

MITTERMEIER, R. A. AND COIMBRA-FILHO, A. F. CONSERVATION OF THE BRAZILIAN LION TAMARINS. pdf

1: Primate Factsheets: Golden lion tamarin (*Leontopithecus rosalia*) References

Golden lion tamarins are an adaptable species well able to live in degraded and secondary forests, depending only on sufficient year round food sources and foraging sites, along with the tree holes they use as sleeping sites (see Coimbra-Filho , ; Coimbra-Filho and Mittermeier).

Social systems[edit] The cotton-top tamarin is a highly social primate that typically lives in groups of two to nine individuals, but may reach up to 13 members. At the head of the group is the breeding pair. This social grouping in cotton-top tamarins is hypothesized to arise from predation pressure. The dominant female is more likely to give birth to nonidentical twins than a singleton, so it would be too energetically expensive for just one pair to raise the young. This suppresses sexual behavior and delays puberty. Cotton-top tamarins display high levels of parental investment during infant care. Males, particularly those that are paternal, show a greater involvement in caregiving than do females. First-time sires spend a greater amount of time carrying the infant than experienced ones, and in smaller groups, sires do a greater proportion of carrying and feeding the infant than in larger groups, where helpers take on more of the work. Total care for infants remains constant with varying group size, and infant outcome is not significantly different in groups that have differing levels of experience in raising offspring. The cooperative breeding hypothesis predicts that cotton-top tamarins engage with this young-rearing paradigm, and in turn naturally embrace patterns of prosocial behavior. Though some studies indicate that cotton-top tamarins have the psychological capacity to participate in reciprocally mediated altruism, [30] it is unclear whether the cotton-top tamarin acts solely using judgements on reinforcement history. That is, cooperation in cotton-top tamarins can be better described by mutualism than by true altruism. Cotton-tops ultimately use this information to guide future cooperation. Brief periods of defection tend to cause swift, irreparable breakups between these primates and their cooperators. To avoid this, cotton-top tamarins may make economically driven decisions based on the projected incentives of a potential cooperator. They have been observed to immediately start denying cooperation with monkeys that deny them benefits. Based on this, researchers believe that repeated interactions in a cooperative society like that of the cotton-top tamarin can heighten the chances that an individual will designate behavioral punishments to others in its group. Another way to look at punishment in cotton-top tamarins is by observing their aggressive behavioral responses within and between groups, as well as between species. The cotton-top tamarin, like many marmosets, other tamarins, and specifically those in the genus *Saguinus*, stages aggressive displays almost exclusively towards fellow monkeys that belong to the same gender. Females typically employ scent-marking intruder response tactics, whereas males are more prone to vocalizing threats, physical aggression, and piloerection. The ability to use both of these separate glandular fields for threat signals may indicate females have developed diverging evolutionary threats through differential use of these markings. The intensity of female threats is generally comparable when directed at intruders of either genders. In contrast, male cotton-tops are considerably more threatening towards fellow males than towards females. Researchers describe its repertoire of 38 distinct sounds as unusually sophisticated, conforming to grammatical rules. They concluded that it uses a simple grammar consisting of eight phonetic variations of short, frequency-modulated " chirps " each representing varying messages and five longer constant frequency "whistles". They hypothesize that some of these calls demonstrate that the cotton-top tamarin uses phonetic syntax , while other calls may be exemplars of lexical syntax usage. Despite this limitation on speech producibility, researchers believe that language acquisition occurs early on with speech comprehension abilities arising first. Regardless, infant cotton-tops are able to respond in behaviorally appropriate ways to varying contexts when presented with adult chirps. This indicates that verbal perception is a quickly acquired skill for offspring, followed closely by auditory comprehension, and later by proper vocal producibility. Castro and Snowdon observed that aside from inconsistent adult-like chirping, cotton-top infants most often produce a prototype chirp that differs in vocalization structure from anything seen in the full adult range of vocalizations. Infants are thought to

