

SPECIAL POINTS OF INTEREST:

- 2015 World Lemur Festival
- Support at Macolline Botanical Garden Begins
- First Duke Global Health Initiative Collaboration

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Duke **LEMUR CENTER**
SAVA CONSERVATION
M a d a g a s c a r

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Conservation news from the Sambava-Andapa-Vohemar-Antalaha region of NE Madagascar

US Ambassador and Prime Minister of Madagascar Visit SAVA Conservation

by Lanto Andrianandrasana

On November 10, Duke Lemur Center SAVA Conservation was very honored to host US Ambassador to Madagascar, Mr. Robert Yamate, and the Prime Minister of Madagascar, Mr. Jean Ravelonarivo. At the official ceremony, SAVA Conservation director Dr. Erik Patel, and project manager, Lanto Andrianandrasana, spoke briefly about the main activities of SAVA Conservation, followed by a short question and answer period. We then proceeded to the main focus of this visit, which was the donation of 93 quality raincoats from the US Embassy to the CLP guards, who work with the MNP park agents and are very important for the protection of Marojejy National Park. Ambassador Yamate emphasized the importance of the engagement of local populations for the protection of the parks and reserves in Madagascar. Here is an excerpt from his speech: **“The protection of Marojejy National Park and the other protected areas in the country cannot be done by the government and law enforcement alone. It requires the engagement of the local populations, of residents such as the many who are present here today, because ultimately this is your country, your heritage, and your lives that are threatened when protected areas are encroached upon, and natural resources stolen. I commend you for your commitment.”** Prime Minister Ravelonarivo made a short speech to say that the Malagasy government makes protection of the environment in Madagascar a priority, and he thanked the US Embassy for their support in all aspects. The ceremony was closed with a cocktail hosted by SAVA Conservation. The US embassy team accompanying Ambassador Yamate are listed here:



Erik Patel showing Ambassador Yamate the raincoat logo, with Prime Minister Jean Ravelonarivo.

- Mr. Luke Zahner, Public Affairs Officer
- Mr. Daniel Whyner, USAID Natural Resources Advisor
- Mr. Salvador Molina, Political Officer
- Mr. Handrimalala Raveloson, Press Assistant
- Ms. Mirana Rakotoarison, Political and Economic Assistant

US Ambassador and Prime Minister Visit Continued



Logo and credit on each raincoat.



Post-ceremony refreshments hosted by SAVA Conservation.



MNP CLP guards wearing their new raincoats.

Although Ambassador Yamate had to return quickly to Tana, on the following day the staff members of the US Embassy went to Manantenina to meet with Marojejy guides, porters, cooks and villagers to discuss the protection of Marojejy National Park. People talked about their challenges for the protection of Marojejy which are primarily poverty and lack of education. People who go inside the park to destroy it don't understand the law and they think it's the only way to survive, so they asked support for their livelihood. Luke Zahner of the embassy encouraged people to discuss with their deputy (representative) about their problems because that is part of their responsibility at the assembly – to listen to their people and try to find solutions to their problems. After a long discussion, the US Embassy staff walked through Manantenina to see the village and meet local people. In the afternoon Guy Tam Hyock, the president of the APPA association and SAVA Conservation collaborator for fish farming, invited us for lunch after watching the film about SAVA Conservation's fish farming project in Andapa. The group visited Guy's fish ponds, then at the end of the afternoon the visitors explored from a higher view, the beauty of the green rice fields of the Andapa basin. On November 12 Dan, Salvador, and Erik visited Antanetiambo nature reserve, and Luke did an interview with the local radio channel in Andapa. They all returned to Sambava the same day. DLC-SAVA Conservation was very pleased to host the US Ambassador, Embassy staff, and Prime Minister. The visit raises SAVA Conservation's profile both in the region and nationally.



