

Wetlands of the U.S. Virgin Islands

2010 edition



Prepared by the University of the Virgin Islands
Commissioned by the Division of Environmental Protection,
Department of Planning & Natural Resources,
Government of the U.S. Virgin Islands

WETLANDS OF THE U.S. VIRGIN ISLANDS 2010 Edition



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LIST OF ACRONYMS

DPNR	Department of Planning and Natural Resources
USA	United States of America
USVI	United States Virgin Islands
VI	Virgin Islands



NOTES TO READERS

This publication is meant for a general audience, and should not be used as a technical guide for wetlands delineation or evaluation. Detailed technical guidelines are available from several sources, some of which will be noted at the end of the report. This report provides an overview of the types and current status of wetlands in the U.S. Virgin Islands, the benefits provided by wetlands, the threats to wetlands, the current management framework, and summary information on selected sites.

The 25 site descriptions in this report are essentially those sites that were surveyed during Phase 1 and Phase 2 of the project “Inventory of USVI Wetlands and Riparian Areas”. There are [xx] wetlands identified in the U.S. Fish and Wildlife Service’s wetlands database for the U.S. Virgin Islands. Many of those sites were previously catalogued in other reports, and as such, are not necessarily covered in this report.

It is not possible to include in this publication pictures of all the birds and plants associated with wetlands. As such, persons intending to visit wetlands should take with them a field guide for birds and one for wetland plants. Examples of such guide books are listed in the back of this report, under Wetland Information Sources.

In order to ensure that information on wetlands in the U.S. Virgin Islands is kept current, this report will be revised periodically.



1. Introduction

What is a wetland?

Wetland is a generic term for areas that are covered by water, or where the soil is saturated, for long periods of time. This saturation by water creates soil conditions and support vegetation specific to wetlands. Wetlands form under different conditions, and are often called by different names. Within the United States of America (U.S.A.), the Federal agencies responsible for management of wetlands have defined wetlands according to their mandates and information needs. Many of the States have also adopted their own definitions. The wetland definition adopted by the U.S. Virgin Islands (USVI) is a modification of the definition adopted by the United States Army Corps of Engineers.

Within the USVI, a wetland is defined as “An area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands in the U.S. Virgin Islands generally include watercourses, marshes, swamps, artificial ponds and impoundment, salt ponds, lagoons, shallow seagrass beds, and other similar areas.”

In the U.S. Virgin Islands, wetlands can be naturally occurring, like lagoons:

Bethlehem Ghut - Fair Plain Lagoon mouth, St. Croix.



red mangroves with proproots

seedlings of mangroves

seaside mahoe

sand bar closing the mouth of the ghut

Or they can be man-made, like artificial ponds:

Pond at Fairgrounds, V.I. Dept. of Agriculture, Upper Love, St. Croix.



overgrown pasture

horse

egret



1.1 Types of Wetlands in the U.S. Virgin Islands

The wetland definition states that **“Wetlands in the U.S. Virgin Islands generally include watercourses, marshes, swamps, artificial ponds and impoundment, salt ponds, lagoons, shallow seagrass beds, and other similar areas.”** Each type of wetland is formed under a specific set of conditions, and will typically have associated plants (flora) and animals (fauna).

Type 1: Watercourses (Ghuts)

A watercourse is defined in the Virgin Islands Code as **“... any stream with a reasonable well-defined channel, and includes streams which have a permanent flow, as well as those which result from the accumulation of water after rainfall and which regularly flow through channels formed by the force of the waters”** (Title 12, Chapter 3, Section 123(b) of the Virgin Islands Code (Annotated, 2006 Edition)).

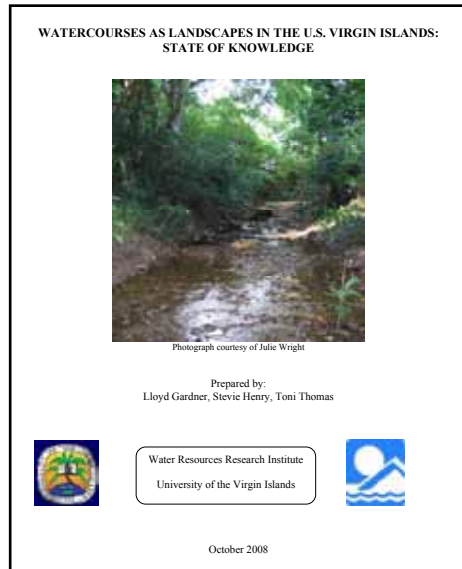
In the USVI, watercourses are commonly referred to as ghuts, and well-known examples are Mahogany Gut (St. Croix), Fish Bay Gut (St. John), and Turpentine Run (St. Thomas). Ghuts are the main drainage channels for discharge of runoff from rainfall events. In addition to that function, ghuts provide a range of goods and services that support the development processes of the USVI (*See Chapter 3 for more information on the benefits provided by ghuts*). Ghuts also contain permanent pools of freshwater, which function as habitats for rare species of aquatic animals (e.g. Mountain Mullet and American Eel). Ghuts take a range of shapes, sizes, and depths, depending on the terrain and the size of the watershed. The vegetation found inside ghuts also varies accordingly, but two distinct forest types have been associated with ghuts. These forest types are Gallery Moist Forest and Gallery Shrubland (Thomas and Devine, 2005).

Pearl B. Larsen students at the falls, Caledonia Ghut, St. Croix.



Type 1: Watercourse (Ghut), continued

For more information on watercourses (ghuts) in the U.S. Virgin Islands, read: Gardner, Lloyd, Stevie Henry, & Toni Thomas. 2008. Watercourses as Landscapes in the U.S. Virgin Islands: State of Knowledge. Water Resources Research Institute, University of the Virgin Islands. (click on the book below to link to the publication, or go to http://www.uvi.edu/sites/uvi/Publications/watercourses_landscapes.pdf).

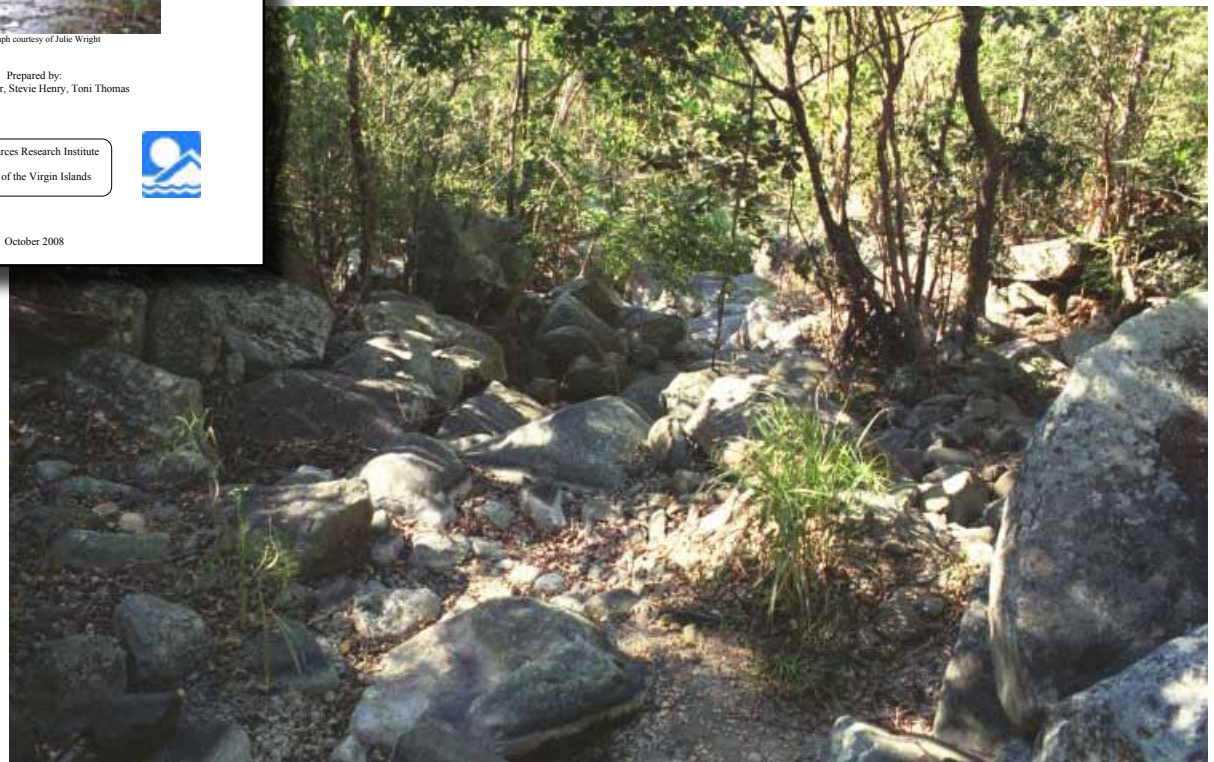


Frequently Asked Question:



QUESTION: *Is a dry ghut channel a wetland?*

ANSWER: *Not necessarily. Whether or not the ghut is a wetland depends on the portion of time the soil remains covered or saturated by water. That may be difficult to determine unless there is always standing water visible. A useful guide to follow is the following: the ghut may be classified as a wetland if there are permanent pools in the ghut, if water continues to run in the ghut several days after a very heavy shower of rain, if the soil remains saturated for long periods, or if the ghut is a major drainage channel. Also remember, although you may not see water at your particular point of observation, waterlogged conditions may exist above or below that point.*



Bonne Resolution Ghut, St. Thomas.

Type 2: Marshes

A marsh is defined as “a water-saturated, poorly drained area, intermittently or permanently water covered, having aquatic and grass-like vegetation” (http://water.usgs.gov/water-basics_glossary.html). Marshes in the U.S. Virgin Islands are typically fresh-water wetlands formed in depressions in the landscape, and maintained by surface or sub-surface flow of water.



Tutu Park marsh (grassy area, center of photo), St. Thomas.

Frequently Asked Question:



QUESTION: *I want to develop my property. How do I tell if there are wetlands on the property, and what can I build?*

ANSWER: *All ponds are wetlands, and most major ghuts (deep, wide, channels water after most rainfall events) are wetlands. However, it is important to remember that all watercourses (natural ghuts) are protected by law, and persons wishing to build or clear vegetation within 30 feet of a ghut require a licence from the Department of Planning and Natural Resources.*

Coastal wetlands are submerged lands, and are thus protected in law. Any kind of development activity adjacent to, or within wetlands, requires special permission from the Department of Planning and Natural Resources.



Magens Bay swamp, St. Thomas.

Type 3: Swamps

A swamp is defined as “**an area intermittently or permanently covered with water, and having trees and shrubs**” (http://water.usgs.gov/water-basics_glossary.html). In the U.S. Virgin Islands, swamps are generally located on the coast. Water level is determined mainly by surface runoff during the rainy season, but brackish conditions exist in areas of the swamp closest to the sea, or during the dry season. As a result of this salinity gradient, plants adapted to both fresh water and saline conditions may be found in some swamps. Example, Magens Bay swamp, St. Thomas.

Frequently Asked Questions:



QUESTION: *Why do some swamps smell foul/stink?*

ANSWER: *Wetlands (water-logged areas) are normally deprived of oxygen, and the bacteria that break down the organic matter (anaerobic bacteria) produce a gas known as hydrogen sulphide. The hydrogen sulphide is the source of the foul smell, which is sometimes likened to the smell of rotten eggs.*

QUESTION: *Does the foul smell mean that something is wrong with the swamp?*

ANSWER: *The smell is a by-product of decomposing organic matter. The process is beneficial to the wetland because it introduces oxygen, as well as recycles carbon and sulphur, all elements necessary for the plants and animals that live in wetlands.*

Type 4: Artificial Ponds and Impoundments

“A pond is a body of standing water, either natural or man-made, that is usually smaller than a lake” (<http://en.wikipedia.org/wiki/Pond>). In the U.S. Virgin Islands, man-made (artificial) ponds are created primarily for provision of water for agricultural purposes. Increasingly, ponds are created for storm-water management purposes on sites with large developments or on sites that are periodically flooded. An impoundment is a body of water resulting from the placement of a stone dyke or earthen berm across a natural drainage channel (ghut). Impoundments were used in the early 1900s as part of the system of collection and distribution of potable water (Lawaetz, 1991), particularly on St. Croix (e.g. Creque Dam). Currently, impoundments are constructed and used mainly to provide water for agricultural purposes. Both ponds and impoundments provide habitats for a range of resident and migratory species of water birds.



Creque Dam pond and reservoir, St. Croix.



Pond at Bordeaux, St. Thomas.

Type 5: Salt Ponds

A salt pond is a coastal wetland that is separated from the sea by a low sandbank, sand dune, or similar feature. Salt ponds are formed over long periods by the accretion of reefs, growth of mangroves, or the accretion of sand along the mouth of an embayment. Once the pond is separated from the sea, water exchange between the two is primarily through the separating barrier. Depending on the size and structure of the salt pond, openings to the sea may be created during the rain season if the pond collects significant amounts of surface runoff. The barrier may also be overtopped by the sea during periods of significant wave action. Such wetlands are commonly called salt ponds because the water in the ponds becomes hypersaline during the periods when the water level is low; that is, the water becomes more saline than ordinary sea water. In some ponds, the salt can be seen as a crystalline deposit along the edges of the pond or towards the landward portion (back) of the pond.

Salt ponds provide a habitat for many species of birds, but few plants are adapted to survive in such hypersaline conditions. Plants typically found at salt ponds are Black Mangrove, White Mangrove, and the shrubs Saltwort and Sea Purslane

For more information on salt ponds in the U.S. Virgin Islands, read: Stengel, Carolyn A. 1998. The Survey of the Salt Ponds of the U.S. Virgin Islands. Division of Fish and Wildlife, Department of Planning and Natural Resources. Final Report, July 31, 1998.



