RAPHIA

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Newsletter of Caño Palma Biological Station


American Pygmy Kingfisher


Keel-billed Toucan


Red-legged Honeycreeper

Birds of Caño Palma

Check Out the Research Opportunities


Montezuma Oropendola

Canadian Organization for Tropical Education & Rainforest Conservation

SUMMER 2023 ISSUE

Caño Palma -- Bird Hotspot

We're all aware that Costa Rica is a biodiversity hotspot. And Caño Palma is one of those locales that contributes to this designation. Just look at our eBird listing - **https://ebird.org/hotspot/L441071** - and they list us as a hotspot.

So, station manager Charlotte recently suggested to the ornithologically immersed Ryan Jack that it was time to update our local list of birds. Ryan set to work and so far he personally has observed 247 species in the station's vicinity (see Page 5 for Ryan's story).

To check out the full station list that Ryan and others have built up, go to the eBird address above. There you'll find that in total 329 species have been observed around Caño Palma (as of this writing). For the sharp-eyed birdwatcher, maybe you can help us catch up with Tortuguero, which has 439 species listed.

The point of all this - Caño Palma is a great place to study birds. So much of the area is undisturbed. It's a place where Greg Davies could research a bird like the sungrebe that likes secluded waterways. Where Dr Steve Furino and Mario Garcia Quesada could track down rufescent tiger-herons in their difficult-to-access refuges. And where we monitor and study the critically endangered great green macaw.

Which brings us to other research opportunities: Our two intriguing manakins - the white-collared and red-capped (*Raphia* - Spring 2021 and Spring 2022). Or the possibilities for the agami heron (*Raphia* - Fall 2021). Plus the Tyrannidae family including the great kiskadee (*Raphia* - Summer 2021).

With those 329 species of birds in our area, the possibilities for study are endless.

-- DD --

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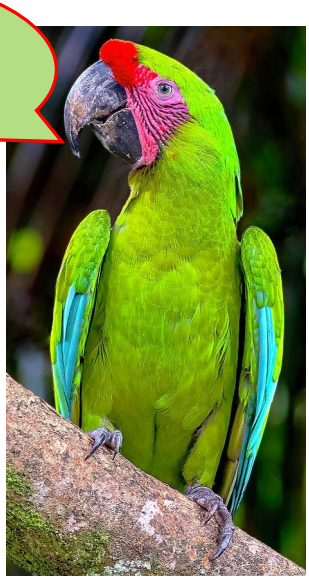

At the June 8th AGM, the following people were elected to the Board of Directors:

Chair - Dr Kym Snarr
Vice Chair - Nick Humphreys
Director of Development - Amy Cocksedge
Director of Web Services - Jess Sutton
Director at Large - Dr Nathan Lovejoy

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

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I'm a Conservationist...Get Me In There!! by Jess Callaghan

All 12 students partaking in the University of Kent's Tropical Field Course had incredible natural-history experiences at the Caño Palma Biological Field Station in Costa Rica, which is especially motivating for our final year of our Wildlife Conservation BSc. I will forevermore think fondly of this trip, which is undoubtedly the highlight of my undergraduate degree. Keep reading to find out why…

Getting There

After arriving in Costa Rica, we travelled to the Caño Palma Biological Field Station the following morning. The last leg of our journey is only accessible by boat! On this ride, there were lots of wildlife-spotting opportunities as well as views of the jungle paradise.

The Field Station itself is located in the jungle. We stayed in basic dormitories with bunk beds, pre-hung mosquito nets, a fan, and some small shelves for clothes. Caño Palma also has a library, kitchen and dining area, flushing toilets, shower blocks, and a relaxing area above the dock. Students were separated into smaller groups to complete Mammal, Macaw and Caiman Surveys, Morning Turtle Census, Night Turtle Patrol, plus Ad Hoc Activities.

I had an unforgettable experience on the Caiman Survey, cruising along the river at night by torchlight, looking for the red reflective eyeshine of spectacled caimans. It started raining heavily with immense thunder and lightning, but we were dry beneath the roof of the boat, and we felt as though we were in Jurassic Park! Dr Bicknell also led the nutrient-cycling experiment, as well as the camera-trapping, which captured agoutis, armadillos and a jaguar!

