Inventory and Conservation Status of Wild Populations of Golden-Headed Lion Tamarins, *Leontopithecus chrysomelas*

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The endangered status of the golden-headed lion tamarin has been recognized since the early 1970's (Coimbra-Filho, 1970, 1972). However, only in the last ten years has *L.chrysomelas* been the focus of considerable attention regarding its conservation. The principal stimulus for this arose as a result of concern over the illegal export of 50-60 animals to Belgium and Japan in 1983/84 (Konstant, 1986). Due to this, the Brazilian Institute for the Environment (Ibama) established the International Committee for the Recovery and Management of the species (Mallinson, 1986, 1987). The recovery was highly successful, and the Committee established a breeding program and studbook for the species. The 1993 studbook, now coordinated by Helga de Bois of the Antwerp Zoo, reported 575 animals in 49 institutions, and efforts are underway to reduce the growth of the population (De Bois, 1993). A Population Viability Analysis Workshop for the entire genus, organized by the IUCN/ SSC Captive Breeding Specialist Group (now the Conservation Breeding Specialist Group) and the Fundação Biodiversitas, held in Belo Horizonte, Brazil, in 1990, established recommendations and priorities for the Conservation Plan for the species (Seal *et al.*, 1990). On the occasion of this workshop, the International Committee was formerly recognized by Ibama, and its mandate was changed to include all aspects of the species' conservation, including the wild populations.

One of the principal recommendations of the 1990 Workshop, concerning specifically *L.chrysomelas*, was the need for studies on the status and distribution of the species in the wild, considering that the captive population was by then well-established and healthy. This paper reports on an inventory of the wild populations of *L.chrysomelas*, and the information obtained on the status of the species in the context of the status of its natural habitats in northeast Brazil.

From April 1991 to March 1993, we conducted field work throughout an area of approximately 37,000 km^2, including the entire known distribution of the species in the south of the state of Bahia, and a small part of the extreme north of the state of Minas Gerais. This region is within the domain of the Atlantic forest, there divided into two principal forest formations: tropical evergreen rain forest in the eastern, coastal part, and seasonal, semideciduous forest in the parts inland and to the west (Mori and Silva, 1980).

Three main approaches were used in this study. The first involved informal interviews of local inhabitants, enquiring about the primates they recognized as occurring in the region. A total of 418 interviews of 620 people were made throughout the region. The second method involved direct censusing of forest patches using recordings of lion tamarin long calls ("playback") to increase the encounter rate (see Kierulff, 1993). Amplified recordings were played every 200 m along parallel trails (200 m apart) so as to cover all of smaller forest patches, or a known fraction of larger patches, in 33 areas. The third approach involved a survey of the archives of the regional office of the Brazilian Institute for the Environment (Ibama) and the Regional Cocoa Growing Authority (*Commissão Executiva do Plano da Lavoura Cacueira - CEPLAC*), principal supervisors and administrators of the socioeconomic activities of the region. The specific aim was to obtain an understanding of the economic growth of the region over recent years, and with this the trends regarding principal agricultural activities and deforestation. The analysis of this data and the elaboration of distribution maps for the species was carried out using the Geographic Information System (CISIG) developed by Conservation International, Washington, D.C., and installed at the Biodiversity Conservation Data Center of the Fundação Biodiversitas, Belo Horizonte.

The "playback" technique was evidently crucial for the success of the direct censuses. A total of 35 groups were registered during censusing, 26 (74%) of which resulted from responses to the long call recordings. Increasing the likelihood of finding groups, it increases the efficiency of censuses in a large number

of areas. It also means that the observers can spend longer with each group, the animals being attracted by the long calls, and allowing more time for more accurate counts of the composition and size.