Southgate Pond, St. Croix.

Frequently Asked Question:



QUESTION: *Why is the water in salt ponds sometimes reddish in color?*

ANSWER: *The color of the water in a salt pond is dependent on the level of salinity. In mid to high salinity ponds, certain types of algae produce a red pigment. Brine shrimp and salt-loving (halophilic) bacteria also contribute to the red color. The water looks red because the salinity is so high that the natural predators of the algae and brine shrimp are dead or excluded from the pond at that time, resulting in a “bloom” of the algae or brine shrimp. In the U.S. Virgin Islands, the reddish hue is usually generated by algae and bacteria.*

Type 6: Lagoons

A lagoon is defined as “a stretch of salt water separated from the sea by a low sandbank, coral reef or similar natural or manmade feature.”

In the U.S. Virgin Islands, lagoons are typically formed by one of two processes. One process involves wave action moving sand and gravel along the shoreline, periodically closing the mouth of an embayment. Sandbars are sometimes breached by strong wave action, particularly during storms. Sandbars/sandbanks often become colonized and stabilized by plants, which can result in the closure becoming semi-permanent or permanent over time. The second process involves the formation of a sandbar across the mouth of a seasonal stream (ghut). In such cases, the sandbar is periodically breached by wave action or by surface runoff discharged through the ghut after rainfall events. Lagoons can have very restricted access or narrow channels that permit fairly consistent flows between the lagoon and the sea.

Lagoons are ecologically productive sites, providing habitats for a range of fish and bird species, including migratory species of birds. Examples of lagoons are the Altona Lagoon (St. Croix) and Benner Bay/Mangrove Lagoon (St. Thomas).



Benner Bay Lagoon, St. Thomas.



Enclosed pond within the Altona Lagoon, St. Croix.

Type 7: Seagrass beds

Seagrass beds are ecosystems dominated by marine grasses. Seagrass beds typically inhabit shallow nearshore areas, but can be found in a range of depths from shallow lagoons to open coastal areas 60 feet in depth. There are 40-50 species of seagrasses world-wide, and most are found in the tropics.

Though seagrass beds are dominated by seagrasses, the communities contain many species of algae. Seagrass beds function as important nursery areas for a wide variety of marine organisms (including important food species). Seagrass beds also function to colonize open areas, and their root systems help to stabilize unconsolidated soils.



Sting ray swimming over seagrass bed.

Seagrass bed, dominated by Turtle Grass (*Thalassia testudinum*).





2. Benefits of Wetlands

There appears to be no consensus in the U.S. Virgin Islands (USVI) concerning the value of environmental resources to the community. On one hand, community groups and environmental groups mobilize against large development projects that they perceive will create negative impacts on the environmental resources, including loss of wetlands. On the other hand, the community routinely clears buffer areas adjacent to wetlands, disposes of solid waste and effluents (legally and illegally) to wetlands, changes drainage channels, and fills in wetland areas.

“Wetlands deliver a wide range of ecosystem services that contribute to human well-being, such as fish and fibre, water supply, water purification, climate regulation, flood regulation, coastal protection, recreational opportunities, and, increasingly, tourism” (Springate-Baginski et al, 2009-page 6).

This chapter focuses on the benefits provided by wetlands to the USVI community.



2.1 Wetlands as Wildlife Habitats

Wetlands provide habitats for several species of fauna (e.g. fish, eel, shrimp, birds, and tortoise), several of which are rare and endangered. Uses of wetlands by wildlife species include:

Nesting and Foraging

A large number of bird species has been identified in wetlands. Observations made at Great Pond and Southgate Pond during the period 1981-1985 identified 87 species of birds at Great Pond and 108 species of birds at Southgate Pond (Sladen, 1992). Of the 87 species identified at Great Pond, 15 species were considered to be threatened or endangered. Twenty-five (25) species nested at the pond, and an additional 45 species were considered to be wetland-dependent species. Of the 87 species, 49 were migrants and 33 were residents. At Southgate Pond, 24 of the 108 species were considered to be threatened or



Nesting bird at Great Pond, St. Croix.

endangered. Thirty-five (35) species were found to be nesting, and an additional 62 species were considered to be wetland-dependent species. A 2008 survey of water birds on St. Croix identified 56 species, most of which are classified as indigenous.

Ghuts also provide nesting and foraging areas. The permanent pools found in ghuts often contain fish, eel, and shrimp. This aquatic fauna is also a source of food for other wildlife species, such as birds. Insects also congregate around pools, and thus the pools become foraging areas for birds and bats.

Migration Corridors

Ghuts form corridors that facilitate the movement of wildlife species (e.g. bats and birds) between nesting and foraging areas. An important function of wetlands is providing areas for migratory species of birds to over-winter or rest. Observations of water birds over many years confirm that many of the species are migratory species. As wetland loss increases, each over-wintering and staging area for migratory species becomes more important.

Watering Holes

Many species of wildlife (e.g. birds, iguanas, deer, bats, bees, goats) use marshes, impoundments, and the pools in ghuts as watering holes. This is particularly important in the dry season, when freshwater is scarce.

One of the more significant habitat functions provided by ghuts is based on the availability of permanent pools of water. Ghuts form the most extensive network of freshwater habitats in the USVI, and are extremely important for several aquatic species that spend part of their life cycle in freshwater and part in the marine environment.

The maintenance of vegetative cover along the banks of wetlands is important for the proper functioning of wetlands. The V.I. Code prohibits the clearing of vegetation along the sides of ghuts. Such riparian buffers maintain the ecological integrity of wetlands by reducing soil erosion, increasing infiltration of groundwater by slowing runoff, reducing the volume of pollutants (such as sediment) entering streams and ponds, and provides habitat for wildlife.

Frequently Asked Question:



QUESTION: *Why should I help protect wetlands?*

ANSWER: *You should help to protect wetlands because, as a resident of the U.S. Virgin Islands, the quality of your life depends to a large extent on the proper functioning of wetlands. Wetlands provide recreational opportunities for locals and tourists; protect coastal water quality (for bathing, fishing, and water for desalination plants) by filtering surface runoff; maintain fish stocks by providing fish nurseries and protecting coral reefs; protect homes, beaches, roads, and other infrastructure by reducing damage from storm waves and flooding; provide water for agriculture; and are very important for recharging aquifers. Water extracted from the ground (by wells) accounts for approximately 30% of the water produced in the U.S. Virgin Islands. Most of the 369 public water systems in the U.S. Virgin Islands (in 2009) used groundwater. The Virgin Islands Water and Power Authority extracts groundwater to supplement water it produces in its desalination plants, and groundwater has been the only source of water after a number of major natural disasters, like hurricanes. Wetlands form a significant part of the natural wealth that you pass on to your children and future generations of Virgin Islanders.*



Iguana at Sugar Bay Mangrove.



2.2 Wetlands as Providers of Goods and Services

Wetlands have provided a range of goods and services that supported various forms of community development over time. Goods and services currently provided by wetlands include:

- Water for agricultural purposes;
- Food;
- Recreational opportunities;
- Economic opportunities;
- Storm protection services;
- Water purification services;
- Opportunity for learning, teaching, and research.

Provision of Water – Streams were the main source of water for domestic purposes (drinking, bathing, and washing clothes) in the USVI in the 18th and 19th centuries, and were still used to a limited degree as late as the early 1960s. Lawaetz (1991) wrote of the Government leasing Punch Spring in 1905 to supply water to Fredriksted, as well as the later construction of the Creque Dam for the same purpose. Dams were also constructed during the 19th and 20th centuries in Estate Canaan, Estate Adventure, Caledonia, and St. George ghuts to (i) control sediment, (ii) enable recharge of the aquifer, and (iii) improve surface water in the streams. Historically, ghuts provided water for agricultural purposes on the three main islands, for irrigation of crops, watering livestock, and production of sugar. Water from ghuts was also used to turn waterwheels for generation of power and to support production purposes in the sugar and rum factories (Lawaetz, 1991). Currently, water for farming purposes is provided primarily by the impoundments, created by constructing berms across drainage channels and ghuts.



Tri-colored Heron, St. Croix.

Provision of Food – The literature contains references to the practice (historically) of collecting freshwater shrimps and fish from streams on St. Croix and St. Thomas. Though ghuts are no longer a significant source of fish for food, many of the coastal wetlands are important for the fisheries industry in the USVI, by functioning as nurseries for many of the fish species commonly referred to as reef or pot fish.

Recreational Opportunities – Recreational activities in ghuts previously included hunting, bathing, hiking, and catching fish and shrimp. Currently, the primary recreational activity is hiking and collecting ornamental fish. Hiking through ghuts is a frequent, and apparently growing, activity undertaken by individuals and groups. The ghuts used for hiking are Caledonia Valley, Butler Bay, Fountain, Canaan, Bethlehem, and Adventure Stream. Bird watching is a major recreational pastime, and many of the coastal ponds are prime bird-watching sites.

Economic Opportunities – In addition to the economic contribution from the fisheries, wetlands also support other economic activities, such as kayak and hiking tours provided by a number of tour companies. Additionally, many of the larger marinas in the USVI are located in wetlands.

Storm Protection Services – Coastal wetlands absorb much of the wave energy generated by storms, thereby protecting coastal resources and social infrastructure (e.g. roads, water lines). Similarly, marshes and other types of wetlands reduce flooding from significant rainfall events and storms. That reduces the damage to homes and social infrastructure. The hurricane refuges for boats are all wetlands. This protection function of wetlands is used all year by fishermen and recreational boaters, as boats are anchored in some coastal wetlands on an ongoing basis.

Water Purification Services – Wetlands act as retention areas and filtering mechanisms for surface runoff, removing or reducing the levels of sediment, solid waste, bacteria, and other pollutants reaching the coastal areas. This function of wetlands helps to maintain the coastal water quality, which in turn is important for healthy coral reefs, for the quality of life of residents, and recreational opportunities for residents and visitors to the USVI.

Education – Wetlands are increasingly being used as living laboratories to teach science in the elementary and junior high schools. Faculty and students at the University of the Virgin Islands, as well as visiting researchers, periodically conduct research on water quality, wildlife ecology, or other functions of wetlands.



Little blue heron at Compass Point, St. Thomas.

2.3 Wetlands and Historical Heritage

The availability of freshwater exerted a major influence on the pace, type, and pattern of development of the U.S. Virgin Islands (USVI), when the earliest settlers, the Amerindians traversed Turpentine Run to establish their settlement in Estate Tutu (Righter, 2002). Similarly, the Arawaks utilised Mint (Diamond) Gut to establish their settlement at Estate St. George (Kesler, 1980). Later, the changes agricultural production systems from St. Thomas to St. John, and later to St. Croix can be linked to water availability. The location of the settlements and the main industrial sites indicate underscore the fact that wetlands influenced the economic and social life of the communities, through the provision of water for domestic, industrial, economic, and recreational activities.

Ghuts with known historical resources include:

- Savan Ghut – Historic drainage channel designed and constructed during the Danish period.
- Water Ghut – Historic feature (well).
- Bethelam Ghut – Remnants of the aqueduct and sugar works.
- Living Ghut² – Pre-Columbian Taino petroglyphs.
- Fairplain Ghut – Amerindian site located at junction with tributary of Bethlehem Gut.
- Salt River – Major Amerindian site, and site of Columbus landing.
- Magen's Bay Ghut – Amerindian site.
- Turpentine Run – Tutu Archeological Village (Amerindian site).



Petroglyph Pool, St. John.

Salt River, St. Croix.



²The name is taken from Loftus, 2003. The ghut crosses the Reef Bay Trail, and contains the Petroglyph Pool.



3. Framework For Management of Wetlands In the U.S. Virgin Islands

Wetlands provide a range of goods and services that contribute to the economic and social development of the U. S. Virgin Islands (USVI). However, the various development activities result in significant degradation of the very resources that support the development of the USVI. In an effort to improve the development process, policies, laws, and initiatives have been developed to protect our natural resources. The primary purpose of the associated laws and programs is to ensure that development can be sustained and the quality of life can be maintained for current and future generations of Virgin Islanders.



3.1 Policy and Legal Framework

A wide array of policies and laws at both the Federal and Territorial levels provide the framework for the development of programs to manage wetlands and wetland resources. The main Federal laws governing wetlands management are:

The Clean Water Act, 1972 – Section 404 of the Act is the primary enabling legislation for regulation of activities within wetlands. The main purpose of the Act is “to restore and maintain the chemical, physical, and biological integrity of waters” in the United States of America (USA). The discharge of dredged or fill material into wetlands is regulated under this Act.

The Coastal Zone Management Act, 1972 – Provides for the conservation of natural resources within coastal areas, and requires the development of programs to ensure environmentally sound development within coastal areas. The Act provides for the designation of special areas, referred to as Areas of Particular Concern, and the designation of program themes for more intense management interventions, referred to as Enhancement Areas.

The Emergency Wetlands Resources Act, 1986 – The purpose of this Act is to promote wetlands conservation for the public benefit, and to help fulfill the USA’s international obligations under various migratory bird treaties and conventions. The Act also requires the development of a National Wetlands Priority Conservation Plan, which is also applicable to states and territories.

The legislation also provides for the acquisition and restoration of wetlands, the protection of wetlands on private property, the creation of wetlands, and the protection of wetland resources (such as birds). A complete list of programs and regulations affecting wetlands can be found here (at <http://water.usgs.gov/nwsum/WSP2425/legislation.html>).



Left, ghut at Pearl B. Larsen School, St. Croix. Right, Mandahl Pond, St. Thomas.