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imitate adult speakers, which use differing calls in various contexts, but by using solely the infant prototypical chirp. For instance, adult cotton-tops are known to significantly reduce the amount of general alarm calling in the presence of infants. Additionally, infants reduce their prototype chirping in the presence of predators. Whether infants are shadowing the calling behavior of adults or they are comprehending danger remains unclear. However, researchers argue that young cotton-top tamarins are able to represent semantic information regardless of immature speech production. When an adult produces a C-call chirp, used to indicate food preference and when navigating to a food source, an infant approaches the adult caller to be fed, but do not use the prototype calling as a proxy for C-calls. General calling[edit] Among the typical cotton-top tamarin communicative vocalizations, the combination long call CLC and the alarm call AC are the most heavily represented in the literature. CLCs encompass a range of contact calls that are produced by isolated individuals using chirps and whistles. It is issued in the presence of kin when a threatening llamas predator is seen. Predators of the cotton-top tamarin include snakes , ocelots , tayras , and most notably, hawks. Researchers have argued that long calls exhibit individual differences, thus can carry information sufficient for recipients to determine caller identity. Using habituation-discrimination paradigms in language experiments, this theory has been confirmed multiple times in literature. Scientists thus consider the whole, intact string of vocalizations to be the unit of perception for CLCs in the cotton-top tamarin. Since tamarins can discriminate between predatory threats using varying vocalizations, recipients of an AC are thought to extract various complex signals from this form of communication. Firstly, an AC recipient is able to identify a cooperating tamarin, and by recognizing which in their group it is, be able to judge the reliability of the AC from past experience. This may arise from a selective pressure for being able to statistically determine the amount of risk present, and how endangered an individual and its group are. This can help confirm predator presence, type e. Food calls[edit] The species is thought to vocalize food preference using C-calls and food retrieval and eating using D-calls. The cotton-top tamarin makes selective, specialized vocalizations in the presence of food. Functionally, this behavior may inform other tamarins of the actions the caller will take in a feeding context and whether a preferable food source is available. While this may appear to be a result from a very primitive form of communication, Roush and Snowdon maintain that the food-calling behavior confers some mentally representable information about food to recipient tamarins. Conservation status[edit] The wild population is estimated at 6, individuals, with 2, adults. The cotton-top tamarin was not selected for the " publication. This land is then used for large-scale agricultural production i. While biomedical studies have recently limited their use of this species, illegal capture for the pet trade still plays a major role in endangering the cotton-top. Before , when CITES listed the species under Appendix I banning all international trade, the cotton-top tamarin was exported for use in biomedical research. In captivity, the cotton-top is highly prone to colitis , which is linked to an increased risk of a certain type of colon cancer. Up to 40, individuals were caught and exported for research into those diseases, as well as Epstein-Barr virus , for the benefit of humans. The species is now protected by international law. Although enough individuals are in captivity to sustain the species, it is still critically endangered in the wild. It now has partner status with the Wildlife Conservation Network. One other individual survived.

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3: Primates-SG - Marmosets and Tamarins Pocket Guide

Coimbra-Filho, A.F. and Mittermeier, R.A. () Conservation of the Brazilian lion tamarins (*Leontopithecus rosalia*). In: Prince Rainier of Monaco and G. Bourne (eds) *Primate Conservation*, pp.

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4: Primates-SG - Primates of Brazil