Ceremony at SAVA Conservation office, L to R MNP Marojejy/Anjanaharibe Sud director, André Mboly, Ambassador Yamate, Lanto

A Tale of Bumpy Roads, Flooding, and Hibernation

by Dr. Marina Blanco

We had anticipated that our adventure was going to begin once we were in the forest, trying to find and capture one of the hibernating lemurs from the top of a thick and slippery tree. In reality, all began in Antananarivo, the capital of Madagascar, while patiently waiting for our flight to Sambava (closest town, with an airport, to get to Marojejy National Park). Air Madagascar, the only available domestic airline, had been on strike for a few days, but every day we were in “Tana”, our hopes were renewed with optimism, only to be crashed again a few hours later: “there may be a flight tomorrow, call tonight at 7pm” they told us at the Air Madagascar office, day after day. As our days continued to pass by while we were secluded in a quiet hotel near the airport, we made the difficult decision to take the painful way to the forest. We would leave behind our hopes for the 1h 30 min-flight to Sambava and take the road north, with 4x4s, and spend the next 3 days in bumpy fashion. The first two days we covered ~940 km, the third day ~300km in 15 hours. The bed at the Sambava hotel never felt so good that last night.



The challenging road to get to the SAVA.

Our research team was comprised of Dr. Peter Klopfer, emeritus professor at Duke and leader of the hibernation research project, Wade Hubbs, Duke undergraduate student, assisting with data collection, Carly Pate, volunteer from Washington State, Jean Basile Andriambeloson, student assistant from University of Antananarivo, Parfait Rafamatanantsoa, tree climber and long-term field assistant from Tsinjoarivo, Primot, a local Marojejy guide, Lex, the cook, and myself. We all gathered for the expedition on Tuesday morning, July 14th, after a day of intensive shopping and equipment arrangement. We drove for 1.5 hours to Marojejy National Park Kiosk in Manantenina, where we picked up our 29 porters (for a week-long mission) and hiked for about 2 hours to our low-elevation site on the east side of the Park. We set up camp under a refreshing light rain, if we had only known that heavy rains will accompany us for the whole expedition...

My last news from this site, from a short mission I had conducted in late May 2015, indicated that 5 radiocollared greater dwarf lemurs (*Cheirogaleus major*) were already hibernating up in trees, unlike other eastern dwarf lemur species (*C. crossleyi* and *C. sibreei*) we had previously studied at other eastern sites, which hibernated underground. This immediately posed an additional challenge. Would we be able to get those hibernating lemurs –any of them– to study their physiology during our mission? That’s why Parfait was there with us. Our tracking of radiocollared dwarf lemurs on the day of our arrival, was a little puzzling. One of the collars was found under water, bad news; signals from 3 of the remaining collars came from the top of trees, as expected; one of them, however, pointed down, near tree roots. I was hesitant to believe there was an actual lemur there, because there was no precedent of a greater dwarf lemur hibernating underground. We returned to camp that afternoon with some trepidation about this individual and prepared our gear for the following day. The gear involved wires, cables, computer, bags and other lab supplies all covered in plastic.

Our fears were unfounded. We “unburied” the furry ball and began the operation. Electrodes were placed under the scalp and securely taped – an experimental box awaited the just-aroused lemur. We kept our fingers crossed that our lemur would eventually go back into hibernation without disconnecting the wires in the process. As we

A Tale of Bumpy Roads Continued

placed the box in the same place the dwarf lemur was originally retrieved from and connected all the cables, we felt the rain falling and washing our sweat, and the cloud of mosquitos following us around and wondered, once again, why a lemur would hibernate in such a place. For the next few days we read through the computer files and identify brain electric activity. Skin temperature (recorded by the radio-collar) showed that the dwarf lemur was reluctant to go back into hibernation and, when he finally did so, he happened to detach the last cable, almost like a last desperate action before turning torpid. We did collect some sleep and heart rate along with temperature data, however.



Crossing a small river on the way back – Dr. Peter Klopfer and Primot.

