

THE CARATINGA ALLIANCE: COMMUNITY-BASED CONSERVATION EFFORTS TO INCREASE FOREST FOR THE MURIQUIS AND WATER FOR THE FARMERS

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Abstract

The northern murequi is Critically Endangered. About 25% of the known population lives in the 1,200 ha of secondary forests of the Caratinga Biological Station (EBC) Feliciano Miguel Abdala Private Natural Heritage Reserve (RPPN-FMA) and neighboring farms. Long-term survival of the murequis there depends on an increase in the availability of suitable habitat. Widespread deforestation has depleted soil fertility and dried up the streams in the region. Community-based conservation actions were carried out: 1) to protect and restore degraded areas to increase the availability of forests for the murequis, and 2) to implement reforestation to improve the water balance vital for the regional recovery of rural production. Rural extension courses were provided for the local communities, which introduced modern production techniques to increase efficiency while decreasing environmental impacts. A new plant nursery was built and a pilot project to test forest restoration techniques was initiated.

Key Words – northern murequi, *Brachyteles hypoxanthus*, community-based conservation, restoration of degraded areas, rural capacity-building, Atlantic forest

Introduction

Socio-environmental panorama

The once-continuous Atlantic Forest in the east of the state of Minas Gerais, is now extremely fragmented. Coffee drove the conversion of enormous tracts of semi-deciduous forests, with extremely high socio-environmental costs (Dean, 1995). The northern murequi (*Brachyteles hypoxanthus*) was one of many that suffered. It is now considered one of the 25 most endangered primates in the world (Strier *et al.*, 2006a). Today, more than 230 northern murequis, or 25% of the known population, inhabit an island of about 1200 ha of secondary forest at the Estação Biológica de Caratinga / Reserva Particular de Patrimônio Natural Feliciano Miguel Abdala (EBC/RPPN-FMA) and neighboring farms. The long-term survival of this population depends on increasing the area of forest available for the murequis (Strier, 1993–1994).

Widespread deforestation and obsolete agricultural techniques have depleted soil fertility in the region and severely reduced the availability of water in the streams that run through the neighboring farms of the EBC/RPPN-FMA. Numerous people have become aware of this; most of them practicing family-based agriculture of coffee, corn, sugar cane, rice and beans. Cattle-ranching is also a common activity in the region. With soils depleted of their nutrients,

farmers turn to milk production for some income. The extensive ranching, in turn, contributes to the compacting and erosion of the remaining land that could otherwise be used for agriculture if correctly managed (IDEA, 1996).

Traditionally, the forest has been seen as an almost infinite source of timber, firewood, and game but, most importantly, as something to get rid of in order to initiate any 'real' economic activity. Deforestation was seen as the essential first step in 'developing' an area, and for centuries, the revenues provided by ecosystem services were almost entirely neglected by most of the local farmers and land owners. Today, the more aware recognize soil fertility, water maintenance and pest control as some of the most useful ecosystem services, now lost due to deforestation. Although some conservation-oriented perceptions are shared by many local people, neither murequis nor their conservation are considered a top-priority (Bueno, 2005).

As is typical of human nature, an environmental crisis is necessary before people can perceive that, instead of an obstacle, the forest can be helpful for maintaining rural production. Understanding the socio-economic and environmental contexts that influence the local communities, their lives and perspectives is essential prior to proposing any practical solutions that could reverse this dramatic panorama. Encouraging the adoption of more

sustainable-oriented production techniques may require above all a demonstration of its practicality: "seeing is believing" (Goodwin, 1998; Twyman, 2000).

Initial conservation efforts

Karen Strier's research on the northern murequi at the EBC/RPPN-FMA began in the early 1980's (Strier, 1999). The initial focus was centered on their ecology and behavior, but was gradually expanded to encompass a much wider perspective on the conservation needs of the murequi population and the forest remnants (Strier, 1999; Strier and Boubli, 2006; Strier *et al.*, 2006b). In 1988, the first local environmental NGO, *Associação Pró-Estação Biológica de Caratinga* (ApEBC), was created and became involved in a number of conservation projects and initiatives. In 1994, the ApEBC initiated its first contacts with the local communities, and worked with the *Instituto de Ecodesenvolvimento Agrícola* (IDEA) to conduct the first socio-environmental diagnosis in the region surrounding the EBC/RPPN-FMA. At the same time, ApEBC built a nursery to produce seedlings of native species to be used for the recuperation of degraded areas in the EBC/RPPN-FMA. In 2001, as an honor to the late conservationist and patriarch, Feliciano Miguel Abdala, his family decided to turn the 957-ha forest of the Fazenda Montes Claros into a Private Natural Heritage Reserve (RPPN), an officially recognized category of protected area in Brazil. A three-year floristic inventory and phenology study was begun in 2002, which served to demonstrate the botanical and ecological importance of the murequi's forest habitat (Boubli *et al.*, 2003). In 2002, the *Sociedade para a Preservação do Murequi* (SPM) was founded to manage the EBC/RPPN-FMA and propose other conservation projects to protect the northern murequi and restore its local habitat.

