

RAPHIA

Winter 2022 Volume 31 Issue 1

ISSN 2564-5927

Newsletter of Caño Palma Biological Station



Ornate Spider Monkey

Monkeys of Caño Palma



Golden-mantled Howler



White-faced Capuchin

Canadian Organization for Tropical Education & Rainforest Conservation



In This Issue of Raphia



Great Research Opportunity

One of the charms of Caño Palma is the early morning calling of the monkeys. On the other hand, being arboreal, these primates are often difficult to observe. Maybe that's why research on our local monkeys is somewhat sparse. That may be worrying because two of our three species are labeled as "threatened" by the IUCN -- the white-face capuchin, pictured above, is listed as Vulnerable and the ornate spider monkey has Endangered status.

So this issue is devoted to the monkeys - the howlers, the capuchins and the spider monkeys - found in our area. And the opportunity for research awaits anyone willing to put in the effort. With that in mind, the two published papers I could find that are based on research around the station are summarized in this issue.

Hopefully we'll see more research being done on our monkeys in the future.

- | | |
|----|----------------------------------------------------------------------------------|
| 3 | Conservation Club •• Raising awareness about conservation with local kids |
| 4 | Foraging behavior of the three local monkey species |
| 6 | Notes from the Station •• Charlotte reports on station upgrading |
| 7 | Understanding the impact of humans on monkeys |
| 8 | Of Monks & Monkeys •• Who are the white-faced capuchins |
| 9 | Tool Use Among Capuchins •• Photos |
| 10 | Notes from the Chair |
| 11 | Blind Scientism •• Shelley provides another perspective |
| 13 | Walking into Quicksand •• Joanne's not-so-excellent adventure |
| 14 | Quicksand •• Avoiding that sinking feeling |
| 15 | Rescuing a Baby Monkey •• Marilyn receives a stranded baby howler |
| 16 | Introducing our new research coordinator & Station Happenings |
| 17 | Turtle Reports •• From turtle RC Sarah |
| 18 | Nicaraguan Election Results |

Follow
Us By
Clicking
On

Website - www.coterc.org

Facebook - [Station Caño Palma](#)

Facebook - [Canadian Organization for Tropical Education and Rainforest Conservation \(COTERC\)](#)

Instagram - [canopalmabiostation](#)

Twitter - [@coterc](#)

Previous issues of *Raphia* can be found at - <http://www.coterc.com/raphia-newsletters.html>

ISSN 2564-5927 (Online)

ISSN 1188-2425 (Print)

Working With Local Kids on Conservation by Morgan Hughes

Teaching the value of conservation to local residents has always been a goal at Caño Palma. As I conclude my term as research coordinator, I can look back with some satisfaction at all the effort we invested in Conservation Club over the past year. I'm quite happy with how the activities worked out and how engaged the kids were. They loved the hikes around the station, to Tortuguero Lodge, into the National Park, and up the Cerro.

Our one setback occurred because of the flooding. After a number of postponements, participation decreased somewhat. But the kids that stuck it out impressed me with how much they learned and how easily they applied their newfound knowledge to our "stretch questions" - that is, thinking and going deeper. We completed two 6-week rounds of Conservation Club, the first with 10 to 12 year-olds and the second involved students from 13 to 15. Overall, I was impressed with their knowledge on entering the program. It was clear they had a love for nature.

While I believe strongly in the importance of environmental education, I've had minimal training. But, with a bit of knowledge about behavioral change theory, I used the chart below to get me started. It shows that our first goal should be taking the kids from precontemplation to contemplation. Precontemplation presumes that they're not ready to take action on conservation. In fact, they may be completely



unaware that their present behavior is even an issue. Contemplation means - and this is where we as educators come in - that they begin to realize that their behaviors towards the environment are problematic, and they start to think about the pros and cons of their previous actions.



Then we move on to creating a community and social network with similar concerns and interests. This has proven to be the most important factor in determining if a behavior change will move past contemplation



and continue in the long term. With this in mind, we created stimulating lesson plans. We wanted the kids to have fun, bond with each other, and associate this fun with conservation.

To build on this, we're hoping to continue Conservation Club next year with a 'science fair' concept that will move the students from contemplation into preparation and action.

In the next Raphia, we'll go over a few of the lessons that stood out as successes during Conservation Club this year.

Foraging Behavior of the 3 Monkey Species at CP

by Kirsty Graham, Megan Bulloch and Todd Lewis

This is a summary of a paper, based on research that took place at Caño Palma, that appeared in Biodiversity Journal, 2013, 4 (2): 327-334.

New World primates have evolved to fill specific niches through variable body sizes, activity levels and dietary preferences. However, these distinct niches may be contingent on maintaining intact forest. Cutting down trees for timber increases competition between species because it reduces the number of their preferred plant species as well as shrinking the total biomass of the food they depend on. Studying basic primate natural history by recording aspects such as diet can assist conservation land-management prescriptions at a local scale by identifying the key habitats and plants that each primate uses, and protecting them as food resources.

