CREATION OF A CENTER FOR FIELD BIOLOGY, CONSERVATION, AND EDUCATION IN THE SOUTHERN BRAZILIAN ATLANTIC FOREST:

Principal Investigator
Mauricio Talebi Gomes, PhD
Pró-Muriqui Association,
Parque Estadual Carlos Botelho, Caixa Postal 37,
São Miguel Arcanjo, SP, CEP 18230-000, Brazil
Phone: +55 11 8433 0322 / +55 11 5595 8893
E-mail: talebi@promuriqui.org.br
Web: www.promuriqui.org.br

Basic Project Information
Flagship Species: Southern muriqui, the Woolly Spider Monkey, *Brachyteles arachnoides*
Project Location: Parque Estadual Carlos Botelho, World Heritage Site “The Southeast Reserves of Brazilian Atlantic Forest”, São Paulo State, Brazil
Location Habitat: Pristine Brazilian Atlantic Forest
Group: Order Primates; Family Atelidae; Subfamily Atelinae; Tribe Atelini
IUCN/SSC 2004 Red List Species Categorization: EN C2a(i)
## CONTENTS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>3</td>
</tr>
<tr>
<td>THE HABITAT – THE BRAZILIAN ATLANTIC FOREST</td>
<td>4</td>
</tr>
<tr>
<td>CONSERVATION OF THE MURIQUI AND OTHER SPECIES</td>
<td>8</td>
</tr>
<tr>
<td>LAND TO BE ACQUIRED</td>
<td>10</td>
</tr>
<tr>
<td>COSTS OF THE PROJECT</td>
<td>12</td>
</tr>
<tr>
<td>LITERATURE CITED</td>
<td>13</td>
</tr>
</tbody>
</table>

### APPENDIX 1. THE MURIQUI AND THE PRÓ-MURIQUI ASSOCIATION

The Flagship Species – Southern Muriqui (*Brachyteles arachnoides*) 1

Publications about Southern Muriquis by the Pró-Muriqui Association 3

Information about Pró-Muriqui Association 6

Curriculum vitae, Mauricio Talebi Gomes, Ph.D., Project director 9

### APPENDIX 2. RESEARCH PROJECTS OF PRÓ-MURIQUI ASSOCIATION

Projects undertaken 1

Projects in progress 2

### APPENDIX 3. EDUCATIONAL PROGRAM OF PRÓ-MURIQUI ASSOCIATION

Environmental Education for Schools 1

Ecotourism 2

Timeline 3

### APPENDIX 4. ADDITIONAL INFORMATION

Views of small parcel 1

Additional Information about Carlos Botelho State Park 2
This proposal requests financial support for acquiring two pieces of forested land in the Brazilian Atlantic Forest. The Atlantic Forest of South America is one of the five leading biodiversity hotspots in the world. It is considered to be more complex and with higher species diversity than most of the Amazonian forests in South America. Within the remaining areas of the Atlantic forest, the best preserved regions are found in the steep inland mountains of the state of São Paulo in Brazil. A key protected area in this ecological region is a state park, the Parque Estadual Carlos Botelho (Parque ECB) that is home to the endangered southern woolly spider monkey, or southern muriqui (*Brachyteles arachnoides*). Parque ECB also shelters other endangered and vulnerable species, including jaguars, giant otters, and purple-headed parrots, as well as more common primates and an impressive diversity of plants and animals. Many species still have not been adequately surveyed because of the rugged and inaccessible nature of the mountainous terrain.

Two parcels of forested land adjacent to the protected areas of the park are for sale. A small parcel of 7.2 hectares (17.8 acres; 1ha = 2.47 acres) is located near the entrance of the park and is especially suitable for a field station with communication, laboratory, and data analysis facilities. This facility will also have lodging for project staff and for visiting scientists studying the ecology of the native flora and fauna. The small parcel is within 800 meters of the muriqui home range, and a foot trail will be established connecting to the network of research trails so that researchers can access the study area without needing to use a motor vehicle. A down payment has been made to secure this parcel, but US$ 25,356 must be raised to complete the payments for it (12,678 by late February and 12,678 by late April).

