

St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Ocean Uses Map Book

Results from:

Participatory Ocean Use
Mapping Workshops

St. Thomas, USVI

May 22-23, 2012



November 2012



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Ocean Uses Map Book

November 2012

Introduction

This map book contains cartographic products derived from the St. Thomas East End Reserves (STEER) Coastal Use Mapping workshops conducted at the Bolongo Bay Beach Resort on May 22 and 23, 2012. This participatory mapping workshop was designed to gather spatial data on human uses of the coastal and marine environment in the U.S. Virgin Islands' STEER.



The STEER Coastal Use Mapping Project is a collaborative effort between coastal resource management agencies (territorial and federal) and non-governmental organizations. Additional partners include the U.S. Virgin Islands (USVI) Department of Planning and Natural Resources (DPNR), the STEER Advisory Committee, and several NOAA line offices including the Office of Ocean and Coastal Resource Management (OCRM), National Ocean Service (NOS), and Coral Reef Conservation Program (CRCP).

Primary funding for the project is from NOAA's Coral Reef Conservation Program, with additional support provided by The Nature Conservancy (TNC). Mapping and GIS technology for the workshop was facilitated by NOAA's MPA Center (OCRM). During the workshop, this expert team was shadowed by local facilitators from the USVI to facilitate a transfer of knowledge and technological skills.

During the two days of workshops, a total of 47 participants, seven facilitators, and seven undergraduate student observers were involved in the project. A total of 87 data sets for 22 uses were collected. Participants were selected based on expertise in the various human use activities that were mapped, as well as familiarity with the mapped region.

Targeted Uses

The uses mapped in the workshop included a variety of extractive and non-extractive activities. These uses are defined on the uses list that follows this document. The targeted uses and use descriptions were compiled with assistance from local stakeholders and resource managers.

Generalized Workshop Process

At the start of the workshop, all participants were assigned to a work group and an associated mapping station. With guidance from the facilitators, participants were asked to draw use

areas based on their knowledge of where this type of activity is known to occur. Each use was explicitly defined (see uses list) and participants were asked to map the general use footprint and dominant use areas, as described below. For some uses, additional areas were drawn to document seasonality, pulse events, temporal variability (day/night) and species-specific use areas. Participants also provided relevant supplemental information on uses (e.g., seasonality, social and cultural significance, historical patterns) that was compiled and added to the final use maps.

- **General Use Footprint** : The general use footprint includes all areas in which the use is *known to occur with some regularity* (over the past 3-5 years), regardless of its frequency or intensity. The general use footprint does not include areas where the use may occur once or twice or where it might *conceivably* occur now or in the future. For this step, all areas drawn will be included in the final data layer.
- **Dominant Use Areas**: Dominant use areas are defined as *ocean areas routinely used by most users most of the time* (within the seasonal patterns for that use). Dominant use areas must be drawn within the general use footprint. Participants worked together to draw dominant use areas as they occur throughout the study region. This step was designed as a group exercise and participants should work together to agree on which areas are dominant use areas and should be included in the final data layer.
- **Supplemental Use Data**: Participants were also asked to provide supplemental information on use patterns both spatially (on the map) and as additional notes collected after the workshop.

Maps

Data compiled during the workshop were processed to create maps documenting the use patterns as drawn by the workshop participants. The following maps show patterns for each use mapped in the workshops and include the general use footprint and dominant use areas, as well as a compilation of the supplemental data provided by participants throughout the mapping process. After initial data processing was completed, draft maps were presented for review to workshop participants and other interested stakeholders.

Contacts

For questions regarding this project or the derived products, please contact either:

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STEER Coastal Uses Mapping Project – St Thomas, US Virgin Islands

NON-EXTRACTIVE ACTIVITIES FOR PARTICIPATORY MAPPING		
Use type	Includes	Excludes
Charter diving and snorkeling	Diving and snorkeling activities organized through a charter/commercial operator, including vessel and shore-based SCUBA, SNUBA, snorkel, freediving, kayak snorkel tours	Swimming, speardiving/extractive activities, non-charter diving and snorkeling, research activities
Non-charter diving and snorkeling	Diving and snorkeling conducted independently, not through a charter operator, snorkel rental from hotels, local resident diving and snorkeling	Charter diving and snorkeling trips
Day charter boat tours	Includes sunset sails, day trip, half day, dinghy tours	Recreational boating of personal vessels, multi-day outings
Term charter boat tours	Multi-day/overnight boat charters	Day charter, sunset sails, half-day outings, dinghy tours, recreational boating of personal vessels
Recreational boating	Recreational non-charter boating (e.g. Yacht Club, Ritz, other), sail or motor boats	Charter boat tours
Thrill craft and high speed activities	Parasailing, jet skis and other forms of thrill craft rental	Non-motorized vessels
Mooring	Non-liveaboard mooring, includes private, day-use, transient	Liveaboard moorings, emergency storm mooring
Liveaboard mooring	Multi-day use for liveaboard boaters	Day use mooring, emergency storm mooring
Anchoring	Anchoring in non-emergency locations	Emergency storm anchoring and moorings
Emergency (storm) anchoring and mooring	Anchoring during extreme weather	Day use mooring, liveaboard moorings, non-emergency anchoring
Paddling	Paddle- driven kayaking (non-commercial tours), SUP (stand up paddle)	Charter/commercial kayaking; use of motorized vessels
Kayak tours	Commercial kayak tours	Non-commercial kayak outings, kayak rental (non-tour)
Kite boarding and wind-surfing	Wind-driven board activities	SUP (stand up paddle), surfing
Ferry transit	Ferry transit	Non-ferry motorized and other boating
Swimming	Racing, general exercise, group or individual, triathlon	Free diving, snorkeling, wading
Camping	Spending one or several nights outdoors for recreational purposes	Liveaboard boaters, living outdoors due to homelessness

EXTRACTIVE ACTIVITIES FOR PARTICIPATORY MAPPING

Use type	Includes	Excludes
Bait fishing	Any collection of baitfish, includes fishing by hook and line and cast net	Other types of fishing targeting fish for non-bait purposes (e.g., aquarium collection)
Handline fishing from shore	All shore-based handlining	Fishing from shore using nets, traps, and pots
Whelk fishing	Any harvesting of whelk	Harvesting of fish, lobster, conch
Lobster fishing	Any harvesting of lobster	Harvesting of fish, whelk, conch
Conch fishing	Any harvesting of conch	Harvesting of fish, whelk, lobster
Other fishing and marine resource harvesting	Fishing and marine resource harvesting not already documented in other categories, includes use of traps, pots, seine nets, gill nets, and lionfish hunting	Bait fishing, handline fishing, whelk fishing, lobster fishing, conch fishing

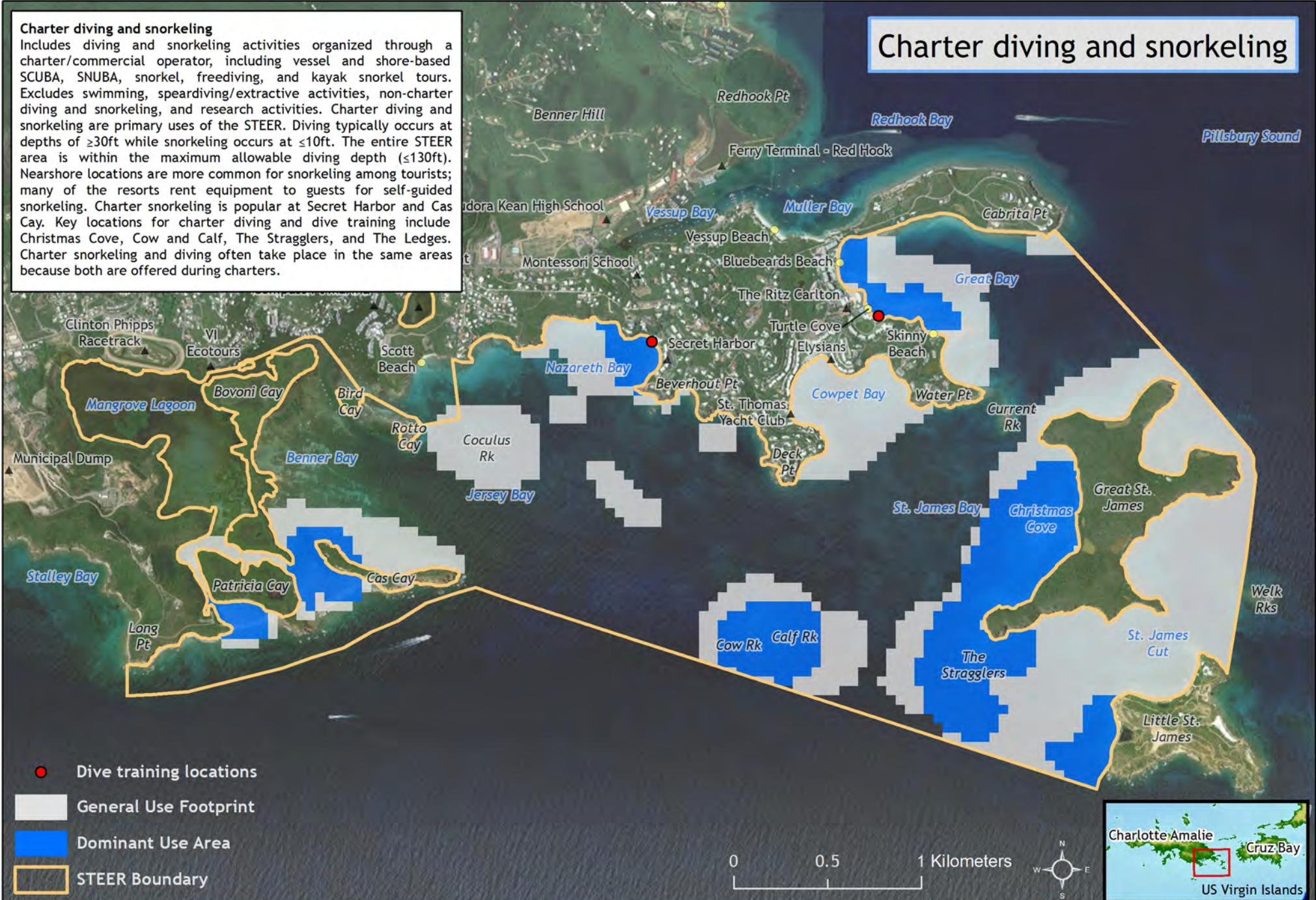
Non-Extractive Uses



Charter diving and snorkeling

Includes diving and snorkeling activities organized through a charter/commercial operator, including vessel and shore-based SCUBA, SNUBA, snorkel, freediving, and kayak snorkel tours. Excludes swimming, spearfishing/extractive activities, non-charter diving and snorkeling, and research activities. Charter diving and snorkeling are primary uses of the STEER. Diving typically occurs at depths of $\geq 30\text{ft}$ while snorkeling occurs at $\leq 10\text{ft}$. The entire STEER area is within the maximum allowable diving depth ($\leq 130\text{ft}$). Nearshore locations are more common for snorkeling among tourists; many of the resorts rent equipment to guests for self-guided snorkeling. Charter snorkeling is popular at Secret Harbor and Cas Cay. Key locations for charter diving and dive training include Christmas Cove, Cow and Calf, The Stragglers, and The Ledges. Charter snorkeling and diving often take place in the same areas because both are offered during charters.

Charter diving and snorkeling



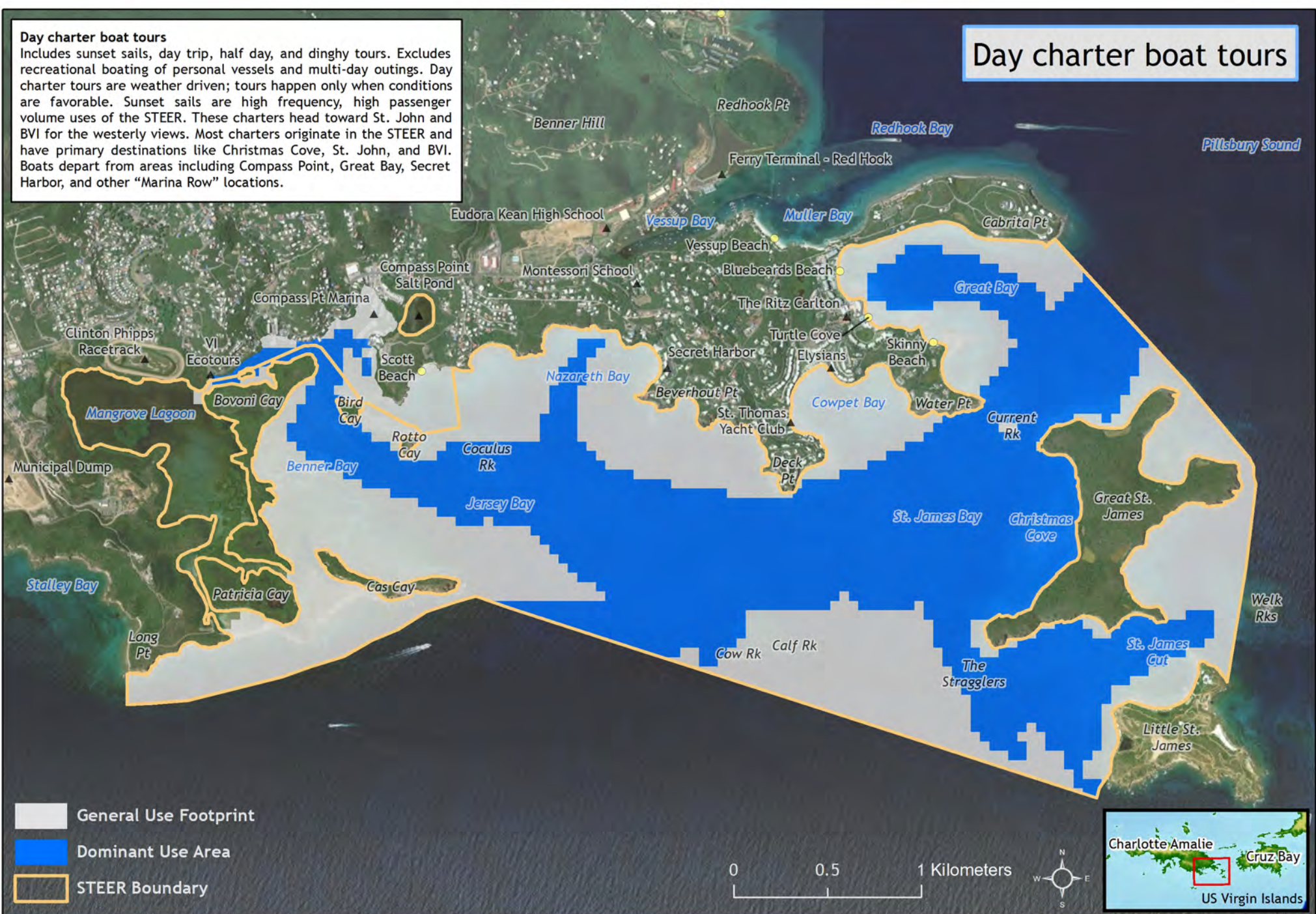
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Day charter boat tours

Includes sunset sails, day trip, half day, and dinghy tours. Excludes recreational boating of personal vessels and multi-day outings. Day charter tours are weather driven; tours happen only when conditions are favorable. Sunset sails are high frequency, high passenger volume uses of the STEER. These charters head toward St. John and BVI for the westerly views. Most charters originate in the STEER and have primary destinations like Christmas Cove, St. John, and BVI. Boats depart from areas including Compass Point, Great Bay, Secret Harbor, and other "Marina Row" locations.

Day charter boat tours



- General Use Footprint
- Dominant Use Area
- STEER Boundary



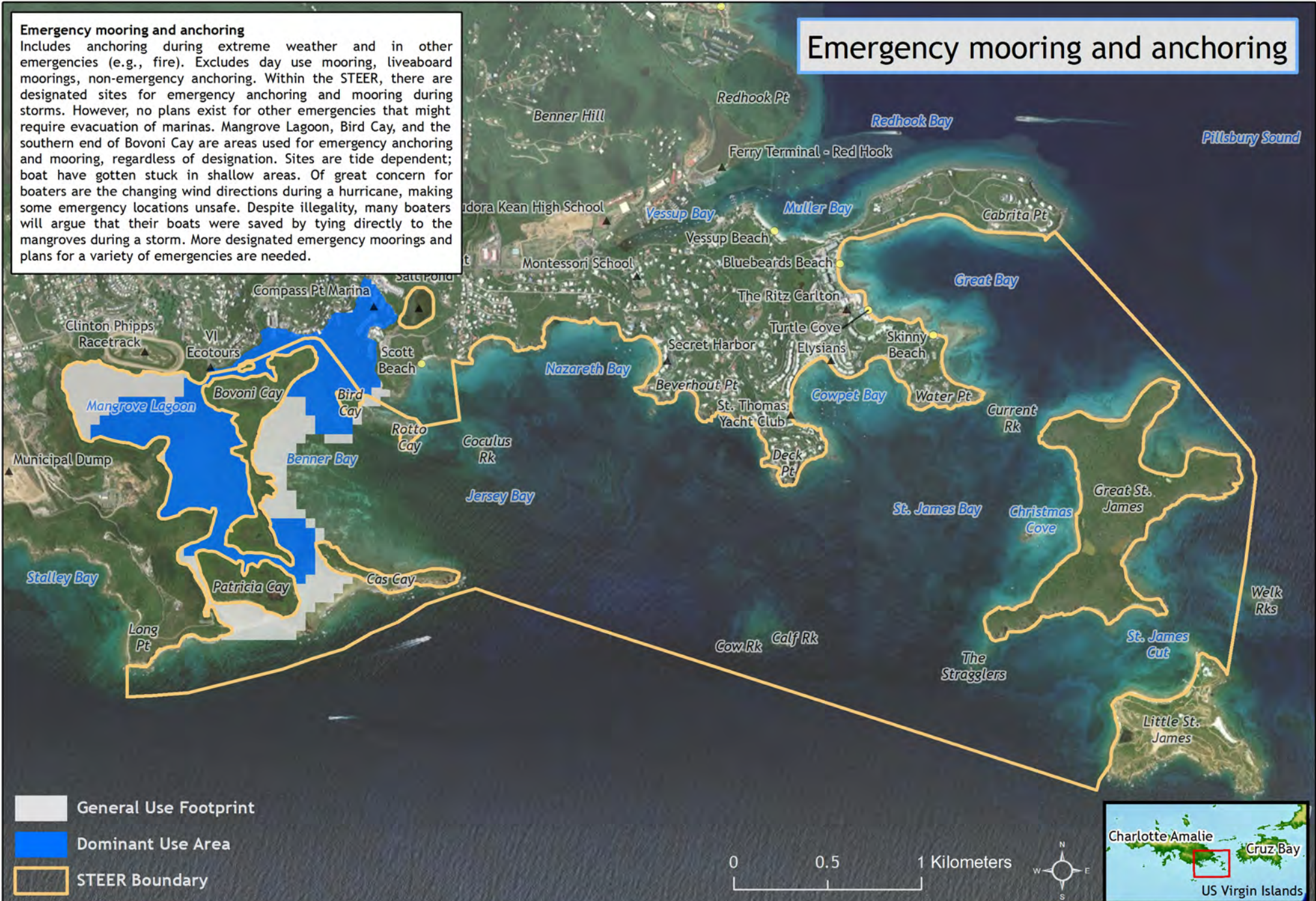
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Emergency mooring and anchoring

Includes anchoring during extreme weather and in other emergencies (e.g., fire). Excludes day use mooring, liveaboard moorings, non-emergency anchoring. Within the STEER, there are designated sites for emergency anchoring and mooring during storms. However, no plans exist for other emergencies that might require evacuation of marinas. Mangrove Lagoon, Bird Cay, and the southern end of Bovoni Cay are areas used for emergency anchoring and mooring, regardless of designation. Sites are tide dependent; boat have gotten stuck in shallow areas. Of great concern for boaters are the changing wind directions during a hurricane, making some emergency locations unsafe. Despite illegality, many boaters will argue that their boats were saved by tying directly to the mangroves during a storm. More designated emergency moorings and plans for a variety of emergencies are needed.

Emergency mooring and anchoring



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Ferry transit

Includes ferry transit. Excludes non-ferry motorized and other boating. Ferry transit is a high use of the STEER. The middle route has heavy traffic, with some ferries heading to Tortola and some to Charlotte Amalie. Along the southern end of STEER, the ferries tend to stay straight (i.e., close to shore); however, transit routes can be weather dependent. Larger ferries typically go to the east and smaller to the west. The high traffic routes lead to conflict between novice boaters and ferries, particularly dangerous at night. Ferry speed and routes that go too close to shore (i.e., within 100-150ft) have led to safety concerns for recreational boaters. Groundings are an issue, as well as coral struck by ferries that come too close to reefs. In July 2011, the Royal Miss Belmar Ferry ran aground on Great St. James.

