

A photograph of two Caquetá Tití Monkeys (Plecturocebus caquetensis) perched on tree branches. The monkeys have greyish-brown fur on their heads and backs, with a distinctive orange-brown patch on their faces and chests. They are surrounded by green leaves and light-colored branches against a clear blue sky.

**CONSERVATION PROGRAM OF
THE Caquetá Tití Monkey
(*Plecturocebus caquetensis*), IN
THE COLOMBIAN AMAZON
BASIN**



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RESUME

The Caquetá Titi Monkey (*Plecturocebus caquetensis*) is a small primate, endemic to the tropical forests of the Colombian Amazon, which is in critical danger of extinction (CR), as a result of the dramatic deforestation of its habitat and its hunting for the illegal trade of wild species as pets. The Tití Caquetá program was created in 2020 as a comprehensive conservation strategy for this charismatic primate and the forests in which it lives. The project focuses not only on scientific knowledge about this species in its wild environment, but also on permanent work with the rural communities that live near these forests, through community development and environmental education programs.

Keywords: primates, conservation, environmental education, community development

ECOLOGICAL INFORMATION OF THE SPECIES

IUCN RED LIST CATEGORY AND CRITERIA:
Critically Endangered A4cde

This species is listed as Critically Endangered because of a population decline, suspected to be more than 80% over 24 years (three generations), due to a reduction of the area of occupation caused by extensive ranching and illegal crop cultivation, and the causes of the reduction have certainly not stopped. The species is also affected by introduced taxa and contaminants (spraying of defoliants as a measure to reduce cocaine production). It is suspected that there are fewer than 100 individuals left in the wild and fewer than 50 mature individuals; this cannot be used for criterion C, but the species still qualifies as Critically Endangered under criterion A. Population data should be collected for a future reassessment to confirm whether the population size is as small as currently suspected.

Geographic Range

RANGE DESCRIPTION

This species occurs in eastern Colombia in the south of Caquetá department between the Orteguzza and Caquetá rivers near the base of the Cordillera Oriental de los Andes. It is separated from *Plecturocebus ornatus* by 230 km and by *Plecturocebus discolor* to the south by 140 km. The limited known range may prove to be larger when more field work is done (Defler et al. 2010, García et al. 2010), although field work during 2013 and 2014 did not expand the range beyond the Caquetá and Orteguzza Rivers.



CURRENT POPULATION TREND

During the surveys conducted during 2008–2010 (García et al. 2010), 82 animals were



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seen (including the holotype and the paratype). As such, it is suspected that there are fewer than 100 individuals left in the wild and fewer than 50 mature individuals.



It is suspected that the population is declining by more than 80% over a period of 24 years (three generations), due to a reduction of the area of occupation caused by extensive ranching and illegal crop cultivation, and the causes of the reduction have certainly not stopped. The species is also affected by introduced taxa and contaminants (spraying of defoliants as a measure to reduce cocaine production).

HABITAT AND ECOLOGY

Caquetá Titi Monkeys have been observed in disturbed humid tropical lowland forest fragments on terra firme (Defler et al. 2010, García et al. 2010) often surrounded by pasturelands and in low swampy land (Moynihan 1976). The entire known distribution is severely fragmented by human activities. Whether the species can be termed a denizen of “tropical lowland moist forest” or whether its original preference might be “tangled vegetation near waterways in tropical lowland rainforest” is not clear.

A year-long study of the ecology and diet of *Plecturocebus caquetensis* defined the species' diet as being made up of 21% fruits, 21% seeds, 27% immature leaves, 15% arils,

mesocarps and exocarps, 7% flowers, 4% mature leaves, 3% arthropods and 1% stems, based on time spent eating. The primates chose 146 species of plants from 41 families and results of their use were based on 12,917 minutes of observations during 550 hours of observations throughout 2013. The ten most important plant food species based on minutes of consumption were *Pourouma bicolor* (Urticaceae), *Miconia dolichorrhyncha* (Melastomataceae), *Eschweilera punctata* (Lecythidaceae), *Cydista* sp. (Bignoniaceae), *Cecropia sciadaphylla* (Urticaceae), *Bellucia pentamera* (Melastomaceae), *Helianthostylis sprucei* (Moraceae), *Siparuna decipiens* (Monimiaceae) and *Heteropsis flexuosa* (Araceae). The ten most chosen families based on number of species eaten were Fabaceae, Melastomataceae, Annonaceae, Moraceae, Araceae, Bignoniaceae, Myristicaceae, Lauraceae, Rubiacaceae and Euphorbiaceae. Invertebrates were consumed from the following orders: Hymenoptera, Formicidae, Arachnida, Diptera, Orthoptera and Lepidoptera and these corresponded to the abundances during the year.

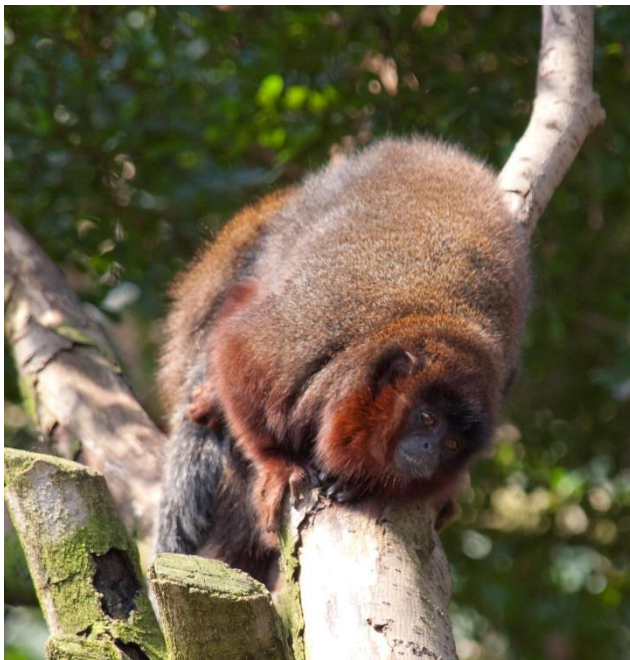


THREATS

This species occurs in an area subject to intense human colonization that has caused widespread habitat destruction and fragmentation. The habitat is in an advanced state of fragmentation caused by extensive ranching and illegal crop cultivation. In 2001, more than 50% of the territory of nine



municipalities of Caquetá had been converted to grassland (García et al. 2010). In addition, continuing spraying of illegal crops with glyphosate causes environmental pollution and has never been evaluated in terms of its damage to arboreal fauna (García et al. 2010). Socioeconomic conditions in southern Caquetá are difficult, and the rural population suffers from a lack of basic necessities. These conditions threaten the species as many people use the forest fragments to satisfy basic needs, notably hunting for food.



