

Uncovering life history traits and conservation strategies for the Golden Swallow,  
*Tachycineta euchrysea sclateri*, a threatened and endemic passerine on the island of Hispaniola

## 2014 FIELD SEASON REPORT

\*Builds upon 2012 and 2013 Field Season Reports –  
available at [www.thegoldenswallow.org](http://www.thegoldenswallow.org) in Spanish and English

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## ABSTRACT

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The 2014 field season saw the continued collection of annual data on the breeding life history of the Golden Swallows via artificial nest-box monitoring. More so than years prior, however, we spent considerable time focusing on a laundry list of side projects that would help us better understand the bigger picture of why the species is as we find it today. We're trying to address all of the possible variables that may be influencing the current distribution and abundance of the swallows, so that we can more accurately project in our conservation plan how to address these issues in the upcoming years. The following 2014 Field Season Report will give the reader a glimpse at what we were able to accomplish, what we're thinking about now, and how what we've learned is directing the future of the project. We will focus specifically on new information we've obtained as opposed to revisiting themes already covered in detail in the 2012 and 2013 Field Season Reports. Look to our upcoming publications for greater detail concerning the data we've collected and a more 'dissected' look at the natural history and breeding biology of the Golden Swallows.

## QUICK FIELD SEASON FACTS

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### **Dates:**

April 26<sup>th</sup> – July 4<sup>th</sup>, 2014

### **Team Members:**

Justin Proctor (USA)

Maria Milagros Jefferies (ARGENTINA)

Ianela García Lau (CUBA)

Silvia Struve Villalobos (VENEZUELA)

### **Study Locations:**

Dominican Republic

Parque Nacional Juan Bautista Pérez Rancier (Valle Nuevo), Cordillera Central

&

Aceitillar Region, Parque Sierra de la Bahoruco

### **Target Species:**

The Golden Swallow / La Golondrina Verde

*Tachycineta euchrysea sclateri*

**Artificial Nest-Boxes:** Parque Valle Nuevo: 185 distributed across 13 micro-sites

Aceitillar: 20 distributed across 3 micro-sites

**Nest occupancy:** 72 breeding pairs in total

## RESEARCH TEAM

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One of our biggest goals for this project was to promote scientific collaboration and thus the exchange of ideas and knowledge, and doing so by specifically involving researchers from around the Caribbean and South America. We were excited to expand our team this year to include three talented young scientists that were invaluable in broadening the project's goals and potential.



Maria Milagros Jefferies (Milagros) is from Mendoza, Argentina, and is currently finishing her licenciatura in biology at the Facultad de Ciencias Exactas y Naturales de la Universidad Nacional de Cuyo, located in her home city. Milagros came to the Golden Swallow Project after recently completing a field season working with the breeding behavior of House and Sedge wrens under the direction of Paulo Llambias. Her specific interests in ornithology focus on social systems, parental care, the possible functions of song, and long migrations.

Silvia Struve Villalobos is no stranger to the study of swallows. Silvia has been an active site coordinator for our larger umbrella project, Golondrinas de Las Americas, for the past several years, spending six months a year in the southwest region of her home country, Venezuela, where she intensively studies the breeding behavior of the White-winged Swallow. Silvia is currently pursuing her degree in Biology at the Universidad de Zulia in Maracaibo, Venezuela. She's particularly excited about the idea of continuing science related to conservation, threatened species, and reforestation.



Ianela García Lau, from Cuba, graduated with her Masters in Zoology and Ecology of Vertebrates from the Universidad de La Habana (UH) in 2010. Since her graduation, she has participated in a variety of different investigative projects through her collaboration with the group Ecología de Aves de la Facultad de Biología (UH), while simultaneously overseeing the Avian Collection at the Museo de Historia Natural "Felipe Poey". Her current studies focus on cavity use by Cuban Martins and relating that information to the natural history of the species.



## PARQUE VALLE NUEVO FIELD SEASON OVERVIEW, METHODOLOGY, and NEST-BOXES

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Another field season has come and gone, and with it we've come out ever the more excited about the new information we learned as well as the new developments surrounding the future of the project. Excitingly, our list of collaborators continues to grow, and this year we were able to welcome aboard Fundación Moscoso Puello (FMP), an organization that has been deeply rooted in the history of scientific investigation as well as land management within Parque Valle Nuevo. FMP will be playing a key role in the continued management of the Golden Swallow Project during future nesting seasons. Furthermore, our field team this year was unstoppable. Composed of four investigators - and four different nationalities - the team members brought with them a diverse set of skills and background experience that collectively allowed us to broaden the scope of our investigation.

Our methods for monitoring nest-boxes, collecting biometrics, banding birds, and handling disturbance have stayed consistent with those outlined in the 2013 Field Season Report.



Within our Parque Valle Nuevo field sites, the season saw the shuffling of some unused boxes and the addition of several more. With permission from FMP, we created a new micro-site (pictured above) of ten nest-boxes along the Rio de Los Gatos, a year-round flow of water flowing southward along the western base of Alto Bandera. One of two pairs of swallows previously seen foraging over the river successfully took to one of the new nest-boxes within a week of its placement. We also began experimenting with three newly erected nest-boxes in broadleaf forest at the far south end of the park in a region known as Jurassic Park. The boxes were placed adjacent to a pair of Golden Swallows nesting in a natural cavity within a dead, upright standing snag. To further test the altitudinal range of Golden Swallow nesting within the National Park, three boxes were placed at the summit of the park's highest peak, Alto Bandera. A male swallow was observed flying at close proximity to the boxes just moments after they were placed, though no nesting has occurred as of yet. Lastly, three boxes were moved from the lower properties of the Villa Pajon Ecologe to an upper field where GOSW have been seen foraging in years past.

The following table summarizes the expansion of the nest-box network and changes in occupancy levels in Parque Valle Nuevo across our three years of study.

Parque Valle Nuevo	2012	2013	2014
Nest-boxes	88	172	185
Nesting Pairs	40	51	72
Box Occupancy	45%	30%	39%
Field Sites	6	10	13

In early May of 2013, 8 nest-boxes were erected in a historically agriculture-dominated region of Parque Valle Nuevo known locally as Nizaito (specified by us as Nizaito Abajo). The land was eventually claimed by the National Park and has been the site of recent pine reforestation efforts by the Ministry of Nature. We originally chose the location as an artificial nest-box site for several reasons:

- the habitat included those features that seem most preferred by Golden Swallows, including the year-round presence of water and open field for foraging surrounded by pine forest for (potential) nesting
- four Golden Swallows had been seen on many scouting occasions actively foraging over the meadows
- the site itself was remote and contained the most expansive open field plot of land we had seen in the National Park

Immediately after being placed, the boxes were occupied and nested in by two pairs of swallows, each ultimately successful in fledging young that season. Upon returning to the site this year (2014), we were pleasantly surprised to find that 5 of the 8 boxes were active. Compared to other micro-sites we have in the park, this rate of increase in occupation from one year to the next is unparalleled.

The first non-swallow nest-box occupant since the beginning of the project was documented here this year. A female Rufous-collared Sparrow / Ciguita de Constanza (*Zonotrichia capensis*) was found incubating two eggs just one box down from a pair of incubating swallows.



Our future plans for this site will be discussed more in the Golden Swallow Conservation Plan section of this report.



## COPULATION

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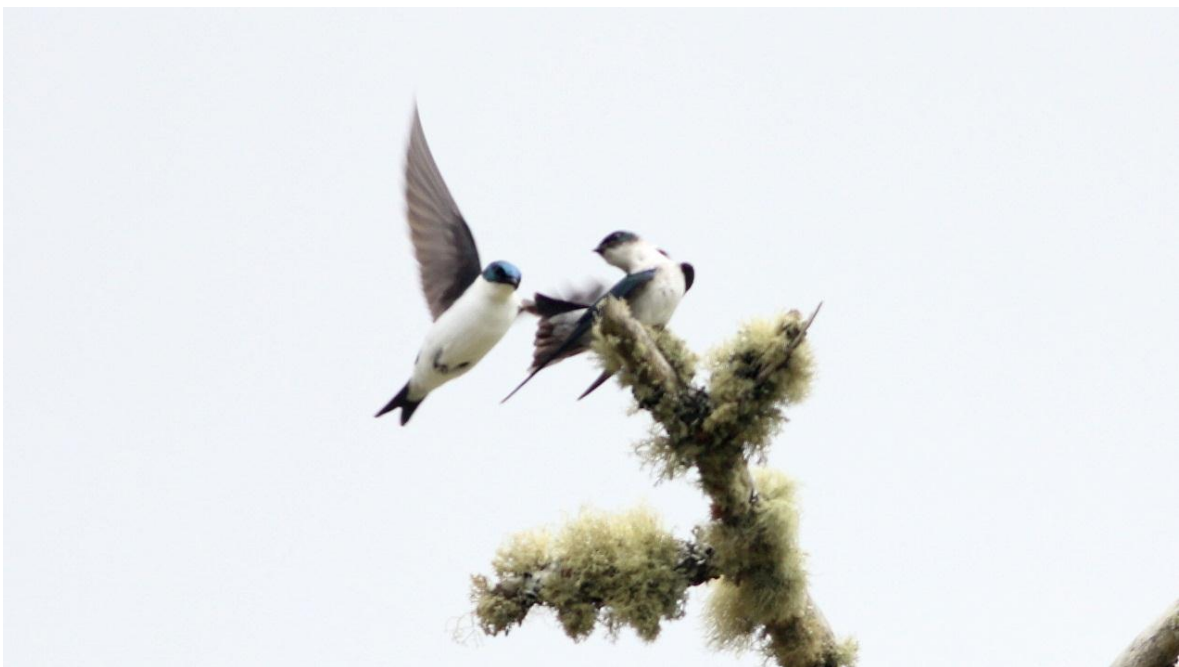
*Tachycineta* species are often seen copulating on top of nest-boxes, especially in the first half of the breeding season. The act of copulation in Golden Swallows had not been witnessed by our field crews in 2012 or 2013, despite extensive efforts waiting and watching for it to occur.

While filming foraging swallows at our Nizaito Abajo site (N 18.740472, S -70.624377, elevation: 2204m) on May 31st, I heard behind me three swallows vocalizing together, located approximately 5m high off the ground out on the end of a dead pine branch. I turned quickly and was able to take several photos before the group split up.



The photo to the left documents two males pursuing (and potentially competing for) a female. The female can be identified as the swallow in the upper-right corner of the photo sporting a chest with darker mottling.

The photo below shows the successful male just a moment prior to copulating with the female. Initially, the female remained perched while the male hovered behind her preparing to make contact. The female then briefly lifted her rump and tail and allowed the male to make cloacal contact.

