

Monitoring and mapping broadleaf mountain forests of southern Sierra de Bahoruco, Dominican Republic



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Executive Summary

Located in extreme southwestern Dominican Republic (DR), Sierra de Bahoruco comprises one of the most globally important wintering regions for Bicknell's Thrush (*Catharus bicknelli*). Most of Sierra de Bahoruco is officially protected as a national park, and it is also a core area within the Jaragua-Bahoruco-Enriquillo Biosphere Reserve. Intensive field studies of Bicknell's Thrush (henceforth BITH) have been conducted since the mid-1990s on the northern slope of Sierra de Bahoruco, which supports the region's largest patch of preferred cloud forest habitat for this globally Vulnerable North American migrant songbird. However, between 2007 and 2008, Grupo Jaragua conducted studies on migrant and resident birds in broadleaf forests of the southern Bahoruco slopes, where we established a bird watching trail near the community of Los Arroyos, in the Park's southwest corner. These efforts led to additional explorations of a larger area of broadleaf forest in this area, to establish its importance for BITH and other birds, as well as to map its extent and logistic accessibility, and to document existing habitat threats.

We conducted field work from November 2012 to April 2013 in the humid broadleaf mountain forest habitat of southern Bahoruco National Park. To map the extent of these forests, we first used a high resolution satellite image mosaic (5-m, SPOT) of our study area from 2011 to digitize vegetation/land cover using Geographic Information Systems (GIS) Software. During bird counts and exploration of road access, we ground-truthed a preliminary forest map in those areas accessible by roads or footpaths. With these data, we prepared a final version in ESRI's shapefile format with polygons classified as: broadleaf forest, pine, sub-humid forest, coffee, agriculture, quarries, sparse vegetation areas, and forest (or non-classified forest). Initially we had proposed to identify hotspots based on the broadleaf forest deforestation rates obtained by comparing extent of forest cover in 1996 and 2003 (from the Ministry of the Environment) and 2011 (obtained in this study). However, this was not possible given classification problems found in those maps. However, we found abundant evidence that the broadleaf forest strip of southern Sierra de Bahoruco is highly threatened, in particular due to forest clearing for agricultural expansion. These activities have thinned and fragmented this forest to the point that some remaining patches are isolated, increasingly degraded forest "islands" within a predominantly agricultural landscape. Our mapping work estimated a remaining area of only 83 km² of this forest type in southern Bahoruco.

Our mapping also highlighted that: 1) the remnant broadleaf mountain forest strip is very thin and irregular, making its very long edge highly vulnerable to agricultural expansion and degradation pushing upslope from the south; 2) the core, middle section of this forest strip (which could not be reached in our surveys) appears to be equally degraded as the two areas we surveyed (Las Abejas and Los Arroyos), as evidenced by the small forest fragments seen in the images. This implies that even in these more remote areas there may be little control of deforestation and cultivation of protected Park lands, and 3) there are elongated forest patches following natural depressions or ravines (especially near El Aceitillar), as well as broadleaf forest "islands" embedded within the high mountain pine areas (especially in the Camino del Chucho), which might serve as BITH refugia and merit further investigation. Also, our

analysis recommends an assessment of forests currently classified as semi-humid (to the east of our study area) for BITH habitat potential (and possibly re-classification of forest type).

In terms of threats, our maps show a vast area (estimated at 34.5km²) of southern Sierra de Bahoruco that has been cut down to make way for expanding agriculture, even though it is within the National Park. Nearly all of the habitat destroyed has been broadleaf mountain forest, which sustains the largest number of unique and rare species of flora and fauna within the park, and is the primary habitat for Bicknell's Thrush. Especially worrisome is that, although some areas have been deforested for decades (even promoted by the Trujillo and Balaguer governments since the 1950s), we saw many recent forest cuts in what little remains of this habitat. If nothing is done to stop these practices and restore deforested areas, it is very likely that within a decade no humid mountain forest will remain on southern Bahoruco, with crops extending right up to the pine forest line.

To evaluate access roads to the broadleaf mountain forests, during all travel in the study area we kept the GPS receiver on and took notes on existing road types marked by waypoints. Back in the office, GPS tracks and waypoints were downloaded to a computer and complemented with field notebook observations, photos and/or video file number if available. For road mapping, we adopted the road classification categories used in the DR topographic maps, but we added an extra category for foot/horse path or trail. Our field work revealed that the study area suffered from a lack of good access roads. Only at opposite ends of the broadleaf forest strip (Los Arroyos and Las Abejas) are there roads suitable for motor vehicles, and both routes require an all-terrain vehicle and rugged tires. Unfortunately, the two access roads to the broadleaf forests are only connected by the road, "Camino de El Chucho", which runs parallel to the Sierra's ridge, but to the north of it. We also discovered that some roads/trails marked on the topographic maps are no longer usable, but that new ones have been created, which we mapped for the first time. Especially prominent is a wide vehicle road that crosses many avocado plantations near Los Arroyos.

We tested BITH recordings and survey protocols during two preliminary field trips, following the standardized protocol and form provided by Chris Rimmer (Vermont Center for Ecological Studies [VCE]), which had recently been developed for BITH monitoring. In addition to conducting standardized surveys at likely BITH habitats selected by two experts, at some sites we used vocal playbacks to explore non-conventional habitats for BITH (like coffee plantations, mixed pine forests, etc.) or while en route to a selected suitable location. For each site checklists were entered into eBird.org for easy sharing. At all three sites of broadleaf mountain forest selected by our bird experts we found BITH (1-2 per survey). Thus, preserving what is left of this forest is key for BITH survival. Two of these sites face serious and imminent threats due to aggressive farm land expansion (see Interviews section).

During our visits to the study area, we interviewed informally local residents we encountered about their livelihoods, production systems, patronage and place of origin (among other things), following a pre-designed questionnaire. We recorded 21 interviews, mainly in the areas of Los Arroyos and Las Abejas. Our conversations revealed the existence of three active agricultural production systems on southern Bahoruco. These include: 1) Subsistence agriculture, whereby a Dominican man or woman is (or claims to be) the owner of some land which is rented out or leased to a Haitian or group of Haitian

farmers. These “tenants” usually plant short cycle crops and live in extremely basic shacks, which belong to the Dominican land owner. Rent for the land is paid in kind, usually a fifth (20%) of the harvest. This system is widely implemented across the entire southern slope of Bahoruco National Park, and in some cases it is combined with other systems detailed below; 2) Industrial Avocado Plantations. This system consists of large tracks of land planted with avocados. On the Sierra’s southern side it is found only in the area of Los Arroyos. These systems produce different avocado varieties, but lately they tend to focus on the *Hass* type, which is the most demanded for export, labor is also predominantly Haitian; 3) Coffee plantations: the plantation owner lets a tenant (usually a Haitian farmer) keep half of the coffee bean harvest, in exchange for his maintenance work on the farm, harvest and processing of the beans for market, etc. As in the previous systems, the land owner provides living quarters (usually a small house or shack) and may allow the renter to grow short cycle crops for the established 20% subsistence agriculture harvest quota. There are a number of issues with the agricultural systems in place in southern Sierra de Bahoruco, with the land appropriation by many inside a National Park being one of our biggest sources of concern, especially for non-sustainable agricultural practices. This situation is aggravated by the lack of park boundary demarcation on the ground, the use (and abuse) of poor/irregular Haitian migrants, child labor, severe erosion, and heavy use of agrochemicals (some banned under DR’s laws).

Even though advocacy activities were not initially included in this project, given the serious situation observed on the ground, we voluntarily undertook them at our own cost, given the high conservation value of Bahoruco and also because we think it could help bring attention to the poor protected area management prevailing country-wide. This included writing two letters to the Ministry of the Environment and helping other partner organizations do the same, holding several meetings with the Ministry and other potential allies and using social media to denounce this situation, and accompanying a technical commission of the Ministry to the study area. We also collaborated with reporters (national and international) to bring public attention to this situation. As of June 2013, the Ministry of the Environment assured us they were prosecuting some of the large land owners in Los Arroyos and asking for all persons occupying land within the park to provide land titles so their cases can be evaluated and a solution sought. However, during a recent visit in December 2013, the situation on the ground remains unchanged, and deforestation continues to advance.

Currently, we are contemplating the possibility of purchasing land from one or more of the current occupiers to designate it for conservation purposes, as we had to do in two lowland areas around Jaragua National Park in order to save critical habitats for endangered iguanas and land mammals (thanks to generous donors). However, it is extremely important that land purchases are strategically chosen. For this, we are currently (with funds from Jensen/BirdLife International) conducting a more detailed study of land tenure in different areas of Bahoruco to be better informed about this option.

Background

One of the most important wintering regions for Bicknell's Thrush (*Catharus bicknelli*) in the Dominican Republic (DR) is Bahoruco National Park, which is also a core area within the Jaragua-Bahoruco-Enriquillo Biosphere Reserve (Fig. 1). In particular, Bahoruco's humid, broadleaf mountain forests are one of the most critically endangered habitats on Hispaniola, not just for Bicknell's Thrush, but for overall biodiversity. Despite the Park's legal protection under the National System of Protected Areas, expansion of agriculture and charcoal making activities are increasingly reducing and fragmenting the remaining forest cover, which also serves as refuge to many other endangered, rare, native and/or endemic species of plants and animals.

Most field studies of Bicknell's Thrush (BITH henceforth) in the DR have been conducted in Cordillera Septentrional, Sierra de Neiba and the northern slope of Sierra de Bahoruco (see Rimmer et al. 1998 & 2003; Townsend et al. 2009 & 2010), which supports the region's largest patch of preferred habitat for BITH. However, between 2007 and 2008, Grupo Jaragua, with support from American Bird Conservancy, conducted studies on migratory birds in the broadleaf forests of the southern slopes of Bahoruco, and identified and established a bird watching trail near the community of Los Arroyos, in the southwest corner of the Park. Because of this, we decided to explore a larger area of forest there to establish its importance for BITH and other birds, as well as to map its extent, road access and document existing threats.

Grupo Jaragua has experience and leadership that can be used to present strong arguments and up-to-date, precise information on BITH habitat conservation in the Biosphere Reserve. Effective actions will require, designing and implementing a spatially-explicit conservation strategy that takes into account the social context and drivers of deforestation. This report compiles and summarizes many of the inputs needed to develop such a strategy.

Study Area

We conducted field work from November 2012 to April 2013 in the broadleaf or humid mountain forest habitat of southern Bahoruco National Park. According to the vegetation/land-use map prepared by the Ministry of the Environment from 1996 imagery (then Subsecretaría de Recursos Naturales under the Secretaría de Agricultura; Tolentino et al. 1998), this forest occupied a strip 1–1.5km wide and some 15 km long, roughly between the villages of Los Arroyos and Las Abejas (see Fig. 2).



Figure 1. Location of Bahoruco National Park within the Jaragua-Bahoruco-Enriquillo Biosphere Reserve of the Dominican Republic.

Methods

Forest mapping

To map the extent of broadleaf mountain forest, we first used a high resolution satellite image mosaic (5-m, SPOT) of our study area in 2011¹ to digitize on the computer screen the vegetation/ land cover using Geographic Information Systems Software (ArcGIS ver 8.3). In some areas of high cloud cover or where it was difficult to discriminate forest types, if available, we used a higher resolution image (0.5 m) from the ESRI server under the World Imagery data set, dated January 9, 2009. During bird counts and access road exploration, we ground-truthed the preliminary forest map for those areas accessible by roads or footpaths. To register all gathered information at the right location, locate points of interest on the map, etc., while we were on the truck we used a laptop running ArcGIS with the SPOT mosaic on the background connected in real time to our GPS unit. With all the data collected, we revised the

¹ This mosaic was purchased by the Spanish International Cooperation Agency (AECID in Spanish) for the Ministry of the Environment of the DR, containing all the Biosphere Reserve. To minimize cloud cover, different sections have different dates within 2009-2011, however, most of the images conforming our area of interest were dated 2011. A contact in AECID gave us a digital copy in 2011.

preliminary map and prepared a final version in ESRI's shapefile format (.shp) with polygons classified according to the following categories adapted from Tolentino et al.(1998): broadleaf forest, pine, sub-humid forest (bosque semi-húmedo), coffee, agriculture (which in some cases could include some cattle farming), quarries, sparse vegetation areas, and forest (or non-classified forest).

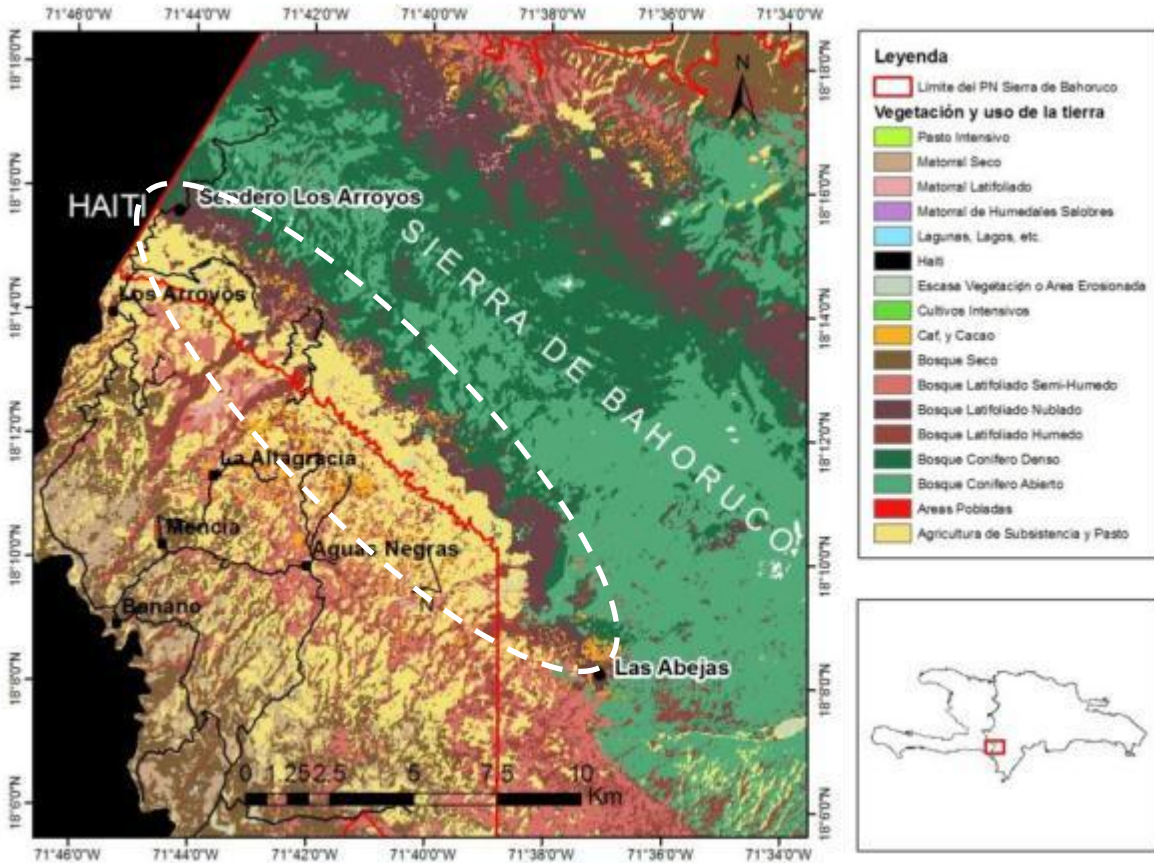


Figure 2. Map of study area (dashed line). This is a portion of the 1996 Vegetation/Land-use map of the DR (Tolentino et al 1998). Our habitat of interest appears as “Bosque latifoliado nublado” (broadleaf cloud forest) in the legend.