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The objectives of this study were to estimate the marmoset CM population in two fragments with reintroduced golden lion tamarin to quantify the association and characterize the interactions between species. During the winter, competition resulted in increases in territorial and foraging behavior when associated with marmosets. Evidence of benefits during the summer was reduced adult vigilance while associated to marmosets. Golden lion tamarins were also observed feeding on gums obtained from tree gouges made by the marmosets. Marmosets represented a threat for the conservation of golden lion tamarins. The lack of natural predators, abundance of prey without natural defenses and disturbed habitats, frequently give the invading species an advantage over the native species Williamson, ; Sakai et al. Introduced species can also be competitors. There is no published evidence of any beneficial effects of introduced species on native species of vertebrates Williamson, The impact of introduced species can increase in fragmented landscapes With, , where many species of animals, especially terrestrial vertebrates, are vulnerable to extinction because they live in small populations with different degrees of isolation Meffe and Carroll, ; Foose et al. There appears to have been considerable genetic losses and genetic structuring cause by fragmentation Grativol et al. The conservation program for this species includes protection of wild populations in biological reserves, translocation of wild groups in small and highly degraded areas to biological reserves, and reintroduction of captive-born animals to forests in private farms within the State of Rio de Janeiro 14 farms Kierulff and Oliveira, ; Kierulff and Oliveira, ; Ballou et al. In the last PHVA Population and Habitat Viability Analysis , one of the priorities for conservation was the understanding of the factors affecting survival and reproduction after reintroduction Ballou et al. One of these factors is the presence of marmosets, *Callithrix jacchus* and *C.* The common marmosets are native to northeastern Brazil Stevenson and Rylands, , and because they were introduced into the state of Rio de Janeiro as the direct result of the illegal wildlife, they are considered an exotic species Ruiz-Miranda et al. There is a strong potential for inter-specific competition because the ecology and behavior of these species is similar to that of lion tamarins Rylands and Faria, Marmosets and lion tamarins are frugivore-insectivores Kleiman et al. The marmosets also feed substantially on tree exsudates mostly gum Coimbra-Filho and Mittermeier, ; Stevenson and Rylands, ; Ferrari, ; Kinzey, The GLTs feed on gums only opportunistically [Peres,]. There are no quantitative data on the population size of the introduced marmosets, on the degree of association between marmosets and tamarins or on the organization of the association. The association between sympatric primates, including the formation of mixed groups, has been documented for Amazonian forest species Garber, ; Heymann, ; Peres, ; Peres, ; Lopes and Ferrari, In these cases, the associations appear to bring mutual benefits in prey capture Peres, ; Lopes and Ferrari, , predator defense Peres, and exploitation and defense of larger territories Garber, ; Heymann, The genus *Leontopithecus* and *Callithrix* are sympatric only in the Atlantic forest of northern Bahia. At the Una Biological Reserve, L. The objective of this study was to assess if the presence of *Callithrix jacchus* or *penicillata* presented a problem for the conservation of *Leontopithecus rosalia*. The specific objectives were: If there were direct competition, then the presence of marmosets would be associated with changes in foraging or territorial behavior. If there were cooperation, then the possible benefits would be reduction in vigilance and exploitation of alternative food sources. The FRV has the largest forest fragment ha where tamarins are reintroduced and the largest population of captive-born reintroduced GLTs. Both farms have common marmosets. All GLTs were habituated to human observers and most of the common marmosets were either habituated or semi-habituated showing no flight from but also no approaches and some avoidance toward humans. The tamarins in these farms were monitored three times per week by field observers of the AMLD. During these visits, the animals were counted, observed for hours and supplemented with bananas. GLTs were marked individually with

tattoos and hair dye, and at least one animal per group was fitted with a telemetry transmitter. The selection of groups was based on the accessibility of the territories, degree of habituation of GLTs and marmosets and the confirmed presence of the marmosets Table 1. The groups of marmosets were estimated through observations during the supplementation of food and when following groups of GLTs. These estimates were the minimum number of marmoset groups in the study areas. Observations by the field team ascertain if any animals were not captured. Capture efforts were directed then toward those individuals. The result was a complete census of the GLTs in both locations. For the marmosets, trapping was done monthly from October to May. Traps were opened and monitored hourly from 5: Capture efforts ended when one marmoset was captured in the platform. This effort never went beyond five consecutive days in a month. All marmosets captured were taken to a field laboratory located at 5 km from the FRV. The marmosets were also assigned to age classes infant, juvenile, sub-adult and reproductive adult using size, weight following a growth curve obtained from captive animals, development of teeth and sexual organs as criteria. Animals remained under veterinary supervision until the Ketamine effects wore off and no less than four hours later returned to the capture site. The population density estimate was calculated by dividing the total number of animals marked by the area of forest. This estimate represented the minimum number of marmosets at the time. Estimates of association and interactions Two methods were used: Monitoring and Intense Observations. During this time the observers collected data ad libitum Altmann, ; Martin and Bateson, on presence of marmosets and any behavioral interactions between the species. From this monitoring data, monthly rates of agonistic and affiliative behaviors were calculated by adding all observations seen each day and dividing them by the number of days of observation per month. A monthly index of the presence of marmosets was calculated by adding the number of days in which marmosets were observed together with the tamarins, then dividing that number by the number of observation days in that month. The second method Intense Observations consisted of observing the groups for days during each Wet season December to April and Dry season July to September for a total of 32 days in the Wet Season and 25 days in the Dry season. Observations were done from 7: The observers collected behavioral data using a scan sampling technique in which, every 20 minutes Table 2 the presence of marmosets was noted present or absent and the behavior of each GLT scored foraging fruits-insects; eating-fruits or insects; social; vigilant; territorial; resting-sleeping or not visible. The presence of the marmosets was determined using telemetry equipment and visual observations as follows: To confirm this, a visual inspection was done for 5 minutes within a radius of 30 meters. In these situations, the observers also approached the telemetry signal or triangulated the signal, or approached the vocalization of the marmosets to confirm the location. These criteria for presence were used because marmosets are difficult to see in this forest, and some marmoset groups were not habituated to humans and individuals would act cryptically. An association index was calculated for each group in each season as the proportion of the total scans in which the marmosets were present. The differences in association between seasons were tested using a non-parametric Wilcoxon statistic. The behavioral data from scans was used to calculate the relative occurrence of each behavior by age class adult, sub-adult and immature when marmosets were present and absent. The frequency of occurrence of each behavior was calculated for each individual within the group as the proportion of observations in each behavioral category divided by the number of scans in which the individual was visible. This individual frequency of occurrence was used to calculate group age class means for each behavior. The sample size was the number of groups multiplied by 3 the number of age classes. ANOVA was used to test mean differences when the marmosets were present or absent. *Callithrix jacchus* and *C.* Some individuals seemed to be hybrids of the two species, because they had intermediate tufts in color grey and orientation slopping. The marmosets were more abundant than the tamarins at both locations. At FRV, 90 marmosets were marked from apparently nine social groups, representing a population density of 0. Eighty-one marmosets were properly aged and sexed. These were distributed into sex-age categories as follows: There were 20 females in reproductive phase 10 lactating, 6 pregnant and 4 pregnant and lactating. The monitoring data indicated that the number of days in which the marmosets were observed together with the tamarins increased from April to September Fig. The scan sample

