

CRA

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FARMING CORAL
STRIVING TO REVIVE THE
"UNDERWATER RAINFOREST"

CANADIANS ABROAD
TAKING THE NECESSARY
PRECAUTIONS

OFFSHORE TRUSTS
MYTHS & REALITIES

BRITTANY BY BIKE



COVER PHOTO: DARLENE & NORMAN MCCULLOUGH, GREYSTONE PHOTOGRAPHICS

CRA magazine

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Striving to Revive the "Underwater Rainforest" Living coral provides more oxygen to the planet than all land-based rainforests. But, the world over, these "underwater rainforests" are in a precarious state due to a variety of factors: if drastic steps are not taken to prevent further destruction, all reefs could be dead within the next forty years. Canadian expat Gwenith Whitford describes a heartening initiative to save the coral.

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For people living abroad, home may seem very far away in times of uncertainty. While recent world events have focused attention on issues of personal and financial security for everyone, these developments have added dimensions for Canadians overseas. Our four experts provide their comments and advice.

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Myths & Realities Historically, some Canadians have reduced their tax burden by using offshore trusts. But the Canadian government is now going out of its way to develop tax laws to quell the use of offshore entities for other than legitimate reasons, a position reinforced with the recent introduction of revisions to the foreign trust rules. Garry Duncan addresses the myths and realities and what still works.

Brittany by Bike

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"This is not my real life. Nor is it a parental fantasy," writes Janis Cooke Newman, author of *Brittany by Bike*. "It's a Butterfield & Robinson family vacation, and it's about as far from real life with a 5-year-old as Versailles is from Chuck E. Cheese's." When it comes to travelling, it seems you can have it all!



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FARMING CORAL

STRIVING TO REVIVE
THE “UNDERWATER
RAINFOREST”



BY GWENITH WHITFORD

By propagating coral on the tiny Caribbean island of Dominica, a company called Applied Marine Technologies Ltd. (AMT) strives to save the world's dying coral reefs. On this organization's Web site, readers are informed that living coral provides more oxygen to the planet than all the land-based rainforests. AMT has devoted itself to reviving the "underwater rainforest."

This ambitious objective has very humble origins. About 15 years ago, Alan Lowe, AMT's Director of Operations, watched a coral reproducing itself in his home aquarium. He developed a fascination with this phenomenon, and his fascination evolved into a plan for a full-scale coral farm.

"AMT is the first commercial coral cultivation facility in the Caribbean, and possibly the largest in the world," says Alan.

His dedication to the propagation of coral is rooted in a deep concern about the precarious state of the world's coral reefs. Both nature and human beings are responsible for their rapid deterioration. Hurricanes and typhoons uproot corals, while pollution, shipwrecks, illegal harvesting for jewellery-making and the random use of dynamite to catch fish have also taken their toll. It is only recently that the gathering of coral for the marine aquarium industry has been halted. Global warming, too, is having an adverse effect on this fragile ecosystem.

"Coral is dying all over the world," Alan explains. "Studies by the U.S. National Oceanographic and Atmospheric Administration and others have

REEF BALL PREPARATION



FILLING MOLDS



INSERTING BLADDER



REMOVING MOLDS

REEF BALLS

"Reef Balls" are a leading make of designed artificial reefs. The balls are made by pouring a special marine-friendly concrete, designed to mimic natural reef systems, into a fibreglass mold which also creates holes in the ball itself. For installation, Reef Balls can be floated using a buoy and towed behind any size boat. Divers position them under water using rubber air bladders. Coral "seeds," brought from the "farm" in mesh bags, are then attached to the ball and the bladders are removed. Reef Balls are used around the world to create habitats for fish and other marine and freshwater species. Over 100,000 Reef Balls have been deployed in more than 1,500 projects, worldwide. Reef Balls are made in many sizes to best match the natural reef type which is being mimicked, ranging from 16x10 cm (2.5 kg) to 2x1.4 m (1,800 kg). Further information on Reef Ball artificial reef systems and the Reef Ball Foundation (a nonprofit organization dedicated to restoring ocean ecosystems) can be found at Web site <www.reefball.org>.



concluded that if drastic steps are not taken to prevent further destruction, all reefs could be dead within the next forty years."

If the coral dies, this will have an extremely adverse effect on other marine life. Its absence will then have dire consequences on the world's

human population.

"Coral provides food and shelter for many of the oceans' creatures. It is a breeding ground for a huge percentage of fish. Destruction of the reefs could lead to mass starvation amongst seafood-dependent people," insists Alan.

Alan feels that Dominica is an ideal venue in which to operate AMT's privately funded coral propagation farm.

"Dominica was chosen for its pristine waters and friendly people," he says of the "Nature Island" of the Caribbean. The team at AMT consists of engineers, divers, marine biologists, construction managers, coral husbandry specialists and marketing

PHOTOS THIS PAGE
RIGHT & FAR RIGHT: SEEDED CORAL



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strategists who are located in Dominica and the United States.

AMT's main objective is to cultivate coral "in captivity" and then put it back into reefs that are distressed or destroyed in order to restore the oceans' ecosystems. This action will provide damaged reefs with an enhanced means to heal.

Otherwise, recovery could take hundreds of years. The organization has an ambitious plan to eventually grow all of the approximately 2,500 different types of hard and soft coral that exist in the world.

Corals have a unique and infrequent means of reproduction, which makes the restoration situation even more urgent. Their sexual reproduction only happens once a year, around the time of the full moon in August or early September. The coral releases approximately 500,000 eggs during this mass spawning. However, fish eat considerable numbers of the eggs and others drift down to the ocean floor, where they die. Alarmingly, often only



one egg per coral will survive and grow.

