

Teacher Training for Conservation of the Golden Lion Tamarin (*Leontopithecus rosalia*) and the Atlantic Forest in Brazil

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Figure 1. The occurrence of the golden lion tamarin (*Leontopithecus rosalia*) in the state of Rio de Janeiro, Brazil.

TEACHER TRAINING FOR CONSERVATION OF THE GOLDEN LION TAMARIN (*LEONTOPITHECUS ROSALIA*) AND THE ATLANTIC FOREST IN BRAZIL

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Introduction

The Atlantic Forest is one of Brazil's most threatened ecosystems, ranking among the world's top five biodiversity "hotspots" (Mittermeier *et al.*, 1999). Today less than 8% of the original forest remains (Fundação SOS Mata Atlântica / INPE, 1998). Among the countless species affected by this extreme habitat fragmentation is the golden lion tamarin (*Leontopithecus rosalia*), an Endangered primate endemic to the coastal lowland forest of the state of Rio de Janeiro.

The range of *L. rosalia* is now restricted to a few forest remnants in the region. According to Kierulff and Procópio de Oliveira (1996), the species occurs in only seven municipalities: Armação dos Búzios, Cabo Frio, Casimiro de Abreu, Rio Bonito, Rio das Ostras, Saquarema and Silva Jardim (Fig. 1). Together these municipalities cover an area of 2,916,631 km²; their total human population is approximately 327,000, served by 247 municipal schools (IBGE, 2000). The local economy is based on agriculture, livestock, commerce and tourism.

Two biological reserves protect the golden lion tamarin: Poço das Antas Biological Reserve and União Biological Reserve, both administered by IBAMA, the Brazilian Institute of the Environment and Renewable Natural Resources. Poço das Antas, located in Silva Jardim, is the largest remaining fragment of golden lion tamarin habitat.

The Golden Lion Tamarin Association (*Associação Mico-Leão-Dourado* – AMLD), a Brazilian non-governmental organization, coordinates a multidisciplinary program to conserve a viable population of golden lion tamarins in their natural habitat. AMLD's strategy includes monitoring all known populations of golden lion tamarins; working with landowners to protect smaller forest fragments for reintroduction of zoo-born family groups; and the implementation of forest corridors connecting these fragments. Both research and community involvement are essential to guarantee the long-term conservation of threatened ecosystems and species (Dietz and Nagagata, 1995; Padua *et al.*, 2002).

The AMLD recognizes that support and involvement from local communities will be essential for the successful implementation of any conservation strategy. We use environmental education to stimulate the local population to become more aware and active in all aspects of forest conservation. The AMLD coordinates environmental education efforts in Poço das Antas Biological Reserve and the surrounding communities.

Methods

The long-term training program started in June 2003 and ended in December 2004 with the participation of 25 teachers from 14 schools in Silva Jardim. The training program began with the basics of the Atlantic Forest: physical characteristics of the forest, native flora and fauna, threats and conservation actions. The activities included presentations by researchers that conduct research in the area, field projects in the forest (Fig. 2), and suggestions on how teachers could carry out similar projects with their students in forest fragments in their region.

After each topic was explored, each teacher planned his or her own project to integrate these concepts and community conservation actions into his or her curriculum. We encouraged the teachers to plan activities according to the characteristics of their school, community, students' level, and their teaching interest. As the program developed, the



Figure 2. Field activity on the soil types of the Atlantic Forest.

teachers presented the activities they carried out in their schools and the results they obtained, and incorporated the feedback they received into subsequent activities.

Results

Out of the original 25 participants, 17 teachers from ten schools completed the entire program, consisting of ten workshops and one seminar. These teachers developed and presented to their students more than 80 study units on the themes of the workshops—native plants and animals, threats, water resources, and conservation actions—integrating subjects such as art, biology, mathematics and Portuguese.

The teachers worked on many conservation-themed activities with their students, including drawing, posters, poetry, music, games, writing projects, interviews, exhibits, history projects, and activities in the field. More than 90% of the teachers began conducting field exercises in nearby forests after the second workshop, helping to improve their students' awareness and appreciation of the local environment. Similarly, these activities helped enhance the teachers' appreciation of the importance of conserving the Atlantic Forest, as well as the local problems that affect the forest and animals such as the golden lion tamarins.

The core group of teachers participated in all decisions relating to the project. They also collaborated in the production of a 2004 calendar produced by the AMLD, intended to highlight the training program; the calendar incorporated 15 drawings about the Atlantic Forest created by the teachers' students. In addition, the teachers helped with the organization of the First Environmental Education Workshop in Silva Jardim, a one-day seminar featuring posters, presentations and mini-courses. The teachers assisted in the planning of the workshop and presented classes to the workshop participants, who included 180 educators from 60 institutions from the seven municipalities where the golden lion tamarin is found. It was an important event in

the region to promote a better understanding of the role of education for the Atlantic Forest and for the conservation of golden lion tamarins.

The training program provided an opportunity for the teachers to try new ideas and teaching methodologies, to evaluate the results, and to share their experiences with the wider community. As a result of this first training program, the Public Departments of Education and Environment of the municipality of Silva Jardim signed an agreement with the AMLD to support the teacher training program and provide financial resources. In addition, the Department of the Environment started its own teacher training project in 2003, based on the official environmental curriculum recommended by the Brazilian Ministry of Education. As this curriculum does not specifically focus on the Atlantic Forest, the Department of the Environment invited the AMLD to participate in these courses, by presenting talks on the local Atlantic Forest habitat and field activities at the Poço das Antas Biological Reserve. This initiative by Silva Jardim is a valuable complement to our efforts to build the capacity of local teachers of Silva Jardim, as—owing to financial limitations—the AMLD teacher training project is only able to train 25 teachers per year.

Conclusions

Support and involvement from the local communities will always be essential for the successful implementation of conservation strategies for the Atlantic Forest and the golden lion tamarin. The AMLD teacher training program has demonstrated its ability to improve awareness of this threatened ecosystem and its flagship primate species, and is important to achieving sustained public support for conservation in the region.

The participation of the teachers in all project decisions is essential to establish a cooperative relationship and responsibility for the project. When each teacher can plan the content and methods used in his or her own project, he or she feels more responsible and invests more time and resources into it.

The partnership between the AMLD and the Public Departments of Education and Environment of the municipality of Silva Jardim has been crucial to guaranteeing the long-term success of our education project in that municipality. This is the model we intend to follow when establishing partnerships aimed at long-term implementation of environmental education in the schools of the seven municipalities where golden lion tamarins still survive.

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