Ferry transit



- General Use Footprint
- Dominant Use Area
- STEER Boundary



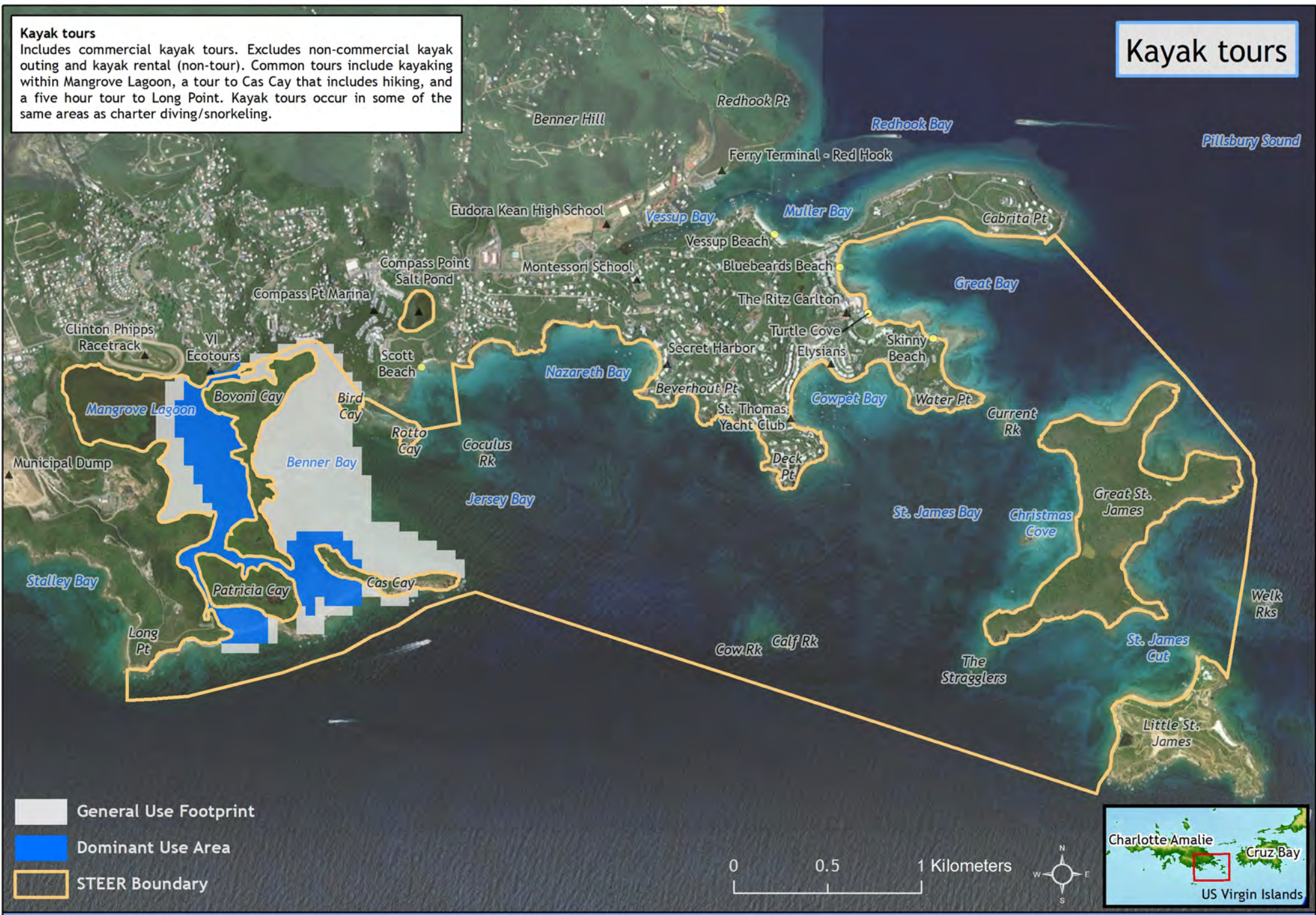
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

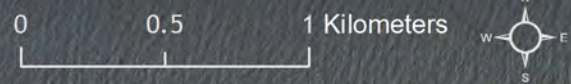
Kayak tours

Includes commercial kayak tours. Excludes non-commercial kayak outing and kayak rental (non-tour). Common tours include kayaking within Mangrove Lagoon, a tour to Cas Cay that includes hiking, and a five hour tour to Long Point. Kayak tours occur in some of the same areas as charter diving/snorkeling.

Kayak tours



- General Use Footprint
- Dominant Use Area
- STEER Boundary



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Kite boarding and wind-sufing

Kite boarding and wind-surfing. Includes wind-driven board activities. Excludes SUP (stand up paddle) and surfing. Several resorts and the yacht club rent windsurf boards, hobby cats, and kite boards. Tourists frequently rent these items. Some commercial operations also offer training. Common origin points include Great Bay and Secret Harbor. Kiteboarding and windsurfing require windy conditions, more common in the winter months and during tropical storms. East and southeast winds are most ideal.

Kite boarding and wind-surfing



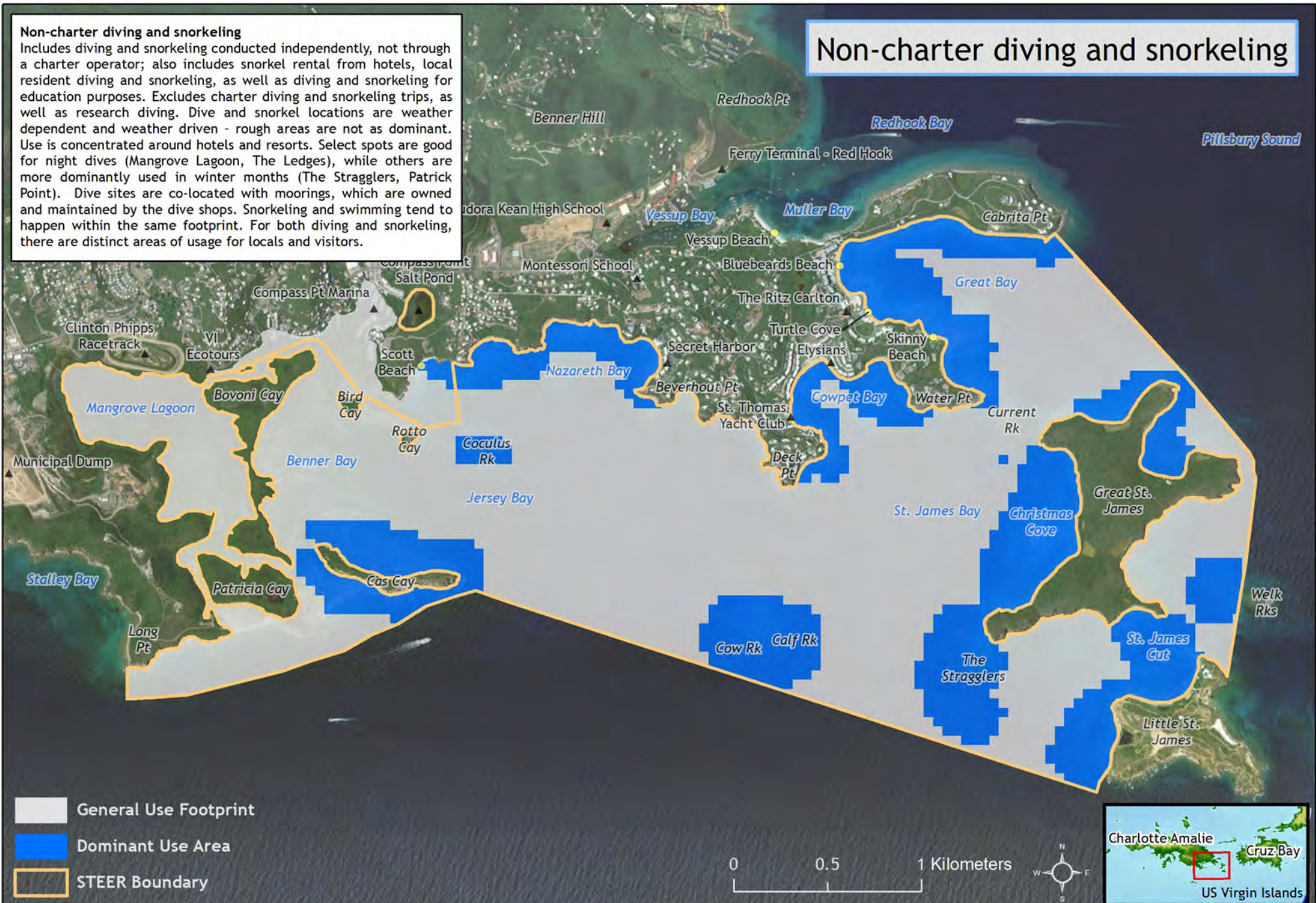
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Non-charter diving and snorkeling

Includes diving and snorkeling conducted independently, not through a charter operator; also includes snorkel rental from hotels, local resident diving and snorkeling, as well as diving and snorkeling for education purposes. Excludes charter diving and snorkeling trips, as well as research diving. Dive and snorkel locations are weather dependent and weather driven - rough areas are not as dominant. Use is concentrated around hotels and resorts. Select spots are good for night dives (Mangrove Lagoon, The Ledges), while others are more dominantly used in winter months (The Stragglers, Patrick Point). Dive sites are co-located with moorings, which are owned and maintained by the dive shops. Snorkeling and swimming tend to happen within the same footprint. For both diving and snorkeling, there are distinct areas of usage for locals and visitors.

Non-charter diving and snorkeling



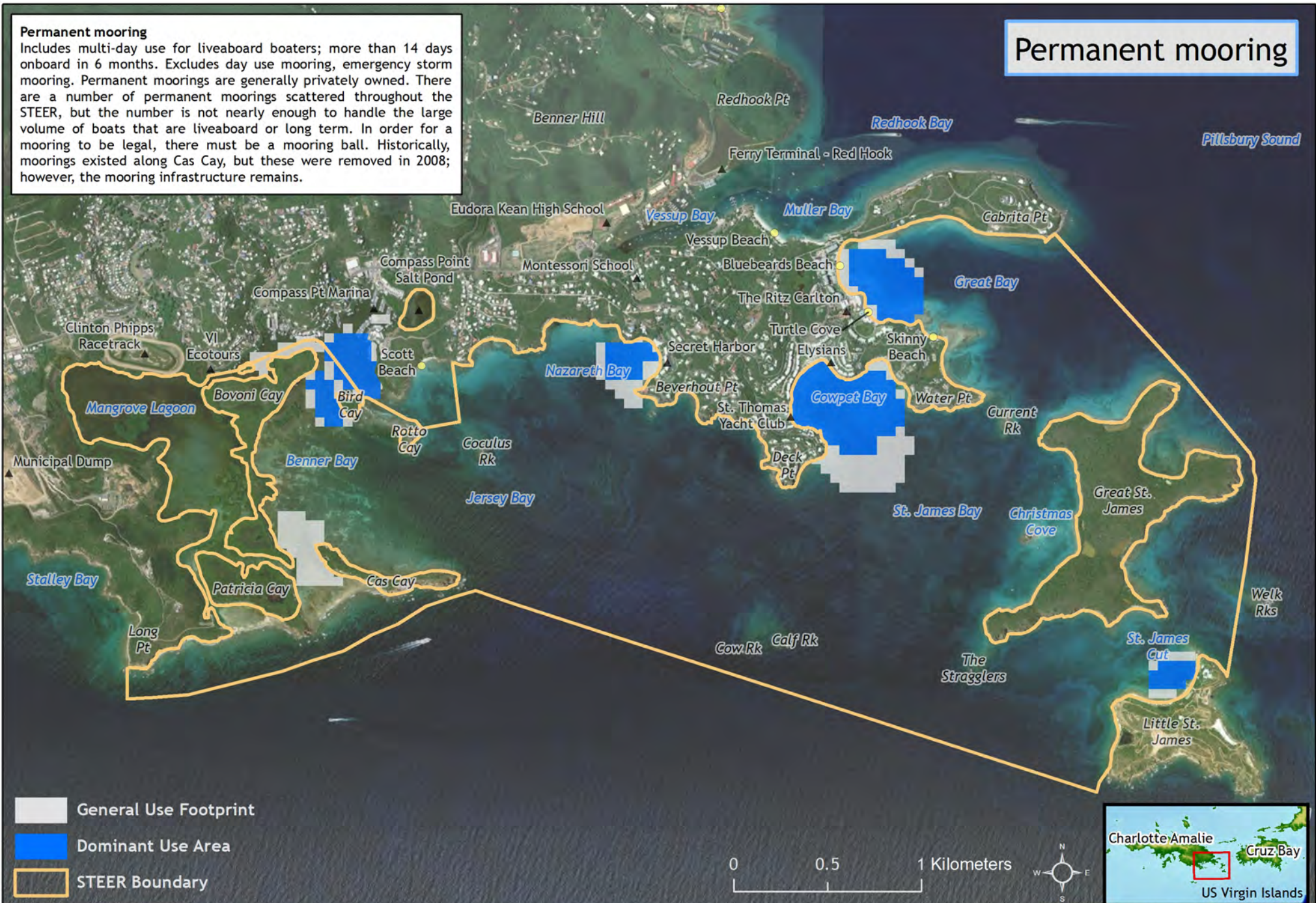
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Permanent mooring

Includes multi-day use for liveaboard boaters; more than 14 days onboard in 6 months. Excludes day use mooring, emergency storm mooring. Permanent moorings are generally privately owned. There are a number of permanent moorings scattered throughout the STEER, but the number is not nearly enough to handle the large volume of boats that are liveaboard or long term. In order for a mooring to be legal, there must be a mooring ball. Historically, moorings existed along Cas Cay, but these were removed in 2008; however, the mooring infrastructure remains.

Permanent mooring



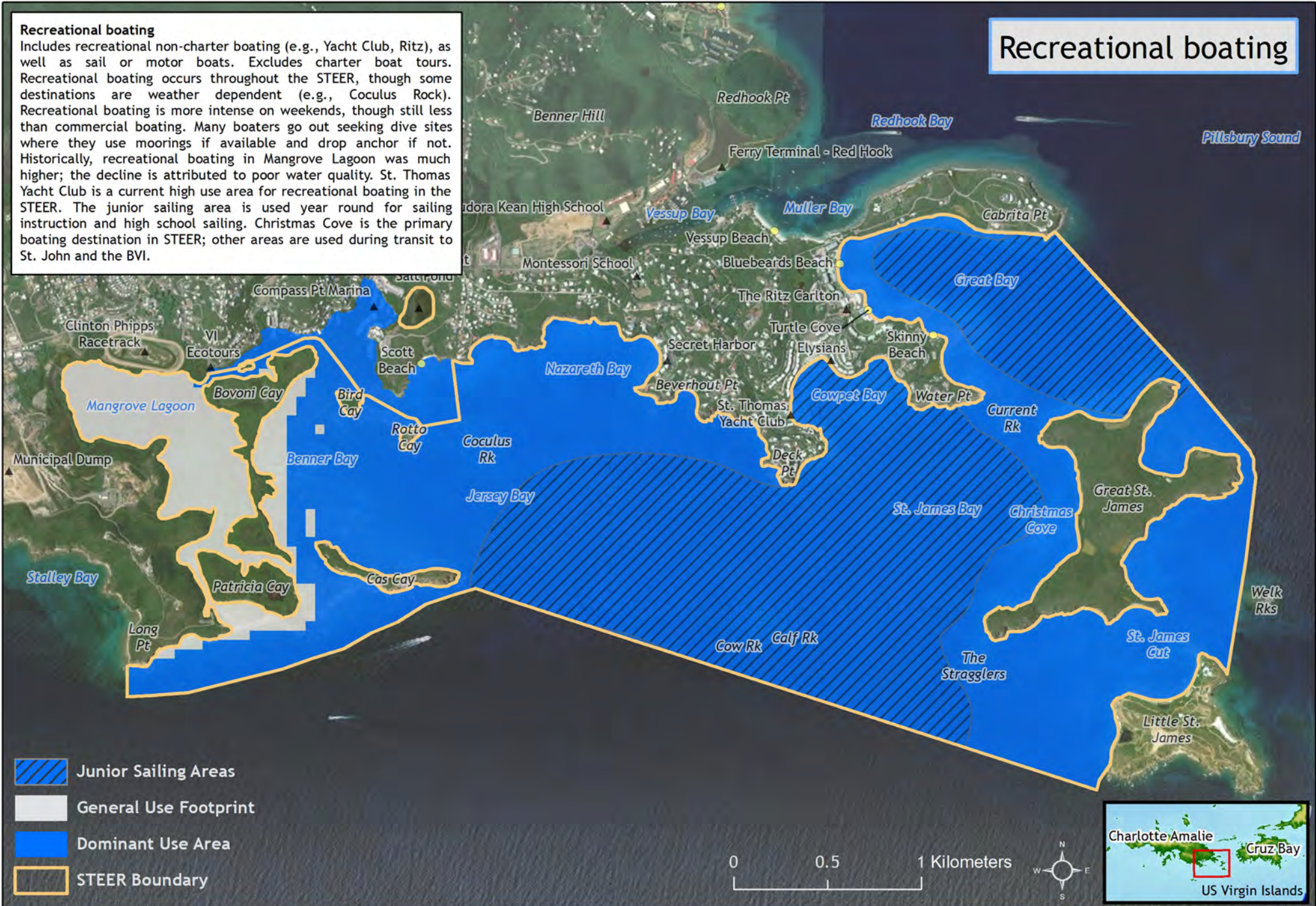
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Recreational boating

Includes recreational non-charter boating (e.g., Yacht Club, Ritz), as well as sail or motor boats. Excludes charter boat tours. Recreational boating occurs throughout the STEER, though some destinations are weather dependent (e.g., Cocus Rock). Recreational boating is more intense on weekends, though still less than commercial boating. Many boaters go out seeking dive sites where they use moorings if available and drop anchor if not. Historically, recreational boating in Mangrove Lagoon was much higher; the decline is attributed to poor water quality. St. Thomas Yacht Club is a current high use area for recreational boating in the STEER. The junior sailing area is used year round for sailing instruction and high school sailing. Christmas Cove is the primary boating destination in STEER; other areas are used during transit to St. John and the BVI.

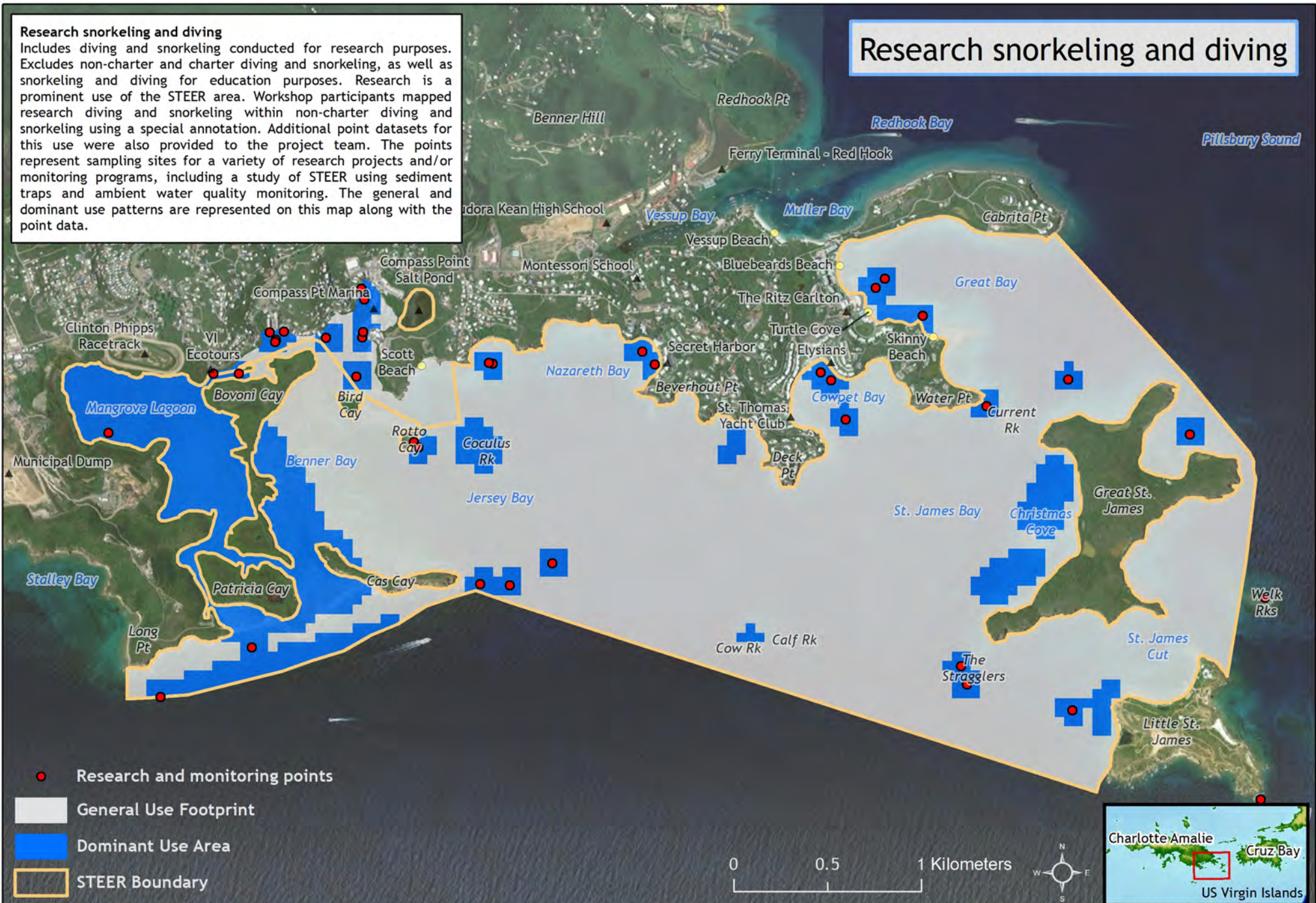
Recreational boating



Research snorkeling and diving

Includes diving and snorkeling conducted for research purposes. Excludes non-charter and charter diving and snorkeling, as well as snorkeling and diving for education purposes. Research is a prominent use of the STEER area. Workshop participants mapped research diving and snorkeling within non-charter diving and snorkeling using a special annotation. Additional point datasets for this use were also provided to the project team. The points represent sampling sites for a variety of research projects and/or monitoring programs, including a study of STEER using sediment traps and ambient water quality monitoring. The general and dominant use patterns are represented on this map along with the point data.

Research snorkeling and diving



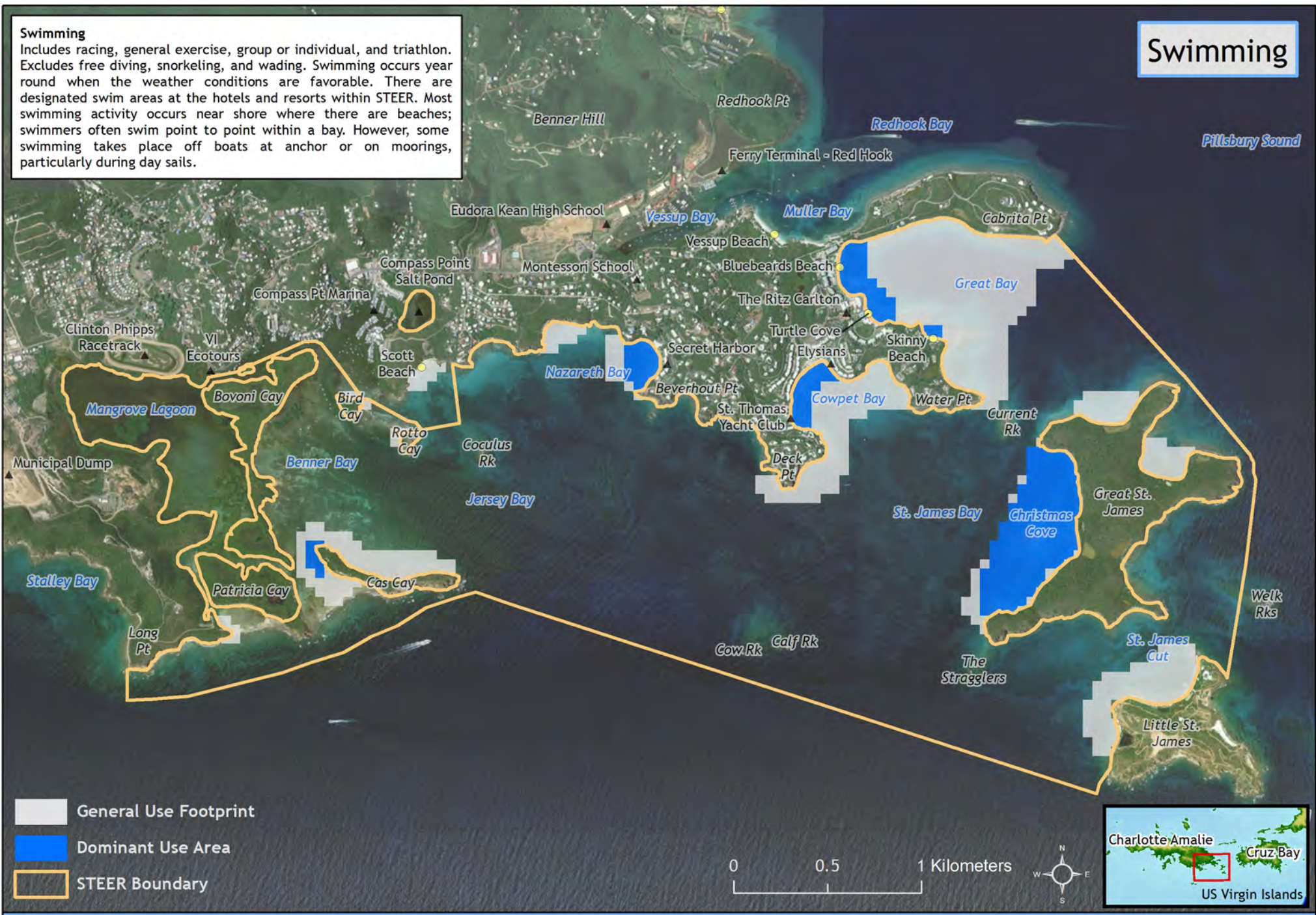
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Swimming

Includes racing, general exercise, group or individual, and triathlon. Excludes free diving, snorkeling, and wading. Swimming occurs year round when the weather conditions are favorable. There are designated swim areas at the hotels and resorts within STEER. Most swimming activity occurs near shore where there are beaches; swimmers often swim point to point within a bay. However, some swimming takes place off boats at anchor or on moorings, particularly during day sails.