We all fell in love with jungle-living, which included falling asleep to the chorus of frogs and insects and waking up to the sound of howler monkeys roaring nearby. The wi-fi at the station was generally reliable, but even on the occasions it disconnected, it was surprisingly refreshing to exist without screen-time. We were provided plenty of recovery time from the late-night activities, and I loved hanging out with the capuchins that descend into the lower canopy in the middle of the station (cont'd on next page)

I'm a Conservationist...Get Me In There!! (cont'd)

around 7am to forage.

Night Turtle Patrol

Rain or not, students all witnessed Green Sea Turtles creating their nests, and some of us even counted the eggs as they were being laid. Patrolling the beach beneath the stars in the darkness, with the smiley-faced moon, bioluminescent sand that glowed under each footstep, and frankly, TURTLES nesting on the beach, made for an incredible night. The feeling of physically protecting each dinosaur-looking, sea-dwelling reptile (turtle) we encountered was indescribable and I couldn't recommend this experience enough for future Conservation students seeking inspiration in the field.

I had a fantastic time at Caño Palma Biological Field Station. A huge THANK YOU to Jake and Helen for arranging this phenomenal trip. Now, I'm very eager to travel back to the rainforest when I finish my degree.

Jess (on right) with Dr Helen Pheasey

Pilot Bird Survey by Ryan Jack

Ryan graduated from Grinnell College in Grinnell, Iowa (2022) with a Bachelor's in General Science (Biology Focus) and a concentration in Environmental Studies. After his 8 months at Caño Palma, he's going to Australia as a research assistant for a study of the Chirruping Wedgebill. Ryan is from Naples, Florida and intends to dedicate his career towards conserving the Everglades ecosystem.

In November 2022, our station manager Charlotte approached me with the idea to start a bird survey at Caño Palma. With the prolific bird life in our area and the halting of the station mist-netting and banding program years ago, motivation existed to begin a new bird-observation program. This motivation was strengthened by the dearth of eBird data from San Francisco northwards, as well as the upcoming arrival of students wishing to pursue a project on birds. Thus the wheels were in motion and it was time to get to work!

Great Tinamou

Working with Charlotte and former and current research coordinators Alex Lascher-Posner and Nathan Delmas, we developed three transects that are being surveyed at least once a week. Covering land and water from Laguana Cuatro south to San Francisco, these three transects cover a wide range of habitats and have allowed us to significantly bolster the eBird database. This allows for students to come to Caño Palma and pursue a project on birds with a significant database to examine. Additionally, this effort illuminates changing trends in the populations of various species and allows for the characterization of area species based on their frequency.

White-necked Jacobin

The Tortuguero area boasts an impressive checklist of 439 species and, while piloting this survey, I've been fortunate to see 247 species so far. The diversity, abundance and beauty of these species is seldom rivaled across the globe. From the breathtaking Agami Heron, adorable American Pygmy Kingfisher, haunting Great Tinamou, enigmatic Great Potoo, magnificent Great Green Macaw, iconic Keel-billed Toucan, ubiquitous Montezuma Oropendola, vibrant Red-legged Honeycreeper and dashing White-necked Jacobin, Tortuguero is truly an ornithologist's paradise.

(cont'd on next page)

Agami Heron

Pilot Bird Survey (cont'd)

A few species of particular note:

One is the **Snowy Cotinga**, a silent, fruit-eating bird that is uncommon across its limited Central American range with particular rarity in Tortuguero. It derives its name from the brilliant snowy-white plumage of adult males.

The **Sungrebe** is a unique water bird frequent in the canals around Tortuguero. In the National Park, we've had the privilege of observing a pair of Sungrebes successfully nest and fledge chicks. This is of importance as not much is known about the nesting habits of Sungrebes. Seeing the tiny chicks riding around on the back of the male is truly a splendid sight.

The **Yellow-headed Caracara** is a smallish species of scavenging falcon common in other parts of Costa Rica. Until recently, it wasn't known to be a resident species of Tortuguero, but last summer folks from the station observed some along Playa Norte. Since then, we've seen them quite frequently across the area, suggesting a resident population and a possible range expansion of the species.

