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**OVERVIEW:**

"Humanity is killing off wildlife and eradicating habitats at an alarming rate. Every year, 200,000 hectares of tropical rainforest are destroyed or impoverished, and hundreds, if not thousands, of species are exterminated. By the turn of the century mushrooming human activity could wipe out a staggering 15 to 25% of all species. While the figures and the impact of such extinction are debatable, the more pervasive impact to our planet is not. Those same forces of extinction also degrade 150,000 hec. of cropland, erode 75 billion tons of topsoil, pour millions of tons of toxic waste and pollutants into the oceans and freshwater, and belch enough carbon, nitrogen and sulfur into the atmosphere to raise global temperatures and acidify rainfall. The very quality of our lives is at stake."

-from Conservation in the 20th Century

**WELCOME** to the first edition of *Raphia*, designed to keep our members up-to-date on the activities of the Canadian Organization for Tropical Education and Rainforest Conservation. We invite submissions from our members for the newsletter, which is published quarterly.

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**RAPHIA PALM SWAMPS**

by Walter A. Glooschenko  
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When one thinks of palms, they think of swaying trees on a sandy tropical beach. And tropical coastal swamps are considered to be dominated by treed mangrove wetlands. This is not necessarily so!

Palms are often the dominant form of treed vegetation in tropical freshwater wetlands, especially those subjected to increased periods of inundation. Flooding followed by a dry season and fire appears to assist the development of these palm-dominated wetland ecosystems. A zonation occurs frequently with a freshwater herbaceous marsh occurring next to the water body such as a lagoon or river giving way to a mixed-treed swamp dominated with palms. Such palms tend to occur in wet depressions and these palm-dominated associations tend to be monospecific, i.e., of very low species diversity in contrast to most tropical forests.

There are three major types of palm swamps named after the dominant palm species. The first of these is the *Mauritia* swamp, which contains up to 21 species of this palm. This is typical of South American wetlands. The second type, the *Metroxylon* swamp, often called Sago palm swamp, is found in the South Pacific and Far East.

The third type of palm swamp is dominated by two species of oil palms, *Raphia taedigera* and *Elaeis oleifera*. These two species occur both in the neotropics, from southern Nicaragua to the Caribbean lowlands of Colombia and the Amazon delta, and span the Atlantic Ocean to tropical Africa. This has led to speculation that the two species originated in Africa and were somehow transported to the Americas.

In terms of Costa Rica, *Raphia* swamps are found on both the Atlantic coast and in the Golfo Dulce region of the Pacific Coast. The Atlantic coast is an ideal habitat as it is characterized by barrier islands with lagoons landward of them. The barrier islands protect the lagoons from high-energy waves and allow the palms to become established. The islands also prevent the inland flow of salt water which would lead to mangrove-dominated ecosystems. The high rainfall and proximity to steep mountains and high runoff also favours freshwater wetland formation on this coast.

The *Raphia* palm is locally called "yolillo" and the swamps are called "yolillales". They make up 7% of all Costa Rican forested wetlands, and some 5% of wetlands in general in the country. Some 600 square kilometres of *Raphia* swamp occur there. Little is known about the ecology of *Raphia* swamps. They appear to be an important habitat for birds, reptiles, amphibians and mammals. Tapirs and peccaries use them for feeding on palm fruits and seeds. They present a major opportunity for research in all areas of tropical biology and ecology.

**WHAT VALUE DOES A TREE HAVE?**

By P.W. BRABY

1. A mature tree can pass up to one metric ton of water vapor into the atmosphere per day. This moisture modifies the climate. A moist atmosphere absorbs more of the sun's energy, maintaining a lower ambient temperature during the day.

The atmospheric moisture controls the winds that are produced by differentials in the temperature from one place to another. The atmospheric moisture falls to earth as precipitation, which is essential for the production of all types of food crops.

2. A tree gives shade to the soil, lowering the evaporation and maintaining a more constant soil temperature. Of course, this helps the growth of our food crops that have a narrow range of tolerance to temperature changes.

3. The roots of a tree can extend as far down as 30 meters into the soil bringing up moisture, minerals, and nutrients that other plants cannot reach. When the leaves fall from the trees, many of these nutrients are available to other plants, by way of the soil creatures that convert waste products into basic nutrients again.

It is important to remember that nature wastes nothing, nor does use up anything. Everything has a use.

4. The roots of a tree form a net around the small particles of the soil preventing their erosion by water and wind.

5. The roots of a tree help to maintain the porosity of the soil so that it can absorb more precipitation and control run-off which can cause flooding.

6. A tree is an atmospheric filter. It "inhales", by means of its leaves all types of pollution, and converts the oxides of carbon into sugars and starches for its food. In this process of photosynthesis, the tree returns oxygen to the atmosphere that we, and all other animals, need to survive.