Swimming



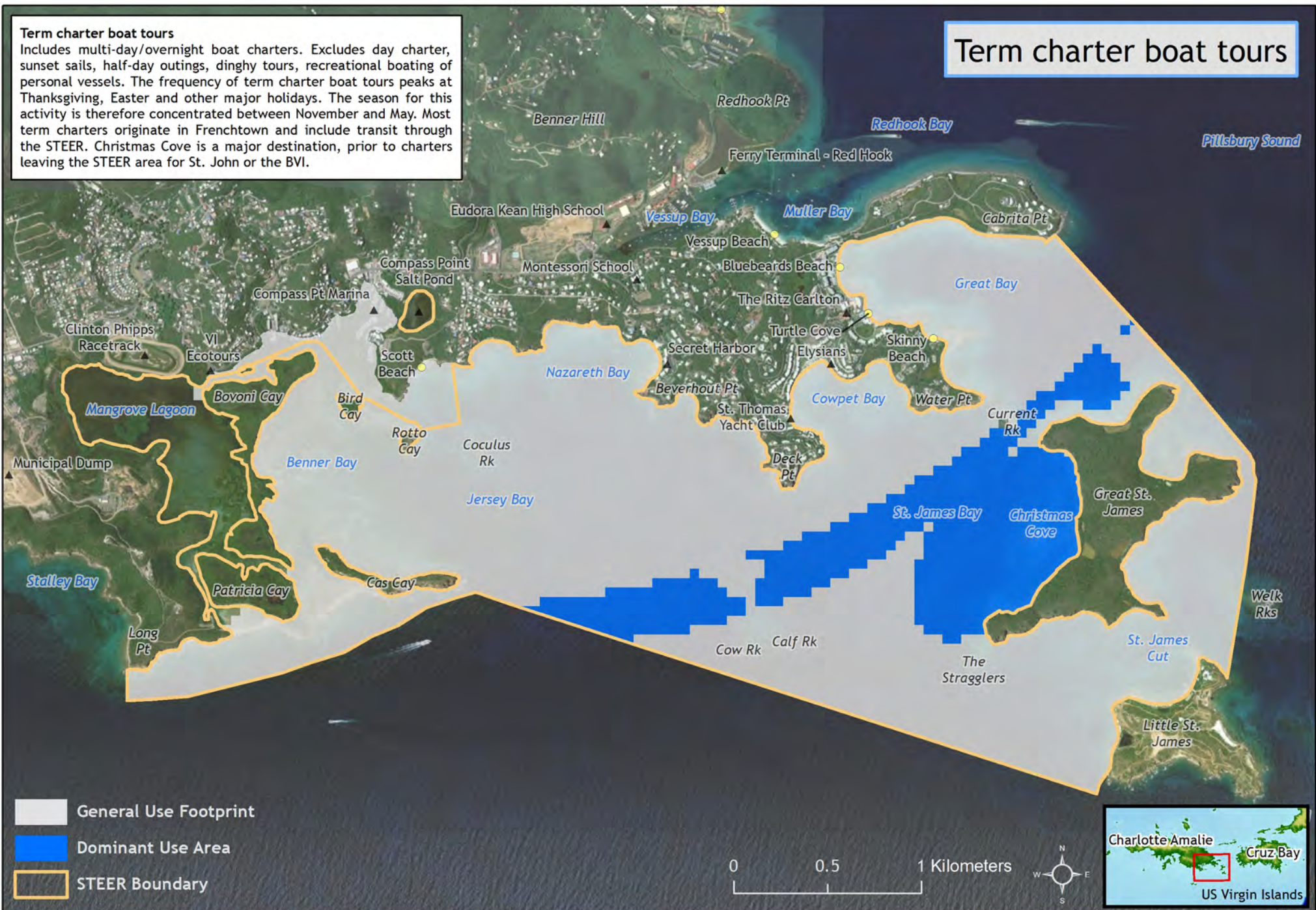
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Term charter boat tours

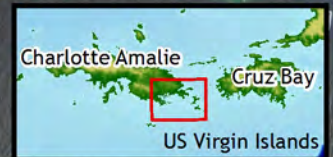
Includes multi-day/overnight boat charters. Excludes day charter, sunset sails, half-day outings, dinghy tours, recreational boating of personal vessels. The frequency of term charter boat tours peaks at Thanksgiving, Easter and other major holidays. The season for this activity is therefore concentrated between November and May. Most term charters originate in Frenchtown and include transit through the STEER. Christmas Cove is a major destination, prior to charters leaving the STEER area for St. John or the BVI.

Term charter boat tours



- General Use Footprint
- Dominant Use Area
- STEER Boundary

0 0.5 1 Kilometers



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012



Thrill craft and high speed activities

Includes parasailing, jet skis and other forms of thrill craft rental. Excludes non-motorized vessels. Many thrill craft activities are occasional uses of the STEER area. Jet ski use occurs from private homes and yachts, as well as from hotels and resorts outside the STEER where rentals are available. There is uncertainty among locals about the legality of jet skis in various parts of the STEER. Wakeboarding and waterskiing also occur in Christmas Cove. There is a parasail operation out of Saga Haven Marina, but the STEER is only used for transit out to Pillsbury Sound where the parasailing takes place. 'Cigarette boats' are used throughout the STEER area along ferry transit routes.

Thrill craft and high speed activities



- General Use Footprint
- Dominant Use Area
- STEER Boundary



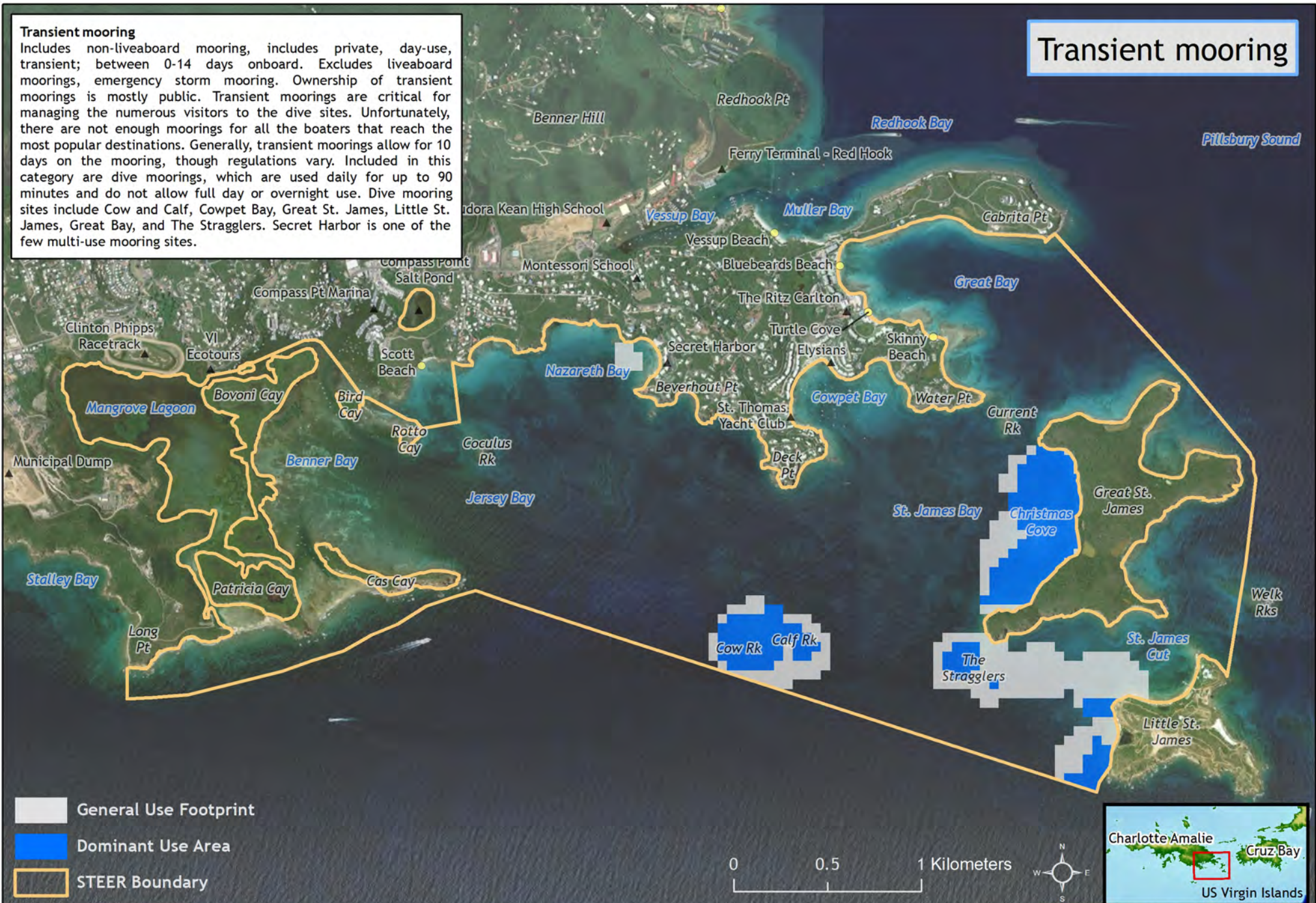
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Transient mooring

Includes non-liveaboard mooring, includes private, day-use, transient; between 0-14 days onboard. Excludes liveaboard moorings, emergency storm mooring. Ownership of transient moorings is mostly public. Transient moorings are critical for managing the numerous visitors to the dive sites. Unfortunately, there are not enough moorings for all the boaters that reach the most popular destinations. Generally, transient moorings allow for 10 days on the mooring, though regulations vary. Included in this category are dive moorings, which are used daily for up to 90 minutes and do not allow full day or overnight use. Dive mooring sites include Cow and Calf, Cowpet Bay, Great St. James, Little St. James, Great Bay, and The Stragglers. Secret Harbor is one of the few multi-use mooring sites.

Transient mooring



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

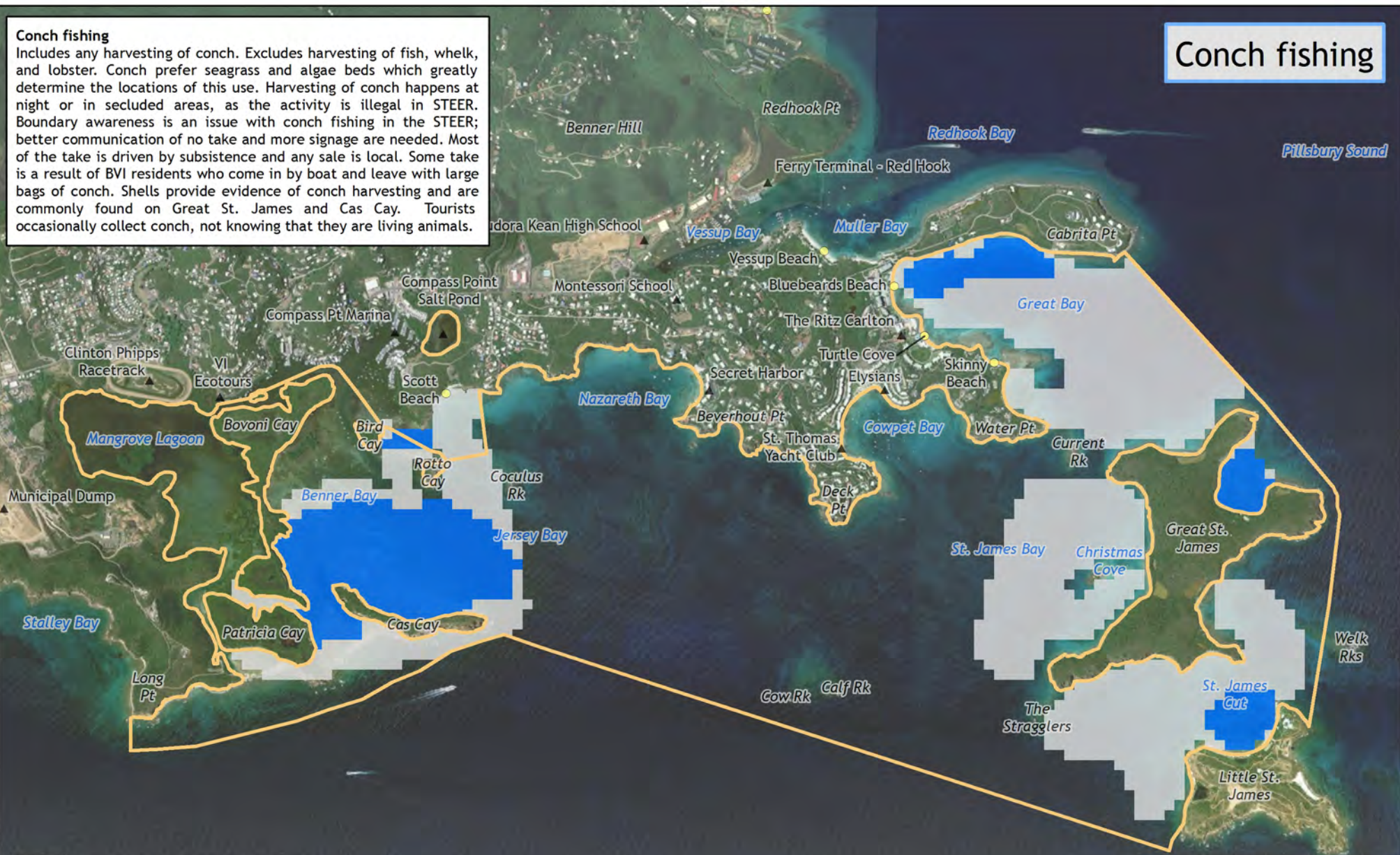
Extractive Uses



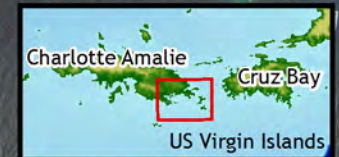
Conch fishing

Includes any harvesting of conch. Excludes harvesting of fish, whelk, and lobster. Conch prefer seagrass and algae beds which greatly determine the locations of this use. Harvesting of conch happens at night or in secluded areas, as the activity is illegal in STEER. Boundary awareness is an issue with conch harvesting in the STEER; better communication of no take and more signage are needed. Most of the take is driven by subsistence and any sale is local. Some take is a result of BVI residents who come in by boat and leave with large bags of conch. Shells provide evidence of conch harvesting and are commonly found on Great St. James and Cas Cay. Tourists occasionally collect conch, not knowing that they are living animals.

Conch fishing



- General Use Footprint
- Dominant Use Area
- STEER Boundary



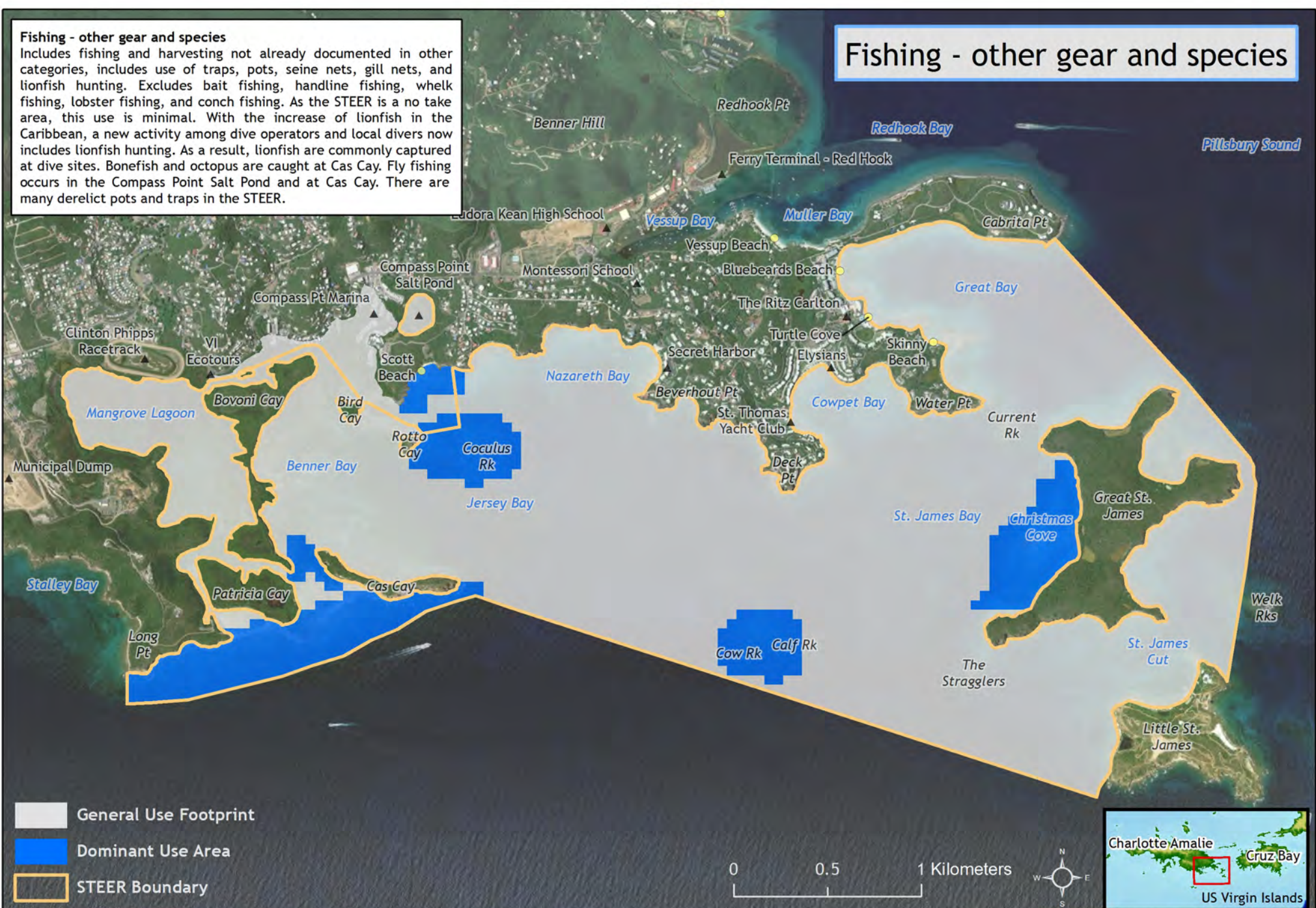
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Fishing - other gear and species

Includes fishing and harvesting not already documented in other categories, includes use of traps, pots, seine nets, gill nets, and lionfish hunting. Excludes bait fishing, handline fishing, whelk fishing, lobster fishing, and conch fishing. As the STEER is a no take area, this use is minimal. With the increase of lionfish in the Caribbean, a new activity among dive operators and local divers now includes lionfish hunting. As a result, lionfish are commonly captured at dive sites. Bonefish and octopus are caught at Cas Cay. Fly fishing occurs in the Compass Point Salt Pond and at Cas Cay. There are many derelict pots and traps in the STEER.