Our drastically shortened mission – thanks to Air Madagascar – did accomplish one goal, to show “proof of concept” (that we can find a lemur in this habitat and collect EEG and temp data). We spent the last day in the forest gobbling up the last few kilos of rice and beans and preparing the gear to return to Sambava on the following morning. On July 20th, the day of departure, porters arrived with news of flooding around the area. On our way in, we had to cross streams more than 40 times, most of them rocky beds with little water. To be cautious, we divided into two teams and placed experienced guides in charge of finding the best way back. We all had underestimated the effect of the continuous rain over the last week. It took more than twice as long to get back and several crossings at waist, even breast height. The tricky current of some crossings provided an unexpected dose of adrenaline rush.



Monitoring EEG data in the field – individual is inside experimental box underground.

As we were back in Sambava, walking by the beach, our feet sinking in sand while foamy waves were disappearing in shiny fashion, we reflected on our precarious, yet unprecedented data. We demonstrated that greater dwarf lemurs still hibernate in humid, warm low elevation forests, that they can hibernate up in the trees but also underground occasionally, and we “proved” that they can be studied using our methodology. In the end, our scientific “stubbornness” only grew stronger. Why would these large dwarf lemurs (700g) hibernate in these humid warm forests? Was it the genetic heritage of their ancestors? The evolutionary “burden” to get fat as quickly as possible? Once they become a big mass of fat, it would be detrimental not to hibernate (imagine an overweight dwarf lemur trying to jump across branches in the highest canopy level). The most pressing question for us was to determine whether these lemurs, hibernating at relatively warm temperature throughout the day and winter time would need to “arouse” in order to satisfy physiological needs or would they be able to passively maintain relatively warm

A Tale of Bumpy Roads Continued

temperatures without the need to undergo energetically costly arousals. If that were the case, what is the temperature threshold? What would the brain activity, heart and metabolic rates look like? We'll definitely need to try again.



Our dwarf lemur freed of all wires and ready to be released.



Research team. L to R – Lex, Parfait, Basile, Primot, Wade, Peter, Marina, and Carly.

2015 World Lemur Festival Celebration

by Joxe Jaofeno

World Lemur Festival (WLF) day was officially on 29 October, and on the following Saturday Duke Lemur Center SAVA Conservation organized a first ever WLF celebration in Andapa. As a motto, we chose " Lemurs are a great attraction for tourists which are an important source of income and also a great flagship for forest protection and reforestation". All the environmental organizations were present, such as WWF, MNP, WCS Makira and local NGOs like Toham-pontsy. We joined together in this event in an effort to raise local awareness about the importance of the lemurs both for their contribution to forest regeneration and their value as source of income for local people in terms of ecotourism, and the necessity of protecting them. We launched the message through Radio and TV first, to invite all people, from authorities to students, to join us for the event. On 31 October 16 representatives of NGOs, Associations and schools paraded around Andapa showing their support for lemurs by dancing and singing as the parade wound its way along the crowded streets. There were about 900 people participating in the parade. The authorities and some organization representatives spoke to emphasize the message behind such an event. In the afternoon, we continued with different activities, all related in some way to conservation, the environment, or lemurs. In the dance contest there were 18 participating groups. The poetry was about conservation and lemurs and was presented by 10 different school children. 35 students participated in drawing the lemurs of their choice. A Radio crochet (Question and Answer) was also another activity presented during this event. Every participant received a gift, ranging from pens and copy books to t-shirts.

The ambience was extremely positive and people are eager for next year's celebration!



World Lemur Festival Continued



Yam and Taro Trainings

by Charlie Welch

SAVA Conservation continues to support the cultivation of yams (*Dioscorea* sp.) and taro (*Colocasia* sp.) as alternative crops to slash and burn rice and manioc. In November Joxe facilitated another training, in the Marovato Andapa Commune, which includes 5 villages. The training was over three days and included both classroom and field instruction, and was attended by 29 villagers. The yams are best adapted for slopes and drier soils, and can be quite large, maturing at 20lbs to 40lbs. Taro can be grown in wet and even flooded conditions, and produces an edible root or corm. It is the same plant that we in the US know as elephant ears, which is planted as an ornamental. Training and assistance in alternative crop production is an important component of conservation, where unsustainable subsistence techniques, such as slash and burn, are being used.