I've had the immense joy and privilege of leading our survey to share my passion for birds and stoke this passion anew within a wonderful and ever-evolving cast of interns and volunteers. I always smile when I see someone's face light up with excitement at seeing a beautiful bird or a unique behavior. While our area is particularly notable for birds, birds are everywhere, and you don't have to be in a Costa Rican jungle to appreciate them. Going back to when I was a toddler, I was entranced by the numerous birds that would visit the bird feeders hanging outside our windows. My passion for birds began then and anyone can do the same no matter where you are. All you have to do is look and listen and it's certain that you too will be entranced by the beauty and behavior of birds. -- Ryan Jack

The Shallow Life of Sand Dollars by Charlotte Foale

Sand dollars litter our beach and for years I didn't question what I was told the first time I encountered them in Florida - that they were fossils. While fossilized sand dollars certainly do exist, the beautiful white disks we so commonly see on our beach are the skeletal remains of an amazing creature.

In life they are echinoderms, and are a distinct type of sea urchin that took its own evolutionary path. The 'petals' you see on the skeleton are petaloids -- tiny holes through which tube feet emerge and through which the sand dollars breathe. These elongated holes help the living creature to reduce lift caused by currents, helping it to stay in place.

Live sand dollars range from purple to brown and are covered in minute cilia. These tiny hairs move small particles of sand to a central mouth on the underside of the creature where the grains are ground up to remove microscopic algae and bacteria. If you have a few spare days in your life, look these creatures up as I'm barely scratching the surface here!

Have a look at these videos. The first one has impressive up-close-and-personal footage of a sand dollar's cilia at work.

A Sand Dollar's Breakfast is Totally Metal | Deep Look - YouTube

Facts: The Sand Dollar - YouTube

Species - Eleven different species of sand dollars live in the tropical and temperate coastal waters of the Americas.

Lifespan - Sand dollars live to be 8 to 10 years old. As mentioned in the video, their age can be determined by examining the growth rings on the plates of their skeleton. Out of water, sand dollars can only survive a few minutes.

Aristotle's lantern – The sand dollar's mouth is a complex mechanism. It's comprised of five jaws made up of calcium plates. To feed, the five jaws are pushed out so that the mouth opens. The jaws then come together to grip whatever the sand dollar wants to swallow.
Where does Aristotle's lantern come into this? In his book *Historia Animalium* (*The History of Animals),* Aristotle gave a systematic biological description of sand dollars. He said the mouth-apparatus looked like a "horn lantern", which in his time was a five-sided lantern made up of thin panes of horn.

Cloning - When sand-dollar larvae sense predators nearby, they can clone themselves into multiple copies, greatly increasing their numbers in order to confuse predators. And their smaller size makes it easier for them to hide. One experiment showed that larvae exposed to the mucus of a predatory fish species responded by cloning themselves. However, cloning can be detrimental to the larvae as it's costly in terms of energy spent as well as possibly causing developmental delays.

Howler Monkeys -- More Adaptations (Part 3) by Doug Durno

Play, Not Grooming

"Although play is generally characteristic of immature animals, it may persist in adults in its social form, particularly when interacting with young individuals, and less often with other adult playmates."

Grooming among primates started out for reasons of hygiene. However, as primates began to live cooperatively in larger groups, grooming took on a social function (allogrooming). As well as serving to strengthen relationships, grooming can function to reduce tensions that inevitably arise in group living.

What produces those tensions? Well, competition for one thing. There's competition for mates. However, for howler monkeys, the greater competition is for food. Not necessarily for leaves, which form the bulk of their diet. But for fruit, which is more energy rich than leaves and thus more greatly desired by this sluggish family. So, you might think that howlers would be champion groomers to reduce tensions.

Not a great photo, but it shows howlers at play. While playing, they hang by their tails, grappling, making faces and maybe shaking their heads at one another.

Yet howlers don't engage in allogrooming. Nor do they have a social structure that would help the group manage competition and conflict.