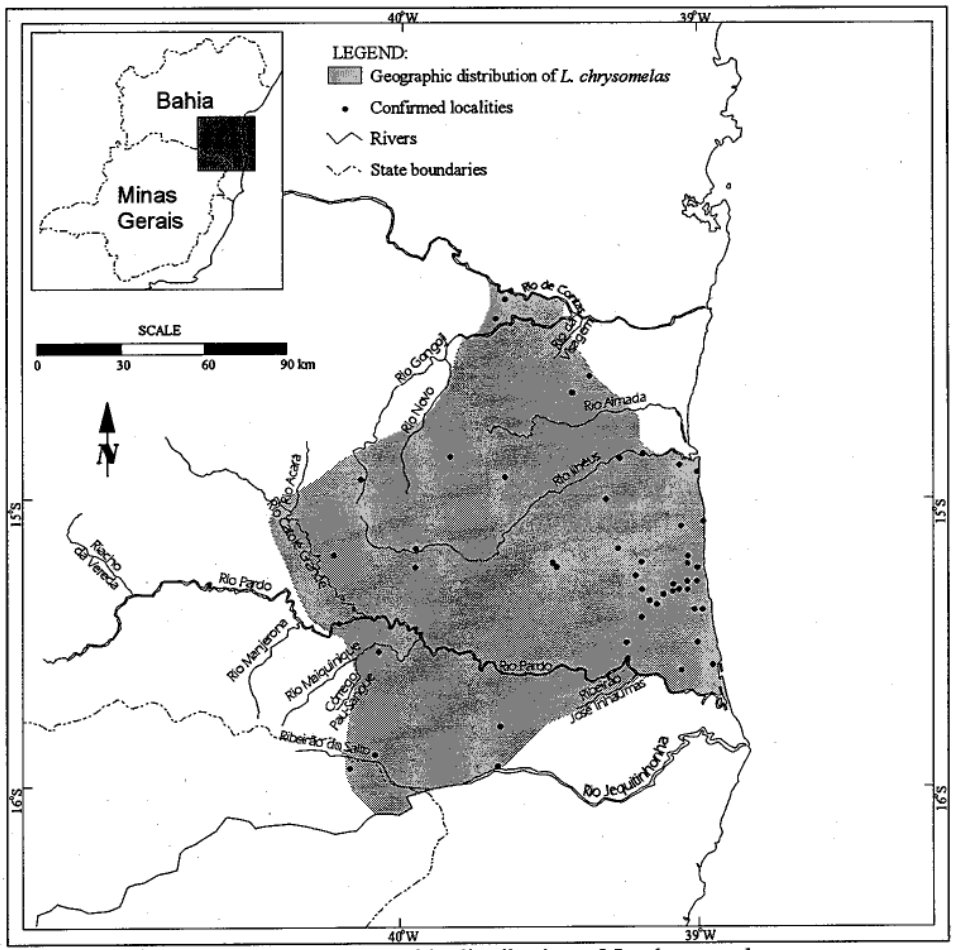

Figure 1. The geographic distribution of *L. chrysomelas*.

The interview program was essential as a complement to the censuses. The lion tamarins are clearly recognizable and easily described, and the interviews provided in most cases reliable information on their occurrence or otherwise in the locality, and therefore a more complete picture of their distribution and total population size than would be possible through direct censusing alone. The interviews also provided valuable information on the capture of primates for pets and on hunting. Positive replies concerning the occurrence of *L.chrysomelas* were obtained for 72% of 181 interviews within the species' range.

Of the 27 areas censused, all within the known geographic distribution, 24 provided direct sightings of *L.chrysomelas* groups, and combining these results with those of the interviews, 94 localities were registered as still maintaining populations of the species. Combining these with results from previous studies (Rylands *et al.*, in press) provides a total of 122 localities where the golden-headed lion tamarin still survives. The geographic distribution, based on these localities, was estimated at 19,462 km^2 (Fig.1); amongst the smallest recorded for any callitrichids.

The geographic distribution of *L.chrysomelas* is divided into two distinct regions in terms of land use. Cattle ranching predominates in the western part, which has resulted in highly fragmented forest. The eastern part corresponds to the principal cocoa growing region of Brazil, where forests are intermixed with cocoa plantations. Cocoa is frequently grown under a system referred to as *cabruca*, where a small number of the forest canopy trees are left standing to provide shade. This provides marginal habitat for numerous vertebrates, including the lion tamarins (Alves, 1990).

Habitat loss, estimated at about 0.5% per year, along with the fragmentation and degradation of forests, and the restricted distribution of the species, indicates that the golden-headed lion tamarin is highly endangered. The largest known subpopulation is in the Una Biological Reserve, now totalling 7059 ha (Coimbra-Filho *et al.*, 1993), where Dietz *et al.* (1994) have estimated approximately 416 individuals, with an effective population size of 160. These factors are sufficient to place *L.chrysomelas* in the endangered category, following the Mace-Lande Criteria, adopted by the World Conservation Union (IUCN) (Mace and Lande, 1991; Mace and Stuart, 1994). Urgent measures are required to guarantee the maintenance of

adequate habitat for this species, and others such as the yellow-breasted capuchin (*Cebus apella xanthosternos*), and the northern masked titi (*Callicebus personatus melanochir*) (see Santos *et al.*, 1987; Oliver and Santos, 1991). Since the public sector lacks the wherewithal for such a proposition, fundamental will be the participation of private landowners. This will require environmental education programs, and particularly the use of the Private Natural Heritage Reserve (RPPN) category of conservation unit now provided for in the Brazilian legislation.

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Golden-headed lion tamarin (*Leontopithecus chrysomelas*). Photo by R. Mittermeier.

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