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Leontopithecus chrysomelas, Golden-headed Lion Tamarin

Amendment version

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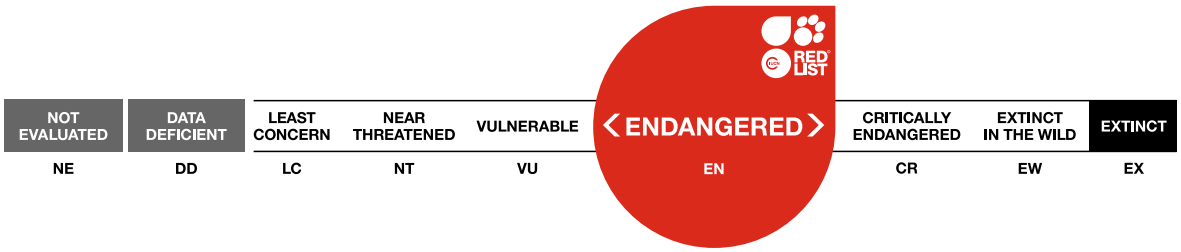

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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Primates	Callitrichidae

Scientific Name: *Leontopithecus chrysomelas* (Kuhl, 1820)

Synonym(s):

- *Leontopithecus chrysomela* (Kuhl, 1820) [orth. error]

Common Name(s):

- English: Golden-headed Lion Tamarin
- Spanish; Castilian: Tamarino León De Cabeza Dorada
- Portuguese: Mico-leão-de-cara-dourada

Taxonomic Notes:

The lion tamarins, *Leontopithecus*, are listed as separate species following Della Serra (1951), Rosenberger and Coimbra-Filho (1984), Mittermeier *et al*. (1988), Natori (1989), and Rylands *et al*. (1993). They have been listed as subspecies of *L. rosalia* by Coimbra-Filho and Mittermeier (1972, 1973), Hershkovitz (1977), Mittermeier and Coimbra-Filho (1981), Forman *et al.* (1986) and Seuánez *et al.* (1988), the latter two publications on the basis of identical chromosome morphologies.

Assessment Information

Red List Category & Criteria: Endangered A3c ver 3.1

Year Published: 2021

Date Assessed: January 24, 2020

Justification:

Leontopithecus chrysomelas is listed as Endangered due to the potential for a population reduction of 50% or more over the course of the next three generations (21 years; 2020-2041). According to recent population viability analyses (Zeigler *et al.* 2013), extensive extirpations were predicted for this species if the annual rate of forest loss in Bahia at the time of the study was to double which, according to Global Forest Watch data, it has (now between 1% and 2% annually). If subpopulations decline linearly, in 21 years, an overall reduction of more than 30% could be anticipated. If subpopulations decline more abruptly, if forest cover loss accelerates and/or if this species is impacted by yellow fever as significantly as the closely-related *L. rosalia* recently has been, a population reduction of 50% or more in three generations could be predicted.

Previously Published Red List Assessments

2020 – Endangered (EN)
https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T40643A17935020.en

2008 – Endangered (EN)
https://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T40643A10347712.en

2003 – Endangered (EN)

2000 – Endangered (EN)

1996 – Endangered (EN)

1996 – Endangered (EN)

1994 – Endangered (E)

1990 – Endangered (E)

1988 – Endangered (E)

1986 – Endangered (E)

1982 – Endangered (E)

Geographic Range

Range Description:

Golden-headed Lion Tamarin is a species of the Atlantic forest in Brazil, found in forest fragments in the state of Bahia and formerly in the extreme Northeast of Minas Gerais. The distribution of *L. chrysomelas* originally extended between the Rio de Contas (northern limit) and the Rio Pardo (southern limit) in southern Bahia (Coimbra-Filho and Mittermeier 1977). However, it was also found south of the Rio Pardo along its middle reaches to the Rio Jequitinhonha on the border between the states of Bahia and Minas Gerais (probably a recent range extension due to forest destruction and the silting of the Rio Pardo; Rylands *et al.* 1988, 1991/1992). In the Northwest, it occurs on both banks of the lower Rio Gongoji, a southern tributary of the Rio de Contas, but along its middle reaches, it is limited to the West of the river, and to the West of the Rio Novo. It crosses the Rio Gongoji, westward, again at its headwaters, occurring in the basin of the Rio Catolé Grande, a northern tributary of the Rio Pardo, which forms the westernmost extent of its range (Pinto and Rylands 1997). The western limits are defined by vegetational changes (mesophytic forest changing to liana forest in the west of its range) associated with an increase in altitude approaching the plateau of Vitoria da Conquista. The westernmost point is about 150 km from the coast. To the south, *L. chrysomelas* crosses the Rio Pardo, occurring in the lower basin of the Rio Maiquinique and east of the Córrego Pau Grande, south to the Rio Jequitinhonha in the extreme Northeast of Minas Gerais (Pinto and Rylands 1997). Although a decrease in range size was observed (mainly on the west of the species' geographical distribution; Raboy *et al.* 2010), the range of the golden-headed lion tamarin still extends over an area of approximately 19,000 km² (Pinto and Rylands 1997).