Fishing - other gear and species



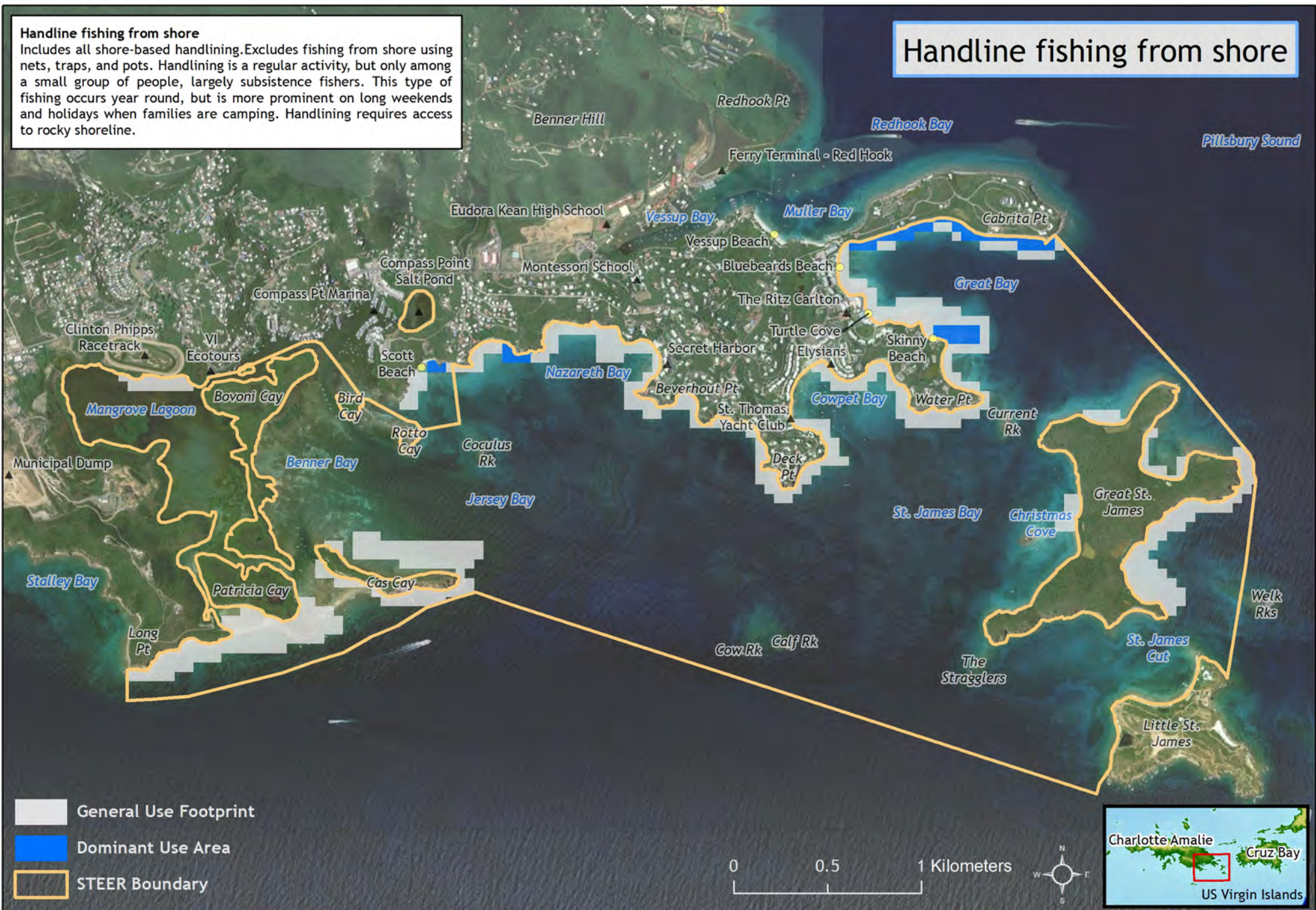
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Handline fishing from shore

Includes all shore-based handlining. Excludes fishing from shore using nets, traps, and pots. Handlining is a regular activity, but only among a small group of people, largely subsistence fishers. This type of fishing occurs year round, but is more prominent on long weekends and holidays when families are camping. Handlining requires access to rocky shoreline.

Handline fishing from shore



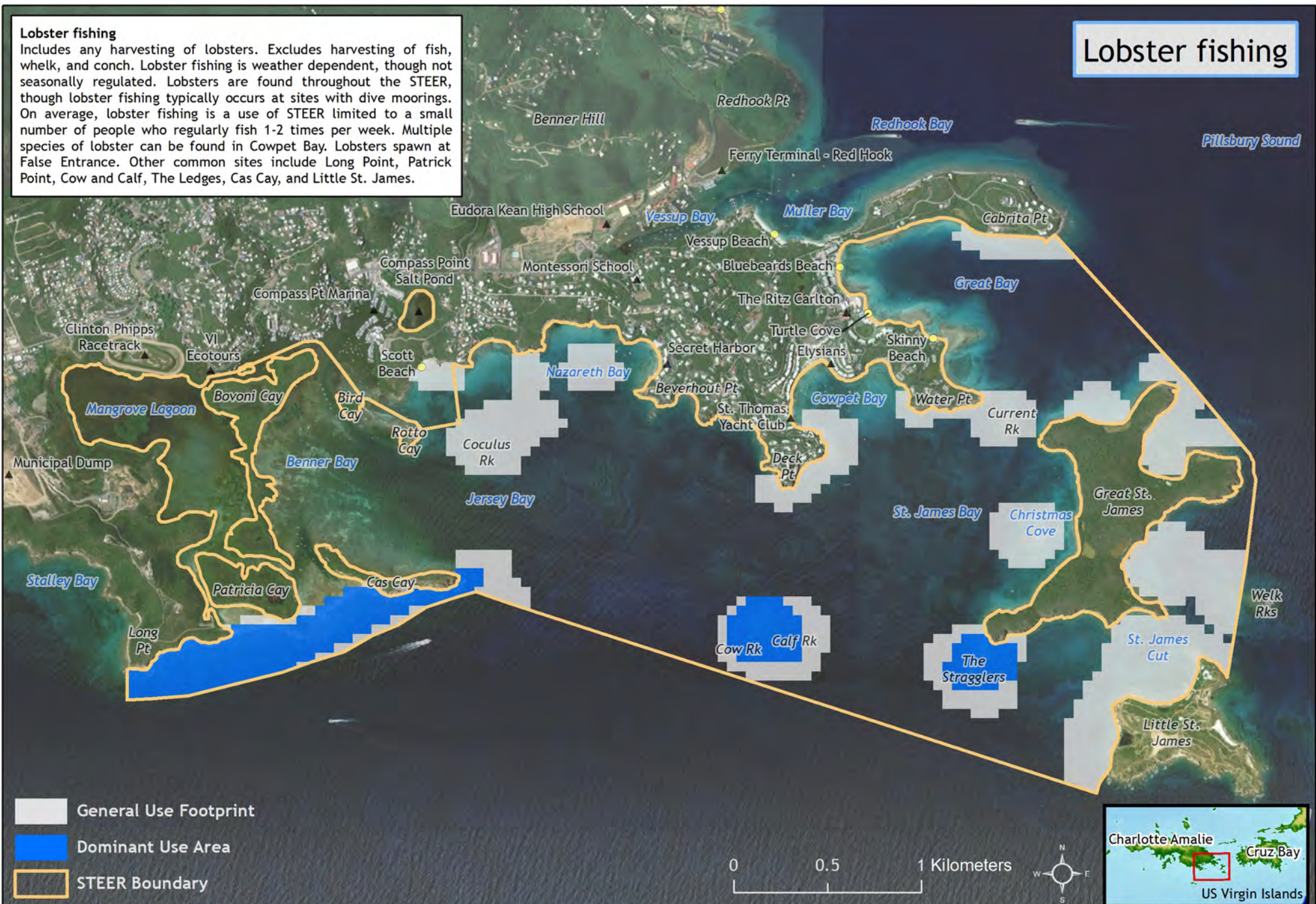
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Lobster fishing

Includes any harvesting of lobsters. Excludes harvesting of fish, whelk, and conch. Lobster fishing is weather dependent, though not seasonally regulated. Lobsters are found throughout the STEER, though lobster fishing typically occurs at sites with dive moorings. On average, lobster fishing is a use of STEER limited to a small number of people who regularly fish 1-2 times per week. Multiple species of lobster can be found in Cowpet Bay. Lobsters spawn at False Entrance. Other common sites include Long Point, Patrick Point, Cow and Calf, The Ledges, Cas Cay, and Little St. James.

Lobster fishing



- General Use Footprint
- Dominant Use Area
- STEER Boundary



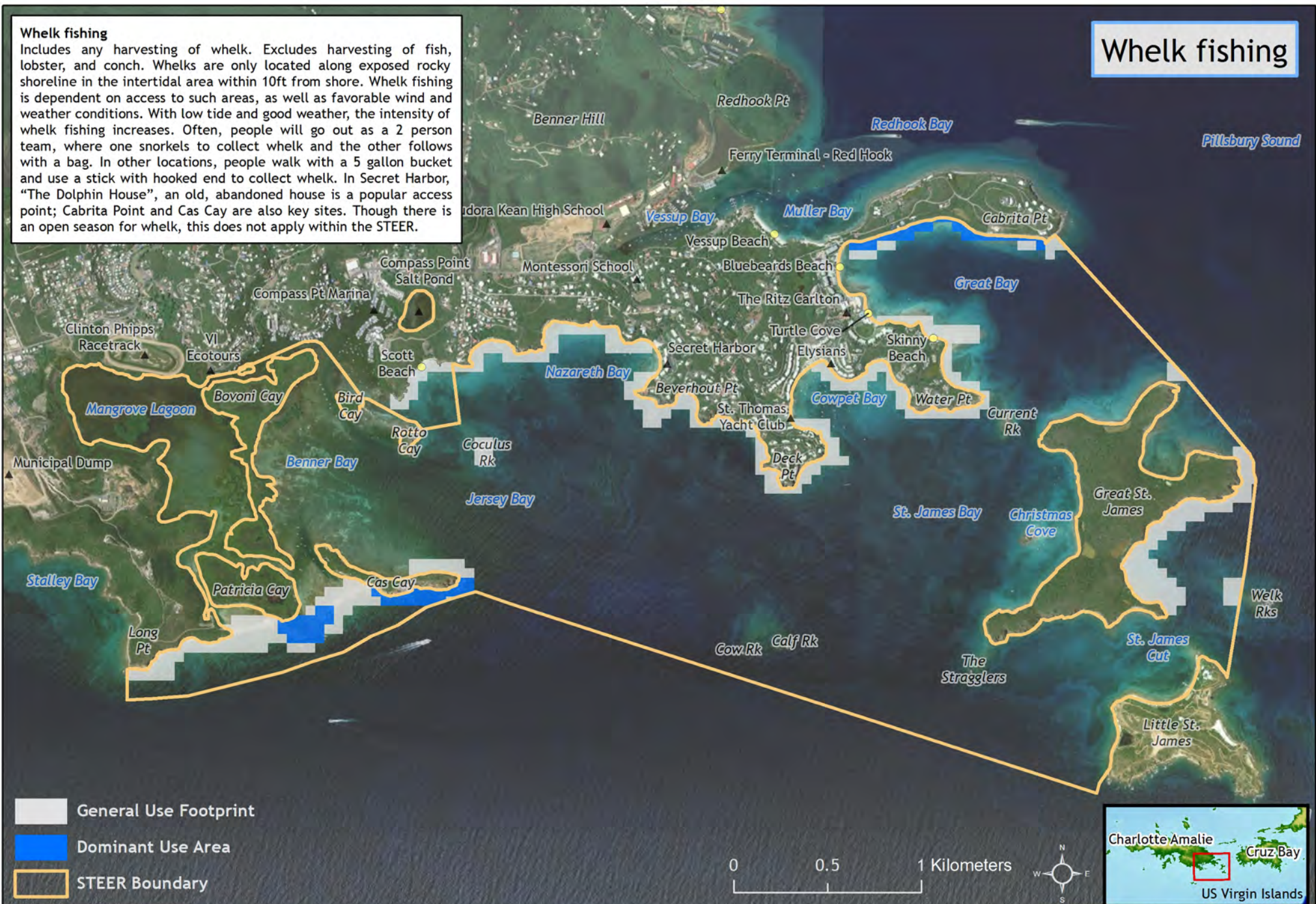
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Whelk fishing

Includes any harvesting of whelk. Excludes harvesting of fish, lobster, and conch. Whelks are only located along exposed rocky shoreline in the intertidal area within 10ft from shore. Whelk fishing is dependent on access to such areas, as well as favorable wind and weather conditions. With low tide and good weather, the intensity of whelk fishing increases. Often, people will go out as a 2 person team, where one snorkels to collect whelk and the other follows with a bag. In other locations, people walk with a 5 gallon bucket and use a stick with hooked end to collect whelk. In Secret Harbor, "The Dolphin House", an old, abandoned house is a popular access point; Cabrita Point and Cas Cay are also key sites. Though there is an open season for whelk, this does not apply within the STEER.

Whelk fishing



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

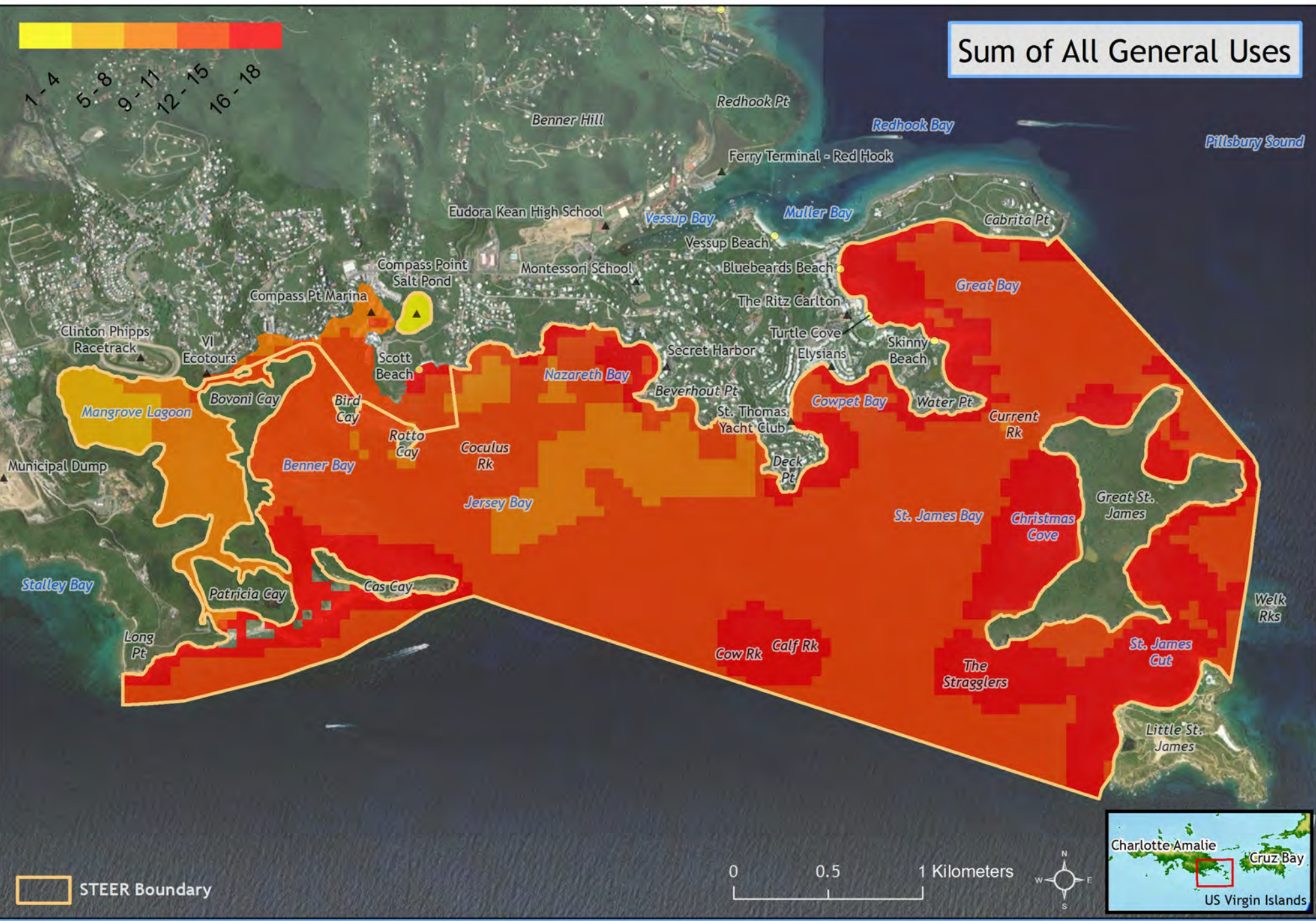
Date: 11/19/2012

STEER Coastal Uses Mapping Project

Heat Maps - All Uses



Sum of All General Uses



STEER Boundary

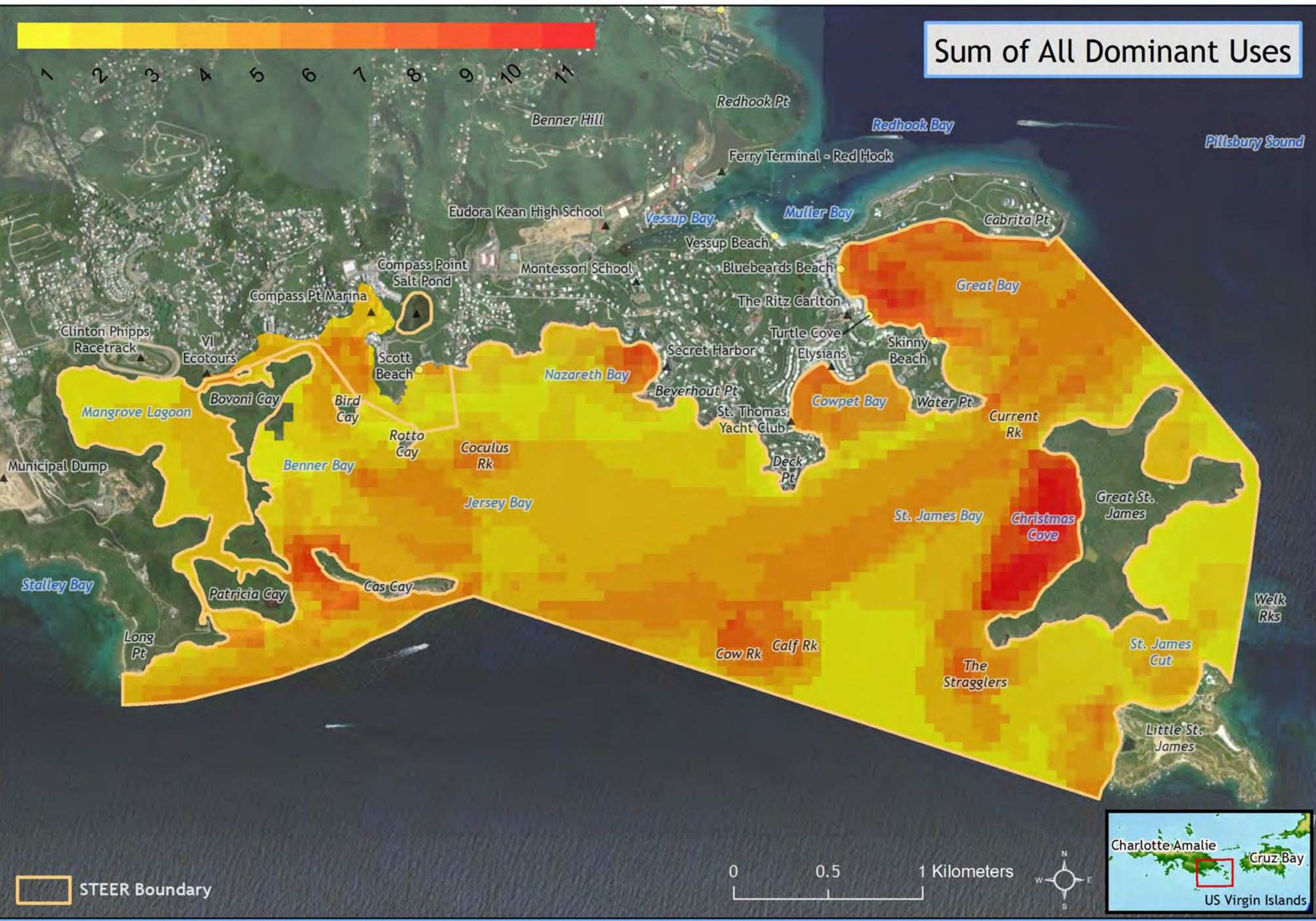
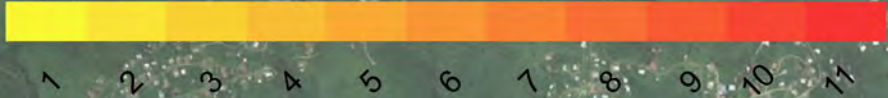
0 0.5 1 Kilometers



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/16/2012

Sum of All Dominant Uses



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/16/2012

St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

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St. Thomas, USVI

May 22-23, 2012



November 2012



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Generalized Workshop Process

At the start of the workshop, all participants were assigned to a work group and an associated mapping station. With guidance from the facilitators, participants were asked to draw use

areas based on their knowledge of where this type of activity is known to occur. Each use was explicitly defined (see uses list) and participants were asked to map the general use footprint and dominant use areas, as described below. For some uses, additional areas were drawn to document seasonality, pulse events, temporal variability (day/night) and species-specific use areas. Participants also provided relevant supplemental information on uses (e.g., seasonality, social and cultural significance, historical patterns) that was compiled and added to the final use maps.

- **General Use Footprint** : The general use footprint includes all areas in which the use is *known to occur with some regularity* (over the past 3-5 years), regardless of its frequency or intensity. The general use footprint does not include areas where the use may occur once or twice or where it might *conceivably* occur now or in the future. For this step, all areas drawn will be included in the final data layer.
- **Dominant Use Areas**: Dominant use areas are defined as *ocean areas routinely used by most users most of the time* (within the seasonal patterns for that use). Dominant use areas must be drawn within the general use footprint. Participants worked together to draw dominant use areas as they occur throughout the study region. This step was designed as a group exercise and participants should work together to agree on which areas are dominant use areas and should be included in the final data layer.
- **Supplemental Use Data**: Participants were also asked to provide supplemental information on use patterns both spatially (on the map) and as additional notes collected after the workshop.

Maps

Data compiled during the workshop were processed to create maps documenting the use patterns as drawn by the workshop participants. The following maps show patterns for each use mapped in the workshops and include the general use footprint and dominant use areas, as well as a compilation of the supplemental data provided by participants throughout the mapping process. After initial data processing was completed, draft maps were presented for review to workshop participants and other interested stakeholders.

