

Amigos

Newsletter

No. 78, November 2012



Wilson Botanical Garden
Las Cruces Biological Station
Apdo. 73-8257 San Vito, Coto Brus, COSTA RICA



**Organization for
Tropical Studies**

Who We Are

The Las Cruces Biological Station is one of three tropical field stations owned and operated by the Organization for Tropical Studies (OTS) in Costa Rica. Along with the Wilson Botanical Garden, Las Cruces was acquired in 1973 and is a hidden jewel that offers natural history visitors and researchers alike an extraordinary place to visit and conduct research.

Far from the noise and bustle of the country's capital city San José, Las Cruces is located in the remote southwestern corner of the country between Corcovado National Park on the Osa Peninsula, and the enormous La Amistad Biosphere Reserve (472,000 hectares) that spans south-central Costa Rica and western Panama. In 1983, UNESCO declared Las Cruces and the Wilson Botanical Garden part of the Reserve due to its incredible diversity and proximity to La Amistad.

The Wilson Botanical Garden, founded in 1962 by Catherine and Robert Wilson, is arguably the most important botanical garden in Central America and a "must see" stop on the itineraries of plant lovers, birders, and other natural history groups. It is famous for its worldwide collection of tropical plants which include palms, aroids, bromeliads, gingers, marantas, heliconias, and ferns. More than 3,000 exotic species of plants can be found in the 10-hectare (~25-acre) garden, including one of the largest collections of palms in the world.

There is an incredible diversity of animals at Las Cruces, and in the immediate area surrounding the station. The most recently updated bird list includes 410 species; close to half the number of birds found in all of Costa Rica. There are also over 100 species of mammals, of which 59 are bats. Some of the more commonly sighted mammals include agoutis, white-faced capuchin monkeys, kinkajous, olingos, and tayras. Reptiles and amphibians also thrive in this moist, cloud-laden habitat and there is an impressive diversity of insects, and in particular moths and butterflies.

Las Cruces protects over 200 hectares of primary forest (home to over 2,000 native plant species) and several smaller adjacent areas that are in various stages of forest recovery. The forest is surrounded by a mosaic of mixed-use agricultural fields and forest patches, and it is this fragmented setting that makes Las Cruces an ideal place to study the effects of forest fragmentation and isolation on animal and plant communities. The landscape surrounding Las Cruces is also ideally suited for research on biological corridors and restoration ecology; key fields of research that are of ever increasing importance. Part of our mission at Las Cruces is to continue to purchase land for reforestation and, in doing so, expand our protected areas and connect some of the isolated forest fragments around the station. For further information on this campaign please visit our website.

At approximately 1,200 meters elevation (3,900 feet), the prevailing temperatures at Las Cruces are cooler than one might expect. Temperatures range from 21-26 °C (70-80 °F) during the day and 15-21 °C (low 60's) at night. Mean annual rainfall is ~4,000 mm (157 inches)! The dry season runs from January – March, and the rainy season from May – November. Most visitors and researchers come during the dry season.

The station is well known for its visitor-friendly amenities: comfortable private sleeping quarters, delicious meals, knowledgeable and enthusiastic staff, and a well-maintained network of paths and

trails. We also provide internet access to overnight visitors.

The nearest town is San Vito, the capital of Coto Brus County. It was settled in the 1950's by Italian immigrants and to this day there is a strong Italian presence. There is an excellent pizzeria, and the Dante Alighieri Italian-Costa Rican Community Center provides language instruction. Indeed, Coto Brus is the only county in Costa Rica where Italian forms part of the elementary curriculum!

We invite you and your family and friends to come visit us for an afternoon, an overnight stay or a week to see and experience firsthand the splendid tropical diversity of the Las Cruces Biological Station and Wilson Botanical Garden.

For more information please visit the OTS website at <http://www.ots.ac.cr/> or contact us directly by email: lcruces@ots.ac.cr. Postal mail can be sent to: Estación Biológica Las Cruces/Jardín Botánico Wilson, Apdo. 73-8257, San Vito de Coto Brus, Costa Rica. Telephone (from the U.S.): 011 (506) 2773-4004.

Reservations can also be made by contacting the OTS office in San José by email edu.travel@ots.ac.cr, postal mail: ESINTRO/OTS, Apdo. 676-2050, San Pedro de Montes de Oca, Costa Rica, or by telephone (from the U.S.): 011 (506) 2524-0607.

The North American OTS office is located at Duke University, telephone: (919) 684-5774 or email: nao@duke.edu.

The Organization for Tropical Studies is a nonprofit consortium of universities and research institutions in the U.S., Costa Rica, Peru, Mexico, South Africa, and Australia.

Founded in 1963, OTS is dedicated to providing leadership in education, research and the responsible use of natural resources in the tropics. To this end, OTS offers graduate, undergraduate and professional education, facilitates research, participates in conservation activities, conducts environmental education programs and maintains three field stations in Costa Rica: La Selva Biological Station in the Atlantic lowland rain forest; Palo Verde Biological Station in the Pacific deciduous dry forest; and Las Cruces Biological Station in the premontane cloud forest near the Panamanian border.

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Front Cover: *Smilisca phaeota*, the
masked tree frog dangling from a
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Photo Federico Oviedo.

Back Cover: Playing games at
the environmental festival in Las
Brisas de San Vito using a unit
from the EcoSuitcases manual – an
environmental education package
that was developed at Las Cruces by
Ariadna Sánchez. **Photo Ariadna
Sánchez.**

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Director's Keys and Notes

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On May 5, 2012, the station
celebrated the 50th anniversary
of the founding of the Wilson
Botanical Garden with great fanfare! The
Garden, established in 1962 by Robert and
Catherine Wilson, reached a major milestone
and a more than deserved B-Day bash was
held.