Rather, researchers are now suggesting that adult howler monkeys use play to reduce tensions that can be produced as they forage for prized fruit. They also determined that female adults play more than males. That surprised them since howlers are particularly energy conservative and the assumption would be that females would play less as they're "more constrained by the energy requirements of reproduction".

But couldn't it just be that eating fruit gives them more energy to engage in play? If that were the case, they'd be playing just as much with young howlers. But they don't - for the reason that juveniles aren't competition for the fruit. So, the researchers conclude that play among adults is a substitute for tension-reducing allogrooming.

Digestion

In the previous two issues, we've discussed adaptations that howlers have for their diet of primarily low-energy leaves:

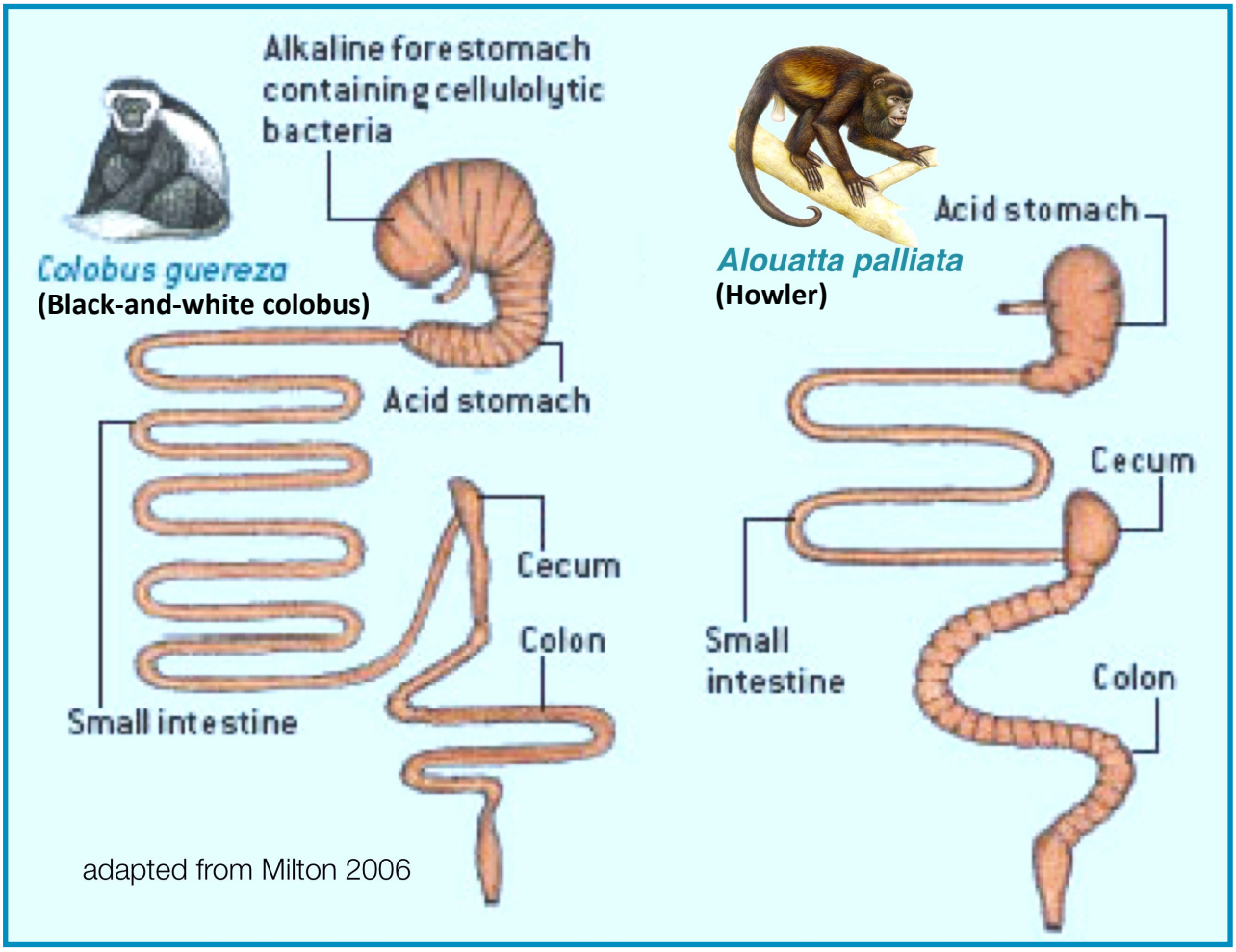
- They minimize energy expenditure by resting much of the day.
- They consume younger leaves as much as possible as they're more nutrient rich and easier to digest.
- Unlike other New World monkeys that are color blind, howlers are trichromatic so that they can differentiate between red and green, which enables them to more easily spot those younger leaves.

