

ST. CROIX EAST END MARINE PARK

Interpretive Guide

June 2009

ACKNOWLEDGEMENTS

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Interpretive hikes highlighting the mangroves and beaches of Great Pond
Photos: Melanie Feltmate, TNC

TABLE OF CONTENTS


The St. Croix East End Marine Park was established for the purpose of managing the resources within the boundaries of the park. These natural and cultural resources provide environmental, economic and social benefits to residents and visitors. Increased demand for recreational, educational and commercial uses require the resources be managed in a manner that guarantees the benefits are available for present and future generations.

INTRODUCTION

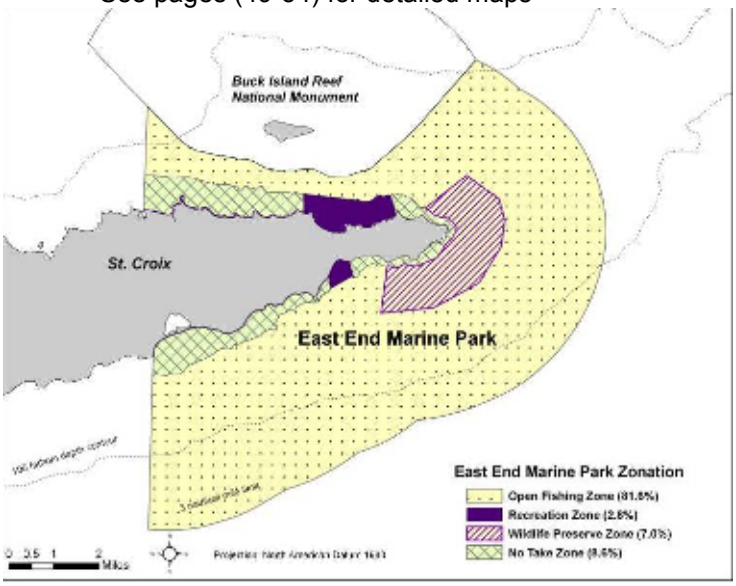
The St. Croix East End Marine Park (STXEEMP or Park) was established in January 2003 with financial and logistical support from the Department of the Interior and National Oceanographic and Atmospheric Administration and support from local government agencies, non-government agencies, and stakeholders. This was a historically significant event in the U.S. Virgin Islands, as this Marine Protected Area was envisioned over 40 years ago. In the 1960's, the east end of St. Croix was recognized for its unique marine resources as a nature preserve. In the 1970's, four areas of particular concern were designated and are now incorporated within the STXEEMP. Finally, in 1998, President Clinton established the US Coral Reef Task Force (CRTF) which mandated the protection of coral reef ecosystems and catalyzed the establishment of the STXEEMP (Executive Order 13089). The Park is now managed by the Department of Planning and Natural Resources Division of Coastal Zone Management. The Park receives continued support from the CRTF and NOAA as well as stakeholders such as the Virgin Islands' Resource Conservation and Development Council, the STXEEMP Advisory Committee, the University of the Virgin Islands, local dive operators, local commercial fishermen, and The Nature Conservancy.

Structure of the STXEEMP

Boundaries: On the north shore, the boundary begins at the northwestern border of Chenay Bay at the eastern jetty of Green Cay Marina and includes Green Cay. The entire park extends out to the 3-nautical mile limit for territorial waters, except where there is overlap with the Buck Island Reef National Monument. The Park extends around the eastern tip of St. Croix, with the southwest boundary ending at the western border of Great Pond Bay.

Map of boundaries and zones-

See pages (49-54) for detailed maps



***Zones* - The Park is composed of four distinct zones:**

- ***Open Fishing Zones*** –General restrictions include taking or injuring coral or live rock, altering the seabed, discharging materials, groundings, anchoring on hard bottom or coral communities, diving without dive flag as well as activities inconsistent with the Park's long-term conservation goals (*e.g*. mining and oil drilling).

- ***Recreation Zones*** – designed to provide areas for snorkeling, diving, boating, and shoreline recreational take-line fishing. Catch-and-release guide fishing and cast-net bait fishing are allowed with a Marine Park Permit, and gill nets used for bait fish cannot exceed 8 x 600 feet. **All other traditional fishing is prohibited.**

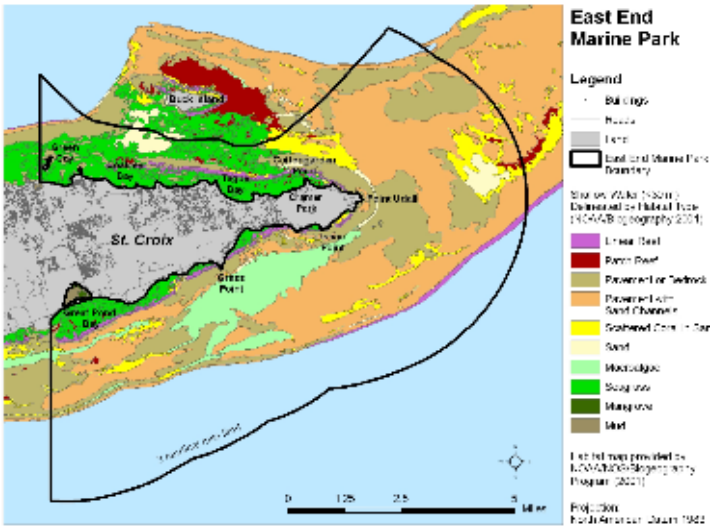
- ***Wildlife Preserve Zone*** – intended to protect nesting female sea turtles using beaches in East End Bay, Isaac Bay, and Jack Bay to lay eggs. During their nesting cycle, female turtles are known to use waters adjacent to their nesting site and have been found up to 1.5 miles from shore. Activities such as net fishing and jetskiing that may disturb or potentially harm nesting turtles in these waters are prohibited. *The Endangered Species Act prohibits harassment, take, or alteration of behavior of sea turtles and encourages staying 50 yards away from sea turtles.*

- ***No-Take Zone*** – designed to encompass large, contiguous diverse habitats. Intended to protect the near shore environments including: coastal mangrove stands, seagrass beds, lagoonal patch reefs, and linear reefs. **ALL FISHING AND EXTRACTION IS PROHIBITED.** Operating a personal watercraft is also prohibited.

ECOSYSTEMS WITHIN THE STXEEMP

Ecosystems within the Park include coralline communities and coral reefs, mangrove forests, seagrass beds, and sandy beaches. An ecosystem includes abiotic factors which are non-living factors such as: soil composition, pH of water or soil, oxygen, nutrient concentration, winds and currents, light, temperature, humidity, tides and salinity. Ecosystems also include biotic factors which are those that are related to, produced by, or caused by living organisms.

Map of ecosystems within Park



CORAL REEFS

Within the Park the coral reef communities are composed of:

- ***Stony corals*** – create the physical structure of coral reefs, providing the three-dimensional structure for other sessile animals to settle as well as habitat and shelter for fish and invertebrates such as lobster.

- ***Soft corals*** – most of these corals, from the subclass *Octocorallia*, do not possess a stony skeleton. Instead, they have calcareous spicules that give them structure and are known for their eight tentacle polyps. Soft corals also provide shelter to other marine animals.

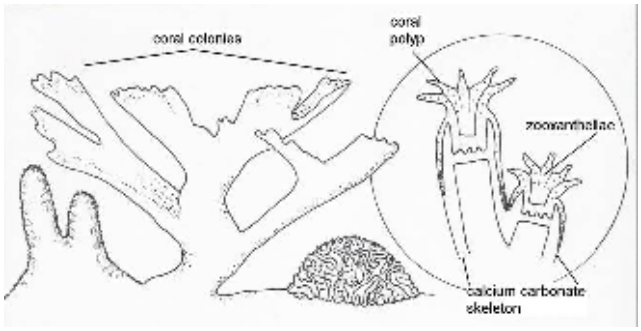
- ***Herbivores*** – animals that utilize plants and algae as their sole or main food source. For example: herbivorous fish, green sea turtles, sea urchins, sand dollars, conch, and some sea stars.

- ***Scavengers*** – animals that eat dead and/or decaying organic material. Some only eat dead animals while others eat plant and animal materials. These are important in keeping the amount of dead biomass low and recycling nutrients in the system. Some examples are: sea cucumbers, lobsters, and crabs.

