and Hamilton Drive.

South Site – The former NOAA Undersea Research Center is located on the eastern shore of the 58-acre South Site. The site is located between Triton Bay and Sugar Bay at the headwaters of Salt River Bay and mangrove wetlands line the shores of these bay areas. This privately-owned parcel includes several structures and a bulkhead along the water for docking boats. Road access is limited to a private road that winds north to the site from the nearest public road. Two Estates, Estate Montpeller and Estate St. John, are located to the south of this site.

West Site – This site encompasses two non-contiguous areas, including the developed NPS Visitor Contact Station and the Salt River Marina. The NPS Visitor Contact Station, a former private home, is located on a hilltop approximately 100 feet above the beach on the northwest side of the bay. The portion of the West Site with the NPS Visitor Contact Station is made up of several parcels of approximately 6.0 acres in all and includes a house, guest quarters, accessory structures and a beach. The portion of the West Site with the marina hugs the shoreline on approximately 14 acres along the western edge of the bay. Mangrove wetlands fringe the area surrounding the marina. This property is privately owned and includes several buildings used for boat maintenance, painting, constructing boats, and office space, plus parking lots for marina guests. Several mooring buoys are located in the bay. Estate Salt River, Greig Hill, and Sugar Bay Subdivision are located adjacent to the West Site.

