LETTER FROM THE AMAZON
NEWS FROM THE FIELD STATIONS OF THE AMAZON CONSERVATION ASSOCIATION

OCTOBER-DECEMBER, 2009

THIS ISSUE:

UNRAVELING THE SECRETS OF THE SHORT-EARED DOG (Atelocynus microtis), Renata Leite Pitman____p.4-5

OF WINGED MARVELS: Graham Anderson, Resident Artist and Photographer____p.7-8
Letter from the director: Preserving life in the last great tropical wilderness
Dr. Adrian Tejedor, Director of Research

Visitors to Los Amigos are often impressed by a large diurnal moth that is streaked with black, emerald, and white. Often confused with a butterfly, the aptly named swallowtail moth (Urania leilus) is in constant warfare with its poisonous host plant: Omphalea. Stressed by hungry Urania larvae, stands of Omphalea increase their alkaid weapon and force Urania populations to migrate hundreds of kilometers to areas free of the moth. There, “naive” Omphalea tolerate defoliation until the balance of power shifts and Urania is evicted again.

Swallowtail moths, as a result of their foraging behaviour, require large geographic areas to migrate and sustain viable populations. Perhaps this is why, in spite of being widespread, Urania is only represented by a handful of species: U. leilus (South America), U. fulgens (Central America), U. boisduvali and U. poeyi (Cuba), and U. sloanus (Jamaica). So, one may ask, if they truly need large areas, how can they survive on islands such as Cuba and Jamaica? Well, as it happens, they sometimes cannot.

Years ago, I was introduced to the Jamaican swallowtail moth (Urania sloanus) via a few odd illustrations. Rather than just emerald, it displayed an arresting array of colors, with gold and copper shimmers on its dorsal side. I longed to visit Jamaica to gaze at this living jewel. As it turns out though, U. sloanus is, unfortunately, no longer living. It was last seen in nature at the end of the 19th century and has since entered the planet’s list of recently extinct species.

How much poorer Jamaica seemed the day I found out, and how bizarre the extinction of an insect on a relatively well forested island. Perhaps, already pressed by cyclically poisonous plants, U. sloanus starved to death when even moderate deforestation was enough to eliminate alternative foraging areas.

The Jamaican swallowtail moth is but one an example of the cascade of human-driven extinctions (which include monkeys, sloths, rodents, eagles and macaws) that have permanently impoverished West Indian nature. While an increased rate of extinction is a well known fate of island environments in the face of human encroachment, larger areas of the world, such as the Amazon basin, have fared better, but not for long.

Currently, large-scale, unchecked human development, mainly in the form of dams and paved roads, threatens to fragment the Amazon into forest islands. Isolated by deforestation, surviving swaths of forest could become as vulnerable to species loss as an oceanic archipelago. In a rapidly warming planet, artificial barriers, such as roads and dams, will obstruct the expected migration of rain and cloud forest ecosystems to cooler or wetter climates, thus magnifying the decimation of biodiversity. Under this scenario, a system of isolated natural preserves may prove ineffective.

The goal of the Amazon Conservation Association is to reconcile human development with the ecological health of the Amazon. By working closely with loggers, miners, and builders we aim to link existing preserves with corridors of managed forest. We hope that the resulting network of anthropogenic wilderness, from the lowlands to the Andes, will help us save species and environmental services into the future.

In this first issue of the Letter from the Amazon, an offspring of the Letter from CICRA, we tell you about work carried out at the stations of the Amazon Conservation Association in Peru: Los Amigos (also know by its Spanish acronym CICRA) in the lowland rainforest of Madre de Dios, and Wayqecha, near the Andean tree line in Cuzco. Stories about the short-eared dog (the Amazon’s rarest carnivore), cloud forest hummingbirds, and our environmental education program in mining towns reveal the interplay between the natural and human dimensions on whose balance depends the health of the Amazon. If we manage to wisely insert ourselves in the wilderness instead of pushing it away into island parks, we will safeguard its integrity for future generations.