Access roads

Evaluating access roads to the broadleaf mountain forest is key for its assessment and monitoring. To do this, during all travels in the study area we kept the GPS receiver(Garmin 60Cx) on and we took notes on existing road types and where motor vehicles (4x4) could transit with the help of waypoints whose number was written in down in a small field notebook. Back in the office, the track files and waypoints were downloaded to a computer with a USB cable. We added a column to the waypoints file to type the comments from the field notebook as well as an indication of any photos or videos taken. For road mapping, we adopted the road classification categories used in the DR topographic maps, but we added an extra category for foot/horse path or trail (*sendero* in Spanish). The categories represent decreasing road quality (see Figs. 3 and 4 for views of each road type in the study area), as follows:

- a) Paved road.
- b) Light surface, year-round use
- c) Light surface, dry weather use
- d) Dirt road
- e) Foot/horse path

Deforestation rate and hotspot identification

Initially we had proposed to identify hotspots based on the broadleaf forest deforestation rates obtained by comparing extent of forest cover in 1996 (following Tolentino et al 1998), 2003 (from the Ministry of the Environment) and 2011 (obtained in this study). However, this was not possible given classification problems in those maps (see details in Results and Discussion section). Therefore, deforestation hotspots were identified subjectively, based on the extent of threats we observed.

Bird Surveys

After two reconnaissance trips to the study area in mid-November and early December 2012 for access road exploration, we tested bird song recordings and the standardized survey protocol during two field trips (26-30 January and 4-6 April 2013) to determine BITH presence. To this end, we followed the standardized protocol and form provided by Chris Rimmer (Vermont Center for Ecostudies [VCE]), which had recently been developed for BITH monitoring. The form was translated to Spanish and some minor format modifications were added (see Annex I).

The adopted field protocol was as follows: at each selected survey point (chosen by experienced BITH experts J. Almonte and E. Garrido) the three main researchers (E. Garrido, J. Almonte and Y. León) and one or two occasional volunteers (H. Andújar, Jim Tietz, Gerson Feliz and/or Jairo Mato –Pirrín) stood silently at a fixed point for 10 (January surveys) or 12.5 minutes (April surveys), recording all individuals of every bird species seen and/or heard. Each survey was divided into four periods (five starting in April) of 2.5 minutes each, during which (except during the first period) we broadcast a recording of BITH calls and songs for the first minute. This was followed by a 1.5–minute silence period during which each individual bird was recorded and its position mapped on our survey form. In April we decided to include an additional 2.5–minute period, since once in January we had detected a BITH shortly after the 10–minute survey ended (this was discussed previously with C. Rimmer).

In addition to standardized surveys, at some sites we played the vocal recording for one minute and listened for 1.5 minutes to explore non-conventional habitats for BITH (like coffee plantations, mixed pine forests, etc.) or while en route to a selected suitable location. During each survey, all individuals of every species detected in a given forest type and within a 500-m radius of a survey point (while travelling back and forth, etc.) were counted. and the data were used to create checklists, which were entered into **eBird.org** by one of the researchers or volunteers (J. Tietz) and shared among all. ²

² Checklists numbers for this project on eBird.org are: S15232248, S15232622, S15250688, S15207357, S15207361, S15207362, S15207364, S15207365, S15207366, S15207367,

Surveys to locals and key informants

During our visits to the study area, we interviewed informally the persons we encountered about their livelihoods, production systems, patronage and place of origin (among other things), following (with modifications) a pre-designed questionnaire from a previous study on the Pedernales River Watershed by Y. León in 2011 (see Annex II). This was not always successful, since many times the persons we met did not speak Spanish and we did not speak Haitian Creole. Also, some Haitian farm workers were reluctant to talk to us, due to irregular migration issues, or simply personal abuses committed by Dominicans in the past. So only when someone was willing to talk we proceeded with our questionnaire (or part of it). In this manner, we recorded 21 interviews, mainly in the areas of Los Arroyos and Las Abejas (see short summary in Table 1). This Table also includes three interviews conducted in 2011 to farmworkers in Los Arroyos area (from the Pedernales River Watershed Project, with the help of translator Gerald McElroy), because we believed they were relevant in confirming some of our findings.

Beginning in April 2013, thanks to funds from the Jensen Foundation and BirdLife International (through another project targeting Sierra de Bahoruco), we were able to conduct additional interviews, and also include a Haitian Creole-Spanish translator (José Luis Castillo) in our trips, which greatly improved our understanding of productive systems and also enabled more in-depth interviews. Also, Luisa Rollins, a doctoral anthropology student from University of Illinois and Miguel Angel Landestoy (from Sociedad Ornitológica de La Hispaniola) joined us on one trip. Because most of these later interviews were conducted outside of the scope of this project and are still being processed, they are not presented in Table 1, but we include some of the knowledge obtained from them in our discussion.



Figure 3. Views of the different road types in the the western part of Sierra de Bahoruco National Park: a = paved road to Aguas Negras, b-c: paved road to El Aceitillar, d = a)Light surface, year-round use road near El Aceitillar, e = light surface, dry season use road between El Aceitillar and intersection to Las Abejas, f = dirt road (covered by grass) on the split of the road from El Aceitillar.

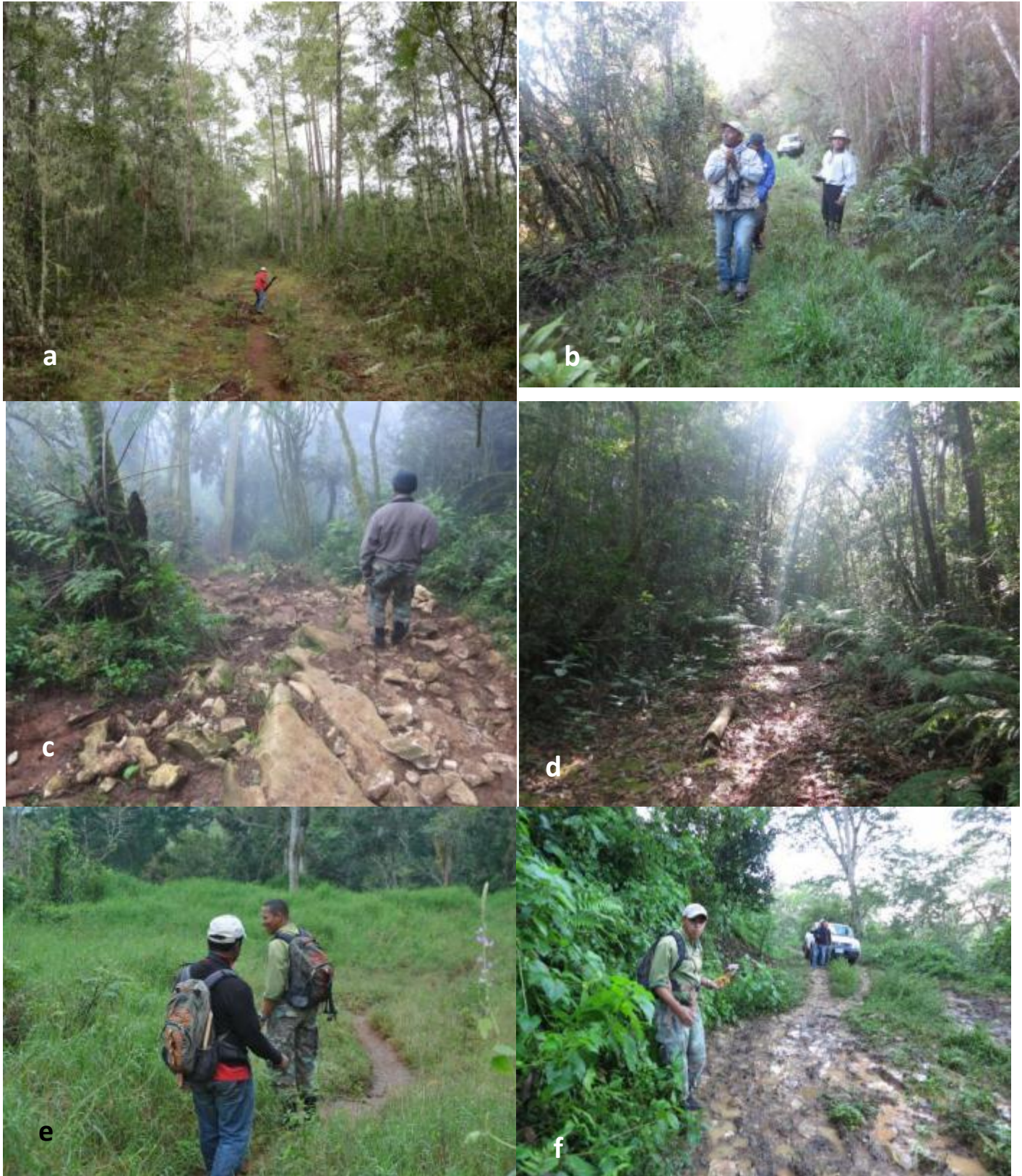


Figure 4. Different road types in the study area : a-b= dirt road of Camino del Chucho; c = Los Arroyos foot path , d= Las Abejas footpath, e-f= footpaths on the coffee plantations near Aguas Negras.

Results and Discussion

Mapping broadleaf mountain forests

We found abundant evidence that the broadleaf forest strip of southern Sierra de Bahoruco is highly threatened, in particular due to forest clearing to expand agriculture. These activities have thinned and fragmented this forest (see Fig. 5) to the point that some of the remaining patches are isolated, increasingly degraded forest “islands” within an agricultural landscape. Our mapping work estimated a remaining area of only 83 km² of this forest type in southern Bahoruco. Although there are larger broadleaf forest areas on the northern slopes of Bahoruco, we estimate these may not exceed 150 km²; although we have not studied them in detail, we have evidence they are increasingly threatened by charcoal production and subsistence agriculture. Therefore, broadleaf forests represent a very small part of Bahoruco National Park Area (the Parks total area is 1151 km²), and these are in urgent need of prioritization for conservation actions.

Our resulting forest map of southern Bahoruco also highlighted some significant findings that can help inform conservation decisions:

- 1) The broadleaf mountain forest strip is very thin and irregular, making its very long edge highly vulnerable to agricultural expansion pushing upslope from the south. In some areas, even where part of the original forest remains, chronic and gradual degradation is occurring as different persons enter to extract wood for cooking, make charcoal, cut beams for construction, etc. Cows often graze and pigs forage within these areas, affecting forest dynamics and natural restoration. This is clearly seen in some areas, such as the Bird Watching Trail in Los Arroyos, where trees are being selectively cut, leaving a very degraded forest often dominated by large tree ferns (genus *Cyathea*), one of the few species lacking usable wood.
- 2) The middle part of the forest strip (which could not be reached in our surveys) does not seem to be in much better shape than the two areas we surveyed (Las Abejas and Los Arroyos), as evidenced by the small forest fragments seen in the images. This implies that in these more remote areas there may be even less control of deforestation and Park land cultivation.
- 3) There are elongated forest patches following natural depressions or ravines (especially near El Aceitillar) and there are also broadleaf forest “islands” inserted within the high mountain pine areas (especially in the Camino del Chucho). We explored two of these depressions and were able to document the vegetation change from pine to humid forest, as well as the presence of different bird assemblages (see Fig. 6). These areas constitute remote fragments of suitable habitat that may serve as important refugia for BITH and other humid mountain forest species; they merit further investigation.

Unfortunately, we could not contrast the estimated area with that of previous vegetation/land cover maps. When we inspected them in detail, we found these maps had a number of areas that were incorrectly classified. These mistakes consisted in wrongfully assigning areas to the coffee plantation category in 1996 and to dry scrubland in 2003. It is difficult to explain these mistakes. However, the 1996 error could be due to the similar appearance of shade grown coffee and broadleaf forests, which

also caused us to revise some of our preliminary classifications after ground-truthing. Although it is possible that coffee plantations occupied a larger area in 1996, some of these plantations occur at very high elevations or are imbedded within natural forests, which makes it unlikely. On the other hand, the 2003 confusion with dry scrubland is not easily explained; this may have resulted from a classification algorithm using spectral signatures that were not very well defined or were defined at the national level and don't apply well to this locality. For future monitoring of this forest, we suggest making a supervised classification of satellite imagery using the ground- truthed areas from this study as training regions for spectral signatures. However, we believe that accurately classifying this area is inherently difficult, as the Sierra's topography, which creates shades in slopes and depressions, and the high contrast of limestone substrate in some areas, could cause classification errors in some unsupervised computer-generated classifications. Further, classification accuracy is compromised by a reduced number of high quality images, due to frequent cloud cover over these mountains.

A question that came up during mapping exercises was the possibility of finding suitable habitat for BITH and other birds in the forest located to the east of our study area. This forest is currently classified as *bosque semi-húmedo* (semi-humid forest) and it seems to occupy a large area. We believe this forest needs to be further explored, its BITH habitat potential assessed and its threats documented. We tried to reach this área on 25 April 2013 by one of the footpaths that runs parallel to the south (east of the bauxite mine of Las Mercedes) but we couldn't reach it in the half-day walk we were able to schedule. The following day setting out from the land of "Tabaquito" Castillo on the Cabo Rojo-Aceitillar road, we crossed a forest in a dry ravine that resembled a lot the broadleaf forest from Las Abejas where we found BITH, however, we did not have the playback equipment and it was late in the season. For a future study, we believe this area also needs further exploration, especially as it is being rapidly cut to make way for more subsistence agriculture.

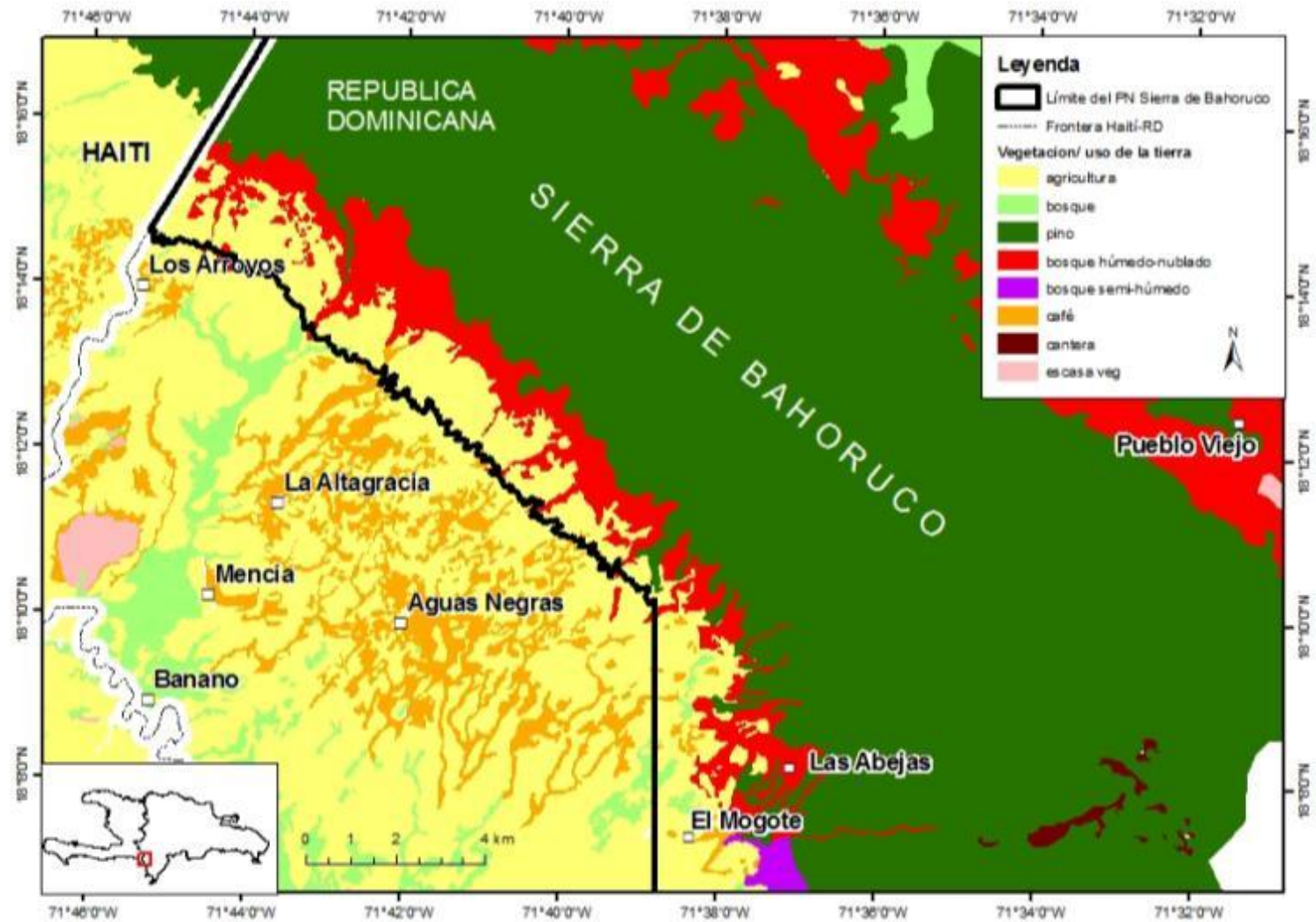


Figure 5. Resulting map from our vegetation/land-cover analyses in our study area between Los Arroyos and Las Abejas on the southern side of Sierra de Bahoruco.