A large parcel of at least 303 hectares (749 acres) overlaps the home range of a group of habituated muriquis that have been under study for 20 years. Acquisition of this parcel is critical to protect the muriqui from development of the land and potential disruption of the normal behavior of the animals. This is an immediate concern, because this land is strategically located in the main area recently chosen for a Regional State Ecotourism Program, launched in 2005 by the São Paulo State Government with support from the Inter-American Bank of Development (IBD). Consequently, real estate speculation is occurring due to anticipated demand for basic infrastructure for tourism such as restaurants and eco-lodges. Discussions with the owner of the large parcel have begun, and funds to purchase this critical muriqui habitat are needed.

This project is a partnership between a Brazilian non-governmental organization, the Pró-Muriqui Association, and the Foundation for Comparative and Conservation Biology (FCCB), which has a special interest in conservation of primates and their habitats. Donors in the United States can make tax-deductible contributions to FCCB, which conveys funds for field projects without any administrative (or other) charges. 100% of the contribution goes to the project.

Pró-Muriqui works with non-governmental and public organizations, governments, businesses, academic institutions and local communities to enhance conservation research activities in the habitat of the southern muriquis. A volunteer-based internship program has been developed over the last four years and provides training in field ecology and field primatology techniques to undergraduate and graduate students. Pró-Muriqui will hold title to the land with appropriate legal conservation provisions.

Muriquis have great appeal for conservation. They are charismatic animals, and are the largest Neotropical primate species and the largest endemic mammal of Brazil, considered a key-flagship species for the Brazilian Atlantic Forest. The fact that the largest urban settlement of Latin America, São Paulo is less than 200 kilometers from the largest known population of one of the most threatened primates in the world creates a special opportunity for conservation education. Thus, beyond saving two areas of continuous Brazilian Atlantic Forest, this project will enable scientists and educators to work within an integrated conservation research and education strategy. This strategy will be the first of its kind with muriquis in Brazil, integrating science and education to conserve the extraordinary biodiversity of the Brazilian Atlantic Forest.
Southern Muriquis (*Brachyteles arachnoides*) or Woolly Spider Monkeys
THE HABITAT – THE BRAZILIAN ATLANTIC FOREST

The Atlantic Forest South-East Reserves, in the states of Paraná and São Paulo, contain some of the best and most extensive examples of Atlantic forest in Brazil. These areas comprise the World Heritage Site Southeast Reserves of Brazilian Atlantic Forest (UNESCO, 1999) and display the biological wealth and evolutionary history of the last remaining Atlantic forests. From mountains covered by dense forests, down to wetlands and coastal islands with isolated mountains and dunes, this area comprises a rich, natural environment of great scenic beauty.

The Atlantic Forest

The Atlantic Forest is one of the five leading biodiversity hotspots in the world. It is considered to be more complex and with higher species diversity than most of the Amazonian forests in South America. Separated from the vast Amazon Basin by huge savanna scrublands, the isolated Atlantic ecosystem runs along the coast from the eastern tip of South America in Brazil, to the northern regions of Argentina. The forest has a unique mix of vegetation and forest types determined by altitude: the lowland forests – a narrow strip of about 50-100 km along the coastal plains which covers about 20% of the region; the montane forest – extending as far as 500-600km inland and as high as 2000m above sea level; and the high altitude grassland.

The Brazilian Atlantic Forest

Brazil covers about 5% of the Earth’s land area yet harbors an estimated 17% of global biodiversity (Mittermeier et al., 1998). Brazil’s Atlantic Forest accounts for at least 2% of the world’s total species of endemic (occurring nowhere else) plants and vertebrates and extends relatively parallel to the coast, from the Rio Grande do Norte to the Rio Grande do Sul. However, Brazil’s Atlantic Forest has been severely reduced (Myers et al., 2000). The eastern seaboard has always been a focus of Brazil’s population and industry. Today, it accounts for 75% of Brazil’s population and 70% of its industrial production. Consequently, due to extensive forest clearance, only 7.5% of the primary vegetation of the Brazilian Atlantic Forest remains, comprising 78,300 km² of primary and secondary forest (Fig. 1, next page).

Despite this severe fragmentation the Brazilian Atlantic Forest has retained a higher species diversity than most Amazon forests of South America (CBSG, 1998), harboring thousands of different plant and animal species. Of its 20,000 types of higher plants, 30% do not occur anywhere else (Mittermeier et al., 2003) and species diversity is very high. For example, 450 different species of trees were recorded in a 2.5-acre plot, the highest plant diversity recorded yet anywhere in the world (da Fonseca et al., 2002). It harbors 252 species of mammals. Comparatively, the Amazonian Basin contains 353 species. Thus, high levels of diversity and exclusive species (endemisms) per unit area combined with the fact that little of the forest remains, underlies the great global importance of this region (Mittermeier et al., 1998; Myers et al., 2000).