Murequi Conservation Project

In mid-2003, we invited the then Director of the ApEBC, the late Eduardo Veado, to collaborate on a proposal for a comprehensive conservation project. Eduardo contributed with the concepts of fencing the RPPN to protect the forest from cattle invasions and of developing a new nursery to produce seedlings for the restoration of degraded areas. The proposal was approved as a PROBIO/Brazilian Ministry of the Environment/GEF project entitled Murequi Conservation (MC). The project created a network of partnerships that included ApEBC, SPM, Conservation International's regional Brazil office (CI-Brazil), the Instituto Dríades, the Caratinga city council, and the National Rural Extension Service (*Serviço Nacional de Aprendizagem Rural*—SENAR-MG), among others. Synthesizing current information on the murequis, and the plans and measures for their conservation in Caratinga, it resulted in a proposal for community-based, grass-roots development that should work towards the common goals of both scientists/conservationists and farmers (Pontual *et al.*, 2005).

The Murequi Conservation project had four components: 1) a macroecological synthesis of the genus *Brachyteles*;

2) an in-depth study of murequi ecology; 3) the development of a community-based conservation action plan; and 4) a pilot project for the recuperation of degraded areas. In this paper, we present the preliminary results and future perspectives of the socio-environmental activities initiated or expanded in February 2004.

Methods

Conceptual tripod

Although the Murequi Conservation project was based on the experiences and knowledge gathered throughout the past two decades of conservation efforts in Caratinga, a new approach to the socio-environmental problems was proposed. This has been the adoption of three conceptual tenets upon which all our initiatives were based: 1) the need for the definition of common goals; 2) for ground-up development; and 3) for collaborative group efforts (*mutirão*). The common goals were the recuperation of degraded areas to increase the availability of habitat for the murequis and the need improve the regional water balance to support rural production. We began with free extension courses to improve rural production efficiency. Members of the local communities volunteered their support as partners in the project. Decisions were made by consensus together with the landowners involved.

Community mobilization

We initiated community mobilization by inviting the EBC/RPPN-FMA neighbors to attend free rural extension courses (Fig. 1). The courses were conducted by the Rural Extension Service (SENAR-MG), a private, rural capacity-building institution sponsored by the state of Minas Gerais Agriculture Federation, an increasingly important partner of MC. The course instructors were skilled, retired University professors that taught theoretical and practical classes totaling 40 hours per course. All students had to achieve high standards of understanding and hands-on technical abilities to be awarded the certificate for the course. Although such courses are usually offered to farmers that live closer to urban centers, our project was able to make these courses available to the isolated communities surrounding the reserve.

The MC mobilization team consisted of two local people, Antônio Bragança and Janaína Mendonça, both communicative and already well known in all the communities. The first reactions were a little skeptical but, after the first extension course was concluded, the picture changed and many participants volunteered for the following courses. The MC team designed practical exercises during the courses to show the farmers the advantages of recuperating degraded areas in protecting springs and restoring fertility to the soils. The idea was to show how habitat recovery had a direct effect on water availability, soil fertility and pest control.

Recuperation of degraded areas

The recuperation of degraded areas involved four lines of action: 1) fencing off springs and forest remnants to prevent the entry of cattle; 2) building a new plant nursery; 3) transplanting seedlings to enrich degraded areas; and

4) conducting a pilot experiment to test recuperation techniques. Fences were built with chemically treated, autoclaved, 2.2-m eucalyptus stakes, using 250 stakes/km with four lines of galvanized, smooth wire. A circle of a minimum of 40 m diameter was fenced off around the springs to