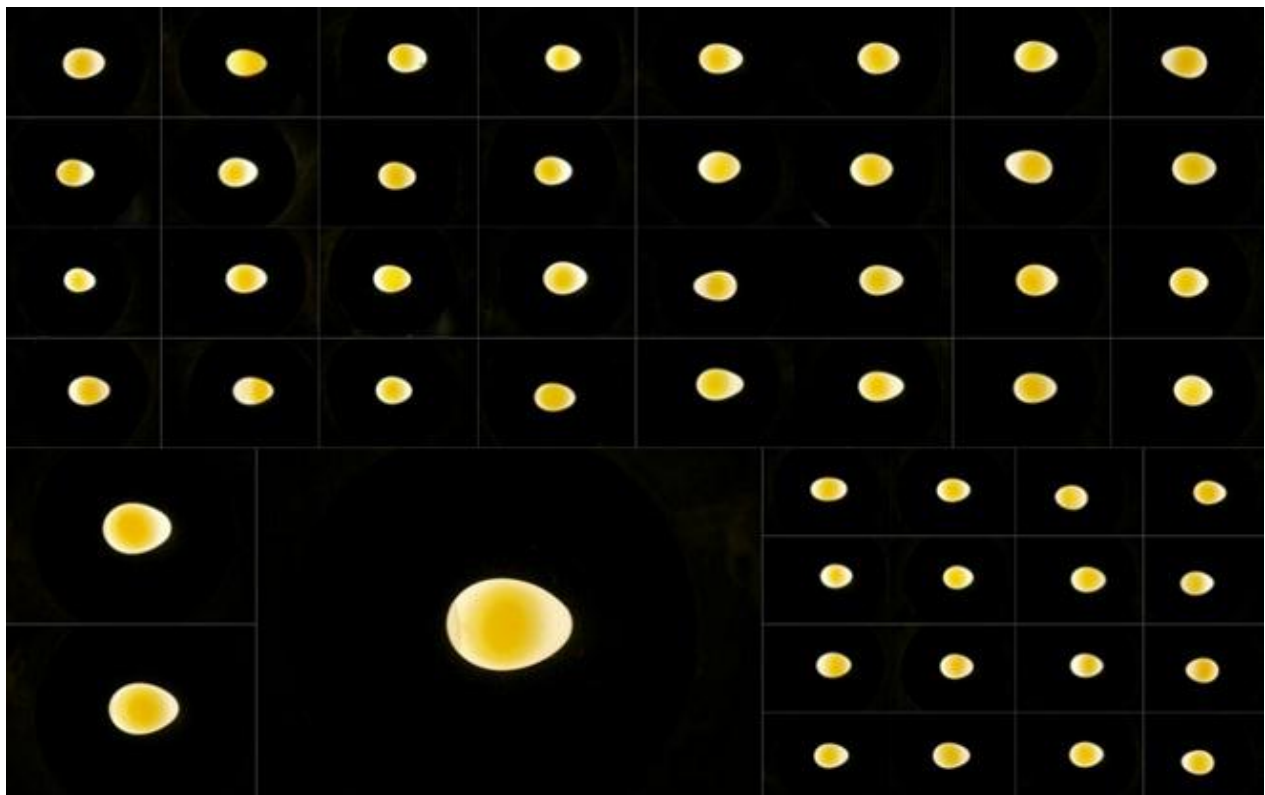


## EGGS and OVOLUX

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The Golondrinas de Las Americas Project (GOLO) invested a great deal of time and effort into photographically documenting egg morphology and development across the spectrum of *Tachycineta* swallows. This field season, equipped with an advanced candling tool called an ovolux, we were able to take a collection of photographs that would contribute Golden Swallow egg imagery to the master database for genera-wide study.

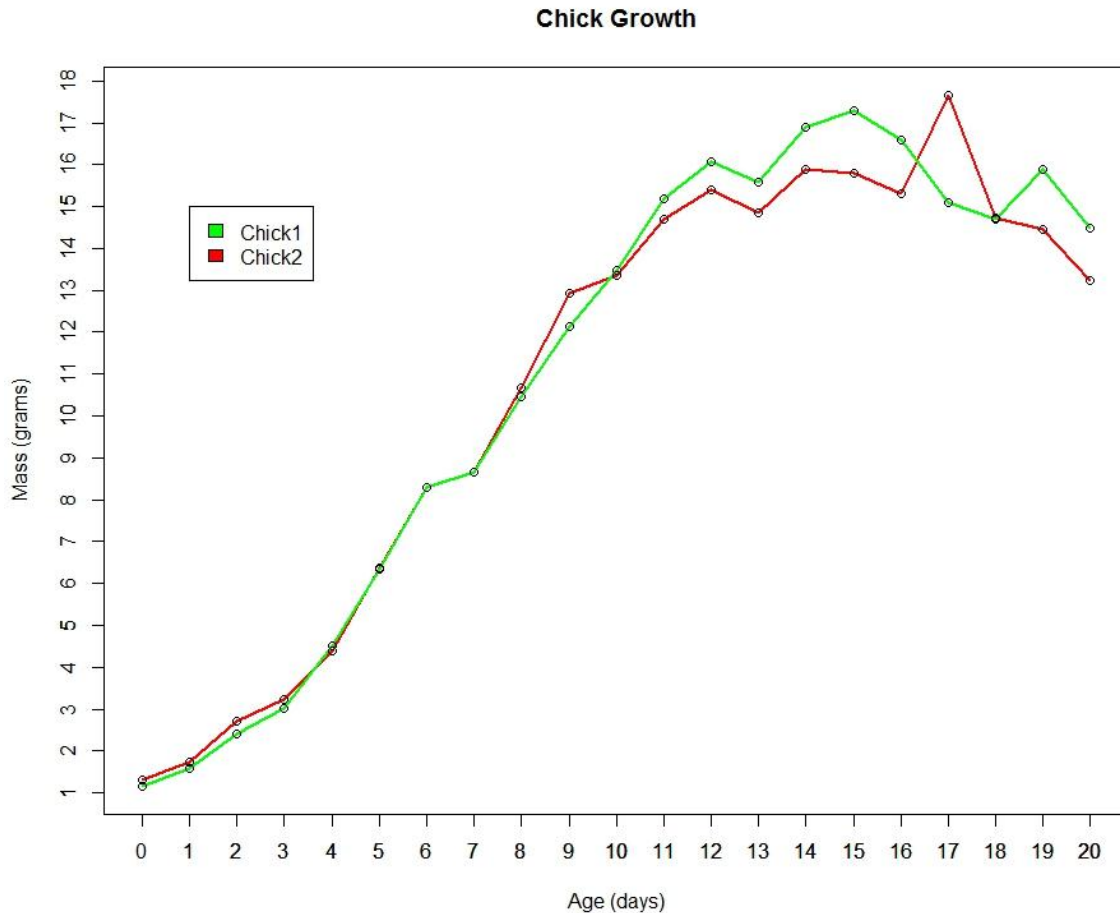
Eric LoPresti, a past member of the GOLO research team and now a graduate student at the University of California, Davis, is currently interested in looking at differences in egg shape across the genera and how that relates to variables including latitude, climate, and the morphometrics of the adult birds. Concurrently, other members of the GOLO community are continuing to modify software that would be capable of extracting egg and yolk size measurements from the photos. Part of the study will look for correlations linked to the female's energy investment into her eggs as a predictor of offspring survival and success.



A collage of photographs taken of Golden Swallow eggs using the ovolux

## NESTLING DEVELOPMENT

Nestling growth rates can be fairly easily measured, and can be a powerful indicator of food supply and parental investment. We measured the growth (head-bill, flat wing length, and mass) of two chicks from the same clutch on a daily basis from hatch-day (Day 0) to Day 20 to get an opening look at Golden Swallow chick development. The graph below plots changes in mass of the two chicks across time. The rate of growth is rapid until it peaks around 15 days, and then slowly declines. To give perspective, adult swallows range from 11 to 14 grams in weight on average, with males tending to be smaller than females.



Additionally, we took dorsal and profile pictures of the two chicks each day to show patterns of growth. The photos will serve as a visual guide inside the *Golden Swallow Manual* for future investigators to reference when estimating chick age in the field.





**DETERMINANTS and LIMITATIONS TO THE PRESENCE and REPRODUCTIVE SUCCESS OF GOSW in PARQUE VALLE NUEVO**

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My field team and I are off and running with the goal of writing a paper that addresses what I believe to be the most pertinent theme in terms of life history – ‘why are Golden Swallows breeding in Parque Valle Nuevo?’. The more we outline what an ‘answer’ to this question might be, the more daunting the topic seems to be. The truth is that because historical data is so meager, it is very hard to know whether or not the species has always been a high mountain breeder on the island. What we can do, however, is identify those factors that are most heavily shaping and impacting the species’ reproductive success (and potentially distribution) and better hypothesize whether or not they are breeding in sub-optimal conditions.

The following table summarizes the factors that we believe have the largest influence on the breeding biology of Golden Swallows, and touches briefly upon ideas as to the specific roles each factor may be playing.

<b>Factors</b>	<b>Pros</b>	<b>Cons</b>
Sub-tropical climate in a high altitude mountain setting	<ul style="list-style-type: none"> <li>* Reduced interspecific competition for food and cavities</li> <li>* Less anthropogenic disturbance → fewer pesticides and herbicides → thus presence of a more natural food regime;</li> <li>* Relatively less habitat modification</li> <li>* Climate/Precipitation induced food pulses → needed to sustain offspring</li> </ul>	<ul style="list-style-type: none"> <li>* Extreme changes in temperature and rainfall → Infrequent and brief annual pulses of insects / food source → only one annual clutch possible</li> <li>* Lower abundance of Hispaniolan woodpeckers → fewer nesting cavities → high intraspecific competition for cavities</li> </ul>
Pine-dominated forest, very few woodpeckers and natural cavities	<ul style="list-style-type: none"> <li>* Lower species diversity → Reduced interspecific competition for food and cavities</li> </ul>	<ul style="list-style-type: none"> <li>* Resin-laden pines (or the pine species itself) may deter woodpecker foraging and excavation → reduced cavity abundance for secondary cavity nesters</li> </ul>
Fire regime	<ul style="list-style-type: none"> <li>* Habitat vitality and renewal → facilitates primary succession and expansion of grasslands → increased foraging habitat</li> </ul>	<ul style="list-style-type: none"> <li>* Lack of old growth forest, lack of old and decaying trees that attract woodpeckers → lack of cavities</li> </ul>
Invasive Mammals		<ul style="list-style-type: none"> <li>* High depredation pressures during breeding season</li> </ul>
Low Anthropogenic Presence	<ul style="list-style-type: none"> <li>* Less disturbance on habitat</li> <li>* Potentially fewer numbers of introduced mammals being added into the system</li> </ul>	

In order for Golden Swallows to successfully raise and fledge young, they must have a reliable cavity in which to nest as well as a strong pulse of food to sustain the energy demands of their chicks. Food and shelter – the basics.

### **First, let's take a look at shelter.**

As we've seen in past field seasons, the Golden Swallows in Parque Valle Nuevo are quick to take to new artificial nest-boxes that we erect both during and in between breeding seasons, which hints that natural cavity abundance is poor. The natural cavities used by Golden Swallows are excavated in this region by only one species, the Hispaniolan Woodpecker (*Melanerpes striatus*). Having only documented three potential pairs of woodpeckers over the past three summer field seasons and wondering why such low numbers, we called upon the help of Josh LaPergola, a Ph.D. candidate in the Department of Neurobiology and Behavior at Cornell University, who has been studying the social behavior of Hispaniolan Woodpeckers for more than four years in the Jarabacoa region of the Dominican Republic. After visiting our field sites, Josh and his team agree that there is a striking absence of woodpeckers, and that the reasons behind that could be related to several possibilities, including: (1) an altitude/climate threshold for the species; (2) the dominating tree species, the Hispaniolan Pine (*Pinus occidentalis*), may not be conducive for excavating and/or not harbor high enough food loads due to physiological properties such as high resin content; (3) extremely high levels of depredation by invasive mammals.

This field season we spent considerable time exploring Parque Valle Nuevo for evidence of woodpeckers, and thus cavities that could be used by Golden Swallows. We found that snags (dead trees) were very infrequent in the lowlands and open valleys of Parque Valle Nuevo, but increased with elevation and on strongly inclined slopes. This points to the possibility of a harvesting effect by local communities, with more easily accessible dead trees being removed and those more difficult to harvest being left untouched. That being said, it is important to note that forest fires are a natural part of this highland pine forest ecosystem, and may burn predominately the lower pine stands and grasslands, leaving high peaks and associated steep slopes unscathed.

### **Now, let's take a look at food.**

Golden Swallows are aerial insectivores, and what they are eating (whether or not they are generalists or specialists) may very well shed light on the timing and success of their breeding season. We are currently in the process of overlaying local temperature and precipitation data from 2012-2014 with chick hatch dates for those same years. Anecdotally, we have noticed that there is a large spike in food abundance at the turning of the wet to dry seasons, while simultaneously a large majority of the swallow nests begin to hatch. What this potentially means is that the birds are laying eggs during the wet season, when heavy, consistent rains severely reduce foraging time and insect abundance, and albeit stressful for the adults, energy demands (food intake) are low compared to later breeding season requirements. The hatching of the eggs is then timed with the changing of the weather, as previously wet conditions are met with longer, warmer, sunnier days, sparking a large emersion of aerial insects. This sudden pulse, though lasting only a few short weeks, provides a window of opportunity for meeting the energy demands of the rapidly growing young. Therefore, what we should see after analyzing the data is a higher success (fledge/survival) rate of nests that hatch during this time period as opposed to those nests that were timed earlier or later and thus hatching young during poor food conditions.