The Federal laws are applicable to the U.S. Virgin Islands, but there are also local laws that are applicable to different aspects of wetlands management. Local laws are contingent on the provisions of the Virgin Islands Code, and Sections of that Code that have direct or indirect bearing on the management of wetlands are:

Title 7, Chapter 3: Soil Conservation – The law provides for the conservation of soil, water, and other natural resources, and focuses on prevention and control of soil erosion, prevention of flood-water and sediment damage, and disposal of water and waste water.

Title 12 – Conservation, Chapter 1 – Wildlife, Sub-chapter VI – Wildlife Restoration, Section 81: Wildlife restoration projects – Requires the Government of the U.S. Virgin islands to support the efforts of the Federal Government concerning wildlife restoration projects, and stipulates that wildlife projects may include “... the selection, restoration, rehabilitation, and improvement of areas of land or water adaptable as feeding, resting, or breeding places for wildlife” (Section 81(b)(1)).

Title 12, Chapter 2: Protection of Indigenous, Endangered, and Threatened Fish, Wildlife and Plants – The Act protects native species of flora and fauna from injury, death, and harassment. It also specifically prohibits the cutting, pruning, removal and disturbance to mangroves, and requires that there be no net loss of wetlands within the USVI.

Title 12, Chapter 3: Trees and Vegetation Adjacent to Watercourses – This Act provides a definition of a watercourse, and provides for the maintenance of buffer/filter strips along watercourses/ghuts. This protection is ensured by prohibiting the cutting or injury of any tree or vegetation within 30 feet of the center of any natural watercourse or 25 feet from the edge, whichever is greater, without written permission from the Commissioner (of the Department of Planning and Natural Resources).

Title 12 – Conservation, Chapter 5 – Water Resources Conservation – Provides a definition of water, and places all waters within public ownership (Section 152(d)). The Act also requires the protection and sustainable use of water resources.

Title 12, Chapter 7: Water Pollution Control – Defines “Waters of the United States Virgin Islands” to include wetlands (Section 182(f)), and requires the development of programs “... to protect, maintain and improve the quality thereof for public water supplies, for the propagation of wildlife, fish and aquatic life, and for domestic, recreational and other legitimate beneficial uses...” The law also requires the regulation of waste discharge to waters of the USVI.

Title 12, Chapter 13: Environmental Protection – This Act provides for the establishment of environmental protection program to ensure orderly development of land and reduction of the harmful environmental impacts of that development. The Act provides specifically for the Earth Change permit program, and requires the program to reduce improper development of land that “... results in changed watershed conditions such as; erosion and sediment deposition on lower-lying land and in the tidal waters, increased flooding, gut and drainage filling and alteration, pollution, and other harmful environmental changes to such a degree that fish, marine life, and recreational and other private and public uses of land and waters are being adversely affected”.

Title 12, Chapter 21: Virgin Islands Coastal Zone Management – This Act establishes the Coastal Zone Management Program to protect, maintain, preserve, enhance, and restore overall quality of the environment in the coastal zone. It provides for the protection of ecologically significant areas through efforts to minimize the adverse impacts of development, and the establishment of protected areas.



The main Federal Government agencies that are responsible for protecting wetlands are:

U.S. Army Corps of Engineers – Responsible for permitting for dredging, filling, or altering wetlands, including drainage channels. Links to USVI programs include the permitting for major projects in the coastal zone (Virgin Islands Division of Coastal Zone Management) and flood control (Virgin Islands Department of Public Works).

U.S. Environmental Protection Agency – Responsible for permitting activities affecting water quality (e.g. waste disposal). Links to USVI programs include water quality monitoring, non-point source pollution, treatment and disposal of waste effluent (Virgin Islands Division of Environmental Protection), and solid waste management (Virgin Islands Waste Management Authority).

U.S. Fish and Wildlife Service – Responsible for management of fish and wildlife species, including critical habitats (e.g. wildlife reserves). The U.S. Fish and Wildlife Service manages wildlife reserves in the U.S. Virgin Islands (e.g. Sandy Point Wildlife Reserve).

National Oceanic and Atmospheric Administration – Responsible for management of coastal resources, including wetlands. The link to USVI programs is primarily through the funding of the Coastal Zone Management Program (Virgin Islands Department of Planning and Natural Resources).

U.S. Department of Agriculture, Natural Resources Conservation Service – Responsible for soil conservation practices on land under agriculture, primarily through the preparation of farm conservation plans. The Department is also responsible for preparation of the Virgin Islands Conservation Plan, and supports the work of the V.I. Resource Conservation and Development Council, which focuses on soil and water conservation practices in watersheds.

The main agencies with regulatory responsibilities for wetlands management in the U.S. Virgin Islands are:

V.I. Department of Agriculture – Responsible for soil conservation practices on land under agriculture. The work of the Department on wetlands focuses on maintaining buffers along ghuts (on properties over which the Department has custodianship) and the establishment and maintenance of impoundments.

V.I. Department of Public Works – The wetlands-related work of the Department is primarily with ghuts, focusing on flood mitigation for roads (drainage) and flood mitigation for areas in the flood zones (cleaning of ghuts, ghut re-alignment, and flood control structures in ghuts).

Department of Planning and Natural Resources – The Department is the primary agency in the USVI responsible for management of wetlands and associated resources, including regulation of development activities that affect the ecological integrity of wetlands. The Department manages several programs, administered by its various Divisions, that directly affect wetlands; including:

Coastal Zone Management Program, administered by the Division of Coastal Zone Management – This program is responsible for management of natural resources in the coastal zone, including coastal wetlands. The Division is also responsible for the regulation of all development activities in the coastal zone.

Non-Point Source Pollution Program, administered by the Division of Environmental Protection – focuses on the protection of surface and ground water by regulating activities that are sources of non-point source pollution.

Water Pollution Control Program, administered by the Division of Environmental Protection – focuses on permitting for stormwater management associated with development activities and permitting for discharge of effluent from industrial, commercial, and residential developments.

Water Quality Monitoring Program, administered by the Division of Environmental Protection – focuses on monitoring of ambient coastal water quality and setting water quality standards for the USVI.

The Division of Fish and Wildlife is responsible for “... monitoring, assessing, and implementing public awareness and other activities that help to enhance and safeguard fish and wildlife resources in the USVI.” The primary role of the Division is in an advisory role to other institutions concerning marine resources and wildlife in the USVI.



Hurricane Hole, St. John.

There are a number of other institutions in the USVI that conduct programs and initiatives relevant to wetlands management. These institutions include:

National Parks Service – This is a Federal agency, but its authority extends only to protected areas its management. As such, any wetland within an area managed by the National Parks Service would be governed by the management plan for that area.

St. Croix Environmental Association – manages the Southgate Pond wildlife reserve.

V.I. Resource Conservation and Development Council, Inc. – undertakes projects focused on water conservation and ghut restoration.

University of the Virgin Islands:

Water Resources Research Institute – supports research on all aspects of water resources, and provides technical assistance to regulatory agencies.

Conservation Data Center – maintains spatial database of natural resources, and provides technical assistance to the regulatory agencies.

Cooperative Extension Services – provides extension services to the community in natural resources management, farming practices, and a wide range of environment and land management practices.

Center for Marine and Environmental Services – conducts research on marine and environmental resources, provides a marine advisory service, and provides technical assistance to the regulatory agencies.



Striated Heron at Flamingo Pond, St. John.



4. Priorities for Management of Wetlands In the U.S. Virgin Islands

Wetlands provide a range of goods and services that support the economic and social development of the U.S. Virgin Islands. However, there is no general agreement in the community to protect wetlands. There is an increasing level of damage to wetlands and associated resources resulting from poor land use practices. Additionally, the number of wetlands changes constantly, as some wetlands (mainly small ponds constructed for agricultural purposes) are lost when land is taken out of agriculture, or there is gain because of ponds constructed for storm-water management or agricultural purposes.

The major issues and priorities currently relevant to wetlands are:

Integration of the Policy Framework – There are several laws relevant to the management of wetlands, and those laws are administered by several agencies. The programs managed by the various agencies are usually in line with national priorities. In 2009, the Department of Planning and Natural Resources initiated activities to develop a Wetlands Management Program. That program will establish a mechanism for integration of the wetlands-related policies and programs of the public agencies in the U.S. Virgin Islands, including the involvement of community organizations

Reduction of Threats – There are significant threats to wetlands and associated resources from natural and man-made sources. The man-made threats are primarily from land use activities (e.g. changed drainage, sediment from construction activities, filling of wetlands, disposal of solid waste and effluents), but also from illegal practices (e.g. solid waste disposal). These threats reduce the benefits provided by wetlands. While threat reduction is a priority of the management agencies, the most important require changes in attitudes and practices of individuals in the community.

Storm Water Management – Due to the topography of the islands, most development activities (including residential development) involve the channeling of surface runoff from rainfall events. Poor storm-water management practices result in damage to wetlands, social infrastructure (e.g. roads), and private property. Individuals and companies undertaking developments must therefore use best practices in the design of storm-water management systems.

Future Demand for Goods and Services from Wetlands – The existing uses of wetlands are expected to continue. There is increased use for recreation, including eco-tourism ventures. With increased development activity, particularly larger resort projects, there is increased use of wetlands for storm-water management. It is forecasted that global warming will increase rainfall variability and intensity. As such, wetlands will play an even greater role in flood protection.

Information Management – In order to make informed decisions concerning the management of wetland resources, the regulatory agencies are constantly updating the databases on physical conditions and status of the resources. The community should become engaged in the management process, especially by sharing information on the use of wetlands and associated resources, and threats to such resources.



5. Wetlands of the U.S. Virgin Islands

The national wetlands database assembled by the U.S. Fish and Wildlife Service lists [xxx] wetlands in the U.S. Virgin Islands. That number is based on a more detailed classification system than used by the relevant local institutions. One of the activities to be undertaken in the Wetlands Program is to improve the accuracy of the information on wetlands contained in both local and national databases.

This chapter focuses on the following sites on St. Croix, St. John and St. Thomas. The sites represent the different categories of wetlands found on each island in the U.S. Virgin Islands. Each section includes a map of that island's wetlands locations. The individual site descriptions include photos, information on the wetland resources, any threats to those resources, uses of the sites, GPS coordinates and adjacent land uses. The birds listed in this section is based on a 2009 survey of water birds on St. Croix conducted by the Virgin Islands Division of Fish and Wildlife, as well as site observations on St. John and St. Thomas by experts from the Island Resources Foundation.

On the following page, see sample aerial photos of wetlands with features to look for.

Summary Descriptions of Selected Wetlands

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Guide to Aerial Photos

The site descriptions that follow include a number of aerial photographs taken in 2007. Below are sample photos with features to look for.

Top, Great Pond, St. Croix. Bottom, Chocolate Hole, St. John.



adjacent habitat:
pasture

open water

sand berm

mangroves

sea

beach

residential area

salt pond

bay with moored
boats

construction zone

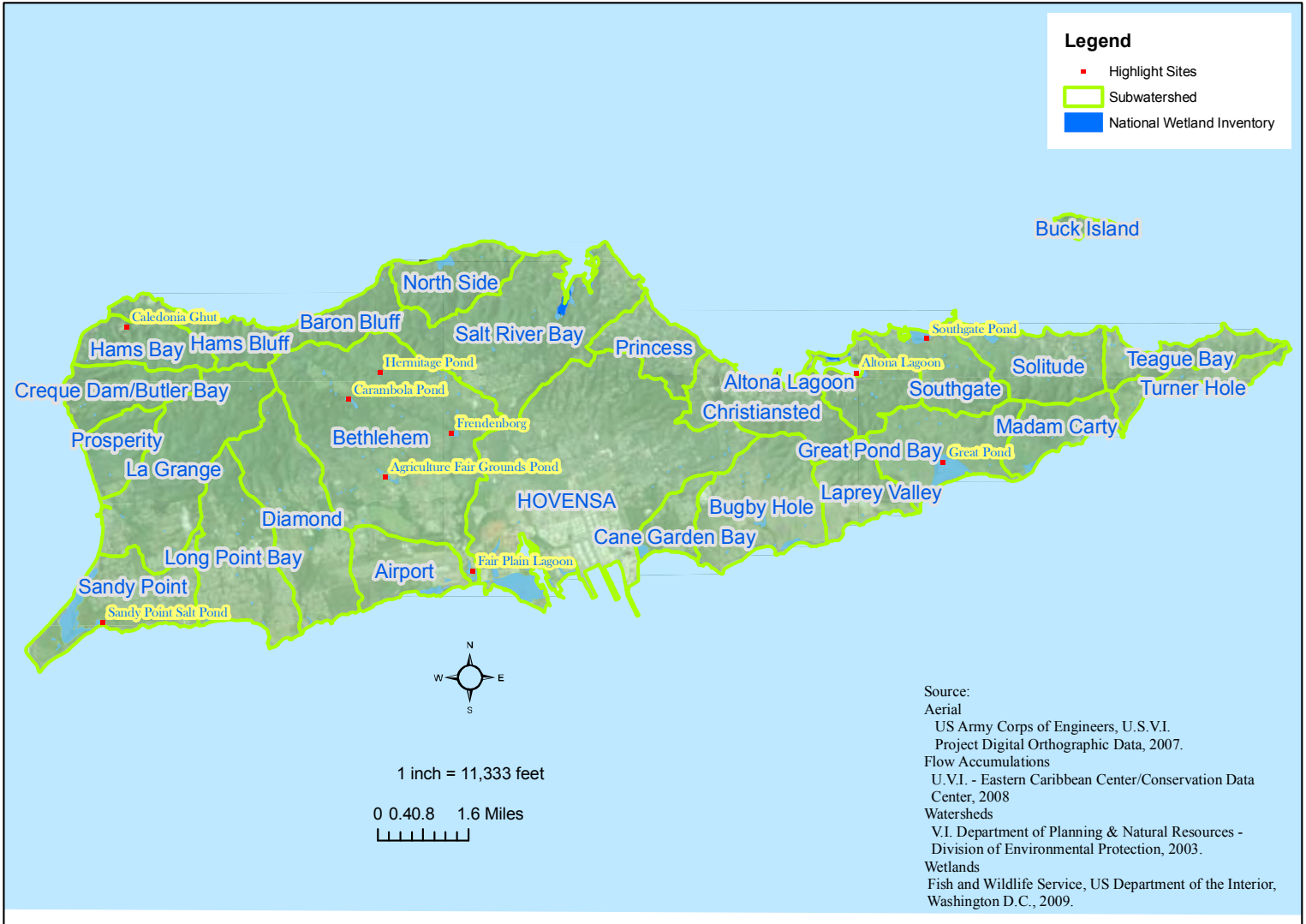
pond





5.1 Wetlands of St. Croix

5.1 Wetlands of St. Croix





Agriculture Fair Grounds (Agfair) Pond, St. Croix



Site Coordinates: 17° 43'25.25"N 64° 48'28.26"W
Watershed: Bethlehem Watershed
Date Surveyed: November 3, 2003
Wetland Category: Impoundment

General Site Description:

This wetland is an impoundment, formed by the construction of an earthen dam across a seasonal stream. The impoundment has gentle slopes, and the depth of the water on the day of the survey was approximately 1-2 feet deep. There is submerged vegetation covering approximately 55% of the pond. The pond is one of three found together on the grounds of the Virgin Islands Department of Agriculture.