Robert and Catherine Wilson established
the first collections of plants in what was
then called the Las Cruces Tropical Botanical
Garden. The initial aim was to offer native
and non-native tropical plants for sale. In
addition to the sale of tropical plants they
also had a short-lived idea to cultivate
tea for production. The project was soon
abandoned due to the excessive overhead
needed to process the would-be harvest, but
the tea hedge along the drive coming into the
Botanical Garden remains a testimony to that
time. In 1973, the Wilsons sold the Botanical
Garden, along with some forested property,
to OTS to oversee its administration – and
they remained as managers of the botanical
garden. In 1987 OTS recognized the
incredible efforts that the Wilsons had made
to establish the garden and their contribution
to horticulture by renaming it the Robert and
Catherine Wilson Botanical Garden. The
collection of plants is world-renowned and
the subject of study by many researchers,
naturalists, and students.

In reality our present-day festivities
started a day earlier. We had too much to
squeeze in one day so we decided to blend
our annual Eco-cultural Festival with the
Golden Jubilee celebration. So on the first
day, we had the usual spectrum of guided
garden walks, games for adults and children,
face painting, a crafts fair, music, talks and
even some theater! These events, always
a big success, were almost entirely run by
volunteers and friends of the station.

The opening of the all-day celebration
on the official anniversary was marked by an
introduction and welcome by yours truly, the
unveiling of a commemorative plaque, and
the planting of a new palm species (*Phoenix*



**Robert Wilson in his Fantastic Gardens
nursery in Florida ca. 1950.**

canariensis) for the Garden collection.
Daytime activities were held as an “open
house” with visits to the garden nurseries and
greenhouses, displays from the Las Cruces
Luis Diego Gómez Herbarium, as well as
exhibits of the more intriguing and unusual
books from the Don Stone Library. We had
many historical photographs of the Garden on
display and a non-Garden related collection of
plant fossils and roots provided by neighbors.
Station personnel gave talks on the history
of the Garden, the use of native plants as
ornamentals, and the potential impacts of
invasive exotic species on our native ecology.
A closing presentation was given on the
construction of gardens from an ecological
point of view.

Finally, in the evening, an invitation-
only gala event was held at the station
that included close friends of the station,
donors, volunteers, community members,
and, of course, all the station personnel
who have provided the backbone of support
and dedication to the maintenance of the
botanical garden. With a buffet and open bar,
the roughly 100 guests stayed late into the
night, dancing and drinking in celebration
of a major milestone for the most famous
botanical garden in Central America! Up
next: the OTS 50th anniversary bash in 2013!
We are all turning fifty!

What's New at Las Cruces?

Zak Zahawi / zak.zahawi@ots.ac.cr

Las Cruces Advisory Committee – Resuscitated!

One of the goals from the OTS strategic plan has been to reinvigorate the inactive station advisory committees at Las Cruces and Palo Verde. The last active Las Cruces Advisory Committee (LCAC) met in 1998 and was dissolved a few years later due to continuous budget shortfalls, so it has been a long time coming! The members represent a broad range of interests and viewpoints on the station's direction, with a mix of long-term researchers and people affiliated with the station as well as more recent researchers. In addition, two members (Susan Cordell and John Kress) were recently elected to the OTS Board of Directors, so the advisory committee will have good representation at the organizational level. A first meeting has been scheduled for the end of 2012 and the group will meet annually thereafter. Members, listed below, will serve 3-year terms.

Susan Cordell - US Forest Service (Hawai'i)

John Kress - Smithsonian Institution; Interim LCAC Chair

Chase Mendenhall - Stanford University

Alison Olivieri - San Vito Bird Club

Bob Timm - University of Kansas

A New Grant for OTS Herbaria

In addition to the growth of HLDG collections, a grant submitted to the last NSF-CSBR call (Collections in Support of Biological Research) was awarded recently, providing funds to upgrade herbarium cabinet equipment at all three OTS station herbaria. The 2-year grant also provides funds to process, mount and digitize all collections using the Las Cruces digital herbarium as a model. By the completion of the grant, all three herbaria will be linked digitally through the central OTS office server system and will provide researchers with access to information and high resolution scans for the more than 13,000 herbarium specimens housed at our field stations. A more detailed article in the next edition of *Amigos* will outline many of the new advances that are being developed with this project.

Soil Warming Workshop

In mid-August, a 5-day workshop was held at Las Cruces with a number of prominent researchers from the University of Georgia and several other institutions. The OTS-sponsored event discussed ideas centered on establishing a series of soil warming plots in the Las Cruces forest and in adjacent pasture areas as a proxy to global climate change. The overall goal of the plots would be to look at the effects of warming on forest recovery and development. Although still in the early stages, this workshop was very motivational. If funding were secured (several grants are in the process of being put together), it would represent the first warming project to be conducted in a tropical system!



Soil workshop participants debate ideas in the field and take in the surrounding scenery at the same time. Photo Zak Zahawi.