At the time of this research, little was known about the local diets of the studied monkeys in Costa Rica's lowland tropical wet forests. Here are some of our findings in the Caño Palma area:

Activity Budgets

	<u>Inactive</u>	<u>Moving</u>	<u>Feeding</u>	<u>Socializing</u>
Howlers	77%	14%	7%	2%
Capuchins	6%	76%	8%	10%
Spider monkeys	31%	41%	20%	8%

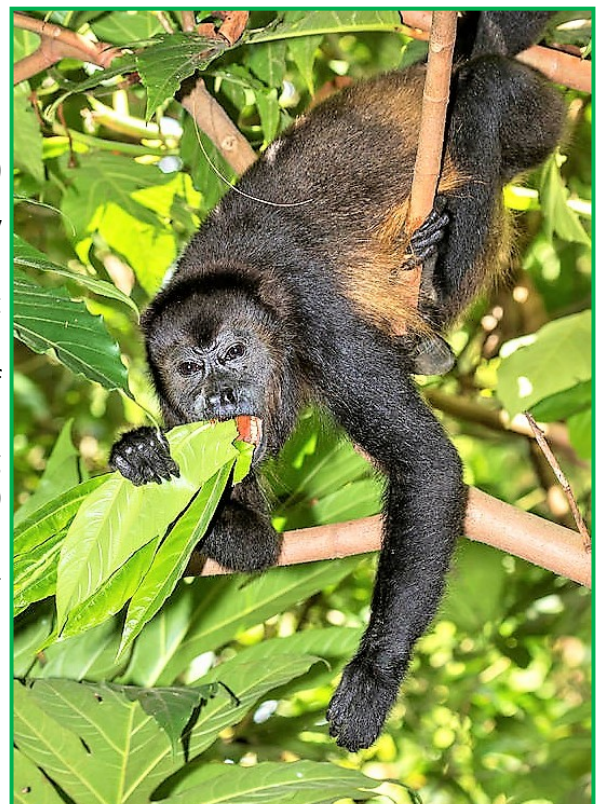
Diet

	<u>Leaves</u>	<u>Fruit</u>	<u>Insects</u>	<u>Stalks</u>	<u>Unidentified plants</u>
Howlers	65%	32%	--	2%	2%
Capuchins	--	77%	15%	--	8%
Spider monkeys	61%	28%	--	11%	--

Mantled howler monkey (*Alouatta palliata*)

From this data, it's evident that howlers are a low-energy species. Firstly, their diet is mostly low-energy leaves, and that's aggravated by their lack of a specialized digestive tract that would more efficiently digest fibre. Secondly, they eat less high-energy fruit. Consequently, the howlers have a strategy of energy minimization, evident from the fact that they spend three-quarters of their time inactive and the least time moving around. Howlers form large, stable groups ranging from 2-39 individuals. They can share the same area without intense food competition among group members because leaves are abundant and readily available.

(cont'd on next page)



Foraging Behavior of the 3 Monkey Species (cont'd)

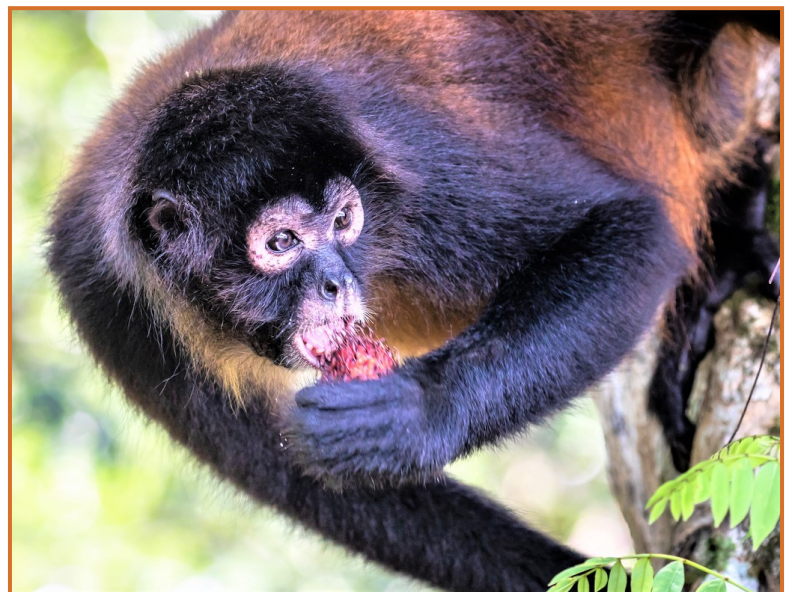
White-faced capuchin

(*Cebus capucinus*) - Unlike the howlers, the capuchins eat a diet high in high-energy fruit and insects, leading to a highly active lifestyle. As well, with their smaller body size, capuchins require fewer calories so that competition is reduced within each group, composed of 10-35 individuals. Such a large group size may be a way to increase their detection of fruit sources, and then to defend these sources from other groups. Pictured at top eating leaves, and below that consuming fruit from palm tree.



Black-handed spider monkey

(*Ateles geoffroyi*) - As fruit can be a sparsely distributed resource, spider monkeys spent quite a bit of time moving around in search of it. They live in a fission-fusion society, which is possibly a response to their preference for ripe fruit. Dividing up into sub-groups helps avoid competition while they forage,



Discussion - Each species has its own social structure based on its feeding specialization. This self-regulating behavior among and within these species highlights the importance of protecting areas that contain preferred food plants, especially in connected habitats like Caño Palma that buffer national reserves.