Adjacent Habitats: Pasture, overgrown pasture, and open scrub.

Primary Use of the Wetland: Provision of water for farming.

Adjacent Land use: Cattle grazing.

Birds Observed at Site:

Common Moorhen, Great Blue Heron, Great Egret, Green Heron, Killdeer, Least Tern, Pied-billed Grebe

Threats: None identified.

Relevance to USVI Conservation Objectives:

Protection of water quality, maintenance of habitat for rare species of plants and animals.



Altona Lagoon, St. Croix



Site Coordinates: 17° 44'58.81"N 64° 40'53.87"W
Watershed: Altona Watershed
Date Surveyed: April 6, 2010
Wetland Category: Lagoon

General Site Description:

The lagoon is essentially an enclosed embayment with a single point of connection to the sea, maintained as a permanent connection by a concrete structure. The wetland is comprised of basically four general areas; (i) the main lagoon, which is said to vary in depth from 1-5 feet, (ii) a small area of open water in the southeastern corner, separated from the main lagoon by an earthen dyke, (iii) small mudflats, and (iv) a riparian forest. Fresh water enters the lagoon by way of several ghuts, and as sheet flow (un-channeled surface runoff) from the surrounding hills. The riparian forest varies in width from approximately 20-60 feet, with greater depths along ghuts. The riparian forest is dominated by red, white, and black mangroves, though seaside mahoe, sea grape, pink poui, almond, and button mangrove are dispersed throughout. There is a species and height gradation in most of the areas of the riparian forest. Red mangroves dominate the inner fringe (on the lagoon side), while black and white mangroves are found mainly on the outer edge of the stand. The height of the trees in the riparian forest varies from approximately 10 feet along the inner edge on the northern side to 30-40 feet in the south-east corner (near the Buccaneer Hotel). The submerged vegetation includes Turtle Grass (*Thalassia testudinum*), Manatee Grass (*Halodule wrightii*), Eel Grass (*Syringodium filiforme*), and green algae. Associated wetland grasses found at the site are primarily *Sporobulus*, *Batis Maritima*, *Sesuvium*, and *Ipomea*.



Left, Great Egret. Above, Wilson's Plover nest and hatchlings, St. Croix.

Adjacent Habitats:

The adjacent forested area is classified as semi-deciduous woodland, though there are thickets of scrub, dominated by Tan Tan and Acacia.

Primary Use of the Wetland:

The lagoon is used primarily for fishing, which takes place most mornings. Food fish caught in the lagoon are Snook, Grunt, Snapper, and Barracuda. Recreational fishing takes place on an occasional basis. The site is said to be a source of crabs.

Adjacent Land use:

The land immediately adjacent to the lagoon is mostly covered by forest, with a small number of residences scattered throughout. The wetland is bordered on its eastern boundary by the golf course of the Buccaneer Hotel and on its northern boundary by a recreational beach complex. There is a fish landing site and restaurant on the north-western edge of the wetland (close to the bridge and beach).

Birds Observed at Site:

Black-necked Stilt, Great Egret, Laughing Gull, Little Blue Heron, Magnificent Frigatebird, White-cheeked Pintail, Wilson's Plover, Yellow Warbler, Zenaida Dove.

Threats:

There is cutting of mangroves along the northern fringe to maintain parking at the beach complex and access (via boardwalk) to the lagoon. The water in the ghuts entering the lagoon display algal blooms and varying degrees of clarity and levels of sediment loading, indicative of pollutants entering the lagoon. Poor waste disposal practices result in solid waste (paper, food wrappers, used tyres) being deposited along the edges of the mangroves, despite the posting of signs warning against disposal of solid waste in the area.

Relevance to USVI Conservation Objectives: Fish nursery, important wildlife habitat.



Bethlehem/Fair Plain Lagoon, St. Croix



Site Coordinates: 17° 41'57.73"N 64° 47'4.74"W
Watershed: Bethlehem Watershed
Date Surveyed: April 8, 2010
Wetland Category: Lagoon

General Site Description:

The site is basically a lagoon formed by the end of the ghut being closed by a sandbar, which is breached periodically by significant rainfall events or strong wave activity. The lagoon is approximately 20-30 feet wide, with the widest part located at the end adjacent to the sea. The lagoon is fringed by a riparian forest dominated by mangroves. White mangrove is the species most abundant along most of the length of the lagoon, though red mangroves dominate the area closest to the sea. The riparian vegetation varies in width of approximately 10-20 feet on both sides of the lagoon, with tree height approximating 25 feet. There is a large amount of mangrove and seaside mahoe seedlings along the edges of the lagoon and on the sand bar.

Adjacent Habitats: Overgrown pasture and mixed scrub woodland, dominated by Tan Tan and Acacia.

Primary Use of the Wetland: None documented.

Adjacent Land Use:

The Anguilla landfill and sewage treatment facility are located on the eastern side of the lagoon. The overgrown pasture on the western side of the lagoon is used to a small extent to graze horses. The Henry E. Rohlsen International Airport (and associated operations) is located on the north-western side of the lagoon. The St. Croix horse racing track is located immediately south of the airport. On land immediately north of the lagoon (and drained by the ghut feeding the lagoon) are a number of commercial and industrial operations.

Birds Observed at Site:

Black-crowned Night Heron, Great Egret, Laughing Gull, Little Blue Heron, Magnificent Frigatebird, Yellow-crowned Night Heron.

Threats:

Illegal solid waste disposal, non-point source pollution via the ghut, chemical pollutants from the industrial and commercial activities along the ghut flowing to the lagoon, potential contamination by effluent from the sewage treatment plant, and potential contamination by leachate from the landfill.

Relevance to USVI Conservation Objectives:

Protection of coastal water quality, protection of critical habitat for wildlife species. The wetland falls within the XX Area of Particular Concern.



Above, Yellow-crowned Night Heron, St. Croix. Right, Little Blue Heron and chick.

Caledonia Ghut, St. Croix



Site Coordinates: 17° 45'44.03"N 64° 52'36.98"W
Watershed: Caledonia Watershed
Date Surveyed: Not Available
Wetland Category: Ghut

General Site Description:

To access the Caledonia trail, follow Route 78 to the junction on the Northwest Road (which turns into the beginning of Route 78 East). The trail head is located at the Aggregate Inc. quarry. Hiking as far as the Caledonia Ghut Waterfall is approximately 2.5 miles. The duration of the hike is 2.5 hours, walking in the river bed. Good hiking shoes are mandatory. This hike is strenuous.

Dominant Flora and Fauna:

Birds: Bananaquit, Black-crowned Night Heron, Black-whiskered Vireo, Bridled Quail Dove, Caribbean Elaenia, Grass Quit, Gray Warbler, Great Egret, Green Heron, Pearly-eyed Thrasher, Puerto Rican Bullfinch, Smooth-billed Ani, Tyrant Fly Catcher, Yellow Warbler, Yellow-crowned Night Heron.

Vegetation: Trees in the Caledonia Ghut are not the typical wetland plants. The vegetation is characterized as Gallery Moist Forest, a forest type found primarily in the upper portions of ghuts in the USVI. The dominant tree species found within this ghut forest are Gre-Gre (Black Olive), Silk Cotton (Kapok Tree/Jumbie Tree), Fustic Tree (dye plant), Rain Tree (Candy Tree), Furniture Wood, Raft Wood (Trumpet Tree), Spicy Guava, Sandbox Tree (Monkey no climb), and Marble Tree (Maria

continued next page

Galba). In addition, there are several species of fern, wild yams, and cocoa beans. A number of plants known to have medicinal properties are also found in the Caledonia Ghut. These “medicinal” plants include Sweet Broom (Licorice Weed), Stone Breaker (Seed Under Leaf), Blue Vervien, Congo Root (Gully Root/Galic Weed), and Midwife Plant.

Uses of Ghut:

Caledonia Gut has fresh flowing water all year round. The Caledonia moist forest historically has been a sanctuary for many rare plants, birds, and humans. To the Maroons (“runaway slaves”), it was a place of refuge. Due to the richness of the bird life, the Caledonia moist forest is often referred to as Bridle Quail Dove country. Residents participate in hikes and picnics to the ghut, and use the water for washing laundry. Faunal species caught in the ghut include shrimps, eels, crayfish, and crabs.

Threats: None identified.

Relevance to USVI Conservation Objectives:

Protection of water quality, maintenance of habitat for rare species of plants and animals.

Source of Information: Ras Lumumba Coriette, Ay Ay EcoTours.



**Top, Bananaquit. Bottom, Yellow Warbler.
Right, Kapok Tree.**





Carambola Pond, St. Croix



Site Coordinates: 17° 44'36.71"N 64° 49'3.36"W
Watershed: Bethlehem Watershed
Date Surveyed: April 8, 2010
Wetland Category: Impoundment

General Site Description:

The wetland was created by the placement of an earthen dyke across a gully. The wetland does not contain any vegetation, and is thus an open body of water.

Adjacent Habitats: The wetland is bordered by a golf course, except along the south and south-western areas, which supports a moist forest.

Primary Use of the Wetland: Water and water trap for golf course.

Adjacent Land Use: Golf course.

Birds Observed at Site: Black-crowned Night Heron, Brown Pelican, Common Moorhen, Gray Kingbird, Great Blue Heron, Great Egret, Green Heron, Pearly-eyed Thrasher, Pied-billed Grebe, Scaly-naped Pigeon, Yellow-crowned Night Heron, Zenaida Dove.

Threats: None documented.

Relevance to USVI Conservation Objectives: Wildlife habitat.



Fredenborg Pond, St. Croix



Site Coordinates: 17° 44'5.17"N 64° 47'24.18"W
Watershed: Bethlehem Watershed
Date Surveyed: November 3, 2003
Wetland Category: Impoundment

General Site Description:

The impoundment is approximately 12 inches deep, with shrubs around the edge.

Adjacent Habitats: Pasture, with low shrubs.

Primary Use of the Wetland: Water for agriculture

Adjacent Land Use: The adjacent land is used for livestock and limited crop farming.

Birds Observed at Site: American Coot, Black-crowned Night Heron, Black-necked Stilt, Brown Pelican, Cattle Egret, Common Moorhen, Great Egret, Green Heron, Killdeer, Least Tern, Little Blue Heron, Pied-billed Grebe, Ruddy Duck, Smowy Egret, White-cheeked Pintail.

Threats: None identified.

Relevance to USVI Conservation Objectives: Wildlife habitat, breeding area for American Coot.



Great Pond, St. Croix



Site Coordinates: 17° 43'36.12"N 64° 39'30.42"W
Watershed: Great Pond Bay Watershed
Date Surveyed: April 6, 2010
Wetland Category: Salt Pond

General Site Description:

The pond is separated from the sea by a sand bar, with a single opening to the sea located close to the eastern end of the beach. The sand bar supports mixed vegetation, mainly Acacia, Tan Tan, Seaside Mahoe, and grasses. The vegetation along the shore is approximately 10-15 feet in height. The vegetation structure of the wetland varies, with the highest density and tallest trees occurring towards the front (towards the sea) and middle of the wetland, and extends approximately 400-500 feet from the shoreline. The trees in that area are black, white, and red mangroves, with the red mangroves occurring mainly along the channel linking the pond to the sea. The red mangroves along the front are approximately 15-25 feet high. The mangrove trees along the edges and extending into the flashes at the back of the wetland are smaller (3-10 feet) and less dense than the stand in the middle of the wetland. Small, solitary black mangroves in the flashes indicate that colonization of the wetland by mangroves is an ongoing process. The main shrubs and grasses found in the wetland are Sporobulus and Sesuvium.

Adjacent Habitats:

Adjacent vegetation is dominated by thorn scrub, merging into an overgrown pasture. A mixed thorn scrub along the eastern edge of the wetland is separated from the wetland by a narrow dirt road.

continued next page

Primary Use of the Wetland: Bird watching.

Adjacent Land Use:

The adjacent land is used for grazing of cattle and horses. A resort development has been approved for land in the general proximity of the wetland.

Birds Observed at Site: Belted Kingfisher, Black-bellied Plover, Black-crowned Night Heron, Black-necked Stilt, Blue-winged Teal, Great Blue Heron, Great Egret, Greater Yellowlegs, Green Heron, Lesser Yellowlegs, Little Blue Heron, Magnificent Frigatebird, Osprey, Semi-palmated Plover, Snowy Egret, Spotted Sandpiper, Tri-colored Heron, Whimbrel, White-cheeked Pintail, Wilson's Plover, Yellow-crowned Night Heron.