But coral can also reproduce asexually. "Asexual reproduction is the fragmenting of coral by breaking a piece away. Under the right conditions, these fragments can take hold and grow," explains Alan.

At AMT, Alan and his team endeavour to recreate the marine environment that is ideal for raising corals. These conditions include appropriate temperature, water salinity and clarity. The facility is designed for 500 tanks, each containing 250 gallons of seawater. Several hundred corals can be raised in each tank. In order to grow the coral "in captivity," parent

REEF RESTORATIONS ON MUSTIQUE & JAMAICA

Over the past year, Applied Marine Technologies (AMT) has been restoring coral reefs off the island of Mustique, damaged by Hurricane Lenny in November 1999. The reef restoration project is the first of its kind.

Using their patented method, AMT propagates corals from a parent stock and uses the "babies" to reseed reefs. The propagated corals are raised on star-shaped bases made of a resin-sand composition. These bases can then be attached with stainless steel screws either to a dying reef substrate or, as in the case of Mustique, to concrete domes (see "Reef Balls" sidebar) settled into the rubble of destroyed reefs. During 2000, AMT flew 1,200 coral patches to Mustique for attachment to the artificial reef placements. Fifteen species of coral were used, with some of the coral polyps propagating in only six weeks. This year, AMT hopes work will begin on coral replacement off Negril on the west coast of Jamaica. This will involve a beta test with the placement of 10,000 baby corals, the full project to include more than one million pieces. While "Reef Balls" were used on the Mustique project, the Jamaica project and future reef restoration projects by AMT will use a more natural product, now under development, which is made of a material similar to the tiles on the space shuttle.

ABOVE: SEEDING CORAL
BELOW: TEAM SEEDING



pieces – called “brood stock” – initiate the patented propagation process. After a few months, many of the cultivated pieces become the brood stock themselves. The system eventually becomes self-sustaining.

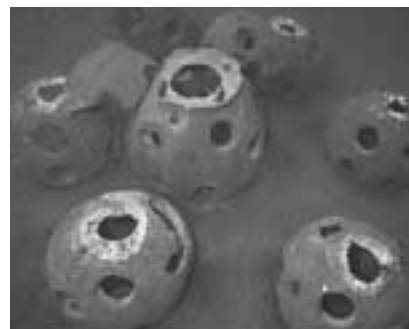
Coral husbandry specialists on the staff maintain the tanks on a daily basis, which includes a cleaning and inspection of each tank every week. When the farm is fully operational, the tanks will hold almost 500,000 cultivated corals. Then, several thousand pieces can be shipped out per month.

“We are experimenting with the various needs of some corals so that we can design species-specific tanks, if needed,” says Alan. “We also have

has been “seeded” over the past year to begin to repair the damage caused by Hurricane Lenny in 1999.

“Our research indicates that we can give a minimum of a 165-year jump by seeding a reef with cultivated corals,” exclaims Alan.

Additional programs which are now being developed include pharmaceutical research utilizing coral enzymes in AIDS and cancer research, the use of certain hard corals, raised by AMT, for bone reconstruction, and supply for home aquaria, thereby reducing the harvesting load from natural reefs. Also, coral that has died at the AMT farm can be employed in jewellery-making and other crafts.



REEF BALLS

which have been grown in captivity at the farm. AMT intends to increase awareness about the importance of preserving these natural wonders. “Education and then positive action are desperately needed to save these ocean treasures,” urges Alan.

As part of their public awareness campaign, AMT has launched an “Adopt-A-Coral” program. This project is designed to aid in the restoration of coral reefs worldwide. Public support will help the coral propagation farm raise coral in captivity to repair damaged reefs so that the oceans’ ecosystems can be re-established.

“The Adopt-A-Coral program is a way for concerned people to take a positive step of their own, and place a piece of coral onto a reef,” says Alan. He feels that this small gesture by many concerned individuals can save the beauty and importance of this wonderful marine environment for future generations. Without assistance from citizens of the world, the revival of our “underwater rainforests” will take a very, very long time.



8 MONTHS AFTER SEEDING

a twenty-five thousand gallon pool where people can see the many types of corals we are working with. We are also committed to the construction of a larger pool that will, in essence, give us a two hundred and fifty thousand gallon interactive pool. People will be allowed to enter this large pool with a guide and receive an education-oriented underwater tour.”

Many exciting projects are underway at AMT’s coral farm, including the coral restoration process off the island of Mustique (see sidebar, page 9) where coral

“All of this can be achieved without continued destruction of natural coral reefs!” enthuses Alan.

AMT recognizes the value of forming partnerships with similarly concerned organizations. They are currently in negotiation with various academic institutions as well as educational foundations. They include the prestigious Living Classrooms Foundation, the ReefBall Coalition, and a conservation organization called REEF. Also under discussion are agreements with various commercial aquaria to showcase living corals

Further information about the Coral Propagation Farm and its Adopt-A-Coral Program can be obtained from **Applied Marine Technologies Ltd.**, Box 1001 Roseau, Commonwealth of Dominica. Tel. 767-445-5903, Fax 767-445-3547, E-mail <info@appliedmarinetech.com>, Web site <www.appliedmarinetech.com>. AMT welcomes prearranged tours of the facility.

Gwenith Whitford is a freelance journalist from Canada who resides in the Commonwealth of Dominica, the “Nature Island” of the Caribbean. She may be contacted at: E-mail <whitfordg@cwdom.dm>.

This article originally appeared in a slightly different form in the December 2000 issue of Caribbean Compass.