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ASSOCIAÇÃO DE PESQUISA E PRESERVAÇÃO DE ECOSSISTEMAS AQUÁTICOS

ARARIPE MANAKIN WILDLIFE REFUGE

CEARÁ, BRAZIL

Final Report of activities 2007-2009

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This project is supported by:

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Chapter 1

Introduction

1.1. General Introduction and Objectives

The main goal of this project was to produce a formal proposal for the creation of a fully protected area in the northeastern slopes of the Chapada do Araripe, based on discussions with key stakeholders and local communities. Supported by the existing Brazilian legal framework on Protected Area creation and management, we intend to provide formal protection for the remaining habitat of the Araripe Manakin and guarantee some room for population recovery. Ultimately, the overall goal is to prevent this species from going extinct.

Specific objectives were: (1) to determine the most appropriate category for the protected area and its limits, based on discussions with Protected Area managers and other stakeholders; (2) conduct a land tenure assessment in the selected area to comply with environmental authorities demands for new Protected Area proposals; (3) produce a preliminary proposal and discuss with the communities and stakeholders along the northeastern slope of the Chapada do Araripe; and (4) to consolidate a formal document to be handed to environmental authorities for the creation of a fully protected area for the conservation of the Araripe Manakin's habitat and the water sources in the Araripe region.

A summary of these objectives and their outcomes are presented below:

Objective 1 – **Defining the category and the limits of the Protected Area**: based on the previous studies (i.e., Viability Study for the Conservation Plan of the Araripe Manakin) and strategies (i.e., Conservation Plan of the Araripe Manakin), and guided by the existing legal instruments that regulate Protected Area creation and management in Brazil (i.e., National System of Protected Areas, Federal Law 9,985/2000), the team has prepared three possible scenarios for categories and limits, which were presented and discussed with the managers of both existing protected areas in the region (i.e., Araripe National Forest and Araripe Environmental Protection Area) and other key stakeholders, including the communities along the slopes of the Chapada do Araripe who will be influenced by the creation of a Protected Area. The team has conducted several meetings, in each of the 3 municipalities where the Protected Area will be established (Crato, Barbalha and Missão Velha), including urban and rural

communities, and local municipal authorities. A preliminary area has already been proposed in the Conservation Plan, and it is important to note that most of this area (which comprises the Manakin's habitat and a buffer zone) is already supposed to be protected by some Brazilian environmental laws (e.g., belongs to the protected Atlantic Forest Domain; has several water springs; has a declivity higher than 45 degrees, etc.), but very little enforcement of these laws is observed in practice.

Objective 2 – Land tenure assessment in the proposed area: during the discussions for the consolidation of the Conservation Plan of the Araripe Manakin, the federal environmental authorities responsible for Protected Area creation at that time (2005-2006) requested that a land tenure assessment should be conducted in order to determine land ownership and evaluate the legal aspects of current ownership, in order to fulfill the requirements for the proposal of new protected areas, especially the fully protected ones, where disappropriation of lands may be necessary. After the creation of the Chico Mendes Institute for the Conservation of Biodiversity, in August 2007, environmental authorities responsible for the creation and management of Protected Areas shifted their orientation regarding land tenure assessments in the sense that these studies had to be performed by government agencies in order to be part of the formal processes of creation of federal Protected Areas. After several discussions, the project team decided to work togeteher with the government agency responsible for this type of assessment (i.e., INCRA, or National Institute of Colonization and Land Reform) to produce a land tenure study that would be officially recognized by the environmental authorities. After initial discussions with technicians from this federal Institute, we were informed that a large assessment was planned for the southern portion of Ceará State. We then managed to have a meeting with the President of this Institute to ask him to give priority to the Araripe region, specifically the three municipalities that encompass the Araripe Manakin's habitat (i.e., Crato, Barbalha and Missão Velha). He was very much interested in the Araripe Manakin's story and gave his team the green light to start these studies in the area required. In September 2009, the land tenure studies were completed for two out of the three municipalities, and the last one is expected to be ready by early 2010.

Objective 3 – Refining and disseminating the proposal: a preliminary proposal was built, based on the scenarios mentioned above, and a series of presentations were conducted with local stakeholders in order to evaluate the proposal and also to disseminate the idea of the fully protected area and its benefits for the urban and rural societies. These meetings and talks focused specially on the water conservation issue, since the area concentrates the majority of water sources that supply the area for irrigation and human consumption and is directly related to the quality of life of the local society.

Objective 4 – Producing a final proposal for federal environmental authorities: after discussing the preliminary proposal with stakeholders and refining the concept, category and limits of the Protected Area (June 2008), a final document was produced and presented to federal environmental authorities responsible for the creation of Protected Areas in their main office in the country's capital, Brasília, in September 2008. Since the initial project was conducted with the partnership of the managers of the two existing federal protected areas in the region, the idea of the fully protected area for the Araripe region, was better accepted by federal environmental authorities. After this meeting, where the National Director for the creation of protected areas and his team were present, the proposal was considered viable and the Director gave his team the approval to further verify the viability of the proposal. By August 2009, almost one year later, a formal process was opened in the Brazilian Ministry of Environment/Chico Mendes Institute (**process no. 02070.001184/2009-73**) and a government technician - the biologist Gabriela Leonhardt – was finnaly appointed as responsible for this process. We are now expecting their first field visit to continue the formal steps to create a protected area.

After several years of research and assessments, we believe the most important single action that has to be taken to prevent the extinction of the Araripe Mankin, its unique habitat and the associated biodiversity, is the establishment of a fully protected area in the NE slopes of the Chapada do Araripe, as stated in the Conservation Plan for the species.

Besides creating a Protected Area for the Araripe Manakin and the rich associated biodiversity that lives in the moist forest, the project is also aimed at protecting the water springs that are concentrated in this part of the Chapada do Araripe. The outflow of these important water sources are being dangerously reduced due to deforestation, and the establishment of a protected area will also greatly benefit the local society that depends heavily on these water resources for their quality of life and their main economic activities.

1.2. Project site: the Araripe region

The Araripe sedimentary basin is located in central northeastern Brazil, in the border of the States of Ceará, Pernambuco and Piauí, covering an area of approximately 11,000km^2 (Figure 1). Although it is completely inserted in the heart of the *Caatinga* biome (dominated by semi-arid thorn forests), the Araripe Basin presents some geological, climatic and ecological features that support unique transition ecosystems, including the slope moist forests that are the habitat of the Araripe Manakin.

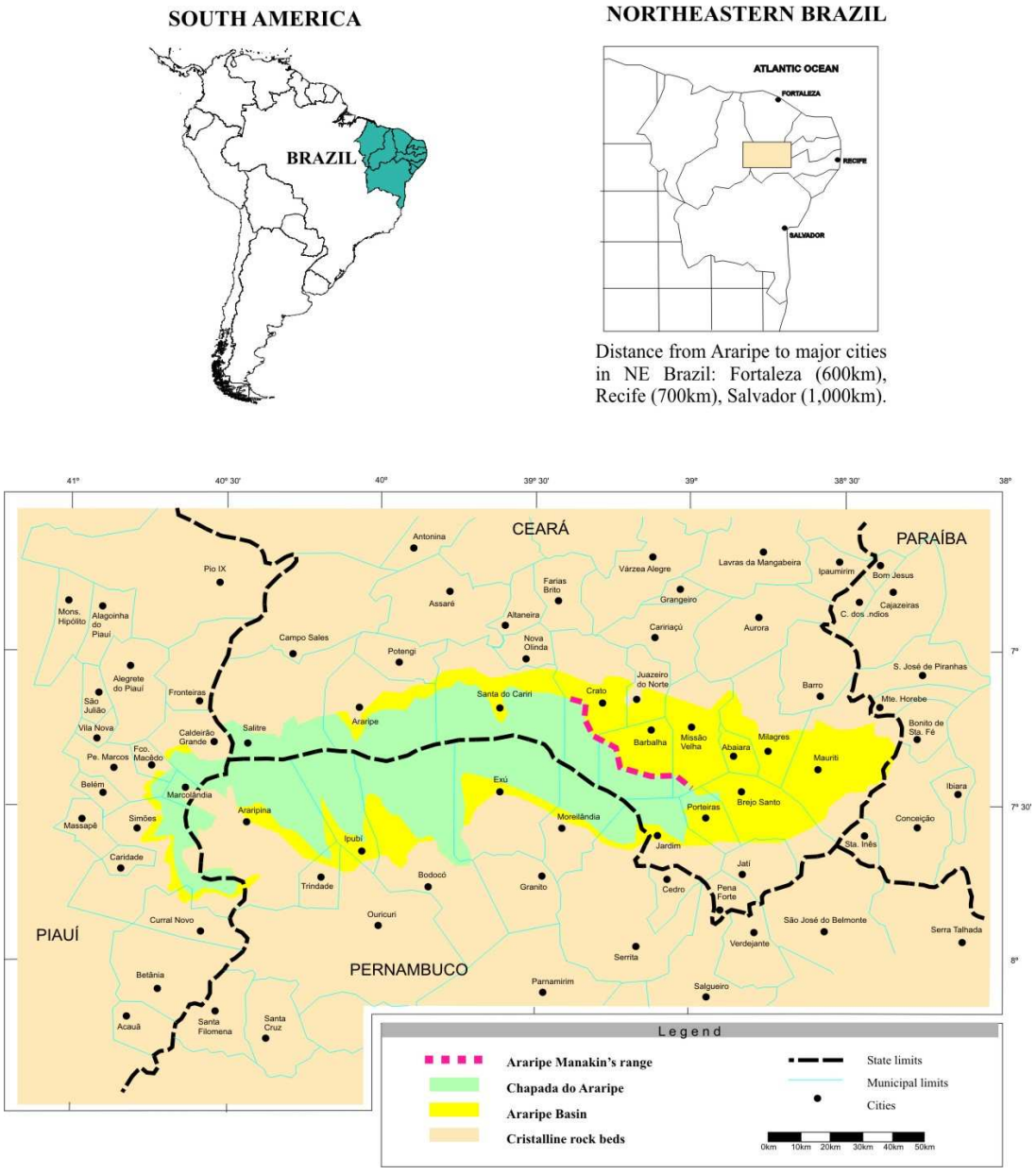


Figure 1. The Araripe Basin, *Chapada do Araripe* (plateau), and the Araripe Manakin's range.

The main distinctive feature of the Araripe landscape is the *Chapada*, a sedimentary mesa, or plateau-like formation found in some bordering areas of the Brazilian Shield, consisting of a large flat plateau, and slopes of varying declivities that gradually merge with the surrounding lowland alluvial terraces that form the Araripe Basin. The plateau of the *Chapada do Araripe* - like an insular flat highland formed by several dry vegetation types - rises 500m above the surrounding lowlands, ranging from 700m to 1,000m of altitude. The slopes host unique moist tropical forests, a narrow ecosystem that occurs along the northeastern slope of the *Chapada*, where a combination of factors allow a year round water supply to maintain this ecosystem. Strictly speaking, these are gallery forests, since they occur along the water springs and streams that flow down from contact areas between geologic formations of different permeability. However, there are so many springs in some portions of the northeastern slope of the Chapada, that the forest seems uniformly distributed along the slopes (Figure 2).

Figure 2. Northeastern slopes of *Chapada do Araripe*, showing the table-like plateau and remaining patches of the dense vegetation along the slopes.

The *Chapada do Araripe* - or Araripe Plateau - presents three homogeneous zones in relation to vegetation cover, terrain inclination and types of pressures over the natural resources (Figure 3):

1) Slope Zone: composed mainly of moist forests (the Manakin's habitat) and including the gallery forests along streams (nesting habitats). Although the overall appearance of this ecosystem is very similar to a rainforest – especially the Atlantic Rainforest (Figure 4) – this moist forest enclave depends much more on groundwater than on the irregular and deficient rains regime of this semi-arid region. As highlighted in the Conservation Plan of the Araripe Manakin, the proper management of water resources is vital for the conservation of the Araripe Manakin's habitat. Surrounded by vast areas of dry forests (*cerrados*) and thorn forests (*caatingas*) this isolated moist forest has evolved a high degree of endemism (e.g., lizards, bats, ants) best represented by the Araripe Manakin, strictly confined to these gallery forests.
2) Plateau Zone: transition moist/dry forests along the northeastern slopes of the Chapada (where the water springs are concentrated), and dry forests (*cerrado*, *cerradão*) on top of the plateau, where the Araripe National Forest is located;
3) Lowlands: where most of urbanization and human activities concentrate, commonly termed the Cariri Valley. The gallery forests alongside river valleys in the lowlands were originally associated with moist forests, and probably had the conditions to support viable territories and nesting habitats for the Araripe Manakin.

The forests on top of the plateau have a strong influence on the maintenance of the Manakin's habitat and nesting areas, since it protects and maintain diversity and energy flows with the moist forests, besides improving water infiltration and retention for the formation of springs and streams that maintain the gallery forests.

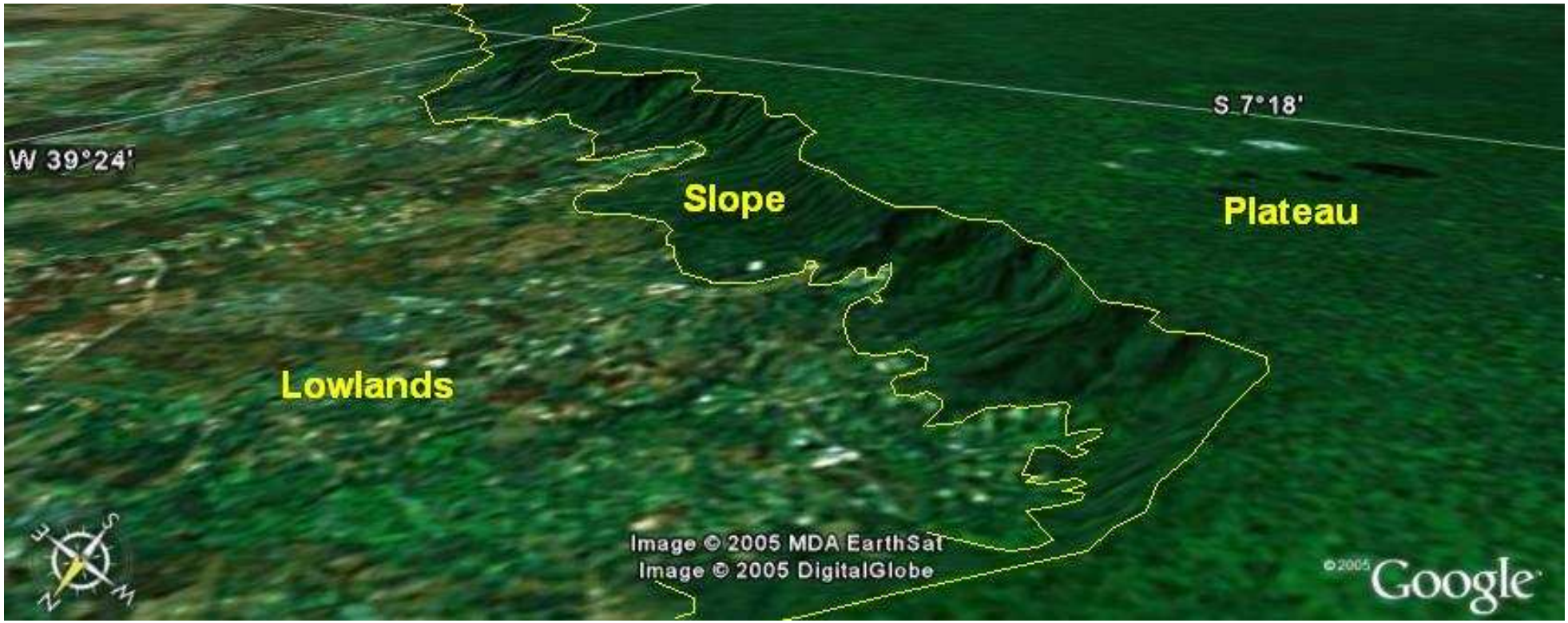


Figure 3. Distinctive zones identified in the Araripe region: plateau, slope, and lowlands or lower terraces. The Araripe Manakin's range is presently confined to the Slope Zone.

Figure 4. Moist forest in the slopes of the Araripe plateau: the Araripe Manakin's habitat.