There are two gaps in the range, one in the north near the coast, south of the lower Rio de Contas to the mouth of the Rio Ilhéus, and the other between the lower reaches of the Rio Pardo and the Rio Jequitinhonha (Pinto and Tavares 1994; Pinto and Rylands 1997). Coimbra-Filho and Mittermeier (1973, 1977) argued that the original range of *L. chrysomelas* extended only to the Rio Pardo in the South, and that deforestation and the silting of the river (see Coimbra-Filho and Câmara 1996) has resulted in lion tamarins crossing the river in recent times (i.e., during the last century) and thus explaining today's presence in those areas and the absence between the Jequitinhonha and Pardo Rivers further east. There is no obvious explanation for the absence of *L. chrysomelas* between the Rio de Contas and the

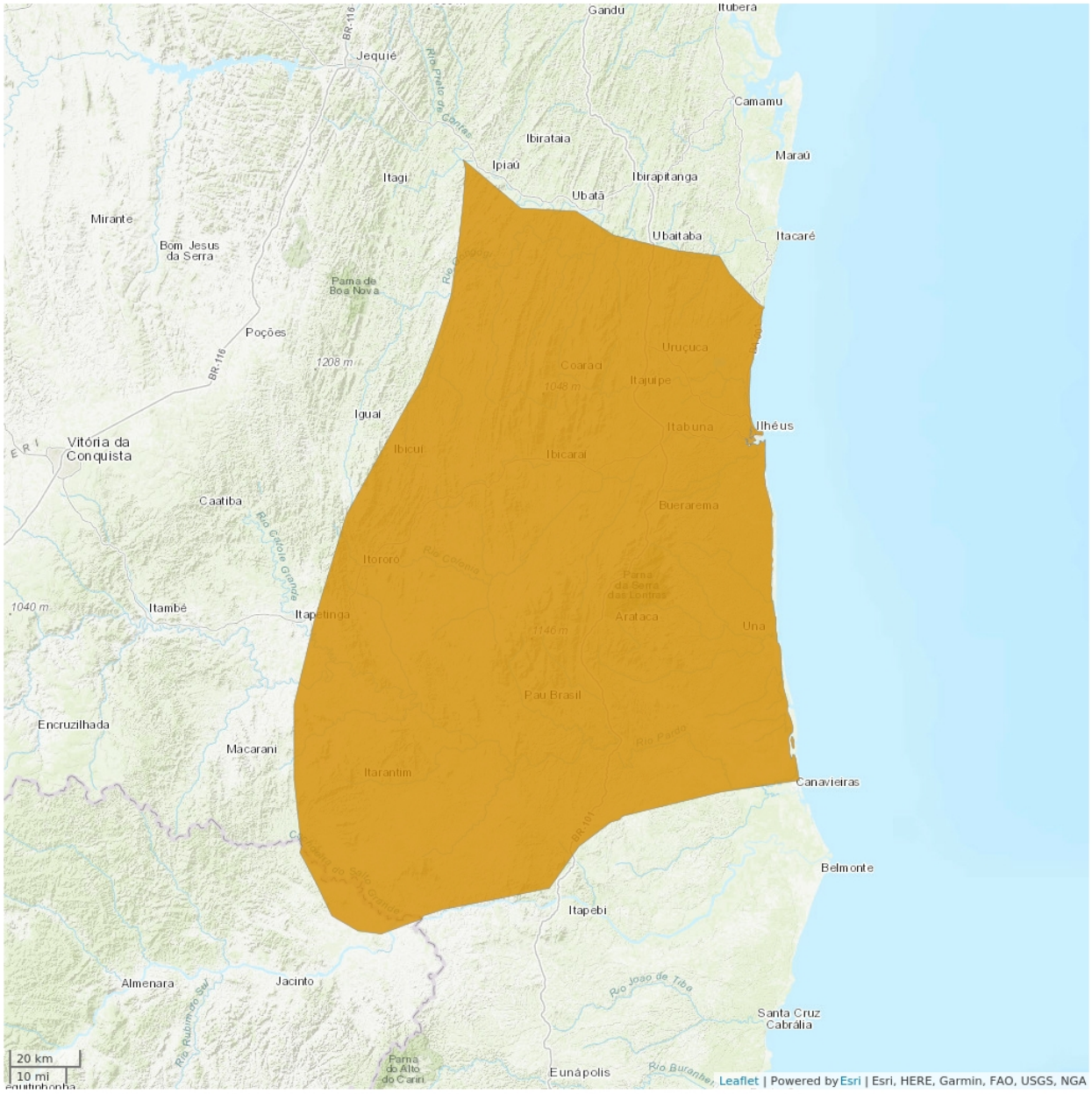
Rio Ilhéus in the Northeast of its range.