Figure 6. a and b) Some of the depressions (*hondonadas*) or dry ravines with humid mountain forest found amidst the pine forest in the área of Aceitillar; c and d): Humid forest path embedded within the pine forest on the El Chucho trail, in both pictures, pine trees can be seen in the background (BITH were detected in some of these patches).

Access roads

Accessing broadleaf mountain forests in our study area was often a challenge due to the lack of good roads (see Fig. 7). Only at the opposite ends of this forest strip (Los Arroyos and Las Abejas) there are roads suitable for motor vehicles, and both routes require an all-terrain vehicle and good tires (we broke a tire on the road to Las Abejas). Unfortunately, the two access roads to the broadleaf forests are only connected by the road or camino de El Chucho, which runs parallel to the Sierra's ridge, but to the north of it. This road starts near El Aceitillar and passes through the old Park Ranger House 3 (Caseta 3), now abandoned, and ends near Loma del Toro where it joins the road connecting Pedernales to the south and continues on the north up to Zapotén Park Ranger House and El Aguacate Army Post.

Travelling distance and time should also be carefully considered for future monitoring plans. From the town of Pedernales it takes at least 1.5 hours to Las Abejas and 2.5 hours to Los Arroyos (or 3 if one goes from the Cabo Rojo-Aceitillar Road and then take Camino del Chucho. This is despite the fact that the road to Los Arroyos had been recently repaired. We know this road deteriorates frequently, increasing travel time up to 4 hours from Pedernales. Coincidentally, we conducted field work at the time the government (Public Works Ministry) was paving some roads, including the road from Pedernales to the village of Mencía and from there to the village of La Altagracia, as well as that from Pedernales to Aguas Negras (although we just saw the segment of Pedernales-Mencía completed).

Our work also found that some roads/trails marked on the topographic maps are no longer usable, so they were eliminated from the preliminary maps we took to the field. On the other hand, new ones have been created, and we've mapped them here for the first time. It's especially noteworthy a wide vehicle road that crosses many avocado plantations (parallel to the Sierras ridge to the south near Los Arroyos). Apparently, this road was built by one of the major industrial avocado growers, Américo Mena in recent years (we saw part of it in 2009 during other field work). It seems to have been improved through time, especially by the investments of two other avocado growers: Saturnino Espinal and more recently the all-powerful José Andújar, who seems to have direct access to heavy machinery from the Public Works Ministry.

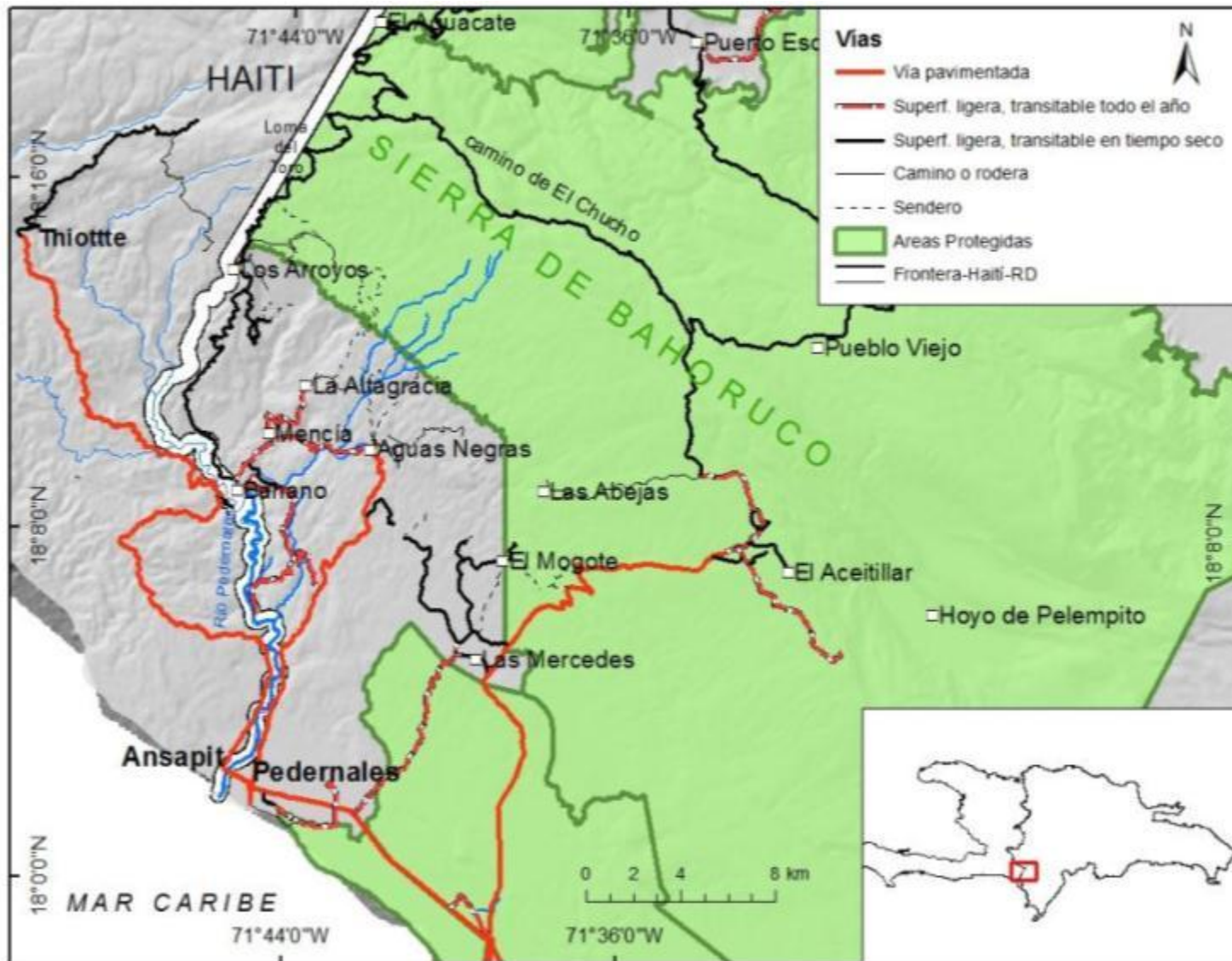


Figure 7. Access roads in study area.

It is possible that there are additional roads in the study area, but not all could be explored within the scope of this project. In any case, it became clear early on that there were no good access roads to the middle portion of the humid mountain forest in the south side of the Sierra. So, we decided to conduct some explorations on foot to try to reach some of these areas (see Figs. 8-10). These ascent explorations are detailed below:

- 1) Attempt through Américo Mena's farm. This is the owner of a large avocado plantation just south of Sierra de Bahoruco National Park (and possibly extending into it in some areas). To reach his farm, on 1 Dec 2012 we took a convoluted road of ~5km starting on the eastern side of the Pedernales-Loma del Toro Road at about 1.5 km south of the military post of Los Arroyos (see Fig. 8). This road ends in a ravine with some natural broadleaf riverine vegetation bordering an unnamed river (a tributary to Mulito River, which in turn is tributary to Pedernales River). This area is locally known as "Boca Tanjón" or "Bucán Tanjón." The vehicle road ends in a sort of religious altar next to Mr. Mena's farmhouse and ravine. From then onwards, we continued on a footpath ascending some 3km north towards the forest, however a rainstorm made us seek refuge and we had to turn around before night fell. However, we would need to walk an additional 5 or 6km, something we could not do the next day as our camping gear got completely soaked in the storm and we were afraid about the condition of the road returning to Pedernales, which in fact presented some difficulty when we went back. We played two calls from BITH in the ravine vegetation, with no response. Overall, the Mena's farmland seemed abandoned; we were told that he had health problems, however, his Haitian workers seem to be staying there doing subsistence agriculture.
- 2) Attempt through Aguas Negras village. In this exploration, we took the recently paved road from Pedernales to Aguas Negras on 2 Dec 2012 (see Fig. 9). From then onwards we tried to follow some of the coffee plantation roads that seemed to be located north of town (according to the topo map). However, we discovered that none of these roads were suitable for vehicles very soon after leaving the village (see bottom of Fig.4). So we started on one of the footpaths northward for about 4km, heading towards the National Park boundary. This path was very muddy, which made our ascent very slow. Unfortunately, we did not reach the park boundary because some of us had to return on the same day to Oviedo and Santo Domingo, and no natural forest was anywhere near in sight.
- 3) Attempt from La Altagracia Village. This exploration ended very shortly, since as soon we were getting ready to start our trek, torrential rains began to pour and we had to abandon our intention (24 Apr 2013). According to locals, part of the trail can be transited by 4x4 vehicles, but with the heavy rains falling, our truck would not make it. We had no doubt about this as we saw large avenues of runoff loaded with sediments and large logs sliding past us in one of the village's street as we were waiting out the rainstorm. One of us (Y.León) saw a similar storm close out ascending roads there on a previous visit to this village in 2011.

4) Attempts from Cabo Rojo- Aceitillar's Pine Forest road. In the company of a local guide (Yonasy, a Haitian worker from Tabaquito Castillo's farm), we did two exploratory hikes on foot (see Fig. 10). One (the shorter one) was on 25 Apr.2013 on a footpath going south from one of the Aceitillar road bends. After leaving behind the pine forest, the path ended in a coffee plantation tended by a Haitian family working for Isabel (a Dominican woman we know from Las Mercedes village) just north of Tabaquito's farm. Although a lot of broadleaf forest has been cut down in this area, in a deep limestone ravine we crossed we found a broadleaf forest remnant very similar to the one found in Las Abejas. It would be important to do some BITH censuses there in the future. On the following day we started a hike going westward from Tabaquito's farm, to try to reach Las Abejas area from here. However, in many parts the terrain was very steep, so we advanced slowly. We ran into numerous crops and recent forest cuttings, including an area being heavily sprayed with herbicides by five Haitian children working for Cigua, a Dominican man from Las Mercedes.³ Finally, we reached the village of El Mogote, which was not marked in any map, even though it has at least 20 houses visible from the road, and a solid-built (cement) catholic church. Here, one of our team members (H. Andújar) took a *motoconcho* ride from El Mogote on a road that connects with Las Mercedes and Aceitillar to retrieve our truck and pick us up, given the slow pace and difficulty of the returning on the same footpath on the same day.

³ See <http://www.youtube.com/watch?v=wZJYKeAQYPs>

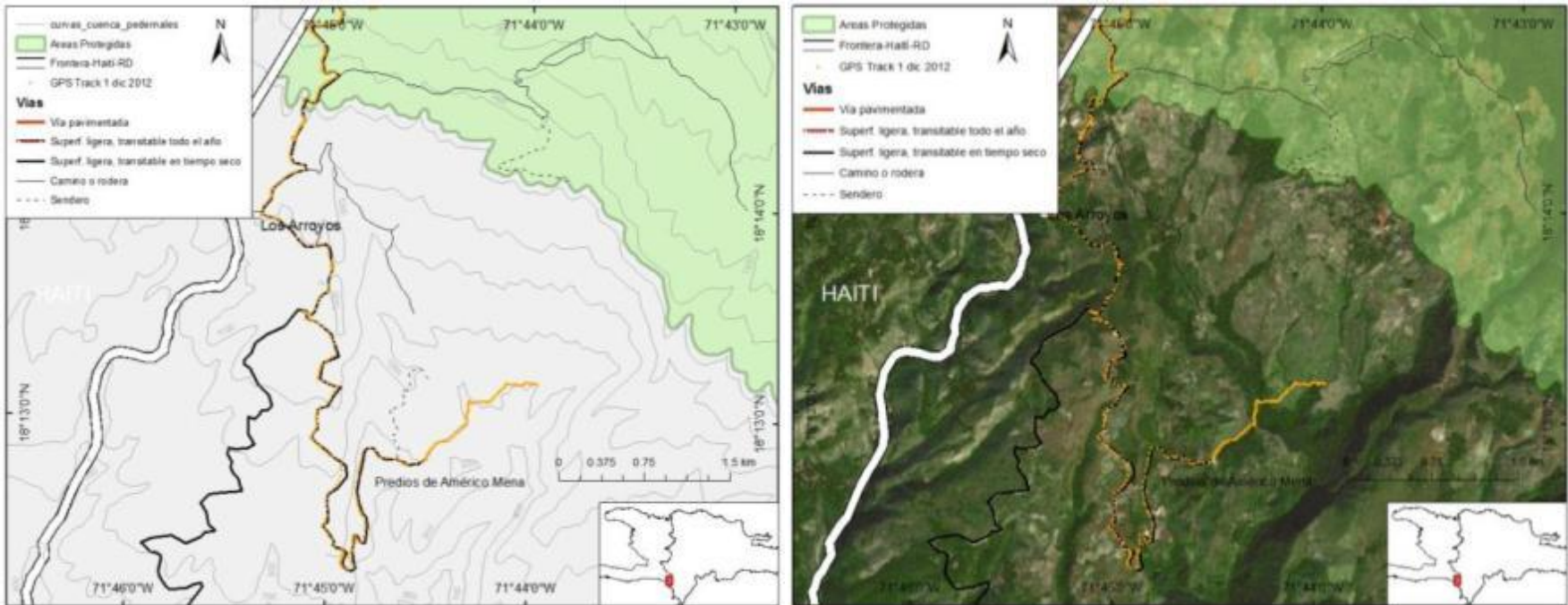


Figure 8. Ascending attempt from Américo Mena's farmland, south of Los Arroyos on 1 December 2012 (in orange).

