

Golden Lion Tamarin (GLT; *Leontopithecus rosalia*) The Strategic Plan for Species Conservation 2016-2025 2019 Annual Progress Report



Associação Mico-Leão-Dourado (AMLD) is a Brazilian non-governmental organization founded in 1992 to keep GLTs from extinction

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Save the Golden Lion Tamarin (SGLT) is a United States public charity created in 2005 to provide technical and financial support for AMLD's conservation work

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Photo: Andreia Martins/ AMLD



GLT adult and new infant

Photo: Luiz Thiago de Jesus/ AMLD



Forest corridor planted by AMLD in 2006, now mature forest

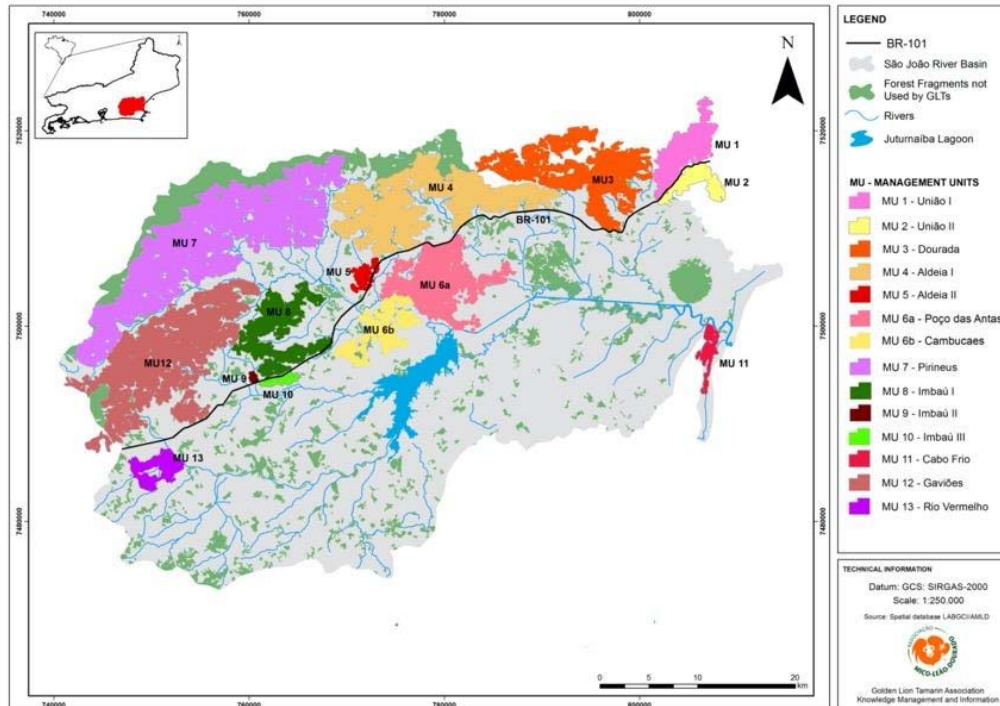
About Golden Lion Tamarins and their forest habitat

In the 1970s, only 200 GLTs were thought to exist in the wild. This tiny red-gold monkey once occurred throughout coastal Rio de Janeiro state in Brazil. Centuries of deforestation reduced GLT habitat (lowland Atlantic coastal forest) by 98%. Now, all remaining GLT habitat is located in the São João and Macaé river basins in the state of Rio de Janeiro, about 80km from the Rio de Janeiro metropolitan area. Deforestation no longer occurs, but remaining forest is fragmented into isolated islands separated by towns and cattle pasture. None of these fragments is large enough to support a viable population of GLTs.

Today, threats that prevent the reconnection of forest fragments include the conversion of forest and pasture to weekend homes and commercial development, as well as highways and other infrastructure. A new and unprecedented threat, yellow fever, reduced the GLT population by 32%.

Our Strategic Plan 2016-2025

In 2015, AMLD and partners developed a 10-year strategic plan to secure at least one viable population of GLTs¹, which we express as 2,000 GLTs in 25,000 hectares of protected and connected forest. Our work focuses on the 14 largest remaining habitat fragments, which we call Management Units – MUs. We are planting native trees to connect these MUs to allow GLTs to cross to find unrelated mates, and we are working with public and private landowners to assure maintenance of this forest in perpetuity. We monitor the GLTs in these MUs to evaluate progress of our actions, detect new threats and find ways to reduce their impact.



The geographic distribution of golden lion tamarins, 14 forest fragments located in the São João and Macaé river basins, Rio de Janeiro state, Brazil.