Now let's look at another adaptation that howlers have for extracting energy from hard-to-digest leaves. Almost all vertebrates lack enzymes needed to break down cellulose, the main ingredient of plants. In humans, cellulose (cont'd on next page)

Howler Monkey Adaptations -- Part 3 (cont'd)

simply passes through our gut as fibre. But howlers and colobine monkeys (their digestive systems are shown below) are able to release more energy from leaves due to bacteria in their stomachs that have enzymes that can break down cellulose. To accommodate the bacteria, colobines have multi-chambered, complex stomachs. On the other hand, howlers have enlarged cecums and colons. The rate of caecal fermentation in mantled howlers is among the highest of any mammal, producing about 31% of the energy they require daily.

The cecum, at the beginning of a howler's large intestine, stores the cellulose for breakdown by those bacteria. The howler's colon, at the end, holds unabsorbed material for further fermentation by the bacteria. But bacteria work slowly. So, howlers have adapted with long transit times for food going through their gut (about 20 hours). This enables them to extract a near-maximum amount of the energy available in their leaf-based diet.



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Data Rescue by Sarah Ravoth

So many of us have spent long hours trudging the sands of Playa Norte in search of nesting sea turtles. Later we'd walk back to triangulate and install nest protection. Finally, under a beating sun, we'd do excavations. And all the while we were carefully recording every little detail.

The goal of all this effort is to better understand the hawksbills, leatherbacks, greens and loggerheads that visit our beach - and ultimately to have a healthier sea-turtle population worldwide.

It's important for us then to input and save all those details in a well-organized manner so they can be easily and accurately accessed by researchers analyzing our data. But, at a research station like Caño Palma with people coming and going all the time, each person inputting the data may have a different method of doing entries.

Sarah Ravoth to the rescue. Or "data rescue" to be more precise. Sarah has received funding through a competitive fellowship program to undertake such a rescue project and will be using COTERC's marine-turtle database. Having done project work at Caño Palma on three occasions, Sarah has had plenty of experience with our data.

So, what is data rescue? In Sarah's words, it involves formatting, organizing and archiving our 20-year dataset in such a way that we're ensuring that its clarity, accessibility and quality persist far into the future.

These are the key areas of needed improvement Sarah will be working on:

1) Presently, file formats are inconsistent across years. Some are paywall-blocked and/or no longer supported by database management systems like Microsoft Access. Sarah's solution will be two-fold:

- Save all data in universally used file formats like .csv
- Save all data in 'basic' formats that can withstand changes in file-format 'trends' so they'll be accessible far into the future (e.g., .txt files).

2) When file formats are inconsistent, researchers then have to tidy them up and reformat, which increases the likelihood of error or bias in their analyses. To remedy that, Sarah will standardize datasets across years to have consistency in properties such as spreadsheet formatting, variable names, units, etc.

3) Can we expect a researcher who accesses a dataset in 50 years to know the meaning of each variable if they aren't described somewhere? It's important then that there be a so-called 'metadata' file associated with the database that provides explanations for such things as short-forms, e.g. "CCWmax = curved carapace width measured at its maximum point".

Further, Sarah suggests that the metadata be published on an open-access repository like Dryad. This benefits COTERC in two major ways. First, it broadcasts the existence of Caño Palma's turtle project on a frequently used platform, thereby establishing the organization's reputability as well as attracting collaborators, researchers, interns and volunteers. Second, publication of metadata would support COTERC's goals of accessible and collaborative science. At the same time, anyone interested in working with our marine-turtle data would still only have access to it by following our procedures.