Contacts

For questions regarding this project or the derived products, please contact either:

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STEER Coastal Uses Mapping Project – St Thomas, US Virgin Islands

NON-EXTRACTIVE ACTIVITIES FOR PARTICIPATORY MAPPING		
Use type	Includes	Excludes
Charter diving and snorkeling	Diving and snorkeling activities organized through a charter/commercial operator, including vessel and shore-based SCUBA, SNUBA, snorkel, freediving, kayak snorkel tours	Swimming, speardiving/extractive activities, non-charter diving and snorkeling, research activities
Non-charter diving and snorkeling	Diving and snorkeling conducted independently, not through a charter operator, snorkel rental from hotels, local resident diving and snorkeling	Charter diving and snorkeling trips
Day charter boat tours	Includes sunset sails, day trip, half day, dinghy tours	Recreational boating of personal vessels, multi-day outings
Term charter boat tours	Multi-day/overnight boat charters	Day charter, sunset sails, half-day outings, dinghy tours, recreational boating of personal vessels
Recreational boating	Recreational non-charter boating (e.g. Yacht Club, Ritz, other), sail or motor boats	Charter boat tours
Thrill craft and high speed activities	Parasailing, jet skis and other forms of thrill craft rental	Non-motorized vessels
Mooring	Non-liveaboard mooring, includes private, day-use, transient	Liveaboard moorings, emergency storm mooring
Liveaboard mooring	Multi-day use for liveaboard boaters	Day use mooring, emergency storm mooring
Anchoring	Anchoring in non-emergency locations	Emergency storm anchoring and moorings
Emergency (storm) anchoring and mooring	Anchoring during extreme weather	Day use mooring, liveaboard moorings, non-emergency anchoring
Paddling	Paddle- driven kayaking (non-commercial tours), SUP (stand up paddle)	Charter/commercial kayaking; use of motorized vessels
Kayak tours	Commercial kayak tours	Non-commercial kayak outings, kayak rental (non-tour)
Kite boarding and wind-surfing	Wind-driven board activities	SUP (stand up paddle), surfing
Ferry transit	Ferry transit	Non-ferry motorized and other boating
Swimming	Racing, general exercise, group or individual, triathlon	Free diving, snorkeling, wading
Camping	Spending one or several nights outdoors for recreational purposes	Liveaboard boaters, living outdoors due to homelessness

EXTRACTIVE ACTIVITIES FOR PARTICIPATORY MAPPING

Use type	Includes	Excludes
Bait fishing	Any collection of baitfish, includes fishing by hook and line and cast net	Other types of fishing targeting fish for non-bait purposes (e.g., aquarium collection)
Handline fishing from shore	All shore-based handlining	Fishing from shore using nets, traps, and pots
Whelk fishing	Any harvesting of whelk	Harvesting of fish, lobster, conch
Lobster fishing	Any harvesting of lobster	Harvesting of fish, whelk, conch
Conch fishing	Any harvesting of conch	Harvesting of fish, whelk, lobster
Other fishing and marine resource harvesting	Fishing and marine resource harvesting not already documented in other categories, includes use of traps, pots, seine nets, gill nets, and lionfish hunting	Bait fishing, handline fishing, whelk fishing, lobster fishing, conch fishing

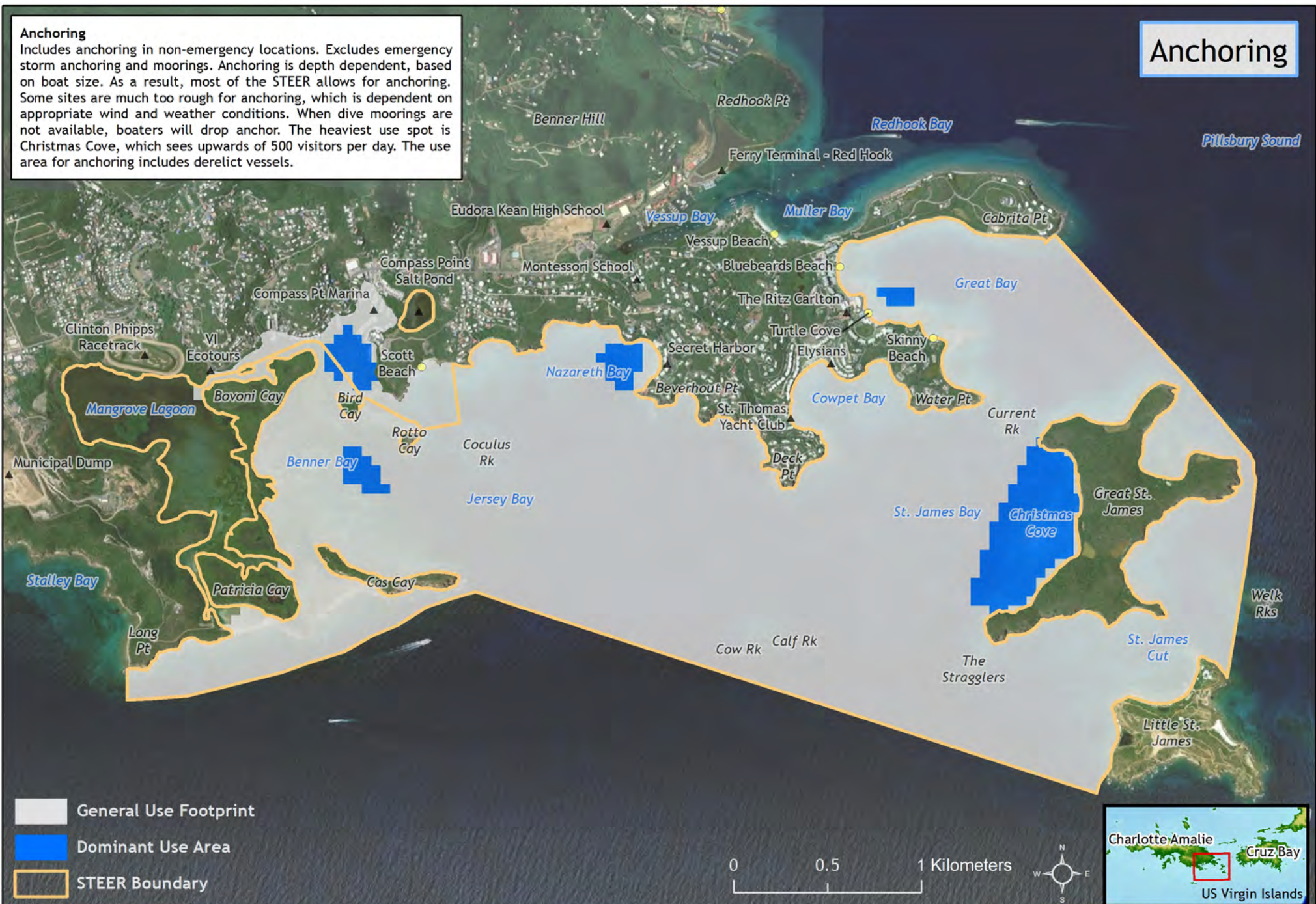
Non-Extractive Uses



Anchoring

Includes anchoring in non-emergency locations. Excludes emergency storm anchoring and moorings. Anchoring is depth dependent, based on boat size. As a result, most of the STEER allows for anchoring. Some sites are much too rough for anchoring, which is dependent on appropriate wind and weather conditions. When dive moorings are not available, boaters will drop anchor. The heaviest use spot is Christmas Cove, which sees upwards of 500 visitors per day. The use area for anchoring includes derelict vessels.

Anchoring



- General Use Footprint
- Dominant Use Area
- STEER Boundary

0 0.5 1 Kilometers



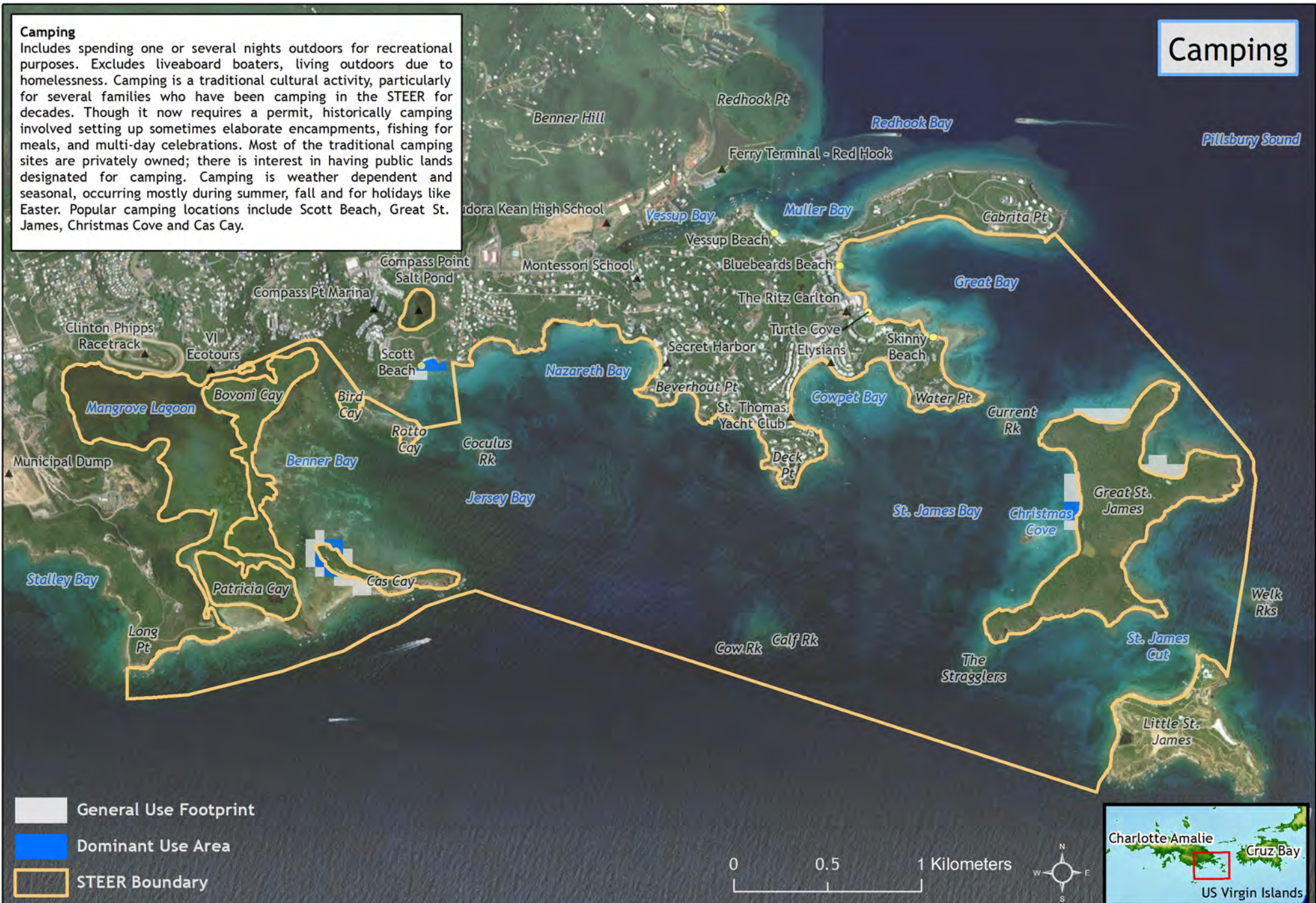
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Camping

Includes spending one or several nights outdoors for recreational purposes. Excludes liveaboard boaters, living outdoors due to homelessness. Camping is a traditional cultural activity, particularly for several families who have been camping in the STEER for decades. Though it now requires a permit, historically camping involved setting up sometimes elaborate encampments, fishing for meals, and multi-day celebrations. Most of the traditional camping sites are privately owned; there is interest in having public lands designated for camping. Camping is weather dependent and seasonal, occurring mostly during summer, fall and for holidays like Easter. Popular camping locations include Scott Beach, Great St. James, Christmas Cove and Cas Cay.

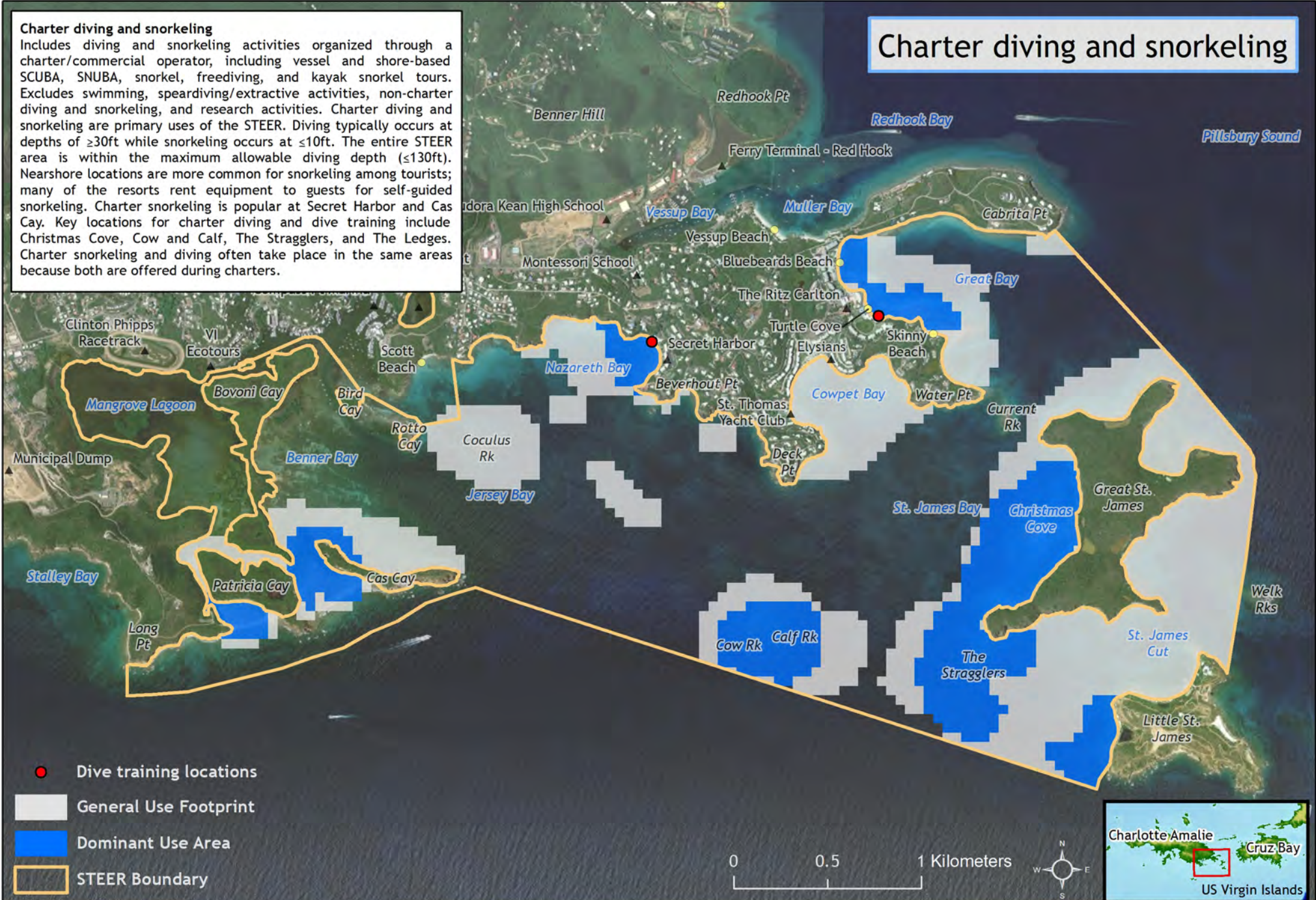
Camping



Charter diving and snorkeling

Includes diving and snorkeling activities organized through a charter/commercial operator, including vessel and shore-based SCUBA, SNUBA, snorkel, freediving, and kayak snorkel tours. Excludes swimming, spearfishing/extractive activities, non-charter diving and snorkeling, and research activities. Charter diving and snorkeling are primary uses of the STEER. Diving typically occurs at depths of $\geq 30\text{ft}$ while snorkeling occurs at $\leq 10\text{ft}$. The entire STEER area is within the maximum allowable diving depth ($\leq 130\text{ft}$). Nearshore locations are more common for snorkeling among tourists; many of the resorts rent equipment to guests for self-guided snorkeling. Charter snorkeling is popular at Secret Harbor and Cas Cay. Key locations for charter diving and dive training include Christmas Cove, Cow and Calf, The Stragglers, and The Ledges. Charter snorkeling and diving often take place in the same areas because both are offered during charters.

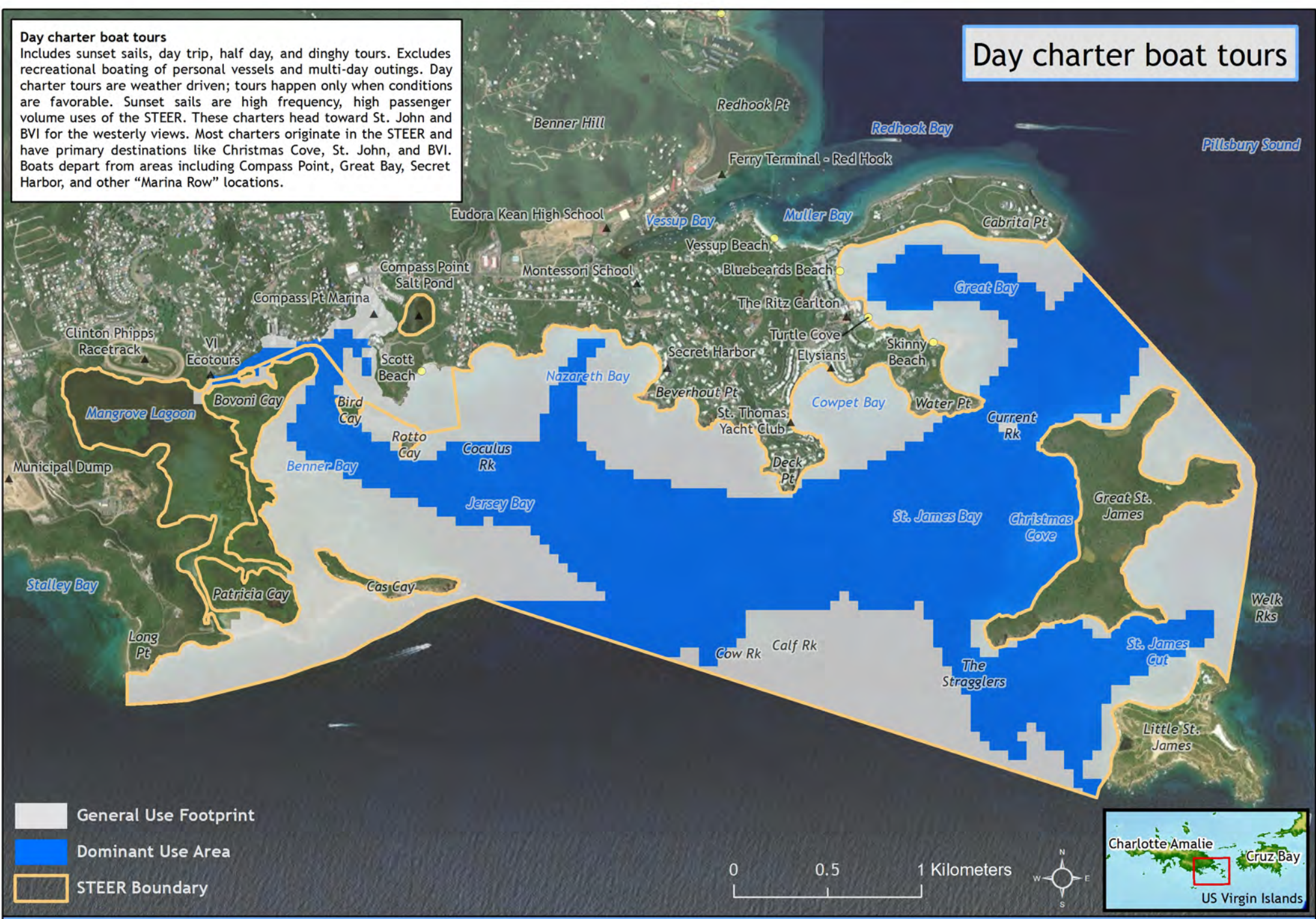
Charter diving and snorkeling



Day charter boat tours

Includes sunset sails, day trip, half day, and dinghy tours. Excludes recreational boating of personal vessels and multi-day outings. Day charter tours are weather driven; tours happen only when conditions are favorable. Sunset sails are high frequency, high passenger volume uses of the STEER. These charters head toward St. John and BVI for the westerly views. Most charters originate in the STEER and have primary destinations like Christmas Cove, St. John, and BVI. Boats depart from areas including Compass Point, Great Bay, Secret Harbor, and other "Marina Row" locations.

Day charter boat tours



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Ferry transit

Includes ferry transit. Excludes non-ferry motorized and other boating. Ferry transit is a high use of the STEER. The middle route has heavy traffic, with some ferries heading to Tortola and some to Charlotte Amalie. Along the southern end of STEER, the ferries tend to stay straight (i.e., close to shore); however, transit routes can be weather dependent. Larger ferries typically go to the east and smaller to the west. The high traffic routes lead to conflict between novice boaters and ferries, particularly dangerous at night. Ferry speed and routes that go too close to shore (i.e., within 100-150ft) have led to safety concerns for recreational boaters. Groundings are an issue, as well as coral struck by ferries that come too close to reefs. In July 2011, the Royal Miss Belmar Ferry ran aground on Great St. James.

Ferry transit



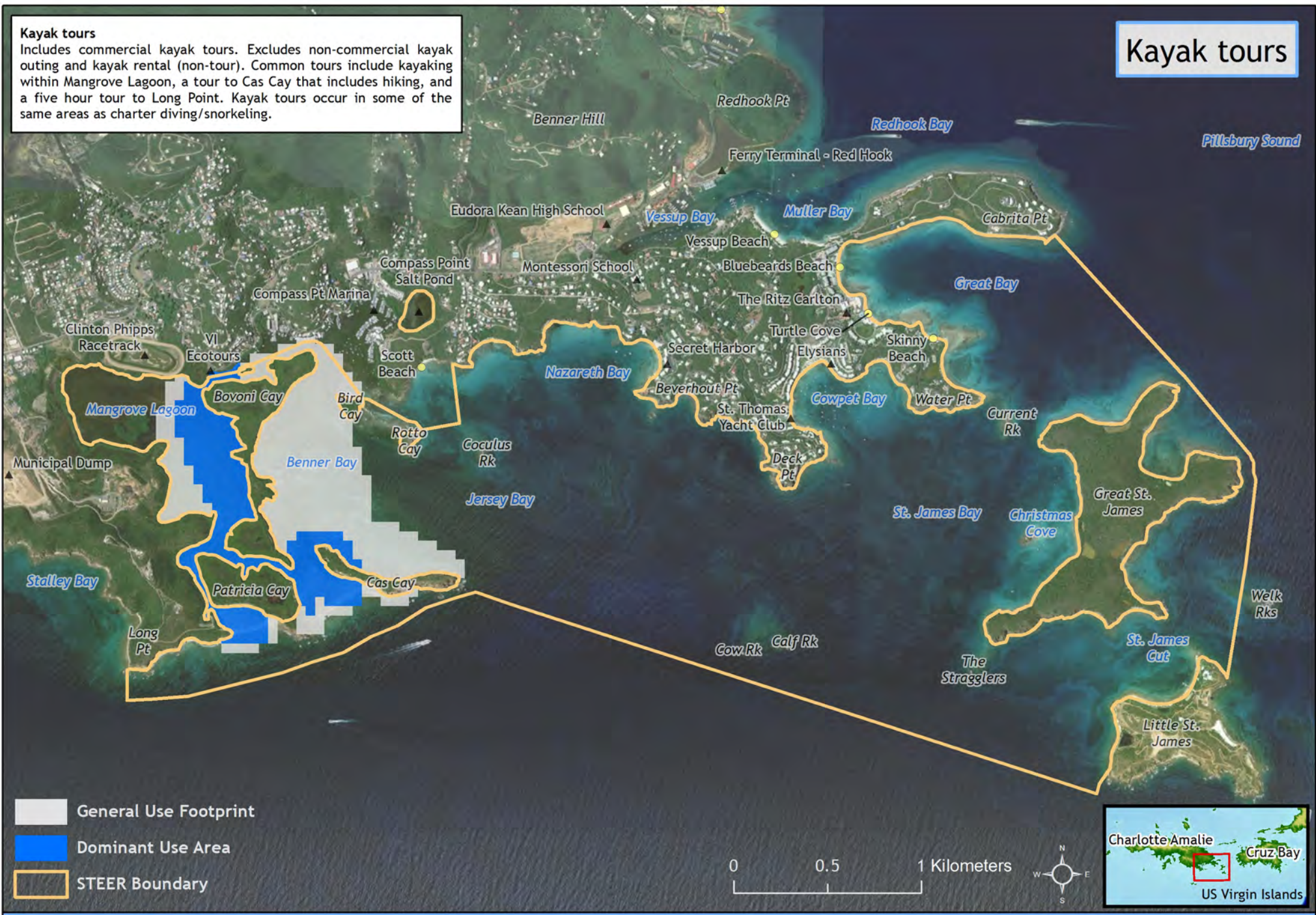
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

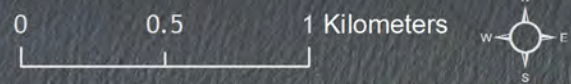
Kayak tours

Includes commercial kayak tours. Excludes non-commercial kayak outing and kayak rental (non-tour). Common tours include kayaking within Mangrove Lagoon, a tour to Cas Cay that includes hiking, and a five hour tour to Long Point. Kayak tours occur in some of the same areas as charter diving/snorkeling.