¹ 98% retention of genetic diversity and 0% probability of extinction over 100yrs as determined by Vortex computer modeling.

I. AN OVERVIEW OF PROGRESS IN ACHIEVING OUR GOAL: 2,000 GLTS IN 25,000HA OF CONNECTED AND PROTECTED ATLANTIC FOREST

In 2019, AMLD made significant progress in keeping golden lion tamarins (GLTs) from extinction in Brazil's Atlantic Forest. Three events brought AMLD closer to achieving its conservation goal:

1. AMLD moved its headquarters from Poço das Antas Reserve, its home for 3 decades, to newly refurbished/repurposed buildings at Igarapé Farm (aka the GLT Ecopark) -- just in time to celebrate its inauguration on August 2nd, GLT Day in Brazil (Strategy 10).
2. Reforestation of the 100ha of cattle pasture at the Ecopark is well underway and will be completed in 2020 (Strategy 4).
3. Wildlife passageways are being installed by the highway construction company at several locations over/under BR101 highway. Construction of the forested wildlife bridge between Poço das Antas and the GLT Ecopark is in progress and should be completed early in 2020 (Strategy 6).

In contrast with this good news, yellow fever continues to be a serious threat to GLT survival (Strategy 12). Although AMLD's monitoring did not detect additional GLT mortality due to yellow fever in 2019 (Strategy 1), yellow fever was reported in states north and south of Rio de Janeiro. The results of AMLD's survey to quantify GLT losses to yellow fever in 2018, a 32% reduction overall, are available here: [Nature Scientific Reports 2019](#).

Strategy 00. Monitoring progress in achieving our conservation goals

In 2019, AMLD researchers published results of their 2014 baseline survey of GLT numbers, available here: [PLOS One 2019](#). Following are 2019 estimates of our viability indicators (number of GLTs and amount of connected and protected habitat) compared with numbers from the 2014 survey.

- Available forest in our geographic scope: 49,159ha
- Number of GLTs: ca. 2,500, down from 3,700
- Forest protected in parks, biological & private reserves: 29,548ha
- Largest block of connected forest: 15,240ha, desired status = 25,000ha
- Number of GLTs in the largest block of connected forest: 1,158
- Current status in terms of our 2025 goal: 284 GLTs in the largest block of connected and protected forest, 6,841ha

The following sections summarize 2019 progress in activities, objectives and adaptations for each of 12 strategies designed to achieve our 10-year goals.

II. STRATEGIES TO RESTORE GLT POPULATIONS TO VIABILITY



Strategy 1. GLT Metapopulation monitoring and management

This strategy addresses three important needs: scientific management of small and isolated GLT populations, collection of information on GLT biology that guides our conservation work and informs about our progress, and detection and reaction to potential threats to the GLT population, including yellow fever. AMLD's Metapopulation Management Team confirmed the compositions of 15-17 GLT groups at weekly intervals in 4-5 locations, and noted threats such as fire, hunters, deforestation, and sick or injured GLTs. Starting in October, offspring were seen in all monitored groups and several non-monitored groups. One group produced triplets, and a group with two reproductive females produced two sets of twins.

Strategy 12. Emergency plan to reduce effects of epidemic disease in the GLT population

During the first quarter of 2018, 10 of the GLT groups monitored by AMLD disappeared. Laboratory analyses by AMLD partners determined that yellow fever was the likely cause. AMLD immediately implemented actions in its strategy to reduce the effects of epidemic disease on the GLT populations. In a survey throughout the species' range, AMLD found a 32% reduction in GLT numbers – down from ca. 3700 to 2500. Details are available here: [AMLD Nature Scientific Reports 2019](#). The GLT population in Poço das Antas, now about 32 individuals (down from 380), is in immediate danger of inbreeding and local extinction. AMLD is waiting on federal permits to vaccinate GLTs to repopulate this reserve.

Strategy 11. Integrate management of the ex situ and in situ GLT populations

This strategy aims to improve the flow of information and support among the 159 zoos holding GLTs worldwide, zoo associations in 4 regions (Europe, North America, Australia and Brazil), ICMBio and AMLD. In 2019, SGLT coordinated strategic planning for this strategy in Brazil. AMLD and SGLT produced reports, videos, educational materials and social media posts as well as presentations at zoo events. The number of zoos providing financial support for GLT in-situ conservation: North America 12; Australia 1; Europe 5. The number of zoos providing technical support for GLT in-situ conservation: North America 4; Brazil 1; Europe 2.