Jamaican Swallowtail Moth (Urania sloanus) from clade.anssp.org
**RESEARCH: Current Stories**

**Landscapes of transformation**
Iona Hawken is studying urbanization, land-use change, and landscape transformation in Amazonia along frontiers of resource extraction. At CICRA, she is currently investigating the impact of hunting on larger vertebrate populations; this is one of many microcosms for an examination of how urbanization impacts land-use change, tropical biodiversity, and ecosystem function. Her research at CICRA will contribute to her PhD at the Yale School of Forestry. [Prints at CICRA. Photo by Sarah Federman]

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**Global warming, displacement, and nesting**
Global warming should displace Andean ecological zones upslope, but not all biotic communities may respond. If producers, herbivores, and carnivores are displaced out of phase, ecosystems will be altered and species could be lost. At Wayqecha, Gustavo Londoño, of the University of Florida, is looking at how these different components affect nesting in birds from the Andes to the rainforest, with the aim to predict reproductive success (and hence species survival) of this diverse group in the face of climate change. [Eggs of the Andes. Photo by Adrian Tejedor]

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**Mini Watsa, I’m my own grandpa: the pichicos of CICRA**
Mini, a doctoral candidate in Anthropology at Washington University, and her dedicated team are investigating chimerism and population genetics of saddleback tamarins, *Saguinus fuscicollis weddelli* (pichicos), and their correlates with affiliative behaviour in callitrichids. In her words: ‘Quite possibly the coolest thing ever. Seriously.’ In fact, after hearing her talk on the subject, we at CICRA are inclined to agree with her. Mini’s team captured and processed one group of pichicos that ranges at CICRA, which they are monitoring intensively; this group recently had a set of twins, which are not only adorable but exciting for an investigation of chimerism. After much work, Mini’s team recently captured and processed the twins! Keep up the good work! **Learn more about Mini and her work at: primatesperu.com** [photo of pichicos by Rene Escudero]

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**Lianka Cairampoma: Pollination and distribution of the gesneriads of Wayqecha**
The degree of ecological specialization of organisms along the Andean slope can limit their altitudinal distribution. Lianka, an undergrad at Universidad Mayor de San Marcos in Lima, is studying one of the most specific of all ecological interactions: pollination, and its relation to the altitudinal distribution of both the plants and the pollinators. Her study focuses on the gesneriads, a plant family that includes many common ornaments. To date, she has discovered one species of gesneriad which is pollinated exclusively by hummingbirds, such as the bearded racket tail (*Ocreatus underwoodii*). [photo of gesneriad flower by Adrian Tejedor]

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**Economics of mutualism: are the tenants worth the trouble?**
Alison Ravenscraft, a recent Harvard College graduate, studies the mutualistic association between several ant species and *Cordia nodosa* at CICRA under the auspices of Dr. Megan Frederickson (University of Toronto). The main goal is to investigate whether *C. nodosa* is investing a significant amount of resources in its ant symbionts, and if, in the absence of herbivory, the tree would experience a net benefit or loss from supporting an ant colony. **Follow Alison at holahormigas.wordpress.com** [A mosquetero as an exclusion experiment. Photo by Sarah Federman]

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**From the Andes to the Amazon, peregrinations of sediment**
The deposition of carbon in fluvial and marine sediments is a final link in the sequestration of atmospheric CO2 from Amazonian forests. If, as is thought, the Andes contribute 80% of sediment to Amazonian rivers, does this mean that Andean cloud forests are disproportionately important exporters of mineral carbon? Kathryn Clark, of Oxford University, aims to answer this question by quantifying the frequency, volume, and distribution of landslides in the Andes. She works in both Wayqecha and CICRA. [A landslide, photo by Adrian Tejedor]
Unraveling the secrets of the short-eared dog (*Atelocynus microtis*): Renata Leite Pitman  
*IUCN Canids Specialist Group  
Coordinator of the Amazonian Canids Working Group*

In December 2006, a logger found a puppy in the woods and brought him to be sold at the Puerto Maldonado market. This would have been just another sad story about the region’s wildlife trade, except that this puppy was an extremely rare Amazonian endemic; the short-eared dog. Described more than 120 years ago, this species is still extremely poorly known. Worldwide, there are currently none in captivity, and historically only 16 individuals have been held by zoos, where they have an incredibly low survival rate. Since 2000, I’ve been conducting a study in Madre de Dios, which seems to be the only study on the ecology of this species.