- ***Predators*** – animals that capture other animals and feed on their tissues. Fish, including groupers, snappers, and sharks, and other smaller fish, marine mammals such as dolphins, octopi, and sea turtles such as hawksbills are examples.

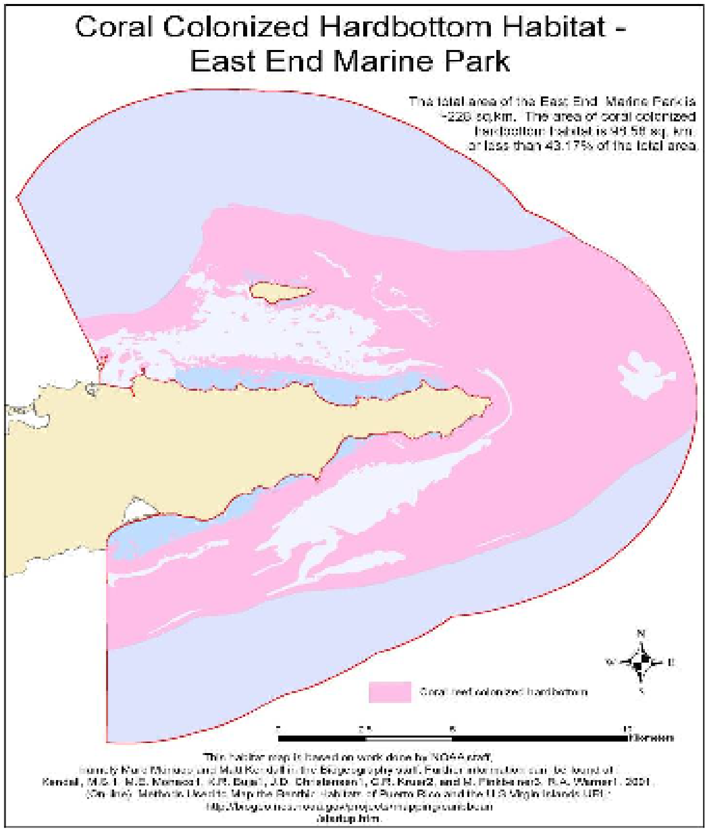
Structure of hard coral

- Coral polyps – small colonial cnidarians (same family as jellyfish) that secrete calcium carbonate (limestone) exoskeleton that will house the next generation of polyps; have small stinging cells called nematocysts that capture plankton for food.
- Zooxanthellae – single-celled algae that live inside the tissues of coral polyps; perform photosynthesis and provide energy to polyps as well as using waste products produced by corals as food. The color of the zooxanthellae dictates the color of the coral.



Structure of soft coral

- Coral polyps – in contrast to the hard corals, most of the soft corals do not possess a calcareous exoskeleton. Soft coral polyps have eight tentacles (octocorals). The tentacles have pinnules, feather-like projections.
- Zooxanthellae – single-celled algae that live inside coral polyps; perform photosynthesis and provide energy to polyps as well as using waste products produced by corals as food. The color of the zooxanthellae dictates the color of the coral.


Coral Colonized Hardbottom Habitat -
East End Marine Park
The total area of the East End Marine Park is
~228 sq.km. The area of coral colonized
hardbottom habitat is 98.58 sq. km.
or less than 43.17% of the total area.
N
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Coral reef colonized hardbottom
Kilometers
This habitat map is based on work done by NOAA staff,

Importance of coral reefs and coralline communities

Coral reefs and coralline communities are complex and dynamic systems. Corals provide structure and habitat for millions of animals and at the same time are animals themselves.

Although coral reefs encompass an area of only about the size of Texas (~240,000 sq. mi.), they are critically important to ocean inhabitants. In addition, coral reefs and coralline communities provide services to humans such as:

- ***Food*** –residents of many islands rely on fish and invertebrates for protein in their diet

- ***Livelihood*** – besides a subsistence food source, coral reefs, coralline communities, seagrass beds and mangrove lagoons provide livelihood for many via commercial fishing, recreational fishing, and tourism activities such as diving and snorkeling.

- ***Shoreline Protection*** – corals are the first defense against major storms because they greatly reduce wave intensity minimizing island and coastline erosion. When they break down, they form part of the sand on beaches which helps protect the coastline as well.

- ***Medicines*** – corals are used as bone graft substitutes and a natural source of prostaglandin, which has many clinical uses including the treatment of glaucoma. Other reef inhabitants contain cancer fighting agents as well. There are still millions of unexamined reef animals!!!

Common corals of the St. Croix East End Marine Park

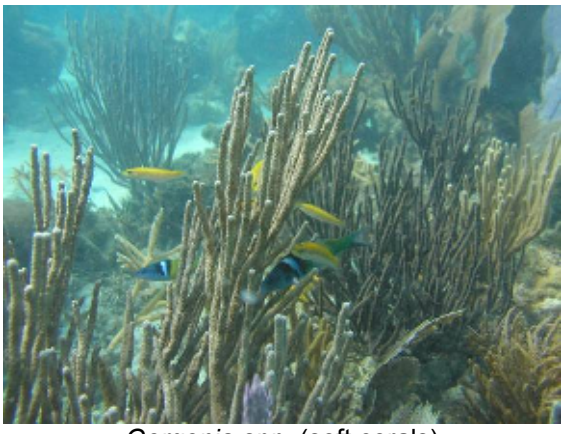
Acropora palmata (Elkhorn coral)
Photo: S. Patterson, TNC

Gorgonia ventalina (Common sea fan)
Photo: NOAA Sanctuaries Team

Diploria strigosa (Symmetrical brain coral)
Photo: NOAA CCMA Biogeography Team

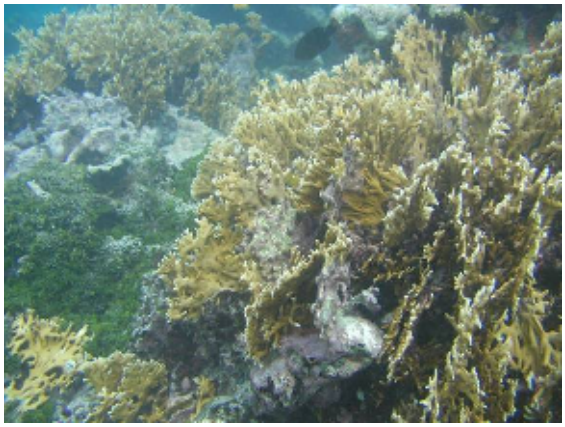
Colpophyllia natans (Boulder brain coral)
Photo: South Florida Water Management District

Dendrogyra cylindrus (Pillar coral)
Photo: NOAA CCMA Biogeography Team



Gorgonia spp. (soft corals)
Photo: NOAA CCMA Biogeography Team

Porites porites (Finger coral)
Photo: NOAA CCMA Biogeography Team



Milepora alcicornis (Branching fire coral)
Photo: NOAA CCMA Biogeography Team

Regulations specific to corals

Corals are protected under the Endangered and Indigenous Species Act of 1990, Title 12, Virgin Islands Code, Chapter 2, Protection of Indigenous, Endangered and Threatened Fish, Wildlife and Plants.

Permits:
A local permit for removal of coral may be issued in advance by the Department of Fish and Wildlife, DPNR on a case by case basis for scientific research purposes. Federal permits are required for construction in and discharges to coral habitat and may be required for collection of acroporid corals.

Penalties:
Any person violating this or any other provision of Chapter 2 can be subject to a fine between $100 and $10,000 and may also be sentenced to serve a term in jail of up to 60 days.

Federal: ESA protection of listed sea turtle species and their habitat, which includes coral reefs; ESA also protects *Acropora palmata* (Elkhorn coral) and *Acropora cervicornis* Staghorn coral), two threatened coral species; Coral Reef Conservation Act of 2000; Coastal Zone Management Act requires a permit of any activity or development that could affect the coastal zone; Clean Water Act prohibits the discharge of contaminants and sewage into navigable waters; Oil Pollution Act prohibits discharge of oil into navigable waters in US coasts and requires reporting of oil spills; Rivers and Harbors Act prohibits dumping of any refuse into the navigable waters of the US; Magnuson-Stevens Fishery Conservation and Management Act lists corals as essential fish habitat.