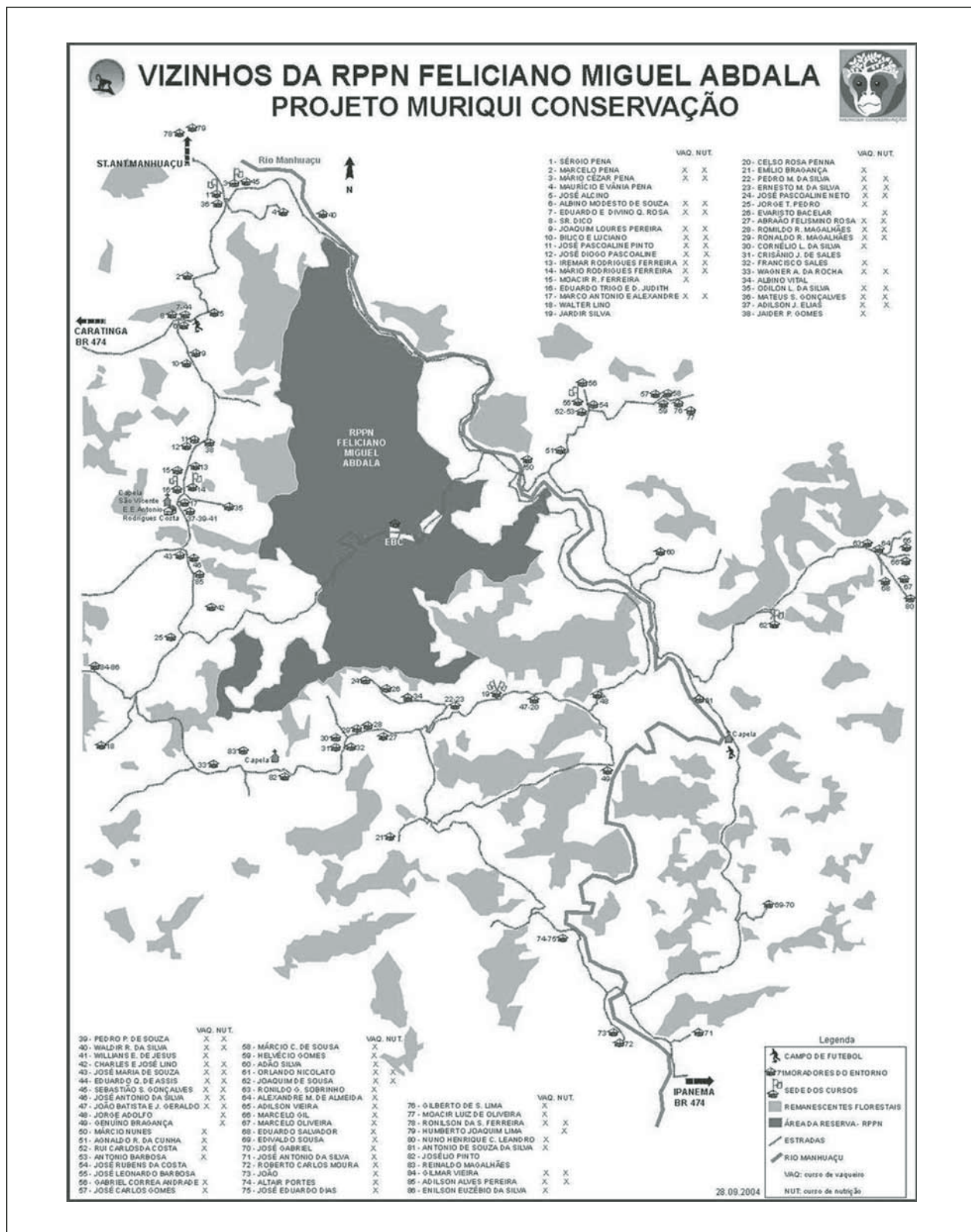


Figure 1. Map of the RPPN-FMA and its neighbors (Eduardo M. Veado, ApEBC).

protect them. The new nursery was built in an enclosure of 75 × 85 m, using gravity powered water aspersers, and natural sunlight with the appropriate shade, and fertilizer NPK 04-14-08. The estimated production was 80,000 seedlings/year. Seedlings to enrich degraded areas were planted with a 3 × 3-m spacing, using 40 × 40 × 40 cm pits prepared with 18 liters of cattle dung and 50 g of calcareous powder.

The pilot experiment was begun in an 8,400 m² fenced area to test different recuperation techniques. The area was divided into 16 plots of 21 × 25 m. The plots were arranged in four groups to test the efficiency of different recuperation techniques: 1) seedlings transplanted to high diversity islands; 2) artificial perches to encourage birds to drop forest seeds; 3) translocation of soil from the reserve, importing, as such, the forest seed bank; and 4) natural regeneration (no treatment). A fifth plot group was maintained outside the fenced area to compare the grazing and trampling effects over the other techniques of regeneration (Boubli and Strier, 2004; Pontual *et al.*, 2005).