The municipalities where the Araripe Manakin occurs – Barbalha, Crato and Missão Velha (Figure 5) - are accessible through highways of federal - BR-122, BR-116, BR-230 - and state administration - CE-060, CE-292, CE-293, CE-359, CE-386. The *Chapada do Araripe* is approximately 600-1000 km from the main northeastern state capitals, and it can also be reached through regular flights from São Paulo, Fortaleza, and Recife.

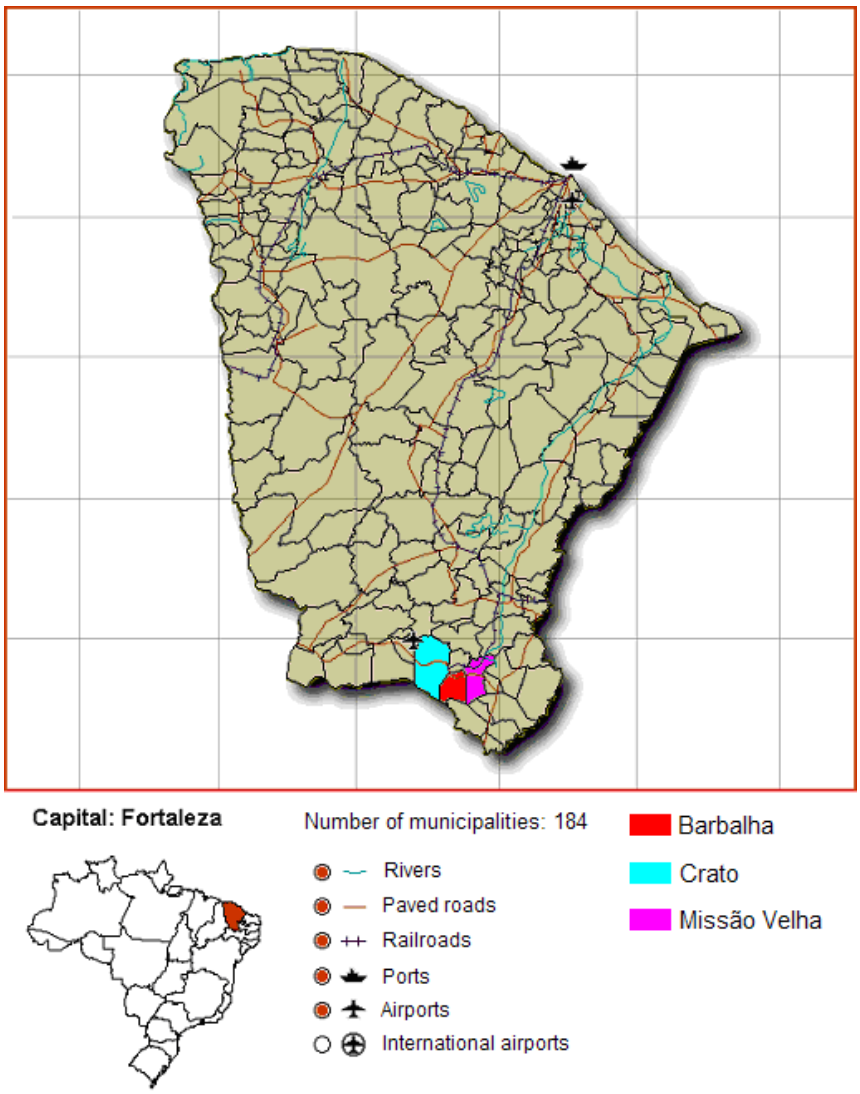


Figure 5 - Map of Ceará State and the municipalities of Barbalha, Crato and Missão Velha.

1.3. The Araripe Manakin Conservation Process

Initial efforts in this long-term conservation process were focused on determining the conservation status of the Araripe Manakin (e.g., overall population size, present range; reproductive cycle and nesting characteristics; major threats). After these research and field assessment oriented efforts, the team managed to produce and publish a Conservation Plan for the species, which was printed with the help of the Brazilian Ministry of Environment, in November 2006. This document recognizes two important, clearly stated issues: (1) habitat loss is the main threat to the conservation of the Araripe Manakin; and (2) the existing protected areas, both of Sustainable Use designation and with no management tools implemented (i.e., Management Plans, Zonings) are not being effective in protecting the Manakin's habitat. In this sense, one of the main recommendations of the Conservation Plan is the creation of a fully protected area encompassing the moist forests along the northeastern slopes of the Chapada do Araripe.

During the discussions to consolidate the Conservation Plan of the Araripe Mnakin, in 2006, the conservation process of this species was internalized in the NGO Aquasis, becoming a long-term, permanent program, with a full-time team, in order to conduct the actions proposed in the Plan and promote the constant discussions and follow up of the strategies presented in that document.

A timeline of the conservation process is summarized below, in order to provide a view of the long-term process and how the strategy to create a fully protected area fits in the broader picture (Table 1).

Table 1. Timeline of the conservation process of the Araripe Manakin (summary 1996-2009).

1996	December 10th. Galileu Coelho and Weber Girão e Silva discover a new species for the genus *Antilophia*, in the moist forests of the NE slopes of the Araripe plateau, Ceará State, NE Brazil.
1998	Species first description in a journal (Coelho & Silva, 1998).
2000	First systematic and funded research project, sponsored by the Brazilian Fundação O Boticário de Proteção à Natureza.
2002	First results published (Silva & Rêgo, 2002).
2004	Project funded by the Brazilian Ministry of Environment (National Fund for the Environment).

2005	CLP Future Conservationist Award: "Conservation of the Araripe Manakin". Extensive field research to determine the actual population of the Araripe Manakin, its present range and remaining moist forest habitat.
2006	Araripe Manakin conservation process established as a permanent process of the NGO Aquasis. Publication of the "Conservation Plan of the Araripe Manakin".
2007	CLP Follow up award: "Araripe Manakin Wildlife Refuge". Establishment of a partnership with key stakeholders to coordinate and consolidate a proposal to create a fully protected area in the Araripe (i.e., Aquasis, manager of the Araripe National Forest, manager of the Araripe Sustainable Use Protected Area, Secretary of Environment of the town of Crato, and the Director of the regional office of the State's Water Management Agency). August 28th. A new governmental institution was created to take care of the Federal Protected Areas and protect endangered species, the Chico Mendes Institute for the Conservation of Biodiversity/ICMBio (see details below).
2008	Consolidation of the proposal to create a fully protected area, including detailing mapping of the limits of the PA based on discussions with stakeholders June 19th. Proposal was formally filed in the Ministry of Environment. September 19th. Proposal was presented by the Aquasis team in Brasília to the Director of creation of fully protected areas (Chico Mendes Institute for the Conservation of Biodiversity/Ministry of Environment), and a group of technicians. The Director gave his team the approval to go on with the process due to its relevance to the conservation of biodiversity and water resources.
2009	Process to create a fully protected area in the Araripe was finally formally opened by the federal environmental authorities (process ICMBio # 02070.001184/2009-73) and a government technician designated to follow up the process.

1.4. Major threats to the Araripe Manakin and its habitat

The Conservation Plan of the Araripe Manakin highlights that habitat loss is the major threat to this species, since its already minute remaining habitat (i.e., less than 28km2) is shrinking daily due to deforestation and diversion of water sources. Figure 6 shows the remaining moist forests along the slopes of the Araripe plateau and the central portion of preserved forests where the Araripe Manakin is confined.

In this topic, we briefly present the main threats to the Araripe Manakin's habitat, to stress the importance of the creation of a fully protected area in order to protect this unique and vanishing forest environment and its associated biodiversity and water resources.

Figure 6. Araripe Manakin present range: 28km2 along the NE slopes of the Chapada do Araripe (Ceará State, municipalities of Crato, Barbalha e Missão Velha).

a) Suppression of the moist forests

The suppression of the vegetation cover along the slopes of the *Chapada do Araripe* has broad consequences for the Araripe Manakin and the unique diversity of living forms that compose this enclave of moist forests. Besides destroying the gallery forest where the Manakin establishes its territory and performs its annual reproductive cycle, it also suppresses the adjoining moist forests that are an important part of the living area of the Araripe Manakin.

Any slope forest with a declination of 45° or higher is protected by federal law (Law 4,771/1965), but enforcement is limited in the region. All Atlantic Forest and associated ecosystems are also strictly protected by federal law (Federal Decree 750/1993), but some scientists and environmental authorities still don't agree about the classification of this enclave as Atlantic Forest. The text of the decree, and several other Resolutions of the National Council for the Environment (e.g., Resolutions 010/1993, 003/1996, 009/1996), however, make it clear that moist forest enclaves in the northeastern Brazilian region should be protected.

In this sense, the Manakin's habitat is clearly protected by several legal instruments, but the pressures for development are much higher than the pressures for enforcing environmental laws. Below are discussed and illustrated some of the main causes of the suppression of the slope forests:

- <u>Forest fires</u>

  During the drier months of the year, i.e., from August till December, and coinciding with the first half of reproductive season of the Manakin, forest fires are perhaps the most important concern for environmental authorities in the Araripe region. Although the fires are more common in the plateau zone of the *Chapada do Araripe*, where the drier Araripe National Forest is located, one of the protected areas in the region, the fires usually reach the border of the plateau and the slope forests when not controlled in time.

  Probably the major investments of the local environmental authorities (i.e., the IBAMA and ICMBio office in Crato) are in fire prevention campaigns, equipment and personnel, especially because the fires attract a great deal of attention from the media and provoke a general commotion in the local society. During the dry season, a team of temporarily hired individuals patrol the National Forest in bycicles and by foot with some basic equipment (e.g., blankes, fire extinguishers) to avoid the development of fires. The IBAMA also keeps four watching towers in the plateau, of about 15-20m high, to

help spot fires during the dry season.

Fires are almost always related to human activities, mainly when the 'slash and burn' practices still used by the small scale farmes get out of control. Hunter's campfires, and fires started to scare away bees while the honey is collected are also common causes. Environmental authorities also report that several fires are started on purpose by local farmers and subsistence hunters that do not agree with the environmental policies of no-hunting, no-cattle and no-crops in the National Forest.

During the development of field activities for this study, three forest fires were witnessed along the slopes of the *Chapada* in the Manakin's habitat. In one of these events, the team was monitoring nests in the best spot ever recorded, consisting of the territories of ten adult males along a series of streams. Despite desperate efforts of the team to control the fire while the fire brigade was on its way (Figure 7), some prime territories were destroyed (Figure 8). Luckily, and thanks to the team's dedicated effort, the nests being monitored – some already with nestlings inside – were not destroyed, and one nest was only a dozen meters from the flames.

Figure 7. Team member trying to prevent the fire from reaching the Araripe Manakin's nests that were being monitored.

Figure 8. Destruction of Araripe Manakin territories due to Forest fires.

o Crops

Suppression of the moist forests for monocultures is mainly related to the culture of bananas (*Musa* spp), as seen in Figure 9. Corn, beans and *mandioca* are also planted in some slope areas, but these require less irrigation, and thus can be grown in drier areas. The banana plantations usually derive water from the streams, and they occupy the gallery forest areas along the streams that comprise the prime Araripe Manakin territories. When not totally suppressing the gallery forest, the banana plantations reduce drastically de diversity of plant species that are used by the Manakin for feeding, and usually makes nestbuilding virtually impossible, since the Manakin has only been observed to nest in native species of the lower strata of the gallery forest above the streams. No nests were found along streams passing through monocultures.

Figure 9. Examples of streams with native gallery forest (right), and with banana plantations (left).

- Recreational facilities

  The hundreds of springs and streams that flow down the northeastern slope of the *Chapada do Araripe* have different outflows and serve not only as a source of drinking water and for irrigation purposes: some of the springs and streams with a higher flow are commonly diverted to provide running water for the pools and artificial waterfalls of several clubs and aquatic parks in the region. Besides the abundant water supply, these clubs also take advantage of the cooler microclimate formed in the northeastern slopes, mainly because of a combination of humidity, height, vegetation cover, wind and rains regime, that provide a welcome break from the hot and dry, semi-arid conditions of the lower terraces and surrounding lowlands.

Only in the range of the Manakin, the existing recreational infrastructure comprises about a dozen clubs of varying sizes and environmental impacts. Most of these clubs have a significant influence on the alterations of the water dynamics of the springs and streams. Some of them have completely channeled and/or piped the springs and streams and the gallery forests along these bodies of water have completely been suppressed (Figures 10 and 11). This is totally illegal according to Brazilian environmental laws (Law 4,771/1965), but the clubs are usually quite old and so culturally and (not so) economically important for the local society that the authorities make a 'blind eye' for this aggression. Also because the clubs are owned by the local elite who have strong influence in the regional economy and politics.

This phenomenon has caused the loss of prime reproductive territories for the Araripe Manakin, leading also to the fragmentation of the moist forests patches, and possibly creating physical barriers for the dispersion of the existing Manakin population.

Figure 10. Caldas recreational club. Note the channellization of the stream and the total suppression of the gallery forest. After several visits to this area, two 'green' individuals were recorded in the surrounding moist forests, but no adult males, denoting that territories are established in this area anymore.

Figure 11. Using water from the springs and streams to irrigate lawns and maintain swimming pools in the clubs along the slopes. Note the proximity of the recreational areas to the moist forests in the background of both pictures.

- Urban pressure

  The constant pressure of the growing expansion of urban areas towards the slopes of the *Chapada do Araripe* are specially felt in Crato and Barbalha, in the core of the Manakin's range. The lower slopes are being sought for the development of medium and high-class condos (Figure 12). In this sense, the moist forests and all its associated biodiversity are slowly being pushed upwards, as the outskirts of Crato and Barbalha expand without any urban planning or respect for the environmental laws that protect this vegetation.

Figure 12. Luxury houses (condos) being built in Crato municipality, in the slopes along the Araripe Manakin's range.

b) Spring and stream degradation

Spring and stream degradation has a direct influence on the conservation of the Araripe Mankin: besides providing a year round supply of freshwater for the maintenance of the moist forests, these sources of water are also vital for the completion of the Manakin's life cycle, since females only build nests above running water.

Water is perhaps the most valuable natural resource in this semi-arid region, and the conflicts for the control and access to the springs and streams date back to pre-columbian times. The fierce *Kariri* Indians controlled these rich environments for hundreds of years, until white settlers displaced them and split the best irrigated lands along the northeastern slopes between the local elite. During the 18th century, a unique water management system was devised by the landowners to minimize the growing and violent conflicts, where the water bodies could be owned privately and water could be sold and controlled. This is totally illegal according to the more recent regulations (i.e., Brazilian Water Management Act), but in some localities this archaic system still persists due to the influence of the local landowning elite. Again, there are two important federal laws that protect water springs and gallery forests, but little enforcement is done.

- Channeling of springs

  In order to have complete control over the water resources, some landowners have been chanelling the water streams along the slopes of the *Chapada*. In some cases, the springs are completely piped with the use of concrete boxes (Figure 13) built straight in the fractures between geologic layer where the water flows from the underground reservoirs. This completely dries out some of the streams, making it impossible for the recovery of the gallery forests. This practice has been observed mainly in the recreational clubs and large properties.

Figure 13. Concrete boxes built to control the water flow directly from the springs.

- Suppression of vegetation along streams

  Recreational clubs and large properties commonly suppress the vegetation along the streams to allow easier access to the water. Streams are usually straightened by the clubs in the shape of narrow concrete canals to supply water for several swimming pools and for irrigation (Figure 14).

Figure 14. Comparison between a preserved gallery forest environment (left, with Araripe Manakin nest over water), and a channeled stream completely devoid of marginal vegetation in one of the recreational clubs in the region (right).

- Spring and stream pollution

  Pollution of surface waters in the slope areas along the Manakin's range are mainly related to the use of pesticides, discharge of domestic sewage, organic pollution by domestic animals (e.g., dogs, pigs, cattle). Some of the streams that are located in public areas, or private areas where the owner allows their use by the community, are frequently used for washing clothes. In the more polluted streams, a severe decrease in species diversity and biomass can be observed in the gallery forests (Figure 15).

Figure 15. A common sight in the springs and streams that are open for public access: local residents washing clothes and domestic animals. The moist forest in the background of this picture is the territory of an adult male Araripe Manakin.