Consistent with the methodology used in 2013, we were able to collect an additional set of bolus samples from provisioning adult swallows this field season, and have turned them over for full analysis to our collaborators Candy Ramírez, América Sánchez, and Ruth Bastardo at the Instituto de Investigaciones Botánicas y Zoológicas (IIBZ), Universidad Autónoma de Santo Domingo. Preliminary data analyses shows that 81% of the insects being provisioned to chicks belong to the family Bibionidae (order Diptera), and may be a fundamental driver in breeding habitat selection. These samples are the beginning steps as we continue working alongside this team of Dominican entomologists to better understand how important the roles of food availability and abundance play in the reproductive life history of the Golden Swallows.



**A Dipteran fly from the family Bibionidae swarms in large densities adjacent to the Golden Swallow nesting sites.**

We are currently busy preparing a manuscript on this topic that will more closely look at the impacts and relationships between these variables that impact the breeding biology of the species.

## OUR FIRST OBSERVATION of a NESTING PAIR in a NATURAL SNAG

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Coordinates: Lat: N 18°41.76' Lon: W 70°35.56' Elevation: 2,248m



While erecting three new nest-boxes on the 20<sup>th</sup> of May in the Jurassic Park region of Parque Valle Nuevo with the help of Fundación Moscoso Puello, we had the great fortune of observing a pair of Golden Swallow nesting in a tree cavity, which was located approximately 17 meters up a 20 meter-high dead snag. The Jurassic Park region is appropriately named for the lush broadleaf forest it contains, making it a strikingly different habitat than the surrounding pine-dominated forests.

This is our first observation – after three years – of a pair nesting in a natural tree cavity. Other ‘natural’ nests have been observed in dense clumps of lichen attached to tree branches, in earthen banks, as well as in the eaves of abandoned buildings.

We monitored and filmed the cavity for approximately one hour. The nesting pair was seen repeatedly circling and then entering the cavity for a duration of 3-5 seconds, at intervals of 5 to 10 minutes. This behavior is most similar to that observed when artificial nest-box nesting pairs of swallows are actively provisioning their young.

Midway through the observation, a pair of Hispaniolan trogon (*Priotelus roseigaster*) flew in and perched on tree branches approximately 5 meters from the snag. Their arrival into the immediate area as well as the time they spent perched was completely silent. A short time later as the male GOSW perched on a dead branch stemming outwards from the snag just one meter below his nesting cavity, one of the trogon took flight and attempted to make impact with the perching swallow. The swallow flew from the perch in time to avoid the encounter. A short period afterwards, the other trogon flew towards the snag and entered a different cavity located just one meter below the Golden Swallow cavity, where we presume the trogon pair to be actively nesting. The response from the Golden Swallows following the trogon’s entrance was an aggressive one, involving repeated alarm calls as well as a change from a foraging to defensive flight pattern.

Finding natural nests has been a high priority for this project, but extensive search efforts have yielded poor results. We are eager to study the natural breeding biology of the species, despite its challenges, and compare that to what we’re finding in our artificial nest-boxes. Most importantly, the quality, design, abundance, and competition over natural cavities are no doubt important variables affecting the nesting success of the species.

## TRAPPING and RETURNING BIRDS

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We continued to trap and band as many of the nesting adults as possible to gather information on return rates, survival, movement, and morphology. We saw a higher than previously experienced rate of nest abandonment after trapping adult males this field season, and decided that the survival of chicks outweighed the data we could gather from the males (despite how valuable that data is). Additionally, though we can only speculate at this time, it appears as though some males after abandoning their original nest (post-disturbance), will seek out a nearby nest to start again. In doing so, the males will disrupt an already on-going nest of another pair of swallows. On several occasions, we found broken or buried eggs in adjacent nests just one day after a male had abandoned his own nest. It's very possible that this now 'vagrant' male becomes aggressive towards neighboring pairs in order to establish a new territory and nesting site. And so the consequences of handling adult males during the breeding season may set into action a chain of disturbances that affect more than just the targeted nest. This behavior and its implications need to be studied in greater detail before this trapping and handling methodology can be safely used as a standard protocol.

The following table and supplemental information outline the number of adult swallows we have successfully trapped since 2012 ('Total # Captured') as well as the number of adults that returned and were recaptured from year to the next.

	2012		2013		2014	
Sex	Female	Male	Female	Male	Female	Male
Total # Captured	42	2	39	19	46	12
# Recaptured	3	0	23	1	27	10

14 females and 1 male were trapped as breeding adults across all three breeding seasons: 2012, 2013, and 2014  
8 females and 5 males banded for the first time as adults in 2013 returned and were recaptured in 2014  
19 females and 2 males were newly banded as adults in 2014

We have recaptured three adults originally banded by Jim Goetz before 2012 during his work with Golden Swallows in Parque Valle Nuevo.

Band 5201: Female, recaptured in 2012, 2013, 2014. Nested in same box in 2012 and 2013, then moved to an adjacent box in 2014.

Band 5204: Female, recaptured in 2012 and not seen again.

Band 5213: Female, recaptured in 2012, 2013, 2014. Nested at same site but in different boxes each year (original box being used in 2012 had to be relocated).

Band 5205: Not found in 2012 but recaptured in 2013 and 2014. Nested with Female 5201 both years.

Once we have obtained original banding information, we'll be able to talk more about life longevity in Golden Swallows. At this point, we know that swallows are surviving for more than four years and that they are highly loyal to boxes and breeding sites across years. We know that Second Year (second calendar year) male and females are reproductive.

Information on swallows that have fledged from our boxes as chicks is recorded in the table below:

	2012	2013	2014
<b>Total Chicks Banded</b>	97	98	101
<b>Returned and Nested As Adults</b>		1 female (from 2012)	4 males and 2 females (from 2012) 2 females (from 2013)

Despite the fact that we band on the order of 100 chicks per year, there are relatively few that have returned to nest at our field sites. This is likely due to the mechanism of dispersal, though mortality could also play a role. Unfortunately we are unable to trap and band every bird nesting at our sites, making it likely that the numbers of returning chicks recorded above are potentially lower. However, there does appear to be a trend of more chicks returning back to our sites after two calendar years (as third year birds) compared to chicks that fledged the year prior.

## NATURAL CAVITY FLEDGLING

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This picture was taken at our field site named Nizaito Arriba on June 14th in the valley just beyond Box 41. No chicks at any of our nest-boxes had fledged as of that date, however this was a recent fledgling in flight, indicating that a nearby natural cavity had successfully fledged chicks and that that clutch had been laid prior to any nest-box clutches. This raises the possibility that natural nest-cavities could be preferred and occupied by higher quality adults.



The yellow gape is an obvious indicator that this swallow is a recent fledgling. Additional signs of age include short wings and tail feathers as well as a stockier body profile.



This section will summarize behaviors that we have consistently recorded through extensive observation.

### **Choosing cavities:**

There is certainly a notable amount of competition over specific boxes, and there are a large number of variables to tease apart in understanding why (proximity to water source, forest edge, other GOSW nests, as well as overall box orientation, temperature, and impact from winds). Box height and design are consistent across almost all boxes. Preliminary tests do not show an effect of box orientation on preference. It's very possible that due to the high site and box fidelity we are seeing amongst pairs, those pairs that arrived several years back during the original installation of the boxes may be more willing to compete for the same box they originally chose as opposed to accepting another nearby, vacant box. In other words, the *'if it works, keep using it'* philosophy. The competition itself could be a result of new swallows entering the population and attempting to dislodge returning, resident swallows. Despite the availability of nearly identical boxes at close proximity, the competition for certain boxes persists each year, driving the theory that some swallows are viewing occupied boxes as higher quality than others and are targeting those boxes before they are willing to accept a nearby box that has never been used. We do not yet know whether both females and males participate in choosing the box.

### **Nest building:**

Only females have been seen constructing nests. The male associated with that female is often found perched overtop of the nest-box or flying in tight circular patterns around the box while the female works on collecting materials and constructing the nest. The male is physically and vocally aggressive both while

perched and in flight towards other GOSW within his territory. We have never observed a male entering a box at this stage of the breeding season.

### **Laying:**

Males continue with similar behavior during the laying period as they did during nest building. Males have not been seen entering nest-boxes at this time. Females are often found sitting on their completed nest several days before laying their first egg, and are shown to pass the night in the box before eggs are laid as well.

### **Incubation:**

Male territorial behavior stays consistent. Males have not been seen entering nest-boxes at this time and are thought not to contribute to the incubation of the eggs. Males often accompany females in flight during the female's approach to enter the box, with the male flying just above and behind her, frequently vocalizing. Females overnight in the box.

### **Provisioning Chicks:**

While in the nest-box, chicks are provisioned continuously by both the male and female. Females provision more often but food load may vary compared to that of males. Males are extremely hesitant to enter the nest-box, as they often will repeatedly circle the box and land at the entrance hole for an extended period of time without entering. Males accompany females in flight when females are entering the box as they did during incubation.

### **After Chicks have Fledged:**

The chicks often fledge asynchronously (sometimes days apart from one another). During this time, both the adult male and female remain in the adjacent area in waiting. Once chicks fledge, it is difficult to follow and observe the family unit. They only remain close to the nesting site for a couple of days, and then disappear completely from our entire study area. Fledglings are more awkward and clumsy in flight, and have been seen resting while perched on low tree branches after short sustained periods of flight. Adults have been observed provisioning the fledglings both in flight and while perched, though we cannot confirm that those adults are the parents of the fledgling.

## **DEPREDATION and MAMMAL TRAPPINGS**

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The first two weeks of the field season involved finishing the previous field season's goal of installing predator guards below all of the nest-boxes, a necessity in countering the strong depredation pressures from invasive mammals. Armed with new funding and volunteers from the nearby town of El Castillo, we were able to construct and erect the remaining predator guards (metal cones) and install them across all of our breeding sites in Parque Valle Nuevo.





Despite moving fast with the installation, three active nest-boxes scheduled to receive a predator guard were all depredated in a single night (May 14<sup>th</sup>, 2014). The stages of the nest and degree of mortality for each nest-box are as follows:

- 1) A female and her freshly laid clutch of three eggs were depredated; the female's band was recovered
- 2) A female and her incubated clutch of three eggs were depredated; the female's band was recovered
- 3) The remains of a swallow (band not recovered) were found in the recently constructed nest awaiting eggs

The attacks appear to happen solely at night when females are in the box during the laying or incubation periods. These attacks are most likely carried out by arboreal Black Rats (*Rattus rattus*), as they have been found overwintering in our nest-boxes when the boxes were still originally attached to trees. No depredation events have occurred in boxes equipped with predator guards.

We decided our knowledge of the presumed predator was poor, and that possibly other species were contributing to these rapid mortality events. We therefore borrowed four Havahart live mammal traps from Fundación Moscoso Puello in order to gain a better idea of what we were up against.



Traps were baited with food scraps and broken, raw eggs, and were placed around the two micro-sites at which we had suffered depredation in the past (Nizaito Arriba and Las Ruinas). Our efforts awarded us with two Indian mongoose (*Herpestes javanicus*) and three Black Rats. Both species were introduced to Hispaniola and have been accredited as the most probable cause leading to the presumed extirpation of Golden Swallows from Jamaica (Graves, Birdlife International, 2013). It's possible that the mongoose may not be capable of scaling a thin metal post nor fully entering a nest-box, and may therefore not be an immediate

**Clockwise from upper-left corner: Indian mongoose; young Black Rat with strange facial morphology likely caused by being 'in between' developmental stages; adult Black Rat.**



threat for Golden Swallows nesting in nest-boxes or cavities in vertical snags. However, the Indian mongoose has been observed depredating a Golden Swallow nest in the bauxite mines of the Sierra de Bahoruco (Townsend, *Journal of Caribbean Ornithology*, 2006) and may be capable of reaching into small cavities and extracting the contents within.

It should be noted that we have not encountered Norwegian Rats (*Rattus norvegicus*) in Parque Valle Nuevo despite their recorded presence on the island.