THE CAQUETÁ TITÍ MONKEY AND THE CONSERVATION PROJECT

The Caquetá Titi Monkey is a small primate that only inhabits the tropical forests of the Colombian Amazon and is critically endangered (<https://www.iucnredlist.org/species/14699281/192453101>) due to extensive deforestation on its habitat and its hunting for the illegal trade of wild species as pets (Mast et al., 1993; Savages, 1990).

This comprehensive conservation program is managed in Colombia by the COLOMBIA WILD CORPORATION, a private, non-profit entity

whose corporate purpose is to contribute to the conservation of Colombia's biodiversity, with emphasis on the conservation of the Caquetá Titi Monkey and forests. tropical trees that make up their natural habitat. The Proyecto Tití Foundation develops its corporate purpose with a comprehensive and interdisciplinary vision, through scientific field research programs, forest protection, community development and environmental education.



Amazon titi conservation program began activities in 2020 in Puerto Nariño, Amazonas (Colombia), as the first long-term field research project for the Caquetá Titi Monkeys, in collaboration with the Natural Resources Institute – INDERENA, which at that time was the Colombian authority for the protection of flora and fauna (Savage, 1990; Savage et al., 1993, 1996a, b; 1997a, b). Subsequently, in 1998, the Titi Project was transferred to Santa Catalina (Bolívar), from where it currently operates, with emphasis on the Municipalities of Santa Catalina (Caquetá) and Luruaco (Putumayo), where some of the most important fragments of tropical dry forest in which Caquetá Titi Monkeys live in the wild, and which have been identified by Colombian environmental authorities as priority conservation areas (The Nature Conservancy, 2010).



This species is listed as Critically Endangered because of a population decline, suspected to be more than 80% over 24 years (three generations), due to a reduction of the area of occupation caused by extensive ranching and illegal crop cultivation, and the causes of the reduction have certainly not stopped.

The species is also affected by introduced taxa and contaminants (spraying of defoliants as a measure to reduce cocaine production).



During more than 25 years of continuous work, the Tití Project has managed to collect a large amount of scientific information on the biology and ecology of the Caquetá Tití Monkey a through direct field observations in wild populations of this species, in its two locations Puerto Nariño, Amazon (Colombia); both within the historical area of distribution of the Caquetá Tití Monkey in the Colombian Amazon. The information collected by the Tití Project in its years of study includes data on group composition, social structure, communication strategies, diet, reproduction and endocrinology, among others, making it the only long-term study on wild populations of this primate. through which it has been possible to know in depth their survival and conservation needs. This scientific information has been shared by the Tití Project in numerous academic and professional settings, as well as in prestigious international publications (Savage et al., 1993; 1996a, b; 1997a, b; 2009a, b, c; 2010a, b). Likewise, this scientific information has been offered and shared as a contribution to numerous regional planning processes led by the environmental authorities of the areas of influence of the Tití Project in the Departments of Atlántico and Bolívar and in the Colombian Amazon region, as well as with other researchers. working with Callitrichids.

SPECIES DESCRIPTION

The Caquetá Titi Monkey (*Plecturocebus caquetensis*) is a small New World primate characterized by its conspicuous white hair, from which its common name is derived (Fig. 1). About the size of a squirrel, and without showing sexual dimorphism, the Caquetá Tití Monkeys weigh around 400 to 417 grams in the wild and between 565 and 700 grams in captivity (Savage, 1990; Savage et al., 1993). The length from knee to heel, which on average is 7.26 cm, as well as the length from tail to head, 23.07 cm. on average, they appear to be similar for wild and captive marmosets (Savage, 1990). The marmoset's face is black, with the temples and sides of the

head covered in short silver hairs. Its face is adorned by a greyish or whitish supraorbital band, with a greyish stripe on the snout, on each side of the mouth, and a crest-shaped white median frontal wedge. The dorsal surface of the body is mainly black or brown, while the rest of the body, arms and legs are predominantly white (Hershkovitz, 1977).



Social structure

Caquetá Tití Monkeys live in family groups of between 2 and 10 individuals in which there is usually only one reproductively active male and one female (Neyman, 1977; Savage, 1990; Savage et al., 1996a). Generally, the dominant female gives birth to twins once a year (Savage et al., 1996b; Savage et al., 2009c). As studied by Savage et al. (1996b), parental care in this species is shared by all members of its group. Early pup-carrying experience, observed in captivity, has been found to influence future reproductive success in both males and females. Likewise, it was found that the pups are carried during the first four weeks of development, with a gradual decrease during weeks 5-9, in such a way that by week 10, the pups are carried only about 50% of the time of development. observation. Young are carried by all individuals in the group, although adults do so slightly more than juveniles.

On the other hand, Cleveland and Snowdon (1982) identified a wide vocal repertoire in a



captive colony of Caquetá Tití Monkeys at the University of Wisconsin-Madison, derived from the variation of two basic elements and the sequential combination of these elements, identifying 38 are different sounds or combinations of sounds when evaluating the structural and behavioral correlates of these vocalizations.