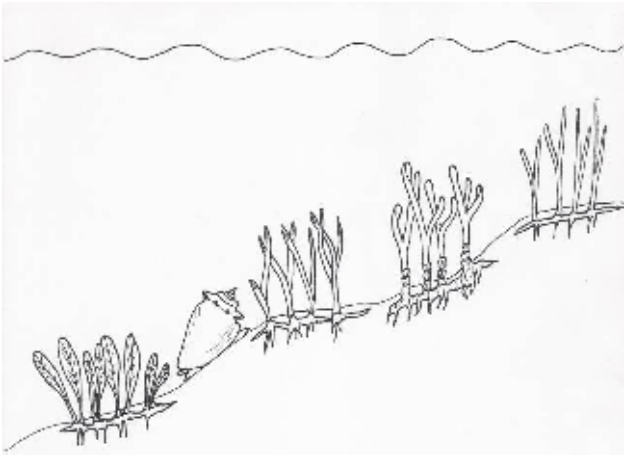
Possible threats to corals within STXEEMP

Actions that may result in damage to corals include:

- Anchoring of boats on the coral reef damages corals directly by knocking or dragging coral heads or the rubbing of the chain across coral habitat.
- Kicking and touching by divers and snorkelers damages corals directly and over time.
- Raw sewage discharge to marine waters changes the chemistry of coral reefs, increasing nutrients in the water and resulting in algae growth.
- Runoff from land containing motor oil, soil from land clearing, and fertilizers or pesticides used in gardens affects corals either by smothering corals, or by results of pollution from the chemicals in the water.
- Accumulation of inorganic debris is a major concern because of the heavy usage of beaches and amount of boating in the STXEEMP. Anything that is left on the beach, thrown on the ground in the road, discarded from boats, or lost during fishing can end up in the sea and is considered marine debris.
- Outflow to marine waters of heated or cooled water from industrial or water treatment waste can stress the zooxanthelle causing them to leave the coral and resulting in coral bleaching.
- Over-fishing disrupts coral reef ecosystems. Without large reef fish populations to control harmful algae growth, the algae will outcompete the coral and become dominant.

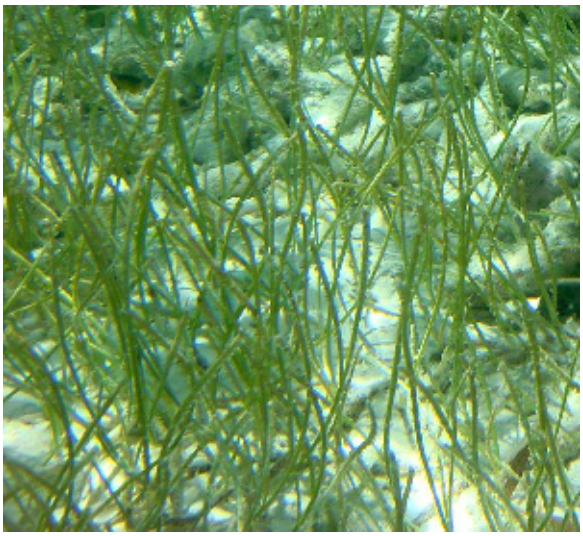
SEAGRASS BEDS

Seagrasses are flowering plants complete with leaves, stems and a root system. They grow in the marine bottom in waters typically at depths of up to 65 feet (19.8 m). Seagrasses provide habitat for animals and plants, including some that live on the leaves of the seagrass, as well as interspersed within the seagrasses, including various species of algae. The seagrass root system is anchored by rhizomes, which are underground, horizontal stems extending from the main roots. This root system is vital for stabilizing the benthic floor. Seagrasses are particularly important for providing shelter and a rich food source for juvenile fishes and invertebrates.



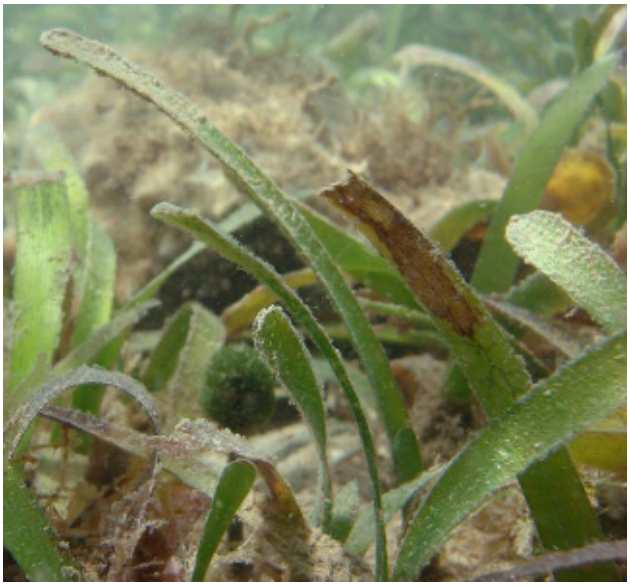
Seagrasses found in St. Croix East End Marine Park

Manatee grass (*Syringodium filiforme*) has cylindrical blades which can grow up to 20 inches long. It is often found growing with other seagrass species in shallower water or alone in patches in deeper waters. Its rhizomes form dense mats in the sediments where it grows. It is called manatee grass because it is one of the preferred foods in the manatee's diet.



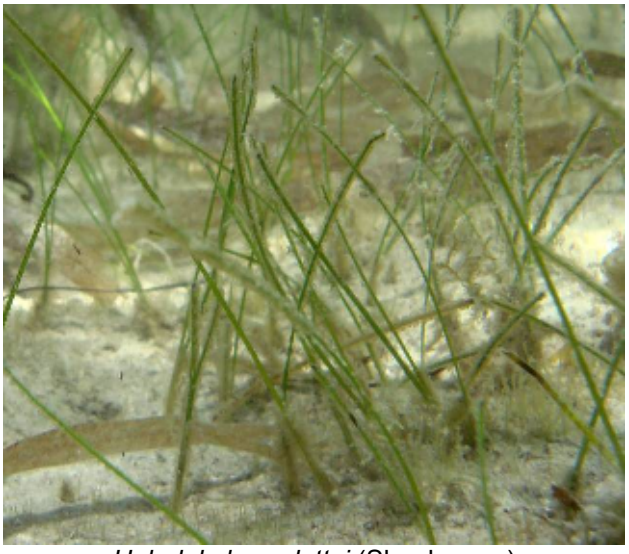
Syringodium filiforme (Manatee grass)
Photo: Lisamarie Carrubba, NOAA Fisheries

Turtle grass (*Thalassia testudinum*) has flat, ribbon-like blades that can grow to 14 inches long and 0.5 inch wide with parallel veins running the length of each blade. The rhizomes of turtle grass can be found as deep as 10 inches below the surface of the substrate. Turtle grass is most often found between the low tide mark and 30 feet. It is a staple of the green sea turtle's (*Chelonia mydas*) diet.



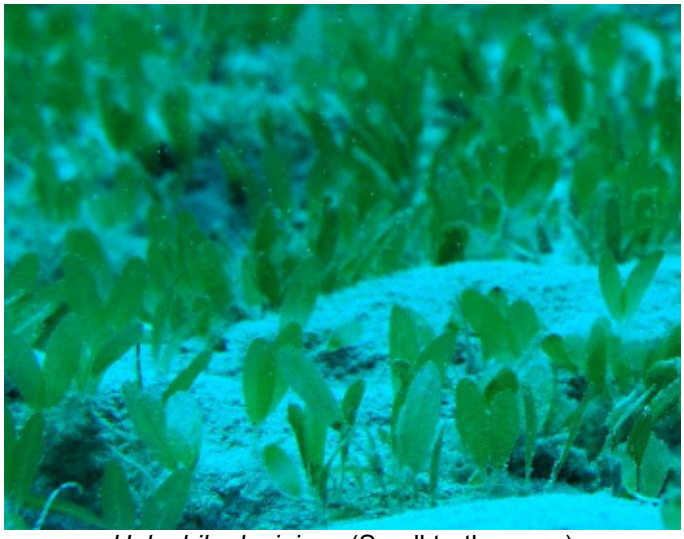
Thalassia testudinum (Turtle grass)
Photo: Lisamarie Carrubba, NOAA Fisheries

Shoal grass (*Halodule beaudettei*) has flat, narrow blades with notched tips and grows 4-6 inches long and .08-.11 inches wide. They are found in dense patches in areas that experience increased wave energy or in high salinity areas. Shoal grass is often found in areas where the wave and tidal conditions are too harsh for turtle and manatee grass. The roots of shoal grass are very shallow and often barely reach below the surface of the substrate.