Rest assured then that Sarah's project will make your efforts in finding nesting sea turtles and recording the data more beneficial to their future.

Is It Just Me? by Ross Ballard

Ross was station manager at Caño Palma from 1998 to 2001.

When I first arrived in Costa Rica, I had only a very superficial interest in birds (mainly were they low in cholesterol or were they amicable with a nice Chablis?). But my last year at Caño Palma changed that. You would really need a heart of stone not to be stirred by the beautiful and interesting avifauna that surrounds you.

That said however, I still find birders, true birders, a strange bunch. A distinction must be made between naturalists who are 'dyed in the wool' birders and others who are mere converts, like myself. I fear that we latecomers will always be outsiders to the pros who dominate this strange pursuit.

From time to time, I visit Dr. Aaron Sekerak, a professional birder and friend who wrote "A Travel and Site Guide to the Birds of Costa Rica" (Lone Pine Press, 1996). A devoted birder, he will sometimes invite me along on an excursion around La Fortuna where he lives.

"Ross, what are you doing tomorrow morning?"

"Going birding with you, Aaron!" is of course the correct answer.

One such morning began at five. A cold, rainy and dark morning it was. Two grown men, great big adults you understand, were venturing into the rainforest on the slopes of the Arenal Volcano to find a bird seldom seen even by the pros.

We walked some distance into the forest until we were in a rain-soaked gully surrounded by underbrush. This was the place! Both of us sat on plastic bags in the cold drizzle, armed only with binoculars. We helped pass the next hour or so by shivering in silence.

For myself, I didn't even know exactly what it was we were looking for, except that it must be awfully gawd-almighty important.

Suddenly Aaron hissed "There it is!". And indeed there it was. Twenty feet away, a scrappy little brown and grey morsel, pushing maybe five inches, even with its long legs. Why it didn't even seem to have a tail! It was not stately. It was not gorgeous. What it lacked in bright plumage, it did not compensate for with a lively demeanor. It may have been a bird, but it was not much of a bird.

In short, it was much like getting socks for Christmas. In no sense was it impressive.

I suppressed the embarrassment I felt for my friend.

"Excellent, Aaron!" I said. "C'mon, I'll buy you a coffee."

"No, no! Let's watch!" Obviously, I had failed to apprehend the significance of the moment.

Those of you who are born birders will not recognize perversity in the preceding account. But as an outsider to your clan, I for one now know that there are two types of people in this world. I will not elaborate further for fear of alienating several good friends.

Later that morning over coffee, I was brought up to speed. The bird we had seen was the seldom-spotted Fulvous-bellied Antpitta. (cont'd on next page)

Is It Just Me? (cont'd)

A Fulvous-bellied Antpitta no less! I had paid my dues, joined a quest, and in so doing had become something of a rarity in my personhood!

Still, I think I prefer to be a rarity among people than an oddity. Such pursuits are better left to the pros. But you cannot deny the potency of these pivotal moments in life. And that is the crux: I have seen the Fulvous-bellied Antpitta! I need doff my hat to no man!

Note - Since Ross wrote his article, the fulvous-bellied antpitta has been split into two species: the thicket antpitta (Myrmothera dives whose range is shown on map), which Ross describes, and the white-lored antpitta (Myrmothera fulviventris) of Ecuador, Peru and a bit of Colombia.

Great News for the Great Green Macaw

The most recent report from research coordinator Nathan Delmas shows a very high number of sightings of great green macaws. This is important because this species is listed as Critically Endangered by the IUCN. Their latest population estimate (2020) was between 500 to 1000 individuals with a decreasing trend.

In Station Happenings on Page 14, Nathan mentions a high number of great green macaw sightings at Archie Carr Wildlife Refuge. He explains that "the numbers listed on the reports are every time a macaw has been active. It doesn't represent the number of different individuals. However, we saw a single group of 82 great green macaws flying over Archie Carr after another group of 10 left a few minutes before. At the same time, more than 30 were spotted over Tortuguero. Our last population estimate indicated that we had 61 individuals in the region of Tortuguero. It would seem like we have at least double that now."