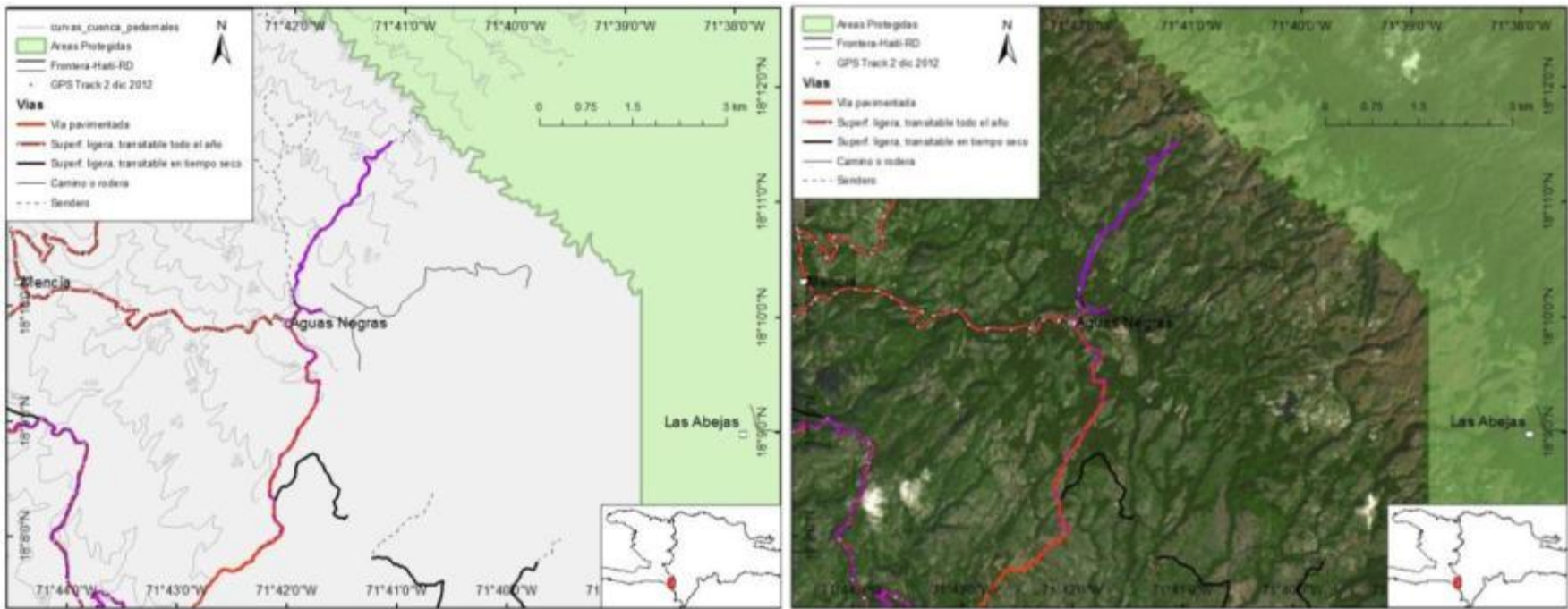


Figure 9. Ascending attempt from Aguas Negras on 2 December 2012 (in purple).

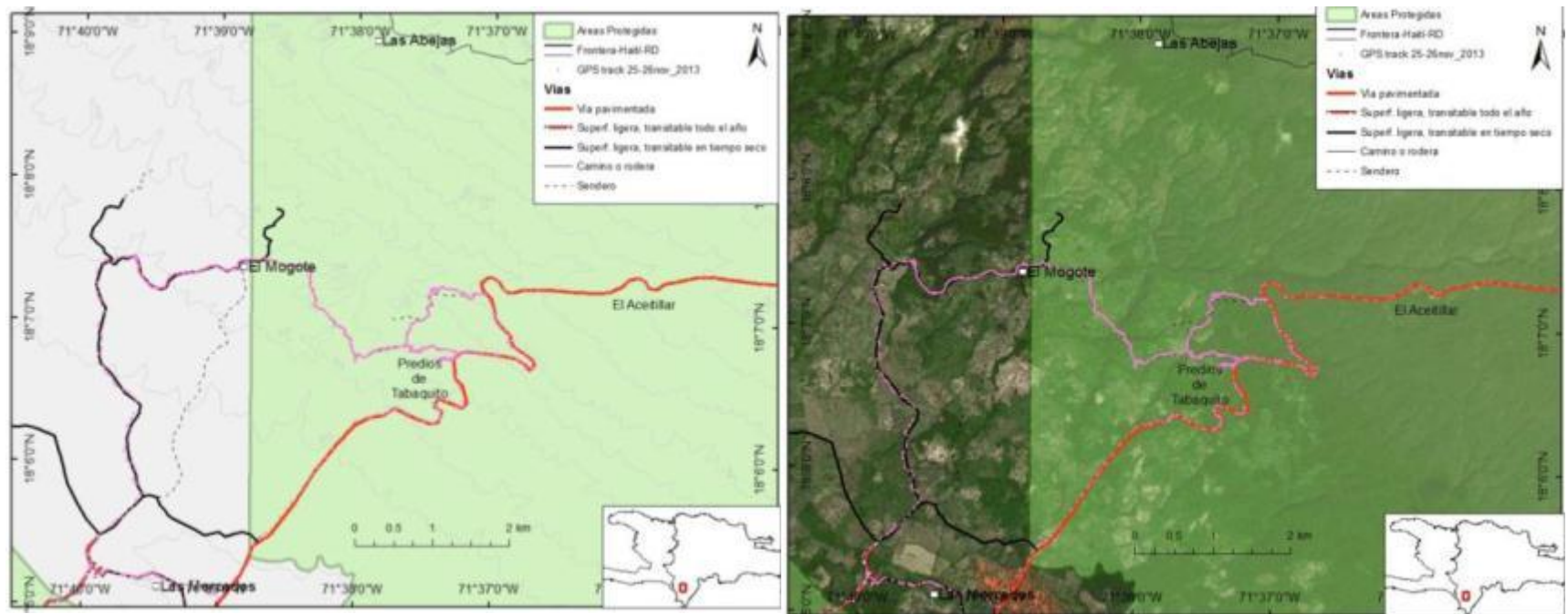


Figure 10. Ascending attempts from 25 and 26 April 2013 (in pink) from El Aceitillar's pine forest.

Bird surveys

At all three sites of broadleaf mountain forest selected by our bird experts (in Los Arroyos, Las Abejas and El Chucho Trail; see Figs. 11-16) we found BITH (1-2 per survey; results are presented in Annex III). Thus, preserving what is left of this forest is key for BITH survival. Two of these sites face serious and imminent threats due to aggressive farm land expansion (see Interviews section). Only El Chucho does not appear threatened at the moment, but it is only a marginal habitat of some humid forest patches that happen to intersect the road.

A major limitation of our study was that we were unable to conduct bird surveys on the central portion of the study area (see Fig. 11), due to the lack of good access roads in combination with bad weather during two of our trips. After the project ended, we returned to the area and had new discussions with locals, which suggested other access routes by footpaths, which we hope to explore in the near future.

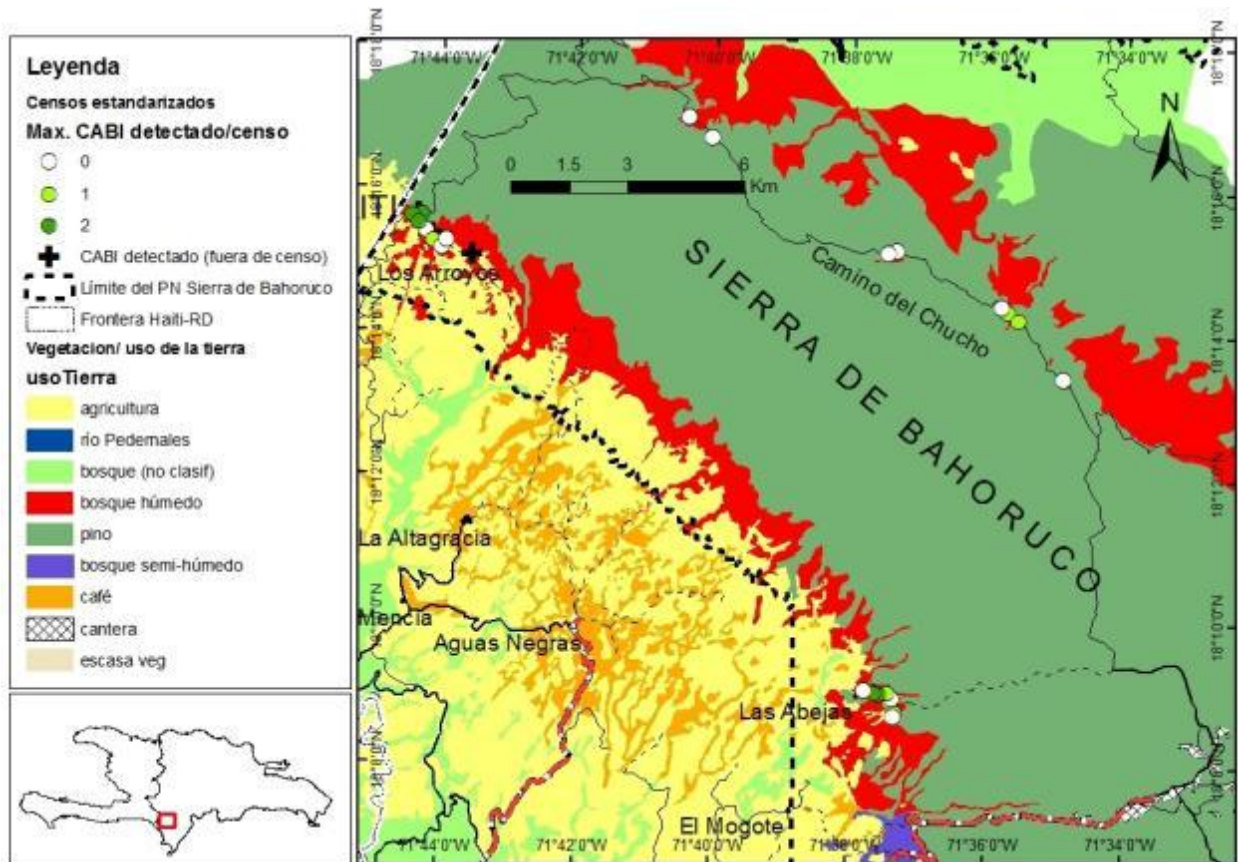


Figure 11. Location and maximum counts of BITH (CABI) through standardized bird surveys. Sites where BITH were detected outside of surveys are shown with a black cross.

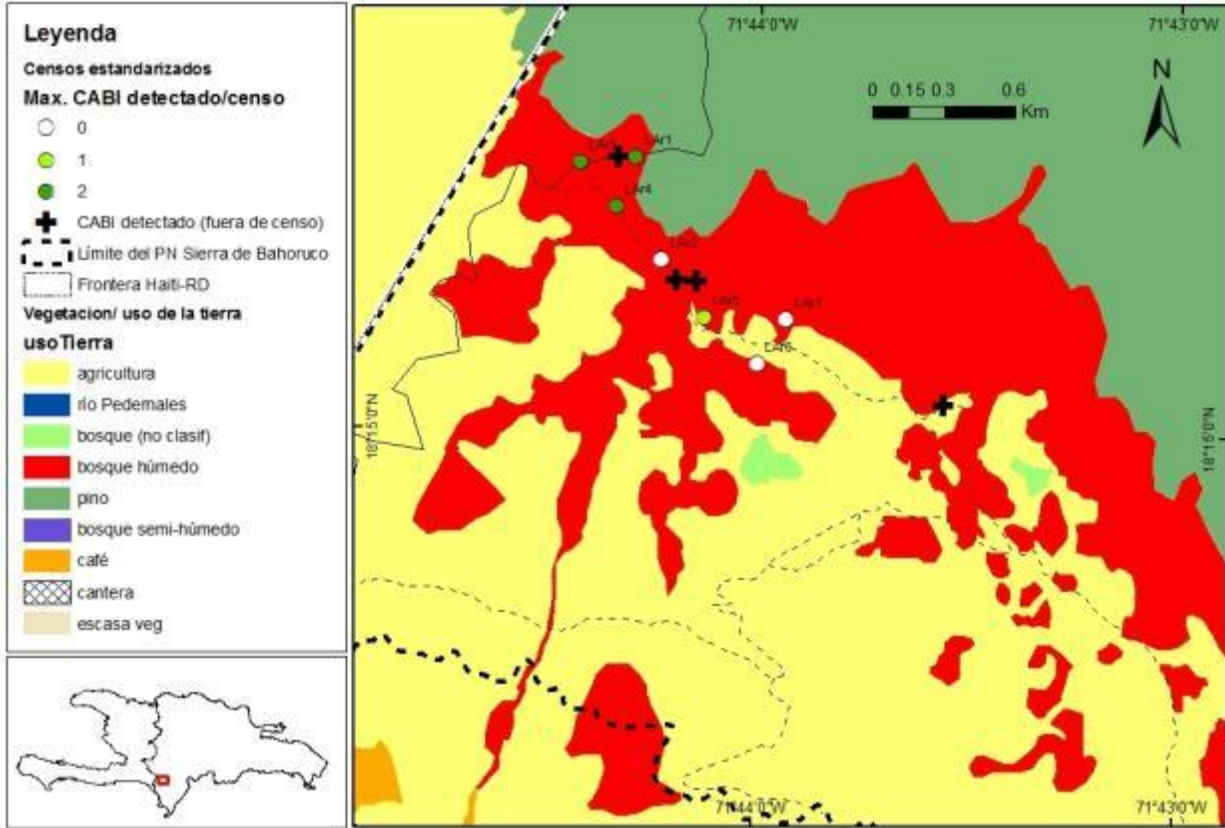


Figure 12. Location and maximum counts of BITH (CABI) through standardized bird surveys near Los Arroyos. Sites where BITH were detected outside of surveys are shown with a black cross. Site codes refer to specific sites detailed in Annex IV.



Figure 13. Views of the forest, researchers, and representative plants species from Los Arroyos.

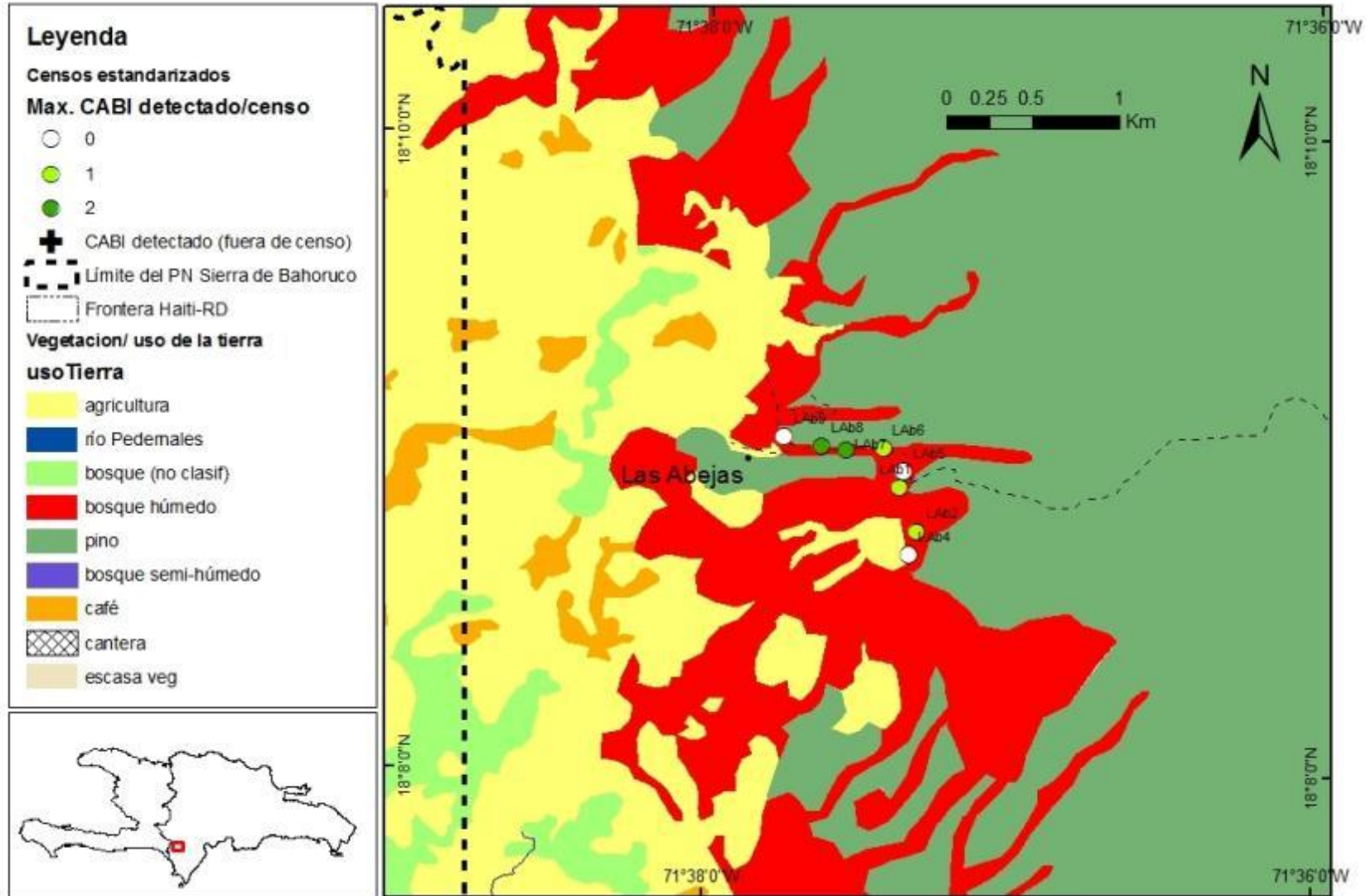


Figure 14. Location and maximum counts of BIRTH (CABI) through standardized bird surveys near Las Abejas. Site codes refer to specific sites detailed in Annex IV.