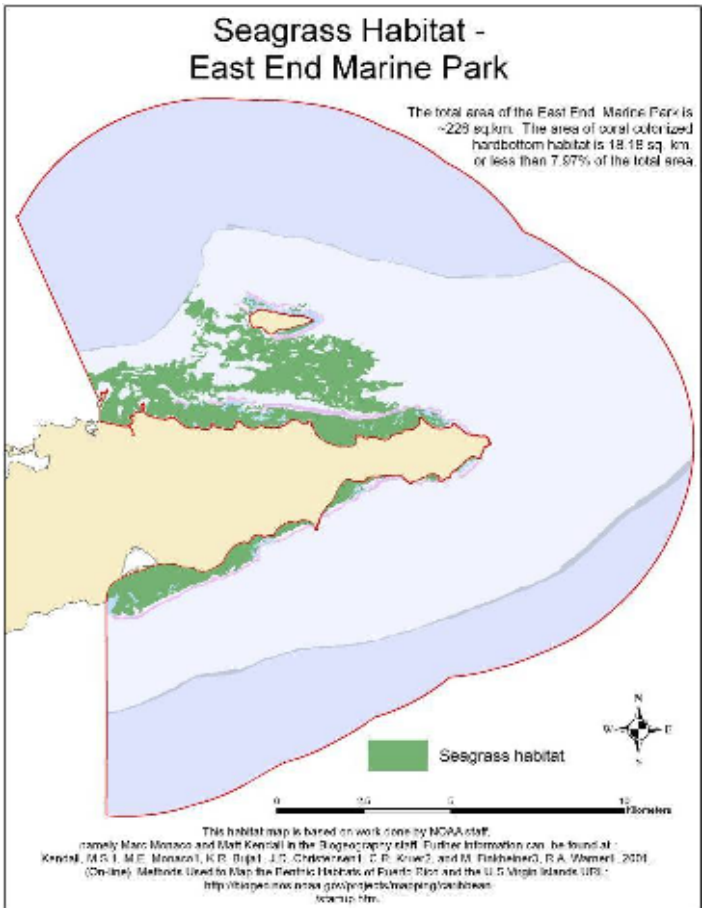


Halodule beaudettei (Shoal grass)
Photo: Lisamarie Carrubba, NOAA Fisheries

Small turtle grass or paddle grass (*Halophila decipiens*) has a paddle-shaped blade with a rounded tip and serrated leaf margin. The blades grow to 0.5-1.0 inches long and 0.12-0.23 inches wide. Small turtle grass is found in soft substrate in depths up to 90 feet and is often found under conditions that are not favorable to the growth of other seagrasses, such as at the mouths of rivers.



Halophila decipiens (Small turtle grass)
Photo: NOAA CCMA Biogeography Team


Seagrass Habitat -
East End Marine Park
The total area of the East End Marine Park is ~229 sq.km. The area of coral colonized hardbottom habitat is 18.18 sq. km. or less than 7.97% of the total area.
N
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Seagrass habitat
0
5
10
Kilometers
This habitat map is based on work done by NOAA staff,
namely Marc Monaco and Matt Kendall in the Biogeography staff. Further information can be found at :
Kendall, M.S.1, M.E. Monaco1, K.R. Buja1, J.D. Christensen1, C.R. Kruer2, and M. Finkbeiner2, R.A. Warner1, 2001
(On-line). Methods Used to Map the Benthic Habitats of Puerto Rico and the U.S Virgin Islands (IR) :
http://biogeo.nos.noaa.gov/projects/mapping/caribbean
/start.htm.

Importance of seagrass beds

Seagrasses are very important for their contribution as primary producers to the marine food web. They use sunlight for photosynthesis to create energy. Seagrasses stabilize the seafloor by holding and trapping sediment. This helps reduce beach erosion and sedimentation on nearby reefs. Seagrasses can improve water quality by trapping fine sediments with their roots, increasing water clarity and light penetration necessary for the good health of seagrasses and neighboring corals. Seagrasses take up nutrients through their leaves and roots. As a nursery area, seagrass beds provide a refuge for juvenile fish and other marine animals, including recreationally and commercially valuable species.

Seagrasses are sometimes labeled ecosystem engineers because they partly create their own habitat: the leaves slow down water currents increasing sediment deposition, and the seagrass roots and rhizomes stabilize the seabed. Associated species benefit from the provision of shelter and the extraordinarily high rate of primary production by seagrass and associated photosynthetic organisms in seagrass beds and on leaves. As a result, seagrasses provide coastal zones with a number of ecological goods and services like: fishing grounds, wave and coastal erosion protection, and essential habitat for life stages of commercially and recreationally important fishery species and protected animals such as green sea turtles.

Regulations specific to seagrass beds

Seagrasses are protected under the Endangered and Indigenous Species Act of 1990, Title 12, Virgin Islands Code, Chapter 2, Protection of Indigenous, Endangered and Threatened Fish, Wildlife and Plants.

Permits:
A local permit for removal of seagrass may be issued in advance by the Commissioner of the Department of Planning and Natural Resources (DPNR) on a case by case basis. The policy of the Territory is to prevent a net loss of wetlands (which includes seagrasses) to the maximum extent possible. Dredging projects require a Coastal Zone Management permit from DPNR. Federal permits are required for construction in and discharges to seagrass habitat.

Penalties:
Any person violating this or any other provision of Chapter 2 can be subject to a fine between $100 and $10,000 and may also be sentenced to serve a term in jail of up to 60 days.

Federal: ESA protection of listed sea turtle species and their habitat, which includes seagrass beds for green sea turtles; Designated as essential fish habitat under the Magnuson-Stevens Fishery Conservation and Management Act amendments in 1996; Coral Reef Conservation Act of 2000; Coastal Zone Management Act; Clean Water Act restricts discharge of any pollutant or sewage; Rivers and Harbors Act prohibits discharge of any refuse or construction of any structure (peers, wharf, dolphin, boom, weir, breakwater, bulkhead or jetty) in navigable waters.

Possible threats to seagrasses within the STXEEMP

Actions that may result in damage to seagrasses include:

- Placing boat anchors and propellers into seagrass beds can pull up seagrass and rhizomes which forms scars and blowouts in the beds. Scars and blowouts may recover but recovery often takes years, if it occurs at all. If the rhizomes are destroyed, particularly in turtle grass, it can take up to 5 years to grow back.
- Allowing mooring gear, such as anchor chains, to move across the seabed leads to scouring of the bottom and elimination of seagrass.
- Dredging, storms, coastal runoff and other types of water pollution can decrease the amount of light that reaches the plants and increase the amount of harmful chemicals interacting with the plants.
- Outflow of heated water and elevated salinity water from desalination plants, industrial and agricultural areas stresses seagrasses.

Seabed scarring from boat prop
Photo: Jose Sanchez, CZM/EEMP

MANGROVE FORESTS

A mangrove forest is a complex of mangroves (trees or shrubs) and other plants that possess certain adaptations that allow them to grow in continuously or regularly flooded areas along the coasts that are exposed to saltwater. Mangroves are unique because they are the only salt resistant trees and shrubs in the world. Depending on the species, mangroves possess adaptations for tolerating varying levels of salinity, limiting salt intake, anchoring their roots in loose soil, dispersing seeds in water, and permitting the entrance of oxygen and the release of carbon dioxide through specialized structures (pneumatophores and lenticels).