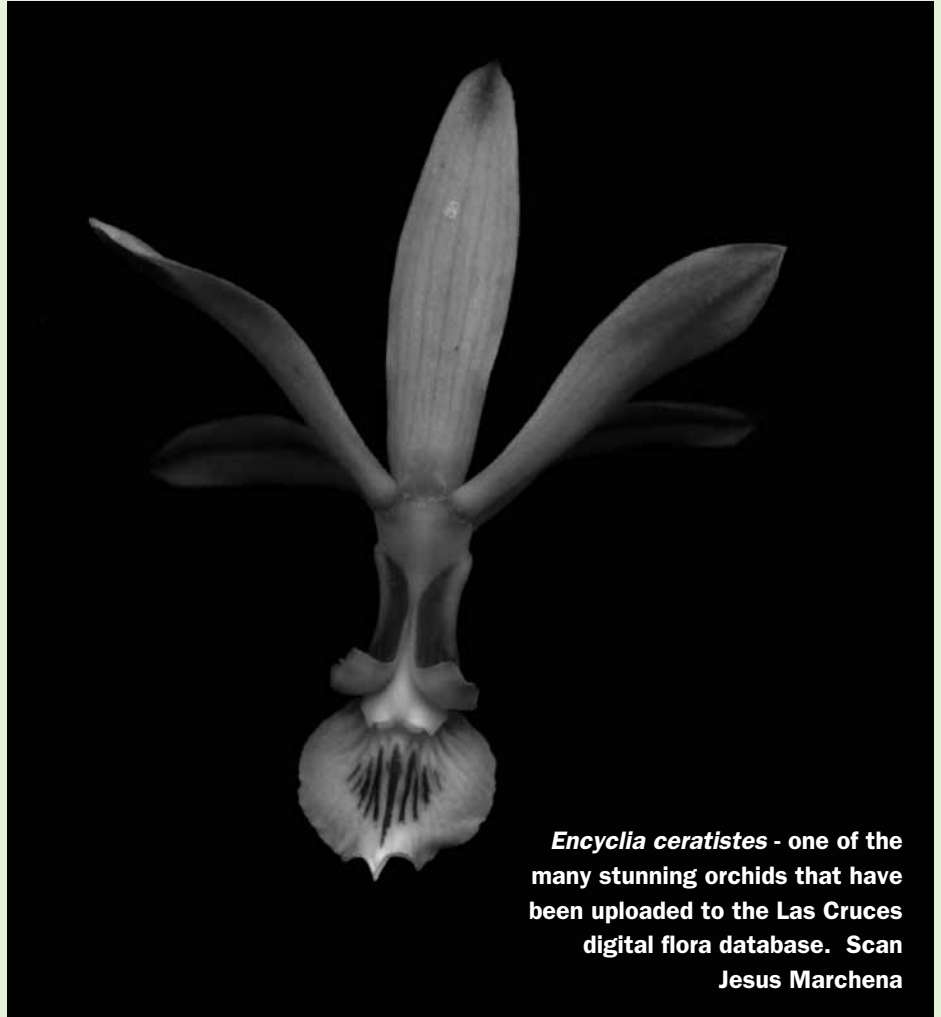
This Just In!!

Just as we went to press, we received news of a \$30,000 donation from the Banco Nacional de Costa Rica for the development of the second phase of Eco-Maletas, the mobile environmental education teaching kit that was developed by Ariadna Sánchez at Las Cruces! This may be followed up with an additional donation from HB Fuller and together these two donations would make the project go regional with the construction of at least 20 additional Eco-Maletas that will be put into action at local schools in Coto Brus! Stay tuned for more news of this exciting development.

Database Updates!

Luis Diego Gómez Herbarium Database:
The Las Cruces Herbarium (HLDG; www.ots.ac.cr/herbarium) now houses more than 3000 accessions. Of these, more than 2200 have been scanned and uploaded to the digital herbarium website. A recent ***** development***** was to get our database linked to the giant GBIF (Global Biodiversity Information Facility; www.gbif.org) network! Now all information housed in our database is also searchable within GBIF, increasing the potential reach of the information housed to a much greater audience. Very Exciting!!

Wilson Botanical Garden Database:
Since its inauguration in FY2010, the database for the Wilson Botanical Garden (www.ots.ac.cr/jbw) continues to move towards its objective of becoming comprehensive, housing all information available for every accession made in the 50-year history of the Botanical Garden. To date all records from 1982-present have been entered and are fully searchable. Records have also been entered fully for 1962-1967; and partially for 1968 and 1981. All records since 2010 have been entered with images, whether they are seeds or adult individuals. In all accessible records total more than 7,500, accounting for close to 50% of all accessions! As with the herbarium, this database was recently linked to the GBIF network. We anticipate completing all entries by the end of this year. The overhaul of this database has been facilitated in part



by a 2010 grant from the Stanley Smith Horticultural Trust.

Las Cruces Digital Flora: The digital flora of Las Cruces is the youngest database of all and is now just a little over a year old (www.ots.ac.cr/florulalc). Although we have a long way to go before we can say that this database is a comprehensive listing

of all vascular plants found in the area, we have made good progress. As of this writing, the database houses more than 800 registered species, with a particularly strong emphasis in orchids. This database has also been linked to the GBIF network making us globally connected in the plant world!

Research at Las Cruces

Does Habitat Fragmentation Affect the Song of Birds?

Patrick Hart / pjhart@hawaii.edu

The effects of habitat fragmentation on population dynamics and genetic diversity of animals have been relatively well documented, however there has been little work on the effects of fragmentation on animal behavior. Behavior is deeply entwined in all aspects of life history for many animals. For example, vocal behavior in birds is often central to territorial defense, mate attraction, foraging, and predator avoidance. More often than not, those individuals that sing the best (have the most complex song with the greatest diversity of syllables and phrases) are also the most successful at holding territories, attracting the most females, and thus having greater reproductive success than their less vocally accomplished neighbors.

