



## EXECUTIVE SUMMARY

*This is a final report of the activities, observations and recommendations from the “Peninsula Marine Ecosystem Survey Week,” April 24-29, 2007 in St. Kitts & Nevis, West Indies.*

The Ocean Foundation and the St. Kitts Foundation, with donations from private donors, sponsored two expert organizations, REEF ([www.reef.org](http://www.reef.org)) and Reef Relief ([www.reefrelief.org](http://www.reefrelief.org)) to train local divers in St. Kitts in survey and assessment methods of nearshore coral reef habitat and fish populations around the southeast peninsula of the island. A third organization, Earth Echo International ([www.earthecho.org](http://www.earthecho.org)), documented the relationship of nearshore marine health to current land-use practices on the Peninsula, from unregulated grazing (goats, sheep, cattle and mongoose) to coastal development, existing and proposed.

Descriptions of data collection and processing methods, as well as initial conclusions from the baseline-monitoring program are found in their individual reports (available upon request). This Executive Summary by the St. Kitts Foundation highlights observations and conclusions that indicate fragility in the environment, new or unidentified threats, rare, unique and representative observations, and observations that could be particularly meaningful to proposed development for the peninsula and St. Kitts.

### MARINE LIFE CONDITION

Eight marine sites were surveyed, six by SCUBA and two by snorkel: Whitehouse Bay (2 sites), Ballast Bay, Green Point, Shitten Bay, Nags Head, Major’s Bay, and the River Taw shipwreck.<sup>1</sup> Divers identified 125 species of fish and two turtle species.

#### *Fish*

In general, the condition of the nearshore marine life is unhealthy and out of balance, evidenced by high macro-algal and low coral cover, abundant small herbivorous fish, and very few large predator fish such as grouper and large snappers. The cause is likely a combination of over-fishing, sedimentation from overgrazed land, and pollution transported through ocean currents.

#### *Algae*

While there are abundant algae for fish to feed on, it appears there is a pattern of nutrient loading, high algal growth, and sedimentation settling which creates a mat of algae that suffocate and kills corals. Herbivorous fish, which usually clean corals of their algae, offer no relief because they do

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<sup>1</sup> The River Taw is a shipwreck located between Basseterre Harbor and South Frigate Bay beach. While this very popular dive site is not on the southeast peninsula, it was important for comparison’s sake. This wreck sits at nearly 50 feet depth and about 1 mile offshore. It hosts the largest size, diversity, and abundance of species observed during the entire week. This shows that with the appropriate reef habitat, water conditions and protection from fishing, the southeast peninsula can have prize dive sites like this one. It is an outlier and is not included in the reports’ general statements about reef health and fish abundance.

not prefer the matted algae. Some healthy algae-eating *Diadema* (sea urchin) populations were observed.

### *Coral*

Surveyors observed few large, reef-building corals (i.e. *Montastrea*). There were many dead corals turned over and coral rubble. Surveyors observed an over-abundance of colorful sponges and soft corals, which seem to take over when hard corals die. Small, healthy coral recruits (<10 years old) were abundant in the shallow (< 10 ft.) areas of Whitehouse Bay. These small corals are highly vulnerable to sedimentation, pollution and general disturbance, but are also a valuable resource because they harbor genetic diversity and are the source materials for new coral growth. Coral recruits such as these provide an opportunity to save and expand coral populations in protected coral nurseries if they are professionally transplanted prior to any seabed disturbance.

### *Coral infection / bleaching*

There is a great deal of stress, bacterial infections and algal overgrowth on both hard and soft corals and sponges. Conditions observed include mucus, brown spotting, and discoloration of sea fans, coral blushing and bleaching.

Coral tissue discoloration was evident at all dive locations and seemed to be occurring early in the year. This raises a “red flag” for a potential significant coral bleaching event this year, which would exacerbate the existing chronic stressors of heavy sedimentation and pollution on these reefs. Reef Relief donated equipment and initiated collaboration with instructors from the local community college to continue the baseline-monitoring, which can be interpreted and shared with the local community to increase their awareness of local reef conditions.

### *Seagrass*

There are sizeable and healthy seagrass beds that provide valuable habitat to crustaceans, echinoderms, turtles, and small fish at Whitehouse Bay, Ballast Bay, and Major’s Bay.

## **WATER QUALITY**

Overall there was slightly better visibility and growth of small, healthy corals nearshore (<30ft) than further out (30-60 ft). This suggests there may be other and greater sedimentation and runoff contributors than erosion from overgrazed land on the peninsula. It is very possible that runoff from inadequately treated sewage as well as industrial, urban, harbor and cruise ship sources from adjacent harbors, especially Basseterre and Charlestown, are impacting the coral reef ecosystem of the peninsula.

Lab results from surface water samples taken during dive surveys from Whitehouse Bay further support this inference, indicating no significant levels of bacteria were detected at time of testing.

## **HUMAN IMPACTS**

Anchor and anchor chain damage in seagrass beds and on coral reef was observed at most surveyed locations.