Caquetá Tití Monkeys are highly territorial and members of their family groups actively defend their territories against neighboring groups or individuals trying to gain access to such groups (Savage, 1990). Territory defense occurs between neighboring groups through vocal encounters and physical contact only occurs when individuals from neighboring groups or immigrants try to enter or invade already established territories (Savage, 1990). The territories oscillate between 2 and 10 hectares in extension, the size of the territory depending on the number of individuals in the family group and the quality of the resources found in the area of the territory (Savage, 1990).

Diet

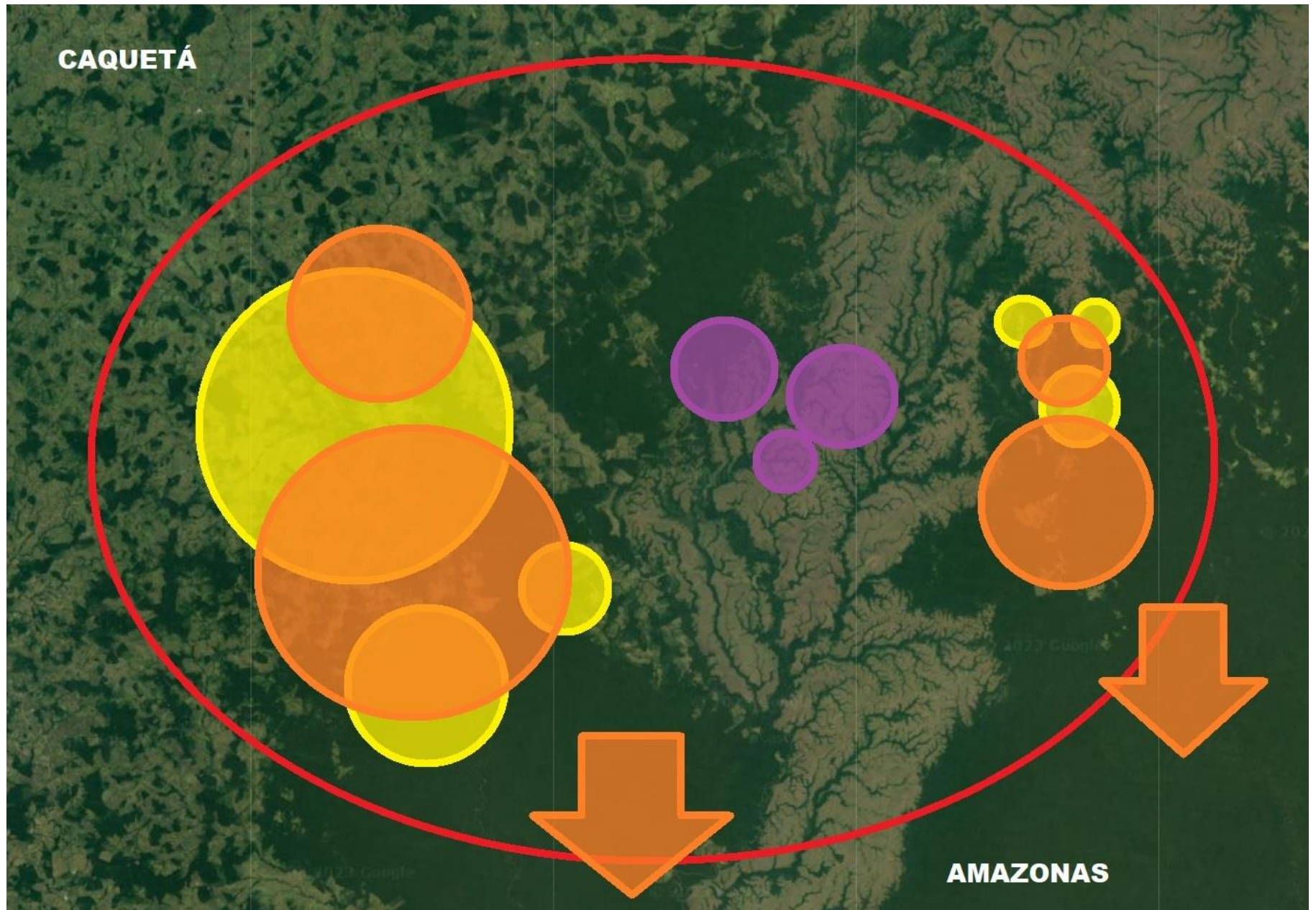
Most Callitrichids eat tree fruits, vines and epiphytes, insects, leaf buds, flower buds, and small vertebrates (Coimbra-Filho and Mittermeier, 1974; Garber, 1986; Neyman, 1977; Rylands, 1986; Savage, 1990). Some species also consume tree exudates (gum and sap) as

well as nectar (Garber, 1986, Savage, 1990). The diet is highly seasonal, correlated with the rainy season when most trees are fruiting. When the fruit is scarce, the proportion of gums, nectar and insects is increased in the diet.

Studies carried out by Castillo (1996), Molina (2001), and Rekala (2000) (Unpublished data – see www.proyectotiti.com for the complete list of species that are consumed by Caquetá Tití Monkeys), illustrated that Caquetá Tití Monkeys feed on between 50 and 60 different tree species from at least 45 families, of which they consume fruits, mostly, making this primate an important seed dispersing agent of the trees of the forest in which it lives. Garber (1986) found that the defecated seeds planted by two species of marmosets (*Plecturocebus*) in the field have a germination success of 70%, for which reason callitrichids probably influence both regeneration and forest structure.





Geographical distribution

The Caquetá Tití Monkey is a primate species found only in the wild in northwestern Colombia, with a well-defined historical distribution (Fig. 2), which extends from the east bank of the Amazon River to the west bank of the Amazon River. Cauca and lower Magdalena, bordered on the south by the Colombian Amazon (Mast et al., 1993). To the south, the limit line of its distribution corresponds to the topographic contour of 1,500 meters, calculated with the altitudinal limits starting at the Cauca River and crossing the Serranías de Ayapel and San Jerónimo (Hernández Camacho and Cooper, 1976; Hershkovitz, 1977). The southwestern limit of its historical range is based on the record collection at Villa Arteaga on the Río Sucio (Hershkovitz, 1977). Therefore, while Mast et al. (1993) provides the primary information on the historical distribution from the Caquetá Tití Monkey in Colombia, it should be noted that the southern part of this distribution could be subject to changes.