- Walking paths along streams

The presence of dirt tracks and walking paths following the streams in the Araripe Manakin's range has shown to have a direct impact not only in the suppression of the gallery forest, but also in the inhibition of nestbuing and incubation activities by the females (Figure 16). Females are very shy and suspicious while building nests, and the constant presence of humans around the streams probably have very negative effects on site selection, nestbuilding, incubation, and nestling feeding and parental care.

Figure 16. Partial suppression of gallery forests along streams in the Manakin's range, to give way for walking paths. This has probably very negative effects on reproductive success due to reduced nesting area and the transit of people.

- Reduction in spring and stream outflow

  Reduction in flow rates of some springs and streams is alarming in some areas. The main factor is the deforestation on top of the *Chapada*, causing a greater evaporation, and reduced infiltration capacity. The water that infiltrates in the plateau is the water that flows through the cracks in the geologic layers of the Arajara and Exu Formations, forming the springs. In some streams, the consequences of flow reduction can be visibly felt in the gallery forests, showing a lower density and species diversity.

  There are cases where the springs have totally dried out, and consequently the steams and their associated gallery forests no longer exist. This reduction in spring flow, and stream quality and overall number, directly reduces the available territories and reproductive habitats for the Araripe Manakin.

c) Slope degradation

- Deforestation of slopes and plateau border areas

The habitat of the Araripe Manakin is mostly situated close to the borders of the *Chapada*, in the contact zone between the Plateau and Slope Zones. These are areas of high declivity and prone to landslides, especially due to the nature of the sandstone material that forms the upper layers of the *Chapada*. The risk of landslides has been aggravated by several factors, especially the deforestation of the dry forests on the plateau and the moist forests along the slopes. The rains regime, highly irregular and concentrated in a few months of the year also contributes for the slope degradation. In recent years, almost every rainy season is expected to bring landslides along the slopes, especially along the Manakin's range, where the rains are more abundant. Landslides have been covering springs and streams, and even destroying patches of moist forest with former Manakin territories (Figure 17).

Figure 17. Severe landslides occurred in the slopes of the *Chapada do Araripe* during the rainy seasons of 2004 and 2009, due to heavy rainfall coupled with deforestation (Arajara District, the type locality of the Araripe Manakin).

1.5. Recommendations from the Conservation Plan

The Conservation Plan of the Araripe Manakin (Figure 18) has five sets of recommendations related to the most important themes identified by the group of researchers, external advisors, stakeholders and collaborators, who participated in the discussions of the Plan:

1. Legal aspects and public environmental policies;
2. Protected Areas;
3. Habitat recovery;
4. Research and Monitoring;
5. Involvement of the local stakeholders.

In this topic, we will present the recommendations of the Conservation Plan regarding Protected Areas, and how the idea of creating a fully protected area in the slopes of the Araripe plateau is considered and prioritized by this strategic planning document.

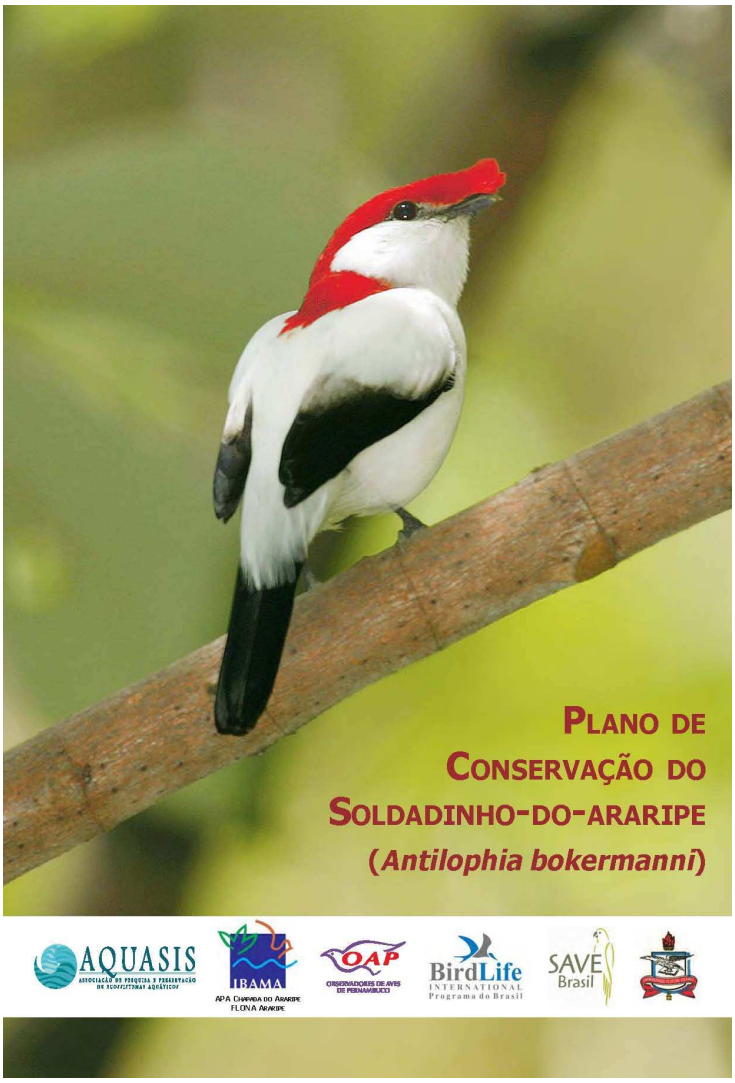


Figure 18. Front page of the Conservation Plan of the Araripe Manakin.

Although there are already two federal protected areas near and/or surrounding the Araripe Manakin's habitat (see Figure 19; and topic ***2.2. Protected Areas in the Araripe region***) they are considered of Sustainable U and the type of management they experience have contributing little to the conservation of biodiversity and water resources along the slopes of the Araripe plateau.

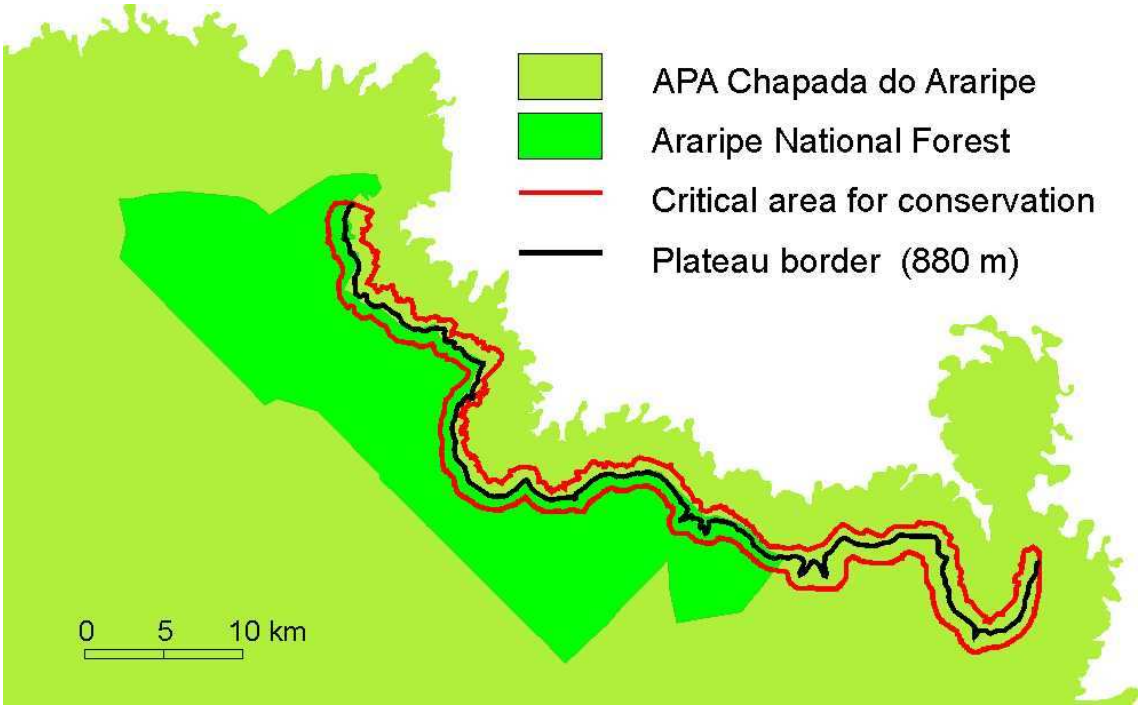
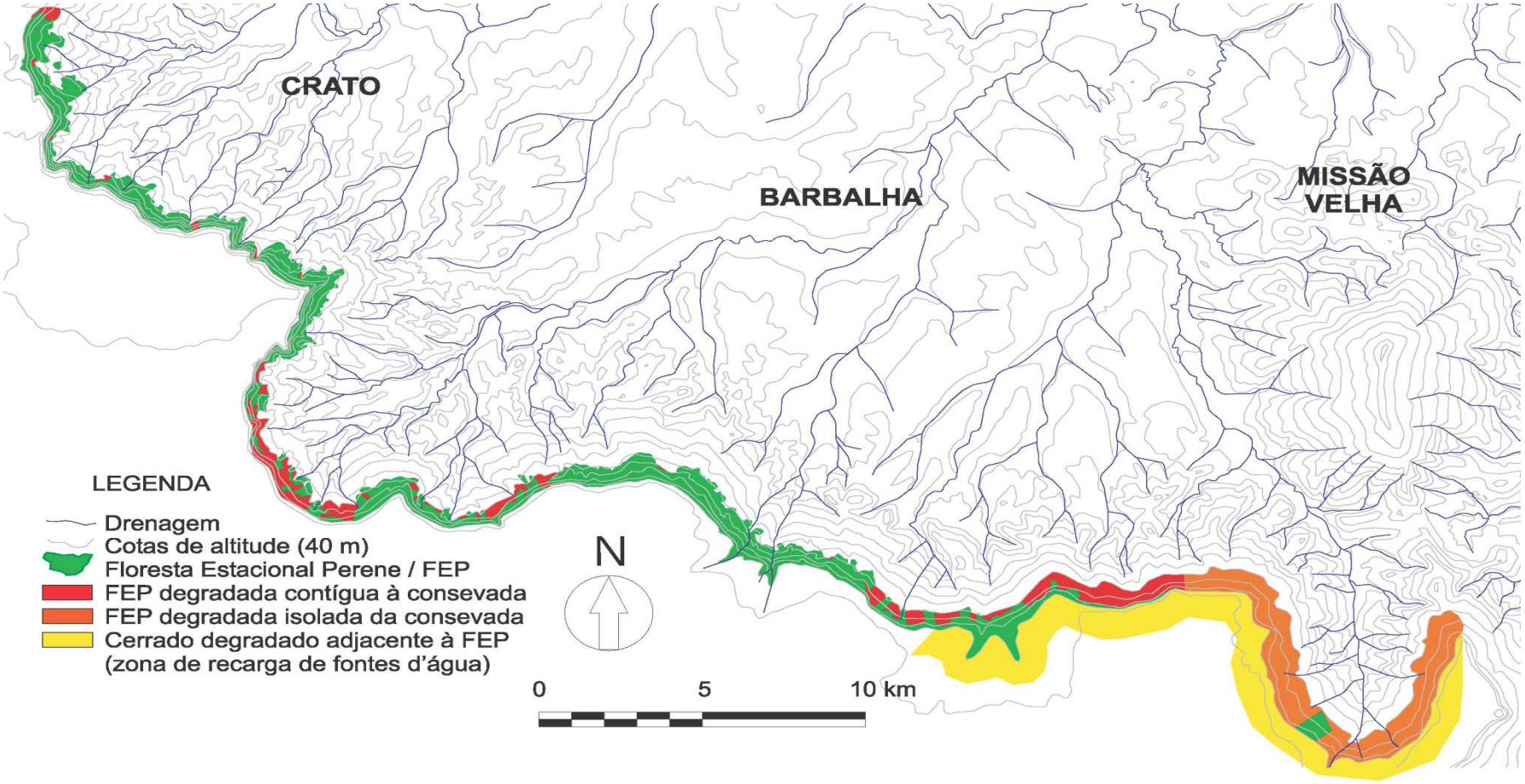


Figure 19 . Two Sustainable Use protected areas in the Araripe (Araripe National Forest and Chapada do Araripe Environmental Protection Area), and the critical area proposed by the Conservation Plan Preliminary for the creation of a fully protected area for the Araripe Manakin's habitat and the water resources.

As stated in the Conservation Plan, the critical situation of the Araripe Manakin and its habitat, and the reduction in the outflow of the springs measured in the Araripe, require more restrictive measures to protect these natural resources. In this sense, the recommendation of the highest priority in the Conservation Plan regarding the topic of Protected Areas, is the **"creation of a fully protected area - encompassing the present range of the Araripe Manakin and the region with the highest concentration of springs in the northeastern slope of the Araripe plateau - including areas to promote habitat recovery, and a Buffer Zone of at least 500m along the lower limit of the protected area, and of 1km along the top of the plateau"** (critical area illustrated in Figures 19 and 20).

Figure 20. Critical areas identified for the conservation of the habitat of the Araripe manakin along the slopes of the Chapada do Araripe. The remaining habitat areas are shown in green, Short-term actions (in red) are recommended for slope restoration. Mid- to long-term actions are recommended for the slopes (in orange) and for the adjoining plateau (in yellow).



1.6. The Araripe plateau in national and international priorities

The Araripe Manakin (Antilophia bokermanni) is classified as Critically Endangered (CR) in the IUCN and Brazilian Red Lists. The site of the project, the Chapada do Araripe, is considered an AZE (Alliance for Zero Extinction, see www.zeroextinction.org) site. Birdlife ranks the site as an IBA (Important Bird Area) and inserted in an EBA (Endemic Bird Area) biome.

The Species Information Sheet, of the IUCN Red List, highlights the "idenfication of new protected areas" as a conservation action priority (www.iucnredlist.org).

The site (Chapada do Araripe) is also considered of "Extreme Biological Importance" by the Brazilian Ministry of Environment (BRASIL, 2006).

Chapter 2

Brazilian Protected Area Legal Framework

2.1. Overview of the main legal instruments

On July 2000, after 8 years of discussions in the Senate and the House of Deputies, the Brazilian Congress passed the Federal Law 9.985 that created a National System of Protected Areas (SNUC – *Sistema Nacional de Unidades de Conservação*), which created 12 categories of Protected Areas in two main branches: Fully Protected and Sustainable Use (Table 2). Two years later, in August 2002, the Federal Decree 4.340 was promulgated, in order to regulate some aspects of the National System of Protected Areas, especially concerning management plans, public hearings, integrated management of contiguous protected areas (i.e., mosaics), management councils, and the relocation of traditional communities living in fully protected areas. Presently, these are the two main legal tools existing in the Brazilian Protected Area legal framework, and any protected area created at the federal, state or municipal level has to comply with the rules and definitions established in these laws to be considered part of the official Brazilian System of Protected Areas. Protected areas created before 2000 had to adjust to one of these 12 categories to be formally accepted and legally valid in the national system.

Table 2 – Categories of Protected Areas established by the National System of Protected Areas, and acronyms used to designate each category.

Category of Protected Area	**Acronym**
Fully Protected areas	
Biological Reserve	**REBIO**
Ecological Station	**ESEC**
National Park	**PARNA**
Natural Monument	**MONAT**
Wildlife Refuge	**REVIS**
Sustainable Use areas	
National Forest	**FLONA**
Fauna Reserve	n/a
Extractivist Reserve	**RESEX**
Sustainable Development Reserve	**RDS**
Environmental Protection Area	**APA**
Area of Relevant Ecological Interest	**ARIE**
Natural Heritage Private Reserve	**RPPN**

According to the legal instruments mentioned above, **Fully Protected** areas do not allow direct use of natural resources or any significant alteration in the natural environment, being managed for biodiversity conservation and the maintenance of ecological services, and allowing basically scientific research, environmental education, and, in most cases, public visitation (except in Biological Reserves and Ecological Stations).

Sustainable Use type of protected areas have the objective to "conciliate nature conservation with the sustainable use of part of its natural resources" (SNUC, 2000). In practice, Sustainable Use protected area should function more as instruments for land use and development planning. In reality, most of these areas do not contribute significantly for biodiversity conservation.

Sustainable use protected areas also do not require land disappropriation, consisting of mainly private properties, and thus are much cheaper and politically less strenuous to create by the government than fully protected areas.