Threats: Coastal erosion, solid waste disposal, and potential impacts from planned resort development.

Relevance to USVI Conservation Objectives:

Major habitat for water birds, including threatened migratory species. Maintenance of coastal water quality and protection of adjacent coral reefs by filtering surface runoff.



Left, Red Mangroves, St. Croix. Right, Black-necked Stilt.



Hermitage Pond, St. Croix



Site Coordinates: 17° 45'1.08"N 64° 48'33.01"W
Watershed: Bethlehem Watershed
Date Surveyed: April 8, 2010
Wetland Category: Impoundment

General Site Description:

The wetland is an impoundment created by the construction of an earthen dyke across a gully.

Adjacent Habitats:

The wetland is bordered on three sides by overgrown pasture that is reverting to forest. The vegetation on the western and south-western boundary is mature secondary forest.

Primary Use of the Wetland:

Provision of water for cattle. The pond is also used by wildlife (including deer) as a source of water.

Adjacent Land Use: Cattle farming.

Birds Observed at Site: Black-necked Stilt, Cattle Egret, Common Moorhen, Least Grebe, White-cheeked Pintail, Yellow-crowned Night Heron.

Other Wildlife Species Observed at Site (Source: St. Croix Hiking Association):

Deer, Red-footed tortoise, Tilapia, Mosquito fish

Threats: None identified.

Relevance to USVI Conservation Objectives: Wildlife habitat.



Sandy Point Salt Pond/West End Salt Pond, St. Croix

Site Coordinates: 17° 41'11.65"N 64° 53'0.85"W
Watershed: Sandy Point Watershed
Date Surveyed: April 8, 2010
Wetland Category: Salt Pond

General Site Description:

The wetland is basically a lagoon that became permanently isolated from the sea. The pond is fringed by riparian vegetation, except for a low rocky shoreline in the south-eastern corner. The riparian vegetation is broken in a small number of places, and varies in width and height of vegetation. The width of the riparian area varies from one-two trees thick in the area of the water park to 20 feet thick along the northern and north-western boundaries. Tree height varies between 5-20 feet, with the tallest trees along the north-western boundary. The main trees in the riparian area are black mangrove, white mangrove, button mangrove, Acacia, and Seaside Mahoe.

Adjacent Habitats:

The adjacent habitat consists primarily of coastal woodland and scrub on the low ridges on the eastern side of the pond.

Primary Use of the Wetland: Bird watching.

Adjacent Land Use:

There is low-density residential development on the lands adjacent to the north-eastern portion of the pond. The western side of the pond is bordered by a sand strip that supports resort development (rental

continued next page

cottages), intensive beach recreational activities (camping, swimming, and watersports), residential development (condominiums and cottages), and commercial development (restaurants). The Vincent F. Mason Sr. Coral Resort recreational facility is located along this sand strip.

Birds Observed at Site:

Black-crowned Night Heron, Black-necked Stilt, Brown Pelican, Great Blue Heron, Great Egret, Laughing Gull, Little Blue Heron, Magnificent Frigatebird, Royal Tern, Sandwich Tern, Snowy Egret, White-cheeked Pintail, Yellow-crowned Night Heron.

Threats:

Solid waste disposal (debris from landscaping) in the riparian area along north-western boundary of the pond.

Relevance to USVI Conservation Objectives:

A large part of the pond falls within the Sandy Point Wildlife Sanctuary.



Left, Brown Pelican, St. Croix. Right, White-cheeked Pintail.

Southgate Pond, St. Croix



Site Coordinates: 17° 45'30.17"N 64° 39'45.97"W
Watershed: Southgate Watershed
Date of Survey: April 6, 2010
Wetland Category: Pond

General Site Description:

The wetland is a complex of open water, mud flats, and areas dominated by grasses. The open water is located in the north-western portion of the site, and occupies approximately 34% of the wetland. Widgeongrass (*Ruppia maritime*) form thick mats in large areas of the pond that is permanently covered by water. The submerged grass provides food and shelter for the water birds. The open water is fringed by mangroves, with the widest and densest areas occurring in the south-west and north-west corners. White mangrove is the dominant tree species in the wetland, in terms of frequency and size of trees. The mud flats occur during the drier months of the year, and are usually found along the eastern and southern sides of the area of open water. The mud flats are populated by small clumps or solitary specimens of white mangrove. The third distinct portion of the wetland occupies the southern and south-eastern portions of the site, and is dominated by grasses. This grassy area is inundated only during the rainy season, and contains solitary trees, mainly white mangrove and Acacia.

Adjacent Habitats:

The site is bordered by open grass areas to the southwest and southeast, and the entire northern boundary is a sand berm that supports a coastal forest.

Primary Use of the Wetland:

The adjacent beach is used extensively for recreational purposes, and the site is used for bird watching.

Adjacent Land Use:

Adjacent land uses include the Green Cay Marina on the north-western boundary, the Cheney Bay Resort on the eastern boundary, commercial development on the south-western boundary, and residential development on the south-western and western boundaries.

Birds Observed at Site:

Antillean Crested Hummingbird, Black-bellied Plover, Black-necked Stilt, Brown Pelican, Common Moorhen, Gray Kingbird, Great Egret, Greater Yellowlegs, Green Heron, Green-throated Carib, Laughing Gull, Least Sandpiper, Least Tern, Lesser Yellowlegs, Little Blue Heron, Magnificent Frigatebird, Pied-billed Grebe, Ruddy Duck, Ruddy Turnstone, Semi-palmated Plover, Short-billed Dowitcher, Smooth-billed Ani, Spotted Sandpiper, Stilt Sandpiper, Tyrant Fly Catcher, White-cheeked Pintail, White-crowned Pigeon, White-winged Dove, Wilson's Plover, Yellow Warbler, Yellow-crowned Night Heron, Zenaida Dove.

Threats:

Discharge (brine) from the Seven Seas Water Company, non-point source pollution entering via the ghuts, and damage from vehicular traffic.

Relevance to USVI Conservation Objectives:

The site is a major wildlife habitat, which functions also as an over-wintering ground for migratory species of birds. The beach is a major turtle nesting site. The site is currently managed by the St. Croix Environmental Association as a wildlife reserve.

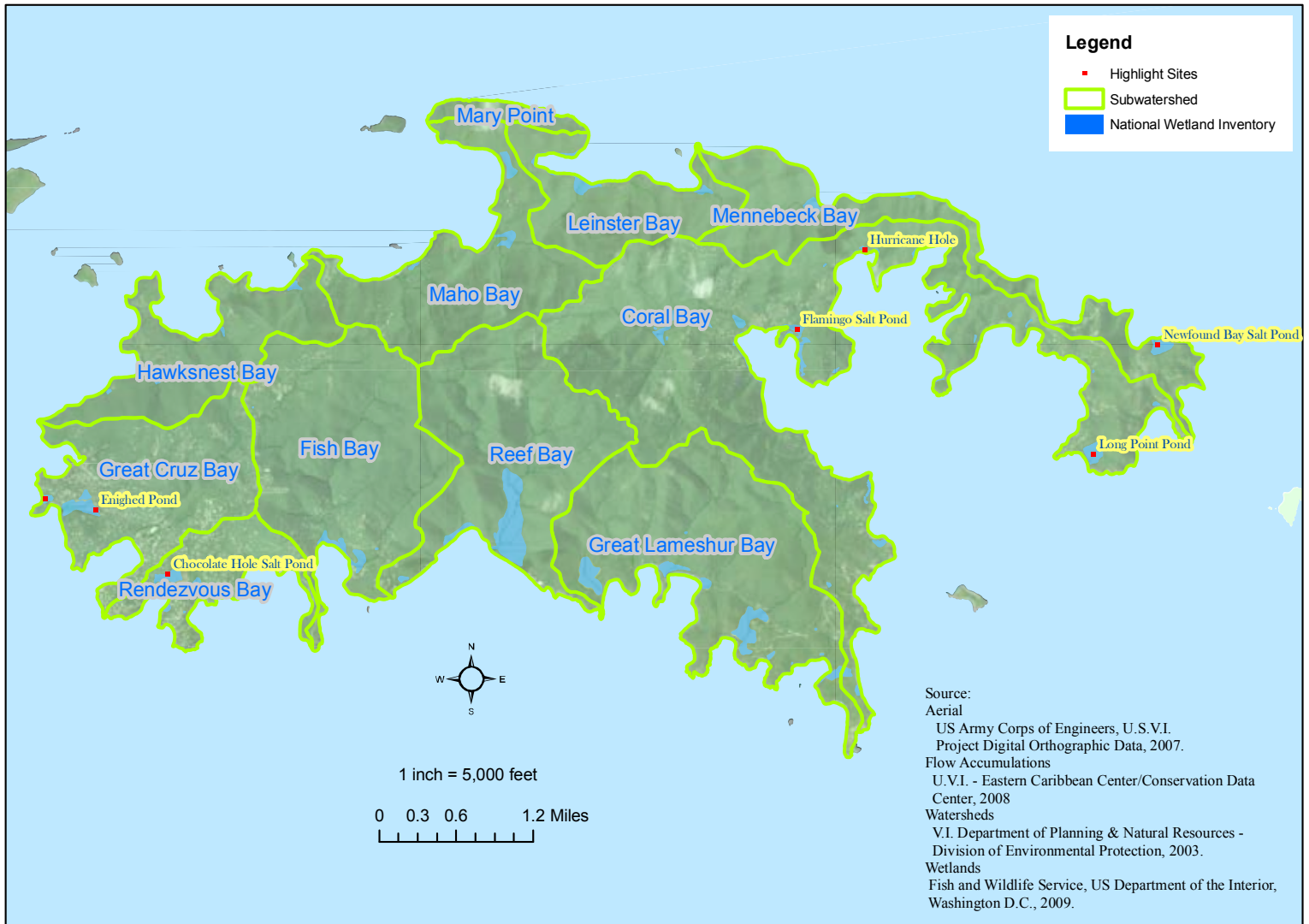


From left, *Justicia carthaginensis*, White Mangroves with taproots.



5.2 Wetlands of St. John

5.2 Wetlands of St. John



Chocolate Hole Salt Pond, St. John



Site Coordinates: 18°19'9.73"N 64°47'0.6"W
Watershed: xx
Date Surveyed: January 23, 2010
Wetland Category: Salt Pond

General Site Description:

The pond is fringed by a narrow band of riparian vegetation, with tree height ranging from 15-20 feet. The riparian vegetation consists mainly of white and black mangroves, with the dominant species being the white mangrove. The sand berm separating the pond from the sea appears to have been breached in the area of the south-western corner of the pond. Access to the pond is through private property.

Adjacent Habitats: Narrow coastal hedge on the sand berm, and surrounding thorn scrub.

Primary Use of the Wetland: None documented.

Adjacent Land Use:

The adjacent land is used primarily for residential development. At the time of the site visit, construction was taking place around the southern, western and eastern perimeters of pond for a condominium development.

Birds Observed at Site:

Magnificent Frigatebird, Pearly-eyed Thrasher, Smooth-billed Ani, Yellow Warbler, Zenaida Dove.

continued next page

Threats:

Sedimentation impacts from construction activities, and potential nutrient contamination of the pond.

Relevance to USVI Conservation Objectives: **See APC report**



Enighed Pond, St. John

Site Coordinates: 18°19'35.8"N 64°47'31.13"W
Watershed: xx
Date Surveyed: January 23, 2010
Wetland Category: Pond

General Site Description:

The wetland was an enclosed lagoon until 2003, when approximately half of the wetland was lost by the creation of the ferry port/terminal. The remainder of the wetland was divided into two portions by the construction of an asphalted access road for the terminal. The western portion of the wetland is a shallow pond fringed completely by mangroves. The eastern portion of the wetland is fringed on its eastern and southern sides by riparian vegetation, on its northern side by the access road, and on its western side by sheet pilings (placed to reduce sediment accumulation in the docking area). The riparian vegetation is composed of low shrubby, red mangroves, and white mangroves, varying in height from 12-25 feet, with the tallest trees located in the south-eastern and southern corners of the pond.

Adjacent Habitats:

Narrow band of coastal forest behind the riparian fringe.

Primary Use of the Wetland:

Used as a sediment trap to maintain the depths required for the operation of the port.

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Adjacent Land Use:

The ferry port and associated infrastructure is located on the north-western and northern boundary. An open lot on the north-eastern border is used as a parking area. The sewage treatment plant for Cruz Bay is situated adjacent to the open lot. Commercial development is located on the eastern side of the wetland, and residential development covers the surrounding slopes.

Birds Observed at Site:

Bananaquit, Black-faced Grassquit, Common Moorhen, Great Blue Heron, Great Egret, Greater Yellowlegs, House Sparrow, Lesser Yellowlegs, Little Blue Heron, Pearly-eyed Thrasher, Snowy Egret, Waterthrush spp., White-cheeked Pintail, Yellow Warbler, Zenaida Dove.

Threats:

Threats include sediments from upland areas, solid waste, and the potential for contamination by sewage effluent. The northern (enclosed) portion of the wetland is to be filled and used for parking for the ferry terminal.

Relevance to USVI Conservation Objectives: see APC report



Flamingo Pond, St. John

Site Coordinates: 18°20'48.08"N 64°42'31.54"W
Watershed: xx
Date Surveyed: January 23, 2010
Wetland Category: Pond

General Site Description:

The pond is bordered on the north and east by the road from Coral Bay to the East End peninsula, and on the south and west by a mangrove forest that separates the pond from the sea. A dirt road that leads to small promontory crosses the wetland on the western side. The pond is usually shallow, with the depth of the water varying between 6-18 inches (10-30 cm) on the day of the survey. A narrow, broken fringe of riparian vegetation surrounds the pond. Different plant species dominate different segments of the riparian area. [Common Name] (*Cryptostegia grandiflora*) dominates the northern portion, black and white mangroves dominate the southern and eastern edges, and red mangrove dominates the western perimeter. Tree height in the riparian fringe varies from 12-18 feet, with the tallest trees being the red mangroves.