The puppy was bought by a local and brought to his farm near the border with Brazil, where he was raised with domestic dogs. At this time, Oso (the name given to the puppy by his first owner) was around three months old. It didn’t take long for this story to reach me, and in January 2007 a friend gave me the picture to the right. Knowing what a rare event this was, and thinking it might be a great opportunity to learn more about the ecology of the species, I immediately got in touch with INRENA to understand the legal requirements to conduct field research with the animal.

In February 2008, when Oso was a year and a half old, INRENA endorsed our study and ACCA approved our research at CICRA, where we have been studying the short-eared dog population since 2003. After conducting quarantine at the Amazon Shelter in Puerto Maldonado and vaccinating to prevent any transmission of diseases to wildlife, I brought Oso to CICRA. My goal was to take Oso on structured walks through an area of forest which approximated the range size of adult short-eared dogs (~7 km²), and record his behavior towards other species and maybe other individuals of the same species. These walks included documenting foraging behaviour in the field and whether Oso is an effective disperser of the fruits he consumes.

Photo of Oso as a puppy at the farm. Photo by JJ Escudero

Key to the success of the study was Emeterio Nufonca Sencia, an excellent local field assistant. Emeterio, like many others in the local community, came to Madre de Dios from the Cusco region 20 years ago dreaming about gold. Like other miners, he made some money and hunted in the region until 2004, when I hired him to open some trails; as soon as I met him I knew he was made for much bigger things. Time proved me right: Emeterio turns out to be one of the brightest people I have ever met. With his natural talent, he quickly made Oso comfortable on the trail system at CICRA, took video footage of Oso’s behavior towards several species of predators and prey, and even more exciting, documented (with video, pictures and a very good text description) encounters with wild short-eared dogs. On February 11th 2009, while Emeterio was walking with Oso on the leash on Otorongo trail, a wild male followed them for 15 minutes. On May 18th 2009, while Emeterio was walking with Oso on the Segundo Mirador trail towards Daniela, a female approached them and followed them for one...
hour. Emeterio documented their mating behavior, the first ever recorded in the wild, although copulation wasn’t possible because Oso was on the leash.

We are now searching for financial support to release Oso with a GPS collar in order to give him a chance at reproducing, and at the same time to help us reveal the secret life of this species. Research to date has been supported by Ideawild, Wildlife Materials, Disney Conservation Fund, Conservation Food and Health, Conservation International, World Wildlife Fund, Amazon Conservation Association, Frankfurt Zoological Society and Amazon Shelter. Research was motivated by John Terborgh, Peter Crawshaw, David MacDonald, Rob Williams and Nigel Pitman, and made possible by the passion for wildlife of over 40 field assistants, most notably Dario Cruz, Lucas Huamani, and Emeterio Nuñonca.

~Dr. Renata Leite Pitman, IUCN Canids Specialist Group Coordinator of the Amazonian Canids Working Group
RESEARCH: Recent Publications

Megan Frederickson, CICRA: Of ants and Plants
Megan, a veteran researcher at CICRA, recently accepted a position as assistant professor at the University of Toronto. Among her current projects, she is heading the ant-plant mutualism project with Cordia nodosa implemented by her field assistant Alison Ravenscroft (p. 3). Her most recent paper with data from CICRA: “Conflict over reproduction in an Ant-plant symbiosis: why Alomerus octoarticulatus ants sterilize Cordia nodosa Trees,” was published in The American Naturalist, April, 2009. The paper explores a trade-off between C. nodosa tree growth and reproduction: Megan found that experimentally sterilized trees grew faster than controls. Continued below...