Kayak tours



- General Use Footprint
- Dominant Use Area
- STEER Boundary



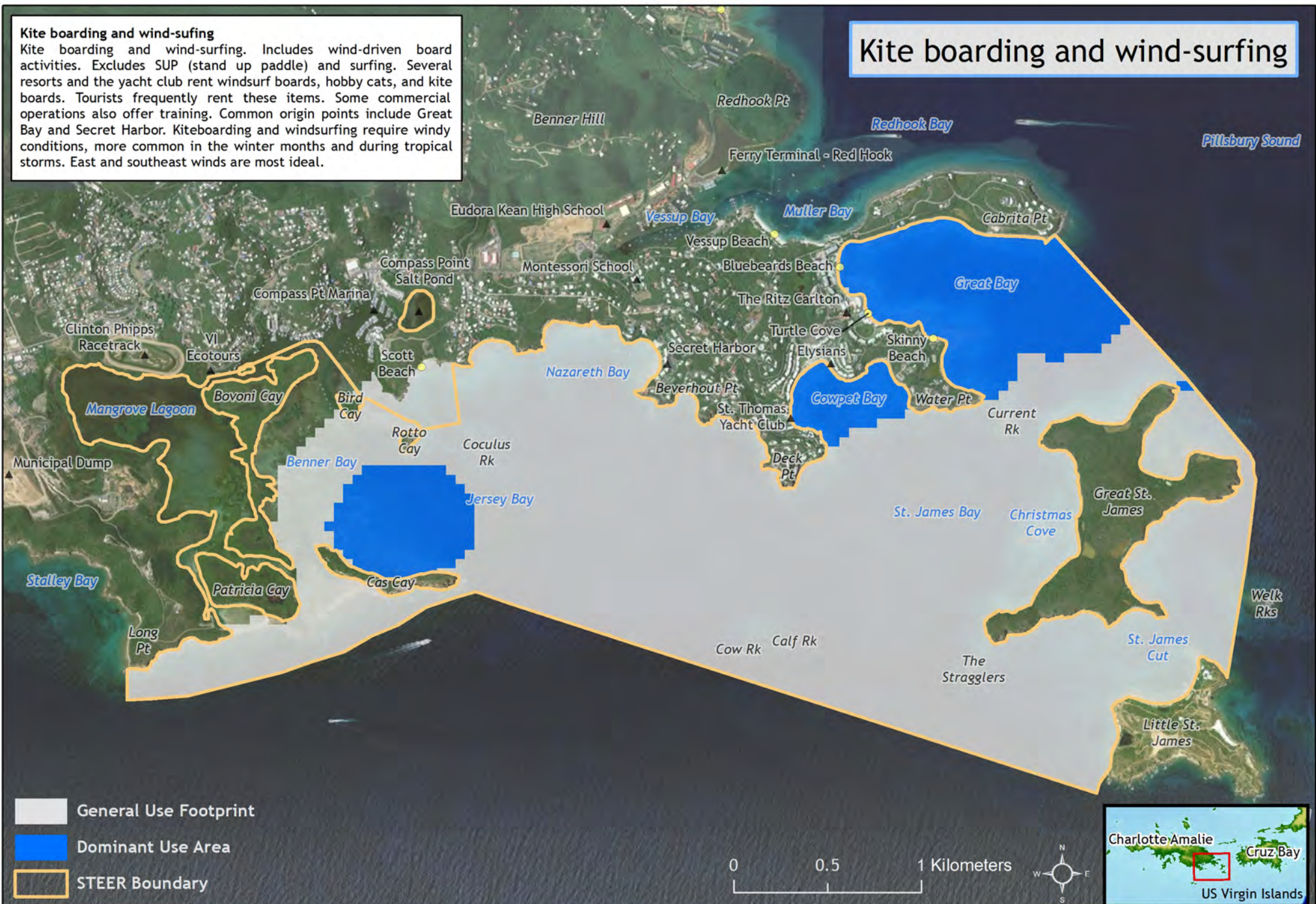
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Kite boarding and wind-sufing

Kite boarding and wind-surfing. Includes wind-driven board activities. Excludes SUP (stand up paddle) and surfing. Several resorts and the yacht club rent windsurf boards, hobby cats, and kite boards. Tourists frequently rent these items. Some commercial operations also offer training. Common origin points include Great Bay and Secret Harbor. Kiteboarding and windsurfing require windy conditions, more common in the winter months and during tropical storms. East and southeast winds are most ideal.

Kite boarding and wind-surfing



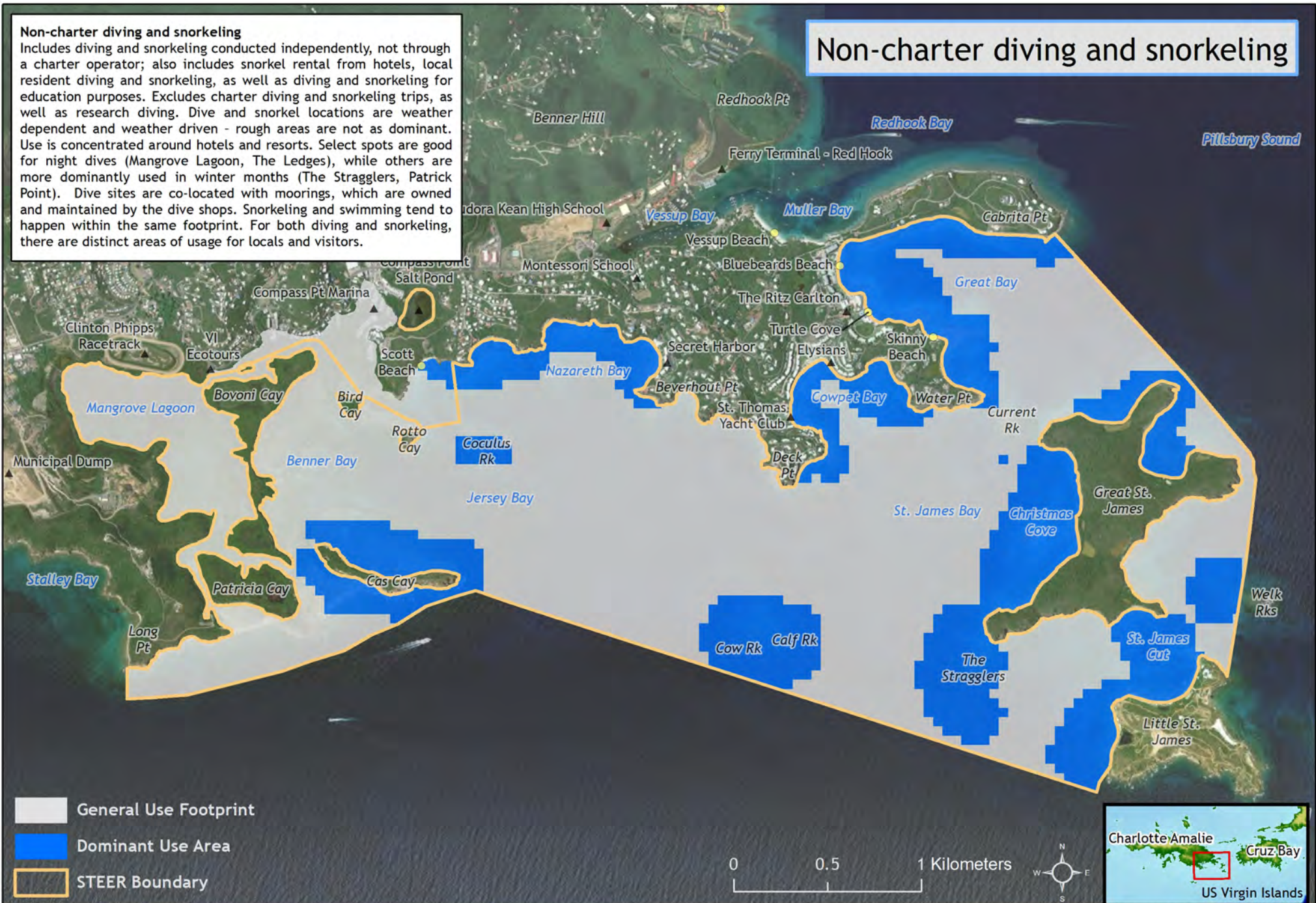
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Non-charter diving and snorkeling

Includes diving and snorkeling conducted independently, not through a charter operator; also includes snorkel rental from hotels, local resident diving and snorkeling, as well as diving and snorkeling for education purposes. Excludes charter diving and snorkeling trips, as well as research diving. Dive and snorkel locations are weather dependent and weather driven - rough areas are not as dominant. Use is concentrated around hotels and resorts. Select spots are good for night dives (Mangrove Lagoon, The Ledges), while others are more dominantly used in winter months (The Stragglers, Patrick Point). Dive sites are co-located with moorings, which are owned and maintained by the dive shops. Snorkeling and swimming tend to happen within the same footprint. For both diving and snorkeling, there are distinct areas of usage for locals and visitors.

Non-charter diving and snorkeling

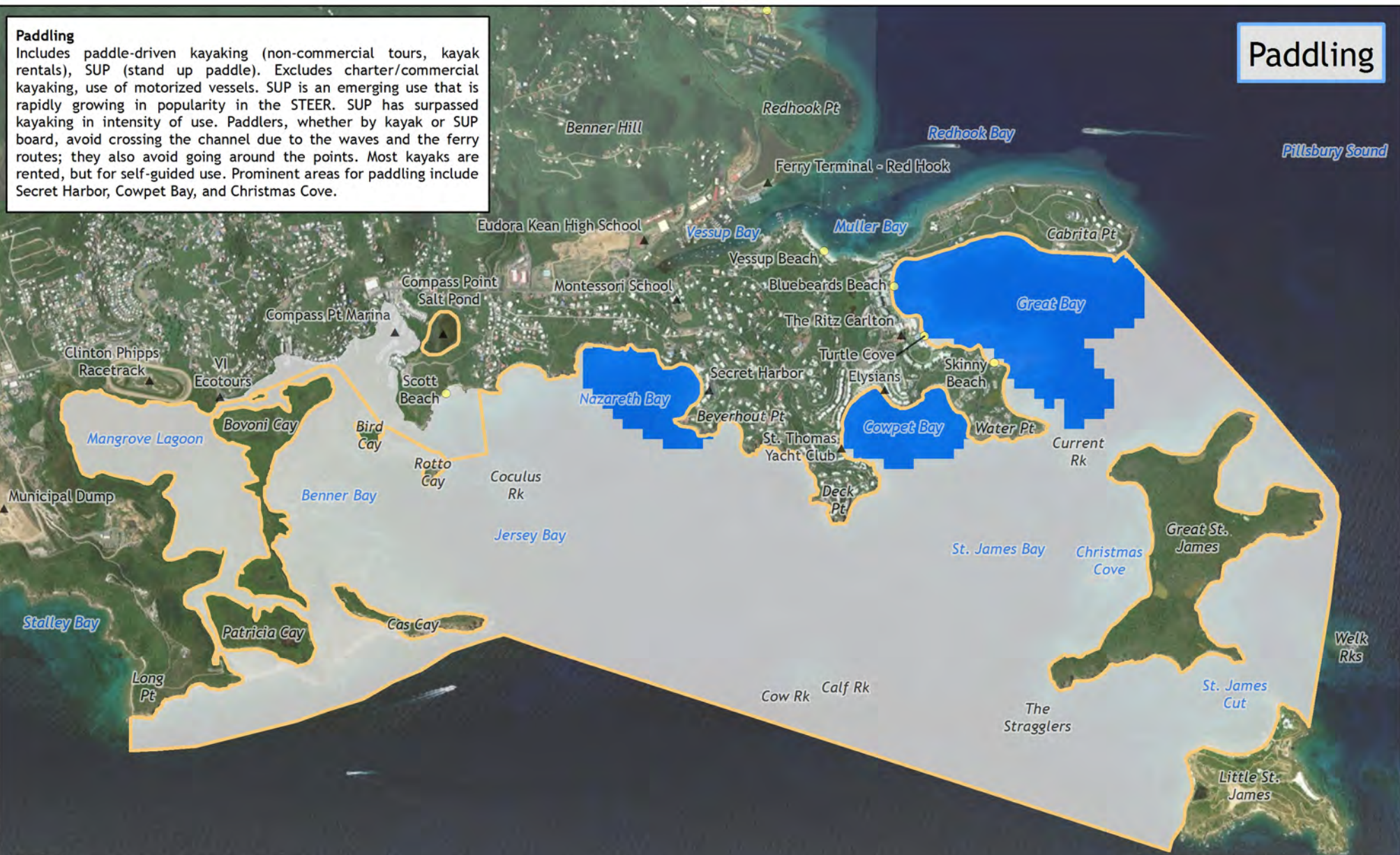


St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

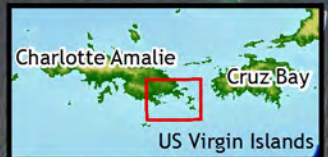
Date: 11/19/2012

Padding

Padding
 Includes paddle-driven kayaking (non-commercial tours, kayak rentals), SUP (stand up paddle). Excludes charter/commercial kayaking, use of motorized vessels. SUP is an emerging use that is rapidly growing in popularity in the STEER. SUP has surpassed kayaking in intensity of use. Paddlers, whether by kayak or SUP board, avoid crossing the channel due to the waves and the ferry routes; they also avoid going around the points. Most kayaks are rented, but for self-guided use. Prominent areas for paddling include Secret Harbor, Cowpet Bay, and Christmas Cove.



- General Use Footprint
- Dominant Use Area
- STEER Boundary



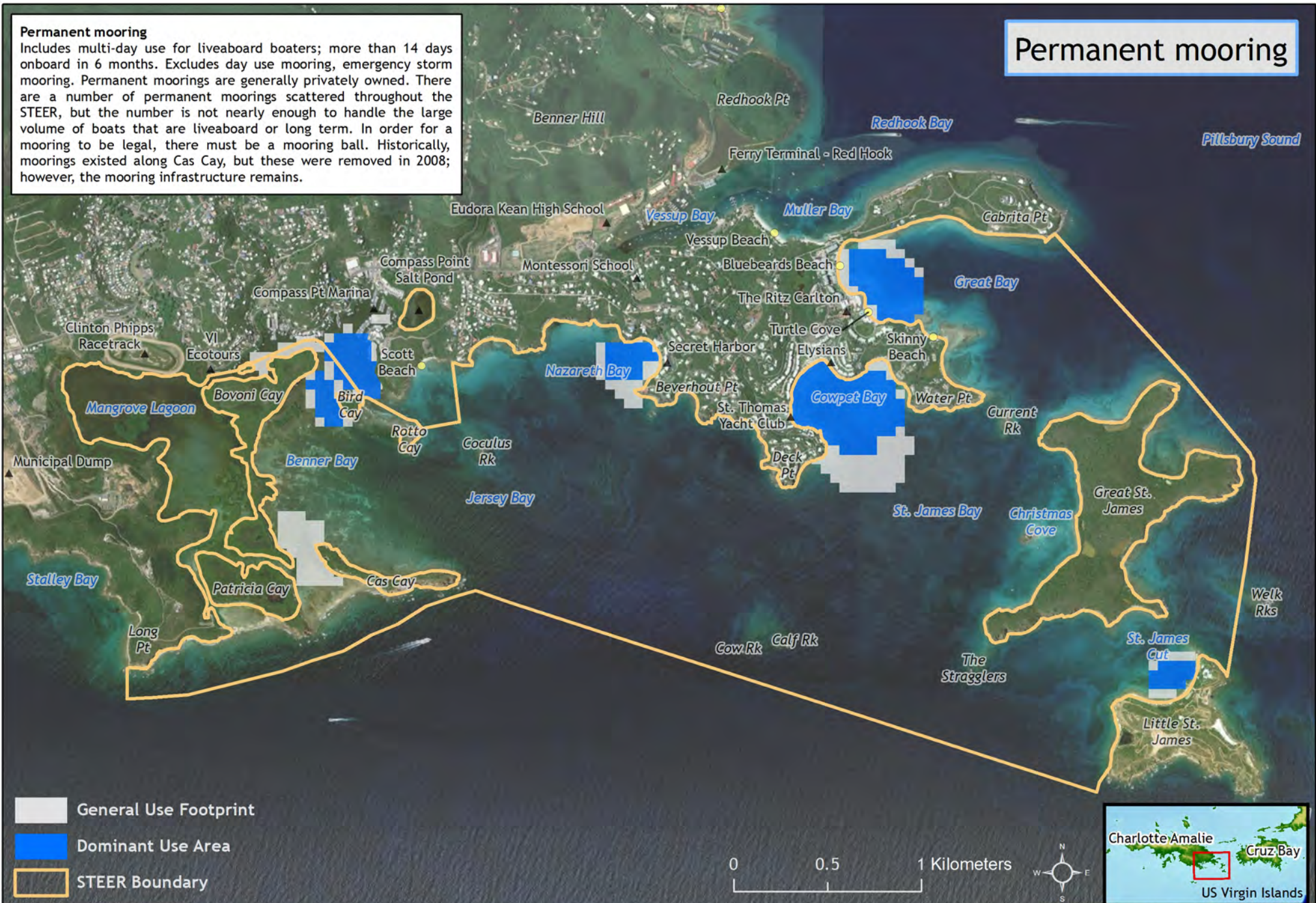
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Permanent mooring

Includes multi-day use for liveaboard boaters; more than 14 days onboard in 6 months. Excludes day use mooring, emergency storm mooring. Permanent moorings are generally privately owned. There are a number of permanent moorings scattered throughout the STEER, but the number is not nearly enough to handle the large volume of boats that are liveaboard or long term. In order for a mooring to be legal, there must be a mooring ball. Historically, moorings existed along Cas Cay, but these were removed in 2008; however, the mooring infrastructure remains.

Permanent mooring



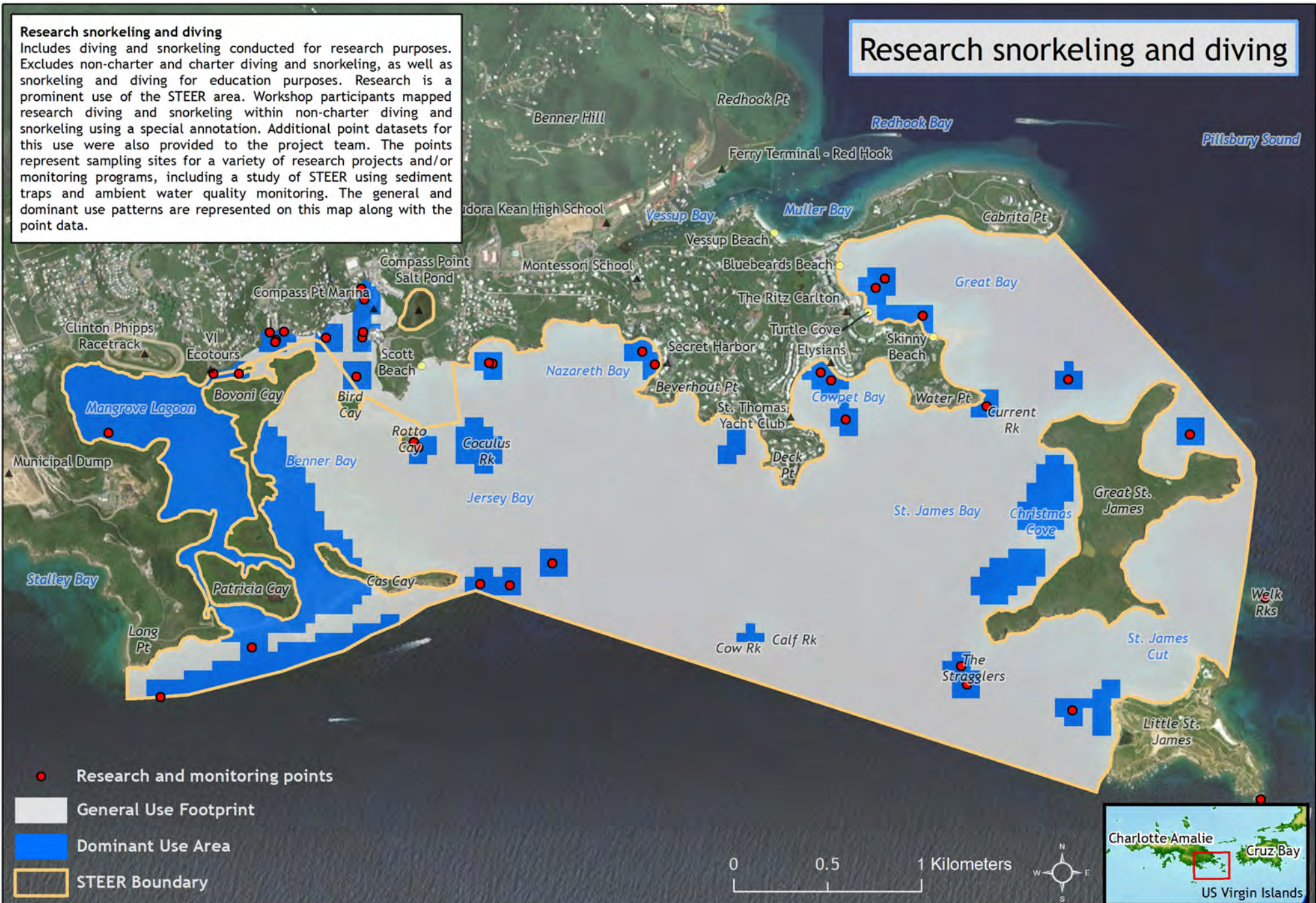
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Research snorkeling and diving

Includes diving and snorkeling conducted for research purposes. Excludes non-charter and charter diving and snorkeling, as well as snorkeling and diving for education purposes. Research is a prominent use of the STEER area. Workshop participants mapped research diving and snorkeling within non-charter diving and snorkeling using a special annotation. Additional point datasets for this use were also provided to the project team. The points represent sampling sites for a variety of research projects and/or monitoring programs, including a study of STEER using sediment traps and ambient water quality monitoring. The general and dominant use patterns are represented on this map along with the point data.