Originally, this system of 12 categories was intended to create a gradient of protection, ranging from a totally "no-take, no entry" concept (i.e., Biological Reserves) to a very flexible category that would be more like a "test tube" for sustainable development, allowing all kinds of development inside their boundaries, including cities and industrial development (i.e., Environmental Protection Area).

Among the 5 categories of fully Protected Areas existing in the Brazilian National System of Protected Areas, the two that were considered by the project team to build the 3 scenarios were the Wildlife Refuge and the National Park. The third scenario considered the production of a Management Plan for the Chapada do Araripe Environmental Protection Area, with a special Zoning category for the slopes including the moist forests and springs as a no-take zone. The pros and contras of each scenario are discussed in ***3.1. Building scenarios***.

2.2. Protected Areas in the Araripe region

The state of Ceará possesses 58 public and private protected areas including those under federal, state and municipal control. Among these, 25 are Environmental Protection Areas ("*Áreas de Proteção Ambiental*"), 14 Natural Heritage Private Reserves ("*Reservas Particulares do Patrimônio Natutal*"), 3 National or State Parks, 2 National Forest, and the remaining areas including a number of different types of reserves (extractive, biological, ecological), botanical gardens and state monuments[1]. In the southern tip of the State of Ceará, in the area known as the Araripe basin, there are two officially listed federal protected areas, both of sustainable usage designations (Table 3).

[1] Superintendência Estadual do Meio Ambiente (SEMACE) website. http://www.semace.ce.gov.br

Table 3. Federal protected areas in the Araripe region.

Category	Area (ha)	Location
Environmental Protection Área of *Chapada do Araripe*	1,063,000	38 municipalities in the States of Ceará, Piauí and Pernambuco. Includes the plateau, slopes and part of the lower terraces of the Cariri Valley. Totally includes the Araripe Manakin's range
Araripe National Forest	38,626	4 municipalities in Ceará State (Crato, Barbalha, Santana do Cariri, and Jardim). Protects the dry forests in the northeastern portion of the Chapada's plateau, directly above the Manakin's range.

Although most of the *Chapada do Araripe* and the immediately surrounding lower terraces fall within these two protected areas, enforcement is limited due to the little personnel available for these protected areas, and few effective ongoing conservation actions are conducted inside their boundaries.

Both protected areas mentioned above are of sustainable use designations, according to the official categories and designations proposed in the National Brazilian System of Protected Areas (as detailed above).

The APA was recently established, in 1997, mainly due to social and political pressure from the local society and scientists, worried about the rapid loss of habitat in the region, and still has no management tools in place, like zoning or management plans.

The Araripe National Forest, created in 1946, and the first National Forest established in Brazil, although much older and smaller than the ambitious APA, has only submitted an official Management Plan for federal environmental authorities in 2004, and it will still require some further discussions to be accepted and put in practice.

In this section, we will provide an overview of the existing protected areas in the region and their conservation and management tools, as well as other non-governmental conservation initiatives relevant to the conservation of the Araripe Manakin and its habitat. The existing legal framework and some legal instruments already mentioned in other sections of this study, will also be discussed, especially those legal aspects that may contribute to the proposal of the Araripe Manakin Wildlife Refuge.

Araripe National Forest (Floresta Nacional do Araripe)

Article 17th of the SNUC describes the main characteristics of a National Forest:

> *"Art.17. The National Forest is an area predominantly covered by native plant species, with the basic objectives of multiple sustainable use of its forest resources and scientific research, with emphasis on methods for the sustainable exploitation of native species."*

The Araripe National Forest was established in May 2nd 1946, and constitutes the first protected area in its category to be established in Brazil (Figure 21). At that time, only four other protected areas had formally been established in the country: the *Itatiaia* (1937), the *Iguaçu* (1939) and the *Serra dos Órgãos* (1939) National Parks, and the Biological Reserve of *Soretama* (1943). Basic information regarding the main characteristics of the Araripe National Forest are summarized in Table 4.

Table 4. Main characteristics of the Araripe National Forest

Name: Araripe-Apodi National Forest (Official). Araripe National Forest (Usual)
Mailing Address: Praça Joaquim Fernandes Teles, s/n, Crato, CE, 63.100-000
Telephones: (55) (88) 3523-1999 (Office); (55) (88) 3501-1702 (Visitor Centre)
Internet or e-mail address: none
Area (ha): 38,262.33 hectares (Register nº 7,433 in the Notaries Office of G. Lobo, Crato, Ceará)
Municipalities: Barbalha, Crato, Jardim and Santana do Cariri, all in Ceará State.
Geographic coordinates: Northern tip: 07º11'42"S; Southern tip: 07º28'38"S; Eastern tip: 39º13'28"W and Western tip: 39º36'33"W
Decree of creation: Federal Decree nº 9,226, May 2nd 1946, published in May 4th 1946.
Vegetation types: moist forests, tall savannah or *cerradão*, savannah or *cerrado*, shrublands or *carrasco*.
Distance to nearest urban centres: Crato: 10 Km; Barbalha: 12 Km; Jardim: 18 Km; Santana do Cariri: 22 Km.
Road Access to the National Forest: BR-122 (via Exu, PE); CE-060 (via Jardim or Barbalha, in CE); CE-292 (via Crato or Nova Olinda, CE); CE-494 (via Crato, CE).

Although the National Forest was established in 1946, it had no management plans or other effective conservation tools until 2001, when a concentrated effort led by a former manager of the protected area led to the production of a preliminary document, in 2003, that was presented for Environmental Authorities (i.e., Ministry of Environment, IBAMA) in late 2004. In order to have an officially recognized forum to conduct all the discussions required before the Plan was presented in Brasília, a Consultive Council was established with 24 members divided as follows:

- 4 representatives from Federal governmental institutions, i.e., IBAMA (Federal Environmental Agency), IBGE (National Institute for Geography and Statistics), PNF (National Forest Program/Ministry of Environment), and "Banco do Nordeste" (Regional Development Bank);
- 4 representatives from State governmental institutions, i.e., COGERH (Water Management Agency), URCA (Regional State University), CBECE (State Fire Department), and State's Health Department (20th regional unit);
- 4 representatives from Municipal governmental institutions, i.e., municipalities of Crato, Barbalha, Jardim, and Santana do Cariri;
- 6 representatives from NGOs and associations, i.e., ACB, Oikos Cariri, Araripe Foundation, Aconguia (Association of tourist guides), Federation of the communities from Jardim, and Rural Workers Union of Crato;
- 6 representatives from communities in the buffer zone around the National Forest, i.e., Serra da Boa Vista, Boca da Mata, Sítio Páscoa, Cacimbas, Macaúba and Belmonte.

According to the manager of this protected area, the main activities legally permitted and practiced today in the Araripe National Forest are:

1) **Exploitation of plant materials** – practiced since colonial times, it refers to the subsistence and commercial activities related to the collection of roots, barks, fruits, leaves, and resins of several native plants;
2) **Firewood collection** – the poor population that lives around the National Forest is allowed to collect every Tuesday, firewood that is deposited in the floor of the Forest, the use of axes and chainsaws for cutting living parts of the plant are forbidden. There is a limit of one cubic meter per family per month. Although several species are collected, some are preferred by their caloric content and low smoke production characteristics, like the *murici* species (*Byrsonima ssp*);
3) **Environmental education and research** – the Araripe National Forest receives about 200 excursions from public and private schools every year, for field classes and environmental education activities. About 15-20 excursions from universities are also recorded every year, including

researchers developing graduate theses. The Environmental Education Facility promotes regular courses and talks in nearby schools and communities;

4) **Ecotourism** – after a partnership was established between the protected area and the State Secretary of Tourism, several tracks in the forest have been implemented with maps and signs. One association of guided tours was established, and the guides were trained and licensed by environmental authorities to develop the ecotourism in the area.

The main problems and conflicts witnessed by the manager of the Araripe National Forest are summarized as follows:

1) **Illegal hunting** – hunting of wildlife is practiced by subsistence, sport, and commercial hunters, commonly using dogs, traps, and firearms. The main target species for this illegal practice are deer, armadillos, agoutis, and guans;

2) **Roads** – traditionally used to transport merchandise goods and people between Ceará and Pernambuco States, this roads are older than the protected area, and constitute a great enforcement problem to the protected area, besides being a constant threat to the wildlife, provoking several casualties, mainly foxes, skunks and small birds;

3) **Urban expansion** – population growth and the constant expansion of the urban outskirts around the National Forest are resulting in negative impacts. The illegal cutting of trees for building materials and fences is increasing, together with the hunting pressure, honey extraction and forest fires;

4) **Cattle raising** – the practice of indiscriminate release of cattle in the plateau of the Chapada during some periods of the year has more than 300 years. Despite enforcement efforts, it is still very widespread between small and medium sized ranchers who claim to have not enough land for their cattle, and creates a tense situation between the local society and the environmental authorities. The 'blind eye' has been the management practice adopted by the managers with few resources and lots of pressure from local politicians and emerging ranchers.

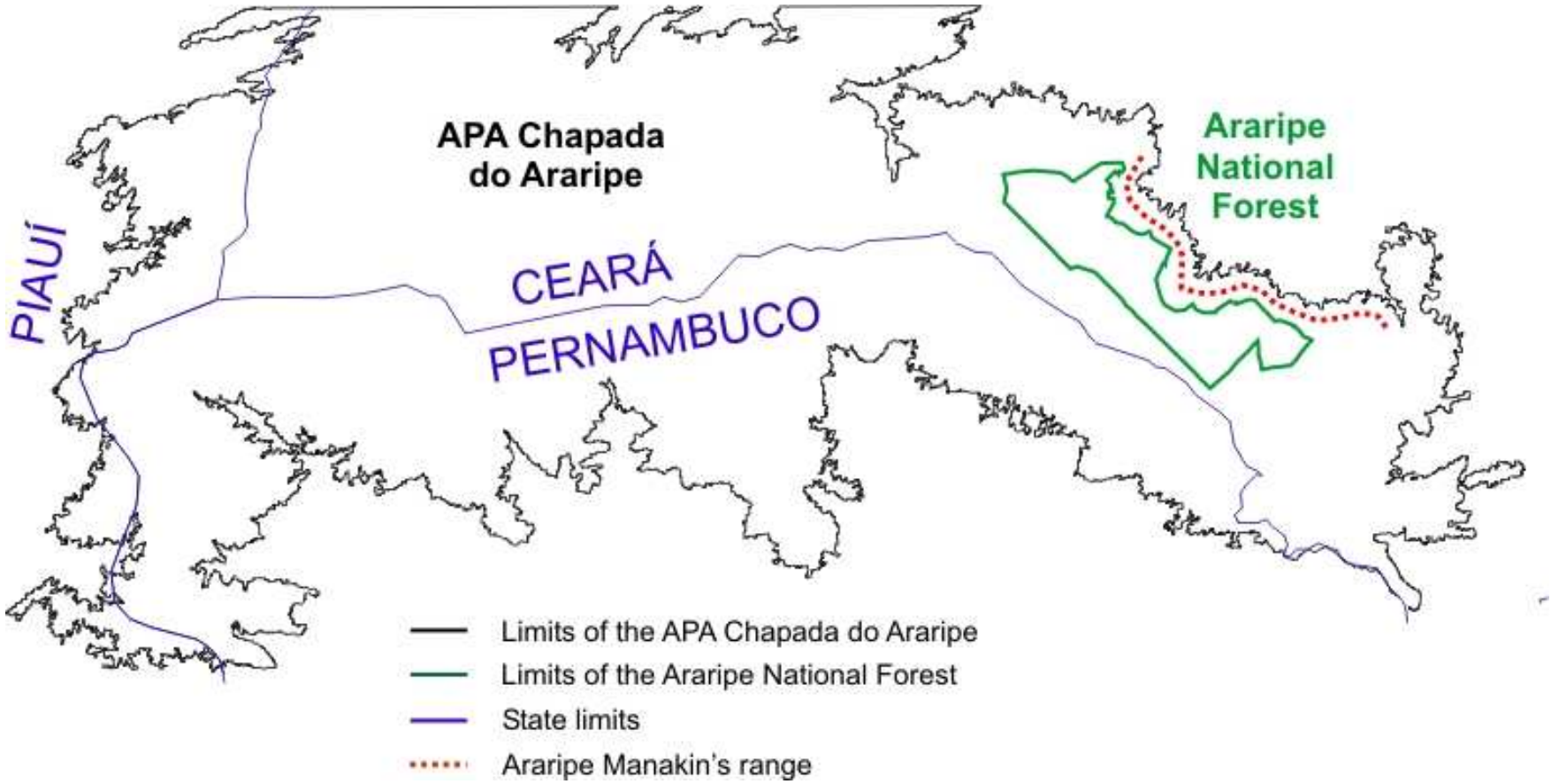


Figure 21. The two main protected areas in the Araripe region: the *Chapada do Araripe* Environmental Protection Area and the Araripe National Forest.

Chapada do Araripe Environmental Protection Area (APA)

Environmental Protection Areas are defined by the SNUC (Article 15th) as "*a generally large area, with a certain degree of human occupation, which presents abiotic, biotic, aesthetic, and cultural features especially important to the quality of life and the well-being of the human populations, and has the basic objectives to protect the biological diversity, regulate the occupation processes, and assure the sustainability of the use of natural resources*".

Being large areas with significant human occupation, this category of Protected Areas are generally established in medium to highly impacted areas that demand urgent conservation and urban planning measures to avoid the collapse of some ecological services or natural resources that are vital to the local economy. Among the twelve categories established by the SNUC, this, in practice, has been the easiest to create - since it does not require land disappropriation or any other unpopular and expensive measures – and the hardest to manage, since everything is virtually possible, depending on the pressures that orient the zoning and management plans. This is also by far the most common Protected Area category in Brazil, and is becoming the most ineffective, since very few established Protected Areas of sustainable usage designation in Brazil have management plans in practice.

The creation of the huge 1-million hectare *Chapada do Araripe* Environmental Protection Area was triggered mainly by a concentrated effort by the scientific community of the Cariri Valley, who managed to draw the attention of the local society to the importance of some urgent conservation measures to protect one of the most valuable resources of the region: the waters that flow from the springs and streams from the great reservoir of the *Chapada do Araripe*, and the remaining vegetation that is responsible for the quantity and quality of this precious resource. The campaign was tremendously helped by recent scientific evidences that the major springs and streams were presenting alarming reductions in their outflow, and that the rich fossil beds of the region were being degraded. Local politicians soon joined the effort and the *Chapada do Araripe* Environmental Protection Area was created by Federal Decree in August 5th 1997 (FIGURE 27).

The objectives of this Protected Area, where the Araripe Manakin's habitat is fully inserted, are (in the order they appear in the creation Decree; bold characters were included when they potentially refer to the conservation of the Araripe Manakin and its habitat):

- to protect the fauna and flora, **especially the threatened species**;
- to **guarantee de conservation of remaining gallery forests**, of the original natural rainwater beds, and of the hydric reserves;
- to guarantee the protection of scenic, archaeological and paleontological sites of the Lower Cretaceous, of the Araripe Complex;
- to regulate ecological, scientific and cultural tourism, and the other economic activities compatible with environmental conservation;
- to promote incentives for the cultural manifestations, and contribute for the revival of the regional cultural diversity;
- to ensure the sustainability of natural resources, with emphasis in improving the quality of life of the populations residing in the Protected Area and its surroundings.

Thirty eight municipalities in three States are part of this huge area, and the urban areas of these municipalities are exempt of the regulations that will be proposed in the management plan. The same group that proposed the creation of the APA, also promoted an initial effort to subsidize a management plan, producing a comprehensive study financed by the Ministry of Environment. Although this process is expected to be faster than the one witnessed in the National Forest – which took 57 years from the creation of the area till the proposal of the management plan – the APA is still in the process of creating a Consultive Committee to discuss these matters based on the study mentioned above.

In this sense, the managers have to rely on the few restrictions posed in the initial decree, where some activities are forbidden (translated from the decree):

- implementation of potentially pollutant industrial activities, that may imply in environmental degradation and alterations in the water sources;
- development of land leveling or opening channels, when these activities result in alterations of the local ecological conditions, especially in the wildlife zones (proposed in the zoning and management plan);
- development of activities that may imply in accelerated erosion, silting of watersheds, or damaging the aquifers;
- development of activities that imply in the killing, capture, or harassing of rare species of the local biota;
- disposal of effluents, residues or detritus in the water resources of the APA, capable of producing environmental degradation.