Adjacent Habitats:

The adjacent habitats include coastal woodland and semi-deciduous forest on the eastern side, along a portion of the northern boundary, and along the promontory on the south-western boundary. The forested areas along the western and southern boundaries are basically mangrove forests.

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Primary Use of the Wetland: None documented.

Adjacent Land Use:

Adjacent land use is primarily residential, with a single commercial development on the north-eastern border.

Birds Observed at Site:

Antillean Crested Hummingbird, Black-necked Stilt, Carribean Elaenia, Carribean Martin, Cattle Egret, Gray Kingbird, Great Egret, Kestrel, L.A. Bullfinch, Lesser Yellowlegs, Little Blue Heron, Mangrove Cuckoo, Northern Parula Warbler, Northern Waterthrush, Pearly-eyed Thrasher, Semi-palmated Plover, Tri-colored Heron, White-winged Dove, Zenaida Dove.

Threats:

Sediment in surface runoff, and potential nutrient contamination from the residential and commercial developments.

Relevance to USVI Conservation Objectives:

Protection of coastal water quality and wildlife habitat.



Frank Bay Pond, St. John

Site Coordinates: 18°19'40.62"N 64°47'52.69"W
Watershed: Great Cruz Bay Watershed
Date Surveyed: November 3, 2003
Wetland Category: Salt Pond

General Site Description:

The wetland is a pond separated from the sea by a sand berm that now supports coastal vegetation and a paved road. Riparian vegetation, dominated by White Mangrove and Buttonwood, is found along approximately 15% of the perimeter of the pond. The riparian vegetation varies in height between 6-12 feet. The hypersaline condition of the pond indicates that there is sub-surface movement of seawater into the pond.

Adjacent Habitats: Adjacent habitats include coastal hedge and dry forest.

Primary Use of the Wetland: None documented.

Adjacent Land Use:

The main road to Cruz Bay borders the pond on the western border, and the remainder of the land surrounding the pond is used for residential development.

Birds Observed at Site: Black-legged Stilt, White-cheeked Pintail.

Threats:

Solid waste, sediment in surface runoff, nutrient enrichment from residential septic systems, and oil and grease in non-point source pollution.

Relevance to USVI Conservation Objectives: None identified.

Hurricane Hole, St. John



Site Coordinates: 18°21'20.34"N 64°42'2.56"W

Watershed: xx

Date Surveyed: January 23, 2010

Wetland Category: Lagoon

General Site Description: Source: Rogers, 2009

The wetland is comprised of four small embayments fringed by mangroves, primarily red mangroves. Two of the bays, Otter Creek and Water Creek, contain "... a particularly high abundance and diversity of corals ...". The lagoon contains 28 species of coral: *Stephanocoenia intersepta*, *Agaricia sp.*, *Agaricia agaricites*, *Siderastrea siderea*, *S. radians*, *Porites porites*, *P. astreoides*, *P. furcata*, *P. divaricata*, *Favia fragum*, *Diploria strigosa*, *D. labyrinthiformis*, *D. clivosa*, *Manicina areolata*, *Colpophyllia natans*, *C. amaranthus*, *Montastraea annularis*, *M. faveolata*, *M. franksi*, *M. cavernosa*, *Oculina diffusa*, *Meandrina meandrites*, *Dendrogyra cylindrus*, *Scolymia cubensis*, *Mycetophyllia sp.*, *Eusmilia fastigiata*, *Cladocora arbuscula*, and *Tubastrea coccinea*.

Adjacent Habitats:

Coastal dry woodland

Primary Use of the Wetland:

The lagoon is used primarily as a storm shelter for boats. The mooring of boats within the bays is managed by the Virgin Islands National Park.

Adjacent Land Use:

continued next page

The site falls within the Virgin Islands National Park, and the surrounding land is maintained under forest.

Birds Observed at Site: None.

Threats:

No current threat documented.

Relevance to USVI Conservation Objectives:

The lagoon falls within the Virgin Islands Coral Reef National Monument.

The U.S. Geological Survey has posted a series of photos of the corals and underwater plants and animals of Hurricane Hole. Below are selections. To see the entire collection, click [here](#) (or go to http://gallery.usgs.gov/tags/HurricaneHole/list/05_03_2010_otk7Nay44G_05_03_2010_0/1).



Main photo: Red Mangrove trees and seedlings. Insets: Left, diverse corals and marine species. Right, a large colony of Boulder Brain Coral grows around a mangrove propoot.



Long Point Pond, St. John

No photo found

Site Coordinates: 18°19'56.64"N 64°40'25.39"W
Watershed: Great Cruz Bay Watershed
Date Surveyed: November 3, 2003
Wetland Category: Salt Pond

General Site Description:

Open pond separated permanently from the sea by a sand berm and cobble beach. There is no riparian vegetation, but occasional specimens of Button Mangrove are found along the edges of the pond. The hypersaline conditions of the water in the pond indicate that there is sub-surface movement of seawater into the pond.

Adjacent Habitats:

Adjacent habitats include coastal scrub on the beach berm, and mixed dry forest and scrub thicket on the slopes surrounding the pond.

Primary Use of the Wetland: None documented.

Adjacent Land Use:

Low density residential development. There are unpaved roads along the western slopes.

Birds Observed at Site: Kingbird.

Threats:

Erosion of unpaved road and sediment in surface runoff to the pond.

Relevance to USVI Conservation Objectives: None identified.



Newfoundland Bay Salt Pond, St. John

Site Coordinates: 18° 20' 41.24" N 64° 39' 57.64" W
Watershed: Mennebeck Bay
Date Surveyed: November 4, 2004
Wetland Category: Lagoon

General Site Description:

The wetland is a lagoon that is closed off from the sea on a semi-permanent basis, with sand berm breached by strong wave action or large amounts of surface runoff during significant rainfall events. The sides of the lagoon are steep, and fringed by mangroves on the southern and western sides,

Adjacent Habitats: Coastal hedge on beach berm, and mixed dry forest on the surrounding slopes.

Primary Use of the Wetland: Recreation (hikers).

Adjacent Land Use: Land is under forest cover.

Birds Observed at Site:

Crested Hummingbird, Kingfisher, Lesser Yellowlegs, Semi-palmated Plover, White-cheeked Pintail.

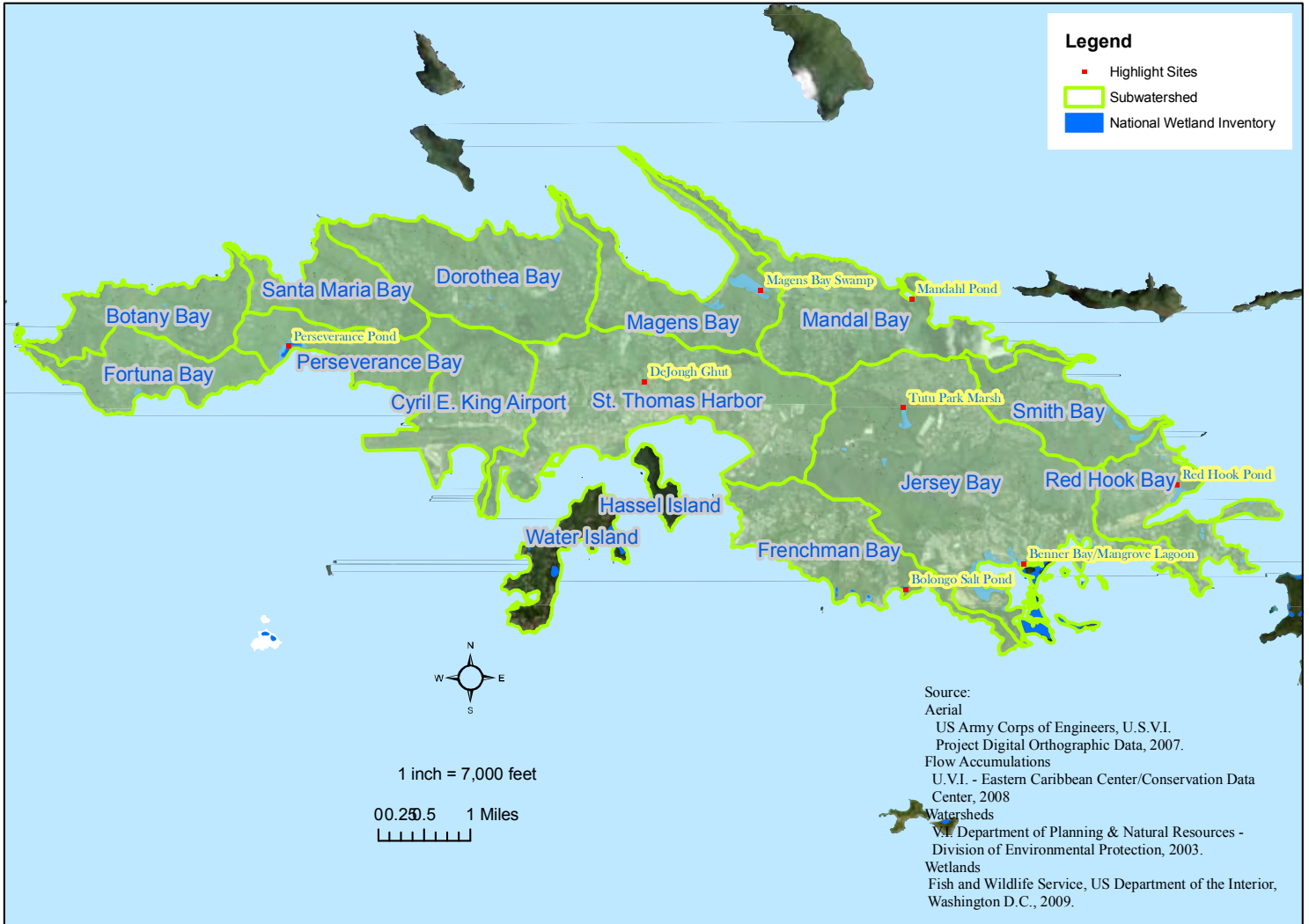
Threats: Solid waste and flotsam from boats.

Relevance to USVI Conservation Objectives: None identified.



5.3 Wetlands of St. Thomas

5.3 Wetlands of St. Thomas



Benner Bay/Mangrove Lagoon, St. Thomas



Site Coordinates: 18°19'0.73"N 64°52'28.96"W
Watershed: Jersey Watershed
Date Surveyed: April 15, 2010
Wetland Category: Lagoon

General Site Description:

The site is essentially a bight; that is, an embayment containing mangrove islands, mud flats, open areas of water connected by channels, and a riparian forest dominated by mangroves. This complex of ecotypes gives the impression that there are several bays, and that the wetland resources are not connected. The riparian vegetation is dominated by red, white, button, and black mangroves. The black mangroves are found mainly at the rear (landward) section of the stand, while the red mangroves are on the outer fringe. The height of the mangrove trees vary generally between 10-20 feet, except in the northwestern corner (in the area of the landfill and race track), where the red mangroves exceed 20 feet.

Adjacent Habitats: Mixed dry forests and coastal scrub.

Primary Use of the Wetland: Recreation, marina and related facilities.

Adjacent Land Use:

The Bovoni landfill, sewage treatment plant, and Bovoni industrial complex are located on the western

continued next page

side of the bight; marinas are located within the lagoon at Independent Boatyard and Compass Point Marina; commercial operations (shops, marine supply operations, hardware stores, groceries, vehicle repair operations, bars, and restaurants) are scattered along the northern edge of the lagoon; and residential areas are located on the slopes overlooking the entire northern side of the lagoon.

Birds Observed at Site:

Belted Kingfisher, Caribbean Elaenia, Gray Kingbird, Green Heron, Green-throated Carib, Little Blue Heron, Prairie Warbler, Scaly-naped Pigeon, Waterthrush sp., White-winged Dove, Yellow Warbler, Zenaida Dove.

Threats:

Inputs of sewage effluent, industrial effluents, solid waste, sediment in runoff, loss of riparian areas, and increasing loss of surrounding habitats.

Relevance to USVI Conservation Objectives:

Forms a major part of the Cas Cay/Mangrove Lagoon Marine Sanctuary. The site is a major fish sanctuary.



Bolongo Salt Pond, St. Thomas

No photo found

Site Coordinates: 18° 18' 46.37" N 64° 53' 39.23" W
Watershed: Frenchman's Bay Watershed
Date Surveyed: November 6, 2003
Wetland Category: Salt Pond

General Site Description:

The small coastal pond is approximately 12 inches deep at the deepest end, and is separated from the sea by a very wide sand berm. Surface runoff is channeled to the pond by a ghat, though the brackish nature of the water in the pond indicates that there is sub-surface intrusion of sea water. The riparian vegetation is dominated by white and buttonwood mangroves, which are approximately 6-15 feet high.

Adjacent Habitats:

Adjacent habitats include coastal scrub on the beach berm, and dry coastal forest on the surrounding slopes.

Primary Use of the Wetland: None documented. The pond is accessed through private property.

Adjacent Land Use:

The surrounding slopes support low density residential development, and the Bolongo Bay Hotel is located to the west of the site.

Birds Observed at Site: Black-legged Stilt, Lesser Yellowlegs, Little Blue Heron.

Threats: Solid waste and non-point source pollution in run-off from the road to the north of the site.

Relevance to USVI Conservation Objectives: None documented.