Meanwhile, feral cats are undoubtedly a large threat that has received very little attention in the Dominican Republic. They are also the only predator that has been able to bypass our predator guards. While installing predator guards on our eight boxes at the Visitor Center, we turned around at the sound of a metallic noise behind us to see an adult cat sitting on top of the predator guard while reaching into the nest-box hole with its paw. The predator guard stands over four vertical feet off the ground and offers virtually no holds to grip, yet this cat was able to land directly upon it with an arching jump from the ground while simultaneously grabbing onto the nest-box so as not to slip off the cone. Equally terrifying was the cat's knowledge that there was prey inside of the nest-box, likely something that the cat learned from a distance while watching the adults leave and enter the active nest-box.

The impact that introduced and feral mammals are having across taxa in Hispaniola has not been analyzed in any detail, and may be one of the large contributing factors towards the decline of other species that nest on the island. We are fortunate in that our study species nests within an artificial box in which we can protect it from (most) introduced threats; however, we can speculate that birds such as the cliff nesting Black-capped Petrel may be left extremely vulnerable to these predators during the breeding season.

## **DISTRIBUTION**

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Proposing a comprehensive conservation plan for the Golden Swallows will be difficult if we are unable to accurately describe the distribution of the species across Hispaniola. The distribution of the Golden Swallow has never been formally addressed in Hispaniola, and so we are trying to clean up eBird observations and couple those with altitudinal and habit parameters that will hopefully give us a much better idea of where the remaining populations of Golden Swallows can be found. This up-to-date distribution map will allow us to better identify (1) the remaining 'strong-holds' for the species, in where populations still persist in large numbers, and conversely areas of extremely low density; (2) where gaps in observations occur - most likely due to the remote and inaccessible nature of the landscape - and so where to focus future transect work; and (3) where populations may be potentially isolated from one another or where there may be high likelihood of connectivity.

In the Dominican Republic, Golden Swallows have been reported from the Cordillera Central, the Sierra de Bahoruco, and the Sierra de Neiba, but there is no evidence of their presence in the Sierra de Martin Garcia, the Cordillera Septentrional, or the Cordillera Oriental. In Haiti, Golden Swallows have been reported from the Massif de la Selle, Massif de la Hotte, Montagnes Noires, Massif du Nord, but not from the Massif du Nord Ouest or the Chaine des Matheux.

Because of its growing strength and accessibility, we continue to promote eBird as an invaluable tool for recording observations. Albeit slowly, there is momentum being gained behind using the database in the Dominican Republic, and we hope that greater future participation will help to not only aid other researchers, but to create a greater sense of bird-minded comradery throughout the country.



Current eBird Golden Swallow observations. Those highlighted in red squares are still awaiting verification. ([www.ebird.org](http://www.ebird.org) → Explore Data → Species Maps → Golden Swallow)

Seeing as the range of the species appears to be strongly linked with mountain geography, we're very interested in how altitude plays a role in distribution. We are experimenting with breeding parameters by placing nest-boxes across a strong elevational gradient within Parque Valle Nuevo (1,973 – 2,838m). If positively confirmed as a nesting site, the lowest elevation of a breeding attempt reported from the Cordillera Central would be at 1,730m in the Aguas Blancas region, where foraging activity during the breeding season eludes to possible nesting, though the rugged nature of the terrain has made it difficult to locate an occupied cavity.

Meanwhile, natural nesting activity in the bauxite mines of the Aceitillar region of the Sierra de Bahoruco is occurring at 1,292m. We currently have 19 boxes in the area, ranging from 1,101 to 1,414m, though have only received initial nest-building activity (box abandoned shortly thereafter) in one nest located at 1,411m.

After eBird observations have finished being filtered and verified, we will be able to more closely analyze the altitudinal range of the species *outside* of the breeding season as well as in other mountain ranges across Hispaniola.

## OUTREACH

Most of what we've learned and accomplished (thus everything you've just read) would never have come to fruition had we not reached out and engaged the endless fountains of help and support that can be found when one simply looks for it. Likewise, many groups and foundations reached out to us. As we've stressed in past reports, science and conservation are not 'go it alone' endeavors. I think that the Golden Swallow Project's three fairly successful field seasons is evidence that outreach, local involvement, and developing local capacity actually works, and everyone comes out ahead.



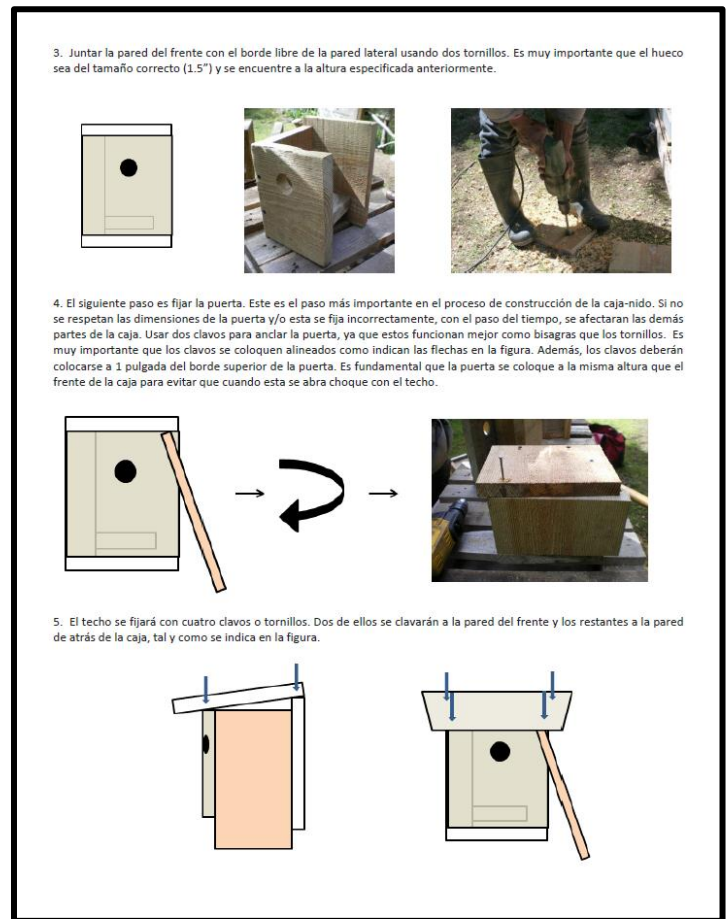
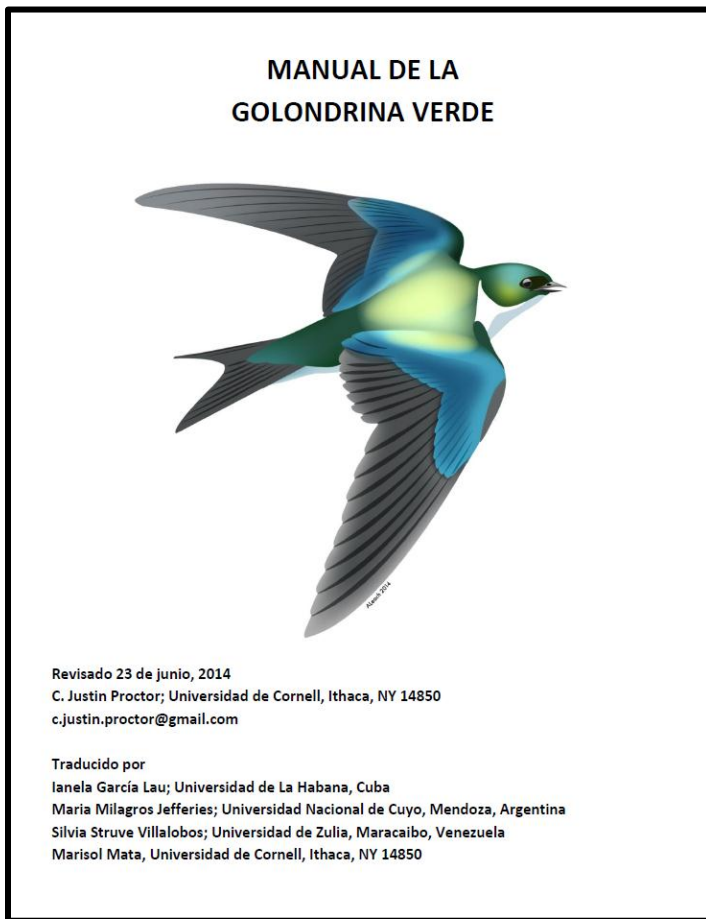
We thought building nest-boxes was a big job until five community members from the nearby town of El Castillo produced ten in one hour's time. We owe a lot of gratitude to Villa Pajon and especially to Jose Delio Guzman for encouraging our involvement with this local group of Dominicans that will be key players in the future of the project.

We were able to continue connecting with local schools and designing educational materials focusing on local bird species. We gave presentations and continued to hammer home concepts of conservation, community involvement, and the recording of observations. However, our big task this year was training. We needed to make sure that as many elements of the project could run themselves via local hands for future years when we can't guarantee the presence of a full-time field team. And so much of our time was spent developing training materials, holding hands-on workshops, and bringing more people on board with the project.



Thanks to helpful input from a variety of collaborators, we were able to develop the first edition of what we've titled the *Golden Swallow Manual*. Available in both English and Spanish, the *Golden Swallow Manual* is a 20 page document covering everything you need to know about (1) building, erecting, and caring for GOSW nest-boxes, and (2) basic monitoring and simultaneous data collection from GOSW nest-boxes.

The Manual was designed to be a stand-alone document – a thorough, step by step training guide filled with pictures, instructional blue-prints, tables, and 'what-if' scenarios. The Manual will be critical for those continuing to monitor our project's nest-boxes in Parque Valle Nuevo and Aceitillar, while promoting the expansion of the nest-box network in the years to come.



We've spoken extensively in the past about the power of the nest-boxes in connecting people with something tangible in nature. One of our goals was to bring science, conservation, and thus the Golden Swallow more into the spotlight. In 2013 we erected eight nest-boxes around the National Park's Visitor Center and an additional eight around the Villa Pajon Ecolodge, while this year we located ten around Fundación Moscoso Puello. These three entities are the largest establishments within the park that collectively draw in the majority of the park's visitors, from tourists to visiting researchers, naturalists, and outdoor sports enthusiasts. With nest-boxes at each location, we can ensure that anyone passing through the National Park becomes acquainted with the research and conservation that we are doing. In a very simplistic way, we make the project visible. And albeit simple, the nest-boxes create interest and curiosity, sparking conversation and encouraging education around the number one theme – stewardship over the local avifauna. There are now nesting pairs of GOSW at each location, and the feedback from visitors that have been able to more closely interact with the

bird has been extremely positive and rewarding. This is a model we're hoping to see extended to include other fauna. When done correctly, making nature more 'visible' can be an invaluable tool for raising support around what can sometimes be a challenging theme.

Outreach comes in many forms, and something we're trying hard to develop is a better sense of connectivity between researchers working inside the Dominican Republic. It may seem odd that these relationships don't just naturally exist, but the truth is that it can be very challenging for scientists to develop and put the needed time into establishing a community amongst themselves. Additionally, some research themes may simply not have much in common, or some investigators may be conducting similar work that is funded by two different (and possibly rival) agencies. There are an entire slew of reasons that can inhibit these interactions.

This year we reached out to form a link with a fellow Cornelian, Josh LaPergola, and his team conducting behavioral studies on the Hispaniolan Woodpecker (*Melanerpes striatus*) in the Jarabacoa region of the Dominican Republic. Beyond their help with natural cavity searching, the interaction itself with a field crew of diverse backgrounds and specialties offered us new insight into the many directions our own project was heading. They were able to help refine some of our protocols and teach us about the landscape and niches filled by other bird species. We were also able to coordinate the short-term exchange of some field assistants between our different field sites to allow them an opportunity to learn new skills in unique environments. The entire experience was a positive one, and we strongly encourage this type of reaching out between investigators to become more of a priority.



We continued the trend by encouraging visits from two bird guides, Ivan Mota – a Dominican naturalist and birder that co-leads 'La Cua Birding and Wildlife Tours' with his wife, Ana – and Kate Wallace, a once Peace-Corps volunteer now founder of a bird guiding company, 'Tody Tours'. We were able to host both Kate and Ivan for several days in Parque Valle Nuevo (thank you to Villa Pajon Ecolodge for offering accommodations), during which we were able to introduce them both intimately to our work and the birds, while receiving helpful feedback in return.

