FRAMEWORK FOR MANAGEMENT OF WETLANDS IN THE U.S. VIRGIN ISLANDS

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LIST OF ACRONYMS

GIS	Geographic Information System
IRF	Island Resources Foundation
USVI	United States Virgin Islands
UVI	University of the Virgin Islands
WAPA	Water and Power Authority

FRAMEWORK FOR MANAGEMENT OF WETLANDS IN THE U.S. VIRGIN ISLANDS

1. INTRODUCTION

1.1 Background

The first phase of the wetlands inventory project, titled, "*The Virgin Islands Wetlands and Riparian Areas Inventory: A Pilot Study to Characterize Watersheds and Wetland Systems, Phase I*", was completed in 2004 by the Department of Planning and Natural Resources, in partnership with Island Resources Foundation (IRF) and the University of the Virgin Islands (UVI). Phase I of the project focused on a limited assessment of watershed/wetland ecosystems. Geographic Information System (GIS) technology was used to produce an inventory of watersheds and wetlands (type and location) throughout the U.S. Virgin Islands (USVI), produce GIS map products, and data for statistical and spatial analyses. Eighteen (18) priority watersheds (of the 50 in the USVI) were assessed and characterized using a matrix based on categorizing watersheds into three groups; (i) undisturbed, (ii) moderately disturbed, and (iii) highly disturbed watersheds. Vegetation characterization, water chemistry sampling, sedimentation history, and an Index of Biological Integrity assessment were completed within each selected watershed.

The information and data gathered from the pilot study of Phase I were used by the project collaborating institutions to determine the proposed Scope of Work for Phase II of the project. Phase II, titled "*Virgin Islands Wetlands and Watersheds Characterization Phase II: Inventory, Monitoring, Assessment, Management, and Education in the U.S. Virgin Islands*", was designed initially to complete the watershed/wetlands assessment for the Virgin Islands by compiling existing data from multiple projects and sources, filling data gaps, developing appropriate management strategies, and educating the public about the importance of wetlands and watersheds.

The major outputs of Phase II are:

1. Formation of a Wetlands Working Group.
2. Adoption of a definition of wetland for use in the USVI.
3. Maps showing the locations of wetlands in the USVI.
4. Conceptual framework for management of wetlands in the USVI.
5. Publication titled "Wetlands of the U.S. Virgin Islands".
6. Final Technical Report.

This paper presents the proposed *Wetlands Management Framework for the U.S. Virgin Islands*. The proposed framework takes into consideration the current situation in terms of the management framework and state of wetlands, as well as the recommended elements and best practices for a wetlands management program. The paper also identifies an **Implementation Agenda** for establishment of the program.

1.2 Rationale for Development of a Wetlands Management Framework

Wetlands in the U.S. Virgin Islands (USVI) provide a range of goods and services that support the social and economic development of the Territory. Due to the range of benefits provided by wetlands, as well as their distribution across the topographic landscape, wetlands fall within the area of responsibility of several Territorial and U.S. Federal agencies. As such, wetlands form critical components of several programs designed to maintain the economic growth of the USVI and quality of life of its residents. Environment and development programs in which wetlands play a critical role include:

(a) Agriculture Development – Impoundments were established to collect water for agricultural uses. The 1979 report on the USVI Sediment Reduction Program noted that there were 278 impoundments in the USVI in 1979 (BC&E/CH2M Hill, 1979).

(b) Reduction in Non-Point Source Pollution – The 1979 Sediment Reduction Program was designed around the functioning of impoundments as sediment traps. The existing Earth Change Permit process was similarly designed to reduce soil erosion and sedimentation of waterways, and development activities affecting ghuts are regulated within this process.

(c) Coastal Zone Management – Wetlands form one of the nine (9) Enhancement Areas for the USVI Coastal Zone Management Program, as required by Section 309 of the Coastal Zone Management Act, 1972.

(d) Wildlife Management – Wetlands function as important habitats for a range of wildlife species, and associated management interventions range from periodic resource assessments to designation and management of wildlife reserves by both Territorial and Federal agencies.

(e) Water Resources Management – Surface water forms one of the components of waters of the USVI as defined by the Virgin Islands Code. While there is no water resource management program, the non-point source pollution program was developed to protect the quality of the waters of the USVI for a range of social and ecological purposes.