Figure 15. Views of the forest, researchers, and representative plants species from Las Abejas.

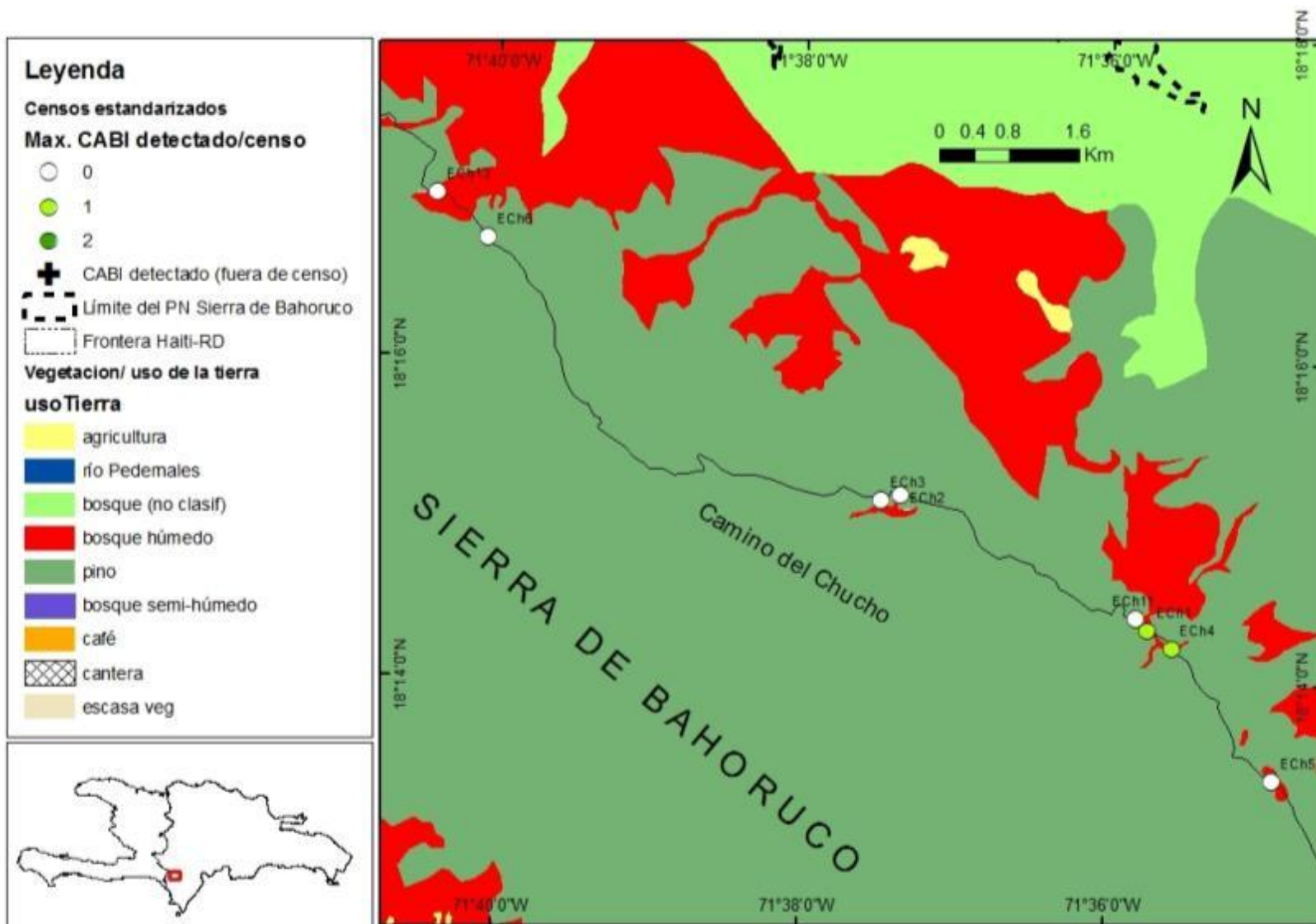


Figure 16. Location and maximum counts of BIRTH (CABI) through standardized bird surveys on El Chucho Trail. Site codes refer to specific sites detailed in Annex IV.



Figure 17. Views of the forest , researchers, and representative plants species from El Chucho Trail.

Local and key informant interviews

As our maps show, there is a vast area (estimated at 34.5km²) of southern Sierra de Bahoruco that has been cut down to make way for expanding agriculture, even though it is within the National Park. Nearly all this agriculture has replaced broadleaf mountain forest, which sustains the largest number of unique and/or migratory species of flora and fauna of all the parks habitats, and is the primary habitat for Bicknell's Thrush. Especially worrisome is that, even though some areas have been deforested for a long time (even promoted by the Trujillo and Balaguer governments since the 1950s), we saw many recent forest cuts in what little remains of this habitat (see Figs. 18 and 19). If nothing is done to stop these practices and/or restore deforested areas, it is very likely that within a decade there will be no humid mountain forest left on southern Bahoruco, with crops extending right up to the pine forest line. Thus, understanding the social drivers of this deforestation is key to designing effective conservation actions.

Most of our respondents were farmers, farm workers or day workers, but we also were able to talk to one major agroindustry producer (Chichilo Espinal).⁴ Basically, our conversations revealed the existence of three agricultural production systems in place on southern Bahoruco. These are:

- 1) Subsistence agriculture. In this system, a Dominican man or woman is (or claims to be) the owner of some land which is rented out or leased to a Haitian or group of Haitian farmers. These "tenants" usually plant short cycle crops, especially beans, corn, local pumpkins (*ayyama*), yams (*yautía*), carrots, etc. The shack where the Haitian lives (usually with part of his direct family and in some cases even extended family) is extremely basic (see Fig. 20) and belongs to the Dominican land owner. Rent for the land is paid in kind, usually a fifth (20%) of the harvest. However, the Haitian farmer often has to take loans from the Dominican before harvest time in order to buy seeds or planting stock, agrochemicals and implements (especially fumigation backpacks), farming tools, food, etc., resulting in a larger portion of the harvest going to the Dominican. This system is widely implemented across the entire southern slope of Bahoruco National Park, and in some cases it is combined with other systems detailed below.
- 2) Industrial Avocado Plantations. This system consists of large tracks of land planted with avocados. On the Sierra's southern side it is found only in the area of Los Arroyos (but can also be found in the northern side near Puerto Escondido, but there we have not studied it in detail). The land owners are well-known patrons locally considered to be "rich", and farm plots are larger than in the subsistence agriculture system. We have been told that some of the owners even have legal titles to this land. These systems produce different avocado varieties, but lately they tend to focus on the *Hass* type or grafted avocados,⁵ which is the most demanded for export. Major producers usually have small to mid-size trucks (usually Daihatsu brand) to transport avocados to Pedernales, where they are packed in ship containers for export. Haitians are usually hired in the plantations as permanent or seasonal workers, and live on the farmland

⁴ After the project ended (in December 2013) we were able to speak to Yumelo Espinal as well.

⁵ The *Hass* avocado was developed in 1926 in California, and in our study area is commonly grafted into a tree foot of a local avocado variety. Thus, the name *Hass* or grafted avocado (*aguacate injerto*) are used interchangeably. In comparison with traditional local varieties, *Hass* avocados are smaller, darker and have a bumpier surface.

in very basic shacks (similar to the ones in subsistence farming) along with their families. They receive some salary to do farm chores or are allowed to do subsistence farming in part of the farm (or are even encouraged to cut nearby forest areas to do so). Others are contracted as day workers to help fumigate, cut out weeds, or help at harvest time.⁶ Many are allowed to grow some crops under the same subsistence agriculture sharing system (20% goes to the land owner). Some also have some cattle or horses grazing on the property. The most sophisticated farm is that of José Andújar, with an agronomist living on site who manages the farm and workers year-round near Los Arroyos. This producer also made an enormous excavation of about 20m x20m and 3m high for a water reservoir needed for dilution of agrochemicals and worker's needs. After we denounced this to the Ministry of Environment (see Advocacy section), they seem to have stopped him from finishing it (by covering it with cement and rocks to make it impervious). However, during our last visit (12 December 2013), the excavation had not been filled nor the forest restored, so at any moment, we feel it can be finalized.

- 3) Coffee plantations. This was the least studied system, since many coffee plantations at the time of our field work were being substituted by subsistence agriculture or had simply been abandoned. We think this is due to the incidence of two recent coffee pests, which have reduced yields nationwide and in this area: the coffee borer beetle and the coffee rust fungus. In addition, coffee prices have greatly decreased during the last two years. However, the system seems to work in the following manner: the plantation owner lets a renter (usually a Haitian farmer) keep half of the coffee bean harvest, in exchange for his maintenance work on the farm, harvest and processing of the beans for market, etc. Like in the previous systems, the land owner provides living quarters (usually a small house or shack) and may allow the renter to grow short cycle crops for the established 20% subsistence agriculture harvest quota.

⁶ In some areas, adoption of a form of the Haitian system of *Kombit* is widespread at harvest time. This consists in gathering all Haitian farmers in a given area to help with the harvest in exchange for a big meal, moonshine (clerén or tafia) and in some cases some payment for the day's work (typically \$US4-5) provided by the Dominican landowner.



Figure 18. Some of the threats observed in the area near Los Arroyos Birdwatching Trail: a) trail entrance sign seen from the Pedernales road; b) person taking gathering firewood in the trail area; c- d) two charcoal ovens at different stages on the side of the trail; e) water reservoir excavation from José Andújar; f) recently established avocado plantation near the east end of the trail. All photos by Yolanda León.

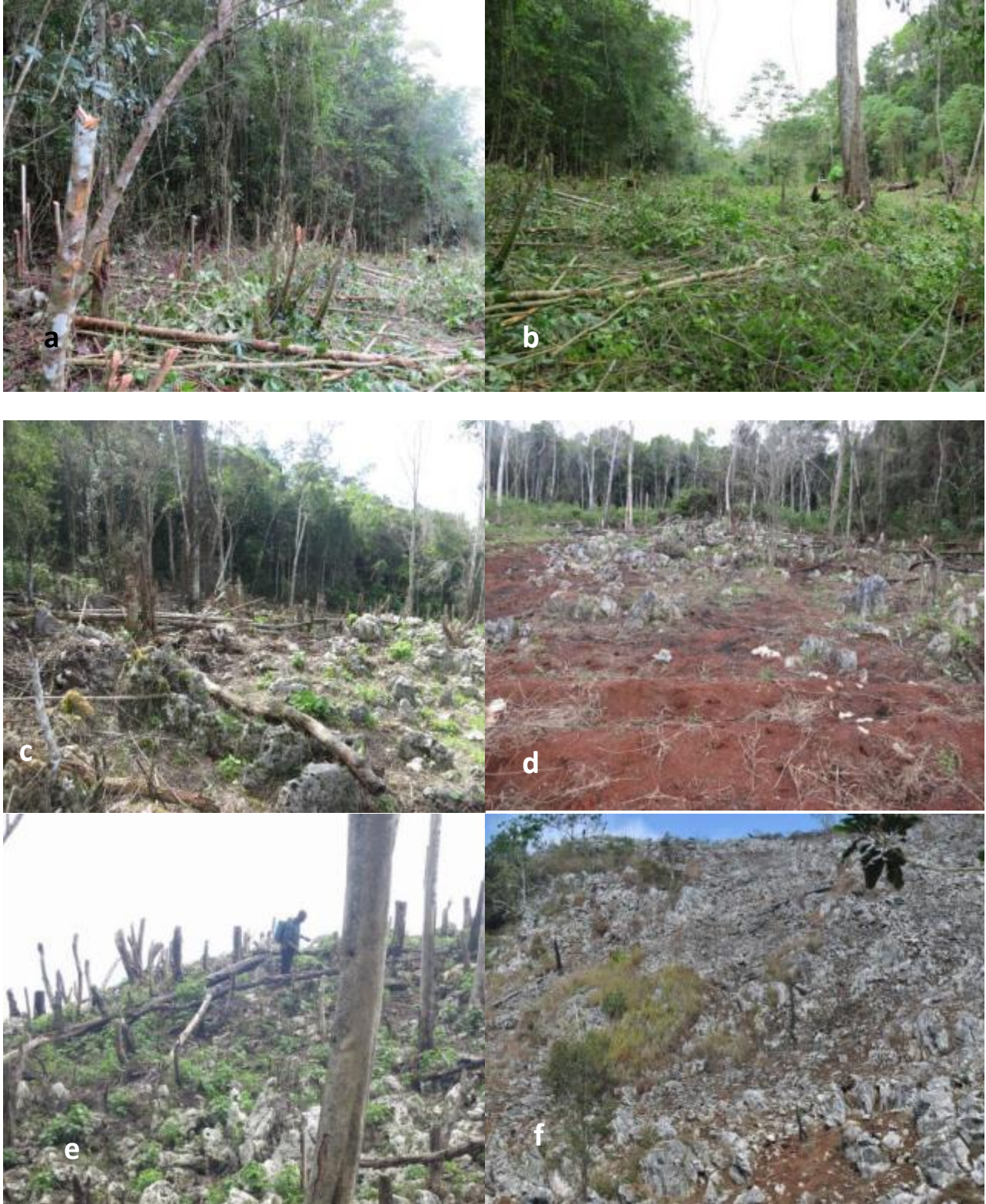


Figure 19. Some of the threats observed in the area near Las Abejas, southern Bahoruco. a-d) Recent forest cuts for subsistence agriculture; e) Intense herbicide spraying in recently cut forest to plant beans; f) view of an eroded slope after possibly one or two crops of similar subsistence agriculture practices.

Advocacy activities

There are a number of issues with the agricultural systems in place in southern Sierra de Bahoruco, with the land appropriation by many inside a National Park being one of our biggest sources of concern, especially for non-sustainable agricultural practices. This situation is aggravated by the lack of park boundary demarcation on the ground. Even when we acknowledge that some persons are well aware of the parks existence, many (if not all) don't have a clear idea of where its legal boundaries lie. Some locals believe the park started where the pine forest begins, and none seem to know that the park had increased its size after Sectorial Law 202 of 2004. For months we have been discussing this issue (as it is a common problem to most protected areas)with the Ministry, as Park demarcation on the ground continues to be practically non-existent. But they just don't seem very interested in facing the many conflicts involved.

Even though advocacy activities were not initially included in the Project, given the serious situation observed on the ground, we voluntarily undertook them at our own cost, given the high conservation value of Bahoruco and also because we think it could help bring attention to the poor protected area management prevailing country-wide. We started by sending two letters to the Ministry of the Environment expressing our concern about the situation of the Park and providing details.⁷ We also helped other partners like VCE and Cornell Lab of Ornithology who prepared formal letters echoing our concerns.

We also attended a meeting with JC Martínez, C. Rimmer (from VCE) and Jesús Moreno (Fundación Ecológica Loma Quita Espuela) with José Enrique Báez (Protected Area Director of the Ministry of the Environment) to discuss this problem. Mr. Báez promised to follow our suggestion that an open but firm dialog was needed with the producers established within the park, the Ministry, Grupo Jaragua and any other concerned groups/persons to clear out the protected área boundaries, negotiate a plan to solve this problem, etc. A date for the following week was set but needed to be confirmed by Mr. Báez. This never happened, and two weeks later, we found out that Mr. Báez had met in Barahona at the agreed upon date with Provincial Environment Directors of Pedernales and Independencia Provinces (which share the Park's territory) as well as the protected area administrators from the area to talk about the situation we denounced. To this day, we don't know what was discussed there. We suspect that we were not invited to this meeting when the Ministry realized that persons with strong ruling party connections were involved and profiting from the agricultural systems in place inside the Park. Per suggestion of Jesús Moreno, Y. León and him met with two members of ECORED (Red Empresarial por el Medio Ambiente) to voice our concern and see if they could help us put pressure on the Ministry to act, however, they said they were only going to write a letter to the Ministry.