Original paper can be found at

http://www.coterc.org/uploads/1/6/1/8/16182092/foraging_behaviour_of_three_primate_spec.pdf

Notes from the Station

by Charlotte Foale

Feliz Año a todos!

Here at Caño Palma we've had a great start to the new year.

We're very excited to welcome our new Research Coordinator, Lianne Woudstra, and the energy, enthusiasm and focus she brings to the role. We've long been interested in parasites and we're very much looking forward to tapping her expertise and learning more about local tick populations!

Lianne's arrival isn't the only the event that's brought us joy - with the end of December rains we've been able to start working on some major infrastructure repairs. While that might not sound exciting to many, after two years of Covid uncertainty and relentless patching, it's a great feeling to be able to rip off rooves, replace flooring and crack open some cans of paint.

With relentless humidity, and the seasonal rains and flooding that are part of our annual cycle, maintenance is a constant focus for us. Major tasks are wedged between turtle seasons when we have fewest people on base, but for the past two years, financial uncertainty has had us postponing all but the essential. This year, thanks to the amazing support you showed in our online fundraising event, we're able to move forward and address some pretty big jobs. The rancho suffered significant damage to the roof from falling branches during stormy weather, so roof replacement was the first job on our list. The dorm and library rooves will follow, but first came the replacement of the dorm toilet block. A more substantial and weather-proof structure will replace the wooden one, and we'll be moving them a little further from the main building for a little more privacy.

I'm sure those of you who've spent time here will understand the necessity of making this very rustic experience as safe and comfortable as we can. While the people and the research make a biological station what it is, equipment and people alike need a safe, dry place between surveys!

We not only have to thank all who donated the money to make this



work possible, but also everyone who is on base and is pitching in with the work in progress. Sebastian Martinez (upper photo) has been a gem, staying on after turtle season and helping Manuel, Emanuel and León (our favorite contractor - in photos at left and right). Keep an eye on our Instagram and Facebook pages for updates and progress reports as we get ready to welcome 2022's young (and young at heart) biologists!



Do Humans Affect Monkey Physiology?

by Vanlangendonck, Nuñez, Chaves and Gutiérrez-Espeleta

This is a summary of an article that appeared in the Journal of Primatology, 2015, 4 (1). You can access the original article at

New Route of Investigation for Understanding the Impact of Human Activities on the Physiology of Non-Human Primates (coterc.org)

Does the presence of humans have any impacts on monkeys? That's what our researchers set out to investigate in Tortuguero National Park and the area around Caño Palma. They were looking for impacts on monkey physiology - that is, changes in how their bodies carry out physical and chemical processes.

They concentrated on two steroids - testosterone and cortisol - focusing on areas with either high human presence (HHP) or low human presence (LHP). The monkeys studied were:

- **golden-mantled howler monkey** (*Alouatta palliata palliata*), a subspecies of mantled howler
- **ornate spider monkey** (*Ateles geoffroyi ornatus*), a subspecies of Geoffroy's spider monkey

Cortisol - It's the primary 'stress hormone'. In threatening situations, its release provides the necessary physical resources to either fight your way out of a dangerous situation or flee from it. However, cortisol has some negative effects: in maximizing the quantity of energy available for fight or flight, it can slow digestion, shut down the reproductive system and pause the immune system.

Testosterone - It's the primary sex hormone and anabolic steroid in males. (Male levels are 7 to 8 times higher than females') Testosterone plays a key role in the development of male reproductive tissues such as the testes and prostate, as well as promoting secondary sexual characteristics like increased muscle and bone mass, and the growth of body hair. Testosterone in both sexes is involved in health and well-being - e.g. mood, behavior and the prevention of osteoporosis. At normal levels, testosterone directs energy to optimizing the male's response to mating stimuli. But when male monkeys are challenged for

access to females in the troop, their testosterone levels rise, increasing their aggressiveness. Chronically high testosterone levels may negatively affect the fitness of groups living in high population densities. Such detrimental effects include higher energy expenditure, the suppression of immune function, and susceptibility to parasitism.

Research Results

In this study, both sexes of howlers showed significantly higher levels of cortisol in areas of HHP as compared to those in areas of LHP while spider monkeys weren't affected. Our researchers theorize that howlers may respond this way because of their smaller home range, which could limit their ability to evade encounters with stress-inducing humans from nearby settlements. As well, since humans may be fragmenting surrounding forests, thus decreasing food availability and making feeding more difficult, this would likely lead to an increase in the effort expended to feed.

As far as testosterone, males of both howlers and spider monkeys showed higher levels in areas of HHP than in areas of LHP. The researchers found that they aggressively display in the presence of humans as they would in the presence of any predator. Their data suggest that the most important factor for elevated testosterone levels is proximity to the canal and the noise from passing motor boats. Throughout the study, male howlers began howling when motor boats passed whereas they rarely howled otherwise. They typically howl to express or to assess fighting ability in the context of protecting their territory or expanding it.

Recommendation - Should further studies confirm a relationship between human-related noise disturbance and hormonal levels among non-human primates, strong policy guidelines for tourism management and/or noisy human activities should be implemented to prevent impacts on the primates and other wildlife.