White, Black and Red Mangrove diagram showing unique leaves, roots and seeds

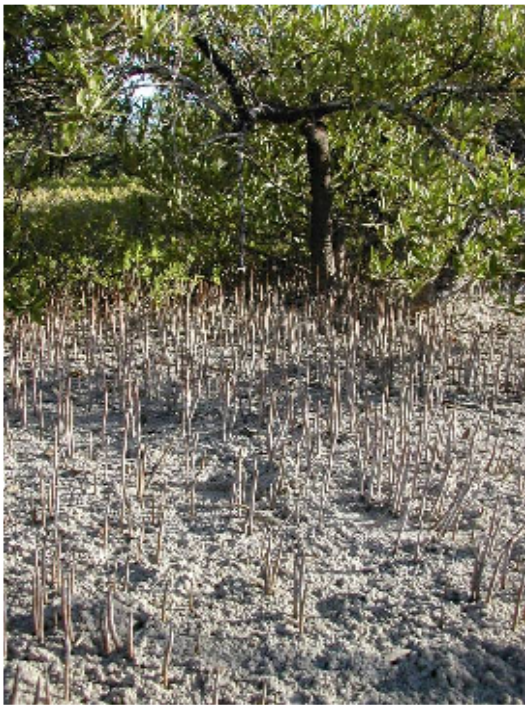
Mangroves of the St. Croix East End Marine Park

Red mangroves (*Rhizophora mangle*) live closest to the water where salinity changes are minimal. They extend arching aerial roots (known as prop roots when extended from the trunk, and known as adventicious roots when extended from the branches) that provide support and stability to the tree. They take in air through pores in their bark (lenticels). They exclude salt by having almost impermeable (waxy) roots and concentrating salt in old leaves that then fall from the tree. Their seeds, called propagules, germinate while still on the tree, where they can remain for a year.

Rhizophora mangle
(Red mangrove)
Photo: Kim Ishida, TNC

Propagules
Photo: Karlyn Langjahr, CZM/EEMP

Black mangroves (*Avicennia germinans*) are the most salt tolerant of the mangroves and, in highly saline soils, often are dwarfs. They have specialized roots (pneumatophores) which stick out of the soil and are covered with lenticels. These provide oxygen to the tree, particularly when soils are flooded.



Avicennia germinans (Black mangrove)
Photo: Lisamarie Carrubba, NOAA Fisheries

White mangroves (*Laguncularia racemosa*) have two glands on the base of their leaves by which they excrete salts. Their leaves are elliptical and of a yellow-green color. They also have pneumatophores but in lesser amounts than the black mangroves and with a different growth pattern. The white mangrove can be generally found growing above the high tide line farther upland than the red mangrove or the black mangrove.

Laguncularia racemosa
(White mangrove)
Photo: Lisamarie Carrubba NOAA Fisheries

White mangrove leaves
Photo: Kim Ishida, TNC

Buttonwood or button mangroves (*Conocarpus erectus*) are known for their button shaped fruits and also have glands in the leaves for excreting salts. Their leaves are sharp-pointed and you can normally see that many branches have a yellow to reddish leaf. This tree is found from the shoreline to ledges along rocky coastlines where salt spray hits the tree.

Conocarpus erectus (Buttonwood)
Photo: Lisamarie Carrubba, NOAA Fisheries

Importance of mangroves

Mangroves provide habitat for:

- Tree dwellers – migratory and resident seabirds, iguanas and other reptiles
- Aquatic animals – including juveniles of many species; fish, lobster, mussels, sharks, manatees
- Filter feeders – barnacles, oysters, sponges, tunicates and bryozoans live on roots in the water
- Mangrove crabs – munch on dead leaves, which provide nutrients to bottom feeders and are a food source for other organisms

Mangroves are critically important to tropical coastal areas worldwide. They provide important services to humans by protecting the shoreline as they buffer wave energy. They act as a barrier from storm surges and hurricanes. Mangroves also act as a sediment trap, improving water quality before runoff from land reaches the sea. As water passes through the forest, it is slowed down and sediment settles among the mangrove roots and nutrients are absorbed by the plants in the forest. In addition, the protected area formed by red mangrove roots is an important sanctuary for many juvenile animals like some fish species, lobster, and conch.

Regulations specific to mangroves
Mangroves are protected under the Endangered and Indigenous Species Act of 1990, Title 12, Virgin Island Code, Chapter 2, Protection of Indigenous, Endangered and Threatened Fish, Wildlife and Plants. All four local mangrove species are protected under this Act. Section 105 prohibits pruning, cutting, removing or otherwise disturbing of any growth of mangroves, whether on private land or not.

Permits: If necessary, a local permit for pruning, cutting, or removal of mangrove trees by species and area may be issued in advance by the Division of Fish and Wildlife on a case by case basis. The policy of the Territory is to prevent a net loss of wetlands to the maximum extent possible. Permit applications are submitted to the Division of Fish and Wildlife, DPNR. Federal permits are required for discharge of fill, mechanized removal and construction in mangrove habitat.

Penalties: Any person violating this or any other provision of Chapter 2 can be subject to a fine between $100 and $10,000 and may also be sentenced to serve a term in jail of up to 60 days. For the purpose of assessing the penalty each mangrove is considered a separate offense.

Federal: designated as essential fish habitat under the Magnuson-Stevens Fishery Conservation and Management Act amendments in 1996; Coral Reef Conservation Act of 2000; Coastal Zone Management Act requires permits for any activity or development that could affect the coastal zone; Clean Water Act prohibits discharge of any contaminants and sewage without a permit. Section 404 regulates the dumping of dredged or fill material in wetlands; Rivers and Harbors Act prohibits dumping refuse into the navigable waters of the US.

Possible threats to mangrove forests within STXEEMP

- Pollution – Two types of pollution affect mangroves within the Park. Point-source pollution, which is any discharge that can be isolated to a specific source, including industrial discharges and oil spills. Mangroves have been found to be particularly sensitive to oil. The other is non-point source pollution, which includes discharges for which a single source cannot be pinpointed. Examples of non-point source pollution affecting mangroves include agricultural and pesticide runoff.

- Trash – Mangroves are often considered smelly places suitable for dumping trash and other unwanted materials. The deposit of trash can alter drainage patterns in the forest, physically damage the vegetation, harm birds and other animals living in the forest, and lead to fill that may eventually result in the conversion of the area from a wetland to upland.

- Deforestation – is done for many purposes such as coastal development and timber harvesting. Development of hotels, resorts, and waterfront properties may result in the clearing of mangrove forests for construction.

- Sedimentation- sediment runoff from exposed soils upland of mangrove swamps fill in the ponds at a faster rate than what would normally occur.

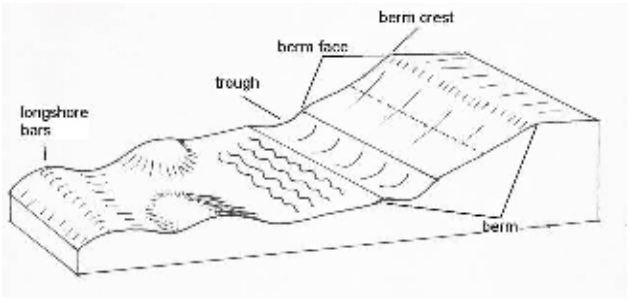
BEACHES

A beach can be defined as a shoreline feature of deposited material. The main component of the beach is beach sediment. Beach sediment comes in all shapes and sizes, from rounded car-sized boulders to sand grains barely visible to the naked eye. Other components are the sea and beach vegetation. Animals found at the beach vary depending on the substrate but often include: crabs, shorebirds, insects, clams, oysters and sand dollars. Some animals burrow into the sand and feed on material deposited by the waves.

Rod Bay, STXEEMP
Photo: Melanie Feltmate, TNC

Structure of beaches

- Berm – the flat, dry part of the beach mostly above water where beachgoers set their towels. This area is influenced by the waves at high tide and during storms
- Berm crest – marks the seaward limit of the berm and shoreward limit of the beach face
- Berm face – slope leading down towards the water from the crest
- Trough – very bottom of the face; may or may not be found, depending upon the physical characteristics of the beach
- Longshore bars – slightly raised, underwater embankments formed where the waves first start to break



Importance of beaches

A beach is an unstable environment that exposes plants and animals to harsh conditions. The amount of organic matter a beach can host and thus the wildlife it can support varies depending on the wave energy and sediment size. Despite the variety, all beaches provide habitat and a food source for wildlife. Crabs, insects and shorebirds feed on beach dwellers that burrow in the sand. Beach vegetation is important because it helps stabilize the beach by holding or trapping substrate.

Some birds and sea turtles rely on sandy and rocky beaches and vegetated dunes for nesting. The success of sea turtle nesting is dependent on several different factors. It is important that disturbances near shore are minimized so that turtles are able to come in from deeper waters. It is also critical to minimize vehicle access to beaches so as not to disturb nesting turtles and birds or destroy existing nests. Once turtles hatch, the hatchlings may become disoriented if there is too much light pollution from developments adjacent to the beach. For these reasons, sea turtle nesting and human use of beaches can sometimes come in conflict.