Preparing for planting.



Plantation of yaro.



A harvested yam.

Support of Environmental Education at Macolline Botanical Garden Begins

by Charlie Welch

As mentioned in the vol. 3, no. 3 newsletter from last year, SAVA Conservation has been planning to extend environmental education to Antalaha, in the southern part of the SAVA region, through support of organized school visits to Macolline Botanical Garden. That collaboration has now begun with the startup of SAVA sponsored class visits to Macolline in November. The class tours of the botanical garden and interpretive center are given by experienced guides, and include preparatory and follow-up meetings and discussions with the students. The collaboration is an exciting expansion of SAVA Conservation environmental education objectives in the region, and we are very pleased to be working with Macolline owner operator Madame Marie Helene Kam Hyo, and her dedicated assistant Joey Moscovitch. We fully expect the



Instruction in the Macolline interpretive center.

partnership to grow over time, and are pleased to know that youth of Antalaha and surrounding area will now be exposed to environmental education, in what is a critical part of the SAVA region.



A class on a visit to Macolline.

Botanical Survey in Marojejy

by Charlie Welch (from MBG Report)

By working with collaborators and partners, SAVA Conservation is able to achieve much more in terms of conservation, than if we tried to do everything ourselves. In that Madagascar is a priority 'biodiversity hotspot', many conservation organizations are active in Madagascar, which presents frequent opportunities to collaborate. Missouri Botanical Garden (MBG) personnel were engaged by SAVA Conservation to carry out a botanical survey in a remote sector of Marojejy National Park, in the zone around borne 37, during the drier months of October/November. The area was already known to be one



Richard taking a GPS reading, with the survey team.

where deforestation and even burning for cultivation had occurred in the past, and the MBG survey demonstrated that to be true. The professional MBG team used 5 botanical plots and 9 transects in a sampling of the vegetation of the area. In all, 135 plant species were identified, in a mosaic of primary and secondary forest, and including also some open areas of herbaceous vegetation. If all had been primary forest, more total species would have been expected.

The choosing of the borne 37 zone for the survey was not random. We knew there were problems of intrusion into the reserve in that area, as there was no shortage of evidence of cutting over time. The botanical study was a useful method to demonstrate to our collaborators at Madagascar National Parks (MNP) the problems in that part of the park. As a result of the study, MNP has already carried out investigative action in that part of Marojejy. Also, the botanical study provides a good baseline for the existing flora in the area, which would be extremely useful if forest restoration efforts are undertaken at some point in the future.

We are very grateful to Richard Randrianaivo of MBG, and Jacky Andriatiana of Parc Botanique et Zoologique de Tsimbazaza for their diligent work in carrying out the survey. Richard and Jacky were accompanied by both MNP and DLC-SAVA Conservation contract personnel.



Pressing plant samples.



Richard with plant samples in a press to dry.

Project Support Report

Fiscal year 2014-'15 was again successful year in many ways for DLC SAVA Conservation, and that includes fundraising. We are very pleased to report that through the generous donations of individuals, foundations, and institutions, in addition to grants. SAVA Conservation was funded independently, and without reliance on direct DLC operational funding. We cannot thank our donors enough for their generosity and confidence in our ability to bring meaningful conservation and progress to the SAVA region of northeastern Madagascar.

The three year Helmsley Charitable Trust grant continues to be a critical driver of the project, but all of our donors and supporters play a crucial and indispensable role in ensuring the continuity of important project activities. We will continue to seek new support for our conservation work, and with the help of DLC's capable and enthusiastic development team of **Niki Barnett** and **Janice Kalin**, and grant writing assistance from **Valorie Sterling Cook**, we believe that the future of funding for SAVA Conservation continues to be bright.

Once again, a heart-felt thank you to all who have supported us in the past, and continue to support us now and into the future – we could not do it without you.

Donations can be made at <https://www.gifts.duke.edu/?designations=Duke%20Lemur%20Center>
Please be sure to designate the donation to SAVA Conservation.