There is an introduced population in the State of Rio de Janeiro (Kierulff 2010), which has been translocated to the state of Bahia.

Country Occurrence:

Native, Extant (resident): Brazil (Bahia, Minas Gerais)

Distribution Map



Legend

EXTANT (RESIDENT)

Compiled by:

Biodiversitas Brazil 2008

The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

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Population

The total wild population in the mid-1990s was estimated to be 6,000-15,000 animals (Pinto 1994, Pinto and Rylands 1997), which would have translated to a maximum of 6,000 mature individuals based on an average group size of five animals. The most recent population estimates put the total number of mature individuals at less than 2,500 (Instituto Chico Mendes de Conservacao da Biodiversidade 2018). The estimated population in the Una Biological Reserve in the mid-1990s (at that time measuring 7,059 ha) was 400-450 individuals. However, the reserve has since expanded to a size of 18,500 ha, and holds an estimated population of about 1,100 *L. chrysomelas* (based on the PHVA 2005, Holst *et al.* 2006). This likely represents 250 or more mature individuals.

Densities vary according to habitat type and time. First reports on population density were provided by Rylands (1982, 1989), reporting 5.0-17.0 individuals/km² in a forest fragment at municipality of Una, in Lemos Maia Experimental Station. In Una Biological Reserve, different estimations were made over time. Dietz *et al.* (1994) reported densities of around 8.0 individuals/km² and two years later, they estimated a density of 5.0 individuals/km² (Dietz *et al.* 1996). In a compilation of unpublished data from Una Biological Reserve, Holst *et al.* (2006) reported densities of 10 individuals/km² and 11 individuals/km² in a more preserved and in a degraded part of the reserve, respectively. In a semi-deciduous forest, Guidorizzi (2008) reported a density of seven individuals/km². Recently, a population density estimation within the species' ranges was conducted in three different habitat types, being primary forest, a mosaic of primary and secondary forest and cacao agroforest or cabruca. The average density of tamarins in cabruca areas was 17 individuals/km² (range: 10–21 individuals/km²), the highest density ever recorded for the species. The average density in mosaic forest was 13 individuals/km² (range: 8–18 individuals/km²), and six individuals/km² in primary forest (range: 4–11 individuals/km²) (Oliveita *et al.* 2011).

Current Population Trend: Decreasing

Habitat and Ecology **(see Appendix for additional information)**

Lowland seasonal rain forest along the Atlantic coast of Brazil, white sand piaçava forest and secondary forest. Also known to use cabruca - cacao plantations that are shaded with some few native trees remaining from the original forest. They have been observed in secondary growth forest, in abandoned rubber plantations, but evidently always require old-growth forest providing abundant tree holes, which are used as sleeping sites, and epiphytic bromeliads, which are key foraging sites. Lion tamarins are an adaptable species well able to live in degraded and secondary forests, depending on sufficient year round food resources and foraging sites (see Coimbra-Filho 1969, 1976; Coimbra-Filho and Mittermeier 1973). Near the coast, in the cocoa growing region, there is no distinct dry season with rainfall exceeding 2,000 mm a year (the heaviest rains are from March to June). In the west of their range the forests are mesophytic with a distinct dry season, and in some areas the forests are semi-deciduous, with rainfall as low as 1,000 mm a year (Rylands 1989; Pinto and Rylands 1997).

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Golden Headed Lion Tamarins eat mostly ripe fruits, flowers, nectar, plant exudates (gums) and animal prey, including frogs, snails, lizards, spiders and insects, mostly found in epiphytic tank bromeliads (Raboy and Dietz 2004, Oliveira *et al.* 2010, Oliveira *et al.* 2011). Golden-headed Lion Tamarins live in extended family groups of usually 4–8 individuals (maximum of 15 individuals) depending on forest type (Oliveira *et al.* 2011). Generally, only one female per group breeds during a particular breeding season. Reproductive female lion tamarins may produce 1–2 offspring per litter, and up to two litters per year (Dietz *et al*. 1994; Holst *et al.* 2006), with peaks from October to December and February to May. In cabruca agroforests all litters consisted of twins in every reproductive season (Oliveira *et al.* 2011), while Holst *et al.* (2006) reported females having four offspring a year (two litters of twins). Dietz *et al.* (1996) observed 13 litters (20 infants) from seven reproductive females in which 54% were twins and 46% singletons. Similarly, Bach *et al*. (2001) reported two litters per year for only 27% of reproductive females. Groups defend home ranges of 40 to more than 100 ha (the size depending on availability and distribution of foods and second-growth patches). A group studied by Rylands (1982, 1989) in the Lemos Maia Experimental Station, Una, used a home range of about 40 ha. Home ranges in the Una Biological Reserve were found to be larger, reaching from 65 up to 200 ha (Dietz *et al*. 1996). Raboy & Dietz (2004) reported an average home range size of 123 ha based on three groups (ranging from 119 to 130 ha) while Oliveira *et al.* (2011) reported home range size to vary within different habitat types. The average home range size in cabruca was 45 ha (ranging from 22-84 ha), while groups from primary forests had average home ranges of 140 ha (ranging from 93-197 ha) and in mosaic forest (primary and secondary forests and cabrucas within the species home range) averaging 65 ha (ranging from 64-66 ha) (Oliveira *et al.* 2011).