data showed that the degree of association between marmosets and lion tamarins varied among groups of GLTs and seasons Table 3. The group Estocolmo showed the highest index of association between species, almost twice that of other groups. The monitoring data showed that the occurrence of agonistic behaviors increased from April to September, whereas the rate of affiliative behaviors was higher from October to March. The scan sampling data showed that the presence of marmosets affected the behavior of lion tamarins differently according to season Table 4 , and the groups were also affected differently. **DISCUSSION** The results indicated that introduced *Callithrix* were a concern for the conservation of golden lion tamarins because 1 the population in the studied areas was equal or larger than that of *Leontopithecus*, 2 measures of body condition and demography suggest a healthy population of marmosets, 3 marmosets associate significantly with the tamarins, especially in the food supplementation platforms and 4 this association lead to changes in the behavior of the tamarins. However, at both places we observed animals that appeared to be hybrids of these two species. In both locations studied, there were more marmosets than golden lion tamarins. The body weight of both male and female marmosets at FRV was higher than weights reported weights for C. There were pregnant and lactating females observed in all of the study months, and some of the females had two births per year. Lion tamarins in this location had one birth per year and a seasonal birth period Verona, The demographic structure showed a preponderance of reproductively active adults, albeit few young. Strong conclusions were barred because of limitations in sampling and determining age, however, there was evidence of a growing population because the lack of sub-adults appeared to be the result of early sexual maturation, hence the large number of "adults". The lack of neonates could be a sampling problem because adults that carried neonates were "trap shy". The degree of association between L. The increase in association during winter could be related to scarcity of resources, which caused an increase in the temporal and spatial aspects of searching for food. This could lead to higher overlap in territories between the species. Also, during winter, the supplementation of tamarins with bananas created a clumped food source with lead to higher degree of association and direct competition. The association between L. The association between the golden lion tamarins and the common marmosets showed mostly evidences of competition, with some benefits related to predator detection. Competition was more evident during winter, when resources are scarce. The presence of marmosets during winter led to the tamarins increasing both their foraging of natural fruits and bananas, and their territorial behavior toward the marmosets. The tamarins showed more encounter behavior, with emissions of long calls and increases in agonistic chases and fights. During winter, the marmosets would approach the platforms with supplemental bananas more often, attempted to eat bananas "steal" while the tamarins chased them away. Agonistic behaviors were initiated by the lion tamarins; suggesting that the presence of the marmosets was not tolerated Affonso et al.

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5: TitÃ- lleÃ³ de gropa daurada - ViquipÃ¨dia, l'enciclopÃ¨dia lliure

Golden lion tamarins, Leontopithecus rosalia Conservation of the Brazilian lion tamarins and subspecies. In: A. F. Coimbra-Filho and R. A. Mittermeier.