Of Monks and Monkeys -- White-faced Capuchins (1) by Doug Durno

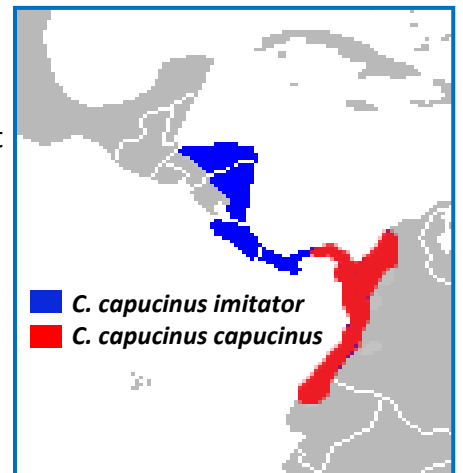
A lasting memory Joanne and I have of Caño Palma is once coming face to face with capuchin monkeys feeding just above water level while we were canoeing the canals. There were 5 or 6 of them plus a youngster clinging to its mom's back, which they do for their first 6 weeks. Due to their black caps, it was easy to identify them as capuchins, a name derived from the order of monks known as Capuchins who wear a similarly colored hood, or *capuche*. The picture at right shows the extent of the cap (or hood) on this species quite nicely.



More specifically, what we were seeing were white-faced capuchins (*Cebus capucinus*), a species whose range is one of the largest among New World monkeys. However, their numbers have been decreasing rapidly in Nicaragua and to a lesser degree in Honduras due to deforestation. This emphasizes the importance of our area and the need to keep the forests intact.



The 21 species in the capuchin family (Cebidae) are considered quite intelligent. In fact, they have the largest relative brain size among monkeys and are known for their tool use (see next page). White-faced capuchins have been observed using sticks to chase snakes off as well as to probe holes in trees. They're also highly trainable. They've been taught to assist paraplegics by doing tasks such as getting food from the fridge and microwaving it, combing hair, and turning the pages of a book. And of course you may have seen a capuchin in the TV series *Friends*, the movie *Pirates of the Caribbean* and other roles.



Tool use isn't limited to sticks. Capuchins have been observed breaking open hard fruits by pounding them with a stone. Fruits are their main nutrition source, and they'll eat just about any kind. One study noted that they ate 95 different varieties though figs are a favorite. However, they are omnivores. They'll consume almost any type of insect. Their vertebrate menu includes birds, bird eggs, frogs, and they opportunistically take squirrels, young coatis and other small mammals.

They're quite versatile about habitat too. Seemingly, they can live in just about any type of forest including the mangrove where we saw them.

In search of food, they travel extensively, averaging about 2 kilometers a day. And that's within a fairly large home range of up to about 0.75 sq km. With such a large range, they necessarily overlap with other monkey troops. That can spell trouble since, when troops do meet, males often act aggressively, sometimes to the point of killings. Recent research suggests that they're not trying to protect their territory. Rather, it may be that they're protecting access to the females in their troop, and it's the alpha male who's the primary participant as he has more to protect.

(cont'd on next page)

White-faced Capuchins -- Of Monks and Monkeys (cont'd)

The overlap also means they're competing with other troops for food resources. One theory suggests that their high intelligence is an adaptation that supports their need to remember where the best fruit trees are in a large feeding territory. You won't stay healthy long if you're just wandering around hoping to find food.

The same study also found genes that enable white-faced capuchins to adapt to very different habitats. For instance, Caño Palma is wet and humid. Con-

versely, Santa Rosa National Park in northwest Costa Rica is dry and subject to drought. At Santa Rosa, researchers found the local capuchins had genes involved in metabolism, kidney function and water balance that are adapted for a habitat where water and food are seasonally in short supply.

In the next issue, we'll continue our look at the white-faced capuchin.

Reference - <https://www.pnas.org/content/118/7/e2010632118>

Tool Use by Capuchins



These photos show bearded capuchins using tools in various ways:

- A. Using stick to probe crevice in wood for insects
- B. Using stick to dig into caiman nest for eggs
- C. Using stone to dig hole
- D. Cracking open nut with stone



Winter

2022

Notes from the Chair

by Dr Kym Snarr



Welcome to 2022! As the global struggle with Covid-19 continues, do recall that pandemics take at least 3-5 years to work a novel virus into an endemic virus. Be patient and be safe! Despite the pandemic, COTERC continues to support CPBS in its Mission to provide leadership in education, research, conservation, and the educated use of natural resources in the tropics. CPBS is vital to carrying out this MISSION. Currently, I am packing up research equipment purchased with donated monies and equipment to take down to the station. I'll be there for the next three weeks as will my husband, Art Shannon, who will be assisting in the ACER forestry plot work that takes place annually.

Having been making such trips almost annually for the past 15 years, I'm excited to be getting these supplies down to the station after having to miss last year due to Covid. This time I am packing my N45 masks and am grateful for my 3rd vaccine in the face of omicron.

It is exciting to see this issue's focus on primatology. Over the years, we have had research on primates resulting in Masters papers, unpublished reports, and in 2013, a published paper (see page 4) led by student researcher, Kirsty Graham from Quest University, Squamish, BC, Canada.