The problems and conflicts faced by the managers of this Protected Area are enormous, ranging from illegal hunting, logging and extensive sacking of paleontological sites, to the expanding agricultural activities and urban settlements in almost all the 38 municipalities that comprise the area. Fortunately, for the conservation of the Araripe Manakin and its habitat, the headquarter of the manager of this protected area is located in the city of Crato, close to the Manakin's range, and they seemed concerned about the protection of the remaining moist forest along the slopes of the Chapada.

2.3. The Chico Mendes Institute for the Conservation of Biodiversity

On August 28th 2007, the Brazilian Ministry of Environment announced the creation of the Chico Mendes Institute for the Conservation of Biodiversity, (ICMBio) which would have the mandate to take care of the creation and management of all federal Protected Areas, and also conduct research and conservation actions with endangered species. The conservation community was somewhat surprised by this unilateral measure, since there was no public discussions and very little involvement of protected area managers and other government employees involved with the management of protected areas in the process. However, although there was some initial uproar from some protected area managers and park rangers, the idea was soon accepted, since the concept seemed interesting enough: to have a whole new Institute for biodiversity protection.

The former governmental agency responsible for the protected areas and natural resource management (i.e., IBAMA), has been since then responsible for enforcement of environmental laws and regulations, and the issuing of permits and environmental licensing.

From August 2007 till April 2008, the new Chico Mendes Institute was trying to organize itself and its new structure without a proper budget. Employees were relocated from IBAMA and the two Institutes were sharing their infrastructure and materials. During this period, many conservation biologists had the feeling that instead of two institutions we had "two halves". To this date (November 2009), the new Chico Mendes Institute has not yet been able to organize itself into a functioning organization: they are still sharing office space with IBAMA, competing for the spoils of the former organization (e.g., vehicles, equipment, buildings, etc), and struggling with the federal government to give them a proper budget so that they can effectively take the great responsibility to protect the Brazilian biodiversity.

Chapter 3

Building the Protected Area Proposal

3.1. Building scenarios

In order to facilitate decision-making and the involvement of stakeholders who are not familiar with the Brazilian legal framework of protected areas, the project team and some local partner initially tried to devise viable scenarios that would comply with the proposals of the Conservation Plan of the Araripe Manakin and be legally and socially acceptable.

The five categories of fully protected areas present in the National Protected Area System were considered (i.e., *Biological Reserve, Ecological Station, Wildlife Refuge, National park and National Monument*) and, according to their definitions, two were considered viable for our purposes, the National Park and the Wildlife Refuge:

> ***"Article 11. The National Park has the basic objective to preserve natural ecosystems of great ecological relevance and scenic beauty, allowing scientific research, environmental education and interpretation activities, recreation in close contact with nature and ecotourism."***
>
> ***"Article 13. The Wildlife Refuge has the objective to protect natural environments that ensure conditions to the existence or reproduction of species or communities of the local flora and of resident and migratory fauna."***
>
> ***National Protected Area System (MMA, 2000)***

In this sense, preliminary meetings with the managers and the teams of the two existing protected areas in the Araripe were conducted to discuss the viable scenarios and 3 alternatives were designed:

1) Produce a **Management Plan for the existing APA Chapada do Araripe**, with the Manakin's habitat and the water springs included in its zoning as a no-take area for strict protection of the moist forest habitats and the water springs;
2) Create a fully protected area (**Araripe Manakin Wildlife Refuge**) along the slopes of the Chapada do Araripe to protect the moist forest habitats and the water springs;
3) Create a larger fully protected area (**Chapada do Araripe National Park**) to encompass the slopes and part of the Araripe plateau.

The characteristics of each viable scenario were then summarized in a comparative matrix, pondering pros and contras related to conservation effectiveness, economic and social costs, potential political and social resistance, management challenges and opportunities (Table 5).

Table 5. Comparative table of the 3 possible scenarios devised to create a fully protected area along the slopes of the Araripe plateau, following recommendations of the Conservation Plan of the Araripe Manakin.

	Scenario 1	**Scenario 2**	**Scenario 3**
PA category	**National Park**	**Wildlife Refuge**	**Zoning of the APA**
Land property	Public lands	Private or public	Private property
Disappropriation	Mandatory	Optional, depending on Management Plan	No
Limits	Large portion of the plateau (including National Forest) and slopes	Small portion of the plateau and slopes	Slope area
% of protected Manakin habitat	Very high	Very high	Very high
Management challenges	• Conflict with communities that use the resources from the National Forest • Water Parks and Hotels, urban growth	• Public management on private lands • Water Parks and Hotels, urban growth	• Public management on private lands • APA has proved too large to manage
Drawbacks for creation	• Cost of refunding landowners	• Category less know to the public	• Management Plan and Zoning time-consuming • “weak” legal instrument
Opportunities	• Ecotourism • Birdwatching • Water Parks and Hotels • Habitat recovery	• Ecotourism • Birdwatching • Water Parks and Hotels • Habitat recovery	• Ecotourism • Birdwatching • Water Parks and Hotels • Habitat recovery

3.2. Discussing scenarios with key stakeholders and local communities

The three proposed scenarios for the creation of a fully protected area (i.e, National Park, Wildlife Refuge, and the Zoning of the APA) were then presented to individuals and organizations, representing groups of stakeholders.

The discussions, meetings with government authorities and presentations in rural communities were jointly conducted by the team of educators and the protected area team. In this topic, we will present an overview of the groups of stakeholders that have been involved in the discussions of the creation of a fully protected area, trying to characterize each group and summarize its contributions.

Government authorities

These have been key stakeholders and have participated closely in the construction of the proposal of the fully protected area for the Araripe, especially:

- the manager of the APA Chapada do Araripe;
- the manager of the Araripe National Forest;
- the Director of the regional office of the State's Water Management Agency;
- the Municipal Secretary of Environment of Crato.

Besides participating in the discussions, these stakeholders have also later signed the formal document to request from the Ministry of Environment/Chico Mendes Institute for Biodiversity Conservation the creation of the fully protected area.

In terms of creating a fully protected area there is a consensus among government authorities that the slopes of the Araripe plateau have to be fully protected in order to preserve its rich and endemic biodiversity, and to guarantee the protection of the numerous water springs.

Rural communities and small landowners

The rural communities found along the lower slopes of the *Chapada* are mainly concentrated in small villages, or scattered along the roads that run along the foothills of the Araripe. Although they benefit from the pleasant climate and the abundance of water, the lack of environmental awareness, together with the limited economic opportunities and social policies, leads to traditional, but generally unsustainable use of those resources.

The main economic activities in the rural areas along the Manakin's range (i.e., Crato, Barbalha and Missão Velha municipalities) are: small-scale agriculture (banana, maize, beans, cassava); Backyard-grown chicken and medium-sized mammals (e.g., goat and pig); extensive cattle farming; small business for general household supplies; and employment in the nearby towns and recreational parks.

Although these communities use little pesticides and fertilizers – more so because of the costs rather than for environmental and health concerns – their traditional methods of "slash and burn" for clear cutting the lower slopes for agriculture and cattle, and the diversion of streams for irrigation purposes, has had profound effects on the vegetation cover of the Araripe, especially along the lowlands and lower slopes.

However, most of the people of the local communities that participated in the activities expressed a strong desire to understand the environmental changes they have been witnessing for the past decades (e.g., reduction in stream outflow, scarcity of wildlife), and were eager to discuss ways to reduce their impact over their environment (Figures 22 and 23).

Regarding the protected area, the majority was inclined to support the proposal if it would help to improve water availability and reduce the conflicts for water use with the larger landowners, who in some places deny the access to springwater. These communities would also favor the scenario where only the slopes and part of the plateau is protected (Wildlife Refuge scenario). Although they want the forest on top of the plateau to be protected, they also express the desire to continue using the forest resources, like wood for fuel and construction, fruits, animals, and grazing areas.

Some of the small landowners, especially the ones who moved to nearby towns and kept their properties as a complementary income or vacation house, have expressed the desire to promote the conservation of the remaining moist forests in their slope properties. One of them has actually started the process to turn part of the property into a Private Reserve.

Table 6 summarizes some of the key rural communities along the slopes of the Chapada, in the Manakin's range and neighbouring areas of remaining moist forests, and Table 7 shows some small landowners interested in the conservation of the Manakin's habitat.

Figure 22. Discussions with rural communities about sustainable living, the Protected Area scenarios and their implications for their lives. Arajara District, Barbalha municipality.

Figure 23. Discussions with rural communities that depends on the collection of the “pequi” fruit in the National Forest. Cacimbas locality, on the road between the municipalities of Barbalha and Jardim.

Table 6. Key rural communities along the Manakin's range where the protected area was presented and discussed.

Communities	Municipality	Description
Jamacaru	Missão Velha	Rural village in the eastern extreme of the Manakin's distribution
Gameleira	Missão Velha	Small community in the foothills of the *chapada*, close to some important nesting areas.
Arajara	Barbalha	Rural village, type locality of the Araripe Manakin, potential for hosting ecotourism and birdwatching activities.
Riacho do Meio	Barbalha	In the outskirts of Barbalha, this area has also potential for ecotourism and birdwatching activities. The underutilized facilities of the municipal park could support meetings.
Granjeiro	Crato	One of the best nesting areas found so far, this rural area in the outskirst of Crato is developing into an elite neighbourhood, displacing the rural community, or hiring them as caretakers.
Guaribas	Crato	String of houses and small properties scattered along the road in the foothills of the Chapada, this is the western extreme of the Manakin's distribution, with potential for rural tourism (e.g., waterfalls, sugar cane mills).

(Source: fieldwork survey)

Table 7. Small landowners in Manakin's range interested in preserving the moist forests and supporting the creation of the fully Protected Area.

Landowner	Municipality	Description
José Wolkmar (Sítio *Melo*)	Barbalha	Local artist interested in preserving the remaining moist forests. At least three streams were recorded in this property with viable territories dominated by adult males.
Jácio	Missão Velha	Local politician whose property encompasses nesting areas, and has offered logistical support for research.
Heitor de Santana	Missão Velha	Araripe Mankin's nesting area. Local landowner who has already started the process to establish a Private Reserve (RPPN), and is very concerned about environmental regulations.

(Source: fieldwork survey)

Large landowners and recreational clubs

Large agricultural activities are rare in the slopes of the *Chapada*, since the steep terrain does not allow the use of heavy machinery, and most of the large properties are related to recreational clubs located in the foothills of the *Chapada*, and use the abundant water resources to maintain artificial pools and cascades.

In this sense, since these enterprises depend on a constant supply of springwater, they are concentrated in the northeastern slope of the *Chapada*, in the Araripe Manakin's range. They usually channel the water springs and divert the streams to provide their water needs, suppressing totally or partially the gallery forests that compose the Manakin's nesting territories.

Although some of these areas are officially protected (a portion of the *Arajara Park*, the type locality of the Araripe Manakin, was turned into a private reserve, as part of the environmental compensations negotiated with governmental agencies) the effective protection of the region's biodiversity is not guaranteed. Logging and water channeling are common practices.

Most of these clubs have been experiencing losses due to environmental problems, especially the reduction of spring outflow and the erosion caused by the suppression of the slope vegetation cover, and some of them, especially the *Arajara Park* – the biggest club and located in the type locality of the Araripe manakin - are becoming more interested in ecotourism and birdwatching. Table 8 lists some of the main clubs and recreational parks in the Manakin's range, especially the ones located in nesting areas.

These enterprises seemed to be interested in the creation of the protected area, mainly because they would guarantee the surrounding forests around their properties and probably improve spring outflow, one of their major concerns presently. They would support any relocation or disappropriation of lands, but seemed interested in promoting active habitat recovery. One of the water parks have already started to experiment with planting along the slopes to reduce the risk of landsliding.

This group of stakeholders seemed more inclined to the scenario where there is no disapropriation (Wildlife Refuge, since they also do not believe that the Zoning of the APA would have any significant practical impact on the conservation of slope forests).

Table 8. **Main recreational parks in the Manakin's range.**

Recreational Park	**Municipality**	**Description**
Arajara Park	Barbalha	Type locality of the Araripe Manakin. Presently the easiest place to spot the Araripe Manakin, due to the easy access, and consistently visited by foreign groups of birdwatchers. The Park has established a Private Reserve (RPPN), but landslidings are still common during the rainy season. Park management is friendly to the Araripe Project and willing to do participate in the discussions.
Caldas Club	Barbalha	Weekend club, has produced several alterations in the streams and suppression of gallery forests.
Riacho do Meio Ecological Park	Barbalha	Municipal park. Although part of the gallery forests have been suppressed for the construction of concrete pools, it still presents some nesting areas. There are no management actions implemented, but the municipality has expressed the desire to manage it in a more conservation-minded way. Could become an important visiting area for birdwatching and environmental education.
Granjeiro Club	Crato	Weekend club, has produced several alterations in the streams and suppression of gallery forests. Neighboring areas with natural vegetation comprise the best nesting areas found so far.
Serrano Club	Crato	Weekend club, has produced several alterations in the streams and suppression of gallery forests.
'Serviço Brasileiro de Apoio às Micro e Pequenas Empresas' (SEBRAE)	Crato	Non-profit organization that supports the competitiveness and sustainable development of small businesses. It is a result of the union of both public and private sectors, and research entities.
'Serviço Social do Comércio' (SESC)	Crato	Non-profit institution which main goal is to promote the cultural and artistic development and social welfare, as well as improve the quality of life of workers in the trade and service industries.
Associação dos Produtores Rurais	Crato	Landowners' association.

(Source: fieldwork survey)

Other institution that deserves attention for already getting involved in the actions to promote the Conservation of the *Chapada do Araripe* are: FECOMERCIO, the State's trade organization, and the 'Serviço Social do Comércio' (SESC/Crato). Both institutions were involved in the logistics and financing the materials for the exhibition promoted in the city of Crato central square, showing a great interest in taking part of the long-term initiative (Figure 24).

Figure 24. Outdoor in Crato's central square about the conservation of the Araripe manakin and the region's natural resources, sponsored by Ceará State Trade Federation.

The 'Serviço Brasileiro de Apoio às Micro e Pequenas Empresas' (SEBRAE) is also a potential partner once it is developing the 'Programa Araripe', an initiative of SEBRAE of Ceará, Pernambuco and Piauí States, aiming the integrated and sustainable development of the *Chapada do Araripe*, through environment management. This programme is being developed in partnership with 'Fundação Araripe', 'Universidade Regional do Cariri', 'Fundação de Desenvolvimento Tecnológico do Cariri' (FUNDETEC), and has the participation of IBAMA, and the Ministry of Integration, among other government bodies.

Local NGOs

There are a number of NGOs and civil society organizations working in *Chapada do Araripe* (Table 9). Most of them are working with children, education and/or focused on improving economic activities, a consequence of the region's socioeconomic limited opportunities. The most active NGOs are located in Crato; among these, two must be highlighted: 'Fundação Araripe' and 'Associação Cristã de Base'. The first one develops projects involving landscape planning, public health, environment conservation, watershed protection, research and dissemination. Among its main projects is the socioeconomic and biological study produced to support the development of the Management Plan of the protected area APA *Chapada do Araripe*. The second one seems to be developing a consistent work involving the local communities, specially related to the promotion of a better quality of life using agroforestry systems and 'organic' certificates for small farmers.

One NGO in Nova Olinda municipalty, "Casa Grande",although not directly located in the Manakin's range, has been developing communications tools for the local communities (e.g., community radio) and is very influential with the rural communities, since they provide free education for their children (Figure 25). When visited, both the children and their teachers agreed immediately to sign a petition to create the Fully Protected Area along the slopes of the Chapada, and disseminate the idea among their communities.

Regarding the creation of the fully protected area, two influential NGOs responded in different ways. A representative of the board of the Fundação Araripe expressed that the foundation would rather insist on producing a Management Plan and Zoning of the APA Chapada do Araripe instead of creating a fully protected area. Since the Fundação Araripe was co-responsible for the proposal and creation of the huge and little managed Sustainable Use APA Chapada do Araripe, they are struggling to produce a Management Plan for this PA and promote its proper management.

Another NGO, Associação Cristã de Base, whose main activities are related to the promotion of social welfare through improving agricultural techniques, would support the full protection of the slopes, but would not be sympathetic to the full protection of the National Forest.