III. STRATEGIES TO CONNECT FOREST FRAGMENTS AND PERMANENTLY MAINTAIN FOREST COVER

Photos: Carlos Alvarenga/ AMLD



Igarapé Farm hillside pasture, October 2018, and March 2020, following reforestation by AMLD

Strategy 4. Forest restoration

The objectives of this strategy are to restore connections between isolated forest fragments and to increase the amount of habitat available to GLTs, thereby contributing directly to AMLD’s conservation goals. All forest planting this year took place in the GLT Ecopark, 44ha of former cattle pasture were planted using 97 native tree species (72,465 tree seedlings). AMLD reforestation involved 34 landowners and created 18 local jobs. AMLD and partners are monitoring the return of biodiversity as these forests mature.

Strategy 2. Forest protection

AMLD defines “protected forest” as areas that meet 3 criteria: 1. have permanent legal protection; 2. are covered with mature-stature forest or are in the process of restoration--which takes about 7yrs; 3. have an effective conservation program. AMLD mapped the areas and forest of the 6 public conservation units in our Scope: 19,120ha total area; 15,311ha in forest. Of this, 9,040ha of forest are “protected” in Poço das Antas and União Reserves and Atalaia Municipal Park. These units have active conservation programs. All degraded area that can be reforested in the two Reserves has been restored (197ha).

Strategy 6. Influence widening of BR101 highway to include bridges for GLTs

Widening of interstate highway BR101 threatens to permanently isolate GLTs in three large forest fragments from populations north of the highway. During 7yrs, AMLD used social media, lobbying and legal action to persuade the construction company and federal agencies to build wildlife passageways: Brazil’s first forested wildlife overpass, 8 canopy-to-canopy overpasses, 15 tunnels and reforestation along bridge spans. Construction was initiated in November 2018, and is scheduled to be completed early in 2020. This stretch of highway will be the most wildlife-friendly in the country. AMLD and partners are using camera traps to monitor the use of these corridors by wildlife including GLTs.



Photo: Sally Foster

Construction of the forested wildlife passage over BR101. Poço das Antas Reserve is in the background, Igarapé Farm is in the foreground.

Strategy 7. Public policy

This strategy aims to encourage creation of municipal, regional and national public policies that support the restoration and permanent protection of forests and GLT populations in our Scope. AMLD participated in the advisory councils of both Biological Reserves, Três Picos State Park and two municipal environment councils as well as the Environmental Councils of Casimiro de Abreu and Silva Jardim municipalities, Silva Jardim Tourism Council--Agenda 21, and the Sustainable Silva Jardim Movement. AMLD also participated in the National Action Plan for Endangered Atlantic Forest Primates, Atlantic Forest NGO Network, Atlantic Forest Biosphere Reserve program, and the Yellow Fever Work Group, including representatives from Oswaldo Cruz Foundation, ICMBio, RJ Primatology Center, Ministry of Health, Ministry of Agriculture and SGLT.

IV. STRATEGIES TO ENGAGE LOCAL PEOPLE IN THE RESTORATION AND LONG-TERM PROTECTION OF A CONNECTED FOREST LANDSCAPE

Strategy 5. Environmental education—building awareness and citizenship

This strategy is designed to reduce unplanned urban expansion in priority areas for GLTs, reduce fragmentation of GLT habitat caused by roads, and increase local public engagement in the restoration and long-term protection of a connected forest landscape. AMLD again offered its award-winning in-service educator training program titled “Rediscovering the Atlantic Forest” (RAF). This, the 9th cohort, enrolled 45 teachers and non-formal educators from 5 local municipalities. Twenty-seven participants completed the course and received certification. RAF prepares educators to integrate into their teaching the relationships between local Atlantic Forest and human well-being. By sharing these concepts with their students and colleagues they multiply the number of local citizens engaged in forest protection and restoration. The 2019 cohort led 282 educational activities and engaged 540 local students. AMLD also offered its year-long Guardians of the Forest education program. Participants connect with nature and GLTs through fun activities and educational experiences at GLT Ecopark, Poço das Antas Reserve and in private reserves. The 2019 cohort comprised 35 kids age 10-13 from 2 communities that are priorities for forest connection. Finally,

AMLD engaged 1,100 local residents in other educational activities, including “GLT Day” at the GLT Ecopark.