As a trained primatologist, I was first introduced to CPBS by Dr. Frances Burton (UTSC) who was married to Peter Silverman (PhD) the first Chair of COTERC. While my work at the station with the three Costa Rican primates was interesting, I ended up in southern China and Honduras for field work with other primates. With this field experience and after joining the COTERC board in 2007, I introduced a low-cost, basic monitoring method to evaluate large-mammal populations, which included primates. This project grew from a single transect just north of CPBS into three comparative transects, which have been continuously run since 2011. These transects are located on the station property, on the Cerro and in Tortuguero National Park. Many of you have likely walked those transects. And many of you will have seen Manuel Arias detecting faint tracks, estimating numbers of the specific mammal based on these tracks, and ensuring quality data collection. With Manuel as the lead for our long-term monitoring projects, there has been consistency and quality in these data. From the data, the first trend paper on mammals including those on the three primates was written. See: <http://www.coterc.org/mammals.html> and specifically, http://www.coterc.org/uploads/1/6/1/8/16182092/large_mammal_community_composition_and_density_under_a_disturbance_gradient_in_northeast_costa_rica.pdf The three co-authors were Emily Khazan, former Research Coordinator, who recently received her PhD and now sits on the COTERC board as Director of Conservation and Research; Manuel Arias, our lead for the long-term monitoring projects, and Luis M Fernandez a former research and station assistant plus board member. It is clear that the educational portion of our mission is being met when we see the advancement of our former volunteers/interns, coordinators, and assistants.

For all who have visited the station, seeing the three primate species move through the trees has always been a thrill. I certainly experienced this in 1992, being with the first school group who visited the station. Later, as a professor, I could relive that thrill through the eyes of my students during field courses at the station. Now, as Chair, much like Marilyn Cole, our founder, it is still a thrill to look up into the foliage and see a howler monkey peering down, quietly foraging on leaves and going about its life. For those of you who want to experience the thrill and join in the research, or wish to aid as a Board member, feel free to contact us at info@coterc.org or directly to me, chair@coterc.org

Blind Scientism

by Shelley Hutchinson

Shelley is Vice Chair of COTERC.

Sharing a meal with friends and family is a significant tradition in many cultures. The time allows members to reconnect, building bonds and trust. Preparing dishes and sharing with others can be an enriching act. However, the pandemic has challenged and altered many practices we have long taken for granted. These involuntary changes have me questioning other processes. It reminds me of a parable of a mum and daughter preparing a roast for a special dinner. During the preparations, mum cut off both ends of the meat and placed the reduced portion in the pan. The daughter asked why she did this. Mum replied, "It's how your grandmother and her mother prepared the dish. It makes the meat tender and tasty."

While the family enjoyed the delicious meal set be-

fore them, the daughter proudly explained that she learned how to prepare the roast from her grandmother's traditions. She explained the technique of cutting each end to make the dish tasty. Later in the

kitchen, the grandmother agreed the dinner was delicious; however, she said, "My mother, your great-grandmother, only had one pan to cook meat in. When we got the meat from the butcher, it never fit the pan. So, she'd cut the meat so it would fit. The same pan I inherited from her." They all laughed.

When should traditional ways be questioned? When is it time for a change? Caño Palma Biological Station and COTERC celebrated their thirtieth anniversary in 2021. Biological fields stations are place-based facilities that conduct scientific research over a sustained period. They were founded in Europe and adopted in



North America in the late 1800s (DeBont, 2015). Typically, those conducting the research are based in countries other than their own. Although they remain centres for scientific research, many stations have modified their mandates over time. Many now entrench conservation and education in their missions and function as outdoor laboratories for scientists, students, and those engaging in learning the natural environment through science (Tydecks, 2016).

Have the long-standing practices of biological fields stations been taken for granted or overlooked? Whose interests both then and now do these stations serve? What methodologies are used, and by whom? Who determines how the gained knowledge is to be used and by whom? It is undeniable that learning about and understanding all ecological systems are

crucial to humans. As we learn, we build appreciation and a relationship with our surroundings. Who better appreciates and understands these relationships than indigenous people

who have developed traditional ecological knowledge over centuries? As well, should we not similarly involve and acknowledge that local residents have gained knowledge through long-term relationships with their surroundings as being essential?

In reconsidering the purpose of biological fields stations, like the size of that small roast pan, we can determine if their purpose has adapted to the twenty-first century. Instead of cutting things away, it is time to expand or use a larger pan. Perhaps it is time for a change, a better fit. A fit that is inclusive and values all sources of knowledge. A fit where those who live their knowledge are (cont'd on next page)

Blind Scientism

(cont'd)



recognized and empowered. Is it time for biological field stations to transform their mandates and methodologies, and reconcile with local and indigenous communities? The pandemic has taught us that civilization can change, be it voluntarily or involuntarily, and that we humans can adapt. Many institutions will

emerge from this pandemic transformed. Should biological field stations be one of them? Caño Palma could be a leader in this transformation. What are your thoughts on these questions? Comments and dialogue are encouraged. Please submit them to vicechair@gmail.com.