**(Left) Kate Wallace with Golden Swallow chicks in hand**

Our connection with Professor Simon Guerrero put us in touch with his research team studying Hispaniolan Trogons in Parque Ebano Verde, where they are focused on studying the reproductive biology of the species using artificial nest-boxes – a strong parallel in methodology to that of our project. Researchers Maikel Cañizares Morera (Cuban) and Yeral Segura (Dominican) spent a day in the field with us, and kindly offered to act as sounding boards for our many questions related to better understanding GOSW in a broader, ecosystem-wide context.

This field season also provided us an opportunity to connect with director Máximo José Rodríguez and his crew from Marketing Lab Films S.R.L., whom have taken a strong interest in the research and conservation projects happening around the country. They have recently finished a very successful documentary entitled, “*Cordillera Central Dominicana: Oasis del Caribe*”, and were looking to gather footage of the Golden Swallow Project for future outreach. We’re hoping that the interviews, multimedia, and experiences we gave to the group will be beneficial in helping to reach new audiences with current information on some of the efforts underway to protect the Caribbean’s remaining rich diversity of wildlife.

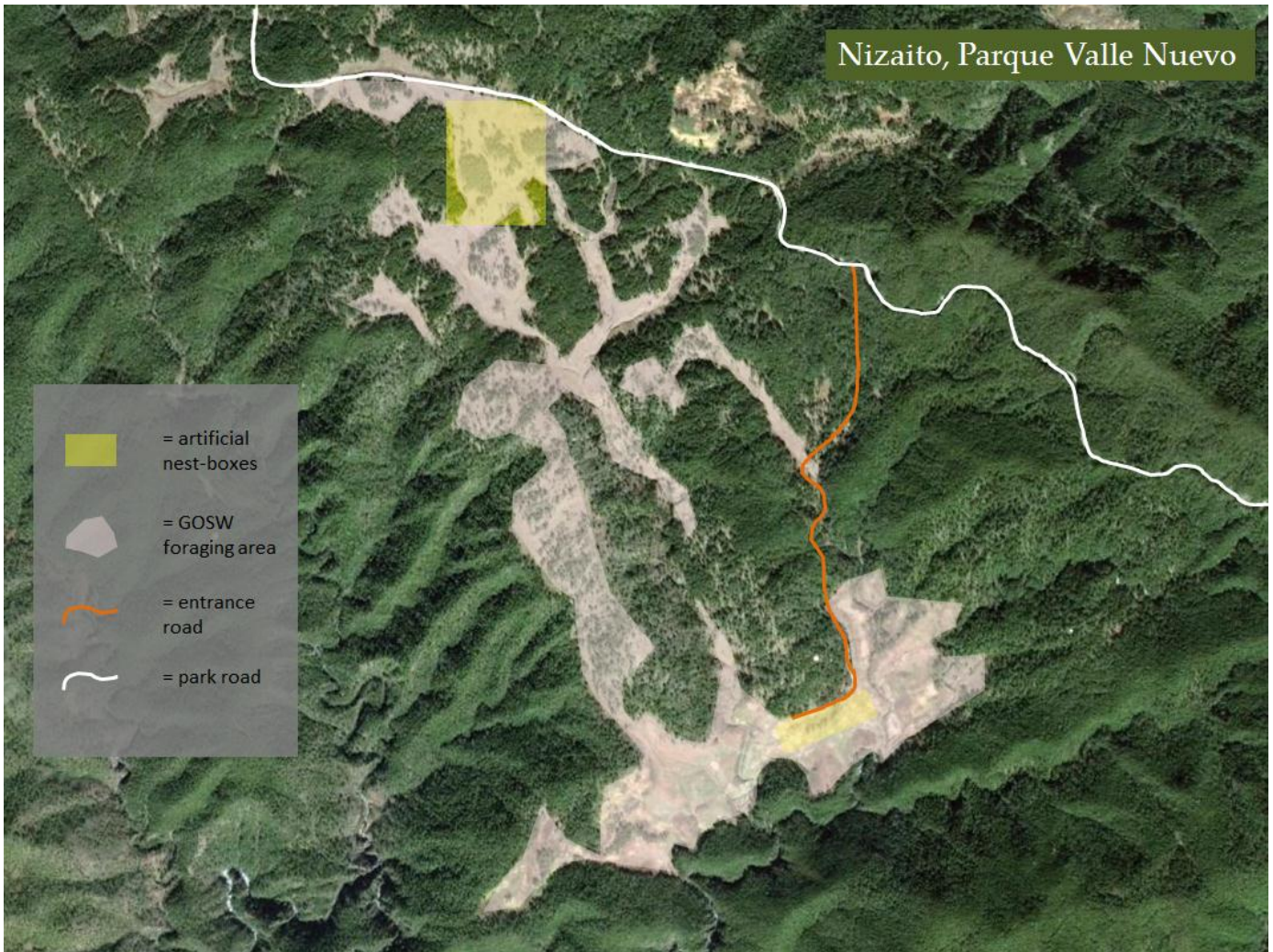


## **GOLDEN SWALLOW CONSERVATION PLAN**

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For three years we looked to designate a specific region of Parque Valle Nuevo as a High Priority Conservation Area for the Golden Swallow, and ultimately unanimously agreed on the lands known as Nizaito. We were searching for a region that could accommodate a large nest-box grid, ecotourism, and involvement from multiple stakeholders. Nizaito consists of a complex network of river heads that descend slowly through open, grassy fields bordered by pine forest until they combine with one another in a wide, open valley below. The expansive confluence of the rivers at the bottom of the satellite image (figure on next page) was farmland for much of the first half of the twentieth century, until it eventually was incorporated into the National Park. Though the clear cutting of forest and digging of irrigation ditches still survive as evidence of the extensive farming practices that once took place there, Nizaito encompasses an array of habitats and resources available for wildlife. The combination of pooled and running water, rock cliffs, open grasslands, and pine forest edge support the largest diversity of birds that we have seen in one single place in the high mountain landscapes of Parque Valle Nuevo.

Nest-boxes located at the headwaters (large, yellow square) have been the most successful three years running, attracting the highest densities of breeding Golden Swallows while also yielding the highest numbers of chicks that survive through to fledging. Meanwhile, a small nest-box grid of eight boxes in the open valley down below (small, yellow square) has proven to be equally exceptional. Here Golden Swallow behavior is significantly different from our other micro-sites in that the swallows show almost no noticeable signs of fear or aggression towards our presence. Throughout the breeding season, we are able to work within a nest-box (measuring eggs and chicks) without causing an alarm response from the adults. Even more incredible, while standing beside a nest-box, incubating and/or provisioning adults will continue to enter and leave as though we aren’t there. This behavior allows for the collection of invaluable photography, videography, and sound recordings of the species.



Both the abiotic and biotic characteristics of Nizaito make it an excellent site for a specific type of ‘quiet’ ecotourism that is not currently available within the National Park. We are in the beginning stages of drafting a full management plan of the area with our collaborators at BirdsCaribbean that would involve the development of interpretive hiking trails, observation towers, picnic areas, and guided tours. Nizaito offers endless opportunities to connect travelers with the ‘raw’ natural environment of the Cordillera Central while using avian ecology as a focal point. We look forward to being an active part of the planning and execution of this plan in the year to come.





## MULTIMEDIA and DATABASE CONTRIBUTIONS

It is critical, yet easy to overlook, that everything we learn during the field season should end up in a proper, peer-reviewed archive available to the public as well as the scientific community. As we've discussed in great detail before, we make it a high priority to disseminate the information we learn down every channel we can find. These field season reports, for example, are constructed in a way that can be read and understood by an audience without a strong background in the sciences, but still filled with important and applicable themes. Meanwhile, our upcoming publications will allow the natural history and breeding biology of the Golden Swallows to enter the realm of the scientific community via peer reviewed journals, and our website makes available a full spread of information, including in-situ documentation of what's happening at our field sites, multimedia, and additional literature on the topic of Golden Swallows.

This year, we will be focusing on revising and adding to official species reports, including Neotropical Birds Online (Cornell Laboratory of Ornithology) and Birdlife International so that the most current and accurate information is available. We have also spent a great deal of time recording vocalizations and grabbing video of the species, both of which are being archived in the CLO's Macaulay Library. We're hoping to team up with several audio specialists to help us analyze the sound recordings we gathered in more detail. This will be particularly interesting when comparing and contrasting vocalizations from the Cordillera Central populations against those swallows in the Sierra de Bahoruco.



	Catalog	Species	Sound Type			Location	Recordist	Date	Length	Quality
			C	S	M					
1.	<a href="#">195115</a> ▶ ⚡	Tachycineta euchrysea sclateri	Call			Dominican Republic Pedernales	Jefferies, Milagros	29 Jun 2014	13:15	★★★
2.	<a href="#">195112</a> ▶ ⚡	Tachycineta euchrysea sclateri	Call			Dominican Republic La Vega	Jefferies, Milagros	23 Jun 2014	1:24	★★★
3.	<a href="#">195108</a> ▶ ⚡	Tachycineta euchrysea sclateri	Call	Song		Dominican Republic La Vega	Jefferies, Milagros	17 May 2014	42:29	★★★

## FUTURE of the PROJECT– A GOLDEN OPPORTUNITY

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When we weren't working, we were busy training. Knowing that the 2014 summer field season would be the last comprehensive field season I could organize and be involved with, we doubled our efforts in making sure that the project, and all of its details, could be turned over and managed by local Dominicans. And so we are incredibly proud to say that indeed the Golden Swallow Project is now fully in the hands of several local groups, including Fundación Jose Delio Guzman (FJDG), Fundación Moscoso Puello (FMP), and Fundación Propagas (FP). Collectively they will continue to care for and monitor the artificial nest-box network in its entirety.



Biologist Mildred Mendez from FP and Moreno, National Park supervisor under FMP have been thoroughly trained in the care and monitoring of the entirety of the artificial nest-box network that falls on National Park land. They will work closely together and with local communities to continue the study and conservation of the Golden Swallows in Parque Valle Nuevo. We can't thank enough the overseeing directors of FP and FMP for their generosity and strong interest in the project, and for making the creation of this team possible.



Meanwhile, nest-boxes in the village of El Castillo and on property managed by the Villa Pajon Ecolodge will be overseen by Fundación Jose Delio Guzman and community leaders from the town of El Castillo itself. Data collected will continue to pass through Cornell University for analysis and then returned to the Dominican Republic to be disseminated.

With care, maintenance, and basic monitoring covered, the swallows will continue to return, breed, and nest on an annual basis. That being said, the stage is set for a lifetime worth of further scientific investigation on the species. Migration, social behavior, and long-term demographics – to name but just a few – are waiting to be explored. We encourage local Foundations to consider the benefits of fundraising and allocating more money to scholarships and fellowships that would be available for Dominican students interested in pursuing higher education and local thesis research.

## POST – SEASON FIRE

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A lightning-induced forest fire began the third week of July, shortly after we had finished our field work and returned home. Aided by both a long, dry spell as well as consistent winds, the fire was able to spread significantly over a short amount of time. A great many groups and organizations came together to fight the fire and aid those on the front lines, and our sincere thanks and gratitude goes out to every individual that contributed in any way they could. Their efforts, combined with a long-awaited rainstorm, diminished the fire in about two weeks' time.

Pajon fields and thick pine forest burned quickly. The fact that all of our boxes are attached to metal posts, and almost all are located away from the forest edge turned out to be a bit of fortunate luck for the project in that the fires swept low through the grassy meadows and spared most of the boxes. Furthermore, a week prior to the beginning of the blaze, all of this year's chicks had fledged, and so no offspring were left vulnerable inside of the boxes.



