

**International Coral Reef Initiative Country Report: British Virgin Islands
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Major Trends in Coral Reef Conditions

The British Virgin Islands comprise some sixty small islands, rocks and cays, totaling 150 km² in area. The archipelago is located on a shelf of 3,130 km², with average depths ranging from 10 to 30 m, within the eastern portion of the Puerto Rican Bank. Coral reefs are widespread throughout the Territory, including fringing reefs, offshore patch reefs and the large (77 km²) barrier-type Horseshoe Reef of Anegada. According to the BVI Conservation and Fisheries Department, reefs around eight of the larger islands cover approximately 7,500 ha, with total reef extent in the Territory being considerably greater. Mangrove and seagrass communities exist in the sheltered bays of some islands, but they represent a relatively small proportion of the marine habitats.

Most of the reefs still are in relatively good condition, although there has been significant deterioration in localized areas. Since 1995, the passage of numerous Tropical Storms and Hurricanes have inflicted damage at popular dive sites at Norman Island, Peter Island, Salt Island, Cooper Island, Ginger Island and Virgin Gorda, where broken *Acropora palmata*, overturned coral heads and dislodged gorgonians have been reported. Divers report that the heavily encrusted rock walls off Deadchest, known as Painted Walls, were scoured clean by the passage of Hurricanes Jose and Lenny in the fall of 1999. Damage has also been noted on the deep reefs near Ginger Island. However, several of the impacted reefs appear to show signs of partial recovery.

Reports of coral bleaching and diseases are primarily anecdotal, with little supportive, quantitative data. Reports have increased substantially in the past few years regarding black band disease, but this may be more a result of increased awareness than an actual increase. The 1998 bleaching event was noticed and reported by divers at Ginger Island, Green Cay, Norman Island, Anegada, Marina Cay and several other locations.

The impacts on reefs and associated systems from human activity have increased significantly over the past two decades. Increasing demand by a growing local population and booming tourism industry in the BVI has put tremendous pressure on commercially valuable species such as Spiny Lobster (*Panulirus argus*), Queen Conch (*Strombus gigas*), and most species of Grouper and Snapper. There is much anecdotal evidence of popular dive sites teeming with lobster and large reef predators only a decade or two ago.

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Today, dive guides are hard pressed to find lobster or large grouper around Norman Island, Peter Island or any of the more populated islands.

A recent survey of over 100 fishermen (Pomeroy, 1999) supports this finding. Over 75 percent of those surveyed believed that fisheries were in a worse condition than five years previously. Among the reasons they cited was that fishing activities now occur in all areas, all of the time, increasingly leading to the catch of juvenile conch and lobster. In the past, no area was fished for too long a period, in order to allow fish stocks to recover. Another reason given was the large number of “ghost” or lost traps. Results of the survey indicated that approximately 1,000 fish traps were being lost each year. In 1998, because of Hurricane George, over 4,000 traps were lost. Since BVI fishermen are not required to use biodegradable panels, the lost traps continue to catch and kill fish.

Other causes also are contributing to the decline in fish stocks, including marine tourism. The Territory has the greatest concentration of charter yachts in the world, in addition to the several thousands of private boats that are either kept in, or visit, the islands. Damage to reefs and seagrasses has been caused by boat anchors and chains. Popular anchorages such as the Bight off Norman Island, Deadman’s Bay at Peter Island and Great Harbor at Jost Van Dyke have been used for years and their benthic communities virtually destroyed. Many boats lack holding tanks and discharge their effluent directly to the sea, leading to water quality problems in bays with low flushing capabilities. In addition, at the more popular dive sites, snorkelers and SCUBA divers have caused coral damage. While nearly all dive operators and boat skippers instruct their guests on proper techniques, further damage appears inevitable as the number of visitors continues to increase.