More Photos from Conservation Club



Looking For Monkeys and Finding Trouble

by Doug Durno

Anouk points her binoculars high up in the rainforest canopy. Joanne and I struggle to hold the pose. Our necks are stiff and tired. We swipe at the bugs. Anouk remains focused. The howler monkeys are not cooperating. We lose them in the foliage. We start the count again. And again.

Half an hour later, Anouk's gaze is still fixed on the troop. Once she's determined its size and composition, she strains through another half hour detailing the activities of individual monkeys. Then we set off to find another troop. We go through the same ache-inducing process. If we're 'lucky', we'll find a third troop.

But the sun's going down. We'd better head back. The path is barely visible. When it turns, Joanne doesn't. She walks straight into a pit of quicksand. Once her feet are submerged, she can't move them. There's nothing she can do to stop sinking. Fortunately, the pit isn't too deep and she only sinks up to her knees. But she can't move.

I look around for a long branch. When laid across the pit, which is only 3 meters across, Joanne can lean on

it while bending forward, trying to move her legs upward through the thick muck. I lean in on the branch and help her pull forward. Inch by painstaking inch, her feet slip upwards. She's tiring. It seems like it could take till nightfall before she'll get out. Fortunately, one foot slides out of its boot and that leg is close to being free. Joanne can now lie forward so that her weight is mostly on the branch. After a lot of effort, the other leg eventually emerges, and Anouk helps pull her over to solid ground.

And me - I'm still strung out over the pit. Trying to stand, I lose my balance. Down I go - knee-deep in the muck. With Anouk and Joanne pulling me landward, I can soon just fall over and sit down and pull my legs out - slowly but out. We rescue Joanne's boot and are on our way home.

Only to find that the trail soon fades away. The three of us stand there, seeing nothing that looks like a path. We're lost. Light is fading. Anouk remains calm though she has to be beat. I know I am. I'm getting nervous. The jungle's thick. But Anouk trusts her GPS. She leads us on and on. Until we find a path. We paddle into the station as the sun goes down.



This is about the maximum depth you could sink to.



Sinking this deep isn't possible

Putting the Quick in Quicksand

by Doug Durno



You've seen the movie. Someone gets stuck in quicksand and they keep sinking until they're rescued just before their head disappears into the sand. It's cheap but great melodrama. It's also wrong.

The photo above, clipped from the Oscar-winning best film of 1962 *Lawrence of Arabia*, shows a guy about to sink beneath the sand. It's a good illustration of two myths about quicksand.

First of all, it's just not possible to sink much more than waist deep in quicksand. Why? We've all seen photos of people floating in the Dead Sea without any effort. That's because the density of the Dead Sea's salt water is 1.24 gram/liter while the human body's density is only about 1 gm/liter. With our lesser density, it's not possible to completely sink below the surface.

The same principle (Archimedes' Principle) applies with quicksand. It has an even higher density of about 2 gm/liter. Try as you might, thrash around mightily, but you just can't sink much more than up to your waist.

Secondly, the photo shows Lawrence throwing the victim a flimsy, unwound headdress in an attempt to pull him out. That's laughable. To lift a foot out of quicksand requires the same force needed to lift up a medium-sized car. Anouk and I could only pull Joanne out very slowly.

So, what happens when, like Joanne, you step on quicksand. Quicksand is composed of sand, silt or clay - fine granular materials - mixed with water. It could be called fluid sand. Water can give solidity to sand -

if you've ever built a sandcastle at the beach, you'll know it's not possible unless the sand's wet. Water molecules want to stick together. Through capillary action, they coat the sand grains and make capillary bridges, binding the grains together.

"The quick in quicksand refers to how quickly the sand shifts when disturbed"

It's when there's too much water in the sand that quicksand can develop. The grains still clump together so that they may appear solid, but the pressure of a footstep will cause the sand to liquefy. Down you go. As you sink, the particles come together again. That's why struggling is bad when you're sinking because you're forcing the water beneath your feet to liquefy, reducing the friction, and you can sink even further. Then the sand solidifies over your feet and, as mentioned, the force necessary to pull them out them is enormous.

So, how can you extricate yourself if you do step in it? First, don't panic. Keep your movements slow. Thrashing around only gets you in deeper. Take as much weight off yourself as possible as we did by extending a branch across the pit for Joanne to support herself and gain some leverage. Or you could grab nearby vegetation or lean on solid ground if you're close enough. Otherwise, you can lie back to increase your surface area. Then slowly apply upward pressure by moving your legs to liquefy the soil that's trapping them. Eventually, they should reach the surface, and you'll be 'floating'.

Or you can just watch where you're going in the first place.

The Rescue of a Baby Howler

by Marilyn Cole

Marilyn Cole, the founder of Caño Palma and COTERC, wrote this article and it appeared in the Winter 1998 issue of Raphia. This is a condensed version.

One evening, staff members from a nearby lodge delivered a baby howler monkey to the station, saying that it had spent the past two nights in a tree on its own. No one knew what happened to its mother, and they were hoping we could care for it. Howlers are leaf-eaters with a very specialized diet. Feeding them even a small quantity of fruit can destroy the enzymes in their stomach that are needed to break down the hard fiber in leaves. It was with a great deal of relief that we found our young guy accepted and ate leaves readily, even though only three months old.

