



## NRCS Supports *Coral Reef Conservation*

### *Protecting Corals in the Caribbean*

October 2013

The islands in the U.S. Caribbean (Puerto Rico and the U.S. Virgin Islands) are surrounded by exceptional coral reef ecosystems. Island communities depend on these biologically rich ecosystems for both the socio-economic and ecological benefits they provide: tourism dollars, food, employment, recreational opportunities, sand creation, shoreline protection, and more. However, human activities can and have destroyed or seriously degraded these same coral reef habitats upon which we depend. Caribbean coral reef ecosystems are threatened by both natural and man-made stressors including climate change, tropical storms, unsustainable fishing, and land-based activities resulting in coastal pollution by sediment, nutrients, chemicals, and bacteria.

The U.S. Coral Reef Task Force (USCRTF) was established in 1998 by Presidential Executive Order 13089 to lead U.S. efforts to preserve and protect coral reef ecosystems. The USCRTF has actively built partnerships and strategies for on-the-ground action to conserve coral reefs. The USCRTF works in cooperation with State, territorial, commonwealth, and local government agencies, NGOs, researchers, and businesses to improve our understanding and conservation of coral reef ecosystems.

In 2002, the USCRTF identified the need for local-level action to reduce key threats to coral reefs in each of the seven states and territories that have significant coral reef resources.



*Photo courtesy of NOAA.*

### **Coral Reef Conservation Through Farm Bill Programs & Projects**

The Natural Resources Conservation Service in the Caribbean Area (NRCS-CB) has actively participated in the U.S. Coral Reef Task Force since the Third Task Force meeting held November 2-3, 1999, in St. Croix, USVI. NRCS-CB staff help the USCRTF Puerto Rico and Virgin Islands Working Groups develop and implement local action strategies to reduce pollution from agricultural activities and land development.

NRCS-CB has reaffirmed the national NRCS agreement to help lead efforts to address land-based pollution threats to coral reefs. The health of living coral reefs depends on superior water quality and clarity, allowing effective penetration of sunlight. Land-based nutrients and sediments have harmful effects on coral health. Farm Bill programs strive to help agricultural producers implement conservation measures that provide on-site and off-site benefits. Proper soil, water and nutrient management from agricultural lands will help protect Caribbean reefs.



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# U.S. Virgin Islands Coral Reef Initiative

## Partnering to Reduce Impacts to Marine Protected Areas

U.S. Virgin Islands (USVI) coral reef ecosystems include a variety of biologically rich habitats including coral and hard-bottom areas, seagrass and mangroves. In recognition of the links between healthy coral reef ecosystems and the quality of life for our community, the USVI established marine protected areas (MPAs) to ensure effective management of these vital resources, instituted land use and resource management policies, and began short and long-term research and monitoring programs.

NRCS-CB has been an active partner in this effort, assisting the USVI in developing & implementing Local Action Strategy (LAS) action plans to address land-based sources (LBS) of pollution and lack of public awareness. The first phase of the LAS focused activities on the Territory's first marine park, the St. Croix East End Marine Park (STXEEMP). The local-federal partnership to develop and implement LAS remains key to effective natural resource management, particularly with respect to reducing impacts from sediment—a critical land-based stressor of USVI coral reef ecosystems.

Recently, USDA-NRCS assisted DPNR-CZM, NOAA-CRCP, NGO partners in developing comprehensive watershed management plans for the 6 watersheds draining to St. Croix East End Marine Park (STXEEMP)



**St. Croix East End Marine Park and subwatershed drainage boundaries.**

waters. These plans focus on reducing LBS pollutants and their impacts to the STXEEMP and the Buck Island Reef National Monument MPAs. Within these watersheds lie residential areas, existing and planned large commercial developments (resorts, golf courses, etc.), agricultural areas (cattle and goat farms) and extensive poorly planned and maintained dirt road systems. LBS pollution such as excessive sediment and nutrients directly affect water and habitat quality in these MPAs. The watershed management plan has been completed and is available at [www.horsleywitten.com/stx-east-end-watersheds](http://www.horsleywitten.com/stx-east-end-watersheds).

## Streambank Stabilization

To help implement watershed management plan recommendations, USDA-NRCS partnered with the St. Croix Environmental Association (SEA) on an FY11 Conservation Technical Assistance Program (CTAP) project to address two high priority areas identified in the plan.

Project partners and contractors completed comprehensive engineering designs and specifications to repair a severely eroding gut (intermittent stream) on a pasture in Southgate watershed. The goal of the proposed design is to stop the active headcut of the East Gut, located on the Adams' family property, from migrating further upstream. The landowners have estimated the rate of headcut migration to be about 10-15 feet per year, which has been confirmed through aerial photography. The design is limited to the emergency repair of the headcut to prevent additional erosion; a more comprehensive stream restoration design to restore floodplain connectivity was not developed for this project.