SAVA Conservation Supporters

2014/2015 Fiscal Year (July 1, 2014-June 30, 2015)

Major gifts

Mrs. Alexandra and Dr. Bill Anlyan *through the Alex Donor Advised Fund*
 Dr. Jelle Boersma/Black Rhinoceros Foundation
 Dr. Allan Chrisman and Mrs. Polly Van de Velde
 Dr. Marianne Jackson
 Dr. Clint and Mrs. Missy Kelly
 Mr. Barry Menne and Mrs. Mary Menne
 Dr. Sara Miller and Dr. David Howell
 Mrs. Nancy Raposa
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Other annual giving

Anonymous
 Ms. Darlene Benzon
 Ms. Chris Caufield
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Other annual giving (Continued)

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 Seneca Park Zoo docents
 Simpona
 South Carolina Aquarium
 Terra Incognita Ecotours
 US Embassy in Madagascar

SAVA Conservation Grant Support, Past and Present



An Unusual Story — Back to the Homeland

by Priscilla Toto



Priscilla at the Marojej mountain summit, with DukeEngage students, Audra Bass and Allison Rogers.

Since leaving Madagascar in 2009 to pursue my studies in the U.S., every time I get the chance to spend the summer break at home, which has been every two years, I try to make myself useful in some ways. My first time returning home in 2011, I spent some time tutoring students in English at my alma matter Lycee Prive Orchidee; my second time returning home in 2013, I spent a month working with Catholic Relief Services in Tana; this past summer, although it was brief, I came to learn and know about the work of Duke Lemur Center's SAVA Conservation. To introduce myself and my intentions of lending a hand in any way possible, I sent out an email hoping for the best, but not expecting anything. However, Charlie Welch and Erik Patel both warmly responded expressing their surprise to learn that a Malagasy student from the SAVA region was studying at an American college. Naturally, they asked me about how I ended up in the States.

It has been six years since I arrived in the States, yet I have not found the right way to answer the question of how I got to where I am today. Some people say it is luck, others say it is fate or destiny, while others say it is God's will. I personally believe it to be a combination of all that. In any case, here is the story.

When I was five years old, my village of Nosiarina welcomed a Peace Corps Volunteer from the United States. Her name was Jalana, and she was to live in Nosiarina for two-and-half years. Jalana became close friends with my mother and me. Unlike other Malagasy children, I was not afraid of her (as a foreigner). I was rather fascinated by her appearance, her lifestyle, and everything she did for our community and its surroundings. She treated my friends and me kindly by allowing us to look at her picture books, to draw pictures with her multicolored crayons, and to listen to her read in her native English language.

Before leaving Madagascar in 2001, Jalana and my mother came to an agreement to send me to a private school in Sambava, which had an excellent reputation. I attended this private school for six school years, from fourth to ninth grade. My family and I kept contact with Jalana, throughout those years by writing letters, occasional phone calls, and a couple of visits from her, bringing relatives each time. After passing my BEPC in the summer of 2009, she came to Madagascar, with her sister and her husband, and they brought me back to the US. I started to attend American high school as a tenth grader at the local Yellow Springs High School, but finished the rest of my high school years at a private school in Dayton Ohio. I now attend the College of Wooster, also in Ohio, from which I will graduate this coming May.

For my third visit to my home in the SAVA this past June, there were no volunteer opportunities with SAVA Conservation at the time of my visit, but Erik and Charlie still found

An Unusual Story Continued

ways for me to be involved with the project. The first occasion was a visit to Marojejy National Park with Audra Bass and Allison Rogers, Duke University students who came to Madagascar with the DukeEngage program. Although I had never visited Marojejy before, accompanying students with biology or evolution research background had its advantages. And the fact our tour guides, Jackson and Rabary, were both living nature encyclopedias did not hurt either! Their passion for nature and conservation made me appreciate everything Marojejy offered a lot more than if we had gone without a quality guide. A scene that left a strong impression on me from that trip was the view from the mountain summit. Not only because the view was breathtaking, quite literally since we were all (except for Jackson) out of breath when we reached the summit, but also because I could see how much of forest had been cleared. There was a stark difference between where people lived and the protected area of the park. At that moment I was very grateful to know that projects like SAVA Conservation existed in the SAVA region to protect forest and provide environmental education to the people there.

