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COTERC25 EDITION

NOTES FROM THE CHAIR - Marilyn Cole

The year 2016 was an important one in the history of COTERC and Caño Palma Biological Station, as we celebrated our 25th anniversary. It seems like just a short while ago that my ex-husband and I made our way to the northeastern shore of Tortuguero in 1990 as Research Assistants for a PhD student working with the endangered Leatherback sea turtles. I fell in love with this magical area surrounded by lowland tropical rainforest, complete with three species of my favourite animals - monkeys - as well as glorious birds and so much more. And how could one resist when offered the opportunity to purchase a piece of this paradise? Although Costa Rica has a good environmental reputation, it was still shocking to see how much rainforest had been destroyed to grow bananas and other crops, as well as to raise scrawny cattle. And here was an opportunity to preserve at least a small portion of the ecosystem.

Accessible only by boat or small plane, my first impression of this tropical paradise was simply "WOW". On my first visit to the property, there was no dock, just a muddy boat-landing area, and beside it a tree full of wonderful, dangling Oropendola bird nests. And perched not far away was a beautiful hawk-eagle.

Marilyn honours Tom Mason for his long service as a Board member.

At first we thought only of preserving this wonderful piece of rainforest with all its biodiversity, but out of this wish I soon came to realize that it was necessary to encourage students and researchers to visit and study this particular habitat, much of which was still little known by scientists. The goal was, and still is, to educate people about the perils of deforestation, and to appreciate and discover the endangered ecosystem of the lowland tropical rainforest.

And so, the charity known as Canadian Organization for Tropical Education & Rainforest Conservation (COTERC) was born in 1991, and the early beginnings of Caño Palma Biological

Canadian Organization for Tropical Research & Rainforest Conservation

RAPHIA

Station came into being. Initially the only structure was a two-room thatched hut where the previous owner had lived with his family. Food was cooked over a fire; water was pulled up by a bucket out of a hole in the ground; and an outhouse served the needs of the family.

We have come a long way since then. We can now boast: accommodations for over 30 volunteers & researchers; a library; a kitchen/dining room/office; and several other buildings. We have a station manager Charlotte Foale, assistant manager Manuel, and two Research Coordinators to train volunteers and to help run the various projects. Plus we have interns to work on environmental-education projects for the local schoolchildren.

Gradually word spread about the station and it now attracts volunteers, interns and researchers from all over the world as well as students from universities in Holland, Canada, the USA and other countries, who spend time working either on our projects or on their own.

We have several projects in which volunteers can work:

- **Turtle monitoring and tagging**, including Leatherback, Green, Hawksbill and Loggerhead species, all of which are endangered.
- **Migratory bird banding** – Here's an interesting aside. A bird banded at Caño Palma was later recorded at the Toronto Zoo, demonstrating the importance of maintaining records between countries as we are losing so many species due to habitat loss, pesticides, etc.
- **Shorebird census** – This is a relatively new project but we are slowly adding to the knowledge of movement for this group of birds.
- **Caiman survey** – Our volunteers go out in a boat at night to count caiman, recording ages and sizes.
- **Snake survey** – We are first in the area to not only collect data on local snakes, but to also pit tag them so that we know if we are capturing a new animal or an earlier recorded one.
- **Plant phenology** – Following a worldwide system of measurements and data collection known as ACER, we are recording flowering and other stages of growth and development of plants and trees in a designated area.
- **Large mammal project** – Our volunteers record the footprints of mammals found in the area and we have now added camera traps to capture photos of mammals such as jaguar.
- **Weather monitoring** – We have been recording daily high and low temperatures and rainfall over several years to determine variation over time.
- **Environmental education** – This is an important outreach program to educate children living in the nearby village of San Francisco about the importance of protecting and conserving the wildlife and forest around them, and to instil a sense of pride in doing so.
- **Beach debris clean-up** – This is a relatively new cooperative project between station personnel and the local villagers to clean up the debris that lands on the nearby beaches. Once collected, the debris is categorized and catalogued.
- And plans are in the works to add a study on otters as well as the endangered green macaw, which has been sighted frequently in the area recently.

I am very proud of what our charity has accomplished in the way of contributing to the overall

knowledge of biodiversity in the Tortuguero region. In Canada, we promote environmental education in the Ontario school system and have initiated seminars on specific topics of interest.

Here in Canada, we are all volunteers including myself. In Costa Rica, our small staff depend on volunteers to help carry out the various projects. We do not receive any government funding, depending entirely on donations and fees charged to volunteers plus our fundraising activities.