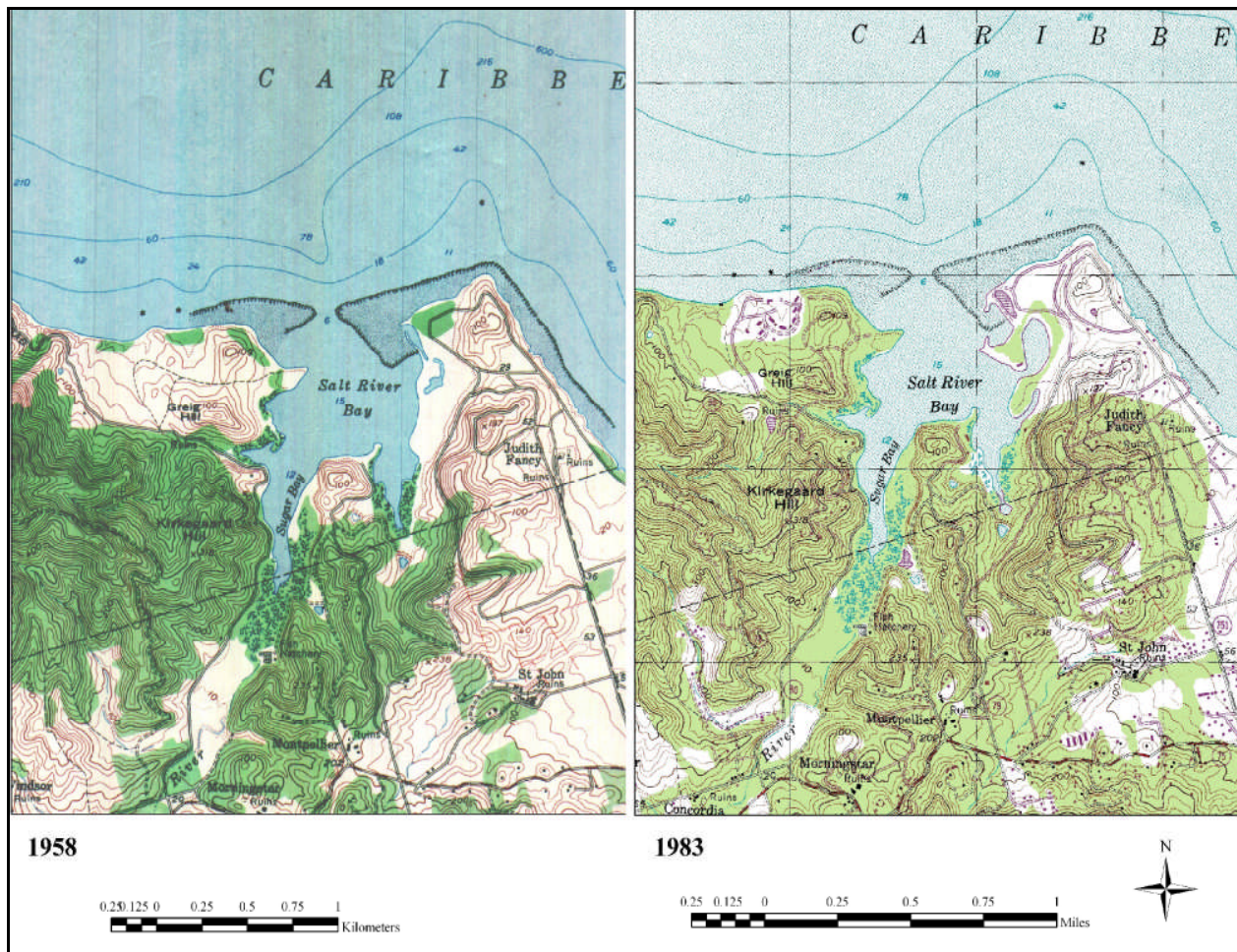


Figure 3-7. Topographic Maps (1958 and 1983) of Salt River Bay

3.9.5 Public Health and Safety

General public health and safety concerns throughout SARI include:

- Sunburn
- Hazardous surf conditions and crosscurrents
- Potentially harmful stingrays, fire coral, spiny sea urchins, and other stinging organisms inhabit shoreline shallows and in near-shore reefs
- Contact with hazardous vegetation includes the poisonous manchineel tree (includes sap, leaves, bark, and fruit) which can cause a chemical burn and the Christmas bush – holly-like, that can cause a severe rash.
- Illegal drug sales
- Poaching
- Spearfishing
- Trash dumping
- Abandoned ruins
- Wells and culverts
- Feral dogs

Site-specific public health and safety concerns would be the deteriorating condition of the abandoned hotel. Additionally, the poisonous manchineel tree has been observed at the East Site.

3.9.6 Energy Requirements and Conservation

Existing energy requirements at SARI are minimal. The NPS Visitor Center is only open 3 days a week in November through June.

3.9.7 Infrastructure

3.9.7.1 Utilities

Utilities – The following utilities currently serve the Island of St. Croix:

- **Electricity** – is provided by the USVI Water and Power Authority (WAPA), a public-power utility. WAPA is an autonomous governmental instrumentality of the Government of the Virgin Islands that produces and distributes electricity. Power is produced at the Richmond Plant, which consists of 2 steam turbine generators and 4 combustion turbine-generators.
- **Water** – Groundwater and desalinization are the main potable water sources on St. Croix. The WAPA produces desalinated water that is sold exclusively to the USVI Department of Public Works (DPW) for distribution. The St. Croix public water supply is supplemented (about 30 percent) by well fields.
- **Natural Gas** – Although there are no natural gas pipelines, gas appliances use bottled propane gas, which is readily available from private suppliers. Other types of petroleum distillate fuels are available.
- **Sanitation** – Sanitation on St. Croix includes a public sewer system and a combination of private disposal systems which are not connected to the public system, individual septic systems, or small private treatment plants. The DPW is responsible for operations and maintenance of the public sewer systems. St. Croix is served by one primary waste water treatment plant (WWTP). The treatment plant has an 8,000 foot ocean outfall. The sewage collection system consists of 87 miles of gravity and force mains with 3 major sewage lift stations and 12 feeder pump stations.
- **Solid Waste Disposal** - Solid waste operations, which include collection and disposal, are under the direction of the DPW. Solid waste collection is a combination of curbside collection and roadside garbage bins. Waste is disposed via landfill on the island.
- **Telecommunications** – Internet service providers include NetZero and Comcast.com. NetZero services include internet access, accelerated dial-up services, premium email, and personal Web-hosting and domain services. Comcast.com is pure broadband. There is a large number of separate telephone companies located at St. Croix and include AT&T, Verizon, Mediacom Phone, and Choice Communications.

East Site – The East Site is undeveloped therefore, no utilities are located within this site. The community (Estate Judith's Fancy) located directly to the east of this site is not serviced by public water and sewer utilities but relies on domestic groundwater wells for potable water (EA 2006). Private home rely on cistern water, where down spouts are lead into the cistern where water is stored for household consumption. Septic systems are used in each household throughout Estate Judith's Fancy; electric power is provided by VI WAPA (EA 2006). During power outages, the majority of homes in SARI are equipped with gasoline powered generators. Information regarding either the quantity or location of

groundwater wells is unknown. At times, when water runs low, desalinated water is delivered by truck for approximately \$200 for 3,500 gallons.