(f) Flood Control – Storm-water management in development activities and general flood control are managed by two separate agencies of the Government of the USVI (Department of Public Works and Department of Planning and Natural Resources).

(g) Waste Management – Wetlands are used as part of the waste disposal strategy in the USVI, in that; a number of municipal sewage treatment plants discharge effluent directly to ghuts. Discharge of untreated sewage to wetlands also takes place when there is equipment failure. Additionally, the two municipal landfills are located in wetlands.

Despite the above program imperatives that involve wetlands, there is no wetlands program in the USVI. Attempts to establish a wetlands program include the 2006 draft wetlands conservation plan prepared by the Division of Fish and Wildlife (Platenberg, 2006) and the current attempt by the Division of Environmental Protection.

However, a wetlands program designed for a single agency to fulfill its mission objectives will not accommodate the afore-mentioned range of program needs. This is particularly true as a number of the uses of wetlands are conflicting across the various programs. What is needed is a

unified approach that supports multiple policies and program objectives, and that prevents program conflicts. This unified approach to wetlands management is hereby termed the "Wetlands Management Framework for the U.S. Virgin Islands".

The purpose of the Wetlands Management Framework is to ensure that all management interventions for wetlands in the U.S. Virgin Islands are designed based on a single policy and strategy and that institutional arrangements are establish to minimize waste and conflicts while maximizing the impacts of each management intervention.

2. SITUATION ANALYSIS

There is currently no wetland management program in the U.S. Virgin Islands, though wetlands for a part of several programs and there are policy and legal mandates for management of wetlands resources (Section1).

There is no clear picture of the current status of wetlands, particularly in terms of environmental quality, species diversity, and ecological integrity. That information gap results primarily from the absence of monitoring programs for wetlands or associated resources. The most extensive information is generated by resource assessments (e.g. survey of water birds or survey of salt ponds) that tend to be island specific and decades apart. Researchers from the University of the Virgin Islands (UVI) also conduct occasional site-specific assessments. Despite the inconsistency or narrow scope of data generated, a number of trends and major issues can be identified.

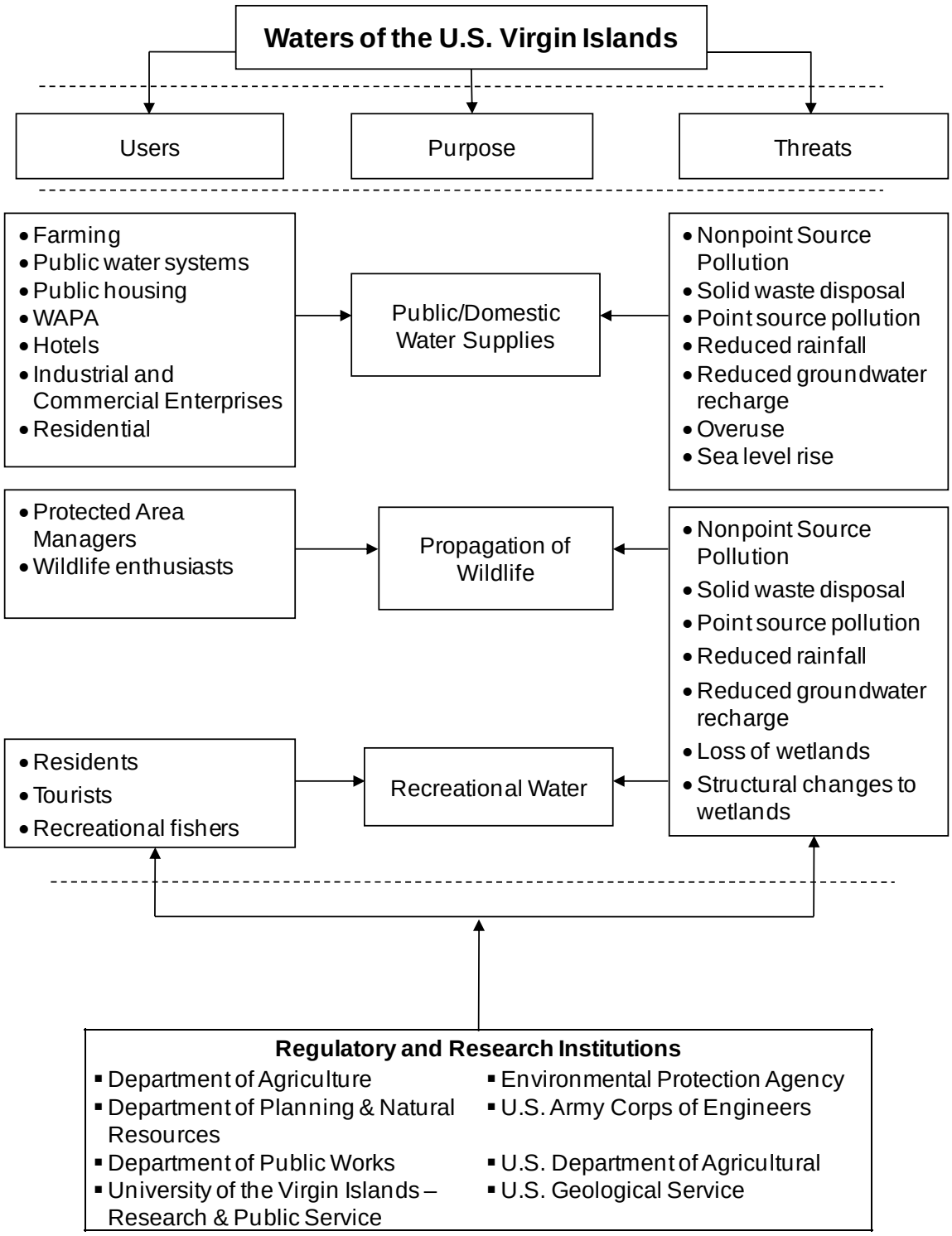
2.1 Current Wetlands Management Framework