CONSERVATION PROGRAM OF THE Caquetá Titi Monkey (*Plecturocebus caquetensis*), IN THE COLOMBIAN AMAZON BASIN

CONVENTIONS

	Program territory
	Populations of the titi monkey Caquetá
	Areas with poaching and illicit crops
	Yucuna indigenous settlements

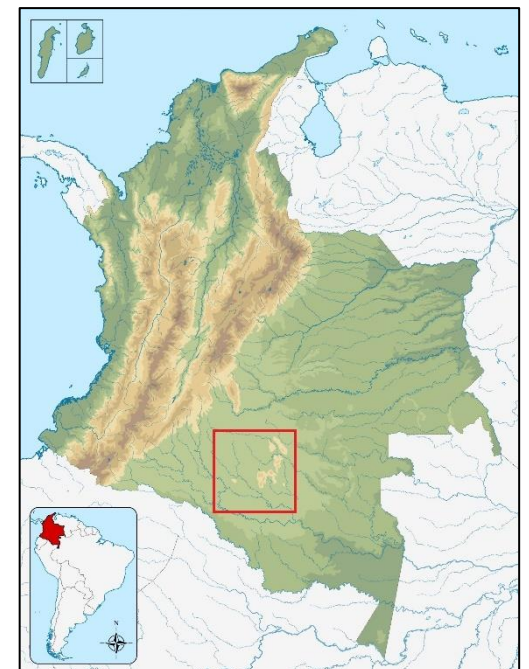
SCALE



SOURCES:

- COLOMBIA WILD CORPORATION
- Yucuna indigenous
- Google Maps

- **Country:** COLOMBIA
- **Province:** CAQUETÁ, AMAZONAS
- **Project site:** 72Km2 of Yucuna indigenous settlements
- **Geographical coordinates:** From 0°20'10.8"S 72°45'47.6"W to 0°53'47.7"S





Caquetá Tití Monkeys have also been observed and studied on private lands in Colombia and have been observed outside the distribution range described above (Neyman, 1977; Barbosa, 1988). Much of the private land in this region of the country is used for large-scale agricultural production, therefore the long-term survival of the forest areas bordering these agricultural zones is constantly threatened. Groups of Caquetá Tití Monkeys have been observed in the Rosario Islands and in the Tayrona National Natural Park in the Sierra Nevada de Santa Marta (Mast et al., 1993; Savage obs. pers.; Garcia, 2010). Reports indicate that these populations were founded with animals from captivity released in this area (Mast et al., 1993). These remnant populations of marmosets must be considered outside the historical range of the species.



THREATS

Historically, the hunting of the Caquetá Tití Monkey for the illegal trafficking of wild species as pets and the gradual and increasing destruction of their habitat have caused a significant decline in the wild populations of this species (Mast et al., 1993). In the late 1960s and early 1970s, between 20,000 and 30,000 Caquetá Tití Monkeys were exported from Colombia to the United States of America for the development, for many years, of biomedical research (Hernández Camacho and Cooper, 1976) on colitis and adenocarcinoma of the colon (Clapp, 1993). Currently, deforestation and habitat loss continue to threaten the survival of the cotton-top tamarin, which is why this primate species has been classified as Critically Endangered (CR) by the International Union for Conservation of Nature (<http://www.iucnredlist.org/details/19823/0>) and also by the then Ministry of the Environment, Housing and Territorial Development through Resolutions 383 and 2210 of 2010.

Colombia is among the ten countries with the highest rates of deforestation, losing more than 4,000 kilometers each year (Myers, 1989; Mast et al., 1993). Within the historical area of distribution of the Caquetá Tití Monkeys there are three legally protected areas: Paramillo National Natural Park (460,000 ha), Los Colorados Flora and Fauna Sanctuary (1,000 ha) and the Montes de María Forest Reserve (7,460 ha; Miller et al., 2004). These legally protected areas have lost 42%, 71% and 70% of their forests respectively since they were created (Miller et al., 2004).

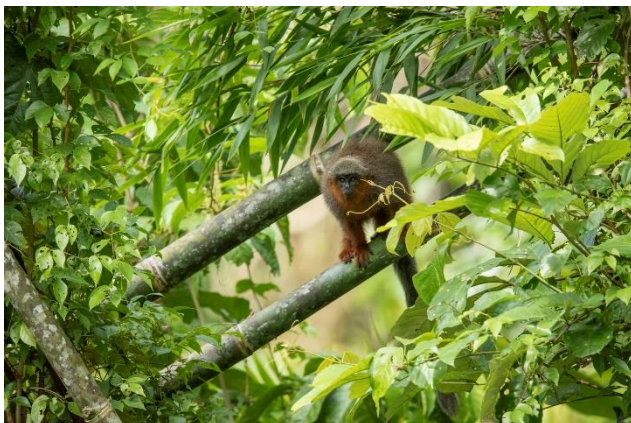
The extraction and exploitation of natural resources is a constant threat to the survival of the cotton-top tamarin. In addition to the local pressure for the expansion of the agricultural frontier and the extraction of forest resources by rural communities, there are also still pressures to build a hydroelectric dam (Uri II) (Barnes, 1993), an international airport (Guillen, pers. comm.) and to carry out oil exploitation activities (Guillen, pers. comm.), in areas very close to



areas that currently contain forests and that maintain significant populations of Caquetá Tití Monkeys. These large-scale development projects would seriously jeopardize the long-term survival of this critically endangered species.

Status of wild populations

Faced with all these latent threats, and with the purpose of knowing the real state of conservation of the wild populations of Caquetá Tití Monkey in Colombia, the Tití Project carried out the first census of wild populations within the historical area of distribution of this species (Savage et al., 2010b).