Singing ability varies among bird groups. Most oscine Passerines (little songbirds) are considered to be “social learners”, meaning they learn their song from parents and neighbors as they grow up. For most other bird groups, song is not learned and is considered more of a “hardwired” genetic trait, like plumage color. So, for most Passerines, song may be viewed as a form of “culture” since it is information that is transmitted within and between generations through learning.

But what happens to bird song, and thus culture, as their habitat becomes increasingly fragmented? The decline in population size that is associated with fragmentation may reduce the potential for the transfer of song components between generations, resulting in reduced song complexity in populations that remain in habitat fragments. This in turn may lead to a potential “Allee effect”



whereby the fitness benefits of song (territorial defense, mate attraction, etc.) decreases with decreasing population density. Thus behavior is of great potential importance in conservation.

For three out of the past five summers, I have been a faculty mentor for a diverse group of undergraduate students from the United States and Pacific Islands as part of the NSF supported NAPIRE (Native American and Pacific Islander Research Experience) program. One of our goals has been to use the fragmented landscape of Las Cruces and the surrounding Coto Brus region to understand how fragmentation might affect the song of birds. In particular, we wanted to know if bird song complexity and repertoire size decreases with fragment size, and if this varies (as might be expected) between song learners and non-song learners. How did we do this? First we identified fourteen different fragments ranging in size from 1.5-400 Ha. With the expert

NAPIRE students Keiko Publico, Leilani Abaya, and Lisa Kaponu, along with technician Michael Atencio-Picado, holding an Orange-billed Sparrow. This bird is an abundant and relatively easy to detect resident of small to large forest fragments throughout the Coto Brus region. Photo Patrick Hart.

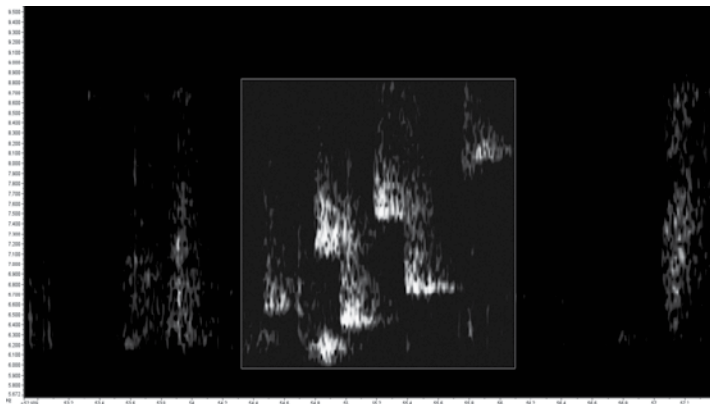
help of Michael Atencio-Picado who lives just down the road from Las Cruces, we visited each fragment multiple times, and recorded every individual of every species as often as we could. We then downloaded these recordings onto a sound analysis program called RAVEN. This program creates a picture of the bird song on the computer screen and allows us to make quite precise measurements on all sorts of characteristics of the songs. Some of our measurements included the number of notes per song, the number of different types of “syllables” that comprised the song of each species, and also the frequency range and average song length. We primarily focused our analyses on bird species that are thought to be relatively sedentary within fragments because these would be most likely to show differences among fragments. In addition, we had to narrow down our list of species to those that occurred in the entire range of fragment sizes, from smallest to

largest. For song learning species, birds that fit these criteria included the Orange-billed Sparrow and the Slate-throated Redstart. For non song-learning species, we chose to focus on the Scale crested Pygmy tyrant and the Little Tinamou.

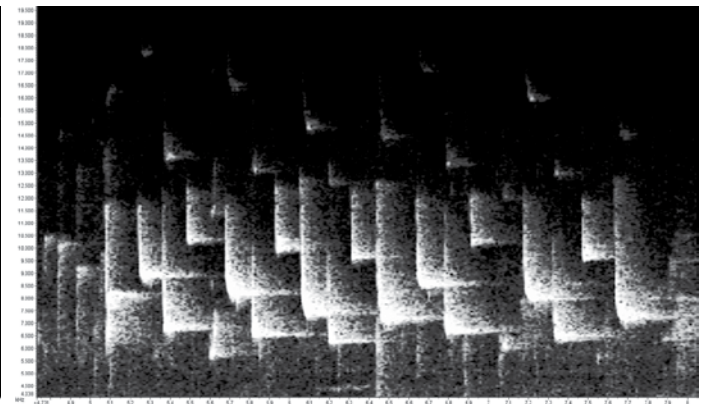
Our results have so far demonstrated that fragmentation does indeed appear to affect the song characteristics of song-learning Passerines. For example, measures of song complexity for the Orange-billed Sparrow such as number of notes per song, number of unique notes within a song, and frequency range all significantly decreased with fragment size (see images below). Song characteristics for the Slate-Throated Redstart also showed similar declines. However, for species that don’t learn their song from others such as the Scale-Crested Pygmy Tyrant and the Little Tinamou, there was little to no effect of fragment size on their song characteristics.

There are still big questions to address

in the coming years. First, it would be great to know if there are age differences between individual birds in fragments of different sizes that might be contributing to the effects we are seeing. Also- birds are sometimes known to vary the acoustic properties of their song based on the environment. It is possible (but unlikely) that environmental differences are responsible for the effects we are seeing. Perhaps the biggest question though is what would the decline in song complexity with increasing habitat fragmentation mean to the life history and population biology of those species? Would less complex song lead to lower mating success or be associated with lower survival rates, or is it just an interesting but inconsequential side-effect of habitat destruction? These questions (and many others) may keep our group busy at Las Cruces for the foreseeable future.