Coincidentally, a reporter and nature photographer, Marvin del Cid from Diario Libre (the newspaper with highest circulation in the DR), published an article on the destruction of the Park on 1 April 2013,

⁷ These letters and other related materials on the Sierra de Bahoruco advocacy campaign can be viewed at: <http://www.grupojaragua.org.do/Bahoruco.html>

with excellent images and videos on the online version.⁸ We contacted him and agreed to work together to keep raising public attention on this issue through this newspaper. Later, he gave our contact to a reporter in charge of doing a follow up piece, so we met with her and gave her abundant information, maps, etc. However, the published article was disappointing in many ways. The headline, beginning and ending section (which included statements from the Ministry and Jorge Brocca from Sociedad Ornitológica de La Hispaniola [SOH]) minimized the problem and said the Ministry had solved it by naming 40 new brigade members for the Sierra and by signing an agreement between SOH and Tropigas Foundation⁹ to protect Sierra de Bahoruco.¹⁰ The brigade members are temporary workers typically used when there are forest fires, who have no training, logistical support or legal standing to stop in any way the situation.

At this point, we decided to leave the Diario Libre route and start to put pressure through social media (Facebook page created “Amigos de la Sierra de Bahoruco” (Friends of Sierra de Bahoruco) and Grupo Jaragua’s Twitter account, which had proved to be very effective in past issues. There, we posted information, short statements, images and videos showing the real situation in the Sierra that the Ministry was trying to hide. Other partners (VCE and Cornell Lab of Ornithology) also posted articles on their web pages.

Finally, on 22 April 2013, we learned that the Ministry had decided to send a technical Commission to Bahoruco to investigate our claims. When we found out (by chance), we called J.E. Baéz and asked him why Grupo Jaragua had not been invited to join them, since we had been the ones who denounced the situation in the first place and could better guide them to problem spots. At first, he still resisted to invite us, but we reminded him that Grupo Jaragua was part of the MaB Committee of the Biosphere Reserve, and that by closing the door on us, the Ministry was not fulfilling its international commitments, etc. Finally, he agreed to us coming along, but he was unwilling to change their scheduled trip departure of April 23rd to accommodate us. Therefore, only Y. León joined them on their second day in the field.

The Ministry’s commission was formed by three technical staff from the Santo Domingo office (Lemuel Familia –Biodiversity Direction, Luis Gómez Cipión –Protected Area Direction and Genaro Paula – Cartography Dept.) and were joined in the park area by César E. Peralta (Pedernales Provincial Environment Office) and José Dolores Jiménez (administrator of Sierra de Bahoruco National Park, headquartered-in Puerto Escondido on the northern side of the Sierra). On the first day (without us) they visited some properties off the Cabo Rojo-Aceitillar road. On their second day (when we joined them) we took them to the Los Arroyos park area to see, among other things, the huge excavation for José Andújar’s water reservoir. We also were able to talk with one person of the new brigade corps¹¹ and with one of the large avocado growers (Chichilo Espinal) on site. The following day, we visited with

⁸ http://www.diariolibre.com/noticias/2013/04/01/i377369_las-amenazas-sierra-bahoruco.html; video http://www.youtube.com/watch?v=Jh-m_qGaKg video 2 <http://www.youtube.com/watch?v=sRGOL7vZZOY>

⁹ A recently created foundation from a Dominican propane gas distribution company.

¹⁰ See the article here: http://www.diariolibre.com/sociedad/2013/04/15/i379326_vigilantes-mas-para-sierra-bahoruco.html

¹¹ Part of this conversation and this visit can be seen here http://www.youtube.com/watch?v=w_6u6hVbyh0

the Commission an área that has suffered many recent cuts and was the focus of a very violent eviction in September of 2012, east of Las Mercedes' bauxite mine, but after two hours they said they had to leave for a meeting in Pedernales with the former provincial Environment Director from Pedernales, Víctor Ferreras (to which we were not invited). This is a lower elevation area (400-600m) and does not seem to hold BITH habitat, but nevertheless is important for the Park's integrity. Again we saw recent and widespread forest destruction, subsistence agriculture crops, and we openly spoke to some producers and workers.

When we returned to Santo Domingo, Lemuel Familia asked us to help him prepare maps for the report, which we did, and the resulting maps were included in his technical report for his supervisor, Viceminister Danneris Santana. It is interesting to note that in this report he included as a land owner within the park the Provincial Director of the Ministry of Environment himself. We think this "slipped by" because respondents gave their patron's local nickname (Rubio Gelín) and not his real name (Leovigildo Méndez), which the Ministry's commission from Santo Domingo didn't seem to know.

By early June we still had no response from the Ministry to our letters or to any communication on this topic. Then, we heard from father Antonio Fernández (a Catholic priest from Pedernales) that the Ministry of the Environment had sent a notice of "*Intimación a desocupar terrenos*" (a sort of threat to voluntarily abandon the land or else be forcibly evicted; see a scanned copy of one in Annex V) to a large number of people from Pedernales and Las Mercedes, without any previous dialog, which was exactly what we asked in our letters that they not do. A few days later, they announced forced evictions for Bahoruco on Diario Libre ¹² We wrote on social media heavily criticizing this action and posting pictures (provided by Red de Solidaridad Jano Siksé) of the abuses committed to Haitian workers during the September 2012 forced eviction by the SENPA (Environmental Police). We also complained why there were some sacred cows (big avocado growers) who didn't receive these notices, especially in Los Arroyos area. A few days later, Diario Libre published a note saying the Ministry was "getting ready to take to court" three of the large agricultural producers of Bahoruco.¹³ In any case, the deadline for the evictions passed and nothing happened.

However, in mid-July, we had to refocus our energies and attention to a new problem that was even more urgent. The Minister of the Environment (Bautista Rojas) had signed a permit to the Dominican Agrarian Institute (IAD) to destroy part of the Loma Charco Azul Biological Reserve, a protected area created in 2009 with technical support from Grupo Jaragua.¹⁴ With bulldozers already on the ground, we had to shift all our time and attention to this issue and could not do follow up or do advocacy for the Sierra de Bahoruco issues at the same time. Fortunately, we were able to solve this problem thanks to support from a number of radio and TV journalists, the UASD Environmental Commission (which hosted a press conference), our use of social media, and different published pieces from our international partners. It was all settled when two weeks later the IADs director called us to his office (Grupo

¹² See: http://www.diariolibre.com/destacada/2013/06/10/i387682_medio-ambiente-anuncia-desalojo-ocupantes-del-parque-nacional-sierra-bahoruco.html

¹³ http://www.diariolibre.com/noticias/2013/06/26/i390026_medio-ambiente-sometera-tres-hombres-por-daos-sierra-bahoruco.html

¹⁴ See <http://www.grupojaragua.org.do/LomaCharcoAzul.html>

Jaragua's Executive Director, Yvonne Arias and Y. León, board president, attended) and we negotiated the removal of the most critical site for Ricords Iguana (*Cyclura ricordii*) from his agrarian settlement plans. The Environment Minister was not invited to this meeting, even though we stated to the IAD's director that we thought he should be present (something he quickly dismissed as unnecessary).

These two advocacy campaigns (Bahoruco and Loma Charco Azul) have put us against the Ministry of the Environment for being openly critical to them, bringing about a negative change in attitude towards Grupo Jaragua by many Ministry staff. This has made more difficult the advancement of other initiatives we had been collaborating on recently with the Ministry (like the demarcation of Jaragua National Park on the ground and the revision of Jaragua National Park's management plan). We even met with the Minister of the Environment (for another issue) at the end of September of 2013, and he refused our request for information on the alleged court proceedings of the Bahoruco avocado producers we had seen on the press, saying that "it was our task to figure it out."

Throughout this process, we have learned that the Ministry of the Environment is mainly a political entity with very little interest in either its mission or in solving protected area conflicts, especially if they affect interests of government party members or persons with strong connections to them. More recent interviews in the field have revealed that not only the provincial environment director (L. Méndez) seems to be involved in park land occupation, but that the Pedernales Red Cross and Hospital directors, a journalist¹⁵, and many others also openly have taken land under the subsistence agriculture scheme inside the Park. Thus, grabbing land from the national park is rather the norm than an exception among government functionaries and many other citizens of Pedernales.

At the same time, we have seen with great sadness how the government exerts a very tight control over the national printed press, especially through *Diario Libre*.¹⁶ Thus, to continue in this fight, our contacts with TV and radio journalists, who are more independent, as well as social media are going to be key for Bahoruco's defense. However, we fear that this is a problem of a very large scale, due to the vast land surface involved, the investments made by some producers (especially avocado growers) and the rightful claims of local people that the park boundaries has never been clearly demarcated. We have no faith in the current authorities of the Ministry of the Environment to draw the courage and resources to either confront this situation or bring about any meaningful change to its root causes on a reasonable time scale.

Currently, we are contemplating the possibility of purchasing land from one or more of the current occupiers to designate it for conservation purposes, as we had to do in two lowland areas around Jaragua National Park to save critical habitats for endangered iguanas and land mammals (thanks to generous donors). However, it is very important that land purchases are strategically chosen. For this,

¹⁵ See his giant pumpkin harvested on Park land here: <http://www.realidadesdepedernales.com/2011/05/vea-una-auyama-y-su-madrecosechada-en.html>

¹⁶ This lack of freedom of speech in the DR's press has been denounced recently by renowned DR journalists to the Inter-American Commission of Human Rights while referring to the media control on opinions that are contrary to government position on Decision 168-13 of the Constitutional Tribunal. Journalist Juan Bolívar Díaz says he estimates 2 to 3000 journalists from different media outlets receive regular payments from the government to silence or keep opposing views in check (see <https://www.youtube.com/watch?v=DsRwbkbWzWc>).

we are currently (with funds from Jensen/BirdLife International) conducting a more detailed study of land tenure in different areas of Bahoruco to have a better idea about this option.

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Table 1. Summary of informal interviews to locals and key informants.

num	fecha	latitud	longitud	Observador	sexo	Localidad	Patrón	Donde vive patron	activ1	detall1	Origen
15	17-Nov-13	18.112	-71.622	Y. León	m	Aceitillar	Tabaquito Castillo	Pedernales	jornalero	habichuelas, maíz	Thiotte
14	2-Dec-12	18.191	-71.685	Y. León	m	Aguas Negras	Gustavo	Aguas Negras?	jornalero	Café	Neiba
18	25-Apr-13	18.091	-71.645	Y. León	m	Camino Aceitillar	Socrates Mancebo	Pedernales	chofer/transportista	carga en su camioneta productos agrícolas	
13	2-Dec-12	18.189	-71.689	Y. León	f	Higo Grande	Toñito, de los "Ive"	Pedernales	jornalero	Café	
4	5-Apr-13	18.152	-71.626	H. Andújar	m	Las Abejas	Manuel, de Pedernales	Pedernales	jornalero	Habichuelas	Thiotte
5	5-Apr-13	18.146	-71.622	Y. León	m	Las Abejas	Marino (esposo de Sandra)	Las Mercedes	jornalero	habichuela, yautía	Thiotte
12	28-Jan-13	18.146	-71.623	Y. León	m	Las Abejas	Marino Perez	Las Mercedes	jornalero		(Haití)
16	17-Nov-13	18.15	-71.631	Y. León	m	Las Abejas	Jalico y Manuel (el Alcalde de Avila)	Avila (cerca de Las Mercedes)	jornalero	tumbando bosque para futura siembra	
1	20-Oct-11	18.244	-71.75	Y. Leon, G. McElroy	m	Los Arroyos	Pilo Marte / Yumelo / Saturnino	Pedernales	agricultor	Zanahoria	Tete Source
2	20-Oct-11	18.249	-71.75	Y. Leon	m	Los Arroyos	Pilo Marte	Pedernales	jornalero	estaba aplicando "producto" al cultivo d papa	
3	20-Oct-11	18.249	-71.75	G. McElroy, Y. Leon,	m	Los Arroyos	Pilo Marte	Pedernales	jornalero	en siembra de papas y cebolla	Fonds Verretes
6	6-Apr-13	18.258	-71.739	Y. León	f	Los Arroyos	Chichilo	Pedernales	jornalera?	recogiendo y cortando leña en sendero aves	
7	6-Apr-13	18.251	-71.728	Y. León	m	Los Arroyos	Andújar	SDQ	jornaleros	estaban arando la tierra	
8	6-Apr-13	18.254	-71.735	Y. León	m	Los Arroyos	Chichilo	Pedernales	jornalero	agricultor y dueño de vacas.	
9	6-Apr-13	18.251	-71.728	Y. León	m	Los Arroyos	Andújar	SDQ	jornaleros	grupo de jornaleros guareciéndose de lluvia	
10	31-Jan-13	18.253	-71.734	Y. León	m	Los Arroyos	Chichilo	Pedernales	jornalero	yautia y zanahoria	
11	31-Jan-13	18.253	-71.733	Y. León	m	Los Arroyos	Chichilo	Pedernales	jornalero	hablamos con el en la bajada, no sabemos exact. donde iba	
17	30-Nov-13	18.257	-71.737	Y. León	m	Los Arroyos	Jornalero	Maiz			
19	24-Apr-13	18.253	-71.731	Y. León, J.L. Castillo	m	Los Arroyos	No	Pedernales	Patron	preparando p. sembrar yautia, zanah., aguac Hass	Los Arroyos
20	24-Apr-13	18.254	-71.737	Y. León, J.L. Castillo	m	Los Arroyos	Chichilo	Pedernales	jornalero	arando para plantar zanahorias	
21	24-Apr-13	18.253	-71.731	Y. León, J.L. Castill	m	Los Arroyos	No	Los Arroyos	agricultor	esta sembrando todo de aguacate injerto	



Figure 20. Haitian families and their rented shacks and land from Dominicans for short cycle crops on Sierra de Bahoruco National Park.