French *et al.* (2002) reviewed the reproductive biology of lion tamarins, Baker *et al.* (2002) review their mating system and group dynamics (focusing particularly on *L. rosalia*) and Tardif *et al*. (2002) investigated aspects of infant care and development.

The size (weight) of Golden-headed Lion Tamarins also varied based on habitat type. Adult male: 584.6 g (n=9) in primary forest; 604 g (n=9) in mosaic (primary and secondary forests and cabrucas); and 668 g (n=12) in cabruca agroforest (Oliveira et al. 2011). Adult female: 586.7 g (n=8) in primary forest; 624 g (n=4) in mosaic forest (primary and secondary forests and cabrucas); 638 g (n=4) in cabruca agroforest (Oliveira *et al.* 2011). However, non-pregnant adult female may reach up to 800g in cabruca agroforest (Oliveira L.C. unpublished data).

Systems: Terrestrial

Use and Trade **(see Appendix for additional information)**

In the past, this species suffered the impacts of illegal trade, for commercial collections or as pets. Precise numbers are not available, but it was common to find this species sold along the main roads in southern Bahia. In addition, some parts of the current captive population, in Brazil and other countries, may probably originate from this illegal trade. To date, the illegal off-take is much reduced, due to national and international regulations and to improved law enforcement. However, it is still common to find tamarins as pets in the private households within the species' range. Additionally, the magnitude of the past trade still needs to be revealed, but can bring unpredictable impacts. This is the case if non-indigenous individuals escape from captivity or are deliberately released into the wild. For example, the *L. chrysomelas* invasive population living at Niterói, in Rio de Janeiro State, formed from released pets, represents a severe threat to the closest populations of the native *Leontopithecus rosalia* (almost 40

km).

Threats (see Appendix for additional information)

With more than 100 localities where *Leontopithecus chrysomelas* still occurs, more populations remain than for the other three lion tamarin species combined. However, the remaining forests are destroyed at an unprecedented rate and those populations surviving are seriously depleted and fragmented. An important aspect, which has contributed to the more favourable situation of the Golden-headed Lion Tamarins, is the traditional and widespread use of the cabruca system for shading cacao trees. Some original canopy trees are left, allowing connectivity between forest patches. If well managed, this could be an important management tool for future conservation efforts.

Threats to Golden-headed Lion Tamarins come from socio-economic transformations resulting from increasing labour costs, low cacao prices and decreasing cacao yields after the appearance of the Witches' Broom Fungus (*Moniliophthora perniciosa*) in Bahia. Such situation led to logging and sometimes to conversion of cabrucas to alternative crops, notably African palm oil and coconuts (Alger and Caldas 1994, 1996; Araujo *et al.* 1998), followed by rehabilitation measures that often go along with thinning of the shade canopies (Schroth *et al.* 2012).

In the west of its range, forests are increasingly destroyed and fragmented because of cattle ranching (Pinto 1994, Pinto and Rylands 1997, Raboy *et al.* 2010). Coffee plantation especially in the municipalities of Santa Luzia, Camacan and Juçari increasingly substitute shaded cacao plantation posing another threat for the tamarins.

It is believed that inbreeding depression occurs within the isolated populations of *L. chrysomelas*, especially in the western half of its range where forest fragmentation is extreme (Pinto and Rylands 1997). Recently, Moraes (2011) observed loss of genetic diversity among wild populations of Golden-headed Lion Tamarins.

Zeigler *et al.* (2010) estimated a 13% loss within the suitable forest habitat for *L. chrysomelas* between 1987 and 2007. The majority of the remaining patches were too small to support tamarin groups over the long-term, with only 5% being large enough to support genetically viable populations. According to Zeigler *et al.* (2013), all 10 *L. chrysomelas* sub-populations that were the subjects of population viability analyses were predicted to be extirpated within an average of 65 years if the annual rate of forest loss in Bahia at the time of the study was to double. According to Global Forest Watch data, it has done so, declining at a rate of between 1% and 2% annually. If sub-populations decline in number linearly in response to habitat loss, in 21 years (three generations time) an overall population reduction of more than 30% could be anticipated. If subpopulations decline more abruptly and/or if forest cover loss accelerates, a population reduction of 50% or more in three generations could be predicted within that time period.