An example of an Orange-billed Sparrow song from a small forest fragment near Las Cruces. The x axis represents time and the y axis represents frequency.



An example of an Orange-billed Sparrow song from a large forest fragment at Las Cruces.

Changes in Herpetofaunal Abundance at Las Cruces – Resurveying the 50-Year Old Plots of Norm Scott

Mason Ryan / mjryan@unm.edu

The tropical world has changed drastically since OTS was founded almost 50 years ago. Global mean temperature and CO₂ levels have risen and tropical forests and organisms are especially susceptible to associated altered weather regimes. Furthermore, habitat loss and disease interact synergistically with climate change to increase risks to tropical diversity. Even protected areas such as Las Cruces Biological Station are not immune to large-scale global change drivers.

As the earth changes, so has the focus of tropical research. In the 1960s tropical biologists concentrated on describing biodiversity as a first step toward uncovering the dynamics of these complex systems. Today the focus is shifting to understanding how tropical forest dynamics and organisms are acclimating to rapidly changing environments. One way researchers evaluate how tropical organisms are changing over time is to compare baseline data collected decades ago to data collected today. Herein lies the value of long-term research stations and annual courses taught by OTS. Since the 1960s OTS graduate courses have run field programs that addressed questions ranging from basic autecology of single species to changes in community composition to ecosystem dynamics. Hidden in those course reports is valuable information that can be used to evaluate how species have responded, and will continue to respond, to climate change, habitat loss, and emerging diseases.

In 1969 Norman Scott initiated an OTS course project with the help of Douglas Futuyma, Robert Colwell and graduate students. They measured the diversity and abundance of leaf litter amphibians and reptiles at La Selva, Las Cruces, and



Rincon de Osa. They intended to use the results of these surveys to compare diversity and abundance between Old and New World tropics and high and low elevations, and evaluate seasonal differences in tropical leaf litter community dynamics. Norman (Scott 1976) was exploring the determinants and distribution of tropical diversity, common themes in tropical biology research.

Norman's baseline data on leaf litter herpetofaunal communities also laid the temporal foundation for future assays of environmental change. Most of the early citations of his 1976 paper were studies about basic tropical herpetofauna ecology. More recently, the paper and data (now cited >150 times) have been used to describe how climate change has altered amphibian and lizard communities. Steven Whitfield and colleagues (Whitfield et al. 2007) published an important paper documenting a 75% decline in both leaf litter amphibians

Gathering leaf litter during herpetofauna surveys at Las Cruces. Photo Mason Ryan.

and lizards at La Selva. Those declines were attributed to climate change induced reductions in leaf litter. Thus, even within a large protected area biodiversity has experienced significant changes.

But the impact of Norman's study does not end there. Over the last 4-years I have been re-surveying study sites from the original 1976 study at Las Cruces Biological Station and Rincon de Osa. The idea to do these surveys was born in 2005 when I met Norman on a herpetological expedition in Honduras and tried to convince him that he should participate. His response was "if you can put it together I'll come." In 2009 I was finally able to initiate this re-survey project with assistance from Jo-

seph Cook's Tropical Biology class at the University of New Mexico, University of Costa Rica faculty (Federico Bolaños and Gerardo Chaves) and UCR students (Beatriz Willink; Adrian Garcia, Jose Salazar, among others) as well as the Las Cruces staff. True to his word, Norman came along. It was his first time visiting these sites since the early 1970s. Norman added a personal perspective on how the landscape at both sites has changed in 40-years and ensured that plot site selection and data collection methods were consistent across this long time span.

The focus of my doctoral work is similar to the long-term research on amphibians at La Selva, but expands the spatial scale to different tropical forest types within Costa Rica and adds an elevational gradient perspective--a key aspect of understanding how species will respond to warming conditions. Las Cruces and Rincon de Osa are separated by approximately 35 km with an elevational change from 50 m to 1200 m. One benefit of this comparison is that a subset of species occur at both elevations, allowing us to evaluate not only how communities have changed since 1969, but also how populations of the same species at different elevations have responded.

Both sites are responding to large-scale global change drivers. Our preliminary results suggest that some leaf litter amphibians and lizards at Rincon de Osa and Las

Cruces have declined, while others have increased. Las Cruces in particular experienced a large decline in the abundance of leaf litter herpetofauna and the loss of two frog species and one salamander species across our sampling time periods (i.e. 1969 to 2000s). The loss of these species may not indicate they are extirpated from Las Cruces, but rather that they are now rarer today than in the past. While it is difficult to assess one cause for the decline in abundance of leaf litter amphibians and lizards at Las Cruces, I suspect an interaction between climate change, adjacent land-use changes, and disease are at play. By continuing this project, I hope to better understand what is driving the decay in the leaf litter herpetofaunal community and how these trends might be projected into the future.

Unfortunately, there is no evidence that the rate of climate change and other threats are slowing. I wonder how much additional baseline data are in the OTS archives that can be used to evaluate how our ever-changing tropical biomes are responding. Because of the temporal baseline established by Norman Scott, we now have a better picture of how some tropical species have responded to a rapidly changing global environment. It may now be possible to create conservation measures to more broadly protect these resources, so decades from now OTS courses can further study the leaf litter amphibians and lizards at Las Cruces and elsewhere.

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Anolis aquaticus surveyed at Las Cruces. Photo Mason Ryan.



Ptychohyla legleri eyeing the photographer. Photo Mason Ryan.