Strategy 3. Strengthen sustainable agriculture on family farms

This strategy aims to empower farm families to generate “forest friendly” income and thus not sell their land to developers. AMLD accomplishes this by providing technical support to family-run tree nurseries that raise and sell native tree seedlings for use in reforestation; providing technical support for local agroforestry initiatives (fruit & vegetable crops planted under forest canopy); and teaching and promoting agroecological farming practices (a mix of modern science and traditional methods). AMLD’s Extension Team developed an agroecology management plan for the GLT Ecopark, including leasing 7ha to a local farm family to sustainably raise organic produce as a demonstration of agroecological methods. AMLD hosted an 8-month course on sustainable agroforestry practices. 90 people attended and 40 were certified, including 35 local family farmers and 5 technicians. The Coordinators of AMLD’s Education and Sustainable Agriculture strategies were recipients of the 2019 Disney Conservation Hero Award for their contributions to informing and engaging the local public about conservation.



Photo: Sally Foster

AMLD agroforestry workshop engaging local landowners in planting fruit trees, native trees and vegetables

Strategy 9. Regional sustainable tourism

Sustainable tourism addresses threats related to habitat conversion (urbanization) by providing economic benefits to local landowners. It also provides an opportunity for all visitors to see wild GLTs and connect with nature. Other options include lunch at partner family farms, visit native-tree nurseries, plant tree seedlings in forest corridors and visit local agroforests. Fourteen family-run farms participated and 7 received a portion of the tour fees. In 2019, 573 people in 64 groups visited GLTs, including 5 university groups, 13 groups organized by tour companies, and 7 local schools. 26% of visitors were from our Scope, 35% from elsewhere in Brazil, and 17% from the U.S. AMLD’s gross proceeds were US\$8,726. All tourists were required to show proof of yellow fever vaccination before viewing GLTs.

V. STRATEGIES TO SUPPORT THE IMPLEMENTATION AND ADAPTIVE MANAGEMENT OF AMLD'S STRATEGIC PLAN

Strategy 8. Communications and marketing

This strategy uses mass media, websites, electronic newsletters, social media, technical publications, conferences, promotional materials, and face-to-face events to reach local, national, and international publics with messages designed to further achieve our strategy objectives and our overall goal. AMLD's activities target the Brazilian audience while SGLT targets the English-speaking audience. On August 2nd, national and municipal GLT Day, AMLD inaugurated its new headquarters. 300 people attended and participated in activities including talks, music, dance, local crafts, visits to see GLTs, farm-to-table foods, and sample artisanal "GLT Beer". AMLD staff and partners published 2 books, 1 book chapter and 5 scientific articles in peer-reviewed journals. AMLD activities were published on 8 web sites, 5 national TV reports, 8 AMLD Facebook short video reports, and 1 documentary (GLT Day). AMLD collaborator Cristina Serra published a book titled *A Conservation History: The Atlantic Forest and the Golden Lion Tamarin*, in Portuguese and English with photographs by the late Haroldo Palo Jr.

Strategy 10. Strengthen AMLD's institutional sustainability

Because GLT habitat is small, fragmented and under pressure for development, the monitoring and protection of the species and its habitat will be necessary for the foreseeable future. AMLD is the only organization with the necessary commitment and capacity to coordinate the development, implementation, monitoring, and adaptation of a strategic plan to save (and maintain) GLTs from extinction. The economic and political crisis in Brazil resulted in cancellation or sequester of funding from most Brazilian sources. AMLD is now forced to increase its reliance on a few funding sources outside Brazil. Nevertheless, AMLD secured financial resources necessary to maintain its management team and implement all activities in its strategic plan. Results of an independent financial audit found no problems and suggested only minor adjustments to AMLD accounting methods. In 2019, AMLD renovated the buildings and moved its headquarters to the 236ha Igarape Farm (GLT Ecopark), across BR101 highway from Poço das Antas Reserve. The GLT Ecopark was recognized as a Center for UNESCO's Atlantic Forest Biosphere Reserve. Because of its strategic location the ranch provides unprecedented opportunities to engage the local public in conservation activities including forest restoration, environmental education, sustainable agriculture and ecotourism—options that were limited when AMLD's headquarters were in a Biological Reserve with restricted public access.



Photo: Luiz Thiago de Jesus/ AMLD

AMLD's new headquarters after a heavy rain

Photo: Sally Foster



Thank You to Our 2019 Supporters!

Our achievements are a direct result of your support - whether it's your generous donations, your petition signing, your fundraising and awareness raising efforts, or technical collaboration. We really couldn't do it without you.

Associação Mico-Leão-Dourado and Save the Golden Lion Tamarin thank you all!