The second occasion for me to work with SAVA Conservation was when they organized a field trip for the students from the CEG school in Nosiarina, to visit Antanetiambo Nature Reserve. On this field trip, the students had the chance to see some Bamboo Lemurs and other species in the Reserve, and ended with an inspiring speech from Rabary on the importance of conservation. Following the reserve visit, we watched a BBC documentary translated into Malagasy, on Madagascar's biodiversity. At the end of the movie, there was a short Q&A session, led by SAVA Conservation environmental education coordinator, Joxe, to see how the students responded to the movie and the whole trip in general. It was very exciting for me to see how involved and enthusiastic the students were throughout the whole trip. I always remember Malagasy students to be very shy, especially when they are put on the spot. Although everyone was tired at the end of the day, the car ride home was still very animated with discussion about what they learned and singing along to the radio.

Like the students, I also learned a lot from the trip. Speaking for the majority of Malagasy people, we really do not know or understand the value of our environment and we take it for granted. For the students who came on the field trip and other children, especially those in the countryside, a walk in the forest is not something to do for fun, but rather it is a chore. In such a relaxed and fun environment, the students were able to learn and appreciate the value of the things they see on daily basis. At least, that is what I hope they got from the trip. Personally, the field trip was a great way for me to reconnect with the current students of Nosiarina, especially now that my friends have all left to continue their studies elsewhere as well. I feel as if I have grown further and further away from the younger students in my hometown and I really wanted to find a way to interact with them. This environmental education field trip was the perfect way to start.

The short time I spent with SAVA Conservation gave me a little glimpse of the larger work they do in the SAVA region in promoting environmental conservation. Ever since my first visit home after being gone for two years, I have developed an interest in international development as a career choice. A lot of the choices I have made in college all revolve around my goal of one day entering the development field. What I find intriguing about development is its flexibility; one can choose to work in education, health, conservation, and many more areas. Thanks to SAVA Conservation my interest in development as a career choice has not only deepened, but I also believe I am getting closer to choosing which specific field to pursue as I plan my post-graduate career.



Silky sifaka in Marojejy.

Photo by Steve Coombs

DUKE CONNECTIONS

Teaching and Learning in the SAVA

by Allison Rogers

While studying abroad in South Africa during the fall 2014 semester, fellow Duke student Audra Bass and I listened to a guest lecturer speak passionately about the biodiversity of Madagascar - we listened when he urged us to see it for ourselves. We excitedly contacted Charlie Welch and Dr. Erik Patel, knowing that a Duke Engage Independent Project with SAVA Conservation was our best option for immersing ourselves in one of the world's most remote biodiversity hotspots. As an Evolutionary Anthropology major with a background in environmental education, Madagascar has always been on my radar - it's a prime example of the disconcerting clash between rapid human development and primate conservation. I was especially interested in how community-based conservation projects were contributing to both the improvement of human livelihoods and the protection of Madagascar's wildlife. SAVA Conservation really was a perfect partner for me, especially because they were looking for more environmental education support for the summer of 2015. Audra and I learned that our job would be to develop better written materials to facilitate the learning process for students visiting the Antanetiambo Nature Reserve or Marojejy National Park.

Matsoke was our home for eight weeks as we contributed to SAVA Conservation's work in the community. I arrived about two weeks earlier than Audra and quickly acclimated to the simplicities of rural life. I tagged along with



Audra with students preparing to show the BBC Madagascar nature film.



Allison and young student planting a tree at Antanetiambo Reserve.