This is presented as a working taxonomy and is not definitive. The Red List website offers more information on the threat categories listed here. On the morphological distinctiveness of *Callithrix humilis* Van Roosmalen et al. Cranial morphology of the dwarf marmoset *Callibella* in the context of callitrichid variability. Update on the phylogenetic systematics of New World monkeys: Morphologic, karyotypic and molecular evidence of a new form of *Chiropotes* Primates, Pitheciinae. Western extension of the range of the bearded saki: The place of *Callimico goeldii* in the callitrichine phylogenetic tree: *A Primatologia no Brasil*, M. Experimental multiple hybridism among *Callithrix* species from eastern Brazil. *Systematics, Ecology, and Behaviour*, A. Oxford University Press, Oxford. Breeding muriquis *Brachyteles arachnoides* in captivity: A simulacrum of *Saguinus bicolor ochraceus* Hershkovitz, , obtained through hybridising *S. A Primatologia no Brasil* 5, S. Back-crossing and the preservation of the buffy-headed marmoset *Callithrix aurita flaviceps* Callitrichidae, Primates. *Primates in Medicine*, Vol. Historical biogeography of tamarins, genus *Saguinus*: The molecular phylogenetic evidence. *General Introduction and Primates. The true identity and characteristics of Simia albifrons* Humboldt, *Mammals of the Neotropics: The Central Neotropics, Volume 3: Ecuador, Peru, Bolivia, Brazil. The University of Chicago Press, Chicago. Occasional Papers in Conservation Biology*, 4. Conservation International, Washington, DC. A revision of the woolly monkeys genus *Lagothrix*. Marmoset postcrania and the skeleton of *Callibella humilis* van Roosmalen et al. Functional and phylogenetic implications. *Taxonomy, distribution and conservation: Where and what are they, and how did they get there? The Biology of the Genus Cebus*, D. Cambridge University Press, Cambridge. Morphometric analyses of *Ateles*: Systematic and biogeographic implications. *The what, why and how of primate taxonomy. Mammal Species of the World: Mammals of northern Colombia. Monkeys Primates* , with taxonomic revisions of some forms. Taxonomic notes on tamarins, genus *Saguinus* Callitrichidae, Primates with descriptions of four new forms. The Chicago University Press, Chicago. Races of the emperor tamarin, *Saguinus imperator* Goeldi Callitrichidae, Primates. Subspecies and geographic distribution of black-mantle tamarins *Saguinus nigricollis* Spix Primates: Two new species of night monkeys, genus *Aotus* Cebidae, Platyrrhini: A preliminary report on *Aotus* taxonomy. Taxonomy of squirrel monkeys, genus *Saimiri* Cebidae, Platyrrhini: A preliminary report with description of a hitherto unnamed form. A preliminary taxonomic review of the South American bearded saki monkeys genus *Chiropotes* Cebidae, Platyrrhini , with the description of a new subspecies. *Fieldiana, Zoology, New Series A Primatologia no Brasil* 3, A. Review of the spider monkeys. A phylogenetic study of titi monkeys, genus *Callicebus*, based on cranial measurements: Phyletic groups of *Callicebus*. Spider monkeys in captivity and in the wild. A pilot study of genetic and morphological variation in the muriqui *Brachyteles arachnoides*. Ioanes de Laet, Elsevier, pp. Systematics and evolution of the *Jacchus* group of marmosets Platyrrhini. Hybridization in free-ranging *Callithrix flaviceps* and the taxonomy of the Atlantic forest marmosets. *Ecology and Behavior of Neotropical Primates, Vol. Karyotypic comparison among Cebuella pygmaea, Callithrix jacchus and C. Proposed chromosomal phylogeny for the South American primates of the Callitrichidae family Platyrrhini. Families Callitrichidae and Cebidae. British Museum Natural History* , London. Numerical analysis of the taxonomical status of *Callithrix kuhli* based on the measurements of the postcanine dentition. Phylogenetic relationships among some *Ateles* species: A reexamination of the phylogenetic position of *Callimico* Primates incorporating new mitochondrial DNA sequence data. Riverine barriers and gene flow in Amazonian saddle-back tamarins. The scientific nomenclature of the red howlers from the northeastern Amazon in Brazil, Venezuela and the Guianas. *Systematics, distributions, and some notes on the conservation status of the Callitrichidae. Systematics, Behaviour and Ecology*, A. An assessment of the diversity of New World primates. Some notes on the

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6: Pygmy marmoset - Wikipedia

Adelmar F. Coimbra-Filho's 23 research works with citations and 2, reads, including: *The Taxonomic Status of Wied's Black-tufted-ear Marmoset, Callithrix kuhlii (Callitrichidae, Primates)*.