Mathias Tobler, CICRA: How a forest grows out of a meal
Animal seed dispersal in tropical forests is a crucial factor in maintaining alpha diversity of tropical trees. In the Amazon, large monkeys were thought to be the sole dispersers of several large-seeded trees but in a recent paper with data collected at CICRA, “Frugivory and Seed Dispersal by the Lowland Tapir,” Mathias Tobler, at the Botanical Research Institute of Texas, has shown that lowland tapirs (Tapirus terrestris) are important dispersers as well. During the course of his study, Mathias and colleagues detected 122 plant species in tapir feces, indicating that this largest of south American ungulates is an opportunistic feeder that increases the seed shadow of tropical trees. Continued below...

The Raptors of CICRA
Margaret (Peggy) Shrum is a doctoral candidate at Clemson University funded by the National Birds of Prey Trust. Her study focuses on mercury contamination in raptors of Southeastern Peru with the long-term goal of exploring a possible correlation between mercury levels in parents and chicks, and nesting success or failure. Raptors are excellent bio-indicators for ecosystem health due to their function as top-predators, and their ability to tolerate 20x the levels of mercury that mammals can before showing symptoms. Interestingly, aside from levels of mercury high enough to cause reproductive failure, Peggy has encountered lead in her captured birds. Recently, Peggy captured and radio-tagged one of three black-faced hawks, a species which was previously thought to solely range north of the Amazon River. When Peggy finds the nest, it will be the first documented nest of this species to ever be found in the wild!

Sterilized trees also produced more hollow domatia, capable of housing larger, more fecund A. octoarticulatus colonies. Megan’s results elucidated why this ant species sterilizes the tree in the wild by chewing off flowers. [C. nodosa and associated ants. Photo by Gabriell Miller]

The disappearance of this endangered species could lead to a decrease in plant diversity or a shift in tree community composition. Mathias’ paper was published in Biotropica, 2009. [Lowland tapir. Photo by Adrian Tejedor]
OF WINGED MARVELS:
Graham Anderson, resident artist and photographer

In 1974, aged 26, I left Australia to work for ten months in Paraguay. While there, I took any opportunity that came along to photograph the country’s wildlife. It wasn’t long before I was enchanted by the hummingbirds; they’re delightful little birds that hover, apparently motionless, their wings a blur, as they insert their beak and tongue into flowers to drink nectar. They flash and sparkle in rainbow colours, like flying jewels, as the light strikes their iridescent feathers at different angles. I’ve wanted ever since to go back to South America with the specific objective of photographing hummingbirds properly, in flight, showing their colours, their variety and their flying skill.

In the intervening thirty-five years I’ve learnt a bit about high-speed photography. Hummingbird wing-beats can vary between ten and eighty beats per second. At the higher speeds, as you can imagine, the tips of their wings travel very, very fast. To ‘freeze’ this sort of motion in a photograph, a short flash duration of about 1/50,000 of a second is required. So in 2009, I came to Peru with my digital cameras, my high-speed flashes, and some electronic devices to trigger the cameras when the hummingbird was in exactly the right place.

Peru has at least 111 species of hummingbirds, distributed all over the country, sometimes in very limited ranges. Many species have found their own ecological niche at a particular altitude in the Andes mountains. In these cases, the map showing their distribution is like a long ribbon that follows a particular altitude along the eastern or western side (or sometimes both sides) of the Andes range. During my travels, I managed to see about twenty-five species of hummingbirds, and to get satisfactory pictures of fifteen species, over eight days, at three locations: San Pedro and Amazonia Lodge.

At Wayqecha, hummingbirds were plentiful; so were the Oreocalyx flowers on which they liked to feed. In fact the flowers were so numerous that there was no certainty a given flower would even be visited by a hummingbird during a given day.
I spent three days with cameras and flashes set up on ‘likely’ flowers, with no success. Then, following the advice of Panchito (the staff cook who is also a skilled birdwatcher and excellent photographer), I set up my gear on a different flower. On my last day at Wayqecha, I got two quite good photos of a Tyrian Metaltail. At last!