Jackson and Rabary for those first couple weeks, which allowed me to learn more about the community and to get a feel for their role with SAVA Conservation. I got to spend several days in Antanetiambo Nature Reserve observing the bamboo lemurs, and accompanied a couple of school groups on visits in the reserve. One of my favorite memories comes from assisting in the annual fish harvest - we harvested a couple thousand fish by hand, and my first catch earned me quite a few cheers from the locals! Once Audra finally arrived, we set to work writing informational fact-sheets about various topics like Antanetiambo, lemur conservation, and sub-fossil lemurs. These sheets will later be translated to Malagasy and used to supplement school visits. We also arranged student visits to the reserve and hosted screenings of a BBC nature documentary about Madagascar. The documentary screenings were an especially huge hit, with dozens of people cramming into the

library or leaning in through the windows to see the film. We learned that the interest in environmental education is there; it's just a matter of providing the means to that education.

Aside from our actual work, Audra and I had the pleasure of fully immersing ourselves in the Malagasy experience. As much as I tried to cram French, I left the country knowing more Malagasy than I ever expected. We attended a wedding and had the taxi-brousse (bush taxi) experience. We learned about the crucial role of agriculture in Malagasy life, and even tried our hand at harvesting coffee and planting beans. We saw the beautiful silky sifaka, and even summited Marojejy; a stale loaf of bread has never tasted so good as from the top of that mountain. We both finally were able to spot chameleons, though we'll never be as good as Rabary, Jackson, or even our host mom Valerie. Overall, I saw firsthand what I'd been learning in the classroom: conservation is complex, and requires the community to see it as investing in the future. By the end of the summer, we may not have left a lasting impression on Madagascar, but I know Madagascar left a lasting impression on me. *Veloma* for now, but hopefully there's another *salama* in my future!

Shining Evolutionary Light on Global Health Challenges:

Assessing Human Health in Rural Madagascar

by Melissa Manus

A simple equation:

289 samples + 20 humans + 11 Duke researchers + 10 cattle + 7 plane rides + 6 Malagasy support staff + 2 months + 1 village = my summer in Madagascar.

I am a masters student at the Duke Global Health Institute. With a background in ecology and evolutionary biology, I am accustomed to compartmentalizing my experiences and processing them in a logical manner. Similar to the way clear-cut taxonomies and phylogenies dominate these academic fields, I'm inclined to summarize my fieldwork experience by grouping variables and building simple equations. However, this method fails to capture the details-- the people, ideas, challenges, and solutions -- of a summer driven by cooperation and adaptation.

Through Duke's Bass Connections program, I joined my advisor, Dr. Charlie Nunn, and a team of Duke researchers in Mandena, Madagascar. Mandena is adjacent to Marojejy National Park, where many SAVA Conservation activities take place. Here, we ran a series of pilot projects that used an evolutionary framework to investigate health burdens in the area. Our research questions were based in evolutionary mismatch, the idea that today's environment is drastically different than the one in which we evolved, resulting in health problems worldwide. This framework is relevant to Madagascar, a country with recently increased exposure to aspects of Western culture. This includes diet and for some, reduced activity levels, which can lead to an increase in the burden of non-infectious diseases.

The team included Dr. Daniel Schmitt, postdoctoral researcher Dr. David Samson, medical students Ashley Sobel and Temini Ajayi, and undergraduate students James Yu, Rachel Clark, Taylor Trentadue, and Anna Willoughby. Each student had ownership over specific aspects and was responsible for planning and executing the projects on the ground. We were supported by local Malagasy assistants, as well as the Duke Lemur Center's SAVA Conservation project.



Melissa taking a skin swab of a zebu.



Melissa and Taylor measuring blood pressure.

My research including collecting skin swabs from humans and zebu (the local cattle) in Mandena. Ongoing analysis of these samples back in North Carolina will allow me to characterize the microbes living on human and zebu skin and investigate microbial sharing, with potential implications for susceptibility to mosquitoes and associated diseases. I was also able to assist with other projects, which included characterizing sleep patterns in a non-electric population, investigating respiratory health and air quality associated with traditional cooking practices, assessing dental and cardiovascular health,

Shining Evolutionary Light on Global Health Challenges *Continued*

and quantifying musculoskeletal health and stressors on lower limb function. We found that like westerners, the Malagasy villagers also get very little sleep - an average of 6.5 hours per night - and that many people (31%) present with surprisingly high blood pressures, despite few obvious risk factors. Additionally, we found that tooth decay and loss are associated with sugary diets, and that people in this community exert unusual forces when walking -- patterns only previously seen in paraplegics and amputees. It is our hope that continued data analysis and return trips to Mandena will further explore these patterns and provide realistic options for improving community health.