Our most recent fundraising event was also a celebration of our 25th anniversary. Organized by the capable committee of Sruthi Surampudi, Alex Lee, Shelley Hutchinson and Patrick Traynor, on November 5, 2016 we enjoyed a sumptuous dinner plus live and silent auctions at Deer Creek Golf Club & Banquet Facility in Ajax, Ontario. Via Skype, we heard the latest news from Charlotte Foale, Station Manager. Our guest speaker Matthew Kolman, post-doctoral researcher from the University of Washington, reflected on his experiences from his time at Caño Palma Biological Station. It was wonderful to see so many familiar faces as well as new ones, and I enjoyed the opportunity to visit with so many of you.

Shelley, Sruthi and Alex , organizers along with Patrick Traynor (not pictured) of COTERC25

We couldn't exist if it weren't for the many dedicated volunteers who have served on COTERC's board over the years or assisted at fundraisers and done so much behind the scenes. I am truly grateful for everyone who has contributed to our success.

Having said that, the tropical environment is very hard on buildings. Twenty-five years later we find that most structures need either repairs or reconstruction. Charlotte's husband Manuel is a master at using whatever is at hand to fix things, but the time has come to replace the dock, the showers and the toilets, and to carry out major repairs on the kitchen and other buildings. All are very costly. The proceeds from the COTERC 25 dinner will help pay for some of these repairs, and over the coming year we will be initiating other fundraising events. We hope that you, our members, will support us as we prepare the way for the future.

If you would like to help, you may donate through Canada Helps, Paypal (info@coterc.org) or by cheque to COTERC, Box 335, Pickering, Ontario L1V 2R6, Canada. You will be issued a tax receipt for any amount over $5.00.

COTERC25 Celebration

Greg Mayne, Marilyn, Art Shannon and Kym Snarr

Jim Taylor, Andrew Morris, Sruthi Surampudi (board members past & present)

The doctor is in the house.

Dr. Nathan Lovejoy

Lori Dunn (L) is the painter of the picture that Greg Mayne acquired in the silent auction.

COTERC25 Celebration

Dawn Todd, Hilary Lee and Jayne Smith

Guest speaker Matthew Kolman

COTERC founder Marilyn Cole and Diane Draper

Elaine Christens and friend with COTERC items on sale.

OUR GENEROUS DONORS TO THE COTERC25 AUCTION

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Tom Mason
Nia Gibson
York University Internship Program
Rosie Brachman
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Unearthing a Turtle Nest

How do you go about re-finding a turtle nest, particularly when the gentle slope of the beach has been eroded away?

Here's the beach as it appears after erosion has taken place. That's Molly McCargar (in blue), Caño Palma's research coordinator, and volunteer Nicole Politis (from Unionville, Ontario) preparing to locate the nest.

The patrol that originally found the turtle laying eggs tied yellow ribbons to 3 trees and wrote down exact distances from each tree to the nest. Nicole holds one end of the measuring tape against the ribbon while Molly prepares to make the measurement.

Photos by Joanne Smith

Molly uses a stick to draw an arc at the recorded distance from each tree. Where those lines intersect should be the location of the nest. In this unusual case, the nest wound up on the top edge of the bank.

In case any newborn turtles still remain in the nest, Nicole uses only her hands to dig. It's obvious that they've found the right spot since the bamboo mesh, which was buried over the nest, is now showing. The mesh protects the nest from dogs that want to make a meal of the turtle eggs.

Nicole starts picking the eggshells out of the hole. Molly counts the eggs so that they know how many successfully hatched.

Here Molly is bagging a few eggshells from which she'll extract and sequence DNA for her studies of local population genetics. Molly describes her research as follows: "It's been suggested that freshwater outflows, such as the river mouth that separates Playa Norte from the main Tortuguero beach, can disturb chemical cues that allow more precise natal homing in sea turtles. Tortuguero is noted for having strong population structure induced by specific natal homing, a trend that increases in strength as you move north up to the southern bank of the river mouth. By using these eggshells to study the genetic diversity and population structure on Playa Norte, we can determine if this trend of increasingly strong population structure continues north of the river mouth, or if the trend breaks down, indicating the outflow from the river mouth may indeed be altering these chemical cues. Additionally, Tortuguero is noted for its very high levels of multiple paternity, which occurs when a female mates with multiple males, stores their sperm, and then deposits a clutch composed of eggs fertilized by more than one of her mates. We are just beginning to realize how much the frequency of this phenomenon can vary even within just one population of a species. By taking 10-20 eggshells from each nest, we will be able to compare the frequency of multiple paternity on Playa Norte to previously published work done in Tortuguero as well as other green-turtle rookeries in the Caribbean."