Flora and Fauna

Who would have thought it! *Leopardus pardalis* at Las Cruces

Zak Zahawi / zak.zahawi@ots.ac.cr



Hard to believe, though many indirect clues, such as tracks and scats, have been documented in the past. We still have big cats at Las Cruces – perhaps not a Jaguar (sigh!) but we do have *Leopardus pardalis* – better known as the Ocelot and the largest of the smaller cats! The species can reach up to 75 cm in size and weigh close to 15 kg – a medium sized dog to give you perspective!

This series of images was taken from a video feed that was placed in the Las Cruces forest by the Stanford University group to monitor artificial flower pollination (the flowers are the backdrop ‘sticks’ in the images in case you are wondering). Needless to say, they received a bit of a surprise upon reviewing this ‘reel’ of film to see a rather unusual pollinator. The curious Ocelot gently walks up to the pollination stage (top image), then gives the camera a quick sniff (middle image), before deciding to retreat backwards out of the setting (lower image). The images are fantastic but the video takes your breath away! Motion sensor cameras that have been recently placed in the Las Cruces forest and surrounding areas have also captured Ocelots in motion – though those images are more of a blur with spots than anything else. Still the confirmed presence of these fantastic predators (on more than one occasion – though it could be the same individual) is really a great boost to our conservation morale, and a good indicator of the health of the Las Cruces forest fragment!

Sighting of *Saimiri oerstedii* (Cebidae) at the Las Cruces Biological Station

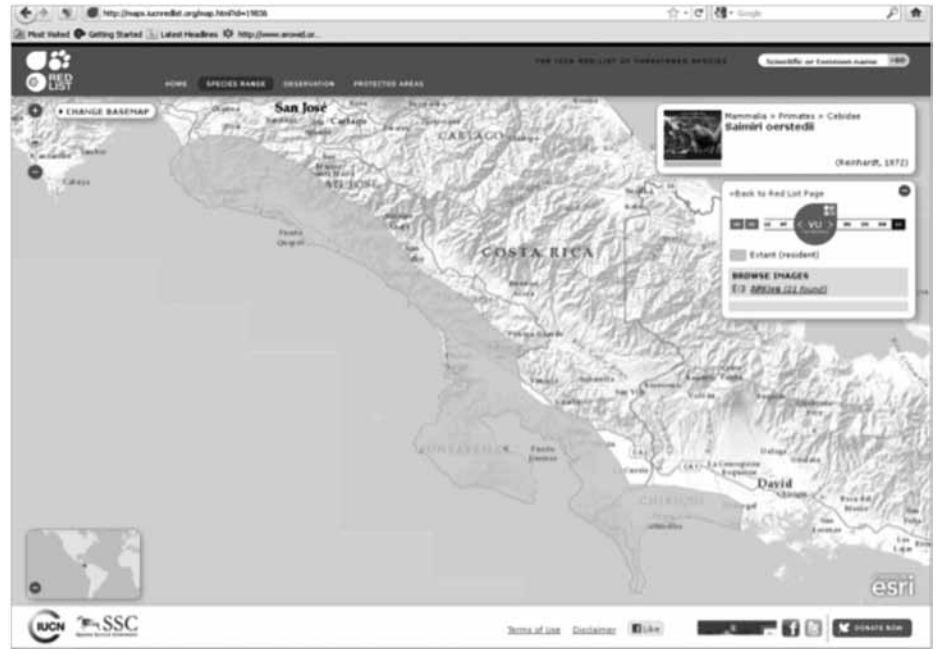
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On Sunday May 6, 2012 a sighting was reported for one individual of *Saimiri oerstedii oerstedii* (squirrel monkey) in the northeastern corner of the Wilson Botanical Garden – along the main road between San Vito and Agua Buena (82° 57' 26.138" W , 8° 47' 11.057" N). The sighting was reported at 9:30 AM and was made by José Delgado, forest guard, and Ariadna Sánchez naturalist guide at the Las Cruces Biological Station. The area is primarily disturbed habitat with a mix of different species of trees, shrubs, and herb, both native species that have colonized the site and a few exotic species that form part of the garden.

The squirrel monkey is considered an endemic species and has a narrow distribution that ranges from the southeastern corner of Costa Rica into the southwestern corner of Panama. In terms of Costa Rica, the distribution is restricted to the lowland Central and Southern Pacific regions, from sea level to 500 m ASL (Elizondo 1999). There are two recognized subspecies in Costa Rica *S. oerstedii citrinellus*, a subspecies endemic to Manuel Antonio National Park and surrounding areas, and *S. oerstedii oerstedii* with a distribution ranging from the Terraba River to the Osa peninsula, spanning the length of the Golfo Dulce and Punta Burica (Wong *et al.* 2011). Population estimates for *S. oerstedii oerstedii* are in the range of 3,000 individuals, *S. oerstedii citrinellus* has a smaller estimate of 500-1000 individuals (Elizondo 1999.).

At the level of Central America, the squirrel monkey is considered the primate

Distribution of *Saimeri oerstedii* in Costa Rica and Panama.



Source: <http://maps.iucnredlist.org/map.html?id=19836>

at most risk of extinction. *Saimiri oerstedii* is on the red list for threatened species according to the International Union for Conservation of Nature (IUCN) and is categorized as Vulnerable. The species is also found in Appendix 1 (primates), for the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 2001). More specifically *S. oerstedii oerstedii* is classified as in danger of extinction, whereas *S. oerstedii citrinellus*, is categorized as critically endangered.

Pacheco *et al.* (2006) have noted sightings for this species above 800 m ASL (with 2 individuals along the border of the Java River at Las Cruces based on observations by Ceballos). Indeed, Pacheco *et al.* (2006) note six locations where this

species has been sighted in and around the Las Cruces area out of a total of 58 registrations for the species. Nonetheless the location of the current sighting, with an elevation of ~1,200 m, classifies it as a new species sighting for Las Cruces.