Within the remaining areas of the Atlantic forest, the best preserved areas are found in the steep inland mountains of São Paulo State. These forests run parallel to the coast line and inland at the southern areas. Most of these forest areas are under official protection of the State Park system (Forestry Institute, São Paulo State) (Morellato and Haddad, 2000). The largest continuous expanse of untouched (pristine) forest is found in an area comprising of 140,000 ha: The Paranapiacaba Ecological Continuum (PEC). Its biological importance is recognized and decreed as “The Brazilian South-eastern Atlantic Forest Reserves World Heritage Site” (UNESCO, 1999) (Figure 2 and 3).
Figure 1: Original and remaining areas of Brazilian Atlantic forest, and the location of São Paulo State.

Figure 2: Original and remaining areas of Atlantic forest within the São Paulo State and the location of the Paranapiacaba Ecological Continuum (World Heritage Site Southeast Atlantic Forest Reserves).
The Study Site – Parque Estadual Carlos Botelho (Parque ECB)

Parque Estadual Carlos Botelho (Parque ECB) (37,432 ha) is located in the biologically important Paranapiacaba Ecological Continuum (Figure 3), in the southern region of São Paulo State, south-eastern Brazil (24°44’-15’S; 47°-46’-10’W) and is bordered by the municipalities of São Miguel Arcanjo, Capao Bonito, Sete Barras and Tapirai. It is located along the Atlantic Escarpment, on the Paranapiacaba Hill which contains the headwaters of the Paranapanema River and is divided by the Ribeira Valley and Paulista Plateau. Altitude ranges from 30-1,003 metres above sea level (See Talebi et al., 2005). See Appendix 4 for more information on geology and climate.

The vegetation is typical of Tropical Atlantic rainforest and characterized as dense broad-leaved sub-montane forest (Custódio-Filho et al., 1992), with primary continuous coverage adapted to relatively stable conditions of precipitation and humidity throughout the year (Pacagnella, 1985; de Moraes et al., 1998). Outstandingly, the Parque Estadual Carlos Botelho contains 2/3 of the last 1% remnant (783 Km²) of pristine primitive forest of the entire ecosystem in Brazil (Talebi, 2003), with high richness and diversity of flora and fauna species (Custódio-Filho et al., 1992). In a similar, neighboring forest to Parque ECB, 55 families, 114 genera and 190 plant species were recorded. The most predominant plant families were Myrtaceae, Lauraceae and Leguminosae Families (Petroni, 2000). In addition, the highest index for species

**Figure 3**: Landsat image to show the position of Parque ECB (PECB) within the Paranapiacaba Ecological Continuum and the position of muriqui populations currently under study. (The white arrow indicates the location of the long-term study-group of the Pró-Muriqui Association. PEI, PETAR and Xitue are the additional protected areas that compose the Paranapiacaba Ecological Continuum.)
diversity for all São Paulo State was found in this area, thus indicating a high floristic heterogeneity for this continuous areas of Atlantic Forest (Petroni, 1993, 2000; Talebi, 2005).

The importance of these areas for fauna is unique in Brazil. Parque ECB is a natural shelter for the Atlantic Forest fauna and its diversity levels remain among the highest registered in the country (Beisiegel and Ades, 2004) (Mittermeier et al., 1998; Myers et al., 2000). This is due to the undisturbed forest conditions, its large extension and the high altitudinal gradient that supports the existence of both low and high altitude forests. In addition, the diverse topography contains several long streams, creating a diversified mosaic of micro-habitats.