Research snorkeling and diving



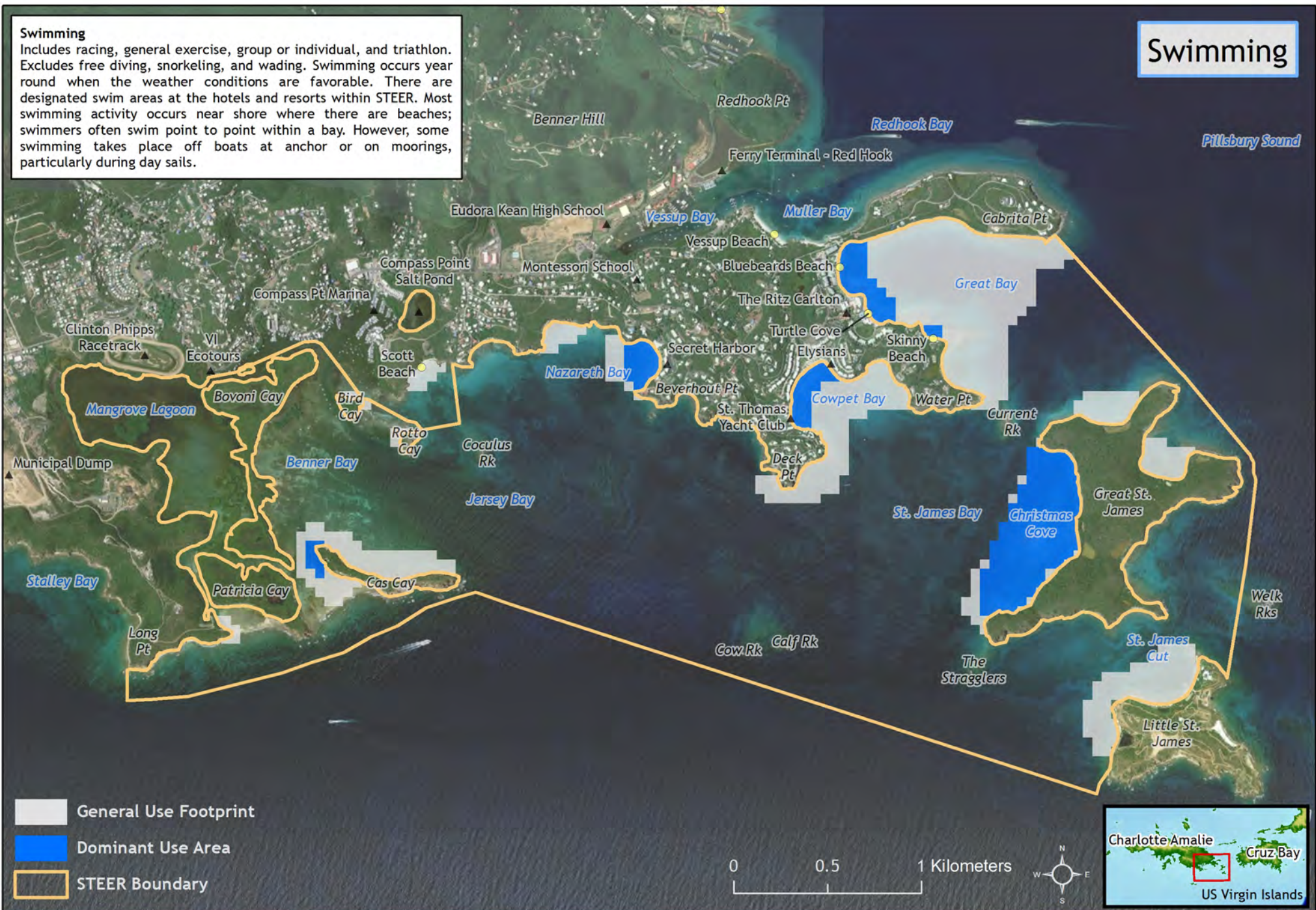
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Swimming

Includes racing, general exercise, group or individual, and triathlon. Excludes free diving, snorkeling, and wading. Swimming occurs year round when the weather conditions are favorable. There are designated swim areas at the hotels and resorts within STEER. Most swimming activity occurs near shore where there are beaches; swimmers often swim point to point within a bay. However, some swimming takes place off boats at anchor or on moorings, particularly during day sails.

Swimming



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

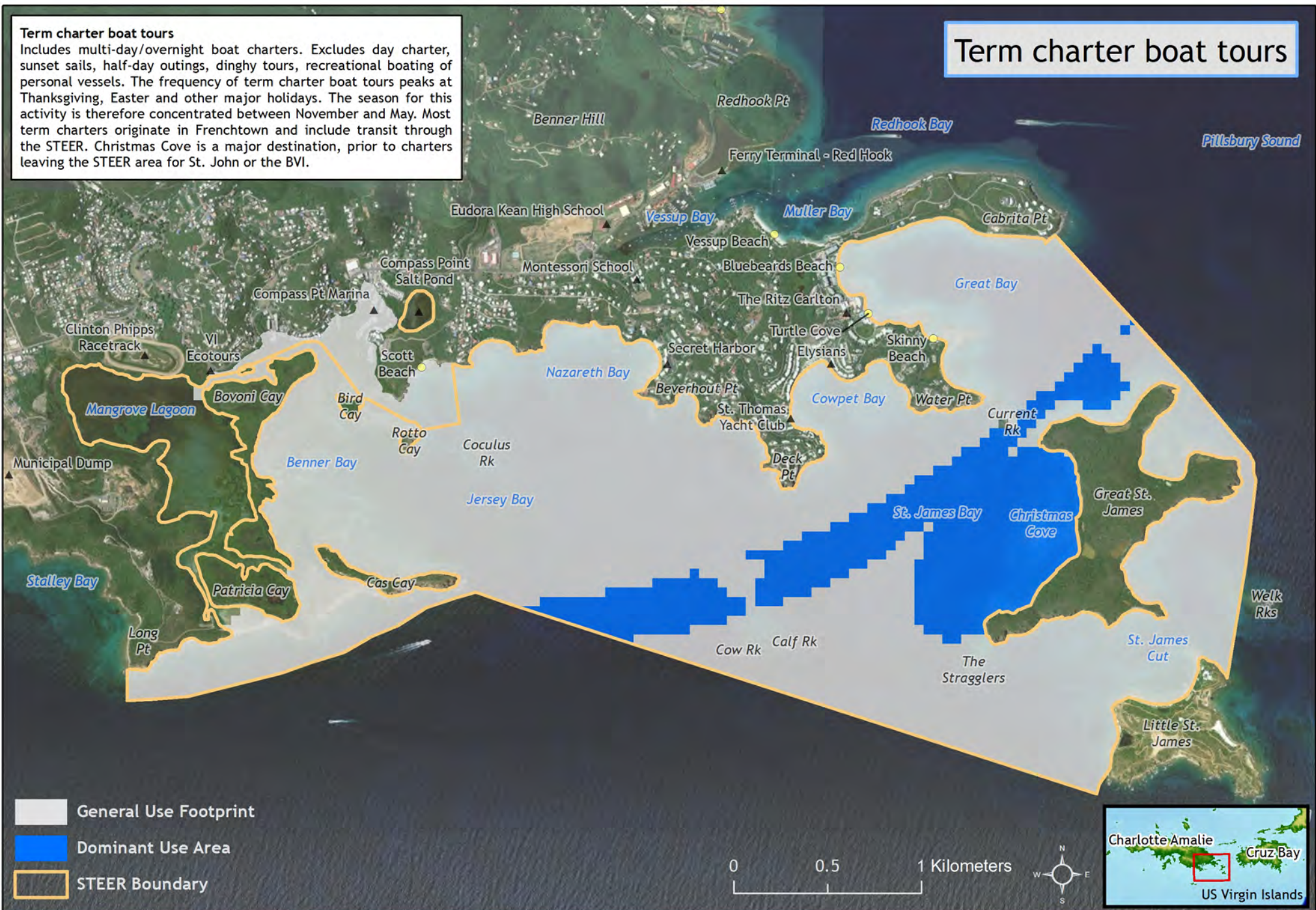
Date: 11/19/2012



Term charter boat tours

Includes multi-day/overnight boat charters. Excludes day charter, sunset sails, half-day outings, dinghy tours, recreational boating of personal vessels. The frequency of term charter boat tours peaks at Thanksgiving, Easter and other major holidays. The season for this activity is therefore concentrated between November and May. Most term charters originate in Frenchtown and include transit through the STEER. Christmas Cove is a major destination, prior to charters leaving the STEER area for St. John or the BVI.

Term charter boat tours



- General Use Footprint
- Dominant Use Area
- STEER Boundary

0 0.5 1 Kilometers



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012



Thrill craft and high speed activities

Includes parasailing, jet skis and other forms of thrill craft rental. Excludes non-motorized vessels. Many thrill craft activities are occasional uses of the STEER area. Jet ski use occurs from private homes and yachts, as well as from hotels and resorts outside the STEER where rentals are available. There is uncertainty among locals about the legality of jet skis in various parts of the STEER. Wakeboarding and waterskiing also occur in Christmas Cove. There is a parasail operation out of Saga Haven Marina, but the STEER is only used for transit out to Pillsbury Sound where the parasailing takes place. 'Cigarette boats' are used throughout the STEER area along ferry transit routes.

Thrill craft and high speed activities



- General Use Footprint
- Dominant Use Area
- STEER Boundary



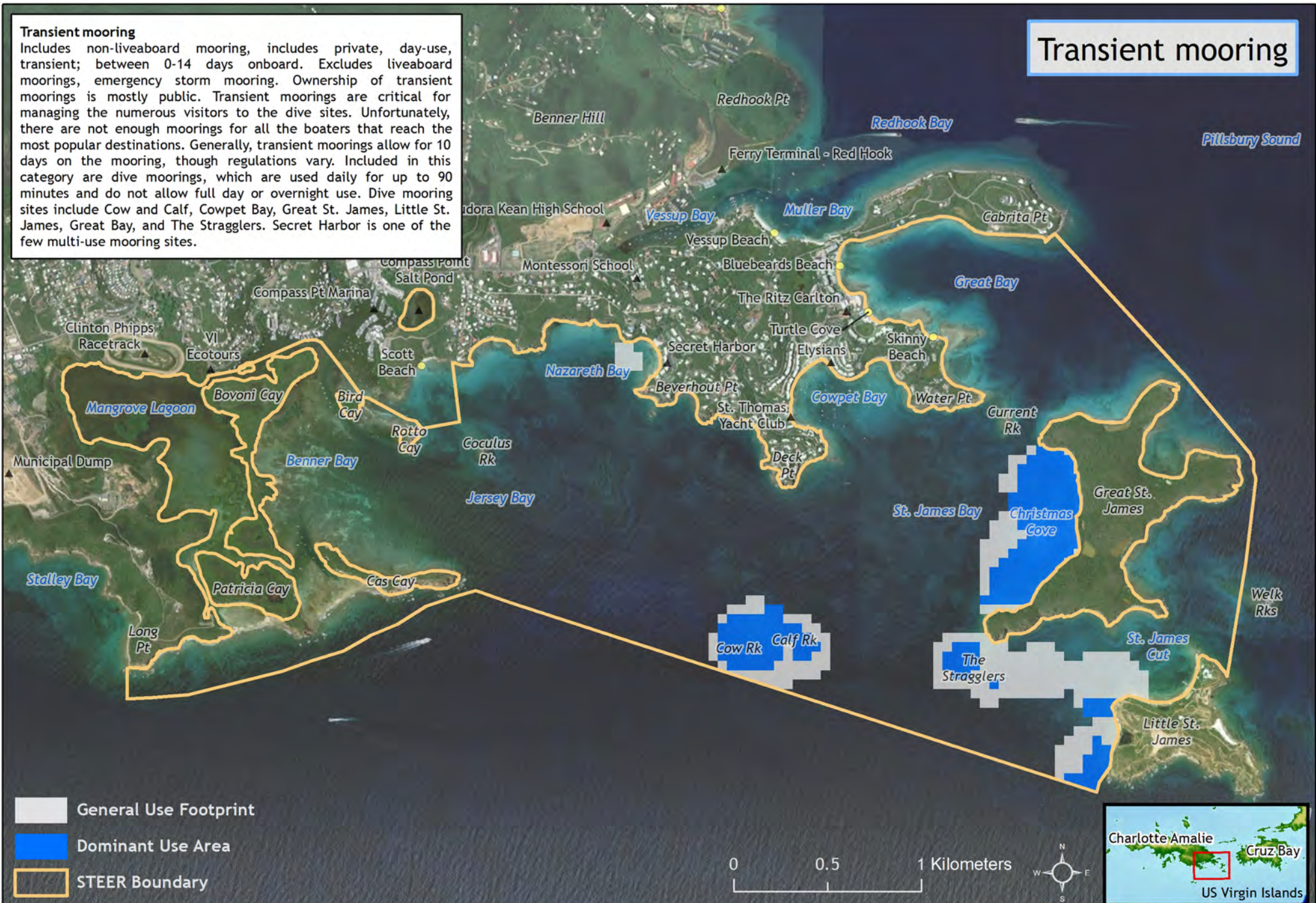
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Transient mooring

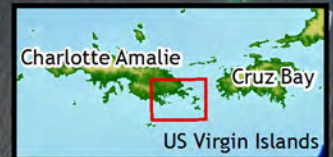
Includes non-liveaboard mooring, includes private, day-use, transient; between 0-14 days onboard. Excludes liveaboard moorings, emergency storm mooring. Ownership of transient moorings is mostly public. Transient moorings are critical for managing the numerous visitors to the dive sites. Unfortunately, there are not enough moorings for all the boaters that reach the most popular destinations. Generally, transient moorings allow for 10 days on the mooring, though regulations vary. Included in this category are dive moorings, which are used daily for up to 90 minutes and do not allow full day or overnight use. Dive mooring sites include Cow and Calf, Cowpet Bay, Great St. James, Little St. James, Great Bay, and The Stragglers. Secret Harbor is one of the few multi-use mooring sites.

Transient mooring



- General Use Footprint
- Dominant Use Area
- STEER Boundary

0 0.5 1 Kilometers



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012



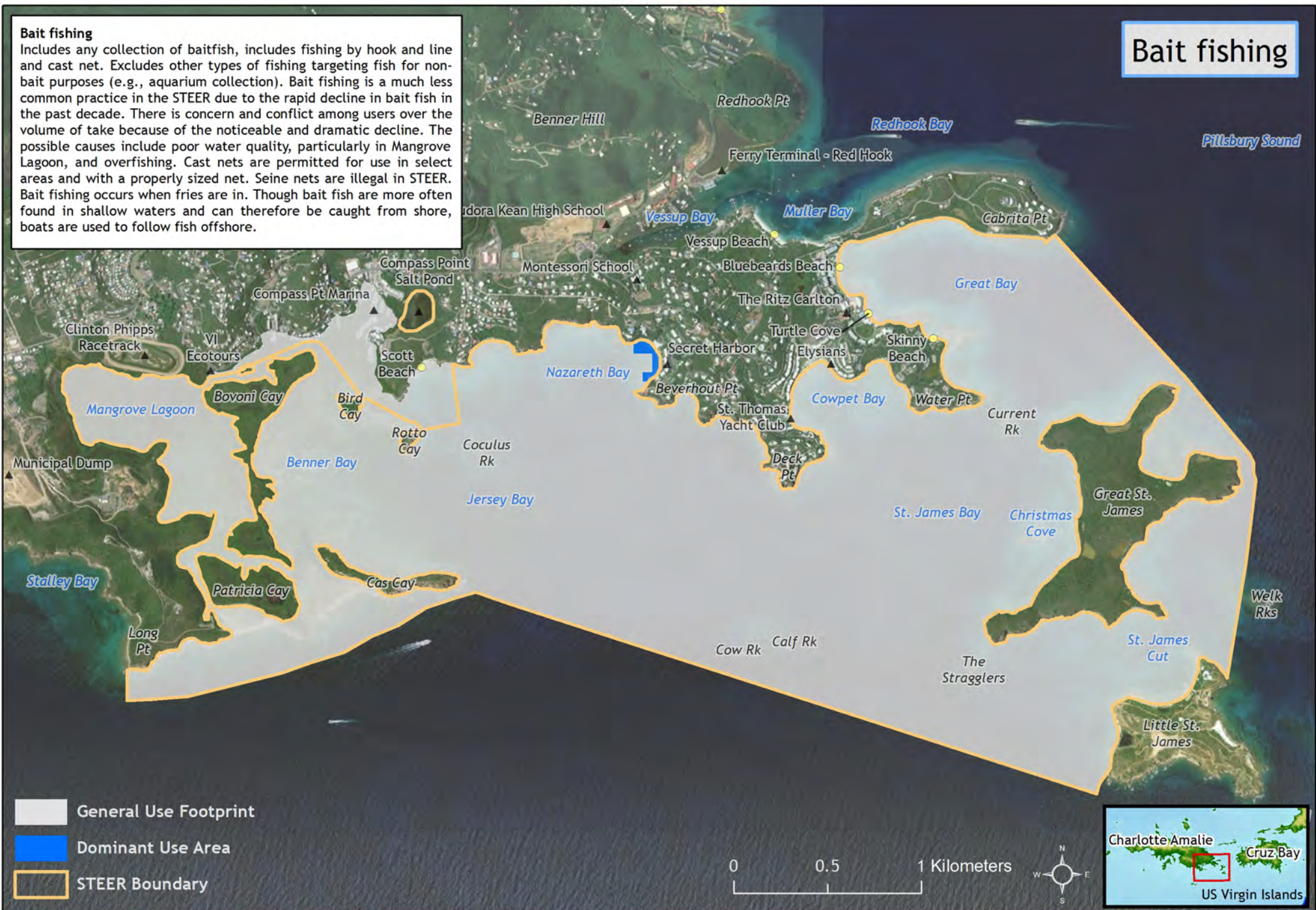
Extractive Uses



Bait fishing

Includes any collection of baitfish, includes fishing by hook and line and cast net. Excludes other types of fishing targeting fish for non-bait purposes (e.g., aquarium collection). Bait fishing is a much less common practice in the STEER due to the rapid decline in bait fish in the past decade. There is concern and conflict among users over the volume of take because of the noticeable and dramatic decline. The possible causes include poor water quality, particularly in Mangrove Lagoon, and overfishing. Cast nets are permitted for use in select areas and with a properly sized net. Seine nets are illegal in STEER. Bait fishing occurs when fries are in. Though bait fish are more often found in shallow waters and can therefore be caught from shore, boats are used to follow fish offshore.

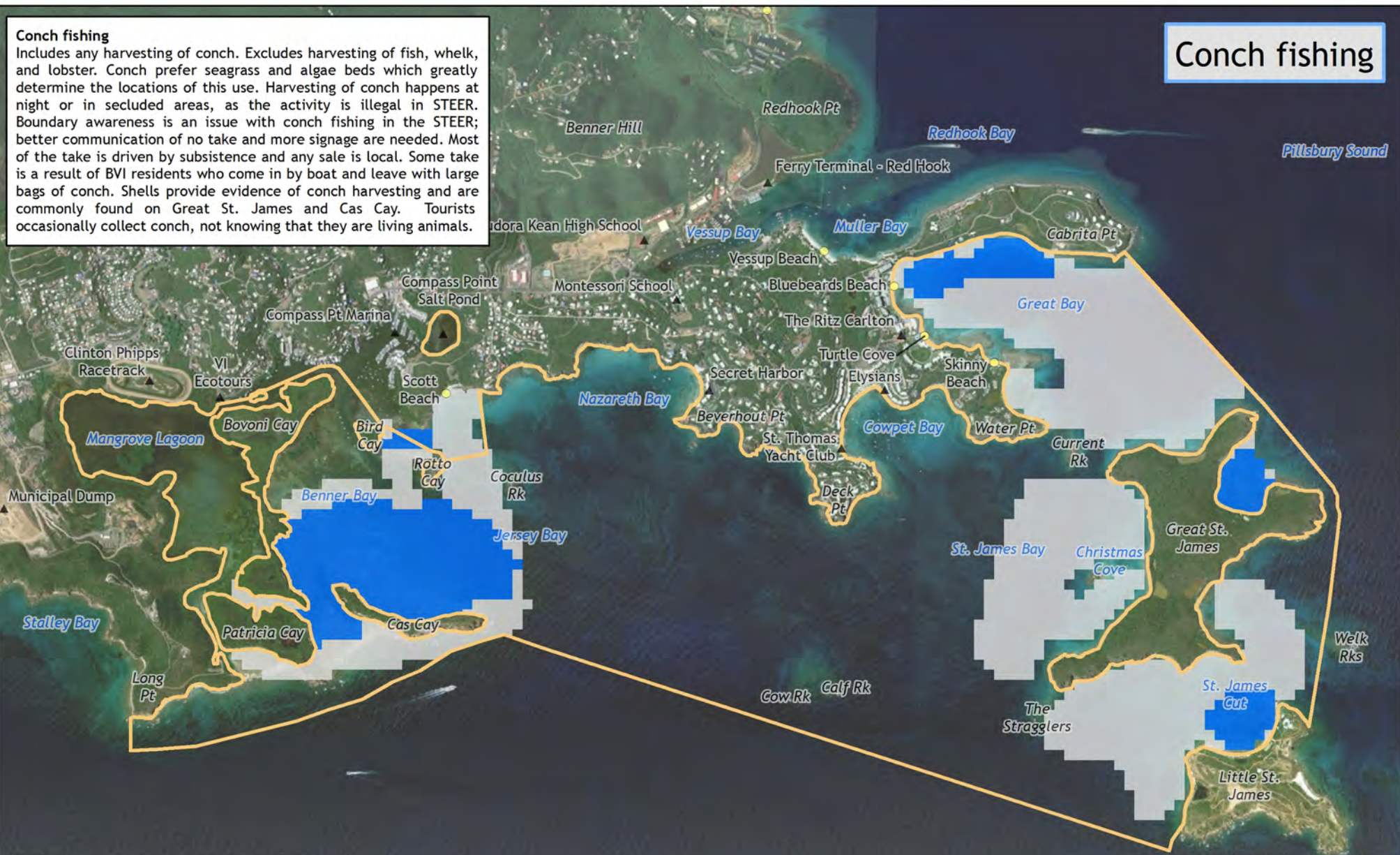
Bait fishing



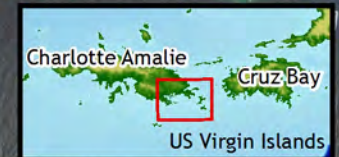
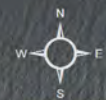
Conch fishing

Includes any harvesting of conch. Excludes harvesting of fish, whelk, and lobster. Conch prefer seagrass and algae beds which greatly determine the locations of this use. Harvesting of conch happens at night or in secluded areas, as the activity is illegal in STEER. Boundary awareness is an issue with conch harvesting in the STEER; better communication of no take and more signage are needed. Most of the take is driven by subsistence and any sale is local. Some take is a result of BVI residents who come in by boat and leave with large bags of conch. Shells provide evidence of conch harvesting and are commonly found on Great St. James and Cas Cay. Tourists occasionally collect conch, not knowing that they are living animals.