Our Major Partner Institutions for their long-term financial and technical contributions:

*Copenhagen Zoo
Disney Conservation Fund
DOB Ecology
Fundo Brasileiro para a Biodiversidade/ ExxonMobil Brasil
EDF Norte Fluminense
Philadelphia Zoo
Smithsonian National Zoological Park/Friends of the National Zoo
Zoo Atlanta*

Institutions and individuals who donated through *Save the Golden Lion Tamarin*

US\$5,000+

Disney Conservation Fund, Greensboro Science Center, James and Lou Ann Dietz, Norman and Laura Grant Dong

US\$1,000-\$5,000

Anne Baker and Bob Lacy, in memory of Devra Kleiman, David Morris, Georgia Chapter - American Association of Zoo Keepers, Jack Minet Regan, Jeremy Mallinson, Leslie Wilkes, Milwaukee County Zoo, North Carolina Chapter - American Association of Zoo Keepers, National Geographic, St. Augustine Alligator Farm Zoo

US\$500 - \$999

Brandywine Zoo Chapter - American Association of Zoo Keepers, Christine Archer, Dickerson Park Zoo, Ellen Luchette's Oaks and Upper Providence Gifted Support Students, Frank Dumond, Patricia Roberts, Toni Allen

US\$100 - \$499

Andrew Engels, Anne Palleson, Cape May County Zoo Chapter - American Assn of Zoo Keepers, Carolyn Crockett & Bob Brooks, Caryl Proccita, Cathie Alderks, Christy Hoover, Clyde Nishimura, David Inouye, Deborah Edlin, the de Moraes Family, Douglas Dunkel, Evan Leatherwood, Gary Kachadurian, Geoffrey Coleman, Haddon Township High School Environmental Science Classes 2018-2019, Hilltop Preparatory School, Ian Yeomans, James Fournier, Joel Klock, John Butler, Judith Stern in memory of Devra Kleiman, Julien Docourneau, Karen Hoel, Karen Snyder & her Third Grade Class - Twin Hills Elementary School, Kari Cohen, Maria Inês Castro, Mathew

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US\$4 - \$99

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Volunteers who generously donated their time:

SGLT Board: Toni Allen, Benjamin Beck, Karen Bonnin, Inês Castro, Nancy de Moraes, James Dietz, Lou Ann Dietz, Fabiano Godoy, Kenton Kerns, Jennifer Mickelberg

SGLT Advisors: Daniel de Moraes, Christine Engels, Kirstin Hill, Sally Foster

Institutions and individuals who provided support directly to AMLD

Institutions who provided financial and/or technical support

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Zoo Partners in 2019

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The AMLD Team

AMLD Board of Directors (Conselho Deliberativo): Carlos Ramon Ruiz (President), Ariane Janer, Gustavo Luna Peixoto, Inês Castro, James Dietz, Lou Ann Dietz; Luis Fernando Duarte de Moraes, Marcos da Silva Freire, Rosa Lemos de Sá

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Consultants: Michelle Reis, Jaime Lima Franch

Interns: Lorena Ramos, Luiz Thiago de Jesus, Luciane Ribeiro, Mateus Nunes



AMLD/SGLT DONATION INFORMATION

Would you like to continue helping AMLD and SGLT keep Golden Lion Tamarins safe from extinction in their native Atlantic Forest in Brazil? If so, you have several options:

- If you are in Brazil you may donate directly to AMLD. You can find information, in Portuguese, here... <http://www.micoLeão.org.br/>. Or contact micoleao@micoleao.org.br .
- Wherever you are outside Brazil you may make a donation online by Paypal or credit card, or by bank wire to *Save the Golden Lion Tamarin*, a U.S. Public Charity created to support AMLD's conservation work. You may also mail a check from a U.S. bank to *Save the Golden Lion Tamarin*, 303 Cavalier Court, Silver Spring MD 20901, USA. Your donation is deductible from U.S. taxes. Click here to make an online donation <http://savetheliontamarin.org/> and to learn about other ways to help.
- If you are in Europe you may contribute to the Lion Tamarins of Brazil Fund. This fund was created to provide a way for zoos to support in situ field research on the four species of lion tamarins. Please ask that your donation be earmarked for "GLTs". You can find more information here... <http://ltbf.org>.

If you would like more information on how you can help save Golden Lion Tamarins please send an email to contact@savetheliontamarin.org .



Photo: AMLD

Inauguration of AMLD's new headquarters, 2 August 2019, "GLT Day" in Brazil