There are several laws that provide the foundation for a wetland management framework, and there are both Federal and Territorial agencies that are involved in programs and initiatives related to water resources, and are therefore directly relevant to wetlands management (Figure 1 and Appendix 1). Though there is this range of institutions and programming that affect wetlands in one way or another, the focus on wetlands appear to be tangential at best. Programs and resource management strategies that should have wetlands management as a central feature have either been inexplicably terminated (Sediment Reduction Program), inconsistent in application (Areas of Particular Concern), relegated wetlands to a low level of priority (Coastal Zone Management Program), or treat wetlands as tangential (Water Pollution Control Program and 2005 Comprehensive Wildlife Conservation Strategy for the USVI). The single attempt to develop a wetlands conservation plan (Platenberg, 2006) focused on one district, and has been approved or implemented. Wetlands are not specifically mentioned in the priority goals or objectives identified in the 2010 USVI Coral Reef Management Program. However, two of the four priority sites (St. Thomas East End Reserve and St. Croix East End Marine Park) include large areas of wetlands).

The absence of policies and guidelines for wetlands management inhibit the development or integration of relevant programs. The 2009 Section 309 Assessment for the USVI Coastal Zone management Program states that policies to increase protections for wetlands were approved by the Coastal Zone Management Commission in 2006, but now needs to be promulgated and adopted as rules and regulations within the coastal zone management program. Similarly, there

is no institutional arrangement that supports information sharing and collaborative programming, both necessary to ensure the development of synergies between the various programs.

Figure 1: Agencies Involved in Water Resources Management in the U.S. Virgin Islands



2.2 Trends and Major Issues

The trends that have been identified are:

(a) **Reduction in Acreage of Wetlands in the U.S. Virgin Islands** – Damage to wetlands and loss of acreage has been chronicled in several reports (Sladen 1986, Stengel 1998). The major activity contributing to loss of wetlands is (past and current) development activity, primarily industrial, resort, and marina development. The continued generation of a range of other threats to wetlands and associated resources (Gardner et al, 2008) remain a cause of concern.

(b) **Continued Provision of Goods and Services** – Wetlands continue to provide a range of goods and services (Virgin Islands Department of Agriculture 1973, Smith 1989, Kelsey et al 2005, Rennis et al 2006, Gardner et al 2008, Valiulis 2009). In addition to the provision of water and food, the environmental services provided by wetlands include wildlife habitats, water purification, groundwater recharge, flood reduction, and storm protection.

(c) **Contribution to Economic Development** – Wetlands have played a significant role in the economic development of the U.S. Virgin Islands (Gardner et al, 2008) through the provision of water for domestic, agricultural, and industrial purposes. Current direct contributions include provision of recreational opportunities, educational opportunities, and water for agriculture.