Ocypode quadrata (Ghost Crab) foraging at Southgate Pond
Photo: Melanie Feltmate, TNC

Jack and Isaac Bays
Photo: © Carly Voight

Additionally, beaches provide services for an island such as:

- Tourism – beaches provide the main venue for “Three S Tourism:” sun, sand and sea. They are instrumental in the tourism market across the globe and locally in the U.S. Virgin Islands.

- Recreation – in coastal areas around the world, beaches are used for recreation and are a part of the local culture as gathering places for families and friends. Many of the beaches in the STXEEMP are regularly used by residents and tourists.

Regulations specific to beaches
Beaches are protected as turtle wildlife areas under the Virgin Island Code, Chapter 12, section 98 which established the East End Marine Park. Marine turtles, nests and eggs are also protected under the Endangered and Indigenous Species Act of 1990, Title 12, Virgin Island Code, Chapter 2, Protection of Indigenous, Endangered and Threatened Fish, Wildlife and Plants.

Permits:
Local and federal permits are required for research on sea turtles and their nesting beaches. Locally, they can be acquired from the division of Coastal Zone Management. Federal permits are required from the US Army Corp of Engineers for construction below the high-tide line.

Penalties:
Any person disturbing turtle wildlife areas under the Virgin Island Code can be subject to a fine of up to $5,000 and may also be sentenced to serve a term in jail of up to 30 days. According to the ESA, disturbance of a next is subject to a fine between $100 and $600 and may also include a jail sentence of up to 1 year.

Federal: ESA protection of listed sea turtle species and their habitat, which includes nesting beaches; Coastal Zone Management Act; Clean Water Act restricts discharge into navigable waters; Rivers and Harbors Act prohibits dumping of trash in navigable waters; Oil Pollution Act prohibits discharge of oil into navigable waters in US coasts and requires reporting of Oil spills.

Possible threats to beaches within the STXEEMP

Threats to beaches within the STXEEMP include sand mining, construction of docks/piers/groins/jetties and other hard structures, and fires. The most prominent threats are:

- Construction – construction on the beach often involves the destruction of beach vegetation which helps to anchor the sand and keep it from washing away. Construction upland could lead to runoff of sediment, fertilizers, sewage onto the beach and into the water.
- Trash – if left on the beach, liquid wastes could leach into the sand and disrupt animals that burrow in the sand. This waste has potential to leach into the sea. Trash may also harbor bacteria that can affect animals that ingest trash and humans who visit the beaches.
- Vehicles – driving on the beach disrupts the animals that burrow into the sand and sea turtle nests.

Unsightly effects of trash and fire at the shore of Browns Bay
Photo: Melanie Feltmate, TNC

NON-COMPLIANCE & STRANDING/HAZARD RESPONSE PROCEDURES

To report an incident, gather as much information as possible such as color, license, location, and make of vessel or vehicle. Please contact:

West Indies Marine Animal Research and Conservation Service (WIMARCS)

WIMARCS runs and operates the Sea Turtle Assistance and Rescue (STAR) network at 877-3-TURTLE (**877-388-7853**). They respond to the following:

- Injured Sea Turtles
- Trapped Sea Turtles
- Disoriented Sea Turtles
- Injured Hatchlings
- Disoriented Hatchlings
- Stranded Dolphins
- Stranded Whales

You can also call WIMARCS directly at **340-772-1382** for any non-emergency situations (i.e. turtle nesting activity or nesting, information, etc.).

Response is dependent on the emergency and WIMARCS will inform the caller of the outcome if they will not be present during the response. WIMARCS coordinates a network of volunteers and qualified personnel if staff is unavailable.

DPNR Division of Environmental Enforcement

DEE responds to all regulatory requirements that fall under the DPNR rules and regulations; both water and land-based. This includes any fishing, hunting and boating rules.

Contact information:
Weekdays:
340-773-5774 (office)
Outside office hours:
340-773-4576 (Carlos Farchette home)
340-713-1509 (Officer Howard Forbes home)
340-513-4747 (Officer Howard Forbes cell)

Depending on availability of officers, expect a response to calls within 30 minutes or less.

DPNR Division of Fish and Wildlife

DFW is not involved in enforcement activities of any kind. This division responds to:

- Indigenous and endangered species issues
- Permitting for scientific research
- Fish/ wildlife kills
- Marine mammal stranding
- Injured or entangled birds
- Oil spills and vessel groundings

In order to provide technical guidance and assistance to other agencies or as their DOI grants permit.

Contact information: **340-773-1082**

DPNR Division of Coastal Zone Management

CZM is the managing authority for the STXEEMP. Activities regulated under CZM that would require a permit from DPNR include:

- Concessionaire Permits such as for catch and release guide fishing and cast net bait fishing
- Permits for any commercial activity, scientific activity or for anything that involves extraction, alteration or addition to any Marine Park resources.

The Marine Park Office may issue cease and desist verbal or written orders to any person observed undertaking activities in violation of the Rules and Regulations or without a permit.

Contact information:

Weekdays only: **340-773-3367** (STXEEMP office)

NOAA National Marine Fisheries Service

Should be contacted for the illegal collection of corals or sea turtles, the hunting or killing of sea turtle or marine mammals and the take of the animals or parts of the animals.

For reporting dead, stranded or injured marine mammals or sea turtles contact:

NMFS office telephone: **727-824-5312**
NOAA Law Enforcement Personnel:
Agent Lynn Rios: **787-890-0715**
Agent Kenneth Henline: **787-749-4405**

U.S. Fish & Wildlife

The U. S. Fish and Wildlife Service staff on St. Croix works within the Division of Refuges. They will respond to endangered species enforcement issues throughout the territories but will coordinate the response through their Special Agent (Ariel Vasquez) who is located in San Juan (787.209.8585). The majority of endangered species enforcement issues that they have worked in the past have involved poaching of sea turtles or sea turtle eggs.

USFWS office telephone: **340-773-4554**
Mike Evans (Refuge Manager/Law Enforcement Officer): cell – **340-690-9451**
Claudia Lombard (Wildlife Biologist/Law Enforcement Officer): cell – **340-690-8325**

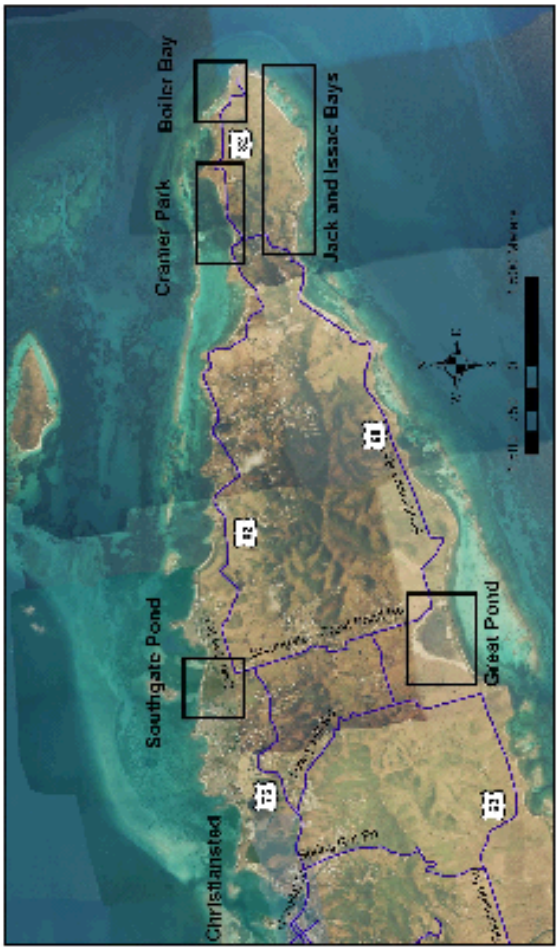
When reporting a sick or injured animal or an enforcement issue it is important to have the following information ready:

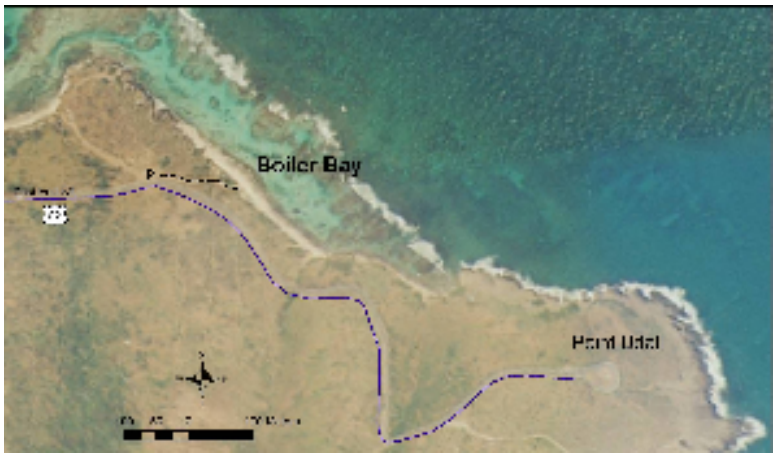
- Name and telephone number of contact person
- Exact location and directions to the incident
- Date and time of observations
- Detailed description of animal including but not limited to: size, color, condition (alive, dead, injured, disoriented)
- Detailed description of suspected offense including but not limited to:
  vehicle/boat description, boat registration number, vehicle license plate numbers, description of people involved, description of observed suspected illegal activities, etc…
  (the more information the better!)