Conservation Actions (see Appendix for additional information)

Included on the Brazilian Official List of Species Threatened with Extinction (Lista Oficial de Espécies Brasileiras Ameaçadas de Extinção, Edict No. 1.522/19th December 1989, see Bernardes *et al.* 1990; Fonseca *et al.* 1994), and likewise on the regional list of threatened species in the state of Minas Gerais (Machado *et al.* 1998). It is listed on Appendix I of CITES.

The Una Biological Reserve (18,500 ha), created to protect *L. chrysomelas*, has an estimated population of about 1,000 animals (Holst *et al.* 2006). A key strategy, which has guided conservation efforts over the last decade, is to promote the preservation of the forests adjacent to the Reserve (Alger and Araújo 1996, Alger *et al.* 1996, Blanes and Mallinson 1997, Santos and Blanes 1997, 1999). Besides the Una Biological Reserve, this species also occurs in: Serra das Lontras National Park (16,800 ha), Una Wildlife Refuge (23,000 ha), Lemos Maia Experimental Station (CEPLAC/CEPEC) (495 ha), and Canavieiras Experimental Station (CEPLAC/CEPEC) (500 ha), Djalma Bahia Experimental Station (145 ha) and in many private reserves (RPPN) such as Serra do Teimoso, Ararauna, Serra Bonita. There is a well-managed captive breeding program for *L. chrysomelas* with a good founder stock (Ballou *et al*. 2002), although currently not contributing to the conservation of golden-headed lion tamarins in the wild. The captive population of *L. chrysomelas*, which arose from animals confiscated from illegal trade in the 1980s (Mallinson 1984, Konstant 1986), is an important genetic reservoir.

Credits

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Bibliography

Alger, K. and Araújo, M. 1996. Desmatamento dos últimos remanescentes florestais próximos à Reserva Biológica de Una: uma ameaça à biodiversidade e à economia local. *Alternativas Econômicas para Conservação e Desenvolvimento da Região de Una, Bahia, Resumos das Pesquisas 1994-1995,*, pp. 2-5. Instituto de Estudos Sócio-ambientais do Sul da Bahia (IESB), Ilhéus, Brazil.

Alger, K. and Caldas, M. 1994. The declining cocoa economy and the Atlantic forest of southern Bahia, Brazil: conservation attitudes of cocoa planters. *The Environmentalist* 14: 107-119.

Alger, K. and Caldas, M. 1996. Cacau na Bahia: decadência e ameaça a` Mata Atlântica. *Ciência Hoje* 20: 28-35.

Alger, K., Araújo, M., Trevizan, S. and dos Santos, G. 1996. Dinâmica do uso da terra no entorno da Reserva Biológica de Una. *Alternativas Econômicas para Conservação e Desenvolvimento da Região de Una, Bahia, Resumos das Pesquisas 1994-1995*, pp. 12-16. Instituto de Estudos Sócio-ambientais do Sul da Bahia (IESB), Ilhéus, Brazil.

Bach, A., Raboy, B. and Dietz., J. 2001. Birth seasonality in wild golden-headed lion tamarins (*Leontopithecus chrysomelas*) in Una Reserve, Bahia State, Brazil. *American Journal of Primatology* 54(1): 69.

Baker, A. J., Bales, K. and Dietz, J. M. 2002. Mating system and group dynamics in lion tamarins. In: D. G. Kleiman and A. B. Rylands (eds), *The Lion Tamarins of Brazil*, pp. 188-212. Smithsonian Institution Press, Washington, DC, USA.

Ballou, J. D., Kleiman, D. G., Mallinson, J. J. C., Rylands, A. B., Valladares-Padua, C. and Leus, K. 2002. History, management and conservation role of the captive lion tamarin populations. In: D. G. Kleiman and A. B. Rylands (eds), *Lion Tamarins: Biology and Conservation*, pp. 95–114. Smithsonian Institution Press, Washington, DC, USA.

Bernardes, A. T., Machado, A. B. M. and Rylands, A. B. (eds). 1990. *Fauna brasileira ameaçada de extinção*. pp. 65 pp.. Fundação Biodiversitas, Belo Horizonte, Brazil.

Biodiversitas (ed.). 1998. *Livro vermelho das espécies ameaçadas de extinção da fauna de Minas Gerais*.In: A.B.M. Machado, G.A.B. da Fonseca, R.B. Machado, L.M.S. Aguiar and L.V. Lins (eds), Fundação Biodiversitas, Belo Horizonte, Brazil.

Blanes, J. and Mallinson, J. J. C. 1997. *Landowner's Environmental Education Program for Una and surrounding areas*.

Coimbra-Filho, A. F. 1969. Mico-leão, *Leontideus rosalia* (Linnaeus, 1766), situação atual da espécie no Brasil (Callithricidae - Primates). *Anais da Academia Brasileira de Ciências* 41: 29-52.