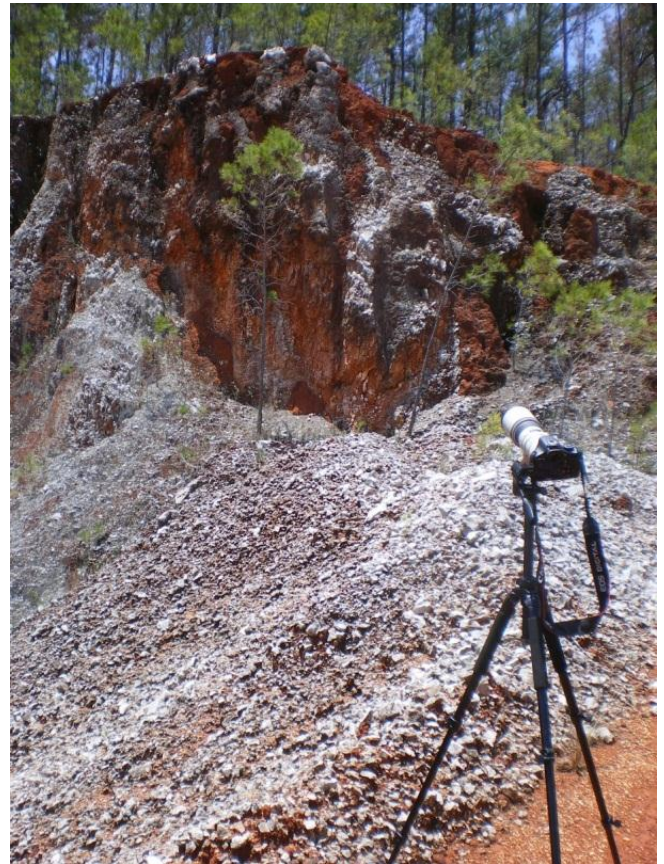
Fire is a common variable in this highland pine forest ecosystem, and records indicate large burnings every 10 to 15 years in parts of the Cordillera Central. How the fire has and will impact the localized migration of the species as well as their food sources in the future is difficult to speculate on at this point. We're planning to head down in December to better figure this all out and to also organize a nest-box restoration and rebuilding campaign so that the boxes will be ready for the 2015 breeding season.



### Aceitillar, Take One

From April 26<sup>th</sup> to April 30<sup>th</sup> I spent time surveying the Golden Swallow situation in the Aceitillar Bauxite mines. This site is reviewed in detail in previous reports. We continue to be fascinated by the few pairs breeding in the rocky cliff walls of these abandoned mines. This was my first visit to Aceitillar prior to the expected Golden Swallow breeding season, and so my principle goals were to document this population of swallows via video footage and sound recordings, as well as to gain a better understanding of the timing of the breeding season at this location compared to that in Parque Valle Nuevo.

At that point in time, I was able to perform a full count of all of the swallows that had arrived in the area, knowing that more may arrive as the summer got underway. Swallows were pairing up and investigating cavities, though I did not observe any swallows gathering nesting material and carrying it in flight back to a cavity. I had been told that the rains had just started for the season. There was a brief but intense shower the night before I arrived. As I was sitting and taking video and sound recordings, I did notice a variety of insects taking advantage of some of the smaller blooming bushes around me. I had no luck in finding standing water except for a large pothole or two in the main road nearby. The ground was dry and dusty. (see *"Bringing Back La Charca"* further on in this report)



I visited the 19 nest-boxes that Grupo Jaragua and I had erected the previous July, and did find one box that had a nest attempt inside. It was difficult to tell the 'age' of the nest, and so I was originally unsure as to whether or not it is from this year or last. The nest was messy, but fairly complete with pine needles and lichen – very similar if not identical in design to those found in Parque Valle Nuevo. It did lack a noticeable cup shape that often precedes laying. This box and nest were located in the most distant bauxite mine (C), and



after a one hour observation, I was unable to detect any signs of the nest being active, though a pair of swallows was seen foraging in the distance. That led me to believe that the pair built the nest sometime earlier this spring and had moved on for unknown reasons (perhaps lack of food?). I would plan to revisit the nest again at the end of the breeding season.



Google Earth image of the Aceitillar bauxite mine region. Nest-boxes are represented by yellow dots, which can be seen clustered in four distinct micro-sites across the region.

The following map highlights the four regions in the Aceitillar bauxite mines where I observed GOSW activity during the April visit. The letter D denotes an area where a Golden Swallow pair was seen foraging and flying consistently throughout the day but I could not determine if they were scouting a cavity in the near proximity. Mines A, B, and C each contain nest-boxes, as can be seen from the photo above.



4/30/14      A: 2 GOSW pairs      B: 3 GOSW pairs      C: 1 GOSW pair      D: 1 GOSW pair

## Decoys and Playback

Before wrapping up the first trip, I wanted to experiment with decoy Golden Swallows around the boxes to see what type of response it would generate from nearby pairs investigating cavities in the rock walls. The underlying goal was to simulate a pair of GOSW investigating the nest-box as a possible nesting site, thus advertising the box as a worthy cavity. Many investigators including myself have tried an array of tactics to lure GOSW into artificial boxes in order to study them, but always without success. To my knowledge, this was the first attempt to do so using playback (an audio player inside the box) and decoys (mounted on the box) simultaneously.

GOSW pairs responded aggressively to decoys and playback at all three nest-boxes I chose (one centrally located nest-box at each mine – A, B, & C). Aggressive, circling flight behavior and alarm calling ensued until the decoys and playback were removed from the nest-box. The attacking GOSW pair left the area immediately after the sound and visual stimulation was removed, showing no interest in the box there afterwards. In all three cases, the swallow pair responding to the decoy and playback did not appear as interested in the fact that another pair of swallows was using the nest-box cavity as they did in the fact that there was simply another (unknown) pair of GOSW in the area.

The following is a screen shot from a video taken of a swallow attacking two decoys attached to the nest-box. The attacking GOSW (streaking by in flight) is outlined in a transparent yellow circle. Thank you to Silvia Struve for her excellent work designing the decoys.



It is important to note that I tested the decoys and playback individually. Decoys alone did not draw a response, which I attribute to the very low numbers of swallows in the area and the fact that they probably could not detect a motionless decoy at such distance from where they were foraging. Playback alone elicited the same aggressive response as it did when combined with the presence of decoys.

## Aceitillar, Take Two

I returned with my field team to Aceitillar on the 28<sup>th</sup> of June. We were successful in recording an abundance of vocalizations as well as video. We were able to locate three active nests, all in natural cavities, one located in Mine A and two in Mine B.

The nest in Mine A was located approximately one foot deep into a shallow-sloped rim of the mine (pictured right), which we were able to access by foot. This came at a surprise seeing as both mongoose and rats would be able to easily access the nest. The nest contained three chicks that we estimated at four days of age, and was constructed of pine needles and lined with lichen. Both adults responded territorially and aggressively to our presence. Two pairs of GOSW were actively nesting in Mine B. One cavity was located in a vertical rock wall while the other was located in a slightly overhanging rock wall. Neither cavity would be accessible to mongoose or rat. Both cavities were located between 5 and 7 meters off the mine floor. Parents were actively provisioning chicks of an unknown age in one nest (we could hear the begging calls of the chicks); while infrequent and long duration visits by the female in the other cavity indicate either late incubation or very young chicks. A fifth swallow that we believe to have been a male was flying around Mine B as well. The two nesting pairs of swallows would respond aggressively in flight if that male approached the immediate vicinity of one of the nests.



We revised all of the nest-boxes to find no activity. The nest-box in Mine C that had contained the supposedly inactive nest had not changed and we maintain the original hypothesis that it was abandoned before completion. Interestingly enough, this nest-box was erected in 2013 directly in front of an older nest-box that had been anchored in the adjacent rock wall. That old box was the only box of all the originals in which we found nesting activity the year prior. Recapping from the 2013 Field Season Report, we had found that old box lying broken upon the ground (likely eroded out of the rock wall over time) and inside it a nest that contained the skeletons of two chicks. It is very likely that the original pair of swallows, whose clutch had failed due to a falling box in 2013, returned in 2014 to nest at the same location and began using the new box on the post we erected just two meters in front of the old location. This reinforces the idea that once an artificial nest-box is used, the pair is apt to return and continue using it during future breeding seasons.

Based on confirmed (and recent: February, 2014) observations of large flocks of Golden Swallows (numbering over 100 individuals) massing in the winter months just northwest of Aceitillar in Boukan Chat Town, Haiti, we believe that the bauxite mine population of breeding GOSW is but a small, potentially skewed view of what's happening with the species in the Sierra de Bahoruco. It is possible that several pairs have grown accustomed to nesting in these mines and return annually; however, the success of this population should not be projected to represent Golden Swallows on the whole that are breeding in the Bahoruco mountains.



Mine B cavity entrance hole

## TRANSECT from PUERTO ESCONDIDO to PEDERNALES

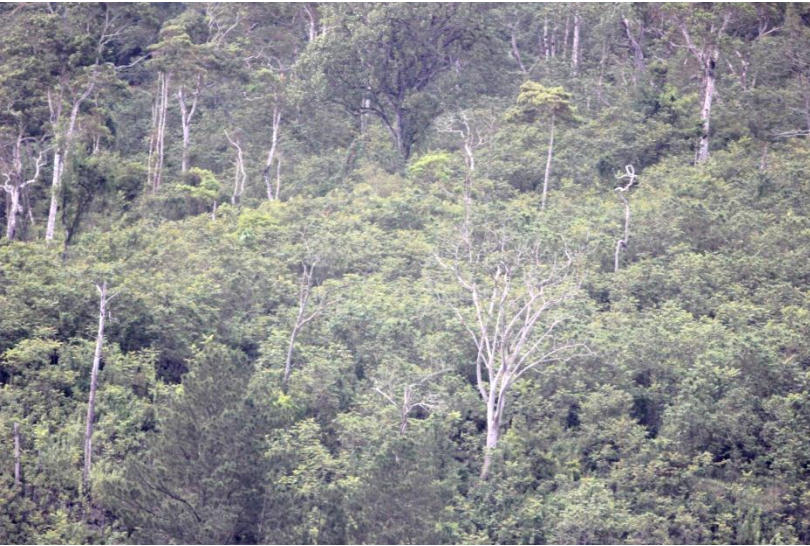
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After wrapping up our field season in Parque Valle Nuevo, we headed southwest to check on the situation with the Golden Swallows in the Aceitillar bauxite mines, as described in the previous entry to this report. In route, we planned to conduct a full day transect by vehicle across the Sierra de Bahoruco mountains on the Dominican-Haitian border, from Puerto Escondido to Pedernales via Zapoten. The following account will focus on aerial insectivores and cavity nesters that we observed or heard.

Beginning at 420m asl, we quickly climbed, and conducted five to ten minute point counts at every vantage point along the way, looking and listening for Golden Swallows both nearby and in the distance. We did not come across GOSW until we reached 1244m, at which point in time we were parked on the upper rim of a lush valley leading up towards Zapoten. The habitat down in the valley below us appeared very thick, lush, and densely forested. Hispaniolan Woodpeckers and Hispaniolan Trogon (*Priotelus roseigaster*) called from below. Three GOSW individuals flew up from the valley below and appeared to either be fighting or possibly feeding a fledgling in flight. They were moving fast and did not remain in view for more than five seconds, though we are positive on the identification. GOSW are often spotted here in low numbers by birdwatchers touring out of Rabo de Gato with Tody Tours. We waited thirty minutes more for them to reappear but they did not. We scanned the valley as thoroughly as possible but were unable to locate any other swallows. The valley is quite extensive and is also filled with dead snags remaining upright. This valley deserves considerably more attention in future trips, as it appeared to be the most pristine and botanically diverse habitat we saw during our crossing of the mountain range.

Approximately one hundred meters further up the road, we spotted a female Caribbean Martin (*Progne dominicensis*) entering an old woodpecker cavity in an upright snag on the hillside above us. Compared with the valley below, this hillside was bare minus a few large standing pines. The female entered the cavity twice for brief durations as we were approaching (most likely indicating that she was provisioning chicks). While we stood close to the base of the tree (the cavity was about 4 meters high up the snag) the female remained distant and did not vocalize.





The picture on the left shows the southeast slopes of the valley – densely vegetated and containing an abundance of upright snags that may offer considerable cavity opportunities. The picture on the right is a female Caribbean Martin in flight.

As we continued climbing up the rim of this valley by vehicle, we noted that thick stands of pine forest began at about 1425m. Near the pinnacle of the valley, at about 1520m, we saw two GOSW pass quickly by in flight. We were surprised at the relatively low numbers of swallows based on all of the favorable elements of the habitat, including woodpeckers, cavities in snags, and other aerial insectivores foraging. As we continued out of the valley, Trogon, woodpeckers, and Antillean palm swifts (*Tachornis phoenicobia*) continued to be abundant and obvious.