There you go - something like 120 individuals. That's a great trend. In the early 2000s, some considered the great green macaw at risk of extinction in Costa Rica.

The Laughing Falcon: Dead Serious by Doug Durno

You may have seen a laughing falcon perched in its favorite spot on an open branch. It sits there and it sits there. With its head down, it appears as if in deep thought. Abruptly, it starts laughing. Did it see something amusing or think of something funny?

But animals don't have a sense of humor, you say. Yet researchers at UCLA came up with 65 species that, when playing, make sounds approximating human laughter. Yet their play can be pretty rough, resembling fighting. So, the laughing sounds can signal non-aggression during such physical moments. Laughter communicates that "This is playtime - I'm not actually going for your throat". (But watch out if you're interacting with a hyena. Their 'laugh' is definitely not a play signal.)

While the researchers did find three birds whose laughing vocalizations actually do signal play (two are Australian - Australian magpies and budgerigars - and one New Zealander - the kea), most such 'players' that make laughing sounds are mammals, and most of them are primates. The researchers found that the primates' playful laughter consisted of panting chuckles, grunts, cackles, trills, squeals and lip-smacking.

So, let's get two misconceptions out of the way. First, Prince claimed that doves cry. They don't. And second, laughing falcons don't laugh. Their laugh-like call is dead serious. It's not playful. The 'laughing' part of its call, starting or finishing it, is but a small part of its vocalization. Here are a recording and video.

https://macaulaylibrary.org/asset/165045

Couple of Laughing Falcons laughing (Herpetotheres cachinnans) - YouTube

The male often starts the proceedings with a maniacal laughing sound, a series of rapid notes. That transitions into spaced-out, repetitive *gwa* calls. It's really annoying - except to the female who responds. Eventually the male's call becomes *gwa-co*. Hence the Costa Rican name for the laughing falcon - guaco.

Speaking of names, the laughing falcon's scientific name is *Herpetotheres cachinnans*. Why *herp*? A falcon obviously isn't a reptile or amphibian. But the laughing falcon does specialize in eating snakes, even venomous snakes such as corals. Now you know why we started with this raptor perched on a branch, looking intently at the ground. It's ready to pounce on any undulating meal it sees. And it does so powerfully, stunning the snake with an audible thud. In case the snake is venomous, the laughing falcon bites the snake's head off. It carries it off to a branch where it will swallow the snake tail first if it's small enough - or tear it into bite-size pieces if it's bigger. Its other main prey is lizards, but it may also dine on bats and small rodents.

You still want to attempt to get a chuckle out of a laughing falcon? Try this snake 'joke':

Why did the two boa constrictors get married?

Because they had a crush on one another.

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Play vocalisations and human laughter: a comparative review (ucla.edu)

Station Happenings by Nathan Delmas, Research Coordinator

April **Marika Breton** returned to take over as turtle coordinator this season. (Her report is on next page)

Manon Francisco (Université de Toulon) is studying the impact of nest flooding on the reproductive success of marine turtles for her master's thesis.

Ambre Salles (Université de Rochelle) is studying nest flooding and its relation to nest predation by microorganisms.

Université du Québec à Montréal:

- **Rose Morel** is studying the impact of weather on macaw activity.
- **Sam Monette** is looking at snake communities around the station.

Alice Very (Ghent University in Belgium) is studying the effect of erosion on the nest incubation temperature.

Mariola Querol (Universidad Católica de Valencia in Spain) is conducting a meta-analysis of the organization's data in order to review the erosion, predation and poaching trends on Playa Norte and their impact on the population dynamics of green and leatherback turtles.

K9 Conservationists - We had a visit from Kayla Fratt who runs this organization. Her dogs sniff out scat and carcasses as well as plants, insects, pathogens and more - all done non-invasively. On one of our mammal transects, the dogs found two ocelot scats.

May **Shawnee State** University - Students from Portsmouth, Ohio, led by Dr Sarah Ivers, made a 9-day visit. They participated in various surveys and helped out in San Francisco.

Tim Von Sprensen - From HAS University in the Netherlands, Tim will work on improving our bat survey.

Cora Scazzola and **Edouard Courret** from the Université de Lille in France will be at Caño Palma for 2 months as mixed-taxa interns.