CONSERVATION OF THE MURIQUI

The Committee for the Conservation and Management of the Muriqui (CCMM), is a consultancy workgroup of specialists composed of public authorities, the scientific community and conservation agencies. It was established in 2002, to coordinate priorities for federal policies related to muriqui research and preservation. The principal investigator of the Pró-Muriqui Association, is the representative member for São Paulo State within this workgroup. The CCMM is expected to provide guidelines and the technical basis for the legislation towards the preservation of the Brachyteles species. Recently the CCMM established that a regional species approach to muriqui conservation is required, since there is variation between populations in their respective habitats. The CCMM recognized two top national priorities for muriqui research in Brazil: the Estação Biológica de Caratinga in Minas Gerais State (EBC) with the northern muriquis, and the long-term research activities of Pró-Muriqui Association at Parque Estadual Carlos Botelho (Parque ECB), with the southern muriquis. Recently however, the CCMM has identified critical actions and approaches that have remained unaccomplished for both species. These include:

- To update the conservation status of both northern and southern muriquis by the execution of a survey of remnant populations, mapping the complete geographic distributions of the 2 species.
- To reinforce the muriqui as a flagship species and improve environmental conservation awareness at the local, regional and national levels; 
- To improve the level of qualified human resources required to address the critical questions concerning muriqui conservation research.

The importance of Parque ECB for muriqui conservation

- The Parque ECB is within the most important remnant of continuous Brazilian Atlantic Forest (Paranapiacaba Ecological Continuum), representing an area of highest biological significance.
- It harbors the largest known population of southern muriquis: estimated to be 500-800 individuals (Paccagnella, 1985) and therefore represents a vital area for the long-term viability of the Brachyteles genus. Studies of muriqui populations inhabiting pristine, ‘natural’ environments are vital to complement studies in fragmented forests, to understand the genus’ behavioural ecology and the parameters affecting its viability.

The Muriqui as a flagship species for the Brazilian Atlantic forest

The muriqui has great potential as a flagship species for the conservation of Brazilian Atlantic Forest, for the following reasons:
- It is found only in the Brazilian Atlantic Forest.
- It is a charismatic species being the largest neotropical primate and living in a peaceful social organization.
- The muriqui habitat is relatively accessible to the public, including school children, and a robust environmental education program can be conducted in relation to the Brazilian Atlantic Forest.
With the muriqui as a flagship species, other forest species would also benefit from conservation activities. These include the following species under pressure for survival:

**Endangered**

**Vulnerable**

**Other important species**
Brown capuchin (*Cebus apella*, PRIMATES)
Hawk-Eagle (*Spizaetus tyrannus*, ACCIPITRIDAE)
Brown howler monkey (*Alouatta fusca*, PRIMATES)
Brazilian Tapir (*Tapirus terrestris*, TAPIRIDAE)

The Brazilian Atlantic Forest has lacked basic assessment studies and detailed data on species occurrence. As more detailed fauna surveys are conducted, it is likely that other species of conservation concern will soon be listed, especially birds and amphibians.

**Southern Muriqui Research at Parque ECB (2005)**

Two groups of wild muriquis fully habituated to humans are under study within an area of approximately 2000 ha. Behavioral ecology data are collected on a daily-basis. The Pró-Muriqui Association has established an extensive 210 km trail system to enable comprehensive data collection. A large majority of the 7,500 feeding trees, 450 phenology trees, day foraging routes and sleeping sites have been located using a global positioning system. The rhythms of plant production (phenology) of the key diet items are monitored on a monthly basis and diet samples are investigated for chemical (nutritional and secondary compounds) and physical (toughness and color) properties. See Appendix 1 for more information on the muriqui, and the Pró-Muriqui Association. See Appendix 2 for details on specific research topics.

**Conservation Objectives**

The conservation objectives of this proposal are:

1. Acquire two areas of Brazilian Atlantic Forest, a small parcel to establish a field research and education center, and a larger parcel to conserve a pristine area of forest and protect the home range of the endangered muriqui. The field research station will provide housing for scientists and educators, collection facilities for biological samples and data processing facilities. In addition, instructional activities will be conducted from these facilities. If resources permit, an ancillary station will be established in the large parcel to facilitate access to the other end of the muriqui home range.

2. Utilize the new facilities to expand conservation awareness of the southern muriqui (*Brachyteles arachnoides*) and its habitat by conducting environmental education programs. This will include training for biology teachers to prepare for field excursions for school children. The other component will consist of scientific ecotourism for the public and for selected students. For further details, see Appendix 3.

3. To implement the Muriqui Flagship Species Research Program. The groundwork for this program to gain broad public support for conservation of the Atlantic Forest has been established with officers of the Forestry Institute of São Paulo State.
LAND TO BE ACQUIRED

The relationship between the land to be acquired, the park, and the home ranges of the muriqui troops is illustrated in Fig. 4.