The BVI has promoted the use of moorings as a means of minimizing anchor and chain damage. Since the early 1980s, a private company has been installing moorings at many popular overnight anchorages. The pay for use model has proven to be a successful blending of profit and environmental protection. At all mooring locations, the benthic communities – primarily seagrasses – have shown signs of recovery. The BVI National Parks Trust (NPT) also operates a mooring system at many of its dive sites where anchor damage has occurred, such as the Rhone National Park, the Caves at Norman Island and the Baths at Virgin Gorda. Businesses and individuals have installed many other moorings. Presently, there are several hundred moorings available throughout the BVI and many more are scheduled for installation. However, the number is greatly exceeded by the boats using the islands, especially at such times as the 2000 Millennium celebrations and holidays.

Almost certainly, one of the greatest threats to the reefs comes from land-based sediments. Since the islands are so small, virtually any poorly planned development has some impact upon the marine environment. A desire for rapid economic growth has prevented full consideration of environmental consequences, with readily observable results. Periods of torrential rainfall on the ubiquitous steep slopes wash large quantities of topsoil from unpaved roads and development sites down to the sea. The main port of Road Harbor turns brown after even a moderate rain. Sediment load in the bay has killed

or seriously damaged all shallow nearshore reefs. Many reefs that were flourishing a few years ago have been reduced to barren rock outcrops covered with filamentous algae. Bays on the north coast of Tortola that were undisturbed until very recently are now subject to sediment plumes. Smaller in scale, but no less damaging to nearshore reefs, are new road cuts and residential construction on Jost Van Dyke and Nail Bay at Virgin Gorda. It is not likely that the affected reefs will survive repeated sediment inundation.

Coastal landfill projects, primarily by the public sector, are proceeding unabated, especially along the southern coast of Tortola. The normal procedure is to deposit soil, rocks and construction debris directly into the water without first installing turbidity screens or bunds, thus allowing sediment plumes to impact nearby marine communities. To date, approximately 75 percent of the Territory's mangroves have been destroyed.

The largest ongoing landfill project is the expansion of Beef Island Airport, which has stirred debate and controversy within the community. International funding agencies, the BVI Government and contracted consultants have been criticized for inadequate environmental planning. Apparently, little or no consideration was given initially to erosion control on the site. Consequently, heavy rains produced substantial sedimentation into nearby Trellis Bay and Hans Creek. Sedimentation on the healthy Hans Creek reefs was especially disheartening, since it is important to reef fish recruitment research being undertaken by the International Center for Living Aquatic Resource Management (ICLARM).

Most islands in the BVI are small in size, with little or no inhabitants or construction activity. However, feral goat herds have reduced the vegetative cover on many steep slopes, and erosion and sedimentation pose a problem even at remote locations. In 1995, four widely dispersed sites in the BVI were surveyed for Sea Fan diseases. A significant number of colonies exhibited lesions and tissue loss associated with an *Aspergillus* fungus. Since this fungus typically is found in terrestrial soil, it is perhaps feasible that its spread has been aided by increased soil erosion.

Large amounts of raw sewage pass into the sea untreated because of septic tank and especially drainage field failure. Owing to steep slopes and very shallow topsoil, the majority of Tortola and Virgin Gorda is unsuitable for this type of system. Fortunately, the North Equatorial Current quickly disperses most of the waste. The most noticeable effects are algal blooms, reefs smothered by filamentous algae and decreased biodiversity in the vicinity of outfalls. More severe impacts are noticeable in marinas, bays and other semi-enclosed areas. Road Harbor, Virgin Gorda Yacht Harbor, parts of North Sound and numerous other locations are experiencing varying degrees of sewage pollution. The popular tourist beach at Cane Garden Bay has suffered such reduced water quality in recent years that the government has built a sewage treatment plant for the community. Other treatment plants are being considered in a Territory master plan that is currently being completed. Most of the larger resorts and more recent developments have installed their own sewage treatment facilities.

An increasing problem is proper disposal of hazardous wastes, including waste oil, batteries, paint and coatings. While landfills and an incinerator absorb much of the normal domestic waste, pollutants frequently contaminate nearshore marine communities. Boat yard contaminants, for example, include organotin compounds such as tributyl tin (TBT), which still has not been prohibited in the Territory. Recent research at Tortola's community college has discovered Queen Conch displaying imposex in heavily used marina areas in Tortola.