In comparing this sighting to the data compiled by Pacheco *et al.* (2006), the report represents an important range expansion of the species in terms of its overall distribution. The possibility exists that individuals are moving up from lowland regions, and taking advantage of forest fragments, riparian strips along the Limón River, and low-intensity agricultural fields in the area.

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De la Comunidad

Remembering Ravi Thackurdeen

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Ravi, along with several other Global Health students, cooking up a storm in the Las Cruces kitchen. Jose Pablo (the teaching assistant for the course) looks on in bewilderment. Photo Jorge Benavides.

On April 29, the OTS Global Health Undergraduate Semester Abroad Program lost a student in a tragic accident on the southern Pacific coast. Although such events are stunning for anyone who even remotely knows the person, Ravi Thackurdeen's loss sent particular shockwaves at Las Cruces as the Global Health program spends roughly six weeks of their 15 week-long semester at the station. Many of the staff here get to know the students on an individual basis, and become friends with them and talk about the things they share. In Ravi's case, for example, he developed a special relationship with the kitchen staff. Every night they would give him a bottle of milk at his request, which he said would help him sleep. On more than one occasion he told them that they were his surrogate mothers and pampered him as if he was one of their own kids. His loss

stunned the station and he will be forever remembered by everyone who works here at Las Cruces.

Ravi was particularly interested in plants and ethnobotany, and was very excited about the herbarium at the station. He made several plant collections while he was doing his final research project and those specimens have now been accessioned into the herbarium collection (see accompanying article for the species list). Digital images of these collections can be viewed on the website (www.ots.ac.cr/herbarium), and can be found by typing in the corresponding accession numbers: 002842 – 002849. OTS has established a scholarship in his honor for undergraduate students, especially those with a passion for public health and ethnobiology. In early December, a memorial service will be held in his honor at Las Cruces we will plant a ceremonial tree in his name.

Integrando Etnobotánica en los Cursos de Las Cruces

José Miguel Chaves-Fallas & Federico Oviedo-Brenes / miguel.chaves@ots.ac.cr/federico.oviedo@ots.ac.cr

Desde la aparición de los seres humanos modernos, hace aproximadamente cien mil años, las plantas han jugado un papel trascendental en la sobrevivencia de la especie humana. A las especies vegetales se les han dado múltiples usos a lo largo de la historia, como fuente de alimento, material de construcción, medicina, tintes naturales, psicotrópicos e inclusive han sido veneradas como entidades divinas, especialmente por las etnias primitivas.

La etnobotánica se considera una ciencia que estudia la relación entre las plantas y las sociedades humanas, incluyendo los usos de especies específicas para fines culinarios, medicinales, sociales y culturales. Las raíces de la palabra provienen del griego *ethnos* que significa raza o pueblo y de *botane* que quiere decir hierba. Dos décadas atrás los estudios etnobotánicos han aumentado considerablemente ya que el conocimiento engendrado en los pueblos indígenas se va perdiendo gradualmente con la pérdida de los ecosistemas naturales y con el avance la globalización.

En Costa Rica existen ocho grupos indígenas: Guaymí, Cabécar, Brunka, Bribri, Huetar, Chorotega, Térraba y Maleku. Los grupos indígenas asentados en este país han generado un gran conocimiento acerca de las plantas y les han dado importantes usos esenciales para su sobrevivencia; todo este conocimiento ha atraído a gran cantidad de investigadores nacionales e internacionales que buscan aprender desde un enfoque holístico y plasmarlo de una manera para extenderlo hacia el mundo.

En las tierras bajas y medias del Pacífico costarricense se pueden encontrar los grupos Térraba, Brunka y Guaymí, este último con gran representación en territorio panameño. La Estación Biológica Las

Familia	Especie	Número Colector	Número de Herbario
Chrysobalanaceae	<i>Licania platypus</i>	3	2842
Combretaceae	<i>Terminalia amazonia</i>	6	2843
Fabaceae	<i>Diphysa americana</i>	7	2844
Fabaceae	<i>Inga densiflora</i>	4	2845
Hypericaceae	<i>Vismia baccifera</i>	5	2846
Malpighiaceae	<i>Byrsonima crassifolia</i>	8	2847
Melastomataceae	<i>Bellucia pentamera</i>	1	2848
Melastomataceae	<i>Miconia schlimii</i>	2	2849

Cruces ha servido como base para el desarrollo del estudio de la etnobotánica en el Sur costarricense, cabe destacar el convenio firmado por la Universidad de Costa Rica (UCR) y Louisiana State University para organizar un curso Internacional de Medicina Tropical en Costa Rica. Este primer curso se realizó en la sede Rodrigo Facio y varios centros médicos del país, la primera lección fue impartida por Luis Diego Gómez Pignataro, el cual sugirió visitar la Estación Biológica Las Cruces, de la cual era director, convirtiendo ese aporte en todo un éxito para los cursos posteriores.