Visiting Santa Rosa National Park

Unlike Europe, which featured conflicts like the 7-Year, 30-Year and 100-Year Wars, Santa Rosa National Park commemorates the 14-Minute War, better known as the Battle of Santa Rosa, in which the Costa Rican army quickly dispatched invaders from Nicaragua in 1856. Hacienda Santa Rosa (La Casona), at right, has been called Costa Rica's "most cherished national monument".

However you're more likely to visit Santa Rosa NP to explore an ecosystem quite unlike the rain-forest that dominates much of the rest of Costa Rica. For Guanacaste province, where the park is located, is mostly covered with subtropical dry forest produced by the drier, sunnier climate of northwest Costa Rica. This forest type consists mostly of deciduous trees that lose their leaves during the dry season. (See article on next page)

Since the habitats are different, you'll find species of snakes, bugs and birds that you may not find elsewhere in Costa Rica. Whatever your quarry, you can search the park's vast wilderness (500 sq. km.) on its many roads and trails. The easiest is a 1.5K paved trail (pictured at right) located near park headquarters. There we saw an elegant trogon plus a northern tamandua (often called Mexican anteater) feeding high in a tree.

If you want to gape at the park's Pacific beaches and mangroves, you'll probably have to walk the 13 km to the ocean as the road is difficult to navigate even with a 4-wheel drive. In addition to the beaches' natural attractions, there's also great surfing around Roca Bruja (Witch's Rock). But for us, the great lure is the *arribada* (arrival) of the Olive Ridley turtles on Playa Nancite. Thousands of Ridleys come ashore to nest on a few nights in September and October (up to 10,000 on a single night). Researchers have yet to come up with a definitive explanation to account for this mass nesting. At least the bad road keeps curious onlookers from disturbing the turtles - unlike the more accessible Ostional Beach just down the coast where people have been photographed standing on nesting Ridleys.

As for the basics of staying at Santa Rosa, camping is one option. However there are dorms. Meals are served cafeteria style. And you don't want to miss the serving time as it's a longish drive outside the park to find food, as we discovered when we arrived late the first night.

Costa Rican university students are frequently staying in the dorms as Santa Rosa is a popular place to do field trips and research.

Doug Durno

Doing Cutting-Edge Research in Santa Rosa

From the cold campus of the University of Alberta in Edmonton, Dr. Arturo Sanchez-Azofeifa and his multi-disciplinary team are right now monitoring many aspects of the dry subtropical forest of Santa Rosa National Park in northwest Costa Rica. He has set up dozens of wireless sensor boxes (see picture below) throughout the park which send the data to the university every 5 minutes. The sensors monitor such things as ground moisture, solar radiation, photosynthesis, plant respiration, carbon levels and weather basics so that Dr. Sanchez-Azofeifa's team can get immediate readings on the health of the environment. As he puts it: "Now, we can basically 'see' the forests breathing in real time" instead of the months it would typically take to analyze all that data."

From the data, the team can make predictions about near-term weather events. For instance, if the data shows reduced photosynthesis taking place and lower ground moisture, there's a pretty good chance that drought is at hand. Whereas normally gov't agencies would have to wait until the drought was in full swing to make policy decisions, Sanchez-Azofeifa's system could give them a lead time of up to six months to make preparations for the drought and its accompanying forest fires that are likely coming.

Sanchez-Azofeifa is doing his research in dry forests primarily because "their seasonal nature makes them very susceptible to changes, especially in rainfall." This also makes them useful for studying climate change. A *Tico Times* article can be found at: www.ticotimes.net/2016/10/07/costa-rica-climate-change-research

Dr. Sanchez-Azofeifa, a native of Costa Rica, is a professor in the Earth and Atmospheric Sciences Dep't at the University of Alberta as well as its Director of the Center for Earth Observation Sciences.

Dry Subtropical Forests

In Central America, the dry subtropical -forest biome stretches along the Pacific coast from Costa Rica's Osa Peninsula north to the Mexican state of Sinaloa. This fits pretty well within the latitudes where these dry forests are generally found - between 10° and 20° on both sides of the equator. In Costa Rica, the forests pretty well overlap the northwestern province of Guanacaste, excepting the mountains in eastern Guanacaste.

Dry subtropical forests are generally dominated by deciduous trees, which means that they lose their leaves seasonally. Leaves fall off with the onset of the dry season, an adaptation to conserve water since leaves allow interior moisture to escape. And in this Central American biome, the dry season is fairly long, from November to April, a period when northeast trade winds predominate. The winds lose their moisture on the eastern side of the cordilleras that stretch down Central America's interior while the western side of the cordilleras gets sun and a long dry spell. As the trade winds move north in the spring, onshore winds from the Pacific take over and this region gets much-needed rains from mid-May to October.