Legislation, Policies and Management

Certain obligations and responsibilities of the BVI result from its status as a United Kingdom Territory. While legally obligated to all international treaties and agreements to which the United Kingdom is a party, local legislation often lags far behind. For example, lagoons, salt ponds, mangroves and coral reefs currently are afforded little legislative protection outside of those geographic areas that have been declared protected.

The National Parks Trust currently manages marine parks at the Rhone National Park and the Baths at Virgin Gorda. However, little special protection is afforded and commercial fishing is legal. Anegada's Horseshoe Reef initially was declared a marine protected area, closed to all activities. Subsequently, limited fishing permits were issued to some Anegadians. Unfortunately, neither the NPT nor the Department of Conservation and Fisheries has the resources and legal mandate to adequately control activities in these areas.

The BVI has no comprehensive coastal zone management plan, even though draft legislation (Coastal Conservation Act) was introduced in 1987 and a Memorandum of Cooperation signed between the government and the United Kingdom in 1999. The proposed legislation would have addressed mangrove protection, development setbacks, anchorage restrictions, watershed protection and sediment control throughout the Territory, not merely the few within established protected areas at present. It also would have required the undertaking of Environmental Impact Statements. Currently, these are undertaken at the discretion of the BVI Government, and are very rarely required – if at all – for public works projects such as land fill and road construction.

The BVI has no enforced regulations regarding marine pollution, even though a mandatory Environmental Protection Imperial Order for Overseas Territories was proclaimed by the United Kingdom in 1988. Neither has it regulations nor facilities for the disposal of toxic wastes.

In summary, at the present time, there is limited government jurisdiction over many activities that impact coastal marine environments. Inadequacies are recognized and efforts appear to be underway to at least partially address the problems. The NPT, for example, recently completed a Parks and Protected Areas Systems Plan that will substantially increase the geographic extent of marine areas under its jurisdiction as well as provide management directives. Legislation for a National Integrated Development Plan was passed earlier this year, which hopefully will lead to comprehensive land use

planning. Development Regulations of the Town and Country Planning Department currently are being revised and updated.

Accomplishments with respect to ICRI and Agenda 21 Objectives

Since 1995, a Fisheries Act (1997) has been enacted and Fisheries Regulations (2001) authorized, which provide for the designation of fisheries protected areas within the BVI exclusive fisheries zone. The regulations also strengthen sea turtle protection. As of July, 2001, the BVI became a party to the St. George's Declaration of Principles for Environmental Sustainability in the OECS.

Successful emergency marine exercises have been carried out jointly by concerned agencies and organizations of the BVI and U.S. Virgin Islands (USVI). These activities represents an important, initial step in protecting the environmental quality of shared marine resources such as the Sir Francis Drake Channel and Pillsbury Sound, where marine traffic of people and cargo is particularly high.

It was evident in 1995 that more marine research and surveys needed to be undertaken. Within the last few years, such projects have been initiated by the NPT, H. Lavity Stoutt Community College, ICLARM, Guana Island Wildlife Sanctuary, Reef Environmental Education Foundation (REEF) and other entities to gather data on reef trends and fish populations. A Marine Resource Center currently is under construction at the College that will significantly increase technical and research capabilities.

Since 1998, Association of Reef Keepers (ARK) has been undertaking annual Reef Check surveys. In addition to undertaking marine surveys, the Department of Conservation and Fisheries has been active in mangrove restoration projects, as well as establishing a comprehensive GIS data base for watershed and marine planning purposes. Several programs are being undertaken at the Caribbean level that have direct relevance to the BVI, including the Reefs at Risk Program.

Environmental NGOs within the BVI are becoming increasingly effective. ARK has been active and successful in ensuring that adequate environmental controls are being undertaken with regard to the Beef Island Airport expansion. In 1998, ARK and the Community College sponsored an erosion control seminar. Island Erosion, a newly established NGO, will hold another erosion and sediment control workshop again later this month. Both ARK and Island Erosion were recently awarded Environmental Awards by the BVI Department of Conservation and Fisheries. Another NGO, Island Resources Foundation, has been assisting the NPT with a review of its legislative framework and requirements for the Parks system.

