



## Conservation Internship

Thanks for your interest in conducting a conservation internship at the Un poco del Chocó-Nature Reserve and Biological Station.

As an intern you will participate in all our daily work that is related with the conservation of our nature reserve. With this info sheet we would like to give you a bit more detailed idea of what your work will possibly look like.

### Conservation Work

#### Trail building and maintenance

In the past few years we have established several nature trails in the reserve. These trails are necessary to access the different parts of the reserve in order to realize field studies or simply to enjoy the forest and observe the diverse animal and plant life.

The trail system already covers a length of about 5km, so you can imagine that there is always some maintenance work to do in order to keep the trails clean from vegetation or fallen branches. The steps also need to be replaced every once in a while.

#### Organic Garden

With our organic garden we would like to self-supply the field station with different vegetables. Besides various fruit trees, we have also planted yucca (manioc), sugar cane, bananas and plantains. There is a small vegetable garden where we grow a lot of different vegetables, e.g. tomatoes, beans, peppers, pumpkins. Interns help to water the organic garden and produce compost, to cultivate and plant saplings, to weed and care for the garden and finally to harvest.

#### Living fences-Project

Habitat fragmentation is a major problem in the Chocó region. While illegal logging and a progressing agricultural frontier are the main reasons for the habitat loss, there are also several minor reasons for deforestation. E.g., in order to maintain fences for their cattle, local people generally cut trees to replace the old rotten posts. But there are alternatives, so-called "living fences"-plants can be used instead. In collaboration with two neighbors we grow those plants and distribute them to the local farmers.

#### Reforestation

In 2015 we have started a small reforestation project in order to replant trees on cattle fields and improve the forest quality in secondary growth. Therefore we collect seeds (and saplings) of primary forest trees, but also of palm trees and pioneer species. With these plants we have created a small nursery and want to support local reforestation projects in the future.

## Environmental Education

The local population in the area around the nature reserve mainly lives on cattle breeding, milk production and illegal logging. Only a few families in the nearby village Las Tolas support alternative sources of income, like ecotouristic projects or hand-made jewelry. Besides poverty, of course, the major problem for sustainable nature conservation in the region is the lack of environmental awareness. Thus we regularly organize environmental education workshops in the reserve. While it is relatively difficult to change the mind of the older generation, it is an easier task to work with kids and young people. Hoping to promote more awareness amongst the next generation, we are currently working with a group of local kids from Las Tolas. As an intern you can help us planning and realizing our environmental education workshops.

## Local Conservation Workshops

In 2012, the Quito Metropolitan District declared the area around the river Pachijal an “Area of conservation and sustainable land-use”. But the declaration itself doesn’t protect the forest remnants from deforestation. Therefore the district administration realizes workshops in order to analyze the various conservation threats and to solve these problems hand in hand with the local people. We form part of the management board and participate in monthly workshops held in the different parts of the conservation area. Interns (who are proficient in Spanish) are welcome to join us for the meetings and get an insight into the local conservation work.

## Biological Field Work

### Longterm Bird Monitoring Project

#### Constant effort mist netting and bird banding

##### Background

The biological station Un poco del Chocó has started a long-term bird monitoring program in August 2014. The purpose of this research is to study the understory bird populations in the reserve, to assess survival and recruitment rates and to relate this data to the environment. Mainly passerines are captured with mist nets. Birds are banded with metal bands and in specific cases as well with color bands. Furthermore, they are weighed, measured, sexed and aged (if possible) and examined for their general fitness (molt, parasites, etc.).

The obtained capture-mark-recapture data allows us to study demographical and ecological parameters. Furthermore, the ecology of many tropical bird species is still poorly known (e.g. molt patterns and strategies). Therefore, this study also aims to fill gaps in our knowledge on tropical bird ecology. The individual marking with color bands is used to realize various behavioral studies on specific bird species.

### Methodology

On the banding days, we will open mist nets from approx. 6-11 am. This means that we will have to be at the banding location 15 minutes earlier to open nets. Once the nets are open they will be checked every 30 minutes. We will go on net rounds to check for birds, extract them and bring them back to the banding station. Here birds will be banded, measured, and we will assess ecological data (sex, age, parasites, fat, molt). Nets will be closed after five hours. After completing two banding days in one location nets will be taken down and will be installed at the next location.

### **Bird census**

#### Background

As only a restricted group of birds can be studied using mist nets (understory, passerines), the mist netting effort is also combined with a regular bird census. Both the number of different bird species found are counted, as well as the number of individuals.

#### Point-stop-counts

The birds in the reserve will be counted once during each banding session applying the technique of intensive point-stop-counts. From 6-10 am 12 different monitoring points will be assessed for 10 minutes each, counting all individuals of birds heard or seen at each point.

#### Transect counts

To study the bird populations around the nature reserve, transect counts are realized on different parts of the road to Las Tolas. Between 6 and 10 am a 4km long transect of road will be walked counting the number of bird species and individuals.

The obtained data shall give more information about migratory behavior of certain bird species in between different altitudes, as well as alterations in the ecosystem, e.g. changes in population size, habitat use and diversity.

## **Flower and Pollination Ecology**

#### Background

In tropical ecosystems, the interactions between flowering plants and their pollinators are very important. On the one hand pollinators often use flowers as their sole energy resource and on the other hand the reproductive success of flowering plants depends on the visitation of pollinators. Therefore, an emphasis of the biological work at *Un poco del Chocó* lies on flower ecology research.

One very important pollinator group in the neotropics are hummingbirds. They often visit a wide array of different food plants and create a complicated network of hummingbird-plant-interactions. Since the beginning of 2017 we are collaborating in a broader study which investigates the ecology of those networks on different altitudinal levels in the Northwest of Ecuador. Therefore, we are researching the

amount of food sources available for hummingbirds over the year and the array of flowers they use.