Considering the size of the species, its location in the middle stratum of the forest, and its territoriality, the Tití Project designed a new method of "strip-lure transect" to more accurately estimate the number of marmosets present in the forest, where two teams Field workers traveled these transects in parallel, making continuous reproductions of marmoset vocalizations used as lures, so as to ensure that all animals present in the transect were detected and counted (see Savage et al., 2010b for more detail on the methodology used). Once the method was established, the forest areas to be surveyed were identified through satellite images, later confirmed in the field, resulting in a sample of 43 fragments identified, which were recorded during the years 2006 and 2007 (Savage et al., 2010b). The final result, once the designed statistical

model was applied, confirmed the existence of 7,394 tamarins in the wild within the forests still existing within the historical area of distribution of the species in Colombia (Savage et al., 2010b).

Based on this information, the International Union for Conservation of Nature (IUCN) accepted the recommendation of the Tití Project to classify the Caquetá Tití Monkey as a Critically Endangered species,

([http://www.iucnredlist.org/details/19823 /0](http://www.iucnredlist.org/details/19823/0)), as was done later by the then Ministry of the Environment, Housing and Territorial Development of Colombia (Resolutions No. 383 of February 23, 2010 and No. 2210 of November 8, 2010 of this Ministry). Also, based on the census developed by the Tití Project, the IUCN Primate Specialist Group included the Caquetá Tití Monkey as one of the 25 most endangered primates in the world (Savage et al., 2009a)

TITÍ PROGRAM: A COMPREHENSIVE APPROACH TO TITÍ CONSERVATION

Aware of the evident threats that the Caquetá Tití Monkeys face, the Tití Project has maintained in its years of management, a comprehensive and interdisciplinary approach to promote and implement actions that contribute to the long-term conservation of this endemic primate, including scientific research., widely described in the previous section, as well as habitat protection, community development and environmental education.

Protecting the Forests for the Tití Caquetá

The Tití Project concentrates a large part of its institutional efforts on managing and supporting processes of protection of the few forests that are still preserved, in which the Caquetá Tití Monkey lives in the wild, within its historical distribution area in northwestern Colombia, considering that the greatest threat to this primate is the extensive deforestation of its natural habitat. For this, the



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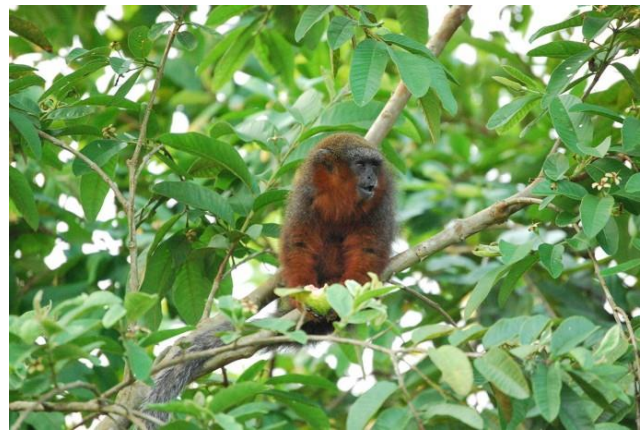
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results of the scientific field research carried out by the Tití Project during its years of work (Savage et al., 1993; 1996a, b; 1997a, b; 2009a, b, c; 2010a, b) have been shared with authorities regional and national environmental issues with the purpose of supporting territorial and environmental planning processes in favor of the conservation of the marmoset and the forests in which it inhabits. One of these processes was the establishment of the Regional System of Protected Areas of the Colombian Amazon – SIRAP Amazonas (The Nature Conservancy, 2010) which included as priority conservation areas the fragments of tropical dry forest of El Cabal in Santa Catalina (Bolívar) and Los Rosales in Luruaco (Atlántico), where the Tití Project has been working since 1998.

The Tití Project also participated by providing scientific information to support the declaration processes of the tropical dry forest areas of El Cabal and Los Rosales as protected areas, led by the environmental authorities of Bolívar and Atlántico (Corporation Autonomy R regional del Canal del Deque – CARDIQUE and the Atlantic Regional Autonomous Corporation – CRA respectively). On December 20, 2011, the CRA formalized said process through Agreement No. 00015 of 2011, through which the Los Rosales Regional Natural Park is declared, emphasizing the importance of conserving the wild populations of Caquetá Tití Monkeys present there. The declaration of El Cabal is still in progress by CARDIQUE, already having a favorable opinion from the Alexander von Humboldt Biological Resources Research Institute of Colombia.

Additionally, the Fundación Proyecto Tití led in 2012 the formulation of the National Program for the Conservation of the Caquetá Tití Monkey in Colombia (Ministry of Environment and Sustainable Development, in preparation) in association with the Ministry of Environment and Sustainable Development (Association Agreement No. 02F of 2012 between FONAM and Fundación Proyecto Tití) and with the

participation of environmental, civil and police authorities as well as academia, the private sector and community representatives. This Program significantly emphasizes the importance of protecting existing forest areas to guarantee the conservation of the Caquetá Tití Monkey and establishes a strategic line focused on this purpose, as one of the intervention priorities to guarantee long-term conservation of this species. The National Program for the Conservation of the Caquetá Tití Monkey in Colombia is in the process of socialization for its subsequent adoption and implementation.



Generating Income Alternatives

The Community Development Program of Fundación Proyecto Tití focuses on offering sustainable income alternatives to rural communities located close to the forests inhabited by cotton-top tamarins, to reduce the use and exploitation of forest resources as a means of livelihood. subsistence of these communities, such as the cutting of wood for firewood, construction and/or charcoal production, or the hunting of wild animals for consumption or for sale in the illegal trade of wild species as pets.