Table 9. Nongovernmental organizations in the key municipalities of the Araripe Project that were visited to discuss the protected area and the conservation process.

Name	Description	Contact
'Associação Cristã de Base'	NGO of socio-environmental focus. It works in partnership with other associations, directly involving local community (mainly in the rural area), aiming to promote of a better quality of life through the development and dissemination of agroforestry systems.	Rua dos Cariris, n. 61, Centro – Crato – CE – Brazil, 63100-000, PO Box: 206 Phone/fax: (88) 3521 3005 e-mail: acb@netcariri.com.br
'Fundação Araripe'	Develops projects involving research on landscape planning, public health, environment conservation, water conservation. One of its main projects: the socioeconomic and biological study produced to support a Management Plan for the APA *Chapada do Araripe*.	Rua Santos Dumont, n. 88, Centro – Crato – CE – Brazil, 63100-040, PO Box: 206 Ph: (88) 3523 1605 Phone/fax: (88) 3521 5033 e-mail: fararipe.org@terra.com.br
'Fundação de Desenvolvimento Tecnológico do Cariri' (FUNDETEC)	Private research and training institution, also involved in the 'Programa Araripe'. It is focused on promoting the sustainable development of the Araripe region, through research for the promotion of public policies, and capacity building.	Rua Teófilo Siqueira, n. 734, Pimenta – Crato – CE – Brazil, 63100-010
'Sindicato dos Trabalhadores Rurais'	Affiliated to the Brazilian Workers Central Union (CUT) and FETAGRI ('Federação dos Trabalhadores na Agricultura'), deals with issues related to the improving working and welfare conditions of rural workers.	Rua Pedro II, n. 56 Crato – CE – Brazil, 63100-100, PO Box: 72

'Associação dos Cordelistas do Crato'	Institution developed to preserve and disseminate the *cordel* cultural tradition. It is very active in the *Chapada do Araripe* region, and has produced a *cordel* edition especially dedicated to the Araripe Manakin conservation issues, per request of the Araripe project team.
'NGO Candeeiro das Trilhas'	Local NGO which is concerned about the conservation of watershed ecosystems along the slopes of the *chapada*.

(Source: fieldwork survey)

Figure 25. Presentation and discussion about the Protected Area scenarios for students and teachers in the influential NGO "Casa Grande"in Nova Olinda municipality, located in the foothills of the Chapada do Araripe, neighboring Crato municipality (probably a part of the original range of the Araripe Manakin).

External NGOs working in the area

The *Chapada do Araripe* attracts the attention of external NGOs, both Brazilian and foreign. These organizations support the work developed by local NGOs, as it is the case of the Conservation Leaderhip Programme (involving Fauna & Flora International, Conservation International, Wildlife Conservation Society and BirdLife International), which has been participating in the process through awards, training and team capacity building and other types of technical and logistical support.

SAVE Brasil, the Birdlife representative for Brazil, has also been participating and sharing technical expertise in protected area creation and management and the management of private reserves.

Research Institutions

Four Universities of State and Federal administration are involved in the conservation process of the Araripe Manakin and have contributed with their expertise and research experience in the Araripe Basin for the definition of the best scenario for the creation of a protected area in the Araripe (Table 10).

Table 10. Research institutions involved in the Araripe Manakin's Conservation Process and the discussions of the fully protected area.

Name	Description	Contact
Universidade Regional do Cariri (URCA)	State University which plays a strong role on scientific research in the Cariri Valley, especially related to biology and palaeontology.	Rua Cel. Antônio Luiz, n. 1161, Pimenta – Crato – CE – Brazil, Ph: (88) 3102 1212 e-mail: urca@urca.br
Universidade Federal do Pará (UFPA) – Campus de Bragança	Federal University located in Pará State, partner in the Manakin Project responsible for the genetic analyses.	Alameda Leandro Ribeiro, s/n bloco B, Aldeia – Bragança – PA – Brazil Ph. (91) 3425 1209
Universidade Federal do Ceará (UFC)	Federal University located in Fortaleza, Ceará, who is helping to identify the plant species in the Manakin's diet.	Av. da Universidade, n. 2853, Benfica – Fortaleza – CE – Brazil CEP: 60020-181 Ph. (85) 4009 7300
Universidade Federal de Pernambuco (UFPE)	Federal University located in Recife, Pernambuco, who is colaborating in the identification of plant species in the Manakin's diet.	Av. Prof. Moraes Rego, n. 1235, Cidade Universitária - Recife – PE CEP: 50670-901 Ph. (81) 2126 8000

3.3. Land tenure assessment

Originally, we expected to produce a preliminary land tenure assessment to facilitate the process of creating a fully protected area in the Araripe, since the former federal environmental authorities responsible for Protected Area creation and management (i.e., IBAMA) oriented us to produce this type of land tenure assessment.

However, with the creation of a new agency to take care of the Protected Areas and biodiversity conservation in Brazil (i.e., the Chico Mendes Institute for Biodiversity Conservation/ICMBio), new methods and procedures were devised by this Institute. When our team consulted the ICMBio authorities concerning the new models for land tenure assessment for the creation of Protected Areas, we were told that this type of assessments – especially when dealing with fully Protected Areas, where disappropriation may be applicable – would only be accepted as part of the formal process to create a new protected area if performed by some State or Federal governmental agency.

In this sense, the team decided to concentrate field efforts in the detailed mapping of the limits and contour of the proposed fully Protected Area, while partnering with the federal and State agencies responsible for this type of land tenure assessment, i.e., INCRA (National Institute for Colonization and Land Reform) and IDACE (Institute for Agrarian Development of the State of Ceará), respectively.

Initially, the team discussed the matter with technician from the federal agency mentioned above (i.e., INCRA), who found out that an extensive assessment was already planned for the region but it would include dozens of municipalities and might take a couple of years to be completed. They suggested that our team should talk to the President of this Institute, explaining the reasons to conduct the land assessments and asking him to put a priority on the three municipalities were the Protected Area is proposed, so that the technical personnel could start the fieldwork in Barbalha, Missão Velha and Crato.

Thanks to the interest and involvement of the technical staff from INCRA, we managed to set up a meeting with the President of the regional office of INCRA in Ceará. The President was very concerned about the protection of the slopes of the Araripe plateau and approved the idea of starting the assessment in the municipalities affected by the Protected Area proposal.

As this report was being closed, the assessments of the municipalities of Barbalha and Missão Velha were finished, and the assessment of Crato is expected to be ready by early 2010. These are being made by a state agency (i.e., IDACE/Institute for Agrarian Development of the State of Ceará) hired by the federal agency (i.e., INCRA/National Institute for Colonization and Land Reform).

This is a very detailed assessments compiled with extensive fieldwork, visits to the properties, interviews with landowner and registrar's offices in the region. As soon as

this assessment is ready, we will be delivering the final product to the federal environmental authorities responsible for the creation process of the fully Protected Area in the Araripe.

In order to produce a more general assessment identifying trends and general aspects of land ownership and property size in the Araripe, our team has also compiled some information available through the National Institute for Colonization and Land Reform (INCRA), and produced a more general assessment of the history of human settlements in the Araripe and its main economic cycles, including some comments about water use and spring ownership that might be useful for government official to understand some characteristics of the land and water tenure issues in the Araripe, as detailed below.

The history of permanent European settlements in the Araripe is not very old, and dates back to the mid-eighteenth century. The territory was occupied by cattle farmers that came from Bahia and Pernambuco provinces. The cultivation of sugar cane in large scale was most evident in the coastal areas of Northeastern Brazil, due to soil and climate conditions, and livestock raising was then developed to promote the inland occupation of semi-arid backlands, and to secure the transportation of sugar cane and timber.

The expansion of large sugar cane and livestock raising areas are the most important causes of land concentration in the state of Ceará. Two other relevant cultures that also contributed to this process was the cotton and tobacco cultivation. The northeastern economy is predominantly based on agriculture, and 60% of its population lives in rural areas (INCRA, 1998). The same is valid to Ceará state and the Chapada do Araripe.

The analysis of the land use and tenure in the Chapada do Araripe, aiming to gather information about the properties with watersheds where the Araripe Manakin occurs is an issue that demands a great effort, because there are more than 120 streams along the species range. In addition to this fact, there is a historical problem originated in 1854 with the creation of a local law (Law 645, January 17th 1854), which allowed the tenure of water. According to this law, a watershed can have one or more owners who use the water according to the quotes established on the watershed deeds. This model is still adopted in the region and led to a market of water, contradicting the state and federal legislation, where the water is of public property, management and use.

As consequence, any land use and tenure assessment must collect information about properties and their spring “owners”. Because of this, we will present here an overview of land tenure situation in the region of the Chapada do Araripe, based on the Census promoted by ‘Instituto Nacional de Colonização e Reforma Agrária’

(INCRA), in 1998, but a further detailed assessment is in progress, as mentioned above.

In relation to the total area surveyed through the census, most of the properties in Barbalha (Table 11) and Missão Velha (Table 13) are small lands (between 1 and 4 hectares). In Crato, the scenery is slightly different, and the average of small and large properties (more than 15 hectares) is similar (Table 12). The large properties, although being less numerous, represent more than 50% of the total area in all three municipalities indicating that there is high land concentration in the region.

Brazilian environmental laws require that 20% of a rural property has to be preserved and managed in such a way that it will permanently assure the maintainance of the original vegetation cover. This is called 'Legal Reserve'. Another legal instrument aimed to protect critical ecosystems, the Forest Code (Federal Law 4,771/1965) establishes one category of protection for different types of vegetation, called 'Areas of Permanent Protection', including mangroves, vegetation along rivers, streams, and springs, vegetation located in slopes steeper than 45°, etc.

In this sense, regarding the properties with established 'Areas of Permanent Protection' (APPs) and 'Legal Reserves' in all three municipalities, the amount of lands with these designation is very small, especially the 'Legal Reserve'. It is important to notice that few landowners designate their lands as 'Legal Reserves' or 'APPs', and this is usually done when forced by environmental authorities or governmental investment banks. In all three municipalities these protect areas are more frequent in medium (between 5 and 15 hectares) and large properties (Tables 14, 15 and 16). Barbalha and Missão Velha, even with smaller number of properties with 'APPs' (Table 14 and 16), proportionally have larger number of hectares of protected areas than Crato (Table 15). Missão Velha is also the municipality with more areas (in number and hectare) of 'Legal Reserve'.

Regarding the type of economic activities, in Barbalha most of the properties are focused on agriculture. However, the total area (hectares) used for livestock raising is almost the same to one used for agriculture, probably a result of the extensive livestock raising system. There are few properties with native species reforested areas, and, on the other hand there are a great number of lands with extractive agriculture and forestry activities. Both agriculture and livestock raising activities are concentrated in large properties (Table 17).

Also in Crato most of the properties are focused on agriculture. However, the total area used for livestock raising is larger than the total used for agriculture, what is also a result of the extensive livestock raising system. There are some properties with native species reforested areas and, on the other hand, there are few lands with extractive agriculture and forestry activities. Both agriculture and livestock raising activities are concentrated in large properties (Table 18).

In Missão Velha, the number of properties and total area used for agriculture and livestock raising practices are very similar. There are few properties with native species reforested areas, and also with extractive agriculture and forestry activities. Both agriculture and livestock raising activities are concentrated in large properties (Table 19).

Table 11. Barbalha: distribution of exploitable areas.

	EXPLORED AREAS		NOT USED	
	NUMBER OF PROPERTIES	AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)
RANGES OF TOTAL AREA (ha)				
GENERAL TOTAL.....	904	13,052.7	436	2,087.4
LESS THAN 1.....	132	60.4	35	7.5
1 TO LESS THAN 2.....	141	135.2	57	29.7
2 TO LESS THAN 5.....	206	504.5	111	106.6
5 TO LESS THAN 10.....	160	841.0	90	171.8
10 TO LESS THAN 25.....	129	1,529.2	68	239.1
25 TO LESS THAN 50.....	80	2,196.9	42	227.4
50 TO LESS THAN 100.....	31	1,701.0	19	246.9
100 TO LESS THAN 200.....	11	1,171.9	5	128.0
200 TO LESS THAN 500.....	10	2,919.1	6	64.6
500 TO LESS THAN 1000.....	2	981.5	1	50.0
1000 TO LESS THAN 2000....	2	1,012.0	2	815.8
2000 TO LESS THAN 5000....	0	0.0	0	0.0
5000 TO LESS THAN 10000...	0	0.0	0	0.0
10000 TO LESS THAN 20000..	0	0.0	0	0.0
20000 TO LESS THAN 50000..	0	0.0	0	0.0
50000 TO LESS THAN 100000.	0	0.0	0	0.0
100000 AND MORE.....	0	0.0	0	0.0
EXCLUDED INCONSISTENT PROPERTIES:	35			

(Source: INCRA, 1998)

Table 12. Crato: distribution of exploitable areas.

	EXPLORED AREAS		NOT USED	
	NUMBER OF PROPERTIES	AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)
RANGES OF TOTAL AREA (ha)				
GENERAL TOTAL.....	1,449	36,918.5	1,194	11,341.1
LESS THAN 1.....	105	49.8	64	9.4
1 TO LESS THAN 2.....	108	119.7	75	26.7
2 TO LESS THAN 5.....	267	619.0	209	214.3
5 TO LESS THAN 10.....	247	1,235.2	209	431.5
10 TO LESS THAN 25.....	299	3,477.8	261	1,165.3
25 TO LESS THAN 50.....	213	4,983.0	191	1,983.3
50 TO LESS THAN 100.....	112	5,488.5	97	1,835.2
100 TO LESS THAN 200.....	55	5,447.9	50	1,781.8
200 TO LESS THAN 500.....	31	7,257.6	27	1,806.6
500 TO LESS THAN 1000.....	9	3,950.0	9	1,566.5
1000 TO LESS THAN 2000....	2	2,084.0	1	345.5
2000 TO LESS THAN 5000....	1	2,206.0	1	175.0
5000 TO LESS THAN 10000...	0	0.0	0	0.0
10000 TO LESS THAN 20000..	0	0.0	0	0.0
20000 TO LESS THAN 50000..	0	0.0	0	0.0
50000 TO LESS THAN 100000.	0	0.0	0	0.0
100000 AND MORE.....	0	0.0	0	0.0
EXCLUDED INCONSISTENT PROPERTIES:	51			

(Source: INCRA, 1998)

Table 13. Missão Velha - distribution of exploitable areas.

	EXPLOITABLE		NOT USED	
	NUMBER OF PROPERTIES	AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)
RANGES OF TOTAL AREA (ha)				
GENERAL TOTAL.....	730	31,815.4	137	1,509.0
LESS THAN 1.....	4	2.9	0	0.0
1 TO LESS THAN 2.....	35	47.5	0	0.0
2 TO LESS THAN 5.....	107	349.5	7	7.7
5 TO LESS THAN 10.....	134	937.7	15	30.1
10 TO LESS THAN 25.....	190	2,823.9	33	163.3
25 TO LESS THAN 50.....	107	3,647.8	19	139.6
50 TO LESS THAN 100.....	78	4,801.9	29	274.0
100 TO LESS THAN 200.....	49	6,120.3	19	265.9
200 TO LESS THAN 500.....	21	5,140.0	13	616.5
500 TO LESS THAN 1000.....	4	1,852.9	2	11.9
1000 TO LESS THAN 2000....	0	0.0	0	0.0
2000 TO LESS THAN 5000....	0	0.0	0	0.0
5000 TO LESS THAN 10000...	1	6,091.0	0	0.0
10000 TO LESS THAN 20000..	0	0.0	0	0.0
20000 TO LESS THAN 50000..	0	0.0	0	0.0
50000 TO LESS THAN 100000.	0	0.0	0	0.0
100000 AND MORE.....	0	0.0	0	0.0

EXCLUDED INCONSISTENT PROPERTIES: 29

(Source: INCRA, 1998)

Table 14. Barbalha: distribution of the properties with permanent protection areas.