7. A tree is a filter for water. It absorbs water from the soil by its roots and along with the water, all types of dissolved chemicals. The "waste" products of the tree's metabolism collect in the cells. Dead cells form wood to support the tree, and provide us with a building material that is impossible to replace. (Oak has a greater tensile strength than steel.) The filtered water returns to the atmosphere (see Para 1.) by respiration and transpiration.

8. A tree is the environment for thousands of life forms, every one which participates in the "food web". We are at the top of the food web and, for this reason, we are totally dependent on all the life forms beneath us in the web.

Because there are no predators for man, we produce no benefit to the food web until we die and are converted once more into nutrition for the lower life forms in the soil. This is why we are under constant attack from parasites, bacteria and viruses, all of which are attempting to fulfill their role in the food web.

9. A tree can give us food and medicines. We only have to learn how to use these benefits and not waste them. We have a lot to learn about nature's "secrets".

10. A tree gives us shade to protect us from the sun's rays. It also gives us beauty. Which of us would like to live in a desert; totally void of green plants, colorful flowers, and shade where we can rest and listen to nature's chorus?

SO, I ask, "What value does a tree have?" "Are the loggers and those who burn the forests paying the rest of us for the real value that they are taking from us?" And the rest of us, "What are we doing to protect and perpetuate the trees that are so essential to human life?"

## CANO PALMA BIOLOGICAL STATION NEWS

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The late spring and summer brought more changes around the station as remodeling and repairs continued. New housing facilities are now finished with accommodations available for 16 to 18 people. Boats and a motor have been purchased which enables daily patrols of station property to deter poaching and palm cutting. Green turtles started nesting around the beginning of June. Poaching of turtle eggs is still a problem along unprotected beaches north of the Tortuguero river mouth (boca).

COTERC has hired a station manager, Greg Mayne, to administer daily operations and to oversee ongoing projects conducted at Cano Palma Biological Station. A local resident, Juan Jose Murillo, assists Greg in clearing and maintaining trails, and guiding visitors through the rainforest. Clearing of the dock area has begun, and construction of a covered marina is underway.

The first group of visitors travelled to Cano Palma this past August. The group included representatives of Trent University, York University, an entomologist, and a naturalist, as well as three members of the COTERC Board of Directors. They spent a total of nine days at the station, and thoroughly enjoyed their encounter with the rainforest.

Since August, others have also enjoyed a stay at Cano Palma. Ben Mora, a professor at Instituto Tecnológico de Costa Rica and COTERC director, has accompanied representatives of the Museo Nacional de Costa Rica, as well as Chantal Daoust, who is affiliated with the Biodome in Montreal. Chantal is undertaking a check-list of the bird species of the Cano Palma region. Daniel Hernandez, from the Museo Nacional, is heading a migratory bird banding project for Costa Rican students, part of which will be taught at Cano Palma. He visited the station to begin preliminary investigations, and to begin mist-netting of migratory birds. He was assisted by two Canadian volunteers, Maria Franke and Jane Muller, both keepers at the Metro Toronto Zoo. Maria and Jane stayed for nine days, and monitored migratory bird movement. These data will be shared with Long Point Bird Observatory in Port Rowan, Ontario. The station is now a permanent migratory birdbanding and monitoring observatory. In addition, Jose Serrano of Tortuguero National Park is identifying species of trees and various plants at Cano Palma. A lawyer from New York, Karen Friedman, also visited the station, and wrote a very complimentary letter upon her return home.



"This dangerous viper, known for its peculiar habit of tenaciously hanging from one's nose, is vividly colored. . . . Oh! Murray! Look! . . . Here's a picture of it!"

## Station Manager's

### News...

Greg Mayne has reported the following sightings:

August: resident Squirrel Cuckoo on her nest; Scarlet Rumped Tanager; Montezuma Oropendola; Great Kiskadee; Toucan; Ringed Kingfisher; Green Heron; Jacana; Anhinga; three empty eggshells of Great Tinamou; 6-8 Black-mantled Howler monkeys (locally known as mono congo); 12 Spider monkeys (known as mono colorado); "huge, gorgeous" Morpho butterfly, and one stray dog!

September: Squirrel Cuckoo has hatched her eggs, and has one chick; Chestnut-colored Woodpecker; many Nighthawks; a pair of Blue-Gray Tanagers; Keel-billed Toucan; a bachelor Howler monkey; frequent Spider monkey sightings; and "we have had hoards of White-lipped Peccaries using our trail system. Either a puma or jaguar has been following them. In the corner of our backyard, closest to the kitchen, a small mammal known as a Tayra (Tolomuco, in Spanish) has been sighted on two separate occasions. Presumably it is after the bananas we can't use. This is PARADISE!".