I made two further stops on my way back towards lowland jungle. These were the Cock of the Rock Lodge at San Pedro, and the Amazonia Lodge on the upper Rio Madre de Dios. Both provide well-maintained hummingbird feeders, and the birds come to them in a steady stream throughout the day. There was no shortage of feathered ‘talent’ for photos at either location. Prominent species at San Pedro were the Sparkling Violet-ear, the Many-spotted Hummingbird, and the Green Hermit. Two rather enchanting species to be seen there are the Booted Racket-tail and the Wire-crested Thorntail. Due to short beak-length, the Thorntails never came to the feeders, so I had to chase them with a telephoto lens for an opportunity at a shot. At Amazonia there were Jacobins and Hermits, Sapphires and Jewel-fronts, Wood-nymphs and Coquettes. In this case it was the Rufous-crested Coquette that never came to the feeders, but I had to try for it. Having set up the camera focused on a likely flower, I could do no more than wait and hope they would come. Eventually, against the odds, they did. The two or three pictures taken this way came out well.

My thirst for hummingbird photos was satisfied, for the moment. But I’m starting to think about eighty-six species that I haven’t seen yet....

Tyrian Metaltail (Metallura tyrianthina smaragdinicollis). Photo by Graham Anderson

Wirecrested Thorntail (Discosura popelairii). Photo by Graham Anderson

~Graham Anderson
STAFF AND COMMUNITY

New Staff Member: Sarah Carbonel
Sarah, a Lima local, recently received her bachelor degree from San Marcos University where she studied zoology with a focus on entomology. She now works at CICRA as a station assistant, while also aiming to complete her biology thesis. Sarah’s work focuses on the Cerambycidae, or long-horned beetle family; she is investigating host specificity of wood burrowing Cerambycidae species to different species of Sapotaceae trees.

Sábado Cientifico: Summary
Sábados científicos constitute an integral part of CICRA’s community outreach programs. This year, Sarah Federman, assistant to Adrian Tejedor, coordinated with the teacher at Boca Amigos to create lesson plans complementing the students’ scientific curriculum. The children are quite young, so classes have a strong emphasis on combining group work, games, and knowledge of local biodiversity with the aim of promoting a sense of communal pride and protectiveness over local flora and fauna.

Sarah Carbonel. Photo by Sarah Federman

Many times, classes are co-taught by volunteers and visiting researchers, which provides the students with a unique opportunity to see scientific investigation in myriad ways. Students often work in teams to solve questions, find and identify useful plants, or act out parts of an ecosystem; in this way we create a positive association between learning, the amazing natural world we live in, and play.

Sarah with the kids from sábados científicos. Photo by Alison Ravenscraft

NEWS

In October, the Minister of the Environment proposed a large decrease in the area of mining in Madre de Dios. His proposal was met with much opposition among local mining communities. Unfortunately for ACCA, a confusingly scaled map of the land privately owned by ACCA at CICRA, and the projected area of the corridor project, resulted in a mistaken belief by some that ACCA intended to buy vast quantities of land, in order to disenfranchise mining communities. Happily, after meetings with officials from the communities surrounding CICRA, and much help from Padre Pablo Zabala of Boca Colorado, community concerns were addressed and the maps were explained. Although distressing for all involved, the experience has opened the door for improving dialogue and greater-community-ties; an opportunity which we sincerely hope to take the most advantage of possible, as evinced by a group of students from Boca Colorado, who visited CICRA for a night and joined in one of our sábados científicos with great success. We hope to continue this trend with similar programs, not only with Boca Colorado, but other communities as well.

Sábado científico class. Photo by Alison Ravenscraft

Group shot of a class. Photo by Andrew Tilker
CICRA


Tobler, Mathias; Janovec, John P; Cornejo, Fernando. 2009. Frugivory and Seed Dispersal by the Lowland Tapir Tapirus terrestris in the Peruvian Amazon. Biotropica. 10.1111(1744-17429).

Wayqecha (Publication for 2008 and 2009)


**CICRA**

**Catharine Powell, Douglas Yu, Frank Azorsa**
Landscape genetics of ants associated with *Cordia*. University of East Anglia.

**Roxana Arauco** Ant assemblages in monodominant and mixed-canopy rainforests: exploring the role of trade-offs in the generation and maintenance of biodiversity. University of Utah.

**Aline Horwath** La biodiversidad y la ecofisiología de briófitos epífitos en un gradiente altitudinal. Cambridge University.