At his age, he would normally cling to his mother and never leave her side. So we took turns acting as surrogate moms. We all sympathized when he joined in the vocalizations heard from nearby howlers. However, we couldn't simply release him as the unrelated troop most likely wouldn't have accepted him, and he wouldn't have survived at his young age. We needed to find him a rehab center.

We attempted to make arrangements to turn him over to local authorities, but the person who was



supposed to pick him up didn't receive the message before his return to central Costa Rica. Rather than delay any longer, I contacted friends at a wildlife center in Alajuela known as ZooAve and arranged to fly the little monkey to them. Suzanne Chacon of ZooAve met us at the airfield and drove us to their center.

ZooAve is a private facility where many animals have been successfully reintroduced to the wild after having been confiscated from poachers and others (many animals end up being kept as pets after being poached). Government officials seize those they come across and turn them over to wildlife rescue centers such as ZooAve.

The monkeys at ZooAve have large naturalistic spaces - plenty of tropical trees to roam around in. ZooAve plans to release a troop of capuchin monkeys to an area of Costa Rica where none are currently found. Of course, these projects are approved by the proper authorities.

Our little howler weighed 160 grams when he arrived at the center. A month later, he was up to 1000 grams. He's currently being introduced to other howlers, and hopefully one day he'll be able to be released to the wild.

Note - ZooAve is now called Rescate Wildlife Rescue Center. It can be visited in Alajuela.

Introducing Caño Palma's new RC

Hi all. My name is Lianne Woudstra and I started as the new research coordinator in mid-December. Just so you know a little bit about me, I'm a biologist specializing in disease ecology. I'm from a small town called Doetinchem in the Netherlands. And I earned a Master's degree at Wageningen University. Past research projects of mine include studying tick-host-predator interactions and lemur microbial health. I've done a lot of live mammal trapping and tick-drag sampling, and used many camera traps for data collection in these projects. My tropical experience comes from working in Belize and Panama. In the coming year, I hope to contribute to high-quality data collection and hopefully start soon with some tick surveys at and around the station. If you would like to know more about me, you can always contact me through research@cotercc.org

So, what is disease ecology? Here's how Wikipedia describes it:

Disease ecology is concerned with the mechanisms,

patterns, and effects of host-pathogen interactions, particularly those of infectious diseases. For example, it examines how parasites spread through and influence wildlife populations and communities. By studying the flow of



diseases within the natural environment, scientists seek to better understand how changes within our environment can shape how pathogens, and other diseases, travel. Therefore, disease ecology seeks to understand the links between ecological interactions and disease evolution. New emerging and re-emerging infectious diseases (infecting both wildlife and humans) are increasing at unprecedented rates, which can have lasting impacts on public health, ecosystem health, and biodiversity.

Station Happenings From reports by RCs Morgan Hughes and Lianne Woudstra

October

Conservation Club - See Morgan's report on Page 3. Some club members learned about sustainable-fisheries management as well as the 'tragedy of the commons' (see box at right),.

Local Conservationists - Kendall Castro Fallas, from the nearby Barra del Colorado area, visited us to take part in the turtle project. He was assisted by Pedro, a local volunteer from San Francisco.

November

Weather - Very rainy month and the grounds were flooded somewhat.

December

Lianne Woudstra (see above) did this month's report.

Snake morphology - Aarya Patel is a recent arrival from Canada. With his interest in snakes, he was out searching for them almost every day, and this resulted in a good increase in the number of captures. Of the 12 total, there were snakes of 6 species. Five were too small to be tagged.

Promar Beach Survey and Cleanup - In collaboration with Proyecto PROMAR, we cleaned up two 10m sections of beach, counting and classifying all items collected. The project will run for 3 years and we're presently in phase 1, which aims to identify the sources of the marine debris. On our last survey four months ago, a total of 27.5 kg of trash was collected. This month, for our second round, we collected 10.5 kg. The major categories collected were plastics at 73% and Styrofoam at 25%.

Tragedy of the Commons - Let's try to explain this concept by using a situation where every shepherd, acting in their own self-interest, allows their flock to graze on a common field. If everybody acts in their apparent own best interest, it results in harmful over-consumption by the sheep - all the grass is eaten - to the detriment of everyone. This describes a situation where individual users (the shepherds) have open access to a resource (the grass). Without shared social structures or formal rules governing access and use, they'll normally act independently according to their own self-interest and, contrary to the common good of all users, cause depletion of the grass through their uncoordinated action.

Sea-Turtle Happenings by Sarah Ravoith, Turtle RC

October

Greens - As is usual in October, nesting by green turtles rapidly decreased as the month went on. Most emergences and nesting took place in the first 10 days. Of the 27 nests identified, 22 were triangulated.

Hawksbills - Though no active nesting was encountered during night patrols, 3 out of the 4 nests that were eventually located were triangulated.

Poaching - Of the 20 poaching attempts, 9 were successful. There was one instance of a turtle being lifted and killed. Predation by dogs became an increasing problem towards the end of the month. However, most of their attempts were unsuccessful due to the bamboo mesh that was installed on top of all triangulated egg chambers. They're placed just under the sand's surface so that they're not visible to potential poachers.