The major issues and priorities currently relevant to wetlands are:

(a) **Need for an Integrated Policy Framework** – There are several laws relevant to the management of wetlands, and those laws are administered by different agencies. Though the programs managed by the various agencies are usually in line with national priorities, there is a need to 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 non-governmental organizations.

(b) **Existence of Significant 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, success of management interventions require changes in attitudes and practices of individuals and institutions in the community.

(c) **Need for Improved Storm Water Management** – Due to the topography of the islands, most development activities (including residential development) involves 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.

(d) **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.

(e) **Need for Improved Information Management** – There is no structured program for research and monitoring of wetland resources. As such, data collection is sporadic, ad hoc, and not necessarily linked to institutional mandates or programs. Data and information is consistently lost. Additionally, databases compiled by Federal agencies are not utilized by USVI regulatory agencies for management decision making. In order to improve decision making in the development planning and development control processes, the environmental management agencies need to develop an overall data management strategy. That strategy should ensure compatibility of data collection regimes and data management systems, as well as establishment of data sharing mechanisms. The civil society institutions engaged in wetland initiatives should also be brought into the information management process.

Other issues requiring attention are:

(a) **Community Perception of the Value of Wetlands** – The continuing threats to wetlands and associated resources indicate that there is a general perception in the USVI that wetlands are not important. However, the conflicts that sometimes arise during public hearings for development projects often focus on environmental issues, including potential impact on wetlands. This contradiction suggests that there is no consensus in the community regarding the value of wetlands. This issue should be addressed in order to reduce conflicts within the development control process, and enable the regulatory agencies and community to make informed decisions regarding tradeoffs in the development process.

(b) **Climate Change associated with Global Warming** – Climate change scenarios for the Caribbean suggest that sea level rise will be approximately 1.5 feet over the next century. This will result in inundation of some coastal areas, increasing acreage under wetlands, but also impacting negatively on social infrastructure and some major resources (e.g. aquifers). More immediately, increased intensity of storms and changing rainfall patterns are expected to create significant impacts on ecosystems, including wetlands. A comprehensive monitoring program should be established to support informed resource management decision making, particularly for critical or fragile ecosystems.

3. PROPOSED WETLANDS MANAGEMENT FRAMEWORK

The Wetlands Wise Use Project of the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) identifies the elements of an effective wetlands management program as:

- Appropriate Policy Framework;
- Appropriate Legal Framework;
- Appropriate Institutional Framework;
- Management Strategy;
- Management Plan/Action Plan; and
- Institutional Program/Annual Plan.

3.1 Appropriate Policy Framework

The development of an appropriate policy framework is best guided by an environmental ethic, which provides the broad philosophical basis and guiding principles for policy and program development. The guidelines prepared by the Ramsar Secretariat on the wise use of wetlands (Davis, 1993) identify the following as principal elements of a national wetland policy:

a. Improvement of institutional arrangements so that wetland policies can be fully integrated into the planning process; and the establishment of mechanisms and procedures for incorporating this integrated, multi-disciplinary approach into planning and execution of projects concerning wetlands.

b. Review of existing legislation and government policies (including subsidies and incentives) including, where appropriate, application of existing legislation and policies, adoption of new ones, and use of development funds for wetlands.

c. Increasing knowledge and awareness of wetlands and their values, including exchange of information, propagation of their benefits and values (a statement of which is given), review of traditional techniques, and training of appropriate staff.

d. Review of the status of wetlands in the national context, including compilation of a national inventory, and definition of each wetland's particular values and conservation priorities.

e. Addressing of problems at particular wetland sites, by integrating environmental considerations into their management, regulated utilization, establishment of management plans, designation as appropriate for the Ramsar List, establishment of nature reserves and, if necessary, restoration.

3.2 Appropriate Legal Framework

The legal framework supports not only the development of regulations, but also provides an underpinning for the establishment of creative and evolving management and compliance strategies. Elements of an effective legal framework include:

a. A framework law that addresses wetland as a specific ecosystem requiring directed management intervention, that links the primary enabling legislation to other relevant legal instruments directed at other programs and development processes.

b. Subsidiary legislation that facilitate the development of an effective institutional framework.

c. Guidance and guidelines to support the use of a wide range of measures and instruments (regulatory, fiscal, and non-fiscal) to enable effective management interventions.