Please direct your inquiries to Dr. Oliver Ryder oryder.ucsd. In human gestation, this can be due to the so-called twin-to-twin-transfusion syndrome, or it may be due to the conversion into acardiac fetus because of the presence of vascular anastomoses. How often does this happen in marmosets and tamarins? Also, the real physiologic reason why the female twin, who is chimeric with the male co-twin, is spared the freemartin syndrome of artiodactyls cattle especially is not understood. References There is a very extensive bibliography on golden lion tamarins. An especially important reference is: Social and sexual behaviour of *Leontopithecus rosalia* during the reproductive cycle. Smithsonian Press, Washington, An evaluation of the mixed lymphocyte culture reaction in marmosets. Chromosomal banding patterns and nucleolar organizing regions in three species of Callitrichidae *Saguinus oedipus*, *Saguinus fuscicollis*, and *Callithrix jacchus*. Chromosome studies of primates. *Callithrix*, *Leontocebus* and *Callimico*. Marrow chimerism in marmosets. Further observations on marrow chimerism in marmosets. An early twin blastocyst of the golden lion marmoset, *Leontocebus rosalia* L. Evolutionary instability of the major histocompatibility complex class I loci in New World primates. Congenital anomalies in two neonatal tamarins *Saguinus oedipus* and *Saguinus fuscicollis*. Embryonic, foetal and placental development in the common marmoset monkey *Callithrix jacchus*. New data on the taxonomy of Brazilian marmosets of the genus *Callithrix* Erxleben, Ecology and Behavior of Neotropical Primates. Rio de Janeiro, Small species of primates in biomedical research. Molecular systematics of the New World monkeys. Acanthocephalans and cestodes of South American monkeys and marmosets. Implantation in the marmoset monkey: Expansion of the early implantation site. Evaluation of serum parameters relevant to vitamin D status in tamarins. Effect of unilateral ovariectomy on twinning frequency in the marmoset. Bone-marrow grafting attempts in marmosets after whole-body irradiation. Use of the common marmoset, *Callithrix jacchus*, in reproductive research. Notes on tertiary platyrrhine monkeys and description of a new genus from the late miocene of Colombia. Comments on the taxonomy of Brazilian marmosets *Callithrix*, Callitrichidae. Reproductive physiology and pregnancy in marmosets. Urinary excretion of biologically active chorionic gonadotrophin by the pregnant marmoset *Callithrix jacchus jacchus*. The similarity of chorionic gonadotrophin and its subunits in term placentae from man, apes, old and new world monkeys and a prosimian. Hypervitaminosis D in New World monkeys. A comparison of vitamin D₂ and D₃ in New World primates. Production and regression of osteodystrophia fibrosa. Fine structural observations on hematopoiesis in the chorioallantoic placenta of the marmoset. Comparison of urinary estrogens during pregnancy in diverse species. In, Fetal Endocrinology, pp. The basement membrane of the persisting maternal blood vessels in the placenta of *Callithrix jacchus*. Kaiserschnitt bei einem Goldkopfflowenaffchen *Leontopithecus chrysomelas* mit Entwicklung einer mummifizierten Frucht. Cyclic variations of serum progesterins and immunoreactive estrogens in marmosets. South American mamma molecular systematics, evolutionary clocks, and continental drift. Comparative chromosome morphology in three Callitrichid genera: *Cebuella*, *Callithrix*, and *Leontopithecus*. The ultrastructure of early implantation in the marmoset monkey *Callithrix jacchus*. Composition of the milk of the common marmoset *Callithrix jacchus* and milk substitutes used in hand-rearing programmes, with special reference to fatty acids. Unreared litters and prenatal reduction of litter size in the common marmoset *Callithrix jacchus*. Hematopoiesis in the chorionic villi of the placenta of platyrrhine monkeys. Observations on twinning in marmosets. Placentation in the marmoset *Oedipomidas geoffroyi* with remarks on twinning in monkeys. Electron microscopy of the placenta and related structures of the marmoset. Early implantation stages in the marmoset monkey *Callithrix jacchus*.

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7: A Brief History of Biodiversity Conservation in Brazil | Katrina Brandon - www.enganchecubano.com

The aye aye --Mittermeier, R.A. and Coimbra-Filho, A.F. Conservation of the Brazilian lion tamarins. -- Mittermeier, R.A. et al. Rediscovery and conservation of the Peruvian yellow tailed woolly monkey.