Excavations - The goal of excavations is to calculate the hatching and emergence success of the nest. **Hatching success** measures how many hatchlings leave the egg, whereas **emergence success** measures how many hatchlings leave the nest area.

November

This month nests of 56 greens and 7 hawksbills were excavated. For the greens, hatching success was just over 70% and emergence success was just a little bit lower.

With nesting activity all but over, night patrols ended on October 29th. However, morning patrols recorded 4 emergences this month. Unfortunately, no egg chambers could be located.

Poaching - One green nest was found fully poached. Dog predation was substantial as they went after nests that were recently hatched or soon to hatch.

Excavations - Nests of 33 greens and 5 hawksbills were excavated. Hatching success for greens was 64% and emergence success was about 62%. For hawksbills, the numbers were 70% and 59%.

December

Save for a few incubating nests, the 2021 nesting season is almost over. We'll continue daily morning census, mesh installations and excavations through the month.

Morning census was carried out daily all month. Since the nesting season was over, efforts focused on recording the status of incubating nests (e.g., natural, predated, poached, wet, eroded). Whenever necessary, mesh was installed and excavations carried out.

Completed nests in December: 42

Excavated nests in December: 22

% of nests excavated: 52%

The nests that were not excavated were either fully poached or partial predations (where the data will not reflect a real hatch success rate since some of the eggs are lost so that the empty shells we count are not a real indication of the total eggs originally laid in the nest).

Ortega 'Wins' in Nicaragua

by Doug Durno

Having jailed his main competition and extinguished term limits, Daniel Ortega 'won' his fourth straight presidential term in Nicaragua's November elections, supposedly with over 75% of the votes.

Foreign reaction was swift. The Organization of American States (OAS) declared the elections "were not free, fair or transparent and have no democratic legitimacy" after Ortega "eliminated all credible electoral competition". Of the 35 OAS member countries, the only one to vote against the resolution was Nicaragua itself.

The Costa Rican Foreign Ministry and President Alvarado issued a statement saying: "In the absence of conditions and guarantees required in democracy to accredit elections as transparent, credible, independent, free, fair and inclusive, Costa Rica does not recognize the election process."



The happy couple -- VP Rosario Murillo and Presidente Ortega -- jubilant as re-election declared

Also condemning the election were the European Union, the USA, the UK, Canada and others.

Vice-president Murillo, clearly an aficionado of irony, reported that congratulations were streaming in from Russia, Cuba, Venezuela, North Korea, Iran, Syria and Bolivia. Note that China isn't on the list. That's because Nicaragua has long been in China's bad books because it maintained diplomatic relations with Taiwan. Now, because of Nicaragua's increasing isolation, Ortega has cancelled Taiwan and is cozying up to China.

In the meantime, the OAS has threatened to expel Nicaragua. They're demanding that the Ortega government meet with them to discuss breaches of the Inter-American Democratic Charter, which could mean Ortega would have to have new, fair elections. They also ask that Ortega allow human-rights organizations to re-enter Nicaragua. They were kicked out for reporting on the widespread protests of 2018 in which they estimated 355 people were murdered and about 2,000 injured by the Sandinista regime. In response, Ortega announced that Nicaragua is quitting the OAS. And he has refused to meet with them.

The OAS also demanded the release of the nearly 40

opposition figures, including seven would-be presidential challengers whose imprisonment ahead of the election assured Ortega's victory. The old autocrat had a snappy reply. He called his captives "hijos de perra de los imperialistas yanquis" or "the sons of bitches of the Yankee imperialists."

As far as the claim that Ortega received 75% of the vote, a Gallup poll in December indicated that only 27% of those who cast a ballot voted for Ortega. 38% voted for other candidates, and 20% cast invalid votes (15% refused to answer the question). To back up these numbers, a further question asked if they thought the election was legitimate: 66% said no and 28% said yes. Only 22% agreed that the re-election of Ortega will bring more prosperity and security to Nicaragua.

Canadian Organization for Tropical Education & Rainforest Conservation COTERC

ADVISORY COMMITTEE

Tom Mason
Dr. Kevin Kerr
Dr. Wm. Rapley

Founder
Marilyn Cole

BOARD OF DIRECTORS

Chair • Dr. Kymberley Snarr
Vice Chair • Shelley Hutchinson
Finance • Greg McLean
Marketing • Patrick Traynor
Data Integrity • Dr. Roberta Fulthorpe
Research & Conservation • Dr. Emily Khazan
Station Advancement • Dr. Nathan Lovejoy
Development • Andrew Morris
Special Events • Barbara Arn
Grants & Funding • Luis Fernandez
Web Services • Vacant
Director at Large • Dr. Sarah Ivers
Director at Large • Brandee Diner
Raphia • Doug Durno

To ensure you feel involved, we welcome any comments or suggestions. If you have an idea for an article, or better yet, would like to write one yourself - if you have a photo or two you think we could use - if you have a suggestion for improving Raphia, please send it along to us at raphia@coterc.org

Contact COTERC at:

info@coterc.org

OR

Box 335
Pickering, Ontario L1V 2R6,
Canada

To unsubscribe from our
distribution list, please
send your request to:
raphia@coterc.org

COTERC is a registered Canadian non-profit charitable organization

#890096183 RR0001 (est. 1991)