3.3 Appropriate Institutional Framework

Although one public sector institution will be given the responsibility of being the lead agency for coordination of a territorial program, effective management will include collaborative arrangements between several public, private, and civil society institutions. An appropriate institutional framework will address the following:

a. Collaborative programming, to assist in resolving conflicts, assist in making decisions relating to trade-offs, clarify roles and responsibilities of different stakeholders, and facilitate diverse stakeholder involvement.

b. Development of an institutional coordinating mechanism that facilitates harmonization of management arrangements and institutional cultures (planning and decision-making systems, legal requirements in the various regulatory processes, reporting requirements and mechanisms, etc.).

c. Shared information collection and management systems.

3.4 Management Strategy

The territorial management strategy is meant to provide strategic focus, translating the policy framework into strategic directions for wetlands management over an agreed period. The territorial strategy should:

a. Provide a structured framework for wetlands management, establishing the goals and objectives of the territorial program, and establishing guidelines and practices that link site management interventions to system management goals and objectives.

b. Facilitate integration with other relevant planning strategies, such as those for tourism, biodiversity conservation, and protected areas.

c. Facilitate integration with the economic development strategies and development control processes.

d. Provide guidance on the design and implementation of a public engagement strategy.

e. Provide a structured approach for coordinating the initiatives of the various institutions implementing wetlands-related activities.

f. Provide a broader perspective for addressing site-specific issues.

3.5 Management Plan/Action Plan

The wetlands management plan is the action plan for the strategy period, and should:

a. Identify priority interventions for the strategy period, setting targets and identifying milestones.

b. Assign institutional roles within each area of intervention.

c. Establish coordinating mechanisms and structures.

d. Identify resource requirements.

e. Establish monitoring and evaluation guidelines and procedures for the implementation of the management plan/action plan

3.6 Institutional Program/Annual Plan

Each institution with assigned roles in the management plan/action plan should establish an institutional plan designed to:

a. Fulfill the institution's obligations identified in the Wetlands Strategy and Management Plan.

b. Be responsive to the institution's legal mandate.

4. IMPLEMENTATION AGENDA

If the above program elements are used as the guide for the development of a wetlands management program for the U.S. Virgin Islands (USVI), the process of development of an appropriate wetland policy will take a minimum of five (5) years. As such, establishment of some elements will proceed apace, rather than wait on the completion of the policy process. The following actions are proposed as the initial steps in the development of the wetlands management framework for the USVI:

1. Preparation of a Draft Wetlands Policy.
2. Preparation of a Wetlands Management Strategy and Action Plan.
3. Design of inter-agency management structure and preparation of associated collaborative agreement.
4. Preparation of institutional work plans.
5. Development of data management policies and data management mechanisms[1].
6. Establishment of framework management support systems (planning, communications, etc.).
7. Establishment and testing of data management system.
8. Preparation of first biennial Territorial Wetlands Report.
9. Preparation of a 5-year work plan.
10. Preparation of program financing strategy and plan.
11. Convene workshop (finalize report and work plan).

[1] The data management policies should ensure that the data collected is valid (measures targeted variables), reliable (comparable values in comparable situations across districts), and useful (aligned with a program and standards).

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Appendix 1: Existing Wetlands Management Framework

Policy and Legal Framework

The existing framework for the development of programs to manage wetlands and wetland resources is comprised of policies and laws at both the Federal and Territorial levels. 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 at: http://water.usgs.gov/nwsum/WSP2425/legislation.html.

Laws of the U.S. Virgin Islands that are applicable to different aspects of wetlands management are contained in the Virgin Islands Code. 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.

Institutional Framework

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

(a) **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).

(b) **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).

(c) **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).

(d) **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).

(e) **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:

(a) **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.

(b) **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).

(c) **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 sin 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.

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.

- **Virgin Islands Water Resources Research Institute**, University of the Virgin Islands – supports research on all aspects of water resources, and provides technical assistance to regulatory agencies.

- **Conservation Data Center**, University of the Virgin Islands – maintains a spatial database of natural resources, and provides technical assistance to the regulatory agencies.

- **Cooperative Extension Services**, University of the Virgin Islands – 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**, University of the Virgin Islands – conducts research on marine and environmental resources, provides a marine advisory service, and provides technical assistance to the regulatory agencies.

- **Coral Bay Community Council** – engages citizens, developers, and government agencies in land and water use planning, as well as environment and development issues. The Council is currently implementing a project that supports implementation of the Coral Bay Watershed Management Plan. The project will address issues such as pollution in ghuts, excess storm-water flows, and filling and altering of ghuts.