Only a few abandoned fish traps were observed and most were not endangering the reef at the time of observation.

Marine debris, especially plastic, is established as a serious problem throughout St. Kitts. Debris reaches nearshore waters from stormwater drains and ghauts that empty directly into coastal areas, as well as from offshore and local vessel traffic, which are also sources of oil discharges.

Signs of over-fishing are clear. The direct removal of fish (includes crustaceans and mollusks) is occurring at a faster rate than some species can reproduce to keep population sizes healthy. Increased fishing pressure reduces large predators (grouper, snapper) and species diversity, resulting in a bottom-heavy (herbivorous), incomplete food web. Surveyors witnessed a lack of large predator fish, lack of large lobsters, and many large piles of conch shells (only one live conch seen).

## **DATA PRODUCTS**

-Expert reports including DVD with 19 transects from surveyed sites (Ballast Bay, Whitehouse Bay, Shitten Bay, Green Point); coral disease monitoring guide; 66 color photographs.  
-Increased data on St. Kitts fish populations by 25% on REEF website and added 5 new survey sites.

## **ACTION ITEMS**

### ***For the St. Kitts Foundation:***

1. Continue initial public awareness campaign for local residents, policymakers, educators and students via radio and television interviews, special events and distribution of educational materials such as the *Coral Reef Guide to St. Kitts* to increase local support for conservation efforts that will protect the marine environment and help guide development on the peninsula.
2. Encourage and identify funding for the Government of St. Kitts and Nevis through the Departments of the Environment and Fisheries to move with urgency toward the implementation of a stakeholder-informed network of marine managed areas, and correlated monitoring and enforcement programs.
3. Continue public awareness campaign on the importance of reducing and managing the numbers of grazing animals on the peninsula in order to reduce sedimentation that is a serious threat to the marine life of the nearshore waters.
4. Initiate community programs that involve Kittitians in the sustainability of their island. Some identified needs include: a) volunteer fish and coral monitoring; b) habitat mapping for marine protected areas; c) reduce-reuse-recycle campaign; d) initiate program with businesses to reduce use of plastic packaging/bags; e) install garbage receptacles at beaches and lookouts on the peninsula and organize collection; f) host youth programs focused on environmental conservation and education; g) donate resources to start a marine science lab/library.
5. Identify funding to install reef-mooring buoys to prevent anchor damage to live bottom. Work with the Fisheries Department and the Coast Guard to assign and enforce regulations regarding allowable uses of buoys.
6. Encourage the Government of St. Kitts and Nevis through discussions and funding assistance to build sewage treatment facilities in Basseterre & Charlestown.

***For KHT Land Holdings Limited:***

1. Develop Principles Guiding Sustainable Development that incorporate a conservation approach as a priority in all planning.
2. Enlist the active involvement of a local biologist from the community college or elsewhere on the decision-making team who can share local knowledge of the peninsula and create the opportunity for community “buy-in” to the proposed development by having a local voice.
3. Connect reef and ecosystem restoration to ecotourism opportunities. For example, where beach nourishment or dredging is proposed, plant coastal mangroves to filter runoff and trap sediment. Mangroves provide valuable kayaking and bird viewing opportunities. Establish coral nurseries starting with Whitehouse and Ballast Bays *before* rebuilding the beach or cutting a marina entrance. Healthy reef will provide an accessible and high quality snorkeling experience. Mark shallow areas adjacent to marina entrances to boats don’t accidentally run aground onto coral.
4. Take a precautionary approach to protecting water quality and existing nearshore reef systems. Reusing de-liquefied sludge from dredging activities as berms and swales in developed areas can prevent degraded water from entering the coastal zone during or after (as stormwater) dredging. Also ensure seepage and polluted runoff from low-lying golf course lawns is diverted away from the coastal zone.
5. Promote the creation of a deed-restricted upland park for areas of the peninsula that are not identified as development nodes. Promote the park as an eco-tourist destination and support creation of infrastructure through a nonprofit entity that can manage the park, remove invasive plants and promote healthy rainforest growth. This will add immense value to the peninsula, increase biodiversity, and become an attraction to those who would stay at the resorts being planned as well as local residents. It would also become an outdoor classroom for local students.
6. Promote the creation of a “pilot” marine park, ideally downstream from an upland park. Work with the St. Kitts Foundation and the appropriate Government entities to fund the management of a nearshore area (similar to Grazer Exclusion Fence) that could serve locals, students, and tourists, and expedite the implementation of a larger network of managed areas.
7. Integrate recycling into the solid waste plan for the peninsula, including proper disposal of batteries, used oil, and other hazardous waste. A commitment to using biodegradable and non-toxic cleaning products and sustainable building materials by the developer and all contractors would reduce waste and increase in disposal needs. If an offshore delivery site for recycled items is identified and a system for delivery established for the development, work with the St. Kitts Foundation and the Government and to start an island-wide recycling program.