REGULATIONS TABLE

Resource	Threatened / Endangered	Permits	Penalties
Coral reefs	Yes, two coral species are listed as threatened; elkhorn coral (*Acropora palmata*) and staghorn coral (*A. cervicornis*).	Federal for any activities affecting *Acropora* spp., construction activities and discharges in habitat. Local for aquarium collection.	Yes
Seagrass beds	No	Local and federal for removal of seagrass, construction and dredging activities.	Yes, $100-10,000 and up to 60-day jail term (USVI).
Mangrove forests	No	Local for pruning, cutting or removal of mangroves. Federal for removal, fill or discharge and construction activities.	Yes, $100-10,000 and up to 60-day jail term, (USVI).
Sea Turtles	Green Turtle & Loggerhead are threatened, Leatherback & Hawksbill are endangered under ESA	Federal and local for research and monitoring.	Yes
Sandy beaches	No	Local for sand mining. Federal for construction below high-tide line and discharges.	Yes

MAPS AND DIRECTIONS FOR VISITORS





Boiler Bay (area with corals)

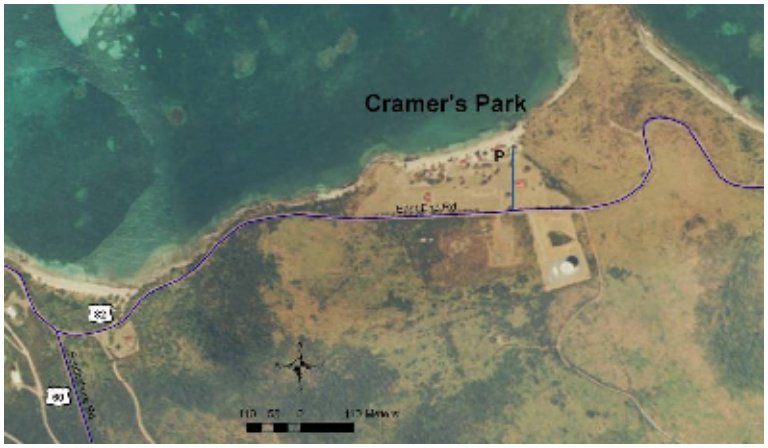
- Head East on 75 until you reach a T in the road (about 1.2 miles from entrance to the Buccaneer Hotel).
- Turn Left and continue for approx. 5.9 miles passing Cheeseburgers in America's Paradise, Chicken Charlie's, The Reef and St. Croix Yacht Club.
- Turn Left to continue on 82; this is marked by a sign for Cramer's Park and Point Udall.
- Continue for about 0.8 miles to a dirt turn-off on the left-hand side. Park and take the trail down to the bay that is East of the parking area.

Jack & Isaac Bays Preserve (corals, beaches)
Land managed by The Nature Conservancy

- Head East on 75 until you reach a T in the road (about 1.2 miles from the Buccaneer Hotel).
- Turn Left and continue for approx. 6.4 miles passing Cheeseburgers in America's Paradise, Chicken Charlie's, The Reef, St. Croix Yacht Club and a turn-off for Cramer's Park and Point Udall – make sure to stay left here.
- Before Point Udall Monument is a place to pull off and park.
- The trailhead begins below this parked area and continues down to East End Beach, then over the crest of the hill to Isaac's Bay.
- Can also be accessed by trail across from Cramer's Park- trail is steep and strenuous

Southgate Pond (seagrass, mangroves)
The Southgate Coastal Reserve is managed by the St. Croix Environmental Association

- Head East on 75 until you reach a T in the road (about 1.2 miles from the entrance to the Buccaneer Hotel).
- Turn Left and continue for approx. 0.4 miles.
- You will reach a dirt road on your left with a sign marking Southgate Coastal Reserve.
- Turn Left and continue on the road for about 0.1 miles and park.



Cramer's Park (seagrass, beaches)
Land managed by Department of Sports, Parks and Recreation

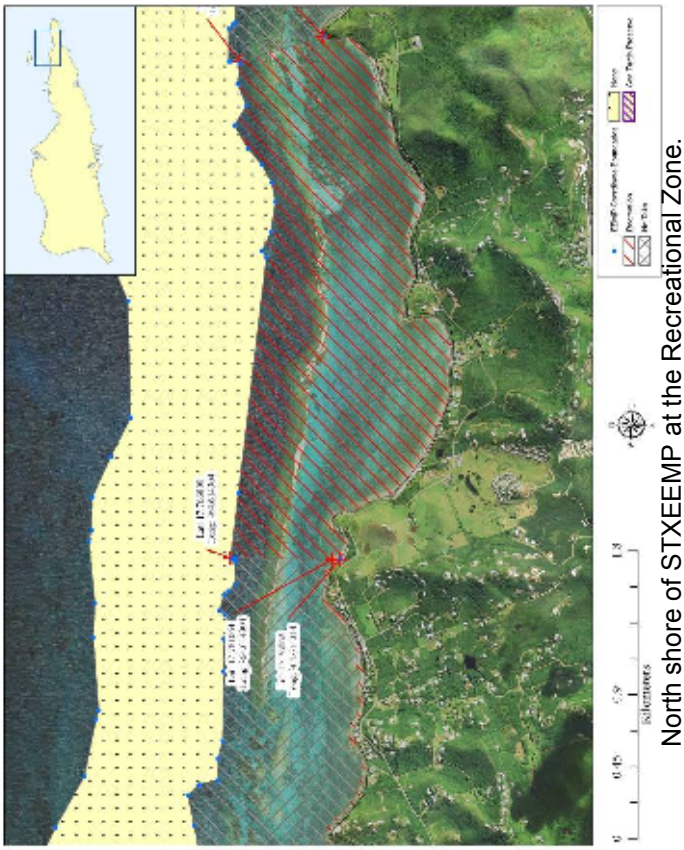
- Head East on 75 until you reach a T in the road (about 1.2 miles from the entrance to the Buccaneer Hotel).
- Turn Left and continue for approx. 5.9 miles passing Cheeseburgers in America's Paradise, Chicken Charlie's, The Reef and St. Croix Yacht Club.
- Turn Left to continue on 82; this is marked by a sign for Cramer's Park and Point Udall.