	PROPERTIES WITH AREAS OF PERMANENT PROTECTION (APPs)			PROPERTIES WITH AREAS OF LEGAL RESERVE		
	NUMBER OF PROPERTIES	TOTAL AREA (ha) OF THE PROPERTIES WITH APPs	TOTAL AREA (ha) OF APPS	NUMBER OF PROPERTIES	TOTAL AREA (ha) OF THE PROPERTIES WITH LEGAL RESERVE	TOTAL AREA (ha) OF LEGAL RESERVE
RANGES OF TOTAL AREA (ha)						
GENERAL TOTAL.....	18	2,531.5	426.0	2	1,318.9	258.0
LESS THAN 1.....	1	0.4	0.1	0	0.0	0.0
1 TO LESS THAN 2.....	1	1.1	0.1	0	0.0	0.0
2 TO LESS THAN 5.....	1	4.8	2.0	0	0.0	0.0
5 TO LESS THAN 10.....	1	8.0	2.0	0	0.0	0.0
10 TO LESS THAN 25.....	6	112.0	30.3	0	0.0	0.0
25 TO LESS THAN 50.....	3	118.4	42.5	0	0.0	0.0
50 TO LESS THAN 100.....	2	126.8	26.0	0	0.0	0.0
100 TO LESS THAN 200.....	0	0.0	0.0	0	0.0	0.0
200 TO LESS THAN 500.....	1	261.6	30.0	1	201.5	40.0
500 TO LESS THAN 1000.....	1	525.6	3.0	0	0.0	0.0
1000 TO LESS THAN 2000....	1	1,372.8	290.0	1	1,117.4	218.0
2000 TO LESS THAN 5000....	0	0.0	0.0	0	0.0	0.0
5000 TO LESS THAN 10000...	0	0.0	0.0	0	0.0	0.0
10000 TO LESS THAN 20000..	0	0.0	0.0	0	0.0	0.0
20000 TO LESS THAN 50000..	0	0.0	0.0	0	0.0	0.0
50000 TO LESS THAN 100000.	0	0.0	0.0	0	0.0	0.0
100000 AND MORE.....	0	0.0	0.0	0	0.0	0.0
EXCLUDED INCONSISTENT PROPERTIES:	5					

(Source: INCRA, 1998)

Table 15. Crato: distribution of the properties with permanent protection areas.

	PROPERTIES WITH AREAS OF PERMANENT PROTECTION (APPs)			PROPERTIES WITH AREAS OF LEGAL RESERVE		
	NUMBER OF PROPERTIES	TOTAL AREA (ha) OF THE PROPERTIES WITH APPs	TOTAL AREA (ha) OF APPS	NUMBER OF PROPERTIES	TOTAL AREA (ha) OF THE PROPERTIES WITH LEGAL RESERVE	TOTAL AREA (ha) OF LEGAL RESERVE
RANGES OF TOTAL AREA (ha)						
GENERAL TOTAL.....	36	3,585.3	534.5	5	899.0	173.0
LESS THAN 1.....	0	0.0	0.0	0	0.0	0.0
1 TO LESS THAN 2.....	0	0.0	0.0	0	0.0	0.0
2 TO LESS THAN 5.....	1	4.0	0.3	0	0.0	0.0
5 TO LESS THAN 10.....	2	15.0	8.6	0	0.0	0.0
10 TO LESS THAN 25.....	4	67.5	12.8	0	0.0	0.0
25 TO LESS THAN 50.....	10	337.3	45.0	3	120.9	17.5
50 TO LESS THAN 100.....	10	669.6	74.9	0	0.0	0.0
100 TO LESS THAN 200.....	5	713.0	76.9	1	100.2	20.0
200 TO LESS THAN 500.....	3	1,207.9	226.0	0	0.0	0.0
500 TO LESS THAN 1000.....	1	571.0	90.0	1	677.9	135.5
1000 TO LESS THAN 2000....	0	0.0	0.0	0	0.0	0.0
2000 TO LESS THAN 5000....	0	0.0	0.0	0	0.0	0.0
5000 TO LESS THAN 10000...	0	0.0	0.0	0	0.0	0.0
10000 TO LESS THAN 20000..	0	0.0	0.0	0	0.0	0.0
20000 TO LESS THAN 50000..	0	0.0	0.0	0	0.0	0.0
50000 TO LESS THAN 100000.	0	0.0	0.0	0	0.0	0.0
100000 AND MORE.....	0	0.0	0.0	0	0.0	0.0
EXCLUDED INCONSISTENT PROPERTIES:	4					

(Source: INCRA, 1998)

Table 16. Missão Velha: distribution of the properties with permanent protection areas.

	PROPERTIES WITH AREAS OF PERMANENT PROTECTION (APPs)			PROPERTIES WITH AREAS OF LEGAL RESERVE		
	NUMBER OF PROPERTIES	TOTAL AREA (ha) OF THE PROPERTIES WITH APPs	TOTAL AREA (ha) OF APPS	NUMBER OF PROPERTIES	TOTAL AREA (ha) OF THE PROPERTIES WITH LEGAL RESERVE	TOTAL AREA (ha) OF LEGAL RESERVE
RANGES OF TOTAL AREA (ha)						
GENERAL TOTAL.....	18	2,147.3	745.3	7	8,680.8	1,801.2
LESS THAN 1.....	0	0.0	0.0	0	0.0	0.0
1 TO LESS THAN 2.....	0	0.0	0.0	0	0.0	0.0
2 TO LESS THAN 5.....	0	0.0	0.0	0	0.0	0.0
5 TO LESS THAN 10.....	0	0.0	0.0	0	0.0	0.0
10 TO LESS THAN 25.....	4	62.9	2.7	1	23.9	5.0
25 TO LESS THAN 50.....	1	25.1	1.0	1	28.8	2.0
50 TO LESS THAN 100.....	6	409.2	107.1	1	54.2	10.2
100 TO LESS THAN 200.....	5	677.2	149.5	2	319.9	40.0
200 TO LESS THAN 500.....	1	358.9	65.0	1	235.0	50.0
500 TO LESS THAN 1000.....	1	614.0	420.0	0	0.0	0.0
1000 TO LESS THAN 2000....	0	0.0	0.0	0	0.0	0.0
2000 TO LESS THAN 5000....	0	0.0	0.0	0	0.0	0.0
5000 TO LESS THAN 10000...	0	0.0	0.0	1	8,019.0	1,694.0
10000 TO LESS THAN 20000..	0	0.0	0.0	0	0.0	0.0
20000 TO LESS THAN 50000..	0	0.0	0.0	0	0.0	0.0
50000 TO LESS THAN 100000.	0	0.0	0.0	0	0.0	0.0
100000 AND MORE.....	0	0.0	0.0	0	0.0	0.0
EXCLUDED INCONSISTENT PROPERTIES:	1					

(Source: INCRA, 1998)

Table 17. Barbalha: distribution of the properties with agriculture and livestock raising activities.

	TOTAL		AGRICULTURE		LIVESTOCK RAISING		REFORESTED		EXTRACTIVE AGRICULTURE	
	NUMBER OF PROPERTIES	EXPLOITED AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)
RANGES OF TOTAL AREA (ha)										
GENERAL TOTAL.....	904	17,157.7	13,052.7	856	15,523.2	453	15,467.5	7	333.7	26	1,431.1
LESS THAN 1.....	132	77.6	60.4	121	70.9	23	15.5	0	0.0	1	0.7
1 TO LESS THAN 2.....	141	198.8	135.2	135	189.3	32	46.1	0	0.0	4	5.7
2 TO LESS THAN 5.....	206	659.9	504.5	193	611.7	93	313.4	0	0.0	2	5.3
5 TO LESS THAN 10.....	160	1,134.0	841.0	156	1,104.1	91	653.3	0	0.0	5	34.6
10 TO LESS THAN 25.....	129	2,009.7	1,529.2	124	1,951.8	93	1,473.3	3	37.1	8	144.7
25 TO LESS THAN 50.....	80	2,735.0	2,196.9	77	2,640.5	68	2,364.5	2	75.7	2	69.3
50 TO LESS THAN 100.....	31	2,062.3	1,701.0	29	1,931.9	27	1,847.3	1	56.5	1	73.8
100 TO LESS THAN 200.....	11	1,497.1	1,171.9	11	1,497.1	11	1,445.2	1	164.4	1	127.0
200 TO LESS THAN 500.....	10	3,223.6	2,919.1	6	1,966.2	10	3,223.6	0	0.0	1	444.4
500 TO LESS THAN 1000.....	2	1,069.5	981.5	2	1,069.5	3	1,595.1	0	0.0	1	525.6
1000 TO LESS THAN 2000....	2	2,490.2	1,012.0	2	2,490.2	2	2,490.2	0	0.0	0	0.0
2000 TO LESS THAN 5000....	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5000 TO LESS THAN 10000...	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10000 TO LESS THAN 20000..	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20000 TO LESS THAN 50000..	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
50000 TO LESS THAN 100000.	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
100000 AND MORE.....	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

EXCLUDED INCONSISTENT PROPERTIES: 29

(Source: INCRA, 1998)

Table 18. Crato: distribution of the properties with agriculture and livestock raising activities.

	TOTAL		AGRICULTURE		LIVESTOCK RAISING		REFORESTED		EXTRACTIVE AGRICULTURE	
	NUMBER OF PROPERTIES	EXPLOITED AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)
RANGES OF TOTAL AREA (ha)										
GENERAL TOTAL.....	1,449	51,549.0	36,918.5	1,403	46,359.3	1,034	49,841.3	10	1,025.8	17	487.9
LESS THAN 1.....	105	59.4	49.8	104	59.1	11	7.2	0	0.0	2	1.2
1 TO LESS THAN 2.....	108	152.7	119.7	108	152.7	31	43.9	0	0.0	0	0.0
2 TO LESS THAN 5.....	267	879.3	619.0	260	859.3	131	444.5	2	5.8	5	20.0
5 TO LESS THAN 10.....	247	1,767.6	1,235.2	238	1,704.5	172	1,253.6	1	9.4	1	8.7
10 TO LESS THAN 25.....	299	4,911.7	3,477.8	292	4,796.7	278	4,621.7	0	0.0	4	59.4
25 TO LESS THAN 50.....	213	7,423.3	4,983.0	207	7,218.1	203	7,077.9	3	89.6	3	97.9
50 TO LESS THAN 100.....	112	7,747.7	5,488.5	106	7,342.8	111	7,673.1	1	92.7	0	0.0
100 TO LESS THAN 200.....	55	7,779.0	5,447.9	50	7,147.4	54	7,678.8	1	185.4	2	300.7
200 TO LESS THAN 500.....	31	9,627.4	7,257.6	27	8,279.2	31	9,839.7	2	642.9	0	0.0
500 TO LESS THAN 1000.....	9	6,050.0	3,950.0	9	6,050.0	9	6,050.0	0	0.0	0	0.0
1000 TO LESS THAN 2000....	2	2,749.5	2,084.0	2	2,749.5	2	2,749.5	0	0.0	0	0.0
2000 TO LESS THAN 5000....	1	2,401.4	2,206.0	0	0.0	1	2,401.4	0	0.0	0	0.0
5000 TO LESS THAN 10000...	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10000 TO LESS THAN 20000..	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20000 TO LESS THAN 50000..	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
50000 TO LESS THAN 100000.	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
100000 AND MORE.....	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
EXCLUDED INCONSISTENT PROPERTIES:	47									

(Source: INCRA, 1998)

Table 19. Missão Velha: distribution of the properties with agriculture and livestock raising activities.

	TOTAL		AGRICULTURE		LIVESTOCK RAISING		REFORESTED		EXTRACTIVE AGRICULTURE	
	NUMBER OF PROPERTIES	EXPLOITED AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)	NUMBER OF PROPERTIES	AREA (ha)
RANGES OF TOTAL AREA (ha)										
GENERAL TOTAL.....	730	37.375.7	31.815.4	706	35.484.7	645	36.045.1	9	683.8	9	374.2
LESS THAN 1.....	4	2.9	2.9	4	2.9	3	2.3	0	0.0	0	0.0
1 TO LESS THAN 2.....	35	48.8	47.5	34	47.6	22	30.0	0	0.0	0	0.0
2 TO LESS THAN 5.....	107	363.7	349.5	105	358.3	82	284.4	0	0.0	2	5.7
5 TO LESS THAN 10.....	134	984.4	937.7	133	975.4	116	854.8	1	6.9	2	18.8
10 TO LESS THAN 25.....	190	3,063.1	2,823.9	185	2,981.5	173	2,809.5	1	16.6	1	11.7
25 TO LESS THAN 50.....	107	3,833.4	3,647.8	105	3,749.5	100	3,608.6	3	113.7	1	30.3
50 TO LESS THAN 100.....	78	5,438.7	4,801.9	71	4,916.0	77	5,370.0	1	80.0	1	68.7
100 TO LESS THAN 200.....	49	6,930.1	6,120.3	45	6,358.9	47	6,706.9	2	234.3	2	239.0
200 TO LESS THAN 500.....	21	6,082.1	5,140.0	19	5,466.1	20	5,750.1	1	232.3	0	0.0
500 TO LESS THAN 1000.....	4	2,609.5	1,852.9	4	2,609.5	4	2,609.5	0	0.0	0	0.0
1000 TO LESS THAN 2000....	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2000 TO LESS THAN 5000....	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5000 TO LESS THAN 10000...	1	8,019.0	6,091.0	1	8,019.0	1	8,019.0	0	0.0	0	0.0
10000 TO LESS THAN 20000..	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20000 TO LESS THAN 50000..	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
50000 TO LESS THAN 100000.	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
100000 AND MORE.....	0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

EXCLUDED INCONSISTENT PROPERTIES: 26 (Source: INCRA, 1998)

3.4. Proposed limits of the Protected Area

According to the discussions with stakeholders there was a general consensus that the slopes of the Araripe plateau should be fully protected, because of its threatened water resources and the associated moist forest with its rich and endemic biodiversity. However people did not seem inclined to support disappropriation of private lands and removal of existing recreational facilities.

In this sense, we tried to produced a mapping of the moist forests along the northeastern slopes, in the critical area identified in the Conservation Plan for the Araripe Manakin, drawing the boundary line of the protected area in a way that it would surround all recreational facilities and houses, to see if it would be acceptable in terms of moist forest and water resource conservation (Figures 26 and 27).

Initially, a satellite image of the Araripe plateau was used to produce a preliminary contour line along the base of the slopes, identifying the major 6 recreational facilities, water parks and/or hotels situated at the border with the slope forests (i.e., Arajara Water Park, Clube Serrano, Clube Granjeiro, Riacho do Meio Municipal Park, Clube Caldas, Clube Lameiro).

After the initial planning, an extensive field campaign was promoted to refine this contour line and identify other facilities and/or buildings that could be situated in the slope area, conflicting with the moist forest conservation proposal. This detailed and field-refined mapping is presented in Figure XX, and was sent with the formal request for the creation of the fully protected area to the federal environmental authorities.