Annex I. Field form used for standardized bird surveys



FORMULARIO DE MONITOREO DE AVES DE BOSQUE

SITIO: _____ Coord: _____
 Observadores: _____ Fecha: _____

Velocidad del viento	Dirección del viento	Cielo
0 = quieto, el humo sube verticalmente	N = norte	0 = claro con pocas nubes
1 = (1-3 millas/hora) aire ligero, el humo se desliza	NE = noreste	1 = nubes dispersas
2 = (4-7 millas/hora) brisa ligera, se mueven plantas, se siente en la cara	E = este	2 = nublado
3 = (8-12 millas/hora) brisa suave, hojas y ramas finas se mueven - NO CENSO	SE = sureste	4 = niebla
4 = (13-18 millas/hora) brisa moderada, ramas se mueven, se vuelan papeles - NO CENSO	S = sur	5 = lluvia ligera / lloviznando
5 = (>18 millas/hora) brisa fuerte, árboles se mueven - NO	SW = suroeste	6 = lluvia - NO CENSO
	W = oeste	7 = nieve - (!) NO CENSO
	NW = noroeste	8 = lluvia - NO CENSO

Simbolos del Mapa

- MAVA posición de una cigüita magnolia vista
- MAVA posición de una cigüita magnolia detectada por canto
- MAVA → MAVA Cambio de posición observado
- MAVA - - - → MAVA Cambio de posición supuesto

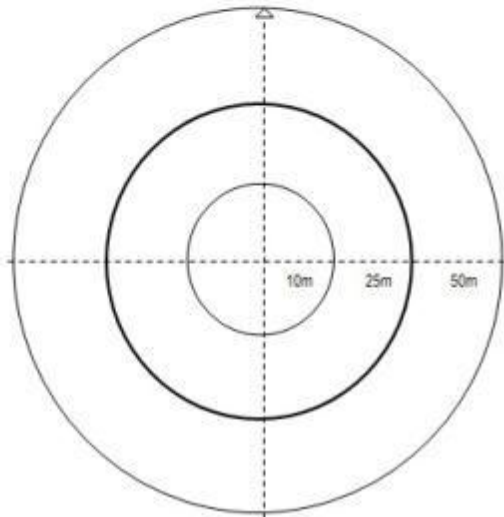
Comentarios generales

Todos los códigos de los mapas están correctos: _____ (iniciales)

Punto # ___ Duración ___ min Vel viento ___ Dir Viento ___ Cielo ___ Temp ___ Hora ___ : ___
 Lista de aves que pasaron volando: _____

🎵 (1 min)

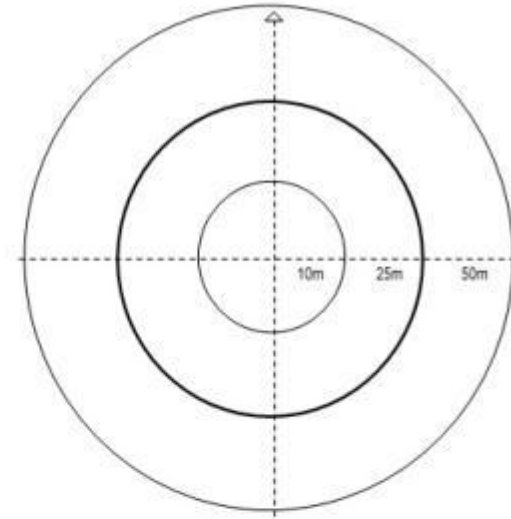
Comentarios: _____



Punto # ___ Duración ___ min Vel viento ___ Dir Viento ___ Cielo ___ Temp ___ Hora ___ : ___
 Lista de aves que pasaron volando: _____

🎵 (1 min)

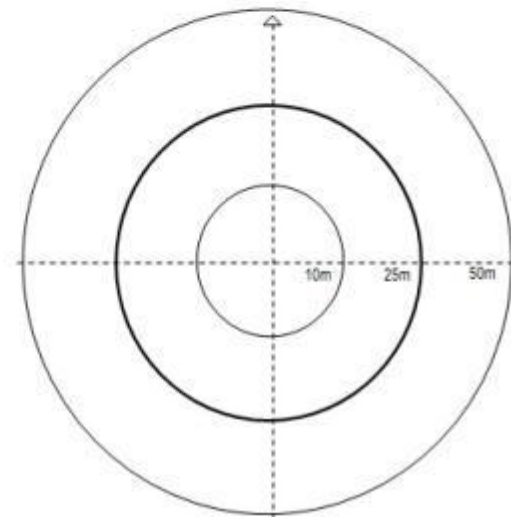
Comentarios: _____



Punto # ___ Duración ___ min Vel viento ___ Dir Viento ___ Cielo ___ Temp ___ Hora ___ : ___
 Lista de aves que pasaron volando: _____

🎵 (1 min)

Comentarios: _____



Anex III. Summary of standardized bird surveys.

Punto	Sitio	Lat	Obs	Fecha	comentarios	Vel. Viento	Dir. Viento	Cielo	Temp	Hora	Vo-lando	Dura-ción	Graba-ción	aves	CABI	CABI No.
LAb1	Las Abejas	18.14825/ - 71.62273	E Garrido, J Almonte, J Tietz, Y León	28-Jan-13	bosquecito latifoliado bien conservado. En algunos sitios hay roca cárstica afilada muy cerca del fin de la carretera, caminando hacia la izquierda.	2	NW	0		8:12:00	AMVE	2.5	no	COFL, MYGE, MEST	0	0
										8:14:30	-	2.5	sí	MEST, CABI	1	1
										8:17:00	ACST	2.5	sí	MEST, CABI	1	1
										8:19:30	-	2.5	sí	CABI	1	1
LAb2	Las Abejas	18.14596/ - 71.62172	E Garrido, J Almonte, J Tietz, Y León Y León	28-Jan-13	Bosque latifoliado, varios arbustos de cafetán	0	-	0		9:32:00	ARCH, AMVE	2.5	no	COFL	0	0
										9:34:30	-	2.5	sí	ACST	0	0
										9:37:00	-	2.5	sí	TOAN	0	0
										9:39:30	-	2.5	sí	CABI	1	1
LAb4	Las Abejas	18.14474/ - 71.62215	E Garrido, J Almonte, J Tietz, Y León	28-Jan-13	bosque mixto latifoliado con pino, en pendiente. Al sur hay conuco; se oye a la gente hablar. Hay carso FILOSO	0	-	0		10:13:00	-	2.5	no	COHI, TOAN, CHSW	0	0
										10:15:30	-	2.5	sí	COHI, TOAN	0	0
										10:18:00	-	2.5	sí		0	0
										10:20:30	-	2.5	sí	COHI	0	0
LAb5	Las Abejas	18.14907/ - 71.6225	E Garrido, J Almonte, J Tietz, Y León	29-Jan-13	Bosque latifoliado, bien conservado, al final de la carretera a la derecha	0	-	0		7:10:00	-	2.5	no	ARCH,PRRO, MEST, MYGE,EUMU, SPDO	0	0
										7:12:30	-	2.5	sí	ARCH, MYGE, AMVE, SPDO, ELFA	0	0
										7:15:00	Grupo de ARCH	2.5	sí	ARCH, MEST	0	0
LAb5									7:17:30	-	2.5	sí	ARCH	0	0	

LA6	Las Abejas	18.15028/ - 71.62363	E Garrido, J Almonte, J Tietz, Y León	29-Jan-13	bosque latifoliado con muchos helechos, al lado de tronco atravesado	1	-	0		7:49:00	-	2.5	no	PRRO, MYGE, SPDO, MEST, EUMU, ELFA	0	0
LA6										7:51:30	-	2.5	sí	SEVI, EUMU, PAIN	0	0
LA6										7:54:00	-	2.5	sí	TOAN, COFL, EUMU, CABI	1	1
LA6										7:56:30	-	2.5	sí	MEST, EUMU, MYGE, EUMU	0	0
LA7	Las Abejas	18.15022/ - 71.62566	E Garrido, J Almonte, J Tietz, Y León	29-Jan-13	Bosque latifoliado, bien conservado, al final de la carretera a la derecha	0	-	0		8:14:00	-	2.5	no		0	0
LA7										8:16:30	-	2.5	sí	MEST, CABI	1	1
LA7										8:19:00	AMVE	2.5	sí	CABI	1	1
LA7										8:21:30	-	2.5	sí	CABI, MEST	1	2
LA8	Las Abejas	18.15034/ - 71.62699	E Garrido, J Almonte, J Tietz, Y León	29-Jan-13	bosque latifoliado con muchos helechos, al lado de tronco atravesado	1	-	0		8:34:00	-	2.5	no	MEST, MYGE, Geotrygon?, PAIN, ARCH	0	0
LA8										8:36:30	-	2.5	sí	MEST, PAIN	0	0
LA8										8:39:00	-	2.5	sí	MEST, EUMU, SPDO, NEMI, CABI	1	2
LA8										8:41:30	-	2.5	sí	CABI	1	1
LA9	Las Abejas	18.15084/ - 71.6291	E Garrido, J Almonte, J Tietz, Y León	29-Jan-13	"cañón" en bajada; bosque claro en medio de bosque latifoliado bien conservado	1	-	0		8:55:00	-	2.5	no	MYGE, TOAN, MEST, PRRO, EUMU,	0	0
LA9										8:57:30	ARCH	2.5	sí	ARCH, COFL, CHSW	0	0
LA9										9:00:00	-	2.5	sí	MEST, ARCH	0	0
LA9										9:02:30	-	2.5	sí	MYGE, ARCH	0	0
ECh1	El Chucho	18.23894/ - 71.59547	E Garrido, J Almonte, J Tietz, Y León	30-Jan-13	Pino mixto con bosque latifoliado. El viento arriba estaba en 5; abajo en 2	2	-	0		7:00:00	-	2.5	no	TOAN, SEDI	0	0
ECh1										7:02:30	-	2.5	sí	CHSW, TOAN, CABI	1	1
ECh1										7:05:00	-	2.5	sí	CABI, SEAU	1	1
ECh1										7:07:30	-	2.5	sí	CABI, SEAU, CATE	1	1

ECh2	El Chucho	18.25274/ 71.6226	E Garrido, J Almonte, J Tietz, Y León	30-Jan-13	"Dedos"de bosque húmedo entrando al pinar. Viento arriba 3-4, abajo, 2	2	-	0		7:33:00	-	2.5	no	DIPI	0	0
ECh2										07:35:30	-	2.5	sí	TOAN	0	0
ECh2										7:38:00	-	2.5	sí	MYGE	0	0
ECh2										07:40:30	-	2.5	sí	0	0	0
ECh3	El Chucho	18.25216/ - 71.62463	E Garrido, J Almonte, J Tietz, Y León	30-Jan-13	Bosque mixto latifoliado con pino, hay varios palo de viento (Dydimopanax). Viento 5 arriba, 2 abajo	2	-	0		07:49:30	-	2.5	no	LOME	0	0
ECh3										07:51:30	-	2.5	sí	CHSW	0	0
ECh3										07:53:30	-	2.5	sí	TIBI	0	0
ECh3										07:55:30	-	2.5	sí	COHI,MIPA	0	0
ECh4	El Chucho	18.2371/ - 71.59285	E Garrido, J Almonte, J Tietz, Y León	30-Jan-13	"Dedos"de bosque húmedo entrando al pinar.	2	-	2		09:11:00	-	2.5	no	TOAN, ELFA, PRRO, DEPI	0	0
ECh4										09:13:30	-	2.5	sí	TIBI, PRRO,	0	0
ECh4										09:16:00	-	2.5	sí	DEPI, TOAN	0	0
ECh4										09:18:30	-	2.5	sí	CABI, PRRO	1	1
ECh5	El Chucho	18.22339/ - 71.5818	E Garrido, J Almonte, J Tietz, Y León	30-Jan-13	"Dedos"de bosque húmedo entrando al pinar. Viento arriba 3	2	-	0		09:49:00	-	2.5	no	0	0	0
ECh5										09:51:30	-	2.5	sí	TOAN	0	0
ECh5										09:54:00	-	2.5	sí	SPDO	0	0
ECh5										09:56:30	-	2.5	sí	TIBI	0	0
ECh6	El Chucho	18.27888/ - 71.66783	E Garrido, J Almonte, J Tietz, Y León	30-Jan-13	Bosque mixto latifoliado-pino. Palo de viento, helechos, liana atravesada sobre hojarasca de pino. Viento arriba 4	2	NE	2		13:48:00	-	2.5	no	0	0	0
ECh6										13:50:30	-	2.5	sí	MYGE	0	0
ECh6										13:53:00	-	2.5	sí		0	0
ECh6										13:55:30	-	2.5	sí		0	0
LAr1	Los Arroyos	18.26035/ - 71.73816	E Garrido, J Almonte, G Feliz, J	31-Jan-13	Bosque latifoliado	2	NW	0		7:22:00	CHSW	2.5	no	MYGE, SPDO, MYGE, PHPA	0	0

			Mato, Y León													
LAr1										7:24:30	-	2.5	sí	MEST, CATE, MIPA, SPDO, MYGE, CABI	1	1
LAr1										7:27:00	-	2.5	sí	SERU, MYGE, COHI	0	0
LAr1										7:29:30	-	2.5	sí	CABI	1	2
LAr2	Los Arroyos	18.25648/- 71.73713	E Garrido, J Almonte, G Feliz, J Mato, Y León	31-Jan- 13	Bosque húmedo		-			7:35:00	-	2.5	no	MEST, MIPA, TOAN, SPDO, SPVA, DEPI	0	0
LAr2											-	2.5	sí	TOAN, SPVA, MIPA, DECO, MEST, COFL	0	0
LAr2											-	2.5	sí	TOAN, MEST, SPVA, COHI	0	0
LAr2											-	2.5	sí	TOAN, MEST, SPVA	0	0
LAr3	Los Arroyos	18.26012/- 71.74038	E Garrido, J Almonte, G Feliz, J Mato, Y León	31-Jan- 13	Bosque latifoliado por debajo del pino. Helechos arborescentes	0	NW	0		6:40:30	-	2.5	no	SPDO, MYGE, CHSW	0	0
LAr3										6:42:30	-	2.5	sí	MEST, CHSW, CABI, MYGE	1	1
LAr3										6:44:30	-	2.5	sí	MEST, PAIN, TOAN	0	0
LAr3										6:46:30	AMVE	2.5	sí	MEST, CABI, ZEAS	1	2
LAr4	Los Arroyos	18.25849 / - 71.73891	E Garrido, J Almonte, G Feliz, J Mato, Y León	31-Jan- 13	Bosque húmedo con cortes recientes	0	NW	0		8:02:00	-	2.5	no	TOAN, ZEAS, PHPA	0	0
LAr4										8:04:30	-	2.5	sí	AMVE, DECO, SPDO, COFL, TIBI,	0	0
LAr4										8:07:00	-	2.5	sí	CABI, DECO, MEST, CHSW, PRRO	1	2
LAr4										8:09:30	-	2.5	sí	CABI, DECO, MEST	1	2
LAr5	Los Arroyos	18.25433/- 71.73538	E Garrido, J Almonte, G Feliz, J Mato, Y León	31-Jan- 13	Bosque raleado cerca de sendero Los Arroyos	0	-	0		9:11:00	-	2.5	no	CATE, PHPA, SPDO	0	0
LAr5										9:13:30	-	2.5	sí	AMVE, ZEAS	0	0

LAr5										9:16:00	-	2.5	si	CHSW, MIPA	0	0
LAr5										9:18:30	-	2.5	si	CABI, PHPA	1	1
LAr6	Los Arroyos	18.25259/ - 71.73328	E Garrido, J Almonte, G Feliz, J Mato, Y León	31-Jan-13	Fragmento de bosque entre siembra de yautía y papa (abandonada ésta última). Se oyen voces cerca	0	-	0		9:41:00	-	2.5	no	MYGE, TOAN	0	0
LAr6										9:43:30	-	2.5	si	DECO, TOAN, MYGE, MIPA	0	0
LAr6										9:46:00	-	2.5	si	DECO	0	0
LAr6										9:48:30	-	2.5	si	ELFA	0	0
LAr7	Los Arroyos	18.25426/ - 71.73214	E Garrido, J Almonte, G Feliz, J Mato, Y León	31-Jan-13	Península de bosque que baja del pino a la zona de zanahora (ahora están cosechando). Vacas, caballos alrededor. En pendiente, con piedras. Bosque se ve raleado.	0	-	0		10:07:00	-	2.5	no	MYGE	0	0
LAr7										10:09:30	-	2.5	si	TOAN, ELFA, MYGE	0	0
LAr7										10:12:00	-	2.5	si	MIPA, MYGE	0	0
LAr7										10:14:30	TAEU	2.5	si	CATE (2)	0	0
ECh4	El Chucho	18.2371/ - 71.59285	E Garrido, J Almonte, H Andújar, Y León	5-Apr-13	Dedo de bosque entre pino	0	-	1	22	17:05:00	-	2.5	no	TOAN	0	0
ECh4										17:07:30	-	2.5	si	TOAN	0	0
ECh4										17:10:00	-	2.5	si	MEST	0	0
ECh4										17:12:30	-	2.5	si	MEST	0	0
ECh4										17:15:00	-	2.5	si	CAJE, LOVI, SHSW, SPDO, TUPL	0	0
ECh11	El Chucho 3	18.24011/ - 71.59678	E Garrido, J Almonte, H Andújar, Y León	5-Apr-13	Dedo de bosque entre pino	0	-	1	17	17:43:00	-	2.5	no	AMVE, ELFA, PAIN, CHSW, TOAN	0	0
ECh11										17:45:50	-	2.5	si	PAIN, AMVE.	0	0
ECh11										17:48:00	-	2.5	si	PAIN, TOAN, AMVE(2), PRRO, XEMO	0	0
ECh11										17:50:50	-	2.5	si	TOAN, MYGE, PAIN	0	0