Conch fishing



- General Use Footprint
- Dominant Use Area
- STEER Boundary



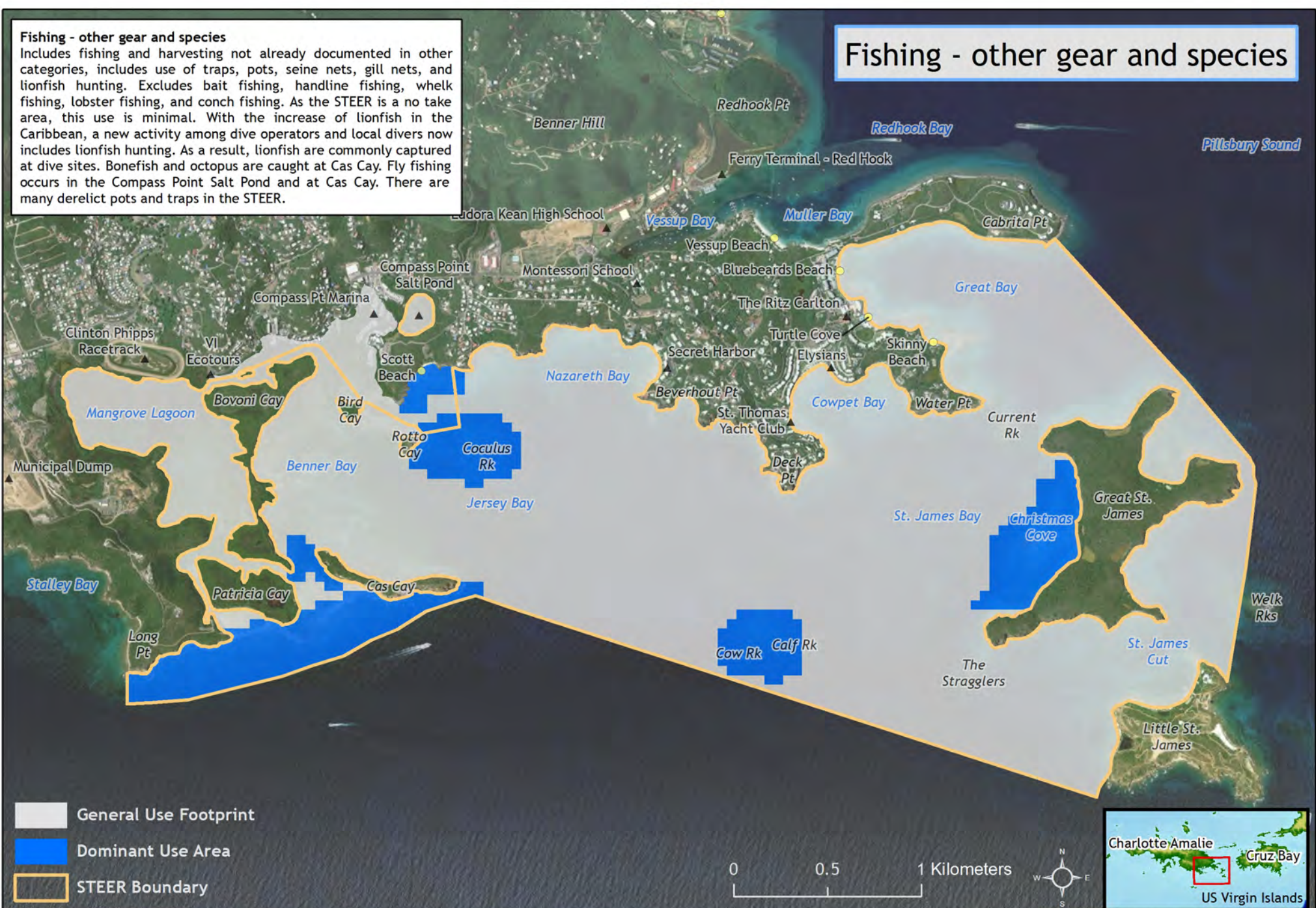
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Fishing - other gear and species

Includes fishing and harvesting not already documented in other categories, includes use of traps, pots, seine nets, gill nets, and lionfish hunting. Excludes bait fishing, handline fishing, whelk fishing, lobster fishing, and conch fishing. As the STEER is a no take area, this use is minimal. With the increase of lionfish in the Caribbean, a new activity among dive operators and local divers now includes lionfish hunting. As a result, lionfish are commonly captured at dive sites. Bonefish and octopus are caught at Cas Cay. Fly fishing occurs in the Compass Point Salt Pond and at Cas Cay. There are many derelict pots and traps in the STEER.

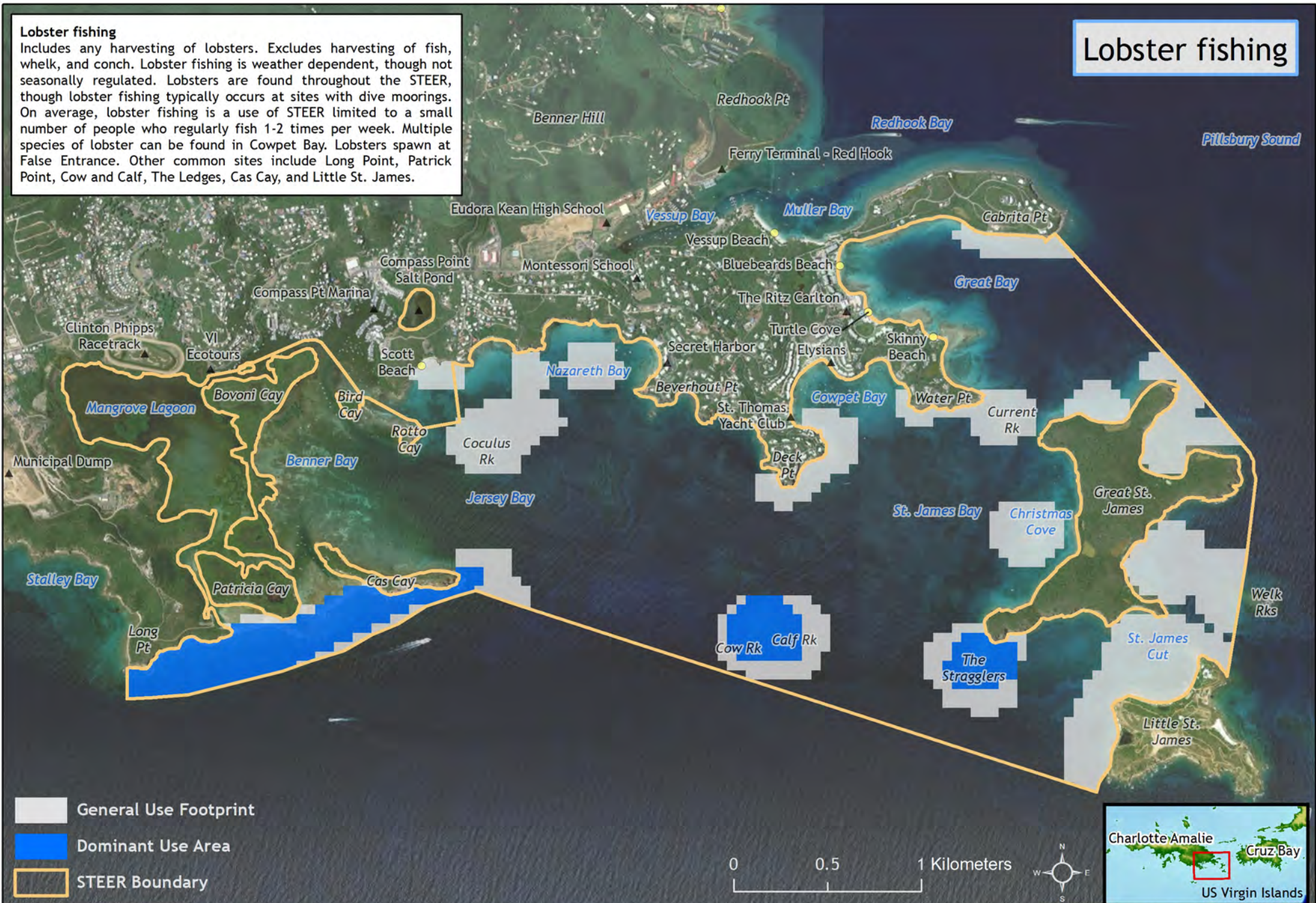
Fishing - other gear and species



Lobster fishing

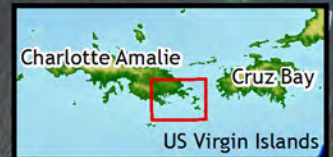
Includes any harvesting of lobsters. Excludes harvesting of fish, whelk, and conch. Lobster fishing is weather dependent, though not seasonally regulated. Lobsters are found throughout the STEER, though lobster fishing typically occurs at sites with dive moorings. On average, lobster fishing is a use of STEER limited to a small number of people who regularly fish 1-2 times per week. Multiple species of lobster can be found in Cowpet Bay. Lobsters spawn at False Entrance. Other common sites include Long Point, Patrick Point, Cow and Calf, The Ledges, Cas Cay, and Little St. James.

Lobster fishing



- General Use Footprint
- Dominant Use Area
- STEER Boundary

0 0.5 1 Kilometers



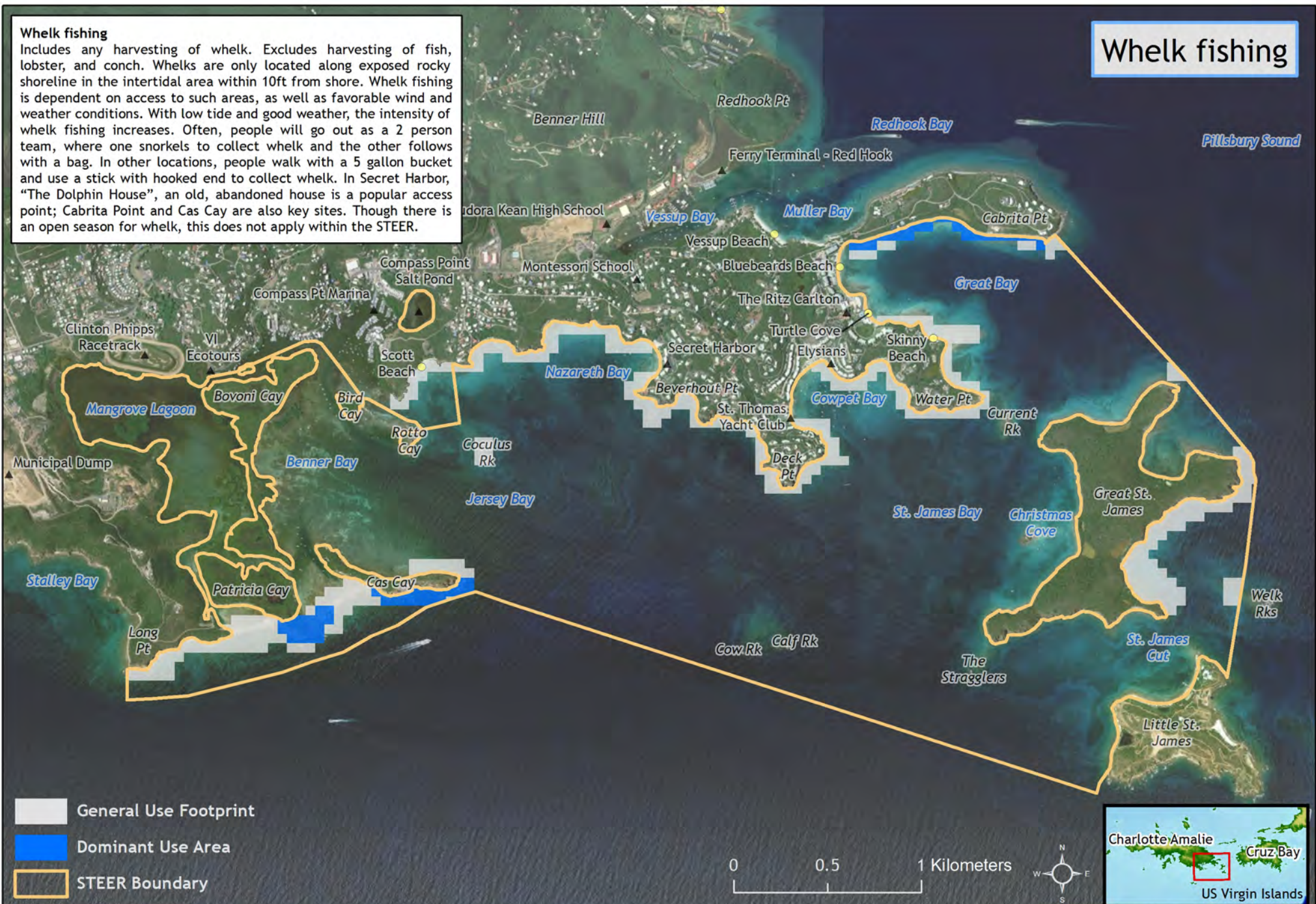
St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/19/2012

Whelk fishing

Includes any harvesting of whelk. Excludes harvesting of fish, lobster, and conch. Whelks are only located along exposed rocky shoreline in the intertidal area within 10ft from shore. Whelk fishing is dependent on access to such areas, as well as favorable wind and weather conditions. With low tide and good weather, the intensity of whelk fishing increases. Often, people will go out as a 2 person team, where one snorkels to collect whelk and the other follows with a bag. In other locations, people walk with a 5 gallon bucket and use a stick with hooked end to collect whelk. In Secret Harbor, "The Dolphin House", an old, abandoned house is a popular access point; Cabrita Point and Cas Cay are also key sites. Though there is an open season for whelk, this does not apply within the STEER.

Whelk fishing



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

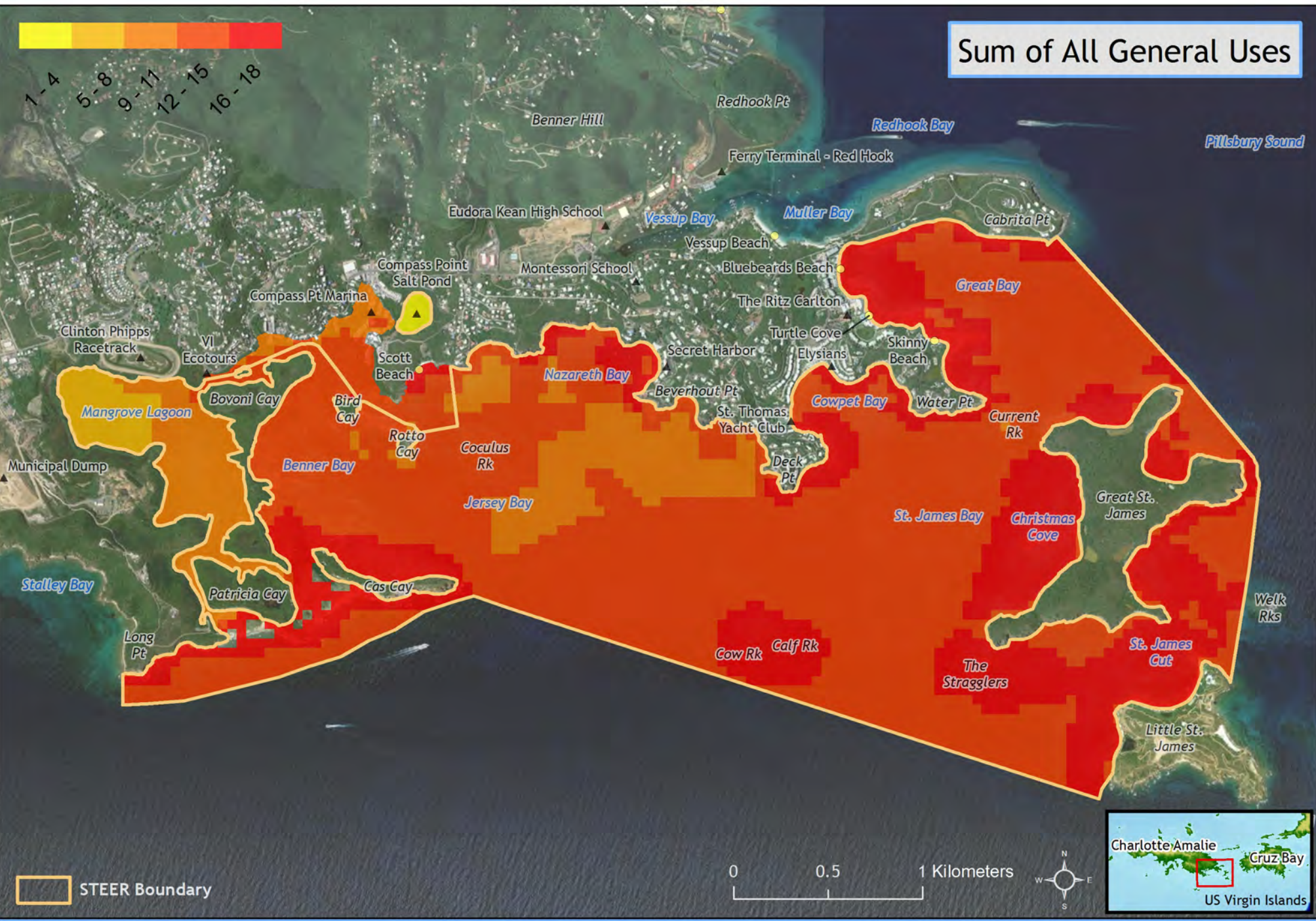
Date: 11/19/2012

STEER Coastal Uses Mapping Project

Heat Maps - All Uses



Sum of All General Uses



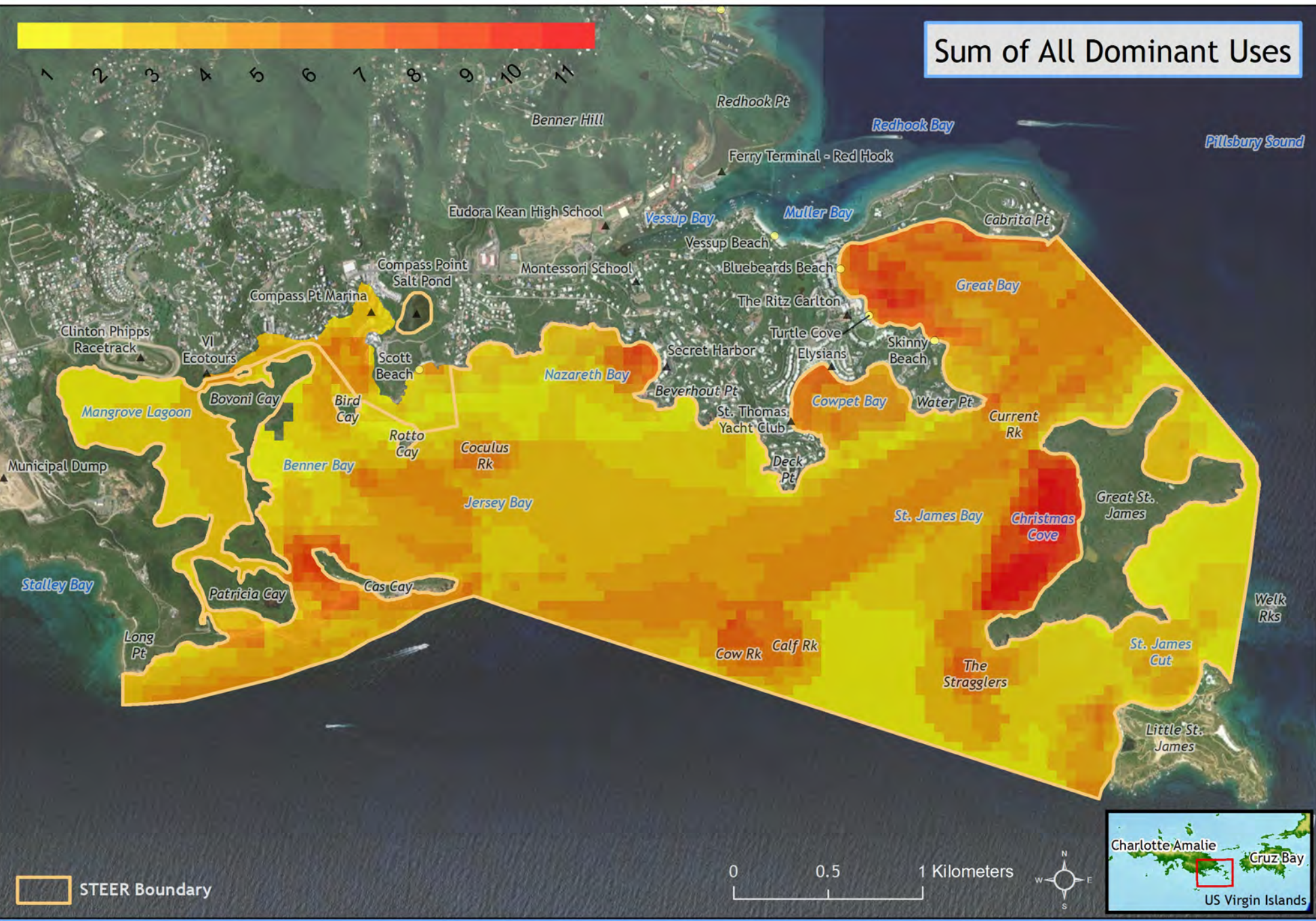
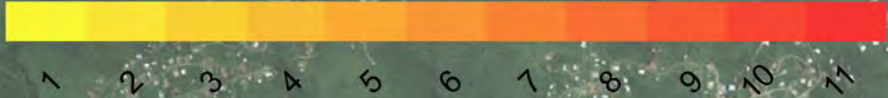
STEER Boundary



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/16/2012

Sum of All Dominant Uses



STEER Boundary



St. Thomas East End Reserves (STEER) Coastal Use Mapping Project

Date: 11/16/2012