Actualmente, dos veces al año, esta estación funciona como sede para el curso de pregrado “Global Health”, en el cual estudiantes extranjeros visitan esta zona para aprender acerca de medicina tropical y salud pública, etnobiología y cultura y lenguaje en Costa Rica. Dentro de las

actividades de este programa se realiza una visita a la Reserva Ngöbe-Buglé (Guaymí), donde los estudiantes tienen un contacto directo con los indígenas, aprendiendo de sus costumbres y a su vez les colaboran con aspectos de índole médico. En el mes de abril el estudiante Ravi Thackurdeen tuvo la oportunidad de coleccionar ocho especies de árboles de la zona que las comunidades Ngöbes utilizaban como materia prima para sus cocinas de leña. Estas plantas, colectadas por este amante de la etnobotánica, más que ocho ingresos para una colección de herbario, son un grato recuerdo de Ravi, joven que dejó su vida queriendo comprender la relación entre las plantas y los grupos indígenas. Gracias Ravi...que la esencia de la Madre Tierra te acompañe siempre.

Plantas colectadas por Ravi Thackurdeen, Reserva Indígena Guaymí, Buenos Aires, Costa Rica

Our Donors



San Vito Bird Club 'Wilson Walk' in August 2012. Photo by Elidier Vargas

The View from Far and Wide

Alison Olivieri / sanvitobirdclub@gmail.com

Completing construction of the Canopy Tower in the Las Cruces forest a little more than a year ago still feels like a thrilling accomplishment for all involved. For one thing, it didn't fall over during the recent 7.6 earthquake. For another, it has enchanted many birders, researchers, students, professors and natural history visitors who have climbed up to experience the fantastic view.

What, exactly, can you see from up there? Birds, of course, along with butterflies, day-flying moths, zooming beetles, dragon and damselflies, and some spectacular, flowering epiphytes in the canopy of trees spread out before your eyes.

But even more than interesting animals and plants, the view from the Canopy Tower includes the road heading up the hill to the village of Concepción where many of the Las Cruces/Wilson Garden employees and their families live. Your continued annual support helps provide salaries, necessary equipment and supplies for these dedicated people who work everyday to keep the buildings and grounds welcoming, beautiful, clean and safe for all comers. Especially in

this time of an economic flat-line in the US -- greatly affecting the economy of Costa Rica -- we ask you to *please support our general annual fund as generously as you possibly can.*

Also from the Canopy Tower, in another direction, you can see pasture above the Las Cruces forest. This property was described eloquently by Gail Hull in the 50th Anniversary Issue of the *Amigos* newsletter. It is the lynchpin of an ongoing effort by Las Cruces -- the Land Acquisition Campaign -- to connect the Las Cruces forest via a biological corridor to the Ngöbe-Buglé (Guaymí) Reserve. We have spoken of this project many times in the past and we are still at it, *asking for your help to make it real.* With each donation you make, Las Cruces inches closer to actualizing this significant research and conservation effort.

Please contribute today! We are counting on you and, as always, we thank you in advance for your help and support.

Bird List: Las Cruces Canopy Tower May 2011 - August 2012

- ✓ Great Tinamou
- ✓ Little Tinamou
- ✓ Crested Guan
- ✓ Black Vulture
- ✓ Turkey Vulture
- ✓ Yellow-headed Caracara
- ✓ Swallow-tailed Kite
- ✓ Sharp-shinned Hawk
- ✓ Broad-winged Hawk
- ✓ Barred Forest-Falcon
- ✓ Collared Forest-Falcon
- ✓ Gray-necked Wood-Rail
- ✓ Band-tailed Pigeon
- ✓ Scaled Pigeon
- ✓ Ruddy Pigeon
- ✓ White-tipped Dove
- ✓ Crimson-fronted Parakeet
- ✓ White-crowned Parrot
- ✓ Blue-headed Parrot
- ✓ Squirrel Cuckoo
- ✓ White-collared Swift
- ✓ Costa Rican Swift
- ✓ Purple-crowned Fairy
- ✓ Gartered Trogon
- ✓ Blue-crowned Motmot
- ✓ Black-mandibled Toucan
- ✓ Fiery-billed Aracari
- ✓ Red-crowned Woodpecker
- ✓ Buff-throated Foliage-Gleaner
- ✓ Ruddy Foliage-gleaner
- ✓ Wedge-billed Woodcreeper
- ✓ Streak-headed Woodcreeper
- ✓ Brown-billed Scythebill
- ✓ Black-faced Anthrush
- ✓ Paltry Tyrannulet
- ✓ Common Tody-Flycatcher
- ✓ Olive-sided Flycatcher
- ✓ Western/Eastern Wood-Pewee
- ✓ Piratic Flycatcher
- ✓ Dusky-capped Flycatcher
- ✓ Rose-throated Becard
- ✓ White-winged Becard
- ✓ Masked Tityra

As always a big THANK YOU to you all!

Las Cruces donors through August 2012

- ✓ White-ruffed Manakin
- ✓ Lesser Greenlet
- ✓ Rufous-breasted Wren
- ✓ Orange-billed Nightingale-Thrush
- ✓ White-throated Robin
- ✓ Clay-colored Robin
- ✓ Swainson's Thrush
- ✓ Tropical Parula
- ✓ Slate-throated Redstart
- ✓ Bananaquit
- ✓ Red-crowned Ant-Tanager
- ✓ Common Bush-Tanager
- ✓ Cherrie's Tanager
- ✓ Bay-headed Tanager
- ✓ Palm Tanager
- ✓ Golden-hooded Tanager
- ✓ Silver-throated Tanager
- ✓ Blue Dacnis
- ✓ Scarlet-thighed Dacnis
- ✓ Green Honeycreeper
- ✓ Buff-throated Saltator
- ✓ Blue-black Grosbeak

Contributors to this list include (in alphabetical order): Hellen Castillo, Kate Desvenain, Julie Girard, Charlie Gomez, Jorge Leiton, Alison Olivieri, Judy Richardson, Rohan A. VanTwist, Jim Zook

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