South Site – The South Site is not serviced by public water and sewer utilities. It was probably served by one or more groundwater wells while operating under the direction of NOAA, but the existence of a well could not be verified (EA 2006). A septic system was probably used at this site and electric power is provided by VI WAPA (EA 2006).

West Site – This Visitor Contact Station is not serviced by public water and sewer utilities, but relies on domestic groundwater wells for potable water. A septic system is in operation at the site; electric power is provided by WAPA. One domestic groundwater well exists on-site; water from this well is treated by reverse osmosis prior to consumption.

The marina is not serviced by public water and sewer utilities, but relies on domestic groundwater wells for potable water (EA 2006). A septic system is probably in operation at the marina but the existence of one has not been verified; electric power is provided by WAPA. The marina site is probably served by one or more groundwater wells providing adequate potable water for consumption or various marina related needs. However, the existence of a well could not be verified (EA 2006).

3.9.8 Road Network

Site Access

East Site - The site is currently accessed by private paved roads that traverse a residential neighborhood (Estate Judith's Fancy) to the east and south of the NPS-owned property. Additionally, an overgrown unused access road (north-south road alignment) connects the East Site to Route 79 (Bennie Benjamin Road) (see Figure 2-3).

South Site - Road access is limited to a private road that winds north to the site from the nearest public road Route 79 (Bennie Benjamin Road) (see Figure 2-3).

West Site - Road access to the Salt River Marina and the Visitor Contact Station is from the south by way of public roads, Route 80 (North Shore Road) and Route 801 (see Figure 2-3).

Traffic

There is very little traffic flow to the East Site. The East Site is accessed through the Estate Judith's Fancy community which allows public access to the beach. The South Site is privately owned; therefore no public vehicles can access the site. The West Site experiences some vehicular traffic to the marina and to the Visitor Contact Station.

The highway safety issues that are relevant to traffic flow to and from the sites are common to all alternatives. Narrow, winding, roads with no paved shoulders, and sometimes overgrown travel lanes on certain segments of Estate Judith's Fancy roads, Route 79, and Route 80 exist (see Figure 2-3).

3.10 VISITOR USE AND EXPERIENCE

Currently there are limited commercial visitor services authorized by the NPS at SARI. SARI is still in the developmental stage. The Visitor Center is open November through June. The hours are 9:00 am to 4:00 pm Monday, Wednesday, and Friday. Park staff are available for scheduled tours of SARI by appointment only. When the Visitor Center is closed, information may be obtained at the NPS visitor

contact station at Fort Christianvaern, Christiansted National Historic Site. Salt River Bay offers visitors a variety of recreational activities. Guided land tours, scuba diving, snorkeling, kayaking, and hiking tours. The St. Croix Coral Reef System provides recreational resources that including water skiing, scuba diving, pleasure boating, and jet skiing. Food, lodging, and other services are available in Christiansted, Frederiksted, and at other island locations. SARI is five miles from Christiansted National Historic Site and can be reached by car via Rt. 75 from Christiansted, connecting to Rt. 80.

3.11 PARK OPERATIONS

Factors in this category describe the existing conditions related to park operations and administration necessary to currently manage SARI. Most of the operations necessary to manage SARI occur at Christiansted National Historic Site, as there are few daily operations related to maintaining SARI including the Visitor Contact Station at SARI.

Personnel – Due to the early developmental stage of SARI there are no permanent NPS staff located at SARI. The staff for SARI is located at park headquarters at Christiansted National Historic Site in Christiansted. SARI is one of three parks managed by one management team which also oversees Christiansted NHS and Buck Island Reef NM. Park staff consists of 15 persons and many intermittent volunteers. Park management includes the Superintendent and five Division Chiefs, including Law Enforcement, Resource Management and Research, Interpretation/Education and Outreach, Facility Management, and Administration. Park full-time staff provides visitor safety, interpretation and resource education, guide park resource management and research projects, and review and permit special activities.

Parking – The only park authorized public parking area at SARI currently consists of a single lot adjacent to the visitor center at the West Site.