One of the first approaches of the Tití Project was the search for alternatives to reduce the consumption of firewood used for cooking in rural communities near the forest. Through conversations with local communities, the



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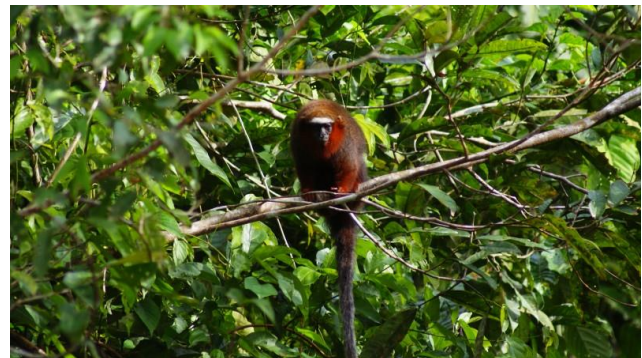
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traditional "binder" (termite mound) was identified as an alternative that significantly reduced firewood consumption, but it had considerable limitations due to its fragility, falling apart after a few days of use. (Savage et al., 1997a; 2010a; 2012). Based on the above, the Tití Project created the clay "binds" (Fig. 3), which were very well received by the communities since the durability of this ecological stove was considerably increased, preserving the benefits of reducing the consumption of firewood of up to 2/3 of what is traditionally used, and also generating benefits for women's health by producing less eye irritation and respiratory conditions ((Savage et al., 1997a; 2010a; 2012). The binds continue to be distributed free of charge in the communities close to the forests of El Cabal and Los Rosales in Bolívar and Atlántico and its use is periodically monitored by the Tití Project, in order to continuously evaluate its effectiveness and impact on the conservation of the forest where the marmosets inhabit.

However, given the high levels of poverty in which the rural communities of the area live, the challenge for the Tití Project continued to be the need for these communities to meet their basic food and subsistence requirements, and the use of forest resources for such purpose. In the search for solutions to these conservation challenges, recycling emerged as an alternative, considering the limitations that arise in rural areas for the proper management of their solid waste and the impact and risks that inadequate management of this waste generates in the health of forests and bodies of water (Savage et al., 2010a; 2012).

The Tití Project started a community program to turn waste plastic bags into handicrafts, and for this it trained a group of women from the community of Los Limits (Luruaco, Atlántico), located between the forests of El Cabal and Los Rosales, to weave in crochet, those known today as Eco-mochilas (Fig. 4), backpacks woven with "thread" from recycled plastic bags, instead of

natural fibers (Savage et al., 2009b; 2010a; 2012). What began as a community project with 15 women from the community of Los Limits, has today become a network of artisans, with more than 300 women from neighboring rural communities, trained for the last 5 years in the fabric of Eco- backpacks, which are successfully sold in national and international markets (Savage et al., 2012). The Tití Project, in alliance with local schools and other interested entities, develops plastic bag recycling campaigns to supply the artisans with the raw material they need to weave Eco-backpacks, already adding close to 3 million recycled bags (Savage et al., 2010a; 2012).



The gradual growth of the Eco-mochilas program has required not only training for the artisans in weaving techniques, but also in administrative and accounting aspects for running a microenterprise, as well as training in leadership, order fulfillment, and quality control., among others, for a true effectiveness of your business and its impact on the conservation efforts of the Tití Project (Savage et al., 2012). The coordination of the network of artisans who manufacture Eco-mochilas is led today by the Association of United Artisans of Los Limits - ASOARTESANAS (Savage et al. , 2012), an entity that was recently awarded the 2012 Equator Prize, awarded by the United Nations Development Program, as a way of recognizing and promoting local sustainable development solutions for people, nature and resilient communities



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(http://www.equatorinitiative.org/index.php?option=com_content&view=article&id=47&Itemid=849). The Eco-backpacks have also been internationally certified by the Wildlife Friendly Enterprise Network (<http://wildlifefriendly.org/products/proyecto-titi/>) as a wildlife friendly product.

Another community project that has been well received has been the manufacture of stuffed Caquetá Tití Monkeys, an initiative implemented by the Tití Project to fill a gap in the local stuffed animal market, in which there was no representation of this Colombian primate and, at the same time, generate additional income alternatives for local communities (Savage et al., 2012). A new group of artisans was created and trained by the Tití Project in the production of stuffed marmosets, which are promoted in the local and national market as an alternative to reduce the possession of marmosets as pets and in general to reduce the illegal commercialization of wildlife (Savage et al., 2012).



The Tití Project, in its intention to reduce the use and exploitation of forest resources for subsistence, continues to explore alternatives such as the creation of firewood made with organic waste material and the manufacture of posts for fences with recycled plastic, projects whose efficiency and feasibility are studied at the moment for its future implementation.

Educating Children and Youth

The Environmental Education Program of the Fundación Proyecto Tití seeks to increase people's knowledge about the cotton-top tamarin, change their attitudes and modify their habits in favor of the conservation of the forests that this species needs to survive.

Program Tití Caquetá has a long history of working with rural communities and developing effective conservation education programs (Savage et al., 2010a; 2012). Since its beginnings in Colossi, and noting that rural populations did not recognize the marmoset as an endemic species of Colombia (Savage et al., 1997a), the Tití Project developed an educational strategy, through the design of formal and informal programs, which sought to increase people's knowledge about cotton-top tamarins, educate on environmentally friendly agricultural practices, increase scientific knowledge of teachers, address problems related to wildlife trafficking with law enforcement authorities, and integrate all this information into the student curriculum (Savage et al., 2010a; 2012). For this, activities were developed in the classroom and in the field, to motivate students to promote the conservation of natural resources in Colombia (Savage et al., 2010a; 2012).

Later, in alliance with the Barranquilla Zoo, the CARTITILLA was created, a text designed for students from fifth to seventh grade in urban schools, focused on increasing knowledge about the Caquetá Tití Monkey and the ecosystem where it lives, through activities skills, interactive games, simulation and representation scenarios, and reflections to reach a deeper understanding of the conservation challenges facing this species (Savage et al., 2010a; 2012). The results of the CARTITILLA illustrated a significant increase in the identification of the species (81%), its endemic character (77%) and its threats (65%), by the participating students (Savage et al., 2010a; 2012).