Coimbra-Filho, A. F. 1976. Os sagüis do gênero *Leontopithecus* Lesson, 1840 (Callithricidae - Primates). Master's Thesis, Universidade Federal do Rio Janeiro.

Coimbra-Filho, A. F. and Câmara, I. de G. 1996. *Os Limites Originais do Bioma Mata Atlântica na Região Nordeste do Brasil*. Fundação Brasileira para a Conservação da Natureza, Rio de Janeiro, Brazil.

Coimbra-Filho, A. F. and Mittermeier, R. A. 1972. Taxonomy of the genus *Leontopithecus* Lesson, 1840. In: D. D. Bridgwater (ed.), *Saving the Lion Marmoset*, pp. 7-22. Wild Animal Propagation Trust, Wheeling, West Virginia, USA.

Coimbra-Filho, A. F. and Mittermeier, R. A. 1973. Distribution and ecology of the genus *Leontopithecus* Lesson, 1840 in Brazil. *Primates* 14: 47-66.

Coimbra-Filho, A. F. and Mittermeier, R. A. 1977. Conservation of the Brazilian lion tamarins (*Leontopithecus rosalia*). In: H. S. H. Prince Rainier III of Monaco and G. H. Bourne (eds), *Primate Conservation*, pp. 59-94. Academic Press, New York, USA.

da Fonseca, G. A. B., Rylands, A. B., Costa, C. M. R., Machado, R. B. and Leite, Y. L. R. 1994. *Livro dos Mamíferos Brasileiros Ameaçados de Extinção*. Fundação Biodiversitas, Belo Horizonte, Brazil.

Della Serra, O. 1951. Divisão do gênero *Leontocebus* (Macacos, Platyrrhini) em dois subgêneros sob bases de caracteres dento-morfológicos. *Papéis Avulsos Zoologia, São Paulo* 10(8): 147-154.

Dietz, J. M., de Sousa, S. N. and Billerbeck, R. 1996. Population dynamics of golden-headed lion tamarins *Leontopithecus chrysomelas* in Una Reserve, Brazil. *Dodo, Journal of the Wildlife Preservation Trusts* 32: 115-122.

Dietz, J.M., Sousa, S.N.F. and Silva, J.R.O. 1994. Population structure and territory size in golden-headed lion tamarins, *Leontopithecus chrysomelas*. *Neotropical Primates* 2: 21-23.

Dos Santos, G. R. and Blanes, J. 1997. Community environmental education in Brazil. *Dodo, Journal of Wildlife Preservation Trusts* 33: 118-126.

dos Santos, G. R. and Blanes, J. 1999. Environmental education as a strategy for conservation of the remnants of Atlantic forest surrounding Una Biological Reserve, Brazil. *Dodo, Journal of Wildlife Preservation Trusts* 35: 151-157.

Forman, L., Kleiman, D. G., Bush, R. M., Dietz, J. M., Ballou, J. D., Phillips, L. G., Coimbra-Filho, A. F. and O'Brien, S. J. 1986. Genetic variation within and among lion tamarins. *American Journal of Physical Anthropology* 71: 1-11.

French, J. A., De Vleeschouwer, K., Bales, K. and Heistermann, M. 2002. Lion tamarin reproductive biology. In: D. G. Kleiman and A. B. Rylands (eds), *The Lion Tamarins of Brazil*, pp. 133-156. Smithsonian Institution Press, Washington, DC, USA.

Hershkovitz, P. 1977. *Living New World monkeys (Platyrrhini), with an introduction to Primates*. University of Chicago Press, Chicago, USA.

Holst, B., Médici, E.P., Marino-Filho, O.J., Kleiman, D., Leus, K., Pissinatti, A., Vivekananda, G., Ballou, J.D., Traylor-Holzer, K., Raboy, B., Passos, F., Vleeschouwer, K., Montenegro, M.M. 2006. Lion Tamarin Population and Habitat Viability Assessment Workshop 2005, final report. IUCN/SSX Conservation Breeding Specialist Group. .

IUCN. 2020. The IUCN Red List of Threatened Species. Version 2020-2. Available at: www.iucnredlist.org. (Accessed: 13 June 2020).

IUCN. 2021. The IUCN Red List of Threatened Species. Version 2021-1. Available at: www.iucnredlist.org. (Accessed: 25 March 2021).

Kierulff, M.C.M. 2010. Invasive introduced golden-headed lion tamarins - a new threat to golden lion tamarins. *Tamarin Tales* 10: 5-7.

Konstant, W. R. 1986. Illegal trade in golden-headed lion tamarins. *Primate Conservation* 7: 29-30.

Mallinson, J. J. C. 1984. Golden-headed lion tamarin contraband a major conservation problem. *IUCN/SSC Primate Specialist Group Newsletter* 4: 23-25.