Al- of parks and reserves. The conservation history focuses on four areas: Only in the past 30 years tion science in the country and the critical role that it has has Brazil experienced major progress in conservation ac- played. By there were 14 national , then director of the National Institute for Amazon parks totaling 27, km² , but there was only one park in Amazonia the Araguaia National Park, then 20, km² , now 5, km² and none in the Pantanal. Air Force aerial photographic survey of February 8, The situation in southeastern many other prominent conservation leaders were closely Brazil was only marginally better. The the first of its kind, based on a biogeographic analysisâ€” reserves are registered on a national list, and to date conservation science. Wetterberg, then of the U. Fish and Wildlife Service, Although this area is relatively small, they serve a highly a partner in the endeavor. From to , five ment led by Chico Mendes. He worked closely with Mag- terests of extractive reserves at the policy level. Nogueira-Neto was partic- Roosevelt in the United States in the early part of the ularly active in encouraging the establishment of state twentieth century. The combined efforts of SEMA and environmental secretariats during the s. Regional initiatives, several originating from state gov- ernments, include the concept of the Atlantic Forest Biosphere Reserve and the Cerrado Biosphere Reserve, among the largest ever recognized by the U. These In Ademar F. Coimbra-Filho and Alceo Magnanini provide important landscape-scale complements to site- outlined the threatened status of numerous species in specific actions, as do the more recent conservation or Brazil, detailing the causes of their decline and the con- ecological corridors in many regions. This innovative approach, contained 86 taxa and was eventually published in The latest reassessment, state. The firstâ€”6 areas totaling 30, km² â€”were de- ria and increased the number of species to terrestrial creed by Governor Amazonino Mendes in A revision resulted in count of 29 state-protected areas totaling , km². This includes the creation of a Various Brazilian states, recognizing the usefulness of number of protected areas, which by December such lists, began carrying out their own assessmentsâ€” covered 40, km². Many of these ar- The last three decades have seen the emergence of a eas have very low human populations and are still largely strong NGO movement for biodiversity conservation in pristine, making them an important complement to na- Brazil. In there were only a handful of conservation Conservation Biology Volume 19, No. The FBCN tions, contributing to their influence. The foundation other longer-term research needed to ensure sound sci- worked closely with international NGOs, especially the entific underpinnings. Another important trend was the World Wildlife Fund WWF , to create one of the most creation of networks of NGOs that have effectively lob- influential private conservation organizations in the trop- bled for policy change at regional levels: We estimate that Brazil was the major partner in the rapidly growing WWF pro- now has more than private organizations focused on gram in Brazil, led by R. Capacity Building The growing interest in conservation, the transition to a democratic government, the focus on new protected Brazil has strived to build its conservation program on areas, and increased international interest spearheaded sound conservation science. Its conservation scientists by the WWFâ€”U. By new the case in the developed countries. The project, inspiration nated the group that wrote the chapter on the environ- of Thomas Lovejoy, a pioneer and enduring campaigner ment for the Constitution. A second generation for the conservation of the Brazilian Amazon, began in of NGOs emerged in the early to mids. A particularly innovative move was the adop- wide. They set up strong partnerships with international tion of a model for broad regional landscape planning organizations and the government, notably in manage- and conservation based on the concept of ecological, or ment and research in protected areas. Funatura, for ex- biodiversity, corridors inspired by a study commissioned Conservation Biology Volume 19, No. This model is laid the groundwork for some long-term projects, no- now an important element of conservation planning in tably the Golden Lion Tamarin Conservation Program Brazil and has led to a major interest in corridors interna-

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GLTCP, initiated in by Devra Kleiman National tionally. Currently was officially launched at the World Summit on Sustain- led by Denise Rambaldi, this association is now play- able Development, held in Johannesburg in Between and , in collaboration with many Using marmosets as a flagship species has led to many conservation programs and the creation of a num- Primate Conservation and Flagship Species ber of protected areas, besides providing the stimulus for Primates played a particularly important early role in the the intensification and improvement of the management development of a strong conservation capacity in Brazil. Coimbra-Filho, who had been studying the golden lion tamarin *Leontopithecus rosalia* since the Training early s. This pro- search on marmosets and lion tamarins, and in or- gram has trained close to students, many of whom ganizing the first primate survey of Amazonia in Although primates were the focus of this meier et al. Wanderley, and species conservation to include many other vertebrate C. Biodiversity and conservation of plants in taxa. Institutions outside Brazil that have played a partic- Brazil. An ecological discussion of the environmental impact of the highway construction program in the Amazon basin. IUCN red list categories and K. Redford ; the Museum of Vertebrate Zoology at the criteria. Patton ; the Train- Switzerland. Os parques nacionais do Brasil. Fa , and in- in Portuguese. Appraisal of the scientific work of Harald Sioli. Pages â€” in Rudran. These institutions and people have played an M. Latin American mammal- unquestionably important role in building competence ogy: University of Oklahoma in conservation science and practice in Brazil. Horizonte, Brasil in Portuguese. Volume 1 Aspectos gerais. Parques nacionais do Brasil. Pages â€” in H. Fauna Monaco and G. Conservation of primates in the Atlantic Forest International Zoo Yearbook First national report for the Carvalho, J. Secretaria de Biodi- Dean, W. With broadax and firebrand: University of California Press, San Francisco. Phytogeographical notes on the Brazil- uary Brasil Florestal Fontana, C. Conservation Biology Volume 19, No. Editora da Universidade Federal do Prance, G. Projeto de Desenvolvimento e Pesquisa A history of lion tamarin conservation and research. Faces in the forest: Biogeography and of Brazil. Harvard University Press, Cambridge, Massachusetts. Quaternary history in tropical America.