**L-R: Roy Adams (property owner), Lydia Collazo (NRCS-CB Engineer), Edwin Almodóvar (NRCS-CB Director) Carol Cramer-Burke (SEA Project Director), and Marlon Hibbert (NOAA rep) discuss next steps to implement the stream stabilization plan (September 2012).**



Severely eroded headcut of gut on Adams Family farm in Southgate watershed, St. Croix, USVI (September 2012).

Several key design elements for this project include:

- Step-pool sequencing and channel widths designed to convey storm flows produced during the 1.5-year storm event. This event approximates what is commonly referred to as the “channel forming discharge” event or the “bankfull” event.
- A step-pool system with boulder sizes selected based on stability requirements for the 100-year storm event flows of approximately 700 cfs.
- Proposed cattle fencing around project area to limit livestock access to restored areas.
- Perimeter boulder walls to reduce site clearing and grading requirements.
- Native plants selected for bank stabilization.

### ***Comprehensive Road Drainage Planning***

CTAP project partners also developed a comprehensive road drainage management plan for an extensive dirt road network in the Hope & Carton Hill neighborhood of Solitude Bay watershed. Approximately 4.5 miles in length, the mostly unpaved road network provides access to roughly 50 homes on a steep mountain slope in the upper portion of the watershed. With the ex-



Steep dirt road in Hope & Carton Hill neighborhood drains to STXEEMP & Buck Island Reef National Monument.

ception of the neighborhood entrance and a few isolated sections, this road network has extensive ruts, exposed bedrock, and pot holes. Runoff from the road network discharges into a gut at the neighborhood entrance. Sediment plumes have been observed discharging from this gut into Solitude Bay during rain events, impacting the St. Croix East End Marine Park.

As part of the CTAP project in Hope & Carton Hill, partners and volunteers installed a residential rain garden demonstration project in the neighborhood.

### ***Greening Storm Water with Rain Gardens***

**Rain gardens** are shallow, man-made depressions that are planted with deep-rooted plants and grasses, preferably native species. They are strategically located to capture runoff from paved areas like driveways, parking areas, sidewalks or streets. Rain gardens fill with a few inches of water after a storm. The rain water slowly seeps into the surrounding soil, rather than running off to flood or erode streets or drainage channels.

The **rain garden** pilot project installed in the Hope & Carton Hill neighborhood shows residents how to capture storm water runoff from their driveways and retain it on their properties. 20% of the total Hope & Carton Hill road network is driveways. Removing driveway runoff from the neighborhood road network will help to reduce road deterioration, improve road drainage and provide homeowners with a beau-



Project partners and volunteers installed a demonstration rain garden at a residence in Hope & Carton Hill, St. Croix, USVI (October 2012).



**NRCS staff lead tour of Hope & Carton Hill rain garden for May 2013 Caribbean Landscape Conservation Cooperative Meeting (May 24, 2013).**

tiful landscape; as well as reducing the amount of eroded sediment that reaches coastal waters, protecting coral reefs.

NRCS also provides technical and engineering design assistance to local government agencies, teachers and volunteers to install **rain gardens** to demonstrate the implementation & use of this low-impact development (LID) practice to attenuate storm water runoff in the USVI. Three rain gardens have been installed in St. Croix (one at the V.I. Waste Management Authority Green House and 2 at local schools); one at a Coral Bay, St. John, school and one is in planning at another St. Croix school.



**Rain garden in action at St. Croix Seventh Day Adventist School (April 2010).**

### ***Restoring Coral Reefs Through Watershed Stabilization***

NRCS provides technical assistance and consultation to local government agencies and community groups to reduce watershed runoff and protect coastal & marine habitats. NRCS has worked with the Virgin Islands Department of Natural Resources, Coral Bay

Community Council, Estate Fish Bay Homeowners Association, St. Croix Environmental Association to provide education and outreach on best management practices (BMPs) to conserve soil and water, thereby reducing storm water and sediment runoff into the coastal waters of the USVI.

NRCS is working with DPNR to revive the Virgin Islands Nonpoint Source Pollution Committee to provide guidance and assistance on methods to reduce the impacts of land-based sources of pollution to coastal waters and coral reef ecosystems.



**Heavy sedimentation of Coral Bay, St. John, after a severe storm. (Photo courtesy of Coral Bay Community Council, November 2009).**

### **For More Information**

Please contact NRCS at the St. Croix USDA Service Center in Estate Sion Farm (340-692-9662 x3) or the NRCS State Office in San Juan, Puerto Rico, or visit our Web site at: [www.pr.nrcs.usda.gov](http://www.pr.nrcs.usda.gov).

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