Great Pond (seagrass, beaches, mangroves)

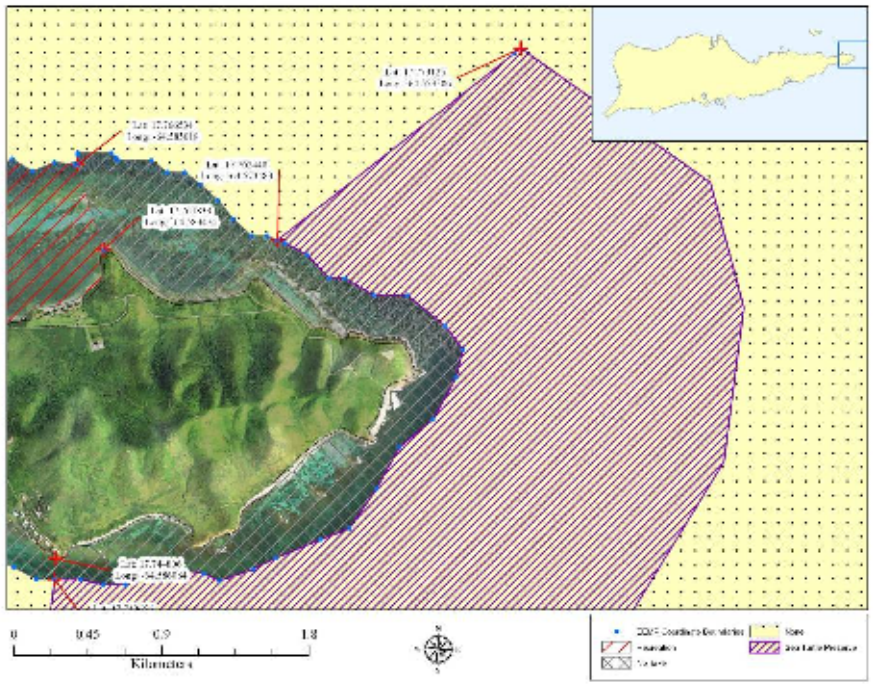
- Head East on 75 until you reach a T in the road (about 1.2 miles from the entrance to the Buccaneer Hotel).
- Turn Right onto 60 and continue South for approx. 2 miles until road curves East.
- Entrance to EEMP office at Great Pond will be the second Right after a dip in the road.

STXEEMP BOUNDARIES AND ZONES

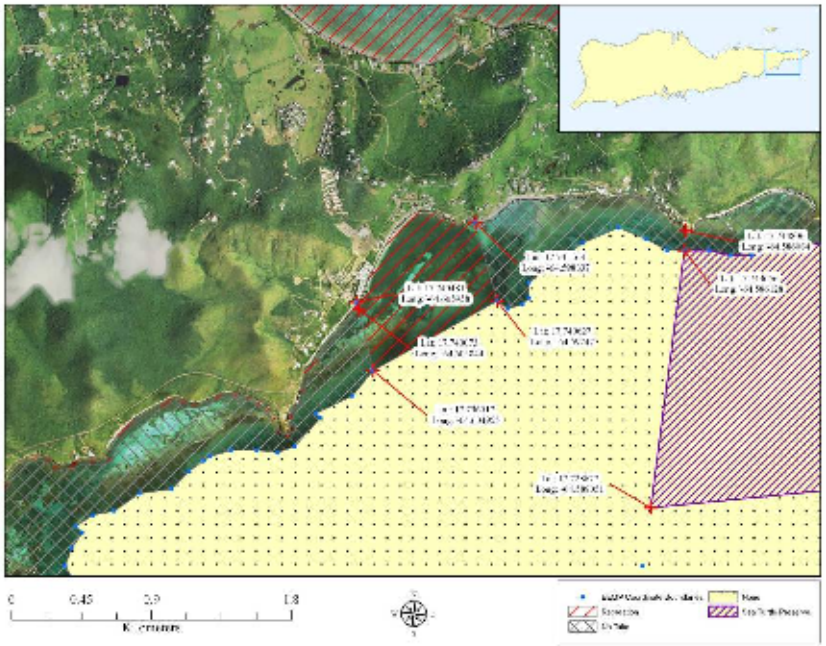
North-west boundary of the STXEEMP beginning at the eastern jetty of the Green Cay Marina. Looking from shore, the boundary extends due north.



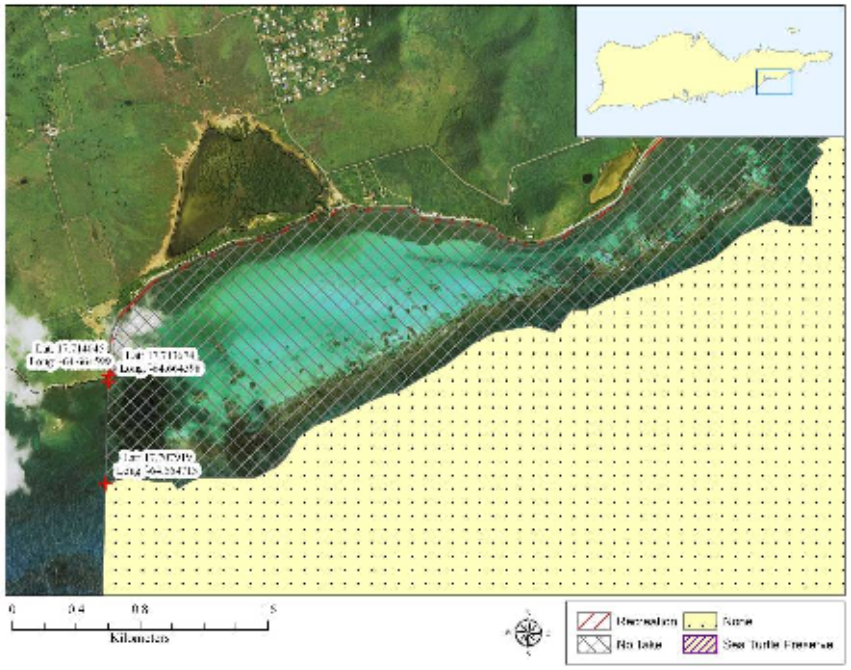
North shore of STXEEMP at the Recreational Zone.



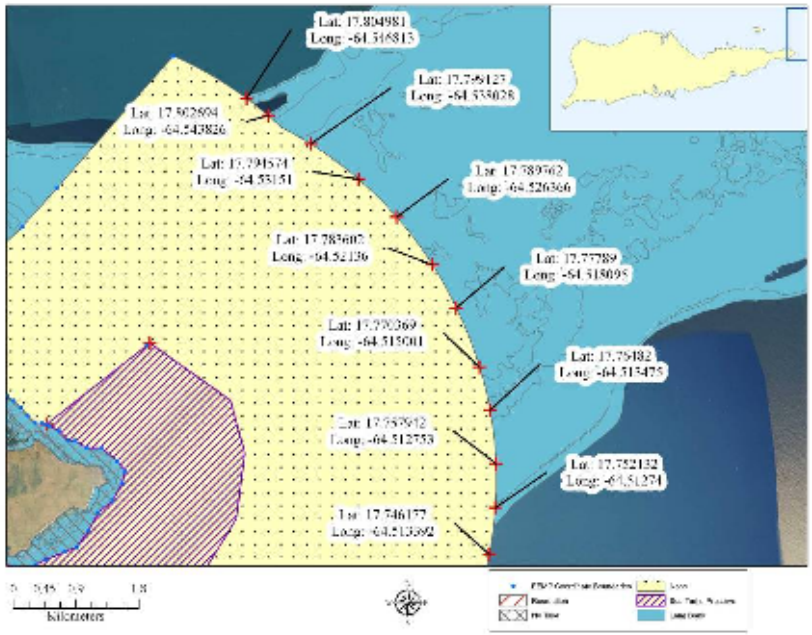
Eastern end of STXEEMP from shore. This map depicts the No-Take Zone extending from shore and the surrounding Wildlife Preserve Zone.



Southern near-shore zones of the STXEEMP showing the south Recreation Zone in front of Divi Resort at Turner Hole. The 100–foot from-shore Recreation Zone extends to the west.



Western edge of the south border of STXEEMP.



Eastern edge of the STXEEMP extending past the Wildlife Preserve Zone. This map depicts the extent of the Open Fishing Zone

CONTACTS **EMERGENCY (340) 772-9111**

FOR MORE INFORMATION Please contact:

St. Croix East End Marine Park
5005 Estate Great Pond
Christiansted, VI 0820
Phone: 773-3367
Fax: 340-719-4551
http://www.stxeastendmarinepark.org/

DPNR Division of Coastal Zone Management
45 Estate Mars Hill
Frederiksted, VI 00840
Phone: 773-1082
Fax: 340-773-3343
http://www.viczmp.com/

DPNR Division of Environmental Enforcement
6003 Estate Anna's Hope
Christiansted, VI 00820
Phone: 773-5774
Fax: 340-773-9310
http://www.dpnr.gov.vi/enforcement.htm

The Nature Conservancy, Southeastern Caribbean Program
3052 Estate Little Princess
Christiansted, VI 00820
Phone: 718-5575
Fax: 340-718-1613
http://www.nature.org/

National Marine Fisheries Service, NOAA Fisheries
Caribbean Field Office, Puerto Rico
Phone: 787-851-3700
Fax: 787-851-5588
SERO: http://sero.nmfs.noaa.gov/
CRCP: http://www.coralreef.noaa.gov/