**Allen Lee** Guacamayos of the Western Amazon. Oxford University.

**Megan Frederickson, Antonio Coral, and Alison Ravenscraft** The economics of Ant-Plant mutualism in *Cordia nodosa* of the western Amazon. University of Toronto; Harvard University.

**Margaret Shrum, Rene Escudero, Luis Cueto, and Yevenor Arimuya*** The impact of mercury contamination on birds of prey in the Peruvian Amazon. Clemson University.

**Sarah Carbonel** Escarabajos longicorneos asociados a las Sapotáceas en CICRA. Universidad Nacional Mayor de San Marcos.

**Sarah Federman** Disperser response to anthropogenic disturbance of riparian succession in western Amazonia. Princeton University.

**Varun Swamy, Cesar Vela, Ronald Suca, Walter Flores Casanova, William Tarque**. Successional regeneration and seed rains in a flood-plain of the Western Amazon. Duke University.

**Renata Leite Pitman, Emeterio Nuñecca, and Andrew Tilker** Unraveling the secrets of the short-eared dog (*Atelocynus microtis*). Duke University.

**Mini Watsa, Gideon Erkenswick, Rhea Mac** Chimerism and population genetics of saddleback tamarins, *Saguinus fuscicolliis weddelli*. Washington University.


**Oscar Vilca** Artist in Residence

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**Wayqecha**

**Huw Lloyd** Abundance and resource partitioning by birds across a dynamic Andean tree-line. Manchester Metropolitan University

**Yadvinder Malhi** Detail assessment of Carbon dynamics along a tropical altitudinal transect. Oxford University Centre for the Environment (*")

**Lianka Cairampoma Barrós** Diversity of *Besleria* L. (Gesneriaceae) in the cloud forest of the Wayqecha biological station and its implications for floral morphology and pollinator attraction. Universidad Nacional Mayor de San Marcos.

**Norma Salinas** Ecophysiological characteristics of forests and climate change in the tropical Peruvian Andes. Oxford University.

**Kathryn Clark** An investigation of the frequency of landslides and the transport of carbon in sediments in the cloud forest of the Peruvian Andes. Oxford University. (Kathryn is also performing part of her study at CICRA).

**Gustavo Londoño** Physiological and behavioral response on avian incubation rhythm along an Andean elevation gradient. University of Florida.

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Frogs of the genus *Bryophryne* at Wayqecha. Photo by Adrian Tejedor

A glass wing butterfly (*Cithaeria* sp.) at CICRA. Photo by Sarah Federman
About the Stations

CICRA is ACCA’s field station in the Amazon Basin. Founded in 2000, CICRA has aided the research of almost 200 projects. CICRA’s purpose is to protect the world’s richest forest by facilitating research and thus a better understanding of this fantastic system’s function; promoting conservation and environmental education; creating space for dialogue between conservation ideologies and local communities with the aim to integrate human activities and the protection and appreciation of the forest in a sustainable manner.

Wayqecha is ACCA’s cloud forest field station founded in 2006. Since its inception, Wayqecha has hosted numerous scientific investigations. Wayqecha is managed out of ACCA’s Cuzco office and seeks to conserve the fragile cloud forest ecosystem while at the same time fostering community relations.

Note from the editor:

Dear reader,

Welcome to the new “Letter from the Amazon.” I hope that you have enjoyed this first attempt at a new formatting style. In this letter myself and the contributors hoped to introduce you to the research, recent publications, and community affairs at both CICRA and Wayqecha, while allowing for multiple narrative voices to be heard. It is my aim that subsequent publications of the letter will provide you, the reader, with the opportunity to follow the news of events and the work being carried out at our stations in a more interactive manner. Thank you for reading!

Until next time,

Sarah Federman
Amazon Conservation Association
Princeton in Latin America fellow, CICRA

Special thanks to the contributors: Adrian Tejedor, Renata Leite Pitman, and Graham Anderson. Also, thank you to Laura Morales and Carmen Giusti for providing information on the research being carried out at Wayqecha, to Sarah Carbonel for her help with the translation of this letter, and to Nigel Pitman, Amy Rosenthal, and to Miguel Morán for their helpful comments.