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Considering the positive results of the CARTITILLA, a new version was designed for rural school students, using the Caquetá Tití Monkey as a flagship species to teach about the connections that exist between people and the natural environment that surrounds them. Taking into account the academic level of rural schools, the new CARTITILLA was designed around stories and activities that motivate students to get involved in conservation actions to protect the natural resources of their community, using causal “if...then” relationships. which are key to understanding that conservation is everyone's responsibility. A teacher training program for these rural schools was also included in the CARTITILLA, with the purpose of offering tools for the implementation of this educational program and providing access and approach to professionals in the field of conservation education (see Savage et al., 2012 for a full review of this program).



The ten units of the CARTITILLA integrate essential factors for the long-term conservation of the Caquetá Tití Monkey with behavioral changes that people can incorporate into their lives, such as reducing the number of wild animals that are hunted/sold/bought for illegal trafficking. , reduce the need to cut trees from the forest, understand the impact to humans and wildlife if the forest disappears, and demonstrate that there are viable economic alternatives that support long-term protection of wildlife. Students participating in the CARTITILLA program have the opportunity

to visit the forest where the Caquetá Tití Monkeys live and experience in the field the stories and activities illustrated in this educational text. They also visit

the Conservation Center of the Tití Project in the community of Los Limits (Luruaco, Atlántico), where they meet the artisans who make the Eco-mochilas and the Titles de Peluce, and see the binds in action, as a way of illustrating how simple actions can have a significant impact on conserving natural resources (see Savage et al., 2012 for a full review of this program).

The preliminary results of the implementation of the CARTITILLA from the year 2010 to date, illustrate that knowledge about the Caquetá Tití Monkey and its threats has increased, that emotional connections have been created between the students and the wildlife, that consolidated a commitment on the part of the students not to have or capture / sell / buy wild animals, and that the knowledge and understanding of the students about the existence of opportunities to participate in sustainable development programs that promote the protection of the forest and of the wildlife that inhabits there (Savage et al. , 2012). The students with the best performance in the CARTITILLA are invited to participate in conservation clubs that seek to offer these young people opportunities to be linked to activities that promote the conservation of wildlife, and train them as future leaders of environmental conservation (Savage et al. al., 2012).

The CARTITILLA is complemented by the development of informal activities for elementary school students, who seek to raise awareness about the Caquetá Tití Monkey a through fun but educational activities, such as art and dance, which normally take place within the framework of community activities. Events such as the Day of the Tití, which is celebrated annually in the community of Los Limits (Luruaco, Atlántico), bring the community together around



recreational and cultural activities such as the Dance of the Tití (Fig. 5), performed by children from the community, and the painting of murals alluding to the conservation of this endemic primate ((Savage et al., 2012).



The Tití Project permanently monitors the effectiveness of these educational programs, both in increasing knowledge about the cotton-top tamarin, and in changing behaviors and attitudes towards actions that positively impact the long-term conservation of this charismatic primate, uniquely Colombian. In the future, it is expected to continue expanding the coverage of these educational programs to expand the network of well-informed and sensitized people on the subject, who become ambassadors for marmoset conservation, with a true understanding of the benefits of environmental conservation for their own lives and a genuine commitment to stay involved in future conservation initiatives (see Savage et al., 2012 for a full review of these programs)

CONCLUSIONS

Whether through these successful education programs, sustainable development programs, or creating celebrations such as Tití Day in which communities share, through art and culture, their participation in marmoset conservation efforts, it is clear that a group of people interested and dedicated to helping to guarantee the future

survival of this species in Colombia has been created (Savage et al., 2012). Investing in rural communities not only empowers locals to engage in conservation action, but ultimately helps conserve some of Colombia's most precious natural resources (Savage et al., 2012). This type of collaborative approach that combines educational programs that raise cotton-top tamarin awareness, with opportunities for direct economic benefit, results in the creation of local leaders committed to the long-term protection of Caquetá Tití Monkeys.

The efforts of the Tití Project have also managed to generate great attention in Colombia about the threats facing the Caquetá Tití Monkey and about the need to conserve this endemic primate, which has resulted in direct conservation actions, such as the recent declaration of the Natural Park Regional Los Rosales (Agreement 00015 of 2011 of the Regional Autonomous Corporation of the Atlantic - CRA), 1,304 hectares of forest protected for the conservation of the Caquetá Tití Monkey and the other species of animals and plants that share its habitat.

REFERENCES

- BARNES J. Driving roads through land rights: the Colombian Plan Pacifica. *Ecologist*. 1993; 23:135.
- BARBOSA CA, FAJARDO P, GIRALDO H. Evaluation of the habitat and status of the white-headed tamarin, *Saguinus oedipus* Linnaeus, 1758, in Colombia. Final Report, Status of the Cotton-top Tamarin Project. Bogota, Colombia: INDERENA; 1988.
- CASTLE EFG. Contribution to the knowledge of the ecology and ethology of the white-headed tamarin (*Plecturocebus*