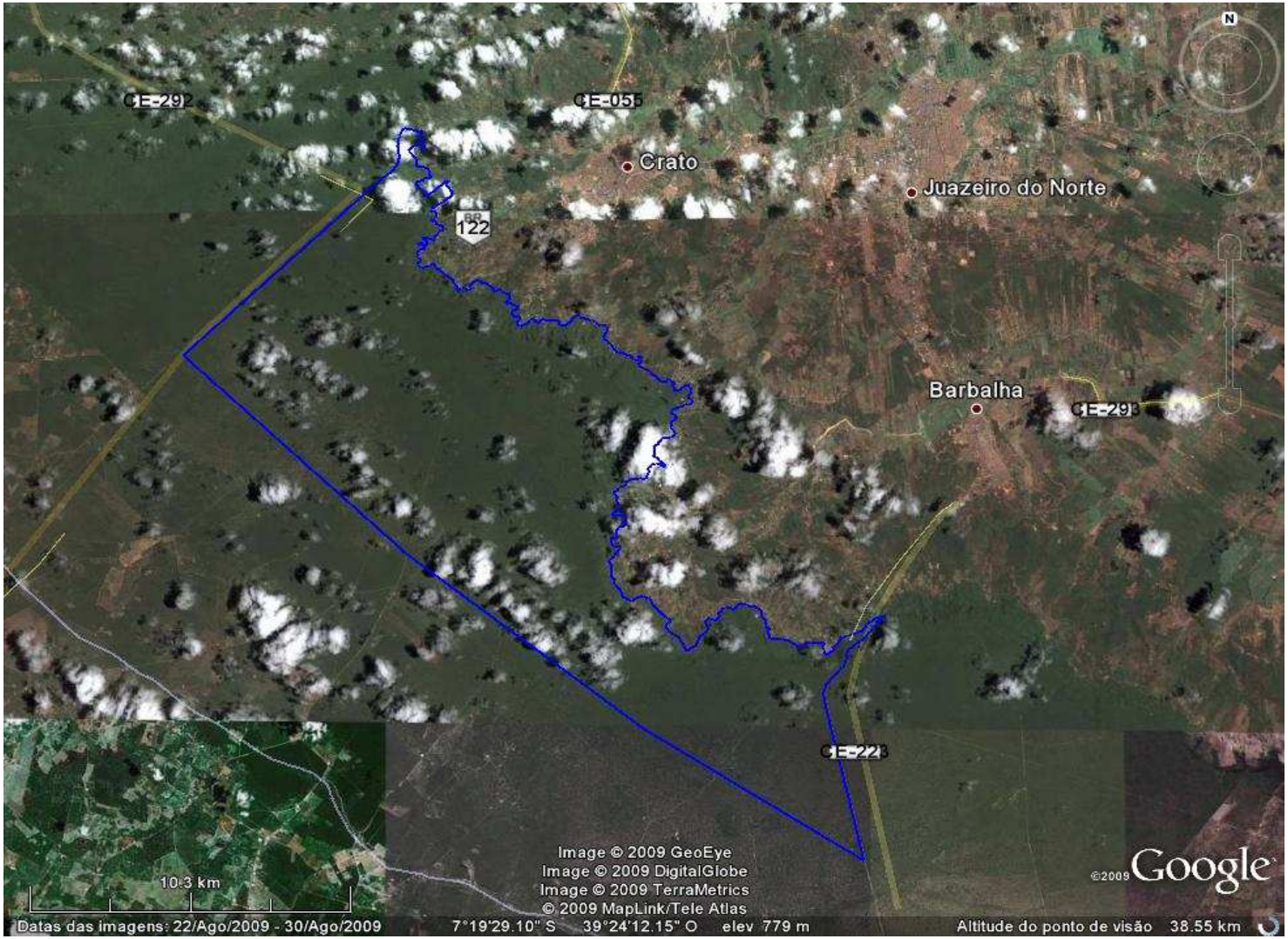


Figure 26. Aerial view of the contour of the proposed Protected Area, including the slopes and part of the plateau of *Chapada do Araripe*.

Figure 27. Lateral view of the contour of the proposed Protected Area in the slopes of the municipality of Crato.

Chapter 4

Opening a Formal Process at ICMBio

4.1. Building a partnership to file a formal request (Jun 2008)

After the discussions with stakeholders and the extensive field surveys to determine a preliminary proposal of the limits of the Protected Area, the team prepared a presentation to discuss the results with some key stakeholders that were interested in signing the request to federal environmental authorities to open a formal process to create a fully Protected Area along the northeastern slopes of the Araripe plateau.

This meeting was conducted on June 4th 2008, in the meeting room of the headquarters of the Chapada do Araripe Environmental Protection Area (APA Chapada do Araripe), with the following participants:

- Jackson Antero (manager of the APA Chapada do Araripe);
- Quitéria Pereira (APA Chapada do Araripe);
- Verônica Lima (manager Araripe National Forest);
- José Nivaldo Soares (Secretary of Environment, Municipal Government of Crato);
- Yarley Brito (Regional Director, COGERH – Ceará State Water Management Agency);
- Pedro Monteiro (Araripe National Forest);
- Alberto Campos (Aquasis team);
- Weber Girão e Silva (Aquasis team);
- Paulo Thieres Pinto (Aquasis team).

The Aquasis team presented the results of the meetings and discussions with stakeholders and, after some suggestions and refinements of the initial idea, the group decided to support the proposal. Other names of stakeholders and organizations were suggested to be included in the process, and it was decided that this group would start the process and would promote the involvement of other interested parties along the process. A partnership was then formed to create a fully protected area with the following organizations:

- Chapada do Araripe Environmental Protection Area (APA);
- Araripe National Forest;
- Ceará State Water Management Agency (COGERH);

- Municipal Government of Crato;
- Aquasis.

A group statement was produced that the organization signing the document intend to promote "the creation of a Fully Protected Area along the slopes and a portion of the Araripe plateau, in order to preserve the springs and water resources, guarantee the recharge of the aquifer by rainwater, and protect the habitat of the Araripe Manakin, a bird endemic to the Araripe region, and Critically Endangered".

As an outcome of the meeting, Aquasis was responsible to summarize the proposal in a document to be sent to the federal environmental authorities responsible for the creation of fully protected areas, and that the document would be sent in official paper of the Chapada do Araripe Environmental Protection Area.

The Aquasis team then produced an initial document that was circulated by-mail with the partners and after an agreement was sent to the federal authorities by **June 19th 2008** (document reproduced in Appendix 2).

4.2. Presenting the proposal to federal authorities (Sep 2008)

After sending the document to request the creation of the fully protected area in the Araripe, the Aquasis team contacted the federal environmental authorities of the newly created Chico Mendes Institute for the Conservation of Biodiversity (ICMBio) to follow up closely the process.

Three months later, an opportunity appeared to present and explain the proposal to a group of technicians of the ICMBio and the national Director of creation of Fully Protected Areas, Mr. Júlio Gonchorowski.

A meeting was set up for **September 19th 2008**, and three members of the Aquasis team flew to Brasília (i.e., Alberto Campos, Weber Girão e Silva, and Thieres Pinto) to present our proposal and discuss the methods used and alternatives (scenarios) that were pondered.

A group of 20 persons was assembled for this meeting:

- Alberto Campos (AQUASIS)
- Fernando Reader (DIBIO/ICMBio)
- Eduardo Godoy (DIREP/ICMBio)
- João Seyffarth (DAP/SBF/MMA)
- Jorge Luiz do Nascimento (DIREP/ICMBio)
- Júlio Gonchorowski (DIREP/ICMBio)

- Magnus Severo (CMA/ICMBio)
- Marcelo Cavallini
- Márcio Barragana (APA Delta/ICMBio)
- Maria Iolita Bampi (DIREP/ICMBio)
- Mariana Fava Cheade (DIREP/ICMBio)
- Nadini Oliveira Sousa (DAP/SBF/MMA)
- Ricardo Castelli Vieira (DIREP/ICMBio)
- Roberta Magalhães Holmes (DAP/SBF/MMA)
- Rogério Vereza (DAP/SBF/MMA)
- Suelma Ribeiro Silva (COPOM/ICMBio)
- Silvio Souza (DAP/SBF/MMA)
- Thieres Pinto (AQUASIS)
- Weber Girão e Silva (AQUASIS)

The main outcome of this meeting was that Director gave his team of technicians the green light to perform a "feasibility analysis", and they asked our team to send some complementary information and mapping info. They explained our team that if the proposal was considered technically (environmentally and economically) and politically feasible, and if the area was included in the federal priorities for the creation of Protected Areas, they would open a formal process to create this PA.

4.3. Process opened at ICMBio (Aug 2009) and next steps

After almost a year the process was considered viable by the federal environmental authorities and coherent with the national biodiversity conservation priorities established in the National Plan for Protected Area and the "Priority Areas for the Conservation of Biodiversity" (MMA, 2006).

A formal process was then created in the new structure of the Chico Mendes Institute for Biodiversity Conservation (ICMBio), in August 2009 (process number 02070.001184/2009-73), and a technician was appointed as responsible for this process:

Gabriela Leonhardt
Chico Mendes Institute for Biodiversity Conservation/ICMBio
Coordination of Creation of Protected Areas / CCUC
e-mail: gabriela.leonhardt@icmbio.gov.br
Phone: (55)(61) 3341-9274

We are now waiting for a field visit (scheduled for January 2010) with the technician responsible for our proposal. She is expected to come to the Araripe to conduct a meeting with the signing partners responsible for the request of the creation of the fully protected area to discuss the further steps. According to ICMBio authorities, these next steps are:

1. Consolidate a "government" document based on our studies and proposals, and the information collected by the ICMBio technician during the field visit;
2. Formal consultations to the two managers of the existing federal Sustainable Use Protected Areas in the Araripe region (who are both already signing partners of our proposal);
3. Publish the proposal in the Ministry of Environment's website, including Protected Area limits and main objectives and restrictions;
4. Plan and prepare three Public Hearings, in each of the municipalities affected by the fully Protected Area, according to the law that established the National Protected Area System;
5. Prepare a preliminary text for the Decree of creation of the Protected Area, including the inputs of the Public Hearings;
6. Produce a final version of the Decree to be dispatched by the Director of creation of Protected Areas;
7. Send the Decree to be signed by the President and published in the official media.

Appendices

Appendix 1. List of acronyms and abbreviations.

Appendix 2. Official document sent to request federal government authorities to open a process to create a fully protected area in the slopes of the Araripe plateau.

Appendix 1. List of acronyms and abbreviations.

DAP	**Department of Protected Areas / Ministry of Environment**
IBAMA	**Brazilian Institute for the Environment and Renewable Natural Resources**
ICMBio	**Chico Mendes Institute for the Conservation of Biodiversity**
INCRA	**National Institute of Colonization and Land Reform**
IDACE	**Ceará State Institute of Agrarian Development**
MMA	**Brazilian Ministry of the Environment**
PA	**Protected Area**
SBF	**Secretary of Biodiversity and Forests / Ministry of Environment**
SNUC	**National System of Protected Areas**

Appendix 2. Official document sent to request federal government authorities to open a process to create a fully protected area in the slopes of the Araripe plateau.

SERVIÇO PÚBLICO FEDERAL

MINISTERIO DO MEIO AMBIENTE - MMA

INSTITUTO CHICO MENDES DE CONSERVAÇÃO DA BIODIVERSIDADE

ÁREA DE PROTEÇÃO AMBIENTAL CHAPADA DO ARARIPE – APA ARARIPE

Praça Joaquim Fernandes Teles, s/n – Pimenta – 63.105-000 – Crato/CE.

Fone/Fax (88) 3521.5138 e Fax (88) 3523.1999

Memo. Nº. 078/2008 – APA ARARIPE/ICMBio – CE. Crato, 19 de junho de 2008.

Ao: Diretor de Unidades de Conservação de Proteção Integral –DIREP/ICMBio.

Dr. Júlio Gonchorosky.

Assunto: Criação de Unidade de Proteção Integral na encosta da Chapada do Araripe.

Senhor Diretor,

A sétima Conferência das Partes da Convenção sobre Diversidade Biológica (CDB), através do seu Programa de Trabalho sobre Áreas Protegidas, teve por finalidade instar os países signatários, inclusive o Brasil, a estabelecer programas nacionais que contribuíssem para redução da taxa de perda de biodiversidade por meio da criação e manutenção de sistemas nacionais e regionais de áreas protegidas. Para implementar seu Programa de Trabalho, o Governo Brasileiro, através do Ministério do Meio Ambiente e um conjunto de organizações da sociedade civil, formulou o Plano Nacional de Áreas Protegidas (PNAP). O PNAP é o instrumento norteador de planejamento e gestão, dinâmico e flexível, que define princípios, diretrizes, objetivos e estratégias para o estabelecimento, até 2015, de um sistema abrangente de áreas protegidas, ecologicamente representativas e efetivamente manejadas, bem como para promoção de acesso e repartição justa e eqüitativa dos custos e benefícios advindos da conservação da natureza.

Desde 2006, as encostas norte-orientais da Chapada do Araripe foram classificadas pelo PNAP como uma das áreas de **importância biológica Extremamente Alta**, com **prioridade de ação Extremamente Alta**.

Esta área é internacionalmente reconhecida como Importante para Conservação das Aves (Important Bird Area, ou IBA, conforme a classificação da Birdlife International) e prioritária para conservação pela Aliança para Extinção Zero (Conservation International) devido à presença restrita do soldadinho-do-araripe (*Antilophia bokermanni*), a ave mais ameaçada de extinção global (Criticamente Em Perigo) em sua família (Pipridae) e a única ave endêmica do Ceará. Este pássaro tem reprodução condicionada à presença de cursos d'água, nas encostas norte-orientais da Chapada do Araripe, nos municípios cearenses de Crato, Barbalha e Missão Velha. São áreas de ressurgência de 47% das 348 fontes d'água de toda a Chapada do Araripe, representando 78% de sua vazão total (mais de 4.700 m3/h), um recurso natural estratégico em uma região encravada no sertão semi-árido do bioma Caatinga.

Apesar de estas encostas estarem situadas na Área de Proteção Ambiental Chapada do Araripe – APA Araripe, e Zona de Amortecimento da Floresta Nacional do Araripe, e de estarem sobrepostas a diversas modalidades de Área de Preservação Permanente (i.e., APP de aclive, topo de morro, área de reprodução de espécies ameaçadas, e de margens de córregos e nascentes), estas áreas ainda são insuficientemente protegidas, existindo degradação dos recursos hídricos e bióticos essenciais para a manutenção da qualidade de vida direta de mais de um milhão de habitantes.

Dados históricos apontam que, em cerca de um século, a vazão da principal fonte d'água desta região declinou para um quinto de sua vazão original, sobretudo devido à supressão vegetal. Esta área de aclive, sem a cobertura florestal nativa, é mais propensa a desmoronamentos, inclusive sobre áreas habitadas, podendo inclusive soterrar e suprimir as fontes.

A floresta que recobre estas encostas é considerada como um relicto de Mata Atlântica, obtendo a umidade necessária à sua manutenção devido à concentração singular de nascentes, orografia e confluência de dois sistemas de chuvas. A biodiversidade desta floresta única é submetida à pressão de caça, extração de madeira e minérios (inclusive uso insustentável de recursos hídricos), decorrente da proximidade da segunda região mais densamente povoada do Ceará, o Cariri.

O soldadinho-do-araripe, por sua dependência à conservação dos recursos hídricos, distribuição restrita, ameaça de extinção e carisma junto à sociedade local, foi adotado pela população do Cariri como uma espécie-bandeira para a conservação das águas da região. Atualmente, a Chapada do Araripe é o maior atrativo para o turismo ambiental da região, explorado de maneira ainda pouco sustentável.

A criação de uma Unidade de Conservação nestas encostas poderá ordenar o uso sustentável do mosaico de paisagens que constitui a Chapada do Araripe, estimulando a vocação natural desta região para o ecoturismo, preservando as matas úmidas de encosta que compõem o último refúgio natural global do soldadinho-do-araripe, e atendendo a

um grande anseio da sociedade local: a recuperação das nascentes degradadas e manutenção da vazão das águas a longo prazo.

A chefia da APA Chapada do Araripe, juntamente com outros parceiros aqui signatários (i.e., a Prefeitura Municipal de Crato, através de sua Secretaria de Meio Ambiente; a Companhia de Gestão de Recursos Hídricos do Ceará – COGERH, através da Gerência da Bacia do Rio Salgado; a Floresta Nacional do Araripe – FLONA Araripe; e a Associação de Pesquisa e Preservação de Ecossistemas Aquáticos – AQUASIS) já vem realizando pesquisas e ações para a conservação mais efetiva deste ambiente singularmente úmido, em meio ao semi-árido nordestino, e já possuem um cabedal de informações suficientes para justificar e embasar uma proposta de criação de Unidade de Conservação de Proteção Integral para proteção dos mananciais da Chapada do Araripe.

Nesse sentido, as instituições abaixo assinadas que compõem esta parceria, gostariam de requerer ao Instituto Chico Mendes de Conservação da Biodiversidade, através desta Diretoria, a participação de um técnico para ajudar a consolidar a proposta de criação de UC de Proteção Integral para as encostas da Chapada do Araripe, pelos motivos acima expostos. Ressaltamos que os parceiros envolvidos já possuem levantamentos de fauna, flora, mapeamentos detalhados das nascentes e vegetação remanescente de mata úmida de encosta, dentre outros, e gostariam de contar com esta Diretoria para consolidar os limites, a categoria, e os trâmites legais da referida proposta de criação de Unidade de Conservação de Proteção Integral.

Atenciosamente,

Francisco Jackson Antero de Sousa
Chefe de UC Federal II.
APA Chapada do Araripe

José Nivaldo Soares de Almeida
Secretário Municipal de Meio Ambiente
Prefeitura Municipal de Crato

José Yarlei de Brito Gonçalves
Gerente da COGERH/Crato
Companhia de Gestão de Recursos Hídricos do Ceará

Verônica Maria Figueiredo Lima
Chefe de UC Federal II
Floresta Nacional do Araripe

Alberto Alves Campos
Diretor-presidente
AQUASIS