Despite months of planning, this summer was filled with unexpected twists, and the days often ended with more questions than answers. In the absence of electricity and reliable storage conditions, would our samples survive temperature fluctuations in the field and during the long trip back to the US? How would we find hundreds of participants for repeat data collections when we often had no more information than their first name? And why was my tent constantly filled with hundreds of ants, despite obsessive cleanings?

This takes me back to the importance of cooperation and adaptation during our stay in Mandena. These projects would not have happened without team collaboration and unwavering dedication from our Malagasy research assistants. Such is the beauty of field work that much of our preparation in the US was futile. The most crucial decisions were made in the moment, by candlelight, over Malagasy beer, and with no internet or external resources. Being able to adapt to realities on the ground is a hallmark of fieldwork and generates fantastic ideas, innovative strategies, and wonderful memories.

No project can be successful without buy-in from the participants. Often, people are compensated for their participation in these types of studies. In our study, participants were given fresh, local coconuts. Participants not



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only found this comical, but the gesture seemed to motivate them to return for subsequent data collection days. The coconuts quickly became a symbol-- it let friends and family know that you had put up with the foreigners swabbing your armpit, connecting nodes to your skull to measure brain activity while you slept, and digging holes around town to bury a massive metal plate used to analyze your walking strides. But it also became a symbol of cooperation. It represented

an endeavor to connect across different cultures, languages, and backgrounds over the shared goal of better understanding and treating health ailments.

Despite my natural tendency to let logic and order dictate my experiences, much of this fieldwork season was driven by surprising circumstances, reactionary decisions, and allowing the natural rhythms of the field dictate our progress. Every field experience is an opportunity to challenge current views, strengthen research skills, and learn patience and appreciation for the process. For these opportunities, I am indebted to the creativity of our research team, the support of our assistants in the village and from SAVA Conservation, and the open-minded and engaging nature of the people of Mandena. Thank you all, and we can't wait to return!



Locomotion testing.

Closing Comments—A Major Personnel Change for SAVA Conservation

SAVA Conservation is about to undergo an important personnel change. As of January 1, 2016, we will be welcoming Dr. Marina Blanco to the position of SAVA Project Coordinator. Marina, already a DLC post-doc, has been working for the DLC for the past three years as our research liaison in Madagascar. You may remember seeing her dwarf lemur and mouse lemur research articles in past newsletters (and in this issue as well), and she is published in scientific journals. We look forward to working with Marina as she helps guide SAVA Conservation into the future.

Dr. Blanco will be stepping into the leadership role that has been defined by Dr. Erik Patel. After serving as Project Director for four years, Erik will be leaving the project at the end of this year, to follow new opportunities and career ambitions. We have much to thank Erik for, and we are indebted to him for jumpstarting such a complex project to the dynamic multi-faceted operation that it is at present. We would not be where we are today without Erik's dedication, knowledge, experience, and above all, his hard work. We wish Erik all the very best in his future pursuits, and we are pleased those will include continued research on the silky sifakas in the SAVA region. There will hopefully be occasions for us to collaborate in the future.

From all of us at DLC and SAVA Conservation, a heartfelt thanks to Erik, and very best wishes for the future!



Erik with project collaborators, Jackson and Desiré Rabary, in Marojejy.

Photo by Jen Crick

Charlie

The SAVA Conservation Team

Charlie Welch – DLC Conservation Coordinator

Dr. Marina Blanco – SAVA Conservation Project Coordinator

Lanto Andrianandrasana – SAVA Conservation Project Manager

Joxe Jaofeno – SAVA Conservation Environmental Education Coordinator

Miaro atiala, mamboly fiainana
 “Protect the forest, and life will grow”