ECh11										17:53:00	-	2.5	si	PAIN, TOAN, AMVE(4), PRRO, MIGE,	0	0
ECh13	El Chucho 7	18.28355/ - 71.67337	E Garrido, J Almonte, H Andújar, Y León	5-Apr-13	Dedo de bosque entre pino	0	-	0	15	8:40:00	-	2.5	no	ELPA(2), SPDO(2), PAIN.	0	0
ECh13										8:42:30	-	2.5	si	PAIN, PRRO, MYGE, TOAN, SPDO(2).	0	0
ECh13										8:45:00	-	2.5	si	LOME, MEST, MYGE, PAIN, SEDO(2), TOAN.	0	0
ECh13										8:47:30	-	2.5	si	SPD, MYGE, DEPI.	0	0
ECh13										8:50:00	-	2.5	si	MYGE.	0	0
ECh3	El Chucho 10	18.25216/- 71.62463	E Garrido, J Almonte, H Andújar, Y León	6-Apr-13	Curva al final de la cuesta	1	SW	0	13	7:07:00	-	2.5	no	DEPI(2), ELFA, MYGE(2), MEST.	0	0
ECh3										7:09:30	-	2.5	si	DEPI(3), TUPL, MYGE, MEST, TOAN.	0	0
ECh3										7:12:00	-	2.5	si	TOAN, MYGE.	0	0
ECh3										7:14:30	-	2.5	si	TOAN, MYGE.	0	0
ECh3										7:17:00	-	2.5	si	ELFA, MEST, COLD	0	0
LAB7	Las Abejas	18.15034/ - 71.62697	E Garrido, J Almonte, H Andújar, Y León	5-Apr-13	Bosque latifoliado nublado	1	-	0	16	8:32:00	-	2.5	no	TUPL, PRRO(2), MEST(2), COFL, MEST(2), MYGE.	0	0
LAB7										8:34:30	-	2.5	si	TOAN, MEST, PRRO.	0	0
LAB7										8:37:00	PALE	2.5	si	MEST, TOAN, PALE, CABI, PRRO.	1	1
LAB7										8:39:30	-	2.5	si	CABI, MYGE, PRRO.	1	1
LAB7										8:42:00	-	2.5	si	MEST(2), MYGE, PRRO, CHSW.	0	0
LAB6	Las Abejas	18.15028/- 71.62363	E Garrido, J Almonte, H Andújar, Y León	5-Apr-13	Bosque latifoliado nublado	2	-	0	16	8:10:00	-	2.5	no	MEST, PAPH, TUPL, ELFA, ARCH, MYGE.	0	0
LAB6										8:12:30	-	2.5	si	MYST, VIAL, CABI, PRRO,	1	1

														MEST, ARCH.		
LAB6										8:15:30	-	2.5	si	MYST, VIAL, CABI, PRRO, MEST, MYGE.	1	1
LAB6										8:17:30	-	2.5	si	MYST, CABI, MYGE, COFL, MEST.	1	1
LAB6										8:20:00	-	2.5	si	NEMI, MYGE, MEST, CABI, COFL, EUMU, TUPL.	1	1
LAB5	Las Abejas	18.14825/-71.62273	E Garrido, J Almonte, H Andújar, Y León	5-Apr-13	Bosque latifoliado nublado	1	N	1	23	9:45:00	ARCH (2)	2.5	no	MYGE, MEST, PHPA	0	0
LAB5										9:47:30	-	2.5	si	MYGE, MEST.	0	0
LAB5										9:50:00	-	2.5	si	MYGE, MEST.	0	0
LAB5										9:52:30	-	2.5	si	EUMU, MYGE, TOAN, CHSW, TAEN, MEST, SPDO	0	0
LAB5										9:55:00	-	2.5	si	MEST, MYGE, CHSW, SPDO.	0	0
Lab2	Las Abejas	18.14596 / -71.62172	E Garrido, J Almonte, H Andújar, Y León	5-Apr-13	Bosque latifoliado nublado	0	N	1	23	10:32:00	-	2.5	no	MEST, MYGE, CHSW, SPDO.	0	0
Lab2										10:34:30	-	2.5	si	COMI, MEST, MIST, PRRO.	0	0
Lab2										10:37:00	-	2.5	si	COLO, PRRO.	0	0
Lab2										10:39:30	-	2.5	si	COLO, PRRO, TOAN.	0	0
Lab2										10:42:00	-	2.5	si	MEST, PRRO.	0	0

Annex IV. Codes used for bird species in the standardized survey form.

Género	Especie	Código	Nombre	Nombre en inglés
<i>Accipiter</i>	<i>striatus</i>	ACTR	Guaraguaito de Sierra	Sharp-shinned Hawk
<i>Amazona</i>	<i>ventralis</i>	AMVE	Cotorra	Hispaniolan Amazon
<i>Aratinga</i>	<i>chloroptera</i>	ARCH	Perico	Hispaniolan Parakeet
<i>Buteo</i>	<i>jamaicensis</i>	BUJA	Guaragua	Red-tailed Hawk
<i>Calyptophilus</i>	<i>tertius</i>	CATE	Chirri de Bahoruco	Western Chat-Tanager
<i>Carduelis</i>	<i>dominicensis</i>	CADO	canario	Antillean Siskin
<i>Catharus</i>	<i>bicknelli</i>	CABI	Zorzal de Bicknell	Bicknell's Thrush
<i>Chlorostilbon</i>	<i>swainsonii</i>	CHSW	Zumbador Esmeralda	Hispaniolan Emerald
<i>Coccyzus</i>	<i>longirrostris</i>	COAM	Pájaro bobo	Hispaniolan Lizard-Cuckoo
<i>Coccyzus</i>	<i>minor</i>	COMI	Pajaro Bobo Menor	Mangrove Cuckoo
<i>Coereba</i>	<i>flaveola</i>	COFL	Ciguita Común	Bananaquit
<i>Contopus</i>	<i>hispaniolensis</i>	COHI	Pewee	Hispaniolan Pewee
<i>Corvus</i>	<i>palmarum</i>	COPA	Cao	Hispaniolan Palm Crow
<i>Crotophaga</i>	<i>ani</i>	CRAN	judío	Smooth-billed Ani
<i>Dendroica</i>	<i>caerulescens</i>	DECA	Ciguita Azul	Black-throated Blue Warbler
<i>Dulus</i>	<i>dominicus</i>	DUDO	Cigua palmera	Palmchat
<i>Elaenia</i>	<i>fallax</i>	ELFA	Maroíta Canosa	Greater Antillean Elaenia
<i>Euphonia</i>	<i>musica</i>	EUMU	Jilguerillo	Antillean Euphonia
<i>Geothlypis</i>	<i>trichas</i>	GETR	ciguita enmascarada	Common Yellowthroat
<i>Geotrygon</i>	<i>leucometopia</i>	GELE	Perdiz coquito blanco	White-fronted Quail-Dove
<i>Loxia</i>	<i>megaplaga</i>	LOME	Pico Cruzado	Hispaniolan Crossbill
<i>Loxigilla</i>	<i>violacea</i>	LOVI	Gallito Prieto	Greater Antillean Bullfinch
<i>Melanerpes</i>	<i>striatus</i>	MEST	Carpintero	Hispaniolan Woodpecker
<i>Mellisuga</i>	<i>minima</i>	MEMI	zumbadorcito	Vervain Hummingbird
<i>Microligea</i>	<i>palustris</i>	MIPA	Ciguita Coliverde	Green-tailed Warbler
<i>Mniotilta</i>	<i>varia</i>	MNVA	Ciguita pegapalo	Black and White Warbler
<i>Myadestes</i>	<i>genibarbis</i>	MYGE	Jilguero	Rufous-throated Solitaire
<i>Myiarchus</i>	<i>stolidus</i>	MYST	Manuelito	Stolid Flycatcher
<i>Nesocittes</i>	<i>micromegas</i>	NEMI	Antillean piculet	Antillean Piculet
<i>Patagioenas</i>	<i>inornata</i>	PAIN	Paloma Ceniza	Plain Pigeon
<i>Patagioenas</i>	<i>leucocephala</i>	PALE	Paloma coronita	White-crowned Pigeon
<i>Patagioenas</i>	<i>squamosa</i>	PASQ	Paloma turca	Scaly-naped Pigeon
<i>Phaenicophilus</i>	<i>palmarum</i>	PHPA	Cuatro Ojos	Black-crowned Palm-tanager
<i>Priotelus</i>	<i>roseigaster</i>	PRRO	Papagayo	Hispaniolan Trogon
<i>Seiurus</i>	<i>aurocapilla</i>	SEAU		Ovenbird
<i>Setophaga</i>	<i>discolor</i>	SEDI	Ciguita de los Prados	Prairie Warbler
<i>Setophaga</i>	<i>pinus</i>	SEPI	Ciguita del Pinar	Pine Warbler
<i>Setophaga</i>	<i>ruticilla</i>	SERU	Bijirita	American Redstart
<i>Setophaga</i>	<i>tigrina</i>	SETI	ciguita Tigrina	Cape May Warbler
<i>Setophaga</i>	<i>virens</i>	SEVI	Ciguita Pechinegro	Black-throated Green Warbler
<i>Sphyrapicus</i>	<i>varius</i>	SPVA	Carpintero de Paso	Yellow-bellied Sapsucker
<i>Spindalis</i>	<i>dominicensis</i>	SPDO	Cigua Amarilla	Hispaniolan Spindalis
<i>Tachycineta</i>	<i>euchrysea</i>	TAEU	Golondrina Verde	Golden Swallow
<i>Tiaris</i>	<i>bicolor</i>	TIBI	Juana Maruca	Black-faced Grassquit
<i>Todus</i>	<i>angustirostris</i>	TOAN	Chicui	Narrow-billed Tody
<i>Turdus</i>	<i>swalesi</i>	TUSW	Zorzal de la Selle	La Selle's Thrush
<i>Turdus</i>	<i>plumbeus</i>	TUPL	Chua chuá	Red-legged Thrush
<i>Tyrannus</i>	<i>caudifasciatus</i>	TYCA	manjuila	Loggerhead Kingbird
<i>Vireo</i>	<i>altiloquus</i>	VIAL	Jualian Chivi	Black-whiskered Vireo
<i>Xenoligea</i>	<i>montana</i>	XEMO	Ciguita Aliblanca	White-winged Warbler
<i>Zenaida</i>	<i>asiatica</i>	ZEAS	Rolón Aliblanca	White-winged Dove

Annex V. “Intimación a desocupar” notice sent by the Ministry of the Environment to land occupiers within Sierra de Bahoruco National Park



"Año del Bicentenario del Natalicio de Juan Pablo Duarte"

ACTA DE INSPECCIÓN Y MONITOREO DE ÁREAS PROTEGIDAS

INTIMACIÓN A DESOCUPAR TERRENOS DE FORMA VOLUNTARIA DENTRO DE UN AREA PROTEGIDA TENDENTE AL SOMETIMIENTO JUDICIAL.

ACTA NÚM. 19 / En la Provincia de Pedernales R.D., República Dominicana, a los once (11) (11) días del mes de Junio del año, Dos Mil Trece (2013).

YO Inj. Rodolfo Moidy Ramirez En calidad de Inspector del Ministerio de Medio Ambiente y Recursos Naturales, dominicano, mayor de edad, portador de la cedula de identidad personal y electoral No. 069-0006656-1 domiciliado y residente en la calle La Cruz Roja Casa No. 705 del sector Los Ables Provincia Pedernales R.D. RD. ACTUANDO, a requerimiento del MINISTERIO DE MEDIO AMBIENTE Y RECURSOS NATURALES (MINISTERIO AMBIENTE), entidad de Derecho Público, del Estado Dominicano, creada en virtud de la Ley General Sobre Medio Ambiente y Recursos Naturales, No. 64-00, del Dieciocho (18) de Agosto del año Dos Mil (2000), con domicilio Social Principal ubicado en la Avenida Cayetano Germosén Esq. Gregorio Luperón, cuarto piso, El Pedregal, de esta ciudad de Santo Domingo de Guzmán, Distrito Nacional, me he trasladado a la propiedad del señor - Sargilio segura pedome - en los brocosos Ubicada dentro de esta misma Provincia, a la Parcela No. _____ Distrito Catastral No. _____, hablando personalmente con _____ portador de la cedula de identidad y electoral o pasaporte No. _____ quien me dijo ser Hija Susiri Segura de mi requerido y tener calidad para recibir actos de esta naturaleza.



Descripción de los hechos o Daño Ambiental.

Actividades agrícolas - dentro de las áreas protegidas, con siembra de productos de ciclo corto tal como: Maíz, Batata, Guandules, habichuela ETC

Le **COMUNICO** al (a) Señor (a)
Jergilio Segura Perdomo

lo siguiente: que está ocupando sin calidad legal alguna y en condición de intruso(a), terrenos dentro del ámbito del área protegida **Parque Nacional Sierra de Bahoruco**, en franca violación a los Artículos. 8,35,36,137,138 Y 174 de la ley No. 64-00 general sobre medio ambiente y recursos naturales, los artículos Nos. 6,9 y siguientes de la ley No. 202-04 sectorial de áreas protegidas y los artículos Nos. 14,15,16,66 y 67 de la Constitución dominicana y en tal virtud **LE INTIMA FORMALMENTE** para que en un plazo no mayor de quince (15) días entregue de forma voluntaria el inmueble o terrenos, **ILEGALMENTE OCUPADO** a su legítimo propietario, el Estado Dominicano /Ministerio Ambiente, o deposite sus alegatos y la Documentación (**Certificado de Título**) que le acredita como propietario por ante dicha institución (Ministerio de ambiente o Dirección Provincial de Medio Ambiente y Recursos Naturales) así se le advierte que de no obtemperar a la solicitud de desocupar el inmueble (terrenos) se utilizarán todos y cada uno de los medios que la ley pone al alcance de mi requeriente, para lograr su lanzamiento o expulsión del lugar ocupado de forma ilegal, en virtud de que esos terrenos pertenecen al Estado Dominicano y se encuentran dentro de un área protegida, y estas son inalienables, imprescriptibles e inembargables, constituyen parte del patrimonio Estatal y no son transferibles en propiedad a ningún individuo o Institución Jurídica.

Que el Principio III de la Ley No. 108-05 de Registro Inmobiliario, del 27 de marzo de 2005, modificada por la Ley No. 51-07, establece: "El Estado Dominicano es el propietario originario de todos los terrenos que conforman el territorio de la



República Dominicana. Se registran a nombre del Estado Dominicano todos los terrenos sobre los que nadie pueda probar derecho de propiedad alguno”.

Que de igual manera la **Ley Sectorial de Áreas Protegidas, No. 202-04 en el Principio No. 5: dispone lo siguiente:** “Las áreas públicas que se encuentren bajo régimen legal de protección en el Sistema Nacional de Áreas Protegidas constituyen un componente inalienable, imprescriptible e inembargable del patrimonio estatal y no son transferibles en propiedad a ningún individuo, Estado, nación o ciudadano de otro país bajo ninguna circunstancia”.

Y para que mi requerido Sr. Sergilio Segura Perdomo no pretenda alegar ignorancia o desconocimiento del contenido del presente acto administrativo. **ASI SE LO HE COMUNICADO, DECLARADO Y ADVERTIDO**, dejándole en manos de la persona con quien dije haber hablado en el lugar de mi traslado copia fiel y conforme con su original del presente acto administrativo, el cual consta de (3) fojas todas firmadas, selladas y rubricadas por mi, INSPECTOR infrascrito que CERTIFICO Y DOY FE.

Recibido por:

Infraactor

CERTIFICO Y DOY FE

Ing. Rodolfo Méndez R.

INSPECTOR INFRASCRITO