### Methodology

#### Transect counts

Once a month we walk a 1,5 km transect in the reserve and note all available hummingbird-pollinated flowers as well as any hummingbird plant interaction. At the end of each count we place several time-lapse cameras in front of flowers and film interactions for three days. After three days, we place them in front of other flowers and film for another three days. Afterwards the video data will be transferred to a computer and analyzed with a specific software to detect interactions.

#### Nectar measurements

To determine the daily nectar production of flowers, the day before the measurements they will be bagged in mosquito netting to avoid pollinators to visit. The following afternoon nectar will be extracted. The nectar volume will be measured with microliter syringes and the sugar concentration will be measured using a refractometer. Then the daily energy production of a plant can be calculated from nectar data and the number of open flowers.

#### Flower morphology

As the morphology of flowers determines which pollinator can visit a flower, hummingbird -pollinated flowers will be collected and measured. A caliper rule is used to measure the lengths of corolla, stigma and anthers.

## **Biodiversity**

### **Camera Trap Project**

Several different camera traps are monitoring the bird and mammal activity in the reserve. Once a week we need to check the traps, replace batteries and read out the memory cards. Then the data has to be analyzed. We try to identify the different species and transfer the data to an excel sheet.

### **Lepidopteran Project**

As changes to lepidopteran diversity are good indicators to study habitat changes and environmental impact, we are monitoring the lepidopteran diversity in three different habitats in the reserve. We use bait traps and butterfly nets to catch and identify lepidopterans in primary forest, secondary forest and edge habitat. On two mornings (per month), four bait traps are placed in each habitat and prepared with banana bait. In the afternoon, the traps will be emptied and butterflies will be identified.

To facilitate the identification of certain species, we are compiling a species list and we are working on a field guide to the different stages of lepidopteran species. As well as many other insects, most lepidopterans can only be identified in their adult stages. Therefore, lepidopteran larvae and pupas are collected and observed at the



field station. Their different stages of development are documented (incl. food plants and behavior) and finally adults can be identified. The caterpillar cages will be revised regularly and any changes need to be documented and photographed.

## Miscellaneous

### Fruit feeding stations

There are several different fruit feeding stations for certain bird and mammal species installed in the reserve. With those stations we try to facilitate the observation of some (rare) species which would normally be very difficult to observe. At the same time these feeding stations are also used to monitor the bird and mammal diversity in the reserve. The banana feeders need to be cleaned and refilled twice a week.

### Blog writing

In times of social media we are also trying not to stay behind and regularly report about news from our reserve on our blog and Facebook page. Therefore our interns will also write short articles in English about their experiences, certain events, or findings for our blog.

## Rate and Dates 2017

The rate for a conservation internship at the Un poco del Chocó - Nature Reserve and Biological Station covers the costs for food, lodging, use of the station's facilities and the lab, supervision and taxes.

Duration of stay	Rate per week	Rate per month
first 4 weeks	199,75\$	799\$
following weeks	169,75\$	679\$

You can start your conservation internship preferably on the following dates:

March 8	October 4 or 11
April 12, 19 or 26	November 8 or 15
May 17	December 6
September 6 or 13	

Furthermore, we recommend to combine the internship with the participation in the tropical ecology & conservation course. Interns who participate in the course before starting their internship will receive a 50\$ credit.

### Dates for the tropical ecology course 2017

March 28 - April 8  
August 22 - September 2  
October 17 - 28

## Exemplary work schedule for four weeks

Week 1	Tuesday	Wednesday	Thursday	Friday	Saturday	So/Mo	
6-7		Bird census 5.30-10.30 AM				free	
7-8							
8-9	Fill fruit feeders		Trail maintainance	Fill fruit feeders	Reforestation		
9-10	Organic Garden			Camera traps			
10-11							
11-12		free					
12-13							
13-15	Lunch break						
15-16	free						
16-17	free						
Week 2	Tuesday	Wednesday	Thursday	Friday	Saturday	So/Mo	
6-7		Bird banding 5.30-10.30 AM	Bird banding 5.30-10.30 AM			free	
7-8							
8-9	Prepare bait traps			Fill fruit feeders	Organic Garden		
9-10	Fill fruit feeders			Camera traps			
10-11	Set up mistnets		Data entry				
11-12		free					
12-13	Bag flowers			Data entry			
13-15	Lunch break						
15-16	Control bait traps	Nectar measurements		free			
16-17				free			
Week 3	Tuesday	Wednesday	Thursday	Friday	Saturday	So/Mo	
6-7		Transect count Hummingbird project			Change time lapse camera	free	
7-8							
8-9	Prepare bait traps		Trail maintainance	Fill fruit feeders	Organic Garden		
9-10	Fill fruit feeders			Camera traps			
10-11	Organic Garden	Blog writing					
11-12							
12-13							
13-15	Lunch break						
15-16	Control bait traps	free					
16-17				free			
Week 4	Tuesday	Wednesday	Thursday	Friday	Saturday	So/Mo	
6-7	Take time lapse cameras down					free	
7-8							
8-9	Fill fruit feeders	Organic Garden	Trail maintainance	Fill fruit feeders	Workshop Kids*		
9-10	Flower morphology						Camera traps
10-11							
11-12							
12-13							
13-15	Lunch break						
15-16	Bag flowers	Nectar measurements	free	Workshop* Planning	free		
16-17							

Please note that the given time schedule is just exemplary in order to show how much time you will spend more or less on which tasks. Work tasks and schedules might change according to current projects.

\* we try to organize an environmental education workshops once every month or two