Mittermeier, R. A. and Coimbra-Filho, A. F. 1981. Systematics: Species and subspecies. In: A. F. Coimbra-Filho and R. A. Mittermeier (eds), *Ecology and Behavior of Neotropical Primates, Vol. 1*, pp. 29-111. Academia Brasileira de Ciências, Rio de Janeiro, Brazil.

Mittermeier, R. A., Rylands, A. B. and Coimbra-Filho, A. F. 1988. Systematics: species and subspecies - an update. In: R. A. Mittermeier, A. B. Rylands, A. F. Coimbra-Filho and G. A. B. da Fonseca (eds), *Ecology and Behavior of Neotropical Primates*, pp. 13-75. World Wildlife Fund, Washington, DC, USA.

Moraes, A.M. 2011. Avaliação da estrutura genética das populações de mico-leão da cara dourada, *Leontopithecus chrysomelas* (Kuhl, 1820) (Primates: Callitrichidae), no sul da Bahia, Brasil. Centro de Biociências e Biotecnologia da Universidade Estadual do Norte Fluminense – Campos.

Natori, M. 1989. An analysis of cladistic relationships of *Leontopithecus* based on dental and cranial characters. *Journal of the Anthropological Society of Nippon* 97(2): 157-167.

Oliveira, L.C., Hankerson, S., Dietz, J.M. and Raboy, B.E. 2010. . Key tree species for the golden-headed lion tamarin and implications for shade-cocoa management in southern Bahia, Brazil. *Animal Conservation* 13: 60-70.

Oliveira, L.C., Neves, L.G., Raboy, B.E. and Dietz, J.M. 2011. Abundance of jackfruit (*Artocarpus heterophyllus*) affects group characteristics and use of space by golden-headed lion tamarins (*Leontopithecus chrysomelas*) in cabruca agroforest. *Environmental Management* 48(2): 248-262.

Pinto, L. P. S. 1994. Distribuição Geográfica, População e Estado de Conservação do Mico-leão-de-cara-dourada, *Leontopithecus chrysomelas* (Callitrichidae, Primates). Master's Thesis, Universidade Federal de Minas Gerais.

Pinto, L. P. S. and Rylands, A. B. 1997. Geographic distribution of the golden-headed lion tamarin, *Leontopithecus chrysomelas*: implications for its management and conservation. *Folia Primatologica* 68: 161-180.

Pinto, L. P. S. and Tavares, L. I. 1994. Inventory and conservation status of wild populations of golden-headed lion tamarins, *Leontopithecus chrysomelas*. *Neotropical Primates* 2: 24-27.

Raboy, B. 2002. The Ecology and Behavior of Wild Golden-Headed Lion Tamarins (*Leontopithecus chrysomelas*). Biology, University of Maryland, College Park, MD.

Raboy, B.E. and Dietz, J.M. 2004. Diet, Foraging, and Use of Space in Wild Golden-Headed Lion Tamarins. *American Journal of Primatology* 63: 1-15.

Raboy, B.E., Neves, L.G., Zeigler, S., Saraiva, N.A., Cardoso, N., dos Santos, G.R., Ballou, J.D. and Leimgruber, P. 2010. Strength of Habitat and Landscape Metrics in Predicting Golden-Headed Lion Tamarin Presence or Absence in Forest Patches in Southern Bahia, Brazil. *Biotropica* 42: 388-397.

Raboy, B.E., Zeigler, S.L., Neves, L.G. and Oliveira, L.C. 2013. Occurrences of *Leontopithecus chrysomelas* above 500 meters in southern Bahia, Brazil and implications for conservation. *Primate Conservation* 26: 25-31.

Rosenberger, A. L. and Coimbra-Filho, A. F. 1984. Morphology, taxonomic status and affinities of the lion tamarins, *Leontopithecus* (Callitrichinae, Cebidae). *Folia Primatologica* 42: 149-179.

Rylands, A. B. 1982. The behaviour and ecology of three species of marmosets and tamarins (Callitrichidae, Primates) in Brazil. Doctoral Thesis, University of Cambridge.

Rylands, A. B. 1989. Sympatric Brazilian callitrichids: the black-tufted-ear marmoset, *Callithrix kuhli*, and the golden-headed lion tamarin, Leontopithecus chrysomelas. *Journal of Human Evolution* 18(7): 679-695.

Rylands, A. B. 1993. The ecology of the lion tamarins, *Leontopithecus*: some intrageneric differences and comparisons with other callitrichids. In: A. B. Rylands (ed.), *Marmosets and Tamarins: Systematics, Behaviour, and Ecology*, pp. 296–313. Oxford University Press, Oxford, UK.

Rylands, A. B. 1993. The ecology of the lion tamarins, *Leontopithecus*: some intrageneric differences and comparisons with other callitrichids. In: A. B. Rylands (ed.), *Marmosets and Tamarins: Systematics, Behaviour, and Ecology*, pp. 296–313. Oxford University Press, Oxford, UK.