Romke Von Dam - Romke also comes from HAS University, and will be seeking to improve our macaw survey.

Sarah Griffin from Wellesley College in Boston will be working with turtles until August.

Keeled mangrove snake (*Tretanorhinus nigroluteus*) - Often called the orangebelly swamp snake. There are less than five reports of this snake in Costa Rica. These primarily aquatic snakes appear to prefer shallow, slow-moving water, especially where aquatic vegetation is abundant. They've been found in mangroves, in or near streams, in the sluggish oxbows of large rivers, lakes and freshwater as well as brackish tree swamps. They're nocturnal, rarely seen during the day when they remain submerged. They often lie at the surface with only the snout above water and rapidly dive to hide in aquatic vegetation, mud or under rocks at the bottom. They prey on small fishes of the families Gobiidae and Poeciliidae, tadpoles, small frogs and toads. Feeding may involve active swimming, but usually the snakes are anchored to aquatic vegetation or they lie on the bottom to ambush their prey.

June **Great Green Macaws** - A great number of great green macaws were observed this month in the Archie Carr National Wildlife Refuge - over 3200. For comment on this number, see Page 12.

Unusual sightings - A **tapir** was spotted north of the station. As well, a **Reticulate Centipede Snake** (*Tantilla reticulata*) was found on snake survey, only the second of this (cont'd on next page)

Station Happenings (cont'd)

species since our snake monitoring program began. As it spends almost all its time beneath the leaf litter of the forest floor, it's difficult to observe - and hence its other name, the litter snake.

Personnel - Many new people joined us this month: **Oliwia Jasnos** from Boston University (sea-turtle project). Young Canadians, **Florence and Emile**, spent a week with us to discover our work in the rainforest. From École Nationale Vétérinaire de Toulouse (France): **Jean Meunier** (otter parasites), **Sébastien Seniut** (impact of barnacles on sea turtles), and **Samuel Duditlieux** (impact of tourism on mammal activity). **Payton Gore** from Colgate University in New York state (turtle intern). **Lucas Perez** from Université du Québec à Montréal (turtle intern). **Louise Pirotais** from VetAgro Sup in Marcy-l'Étoile, France (turtle intern). **Brahmleem Diol** from the University of British Columbia (mixed-taxa intern). **Alanis Reznar** from Eckerd College in St Petersburg, Florida (turtle/community intern). **Noor Fatima** from York U in Toronto, Canada (turtle project).

Bat group - **Dr Bernal Rodriguez Herrera** led a group of students from the Universidad de Costa Rica to study bats by mist-netting them.

Turtle Report by Marika Breton, Turtle Project Coordinator

Nesting Activity - June

A 4-fold increase over last year highlights nesting activity in June. Green and hawksbill nesting accounted for almost all of this.

Species	2022	2023
Leatherback (*Dermochelys coriacea*)	**0**	**1**
Green (*Chelonia mydas)*	**7**	**32**
Hawksbill (*Eretmochelys imbricata*)	**6**	**18**
Loggerhead (*Caretta caretta*)	**0**	**1**
Total	**13**	**52**

In total, there were 157 emergence events - in addition to the 52 nests, 105 halfmoons were found.

Note
- Leatherback nesting season is usually finished by the end of May.
- Loggerheads - It's unusual to find this species on Playa Norte.

Poaching - Two lifts likely occurred this month. Fortunately, it seems one was interrupted - lights and noise were observed, and then the turtle was observed heading back to the ocean.
Three attempts were made to poach nests. Only one was successful.

Nest Protection - As we did last year, we're placing bamboo protection barriers on triangulated nests. For hawksbill nests, we place the barriers 10 cm into the ground, and for greens, they'll be placed 20 cm deep.

Night Patrol - We were able to deploy teams on 27 occasions this month, with two teams being deployed on 9 of these occasions and three teams on one occasion. Night patrol is concentrated on Thursday, Friday and Saturday night, when two teams are usually deployed, in order to combat human activity that's more common on those nights according to data from past years.

COTERC

Canadian Organization for Tropical Education & Rainforest Conservation

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

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