Challenges and Obstacles to Coral Reef Management

BVI legislation on environment protection needs to be substantially amended and augmented. Too many critical habitats, such as mangroves, are not adequately protected

by law. The legislation that exists is fragmented, and does not provide clear authority to governmental agencies over many activities directly affecting the health of the marine environment. The respective roles of individual governmental agencies need to be clarified because of existing overlapping authority. Enforcement of laws is inconsistent and ineffective. Once clear authority has been provided, there must be a financial commitment to ensure adequate monitoring, and a moral commitment to ensure adequate enforcement.

Only recently has information on coral reef trends been collected on a regular basis in the BVI. Such information is critical for proper management of protected areas. This is demonstrated in recent research (currently under peer review) undertaken by Caroline Rogers and Jim Beets of the USGS in the neighboring USVI. Over forty years of data on coral reefs, reef fish assemblages and seagrass beds have been collected for the Virgin Islands National Park of St. John and Buck Island Reef near St. Croix. The predominantly anecdotal information for BVI reefs is reflected by quantitative data for the USVI reefs. Large changes in species composition and trophic structure have been documented within park boundaries. A disturbing finding is that visual surveys of fishes both inside and outside the Virgin Island National Park have shown no difference in the number of species, biomass or mean size of fishes. The reason is that, although protected from commercial fishing for forty years, the park has had heavy recreational use and fishing, and has not been functioning fully as a marine reserve. In addition, commercial fishing has continued immediately outside the park's boundaries. The data indicate the park should be a no-take, no anchoring zone, with a surrounding buffer area, in order to better ensure the replenishment of fishery resources and recovery of benthic habitats. Hopefully, the BVI will learn from the experiences of the USVI.

The major challenge for government and society is to find a way to define and implement responsible growth without having to sacrifice the environmental quality that has been the key to the Territory's economic success. A logical first step is a coastal zone development plan for the entire Territory. Otherwise, the long-term prospects do not appear good.

Critical Success Factors in Coral Reef Management

Citizen support and understanding of the environment are required to protect marine systems. The last three decades have witnessed a cultural, societal and economic transformation. Fortunately, there appears to be a growing consensus among BV Islanders that the time is near for controls and limits, for legislation, and for a re-evaluation of the direction society has taken. Pomeroy's survey, for example, indicated the fishermen's almost unanimous support for the establishment of no-take zones. A critical factor is the enhancement of environmental education in the school system and through public outreach. The Department of Conservation and Fisheries, ARK and others are taking initial steps to accomplish this objective.

Future Plans and Programs

It appears very probable that additional pressure will be brought by the UK Government to ensure that the Territory is in greater accordance with the requirements of international laws and treaties. Earlier this year, for example, the Governor, as the Queen's representative, announced that legislation relating to marine pollution will be introduced during the next legislative session.

As mentioned elsewhere, local government initiatives include expanding the National Park System and strengthening its policies and management plans. A master sewerage plan has been recently completed for implementation. Land development regulations are being strengthened. It is also to be hoped that the new National Integrated Development Plan will lead to a comprehensive coastal zone management plan that embraces all of the Territory, including inland areas.

It is also to be hoped that regional cooperation will be strengthened between the BVI and USVI in order to better manage what, essentially, is one small marine ecosystem (SME). The recent joint emergency marine exercises are a promising start. USVI agencies are participating in an upcoming Erosion and Sedimentation Control Workshop, organized by the NGO, Island Erosion, which will be held in Tortola this month. A more comprehensive approach – addressing, among other things, transboundary resource management issues, harmonization of standards and protocols, and establishment of a mechanism that allows institutions, NGOs and stakeholders to work together in the management and protection of a shared resource – would greatly benefit both territories.

Pomeroy, R.S., Economic Analysis of the British Virgin Islands Commercial Fishing Industry. International Center for Living Aquatic Resource Management (ICLARM) Research Report, March 1999, Tortola, British Virgin Islands.