Photo looking northeast down the valley (in the direction of Puerto Escondido). Note the strong contrast in foliage from west (left) to right (east). The Caribbean Martin nest was found in a snag on the barren hill to the left, while Hispaniolan Woodpeckers and Trogons were heard calling from the valley below (center-right).

We crested over the summit of the Bahoruco and slowly continued down the southern slopes towards Pedernales. At 2316m we came across a burnt stand of pine that seemed ideal for cavity nesters. A pair of Caribbean Martins was provisioning chicks in what appeared to be an old woodpecker cavity located three meters up a standing snag. Good visibility and an absence of wind allowed us to look and listen for other swallows for nearly an hour, but we did not detect any other activity.



**What would appear to be ideal nesting habitat was devoid of GOSW activity**

Adjacent to this burnt stand of pine in a young but healthier pine forest, we initially heard and then located four Hispaniolan Trogon, possibly a family unit traveling together. A male Hispaniolan Woodpecker was also present.

The mid-lower slopes on the south side of the Bahoruco afforded us very little in terms of aerial insectivores. No further Caribbean Martins or Antillean palm swifts were seen. A last and solo Golden Swallow was seen foraging approximately 30m high above a mix of pasture and interrupted forest at 1622m asl.

Our total count of six Golden Swallows for the day is concerning, and despite what appears to be considerably-sized patches of satisfactory breeding habitat, the species is turning up in very low numbers across considerable distances. Why aren't there higher numbers of Golden Swallows in these areas? We find ourselves mulling over that question continuously, but we still don't have a good answer. It is possible that we are missing a variable that affects some fragile part of the Golden Swallow life history and has been the driving factor in keeping numbers low. Perhaps that variable comes into play outside of the breeding season. More than ever, I'm curious to know what we would find in terms of annual migration patterns if we were someday able to use geolocators and track swallow movement across an entire calendar year.

All sightings from the transect have been recorded in eBird.

## BRINGING BACK LA CHARCA

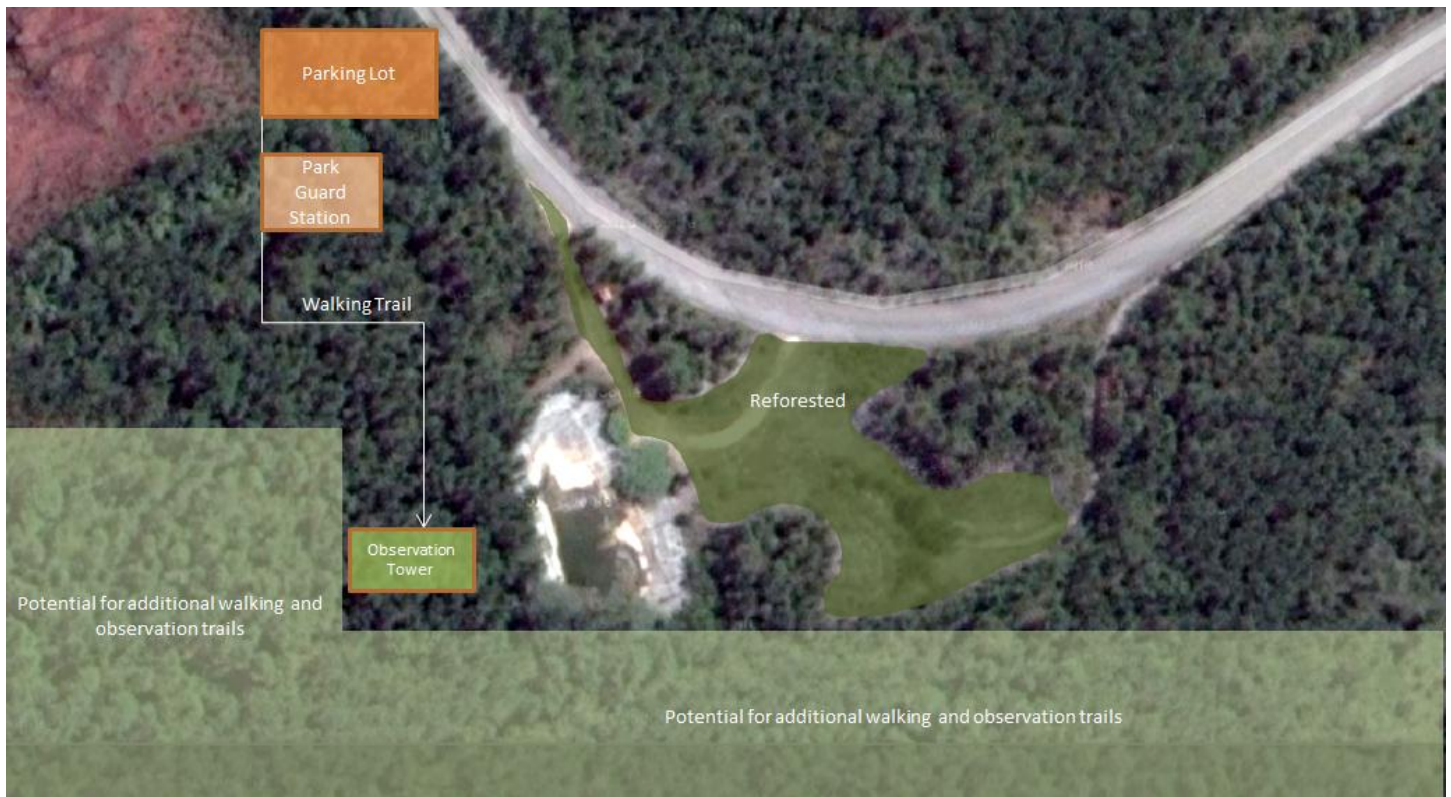
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Kate Wallace (Tody Tours, Puerto Escondido), Steven Latta (National Aviary), and I have recently begun renewing conversation about the possibility and plausibility of restoring the cement basin known as La Charca in the Aceitillar region of the Sierra de Bahoruco. We are currently proposing some preliminary ideas and plans to Grupo Jaragua, the local NGO overseeing the Jaragua-Bahoruco-Enriquillo Biosphere Reserve, in hopes that they will be interested in jumping on board.



La Charca is a cement water reservoir in the Aceitillar region of the Sierra de Bahoruco. The basin was constructed by ALCOA (Aluminum Company of America) at a seasonally high-flow run-off region alongside a highway the company built in order to transport raw bauxite from their mines up in the mountains to a processing factory located along the coast. In its glory days, when filled with water, La Charca was a hotspot for local birdlife – with many of those species being rare endemics. Unfortunately, as it has not been maintained, the basin has acquired many leaks over the years and the puddle of water that remains is insignificant. Accredited for 83 different species on eBird, visitors that pass by La Charca today would be lucky to encounter more than a handful. Golden Swallows used to but no longer drink from the basin.

No doubt, from the outside looking in, bird watchers and naturalists alike would love to see that basin filled with water - and birds - again. And we have little doubt that we couldn't organize a solid team consisting of several capable engineers, carpenters, and laborers to fix the basin. However, the heart of the problem lies in that once we repair and restore water to the basin, how can we properly manage it? More specifically, how do we design (*re-design*) La Charca so that people can enjoy the feature, but not destroy it (washing clothes, hauling out water, hunting, etc.)? A solution could involve changing the layout surrounding the basin, while simultaneously expanding on the great potential of the area by incorporating new features, such as a small parking lot, possibly a guard station (or information station), a walking trail, and an observation tower, all of which would be designed to enhance the experience and viewing while keeping visitors at a respectable distance from the basin itself.



The above graphic depicts an optional new layout for La Charca (the water basin is an off-white color and is located at the center of the image)

It would be great to see diversity come back to La Charca, and equally great to see people enjoying it in a respectful way. We'll be working on it.

## DATA ANALYSIS and PUBLICATIONS, WHAT'S ON THE DOCKET!

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There is a lot of writing and analysis to be done, and it's truly amazing how much more you continue to learn when you're back at base going through the data. Keep your fingers crossed for the following two publications to be cycling around by later this winter.

**"An artificial nest-box approach to uncovering the natural history and breeding biology of the Golden Swallow (*Tachycineta euchrysea sclateri*), a threatened and endemic passerine on the island of Hispaniola"**



**"Determinants and limitations to the presence and reproductive success of Golden Swallows (*Tachycineta euchrysea sclateri*) in the sub-tropical, high altitude pine forests of the Dominican Republic's Cordillera Central"**



It was in 1844 that English naturalist Philip Henry Gosse arrived in Jamaica for his first time. Gosse would ultimately spend 18 months on the island, where he became fascinated in studying the local birdlife he found there. After returning back to London, he went on to publish a book entitled, *“The Birds of Jamaica”*, in which can be found the first formal descriptions of many birds still cruising about the Caribbean landscape today. The encounters he had with one bird in particular inspired Gosse to write the following:

“This exceedingly lovely little Swallow, whose plumage reflects the radiance of the Hummingbirds, is found, as I am informed by Mr. Hill, in the higher mountains formed by the limestone range of the very centre of the island, as in Manchester, and St. Ann’s. It is not until we ascend this central chain, that we meet with this sweet bird, occasionally in the more open dells, but principally confined to the singular little glens called cockpits.”

In this passage Gosse speaks of the Golden Swallow, a small passerine that has only been historically known from two islands, Hispaniola and Jamaica. And while populations of this species continue to persist in several mountain ranges of Haiti and the Dominican Republic, the beautiful bird that Gosse describes in his Jamaican travels has not been seen on that island for more than 25 years.

Gary Graves, Curator of Birds at the Smithsonian Museum of Natural History in Washington, D.C., conducted island-wide searches for the swallow from 1994 to 2012. Though his extensive census efforts across 1,281 sites did not produce a positive sighting, several large tracts of remote land remain to be thoroughly explored for any relic populations, including the Cockpit Country in Trelawny Parish and the Port Royal Mountains and the southern slope of the Blue Mountains in St. Andrew Parish. With recent financial support from the Smithsonian’s James Bond Fund, I was approached by Graves to put together a team to survey these locations.

Beginning in January of 2015, joined by recent Cornell graduates Seth Inman and John Zeiger, our team of three will set off from Ithaca, New York to begin a series of two, one-month expeditions into the heart of the Jamaican wilderness. The team will be drawing on the support of the Smithsonian, the Rufford Foundation, the Cornell Laboratory of Ornithology, and Cornell Outdoor Education. The primary goal of the expedition will be to conduct exhaustive surveys for Golden Swallows by accessing the remote backcountry by foot. Armed with sound recording gear, cameras, maps, backpacks, and tents, the team will attempt to survey habitats that have seen very little human presence. Beyond searching for the target species, the team will be conducting small mammal surveys to better understand the distribution of invasive rats and mongoose that may have been a fundamental driver in the potential extirpation of the Golden Swallows from the island. The team also plans to keep an eye out for a handful of other bird species that fall on a 'high priority list', while additionally incorporating an outreach component that will develop awareness around the theme of conservation of endemic birds.

For more information on the work done by Gary Graves and the history of the Golden Swallows on the island of Jamaica, read Graves' "*Historical decline and probable extinction of the Jamaican Golden Swallow *Tachycineta euchrysea euchrysea**", published in Bird Conservation International, 2013.

Meet the rest of the team:

## SETH INMAN

Seth with Bedouin students in Jordan



Seth spent most of his childhood in Costa Rica and is interested in conservation and environmental history across cultures and over time. During his summer breaks throughout high school and college, he worked on private sector conservation initiatives in the Galápagos Islands, Nicaragua, India, Jordan and Chile, co-founding and collaborating on a multi-media project (<http://raxacollective.wordpress.com>) highlighting entrepreneurial approaches to conservation. Seth recently completed a senior honors thesis in history that explores British conceptions of travel and wilderness in Iceland during the nineteenth century, graduating from Cornell University in May of 2014 with an honors in History. He has been employed by a citizen science program involving education and outreach at the Cornell Lab of Ornithology for the past three years, previously worked for Cornell Outdoor Education and rowed for Cornell's lightweight crew.