Results and Discussion

Rural capacity building

From May 2004 to July 2005, 13 SENAR-MG courses were run for the locals with the support of a number of local partners, including the Ipanema Rural Union, and the Cooperative of Producers of Ipanema (CAPIL). The courses were varied: 11 involved rural extension (five on the fundamentals of cattle-ranching, four concerning bovine nutrition and two about artificial insemination) and two taught fabric painting techniques. In total, 184 students from 12 local communities participated, and were subsequently awarded a federally-recognized certificate for the completion of the course, issued by SENAR-MG. Following our commitment to let the locals choose their options, most of the courses requested were related to livestock management. We hoped that this would help increase productivity, while decreasing environmental impacts. Cattle-ranching may be one of the least sustainable economic activities for tropical forest regions (Belsky and Blumenthal, 1997; Fortney, 2000), but we decided it would be better to improve the efficiency of the more traditional and current production activities before suggesting the introduction of exotic alternatives (Savage, 1997). This seemed especially important after the frustrating experiences that some of the farmers had suffered in attempts at organic coffee farming (Roberto Abdala, pers. comm.). The information gathered during the courses was immediately put into practice.

The traditional concept that forest should be replaced by open areas to increase rural production was challenged from the perspective of the farmer's economics. A change in attitude was based on a "less is more" concept. In other words, local people learned that it is more productive to have fewer livestock, to feed them correctly using less pasture, providing better nutrition, and to use artificial

insemination techniques to breed animals of better quality. This ultimately will account for an increased milk production with a decrease on environmental impacts and unproductive work for the farmers. Artificial insemination may be the key for this socio-environmental improvement.

An insemination nitrogen bottle with 80 doses of high quality Frisian PO semen was donated by the Caratinga City Council to the São Vicente community. Supported by MC, two other communities, Boa Esperança and Pouso Alegre, received a commitment from the Ipanema City Council that a second insemination bottle would be donated. Also supported by MC was the training of a local Animal Health Agent, Albino Modesto de Souza, who has been visiting the communities, providing official vaccination and other animal health programs.

Protection and Recuperation

The Muriqui Conservation Project provided for the construction of 14 km of fences around the EBC/RPPN-FMA and five other properties, to protect springs and forests that were under pressure from cattle grazing. Funding limitations have impeded the protection of more areas. Many other landowners were willing to have their springs and forest remnants fenced because their water supply from the creeks had diminished, and the cattle were eating poisonous lianas in the forests causing numerous deaths and abortions.

The new nursery has produced 40,000 seedlings from 35 native species. Seeds were collected in the forest. Some 6,000 seedlings of 31 species were transplanted to enrich degraded areas around springs and forest edges. In six months of field work, 30 ha was protected and planted. The recuperation pilot project is still in progress. The growth of the seedlings is being measured every 90 days, but it is too early to report on any results.

Regional partners and alliances

Used to isolation and a lack of any official support, the communities around the EBC/RPPN-FMA would rely on their traditions to survive. Most local people are skeptical about change. The *mutirão* is a local concept commonly used to repair a broken bridge or refurbish an old chapel, for instance. Nonetheless, our invitation to join in a group effort to protect and restore degraded areas was a strange novelty, especially after we explained that brand new, highly quality fences would be built inside the partners' properties, in areas that both project staff and farmers would agree upon. Some people suspected that they would have to pay for the fences. Thus, the first protection and restoration measures were carried out in the EBC/RPPN-FMA, so as to demonstrate that there were no tricks, and to help the local people understand what MC was proposing.

When José Alcino, a local landowner, accepted the terms and became our first partner, his neighbors told him he was unwise to trust us. They were sure that, after fencing his spring and forested border, we would take his land

from him. However, after a couple of extension courses many farmers offered their land to be the next recipients of MC fences. Of the 47 neighboring properties of the EBC/RPPN-FMA, 45 declared themselves our partners, although only a small number actually received any fence or seedlings due to funding limitations.

On 27 August 2005, the *I Festival do Muriqui* took place in Santo Antônio, the closest town to the EBC/RPPN-FMA. The festival was organized by local people and MC staff as a celebration of the *mutirão*. During three days of festivities, there were regional music shows, horse parades, and a barbecue, with the participation of more than 8,000 people from the region. For a more select group, the highlight was the formal ceremony in which local authorities and community representatives gave the 184 course conclusion certificates to the people that attended the extension courses. All were invited to receive the diploma, issued by SENAR-MG, in front of thousands of witnesses.

The Muriqui Conservation (MC) is working on further proposals to continue the program for the protection and recuperation of degraded areas. Twenty landowners have signed legal documents attesting that they were willing partners in providing for the conservation and recovery of the Areas of Permanent Protection (forest on steep slopes and along water courses) on their properties as they should according to Brazilian environmental law. The activities of the MC brought new insights and perspectives to the local communities, and they became real partners. Isolation and lack of training has been gradually replaced by dignity and recognition. An alliance between conservationists and the EBC/RPPN-FMA neighbors has been initiated to work for a more sustainable future for the muriquis and the local communities (Pontual *et al.*, 2006).

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