DeJongh Ghut, St. Thomas



Site Coordinates: 18°20'45.49"N
64°56'14.75"W

Watershed: St. Thomas Harbor
Watershed

Date Surveyed: February 27, 2008

Wetland Category: Ghut

General Site Description:

The DeJongh Ghut is one of eight (8) ghuts the St. Thomas Harbor Watershed. The ghut starts in the upper portion of the watershed, containing a portion of the steeply-sloped central mountain ridge of the island. The ghut flows to the St. Thomas Harbor through the undeveloped upland slopes, moderately developed residential areas in Estate Staabi, and the densely populated urban area called Savan. The ghut changes name in the area of the Jane E. Tuitt Elementary School, from which point it is called the Savan Ghut.

The upland portion of the ghut is extremely difficult to access because of the steepness of the terrain, dense forest, and lack of nearby roads. A mixture of moist forest grading into drier forest grows on these slopes, with moist forest providing cover in the riparian zone. The rare, culturally important, native Maubi tree (*Colubrina elliptica*) reportedly grows in this area. The gallery moist

forest in the middle section of the ghut includes rare native plants such as the Royal Palm (*Roystonea borinquena*) and Santa Maria (*Calophyllum brasiliense*). The gallery moist forest grades into mixed formations of native and introduced plant species, and invasive non-native plants appear as the ghut approaches more densely populated and disturbed areas.

The ghut contains several pools, and water was flowing during all site visits during the period February to March 2008. The gut pools were mostly full after a long dry period, suggesting the maintenance of sub-surface flows.

Benefits provided by the Ghut:

Preliminary surveys of the DeJongh Ghut suggest that it provides value in the form of various goods

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and services, including:

- **Landscape Value** – Undisturbed landscape of the upland portion of the ghut offers scenic beauty and supports valuable forest communities.
- **Ecological Value** – The natural geological formations and unaltered flow of clear water contribute to the ecological value of the upper portion of the ghut and provide habitat for a diversity of plants and wildlife.
- **Provision of Water** – Information provided by the Department of Public Works indicates that a cistern in the ghut serves as a source of water, and hoses in the ghut suggest that water is used downstream for domestic purposes or irrigation.
- **Recreation** – Anecdotal information indicates that past ghut recreational uses included bathing, hiking and catching shrimp. The middle and upper parts of the ghut are currently valued for hiking.
- **Environmental Education** – The Jane E. Tuitt Elementary School, other nearby schools, the University of the Virgin Islands, and community groups can use all sections of the ghut for various types of environmental education, including ghut or stream management.
- **Research and Teaching** – Professors from Tuskegee University, Eastern New Mexico University, University of the Virgin Islands, and wildlife specialist from the Virgin Islands Division of Fish and Wildlife have expressed interest in conducting research in the DeJongh Ghut.

Threats:

Nutrient inputs in the middle portion of the ghut, clearing of vegetation and introduction of non-native species in the middle portion of the ghut, and solid waste disposal in the middle and lower portions of the ghut.

Relevance to USVI Conservation Objectives: Wildlife habitat.

Source of Information: Toni Thomas – Cooperative Extension Service, University of the Virgin Islands.

**Captions
needed.**





Magens Bay Swamp, St. Thomas

Site Coordinates: 18° 21' 37.33" N 64° 55' 4.98" W
Watershed: Magens Bay Watershed
Date Surveyed: January 22, 2010
Wetland Category: Swamp

General Site Description:

The Magens Bay Swamp is basically a shallow flood basin with little standing water, except for the occasional small pool and the water in the drainage channel towards the middle of the beach. There is a salinity gradient in the swamp, indicated by the characteristic freshwater vegetation in the upper half and a mangrove forest in the lower half. The freshwater portion contains stands of Roystonea palm, as well other plant species typical of freshwater wetlands (e.g. *Acrostichum danaeifolium*). The mangrove forest contains a mixture of tree species, with the highest trees (Red Mangrove) reaching approximately 90 feet tall.

The Magen's Bay Authority manages the beach and surrounding lands, which includes the wetland.

Adjacent Habitats: Mixed forest on eastern, western, and southern slopes adjacent to the swamp.

Primary Use of the Wetland:

There is no documented used of the wetland. However, the adjacent public beach is intensively used. Nature trails have been established in the forested areas on the western side of the wetland.

Adjacent Land Use:

The Magens Bay beach and facilities are located on the northern boundary of the wetland, and there is low density residential development on the southern side (in the upper watershed). The main ghut that empties to the wetland traverses areas of high residential development, and some commercial development, though these areas are not adjacent to the wetland.

Birds Observed at Site:

Antillean Crested Hummingbird, Bananaquit, Brown-throated Parakeet, Louisiana Waterthrush, Northern Waterthrush, Pearly-eyed Thrasher.

Threats:

Pollution from upland residential and commercial development, loss of ecosystem edge integrity, and solid waste disposal.

Relevance to USVI Conservation Objectives:

The wetland protects the main beach on St. Thomas that forms part of the product for the tourism industry. The beach also supports intensive use by residents. The wetland reduces impact on the beach from surface runoff, and probably reduces other contaminants from reaching the marine environment. The Magen's Bay ghut is also a site of historical importance.



Mandahl Pond, St. Thomas

Site Coordinates: 18°21'32.22"N 64°53'34.91"W
Watershed: xx
Date Surveyed: April 15, 2010
Wetland Category: Lagoon

General Site Description:

The wetland has been transformed from a salt pond to a lagoon by the construction of a permanent channel linking the pond to the sea. The channel, outer opening, and inner openings are protected by groynes. The lagoon is fringed by riparian vegetation approximately 10-15 feet wide. The riparian fringe is mainly mangroves, dominated by White Mangroves, except at the area around the inner end of the channel, where Red Mangroves dominate. The riparian vegetation displays two canopy layers, the first approximately 10-15 feet high, and the second approximately 20-25 feet high. The pond and channel appear to be dredged periodically in order to maintain the operating depths for the boats that use the pond as an anchorage.

Adjacent Habitats:

In addition to the riparian vegetation, the adjacent habitats include scrub thicket surrounding the pond and dry forest on the adjacent slopes.

Primary Use of the Wetland:

The wetland is used as an anchorage for small recreational boats and fishing boats. Fish pots and other

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fishing gear were seen stacked in the riparian vegetation.

Adjacent Land Use:

The adjacent beach is used for recreation, particularly on holidays. The residential development in the adjacent sub-watershed is very low density.

Birds Observed at Site (November 6, 2004 and April 5, 2010):

Brown Pelican, Forsters Tern, Kingfisher, Laughing Gull, Little Blue Heron, Magnificent Frigatebird, Tri-color Heron.

Threats:

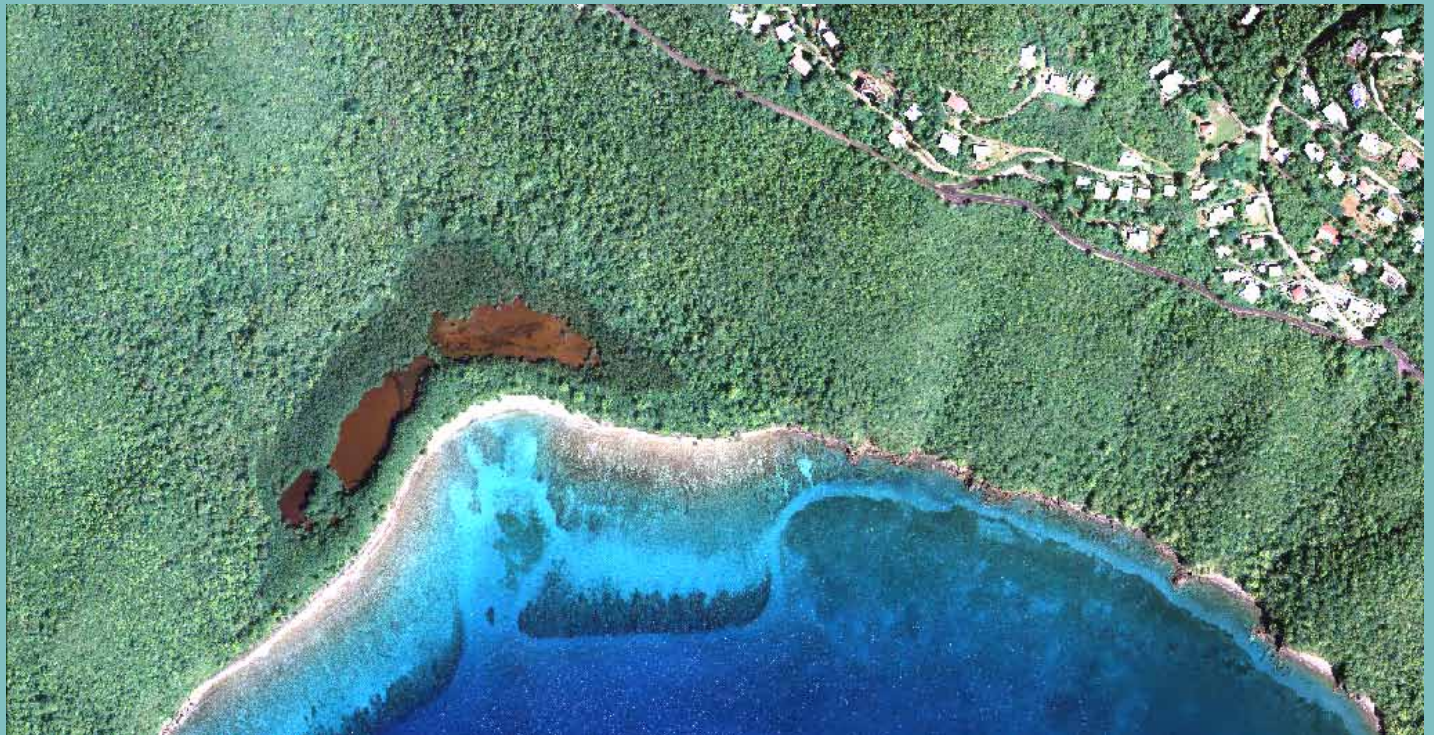
There are indications that vehicular traffic is damaging the sand berm along the recreational area. Extensive growth of filamentous green algae on the rocks along the edge of the water (along the beach) indicates that there is nutrient input to the beach area. Two small mats of the green alga *Caulerpa sertularoides* in the pond suggest that there may be nutrient input to the pond itself.

Applications to develop the area surrounding the pond for residential and commercial uses were submitted to the development control agencies within the past three years.

Relevance to USVI Conservation Objectives: None documented.



Perseverance Pond, St. Thomas



Site Coordinates: 18°21'6.66"N 64°59'47"W
Watershed: Perseverance Bay Watershed
Date Surveyed: January 17, 2010
Wetland Category: Salt Pond

General Site Description:

The pond is located at the end of a natural drainage channel (ghut), but is cut off from the sea by a natural berm composed of sand and pebbles. The wetland was estimated to be approximately 19 hectares in size, with an open water portion of approximately 5 hectares and the riparian forest of approximately 14 hectares. The riparian forest is composed primarily of the four species of mangroves found in the U.S. Virgin islands, though Black and White Mangroves are the dominant species. The water depth on the day of the survey was estimated to be approximately 10-12 inches. Other plant species typical of salt ponds (e.g. *Sporobolus* sp. and *Ipomoea* sp.) are also present at the site.

Adjacent Habitats:

The adjacent habitats consist of semi-deciduous secondary forest on the slopes to the north, west, and east of the pond, and coastal mixed scrub on the beach berm to the south of the pond.

Primary Use of the Wetland: The site is not currently used.

Adjacent Land Use:

The adjacent land is under forest cover. The pond falls on old plantation, and the ruins are situated northwest of the pond in dense forest.

Birds Observed at Site:

Bananaquit, Black-necked Stilt, Blue-winged Teal, Brown Pelican, Caribbean Elaenia, Common Moorhen, Gray Kingbird, Green-throated Carib, Mangrove Cuckoo, Scaly-naped Pigeon, Semi-palmated Sandpiper, Smooth-billed Ani, Waterthrush sp., White-cheeked Pintail, Yellow Warbler, Zenaida Dove.

Threats:

None documented. There is a proposed sub-division for the area, and thus future impacts from land development activities are anticipated.

Relevance to USVI Conservation Objectives:

The wetland is a habitat for several species of wildlife. Due to its fairly undisturbed state, it also offers the rare opportunity for establishment of baseline environmental conditions at a coastal wetland. As such, the wetland is potentially a site for monitoring of environmental changes linked to global climate change.



Red Hook Pond, St. Thomas

Site Coordinates: 18°19'45.62"N 64°50'57.3"W
Watershed: xx
Date Surveyed: April 15, 2010
Wetland Category: Pond

General Site Description:

The pond is located at the end of a natural drainage channel, but is separated from the sea on its south-eastern side by a berm composed of sand, pebbles, and coral skeleton. The pond is fringed by riparian vegetation dominated by mangroves, though it varies in height and composition. The riparian vegetation is thickest along the northern corner, where the gully enters the pond. This area also contains the tallest trees (20-30 feet in height), largest trees, and greatest mixture of tree species, mainly Black Mangroves, White Mangroves, Seaside Mahoe, and Gris-Gris. White Mangroves dominate the side along the main road, short Black Mangroves (5-10 feet high) dominate the eastern side, and Red Mangroves (15-20 feet high) dominate the southern portion of the riparian vegetation. A submerged wetland grass occurs throughout the pond.

Adjacent Habitats:

In addition to marine benthic habitats on the southern side of the pond, the adjacent habitat is primarily dry forest on the eastern and north-eastern slopes above the pond.

Primary Use of the Wetland:

The wetland is used for bird watching and environmental education.

Adjacent Land Use:

The Red Hook marine terminal impinges on the wetland to the south, the main road borders the pond to the west, an access road borders the pond to the north and east, and shopping mall is located across the road on the western side. The gully drains areas to the north that contains residential and commercial development.