Website - www.coterc.org

Facebook - Canadian Organization for Tropical Education and Rainforest Conservation

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COTERC receives no government funding and depends on your generosity to continue our work. Please consider making a donation. You can make a one-time donation or arrange for a monthly withdrawal easily through Canada Helps. Just go to their website

https://www.canadahelps.org/en/donate/

Click on "Find a Charity"

Type in COTERC and then follow the instructions.

Whether the amount is $5 or whatever, your donation is greatly appreciated — and Canada Helps issues a tax receipt directly to you.

COTERC would like to thank the following individuals for their generous donations that will assist in furthering the research we do at Caño Palma.

Pennie Mason

Jim Taylor

Lillian & Larry Hall

Susan Kunanec

Vanessa Phelan

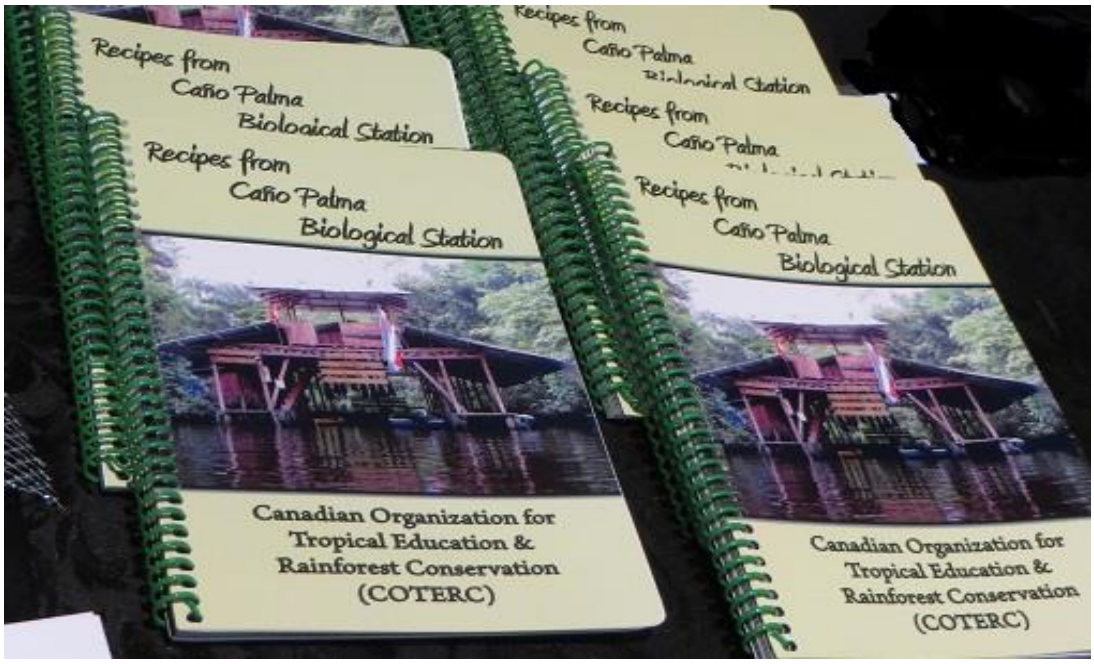
Michelle Hunwicks

Rob Hamilton

Lauren Stewart

Durham Region Aquarium Society

We would also like to thank Microsoft for the donation of MS Publisher and Windows 10 software.



RECIPES FROM CAÑO PALMA BIOLOGICAL STATION

If you have ever visited Caño Palma, you will want this souvenir, whether you can cook or not!! The divider pages feature colour photos of people, wildlife and station buildings, while the delicious recipes speak for themselves! Marilyn Cole has gathered recipes from the cooks, staff and volunteers and compiled the best into this unique cookbook. The Hints and Definitions section features suggestions that all volunteers need to know! You can order online at:

http://www.coterc.com/store/c1/Featured_Products.html

Or contact info@coterc.org (PayPal or cheque)

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Please send_____copies of this cookbook at $20_____each plus
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We welcome any comments or suggestions from our members so that we can be sure that you feel involved. If you have an idea for an article, or better yet, would like to write one yourself - if you have a photo or two that you think we could use - if you have a suggestion for improving Raphia, please do send it along to us at chair@coterc.org

Contact us at

info@coterc.org

OR

Box 335

Pickering, Ontario L1V 2R6, Canada

Membership Application

Canadian Organization for Tropical Education and Rainforest Conservation

Membership Application Form (membership is free)

Surname: _____ First Name: _____ Initial: ____

Email_____

As a member of COTERC, a copy of our quarterly newsletter "*Raphia*" will be sent to your primary email address unless you check one of the following options.

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