Figure 4. Aerial view showing Small Parcel (top left) and Large Parcel (center) in relation to the home ranges of the southern muriqui research study groups (Group 1, light pink line and Group 2, light blue line). State road SP139 (alternating red and black dashes) runs north-south through the park. The small parcel is between this road and the park. (An enlarged view of the small parcel and its location relative to the park entrance is shown in Fig. 5.) The boundary between the park and the private land to its west is irregular and follows the courses of small rivers and streams. The large parcel of private land that is for sale is bounded
on the west by the state road and on the south (solid red straight line) by other private land. Its northern and eastern borders (indicated at several points by white triangles) abut muriqui home ranges or overlap them (white asterisk). Light green wiggly lines within the private land enclose regions of forest that are estimated to be sufficiently mature to provide habitat for muriquis.

The 7.2 hectare (17.8 acre) small parcel intended for the field station is outside the park but adjacent to its boundary. The research station and the resource center will train field researchers and environmental educators within the last continuous remnant of Brazilian Atlantic Forest. The small parcel is located less than 300 meters from the Parque ECB entrance and only 800 meters from the extensive trail system where research on the southern muriqui is being conducted. It is strategically placed for easy access to the paved state road for motor vehicles, and a walking trail will be added to provide access to the trails within the home range of the muriqui for field workers.

The 303 hectare (749 acres) large parcel overlapping the muriqui home range is adjacent to the park on three sides and is next to the road passing through the park. Muriqui Group 1 is fully habituated to human observers and has been under study for 20 years. This group has been observed to cross into the private land many times, and the full extent of its use of the land is clearly greater than the map indicates. Field workers do not have permission or protection to go onto private land to track the monkeys, but local people in the area have reported sighting muriquis in additional locations. Acquisition of this land is important to protect the monkeys and to preserve habitat that they have utilized for many years.

**Current status of the land.**

The small parcel being purchased is shown in more detail in Fig. 5. A larger holding was subdivided into 4 portions, and portions C and D together constitute the small parcel being purchased by Pró-Muriqui, with the assistance of the Foundation for Comparative & Conservation Biology (FCCB). A down payment has been made, and this proposal seeks to secure the balance of the price as described later.

![Figure 5. Aerial view of the small parcel. The area for sale is indicated by the letters C and D. Photos inside the area are shown in Appendix 4. Small streams indicated by the light blue thin line form most of the eastern boundary of parcel D, as well as the boundary between all subdivisions of the private land and the park (arrows). Neighboring areas that have been clear cut are visible.](image)
Future status of the land

After the land has been purchased, the status of the land will be changed to a “Private Reserve of Natural Inheritance” (RPPN) under stewardship of the Pró-Muriqui Association. This legal status will allow the protection of these lands under Brazilian law for the next 100 years. In administrative terms, this means that the land will be part of the patrimony of the Pró-Muriqui organization, and thus under the guidance of the collective decisions of the Board of Directors of the Pró-Muriqui Association.

COSTS OF THE PROJECT:

Small Parcel, Total area 7.2 ha.

Total price = R$ 80,000 (Eighty thousand Brazilian Real) or US$ 36,223 (Thirty six thousand, two hundred and twenty and three American dollars at 12/04/2005, rate of 0.4528 BR for each US$)
Down payment of US$ 10,887 has been made.

Large Parcel, Total Area: 302.4 ha

Price and purchase timetable to be negotiated. More details will be posted on the CIS website as they become available. http://www.primate.wisc.edu/pin/cis/

Field Station

Estimated cost: US$ 50,000-80,000, money to be raised once the land is secured.

FINANCIAL CONTRIBUTIONS TO THIS PROJECT

Financial contributions to secure the parcels of land are needed as quickly as possible. Individuals in the United States can make tax-deductible contributions to Project Muriqui through the Foundation for Comparative and Conservation Biology (FCCB), which conveys funds for field projects without any administrative (or other) charges. 100% of the contribution goes to the project. Please contact:

Joseph M Erwin, PhD
Executive Director
Foundation for Comparative & Conservation Biology
4139 Gem Bridge Road
Needmore, PA 17238
717-573-2081
jerwin@agingapes.org
www.agingapes.org

Foundations or other institutions can also contact Dr. Talebi in Brazil (title page), or

Dr. Max Snodderly
Director, Conservation Information Service
841 River Bluff Road
North Augusta, SC, 29841
msnodderly@mcg.edu
LITERATURE CITED