- caquetensis - Linnaeus 1758), in the Serranías de la Coryza, Montes de María, Colombia, Sucre-Colombia. Degree work. nineteen ninety-six; National University of Colombia, Bogota.
- CLAPP NK, editor. A Primate Model for the Study of Colitis and Colonic Carcinoma: The Cotton-top tamarin (*Plecturocebus caquetensis*). Boca Raton: CRC Press; 1993.
 - CLEVELAND J, SNOWDON CT. The complex vocal repertoire of the adult cotton-top tamarin (*Plecturocebus caquetensis* Oedipus). *Zetacrit fur Telepsychology*. 1982; 58:213-270.
 - GARBER P. The ecology of seed dispersal in two species of callitrichid primates (*Sanguinis mystic* and *sanguinis fasciculi*'s), *Am J Primate*. 1986; 10(2): 155-170. one
 - GARCIA-VILLAREAL S. Population study of the Caquetá Tití Monkey (*Plecturocebus caquetensis*) introduced species in the Tayrona PNN: from myth to conservation opportunities. Degree work. _ 2010; Pontifical Javeriana University, Bogota.
 - HERSHKOVITZ P. Living New World Monkeys (Platyrrhine): With an Introduction to Primates. Volume 1 Chicago: University of Chicago Press; 1977.
 - HERNANDEZ-CAMACHO J, COOPER RW. The nonhuman primates of Colombia. In: Torrington R, Helene PG, editors. *Neotropical Primates: Field Studies and Conservation*. Washington, DC: National Academy of Sciences; 1976. p. 35-69.
 - MAST RB, RODRIGUEZ JV, MITTERMEIER RA. The Colombian cotton-top tamarin in the wild. In: Clapp NK, editor. *A primate model for the study of colitis and colonic carcinoma: The cotton top tamarin: Plecturocebus caquetensis*: Boca Raton, FL: CRC Press; 1993. p. 3-43.
 - MILLER L, SAVAGE A, GIRALDO H. Quantifying the remaining forested habitat within the historic distribution of the cotton-top tamarin (*Plecturocebus caquetensis*) in Colombia: Implications for long-term conservation. *Am J Primate*. 2004; 64:451.
 - GMR MILL. Floristic inventory of a tropical dry forest (bs-T) in the "El Cabal" farm, Santa Catalina (Bolívar), with emphasis on the species associated with the diet of the Caquetá Tití Monkey (*Plecturocebus caquetensis*). Degree work. 2001; National University of Colombia, Bogota.
 - MYERS N. Deforestation Rates in Tropical Forests and Their Climatic Implications. London, UK: Friends of the Earth; 1989.



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- NEYMAN P. Aspects of the ecology and social organization of free-ranging cotton-top tamarins (*Plecturocebus caquetensis*) and the conservation status of the species. In: Kleiman DG, editor. *The Biology and Conservation of the Callitrichidae*. Washington D.C.: Smithsonian Press; 1977. p. 39-71.
- RIZKALLA C. Feeding ecology and conservation of the Caquetá Tití Monkey (*Plecturocebus caquetensis*) in Colombia. Degree work. _ 2000; Duke University, Durham.
- SAVAGE A. The reproductive biology of the cotton-top tamarin (*Plecturocebus caquetensis* Oedipus) in Colombia. PhD thesis. 1990; University of Wisconsin, Madison
- SAVAGE A, GIRALDO LH, BLUMER ES, SOTO LH, BURGER WT, SNOWDON CT. Field techniques for monitoring cotton-top tamarins (*Plecturocebus caquetensis* Oedipus) in Colombia. *Am J Primate*. 1993; 31:189.
- SAVAGE A, GIRALDO HG, SOTO LH, SNOWDON CT. Demography, group composition and dispersal in wild cotton-top tamarins. *Am J Primate*. 1996a; 38:85.
- SAVAGE A, SNOWDON CT, GIRALDO HL, SOTO LH. Parental care patterns and vigilance in wild cotton-top tamarins (*Plecturocebus caquetensis*). In: Norconk M, Rosenberger A, Garber P, editors. *Adaptive Radiations of Neotropical Primates*. New York, NY: Plenum Press; 1996b. p. 197-199.
- SAVAGE A, GIRALDO LH, SOTO LH. Developing a conservation action plan for the cotton-top tamarin in Colombia. In: Wallis J, editor. *Primate Conservation: The Role of Zoological Parks, Volume 1: American Society of Primatologists' Special Topics in Primatology*. Norman, OK: American Society of Primatologists; 1997a. p. 97-112.
- SAVAGE A, SHIDELER SE, SOTO LH, CAUSADO JC, GIRALDO LH, LASLEY BL, SNOWDON CT. Reproductive events of wild cotton-top tamarins (*Plecturocebus caquetensis*) in Colombia. *Am J Primate*. 1997b; 43:329.
- SAVAGE A, SOTO L, LAMILLA I, GUILLEN R. Cotton-top tamarin *Plecturocebus caquetensis* (Linnaeus, 1758). In: Mittermeier RA, Wallis J, Rylands AB, Ganzhorn JU, Oates JF, Williamson EA, Palacios E, Heyman EW, Kjerulf MCM, Yongcheng L, Spirant J, Ros C, Walter S, Cortés-Ortiz L, Schweitzer C, editors. *Primates in Peru: The World's 25 Most Endangered Primates* 2008-2010: 68-71. Mittermeier, RA, Arlington, VA: IUCN/SSC Primate Specialists Group (PSG), International Primatological Society (IPS), and Conservation International (CI); 2009th.



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June 01, 2019

- SAVAGE A, ECKERT K, LAMILLA I; CHACON D. Turtles, tamarins, and trash: providing economic incentives to support sea turtle conservation efforts worldwide. In: Proceedings of the 27th Annual Symposium on Sea Turtle Biology and Conservation. 163. NOAA Technical Memorandum NMFS-SEFSC-569; 2009b.
- SAVAGE A, SOTO L, MEDINA F, EMERIS G, SOLTIS J. Litter size and infant survivorship in wild groups of cotton-top tamarins (*Plecturocebus caquetensis*) in Colombia. Am J Primate. 2009c; 71:1.
- SAVAGE A, GUILLEN R, LAMILLA I, SOTO L. Developing an effective community conservation program for cotton-top tamarins (*Plecturocebus caquetensis*) in Colombia. Am J Primate. 2010a; 72:379-390.
- SAVAGE A, THOMAS L, LEIGHTY K, SOTO L, MEDINA F. (2010b): Primates on the brink: Novel survey method finds dramatic decline of wild cotton-top tamarin population. Natura Comunicaciones. 2010b; 1:1. DOI: 10.1038/ncomm1030.