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## SPECIES OF THE MONTH

DOUBLE-CRESTED BASILISK  
(*Basiliscus plumifrons*).  
Spanish name: Garrobo.

As reported by Greg Mayne,  
Station Manager:



I had an opportunity to watch this fascinating reptile for close to 30 minutes. I could have observed a little longer but, the intensity of the mid-day sun drove me back to a shaded area, out of view. What an interesting individual--coloured a rich, bright green, with two leaf-like crests mounted on it's head, two dorsal fins, and a long black ringed tail. It has a red or yellow iris with a black pupil, two prominent bands of white spots on it's side, and three black bands on the first dorsal ray. It is really prehistoric in appearance, and has the ability to run on water with it's enlarged hind feet. Hence, its nickname: the Jesus Christ lizard. I watched the male hop down from it's perch and snatch up insects with a satisfying gulp, and a peculiar head-bobbing motion. He quickly leaped back into place and commenced waiting for his next oblivious guest for dinner. He had taken three large-sized insects in 30 minutes--really an impressive species!

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### Research Activities

Cano Palma Biological Station has been chosen as one of the permanent migratory bird observatories in Costa Rica. The station is working along with Costa Rica's Museo Nacional and Ontario's Long Point Observatory to establish a bird banding and monitoring program. On October 13, 1991, volunteers travelled to the Station to assist in bird observations and banding.

A check-list of bird species indigenous to the Cano-Palma/Tortuguero region is currently being drawn up using information from the National Park, staff guides, and general observations. Five different habitat zones are being surveyed. These zones include: 1) canals and lagoons, 2) beaches (and plant species belonging to that particular ecological niche), 3) El Cerro (Tortuguero Mountain), at three levels, 4) inundated areas in the forest, and 5) human habitation and secondary growth.

In addition, Pat Herzog, a researcher from the University of Costa Rica, recently travelled to the Cano Palma station to study the status of the Green Macaw.

An entomologist from the University of Costa Rica will shortly begin work on the classification of insects in the Cano Palma/ Tortuguero area. This is a joint project sponsored by COTERC and the Museo Nacional.

COTERC is also involved in a seismic monitoring project. We are working with Dr. Alex Mohajer, of the geology department at the University of Toronto, who is monitoring seismic activity. Part of his research is being conducted on COTERC property.

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**THANK YOU FOR YOUR  
SUPPORT!**

**FUNDRAISING NEWS**

A **BIG** thank-you to Judy Meddings, who recently climbed the CN Tower for COTERC! Judy donated the \$300 she raised from her climb to COTERC, and has also been actively selling COTERC t-shirts, and passing out membership brochures.

The COTERC Garage Sale, held September 7 and 8, was a huge success. We raised \$1700, which will be used to fund research activities at Cano Palma Biological Station. Thanks to everyone who participated in this event!

**RAPHIA :**

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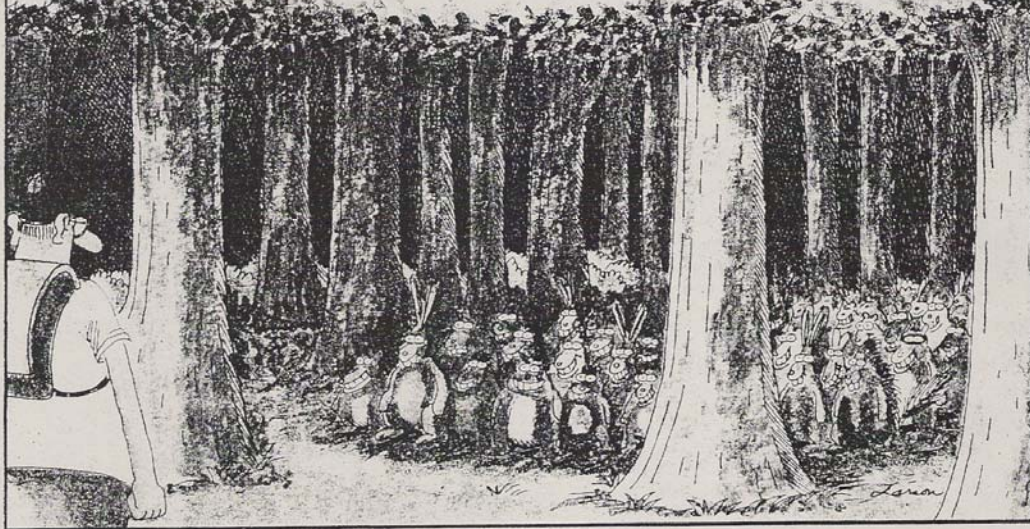
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1988

*Dwayne paused. As usual, the forest was full of happy little animals--but this time something seemed awry.*



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