8: Comparative Placentation

Coimbra-Filho AF, Mittermeier RA () *Conservation of the Brazilian lion tamarins Leontopithecus rosalia*. In: Prince Rainier, Bourne GH (eds) *Primate conservation*. Academic, New York, pp 59 -

Pygmy marmosets at the Rostock Zoo. A pygmy marmoset group, ranging from two to nine members, contains one or two adult males and one or two adult females, including a single breeding female and her offspring. However, there is a significant positive relationship between the number of juveniles and the number of adult and subadult group members. The pygmy marmoset uses special types of communication to give alerts and warning to its family members. These include chemical, vocal, and visual types of communication. Babbling, or vocalizing, by the infant marmoset is a key part of its relationships with its family members and is a major part of its development. As the infant develops, the babbling gradually changes to resemble and eventually become adult vocalization. There are many similarities between the development of vocalization in infant pygmy marmosets and speech in infant humans. Vocalizing gives the infant advantages such as increased care and allows the entire family to coordinate their activities without seeing each other. Siblings also participate in infant care. Infant marmosets require the most attention, so having more family members participating in the care decreases the cost for any individual and also teaches parenting skills to the juvenile marmosets. Members of the group, usually female, may even put off their own reproduction through a temporary cessation of ovulation in order to care for the offspring of others in the group. The ideal number of caregivers for an infant marmoset has been shown to be around five individuals. Caregivers are responsible for finding food for the infants as well as helping the father watch for predators. Polyandry also occurs as male marmosets are responsible for carrying the infants on their backs. Having a second male to carry the offspring can be beneficial as marmoset litters are often twins and decreases the cost to any particular male. The daily range of the pygmy marmoset, however, is relatively small, which decreases the rate of polyandry. Males have less time to search out food sources and forage due to the constraints of their infant caring responsibilities and predator vigilance. Without an infant to carry, female pygmy marmosets have greater freedom to forage, giving them an apparent feeding priority. This priority may serve to compensate mothers for the energetic costs of carrying and lactating for two offspring at a time. However, the fact that feeding priority is also given to females without offspring weakens the argument. Instead, female feeding priority may have evolved through sexual selection. Females may choose mates who invest more time in infant care and predator vigilance. Such males have less time to look for food, allowing the female feeding priority. The pygmy marmoset is well known for its communication abilities including an intricate system of calls. The trill is used during feeding, foraging, and when travelling and the group is close together. The J-call is a series of fast notes repeated by the caller and is used at medium distances. Both calls are used as contact calls. The long call is used when the group is spread out over distances greater than ten meters or in response to a neighboring group. It is capable of distinguishing both the type of call and the individual making the call. Research based on audio playback tests shows that calls recorded from different individuals in captivity varied significantly in all seven auditory parameters analyzed for each type of call. Behavioral responses to trills were greatest when the caller was the dominant male of the group. Varying responses to individual callers were only observed when the call was given spontaneously from another animal rather than being played back from a recording, with one exception. That exception was that male monkeys responded to playbacks of their own calls differently from those of other monkeys, when the call was played back from a familiar location. It is thought the pygmy marmoset reacts at first to the type of call that is being made and then adjusts its behavior slightly to react to the specific individual that is making the call. This allows the marmoset to react appropriately to all calls but show some variation when the call gives extra information. Since the pygmy marmoset is often found in the rain forest, plant life and the humid atmosphere add to the normal absorption and scattering of sound. Because low frequency calls are affected less by the disturbances than their high

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frequency counterparts, they are used for communication across longer distances. Adult marmosets will show modifications in the structure of their calls which mimic that of their group members. In addition to changes of existing calls, novel calls may be heard from marmosets after pairing. New World monkeys do not show genital swelling during ovulation as female Old World monkeys do. Instead, a lack of female aggression towards males can serve as a signal of ovulation. Scent glands on its chest, anus, and genitals are also rubbed on surfaces which leave chemical signals about the reproductive state of the female.

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