Rylands, A. B., Coimbra-Filho, A. F. and Mittermeier, R. A. 1993. Systematics, distributions, and some notes on the conservation status of the Callitrichidae. In: A. B. Rylands (ed.), *Marmosets and Tamarins: Systematics, Behaviour and Ecology*, pp. 11-77. Oxford University Press, Oxford, UK.

Rylands, A. B., Santos, I. B. and Mittermeier, R. A. 1992. Distribution and status of the golden-headed lion tamarin, *Leontopithecus chrysomelas*, in the Atlantic forest of southern Bahia, Brazil. *Primate Conservation* 12-13: 15-23.

Rylands, A. B., Spironelo, W. R., Tornisielo, V. L., Lemos de Sá, R. M, Kierulff, M. C. M. and Santos, I. B. 1988. Primates of the Rio Jequitinhonha valley, Minas Gerais, Brazil. *Primate Conservation* 9: 100-109.

Schroth, G., Faria, D., Araujo, M., Bede, L., Van Bael, S., Cassano, C., Oliveira, L.C. and Delabie, J.H.C. 2011. Conservation in tropical landscape mosaics: the case of cacao landscape of southering Bahia, Brazil. *Biodiversity and Conservation* 20(8): 1635-1654.

Seuánez, H. N., Forman, L. and Alves, G. 1988. Comparative chromosome morphology in three callitrichid genera: *Cebuella, Callithrix* and *Leontopithecus*. *Journal of Heredity* 79: 418-424.

Tardif, S. D., Santos, C. V., Baker, A. J., Van Elsacker, L., Feistner, A. T. C., Kleiman, D. G., Ruiz-Miranda, C. R., Moura, A. C. de A., Passos, F. de C., Price, E. C., Rapaport, L. and De Vleeschouwer, K. 2002. Infant care in lion tamarins. In: D. G. Kleiman and A. B. Rylands (eds), *The Lion Tamarins of Brazil*, pp. 213-232. Smithsonian Institution Press, Washington, DC, USA.

Zeigler, S. L., DeVleeschouwer, K. H. and Raboy, B. E. 2013. Assessing extinction risk in small metapopulations of golden-headed lion tamarins (Leontopithecus chrysomelas) in Bahia State, Brazil. *Biotropica* 45(4): 528-535.

Zeigler, S.L., Fagan, W.F., DeFries, R. and Raboy, B.E. 2010. Identifying Important Forest Patches for the Long-term Persistence of the Endangered Golden-Headed Lion Tamarin (*Leontopithecus chrysomelas*). *Tropical Conservation Science* 3(1): 63-77.

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Disclaimer

External Resources

For Supplementary Material, and for Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.6. Forest - Subtropical/Tropical Moist Lowland	-	Suitable	-
14. Artificial/Terrestrial -> 14.3. Artificial/Terrestrial - Plantations	-	Marginal	-

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.1. Housing & urban areas	Ongoing	-	-	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
1. Residential & commercial development -> 1.3. Tourism & recreation areas	Ongoing	-	-	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.1. Shifting agriculture	Ongoing	-	-	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.2. Small-holder farming	Ongoing	-	-	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.3. Agro-industry farming	Ongoing	-	-	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.2. Small-holder grazing, ranching or farming	Ongoing	-	-	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.3. Agro-industry grazing, ranching or farming	Ongoing	-	-	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		

5. Biological resource use -> 5.3. Logging & wood harvesting -> 5.3.5. Motivation Unknown/Unrecorded	Ongoing	-	-	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		

Conservation Actions in Place

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Action in Place
In-place land/water protection
Conservation sites identified: Yes, over entire range
Occurs in at least one protected area: Yes
In-place species management
Subject to ex-situ conservation: Yes
In-place education
Included in international legislation: Yes
Subject to any international management / trade controls: Yes

Conservation Actions Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Action Needed
2. Land/water management -> 2.1. Site/area management

Research Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
1. Research -> 1.5. Threats
1. Research -> 1.6. Actions
3. Monitoring -> 3.1. Population trends

Additional Data Fields

Distribution
Lower elevation limit (m): 0
Upper elevation limit (m): 650
Population
Population severely fragmented: Yes
All individuals in one subpopulation: No
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes
Generation Length (years): 7

Amendment

Amendment reason: The lists of Assessor and Reviewer names have been corrected in this assessment.

The IUCN Red List Partnership

The IUCN Red List of Threatened Species™ is produced and managed by the IUCN Global Species Programme, the IUCN Species Survival Commission (SSC) and The IUCN Red List Partnership.

The IUCN Red List Partners are: Arizona State University; BirdLife International; Botanic Gardens Conservation International; Conservation International; NatureServe; Royal Botanic Gardens, Kew; Sapienza University of Rome; Texas A&M University; and Zoological Society of London.