Birds Observed at Site:

Black-necked Stilt, Blue-winged Teal, Brown Pelican, Common Moorhen, Great Blue Heron, Green-throated Carib, Little Blue Heron, Pied-billed Grebe, White-cheeked Pintail, Zenaida Dove.

Threats:

Threats include continued loss of wetland to development of port activities and sedimentation from development activities on the western and northern slopes overlooking the pond.

Relevance to USVI Conservation Objectives:

The wetlands falls within the Red Hook Area of Particular Concern, and is managed for its habitat value and use for environmental education.



Tutu Park Marsh, St. Thomas



Site Coordinates: 18°20'30.08"N 64°53'40.31"W
Watershed: Jersey
Date of Survey: April 15, 2010
Wetland Category: Freshwater Marsh

General Site Description:

The wetland is basically a depression in the valley floor surrounded on all sides by gently rolling hills, with the steepest slopes being on the northern and western sides. The wetland is completely filled with Cattail (*Typha domingensis*), with the leaves reaching more than 7 feet tall.

The site has to be accessed through private property.

Riparian Vegetation:

The riparian vegetation is mainly sedge (*Cyperus* spp.), and is found around the edges of the swamp and along the ghuts entering and leaving the swamp.

Adjacent Habitats:

Adjacent habitats include mixed forest along the eastern and western slopes, overgrown pasture and scrub vegetation along the northern boundary, and pasture along the south and southwestern border.

Primary Use of the Wetland:

The wetland is used as a source of water for farm animals. There are also at least three wells located on the fringes of the wetland, providing water for the commercial businesses in the Tutu Park area.

Adjacent Land Use:

The Tutu residential development is located to the north and northeast of the wetland, but comes to within approximately 150 feet of the wetland on the northern side (where it is separated by a road and a narrow strip of fill). There is mixed commercial development to the east (The closest being Tutu Park Mall) and south, and farming activities (mainly goat rearing) in the south and southwestern lands close to the wetland. A few heads of cattle were observed along the northwestern edge of the wetland.

Birds Observed at Site (January 22, 2010):

Antillean Crested Hummingbird, Bananaquit, Black-faced Grassquit, Brown-throated Parakeet, Mangrove Cuckoo, Northern Mockingbird, Northern Parula, Pearly-eyed Thrasher, Scaly-naped Pigeon, Smooth-billed Ani, Waterthrush sp., White-winged Dove, Wilson's Snipe, Yellow Warbler, Zenaida Dove.

Threats:

Illegal solid waste disposal close to northern end of the wetland. Non-point source pollution entering via the ghuts.

Relevance to USVI Conservation Objectives:

The site functions as a habitat for several species of wildlife. An extremely rare plant, a small mallow (*Cienfuegosia heterophylla*), was found at this site in January 2010. Within the U.S.A., the plant is said to be found only on St. Thomas, and has not been reported since the 1920s. This makes the site a priority site for conservation. In addition to the ecological functions, the wetland also provides services in the form of flood protection and water filtration.





6. Flora and Fauna Commonly Associated with Wetlands

Some plants are adapted specifically to the soil and water conditions created by wetlands, and are thus found only in wetlands. Other plants can tolerate a range of biophysical conditions, and are found in ecosystems other than wetlands. Plants that, under normal conditions, are found in wetlands 99% or more of the time they occur are referred to as **Obligate Wetland Plants**. Plants that are found in wetlands 67-99% of the time, but are occasionally found in areas that are not wetlands, are referred to as **Facultative Wetland Plants**. Plants that are likely to occur equally in wetlands as non-wetland areas (34-66%) are referred to as **Facultative Plants**. Plants that occur in wetlands less than 34% of the time are referred to as **Facultative Upland Plants**.

Some species of birds also show a similar dependence on wetlands and associated resources. Some birds require particular wetland conditions for nesting purposes, and are generally referred to as **Water Birds**. Other birds associated with wetlands only feed in wetlands, but will nest in adjacent habitats. Such birds are referred to as **Wetland Dependent Birds**.

The tables below list some of the plants and animals commonly associated with wetlands in the U.S. Virgin Islands, grouping them according to their level of dependence on wetlands and associated resources.

Obligate Wetland Plants in the U.S. Virgin Islands

Common Name

Golden Leatherfern
 Valley Redstem
 Pond Apple
 Black Mangrove
 Maraca Amarilla
 Coco Yam, Dasheen, Taro
 Jointed Flatsedge
 Panal
 False Daisy
 Spikerush
 Scallion Grass
 West Indian Fimbry
 Shoalweed
 (none)
 White Mangrove
 Mexican primrose-willow
 (none)
 Dotleaf Waterlily
 Seaside Paspalum
 Water Lettuce
 Mangrove Vine

Scientific Name

Acrostichum aureum
Ammannia coccinea
Annona glabra
Avicennia germinans
Canna glauca
Colocasia esculenta
Cyperus articulatus
Cypselea humifusa
Eclipta prostrata
Eleocharis geniculata
Eleocharis mutata
Fimbristylis ferruginea
Halodule wrightii
Hydrocotyle sp.
Laguncularia racemosa
Ludwigia octovalvis
Malachra alceifolia
Nymphaea ampla
Paspalum vaginatum
Pistia stratiotes
Rhabdadenia biflora



Black Mangrove



White Mangrove



Dotleaf waterlily

Widgeongrass
 Manatee Grass
 Broadleaf Maiden Fern
 Sensitive Jointvetch
 Pink Redstem
 Pelican Plant, Tobacco Pipe
 Herb of Grace
 Coon's Tail, Horn Wort
 Umbrella Grass
 Piedmont Flatsedge
 Dumbcane
 Water Hyacinth
 Gulf Coast Spikerush
 Knotted Spikerush
 White Twine Vine
 Caribbean Halophila Seagrass
 Smooth Filmy Fern
 Lesser Duckweed
 Palo de Hoz
 Watercress
 Egyptian Panicgrass
 Swampbush
 Sweetscent, Marsh Fleabane
 Red Mangrove
 Papagayo
 Turtle Grass
 Southern Cattail

Ruppia maritima
Syringodium filiforme
Thelypteris angustifolia
Aeschynomene sensitiva
Ammannia latifolia
Aristolochia trilobata
Bacopa monnieri
Ceratophyllum demersum
Cyperus alternifolius
Cyperus distans
Dieffenbachia seguine
Eichhornia crassipes
Eleocharis cellulosa
Eleocharis interstincta
Funastrum clausum
Halophila baillonis
Hymenophyllum polyanthos
Lemna aequinoctialis
Machaerium lunatum
Nasturtium officinale
Paspalidium geminatum
Pavonia paludicola
Pluchea odorata
Rhizophora mangle
Sesbania sericea
Thalassia testudinum
Typha domingensis



Maiden fern

Facultative Wetland Plants in the U.S. Virgin Islands

Common Name	Scientific Name
Swamp Fern, Inland Leatherfern	<i>Acrostichum danaeifolium</i>
White Alling	<i>Bontia daphnoides</i>
Button Wood	<i>Conocarpus erectus</i>
Tropical Flatsedge	<i>Cyperus surinamensis</i>
Jungle Rice	<i>Echinochloa colonum</i>
Tropical Fimbry	<i>Fimbristylis cymosa</i>
Willy Vine	<i>Ipomea tiliaceae</i>
(none)	<i>Nectandra membranacea</i>
(none)	<i>Parkinsonia aculeata</i>
(none)	<i>Sesuvium portulacastrum</i>
Seaside Twintip, Obeah Bush	<i>Stemodia maritima</i>
Salt Plant, Saltworth, Turtleweed	<i>Batis maritima</i>
Capa Rosa	<i>Callicarpa ampla</i>
(none)	<i>Cryptostegia grandiflora</i>
Coin Plant	<i>Dalbergia ecastaphyllum</i>
Bucayo, Immortelle	<i>Erythrina fusca</i>
Salt Heliotrope	<i>Heliotropium curassavicum</i>



Willy vine



Salt plant

Clubmoss	<i>Lycopodium cernuum</i>
Water Dead & Awake	<i>Neptunia plena</i>
Turkey Tangle Fogfruit, Capeweed	<i>Phyla nodiflora</i>
(none)	<i>Sporobolus virginicus</i>
(none)	<i>Ternstroemia peduncularis</i>

Facultative Plants in the U.S. Virgin Islands

Common Name	Scientific Name
Gris-Gris, Black Olive	<i>Bucida buceras</i>
Indian Shot	<i>Canna indica</i>
(none)	<i>Cleome spinosa</i>
Alabama Swamp Flatsedge	<i>Cyperus ligularis</i>
(none)	<i>Evolvulis convolvuloides</i>
(none)	<i>Hippomane mancinella</i>
Bulletwood	<i>Manilkara bidentata</i>
(none)	<i>Opuntia repens</i>
Catclaw, Blackhead	<i>Pithecellobium unguis-catis</i>
(none)	<i>Portulaca oleracea</i>
(none)	<i>Portulaca rubricaulis</i>
(none)	<i>Solanum sp.</i>
White Cedar	<i>Tabebuia heterophylla</i>
Heiti Heiti, Cork Tree	<i>Thespesia populnea</i>
Bay Bean	<i>Canavalia rosea</i>
Trumpet Tree	<i>Cecropia peltata</i>
(none)	<i>Cynodon dactylon</i>
(none)	<i>Euphorbia mesembriantemum</i>
Forked Fimbry	<i>Fimbristylis dichotoma</i>
Bay Hops	<i>Ipomoea pes-caprae</i>
(none)	<i>Opuntia dillenii</i>
(none)	<i>Paspalum sp.</i>
Hairy Shadow Witch	<i>Ponthieva racemosa</i>
(none)	<i>Portulaca quadrifida</i>
Licorice Weed	<i>Scoparia dulcis</i>
Saltmeadow, Cordgrass, Saltgrass	<i>Spartina patens</i>
(none)	<i>Thelypteris kunthii</i>
Limeberry	<i>Triphasia trifolia</i>

Facultative Upland Plants in the U.S. Virgin Islands

Common Name	Scientific Name
Knickers	<i>Caesalpinia bonduc</i>
(none)	<i>Capparis flexuosa</i>
Sea Grape	<i>Coccoloba uvifera</i>
(none)	<i>Gossypium barbadense</i>
Tan Tan	<i>Leucaena leucocephala</i>
(none)	<i>Panicum maximum</i>

(none)

(none)

(none)

(none)

Stinking Toe

(none)

Wild Allamanda

Stachytarpheta jamaicensis

Capparis cynophallophora

Carex spp.

Cocos nucifera

Hymenaea courbaril

Morinda citrifolia

Pentalinon luteum



Stinking Toe fruit

Bird charts to come

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GLOSSARY OF TERMS

- Bight** A recess found along a coast or bay. Due to the low wave energy in bights, mangroves and other salt-tolerant plants often colonize the area. This eventually results in the formation of a complex ecosystem consisting of sand bars, mudflats, sandflats, mangrove stands, shallow waterways, and seagrass beds. Example: Benner Bay/ Mangrove Lagoon, St. Thomas, and Altona Lagoon, St. Croix.
- Ghut** A common term for a watercourse.
- Riparian** Pertaining to or situated on the bank of a natural body of flowing water.
Source: http://water.usgs.gov/water-basics_glossary.html
- Riparian Area** An area between aquatic and terrestrial ecosystems that is distinguished by multiple transitions in biophysical conditions, ecological processes, and biota.
Source: Adapted from Henrietta H. Presler, *Stormwater*, November –December 2006
- Riparian Buffer** An area adjacent to a water body that is fully or partially protected from human disturbances, and thus is able to safeguard the water body from pollution and habitat degradation.
Source: Adapted from Henrietta H. Presler, *Stormwater*, November –December 2006
- Watercourse** “... a natural watercourse means any stream with a reasonable well-defined channel, and includes streams which have a permanent flow, as well as those which result from the accumulation of water after rainfall and which regularly flow through channels formed by the force of the waters.”
Source: Title 12, Chapter 3, Section 123(b) of the Virgin Islands Code (Annotated, 2006 Edition).
- Wetland** An area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.
- Wetland System** A complex of wetlands that share the influence of similar hydrologic, geomorphologic, chemical, or biological factors.
Source: Adapted from the U.S. Fish and Wildlife Service Wetland Classification System.

WETLAND INFORMATION SOURCES

[http://www.birdlife.info/docs/CaribCntryPDFs/Virgin_Islands_\(to_USA\).pdf](http://www.birdlife.info/docs/CaribCntryPDFs/Virgin_Islands_(to_USA).pdf) – Important bird areas in the U.S. Virgin Islands (available [here](#))

<http://www.dpnr.gov.vi/dep/wetlands.htm> - USVI Wetlands Program ([here](#))

<http://www.ramsar.org> – Convention on wetlands of international importance ([here](#))

<http://www.stxenvironmental.org> – Information on Southgate Pond, St. Croix ([here](#))

Also? STX Environmental Association Information Repository, info on wildlife, coral reefs, plants, coral reefs, water, etc. <http://www.usvired.org/STXEIR/index.html>

<http://www.uvi.edu/sites/uvi/Pages/publications.aspx?s=RE§ionCode=WRRI> – Technical reports and brochures on water resources (including wetlands) in the U.S. Virgin Islands ([here](#))

<http://www.vifishandwildlife.com/Education/Images/FieldTripPhotos.htm> - Photographs of field trips to ghuts ([here](#)) **NOTE: link doesn't work**

http://water.usgs.gov/water-basics_glossary.html - Glossary of terms for water and wetlands ([here](#))

<http://water.usgs.gov/nwsum/WSP2425/legislation.html> - Federal wetlands regulations ([here](#))

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