**JOHN ZEIGER**

**John working with a colony of terns at Oneida Lake, NY**

John recently graduated from Cornell University through the Department of Natural Resources. He grew up in Ardsley, NY, a suburb near NYC, and has always been passionate about the natural world. As an undergraduate, John spent two summers assisting with Tree Swallow biological research under the direction of Dr. David Winkler. John's enthusiasm for conservation and the outdoors are strongly measured in his leadership with the Wildlife Society at Cornell. John looks forward to making meaningful contributions to the field of conservation during the expedition to Jamaica, gaining the skills and experience needed to lead his own independent field research abroad in the future.

### **WINTER TRIP to the DOMINICAN REPUBLIC?**

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We are currently applying for funding to support a trip down to the Dominican Republic this December for the same team (myself, Seth, and John) that would be taking part in the Jamaican expedition. Our goals would include the following:

- organize and execute a full nest-box restoration effort (post-fire) in Parque Valle Nuevo
- conduct an 'on-foot' transect over the Sierra Martin Garcia looking for Golden Swallows and documenting other bird species, while simultaneously continuing to prepare the team in avian survey protocols while in a remote setting
- organize and lead a multi-disciplinary team of biologists, engineers, and policy makers in the redesign and restoration of a water basin in the Sierra de Bahoruco that historically served as a local biodiversity hotspot
- investigate recent confirmed reports of high numbers of Golden Swallows flocking and foraging northwest of Pedernales

## FRIENDS and SUPPORTERS of the GOLDEN SWALLOW PROJECT

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We'd like to acknowledge that funding and equipment for the 2014 Field Season was generously awarded by:

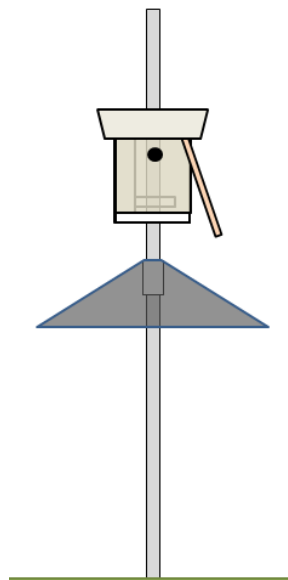
- The Rufford Foundation
- The Cornell Lab of Ornithology's Athena Grant Foundation
- The National Science Foundation's PIRE Support (NSF OISE-0730180)
- IDEA WILD

...and that additional project support vital to the growth and maintenance of the project was provided by:

- Fundación Propagas
- Fundación Moscoso Puello
- Villa Pajon and the Guzmán Family
- Fundación José Delio Guzmán
- Europcar
- Grupo Jaragua
- BirdsCaribbean (Formerly: The Society for the Conservation and Study of Caribbean Birds)
- The Golondrinas de Las Américas Project
- Cornell University and the Cornell Lab of Ornithology
- Graduate thesis committee
  - Advisor: Dr. David W. Winkler
  - Special Committee Members: Dr. Eduardo E. Inigo-Elias, Dr. Amanda Rodewald, Dr. Daniel Ardia
- El Museo de Historia Nacional
- Ministerio de Medio Ambiente
- La Sociedad de Ornitología

Previous funding that allowed the project to be where it is today came from:

- The Association of Field Ornithologists' 2013 E. Alexander Bergstrom Memorial Research Award
- The Neotropical Bird Club Conservation Awards Fund
- Natural Research's Mike Madders Field Research Award
- The National Science Foundation's PIRE Support (NSF OISE-0730180)
- The Florida Ornithological Society
- Fundación Propagas
- IDEA WILD





DATA TABLES, COMPREHENSIVE ACROSS the 2012, 2013, and 2014 FIELD SEASONS

EGGS

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2012	Length (mm)	Width (mm)	Mass (g)
Sample size (n)	127	127	121
Average	18.34	13.16	1.70
Range	15.7 to 20.36	12.25 to 14.0	1.36 to 2.13

Clutch range: 2 – 4 eggs  
 Average clutch size (n=51): 2.96 eggs

2013	Length (mm)	Width (mm)	Mass (g)
Sample size (N)	68	68	68
Average	18.8	13.21	1.75
Range	16.68 – 21	12.33 – 13.79	1.45 – 2.15

Clutch range: 2 – 4 eggs  
 Average clutch size (n=45): 3.07 eggs

2014	Length (mm)	Width (mm)	Mass (g)
Sample size (N)	150	150	129
Average	18.49	13.02	1.69
Range	15.78 – 20.16	12.1 – 13.9	1.42 – 2.11

Clutch range: 2- 4 eggs  
 Average clutch size (n=62): 2.90 eggs

## INCUBATION

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2012	Average Time	Range
N = 36 nests	17.78 days	17 – 21 days

2013	Average Time	Range
N = 35 nests	17.89 days	17 – 19 days

2014	Average Time	Range
N = 35 nests	17.66 days	17 – 20 days

\* Clutch Completion = Incubation Day 1

## CHICKS

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### Morphology:

2012				
Day	N=	Head-bill	Wing	Mass
		(mm)	(mm)	(grams)
3	48	15.29	8.04	3.81
6	48	18.54	13.82	7.56
9	48	21.01	23.70	11.52
12	49	22.92	37.98	14.20

2013				
Day	N=	Head-bill	Wing	Mass
		(mm)	(mm)	(grams)
3	57	14.79	7.716	3.30
6	53	18.06	12.69	7.03
9	51	20.81	22.53	11.18
12	37	22.27	35.99	13.61

2014				
Day	N=	Head-bill	Wing	Mass
		(mm)	(mm)	(grams)
3	71	14.53	7.70	3.12
6	76	17.83	11.84	6.60
9	67	20.49	31.43	10.89
12	71	22.28	33.68	13.51

## FLEDGING EVENTS

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2012	N = 8 clutches	Minimum	Maximum	Average
Age upon fledging (days)		25	27	25.88

2013	N = 3 clutches	Minimum	Maximum	Average
Age upon fledging (days)		25	26	25.33

2014	N = 11 clutches	Minimum	Maximum	Average
Age upon fledging (days)		24	27	25.55

\* Hatch Day = Day 0



## MORTALITY

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LOSSES	2012		2013		2014	
	Depredation	Abandonment	Depredation	Abandonment	Depredation	Abandonment
Adults	>6	n/a	1	n/a	3	n/a
Offspring	14	24	4	17	6	22

\* Abandonment refers to an event in which the parents no longer care for the offspring (whether eggs or chicks)

## ADULTS

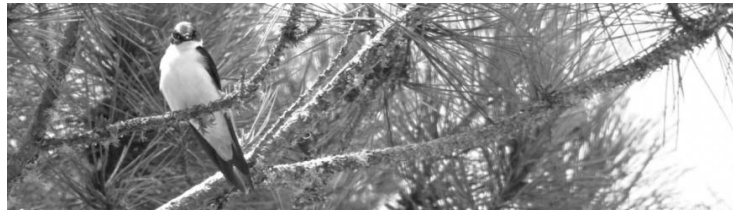
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### Morphology:

MALES_2012	Head-bill (mm)	Wing Length (mm)	Mass (g)
Sample size (n)	2	2	2
Range	25.45 - 25.7	115 - 117	11.23 - 11.41
Average	25.58	116	11.32

MALES_2013	Head-bill (mm)	Wing Length (mm)	Mass (g)	Bill Length	Tail
Sample size (n)	18	18	18	18	18
Range	25.3 - 26.72	112.5 - 119.5	11.1 - 13.07	4.0 - 4.95	53.0 - 59.0
Average	26.2	116.25	12.35	4.49	56.06

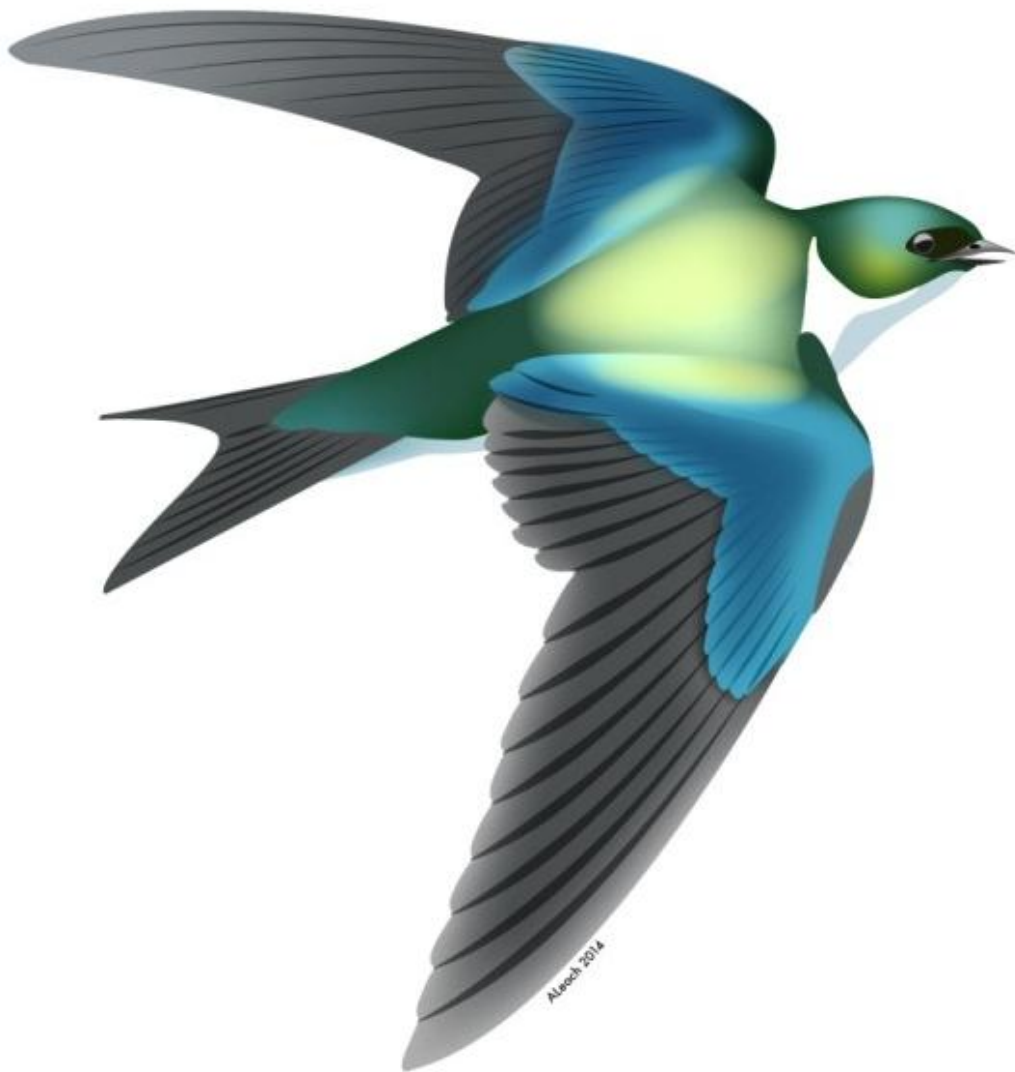
MALES_2014	Head-bill (mm)	Wing Length (mm)	Mass (g)
Sample size (n)	12	12	11
Range	25.4 - 26.65	113.1 - 119.5	11.62 - 13.28
Average	26.09	115.99	12.42



FEMALES_2012	Head-bill (mm)	Wing Length (mm)	Mass (g)
Sample size (n)	41	41	41
Range	25.35 - 26.9	106 - 114.5	11.02 - 14.58
Average	26.1	110.07	13.21

FEMALES_2013	Head-bill (mm)	Wing Length (mm)	Mass (g)	Bill Length	Tail
Sample size (n)	36	36	35	36	36
Range	24.6 - 26.95	104.0 - 115.0	11.43 - 15.22	4.21 - 6.0	47.0 - 56.5
Average	26.003	111.19	13.07	4.73	51.91

FEMALES_2014	Head-bill (mm)	Wing Length (mm)	Mass (g)
Sample size (n)	46	46	46
Range	25.3 - 27.25	107.3 - 118	11.07 - 15.59
Average	25.95	112.21	13.08



**Golden Swallow graphic by Andrew Leach becomes the project's new logo**