

The contribution of local people to species conservation: the case of the catfish *Trichogenes claviger* in south-east Brazil

Trichogenes claviger is a catfish endemic to the Atlantic Forest and headwaters of the Itapemirim River, in southern Espírito Santo state, Brazil. It inhabits clear streams of small fluvial order and is categorized as Critically Endangered on the Brazilian and IUCN Red Lists. After its discovery and description in 2010, attempts to locate new populations, including in the neighbouring State Parks of Forno Grande and Pedra Azul, were unsuccessful. But 9 years after its description, the catfish was found in another locality, c. 4 km from the type locality (V. Reis, pers. obs., 2019).

The type locality of *T. claviger* is important for species conservation, hosting the rare Data Deficient frog *Brachycephalus alipioi* and the Critically Endangered cherry-throated tanager *Nemosia rourei*. In 2021, this area became the Private Natural Heritage Reserve (Reserva Particular do Patrimônio Natural) Mata de Kaetés, managed by the Saíra-apunhalada project. The tanager serves as a flagship species, ensuring habitat protection for local biodiversity.

After partnering with the Saíra-apunhalada project, the previously anonymous fish became known to the local community. Since then, five individuals have been collected in the Reserve, and incorporated into a scientific collection. Later observations, at another location within the Reserve, revealed dozens of juveniles and adults. Then, in May 2023, a local farmer reported the presence of *T. claviger* in an additional location, 5 km from the type locality. In a visit, we verified that the location harbours hundreds of individuals and is a nursery for the species.

With these new records we can now define the extent of occurrence of the species, which is 8,883 km², and revise the area of occupancy (previously 8 km² on the IUCN Red List and now 16 km²). These records reinforce the crucial role of conservation units and their surrounding areas for species conservation. They also highlight the importance of mapping threatened populations and engaging local communities in wildlife observation and conservation.



Trichogenes claviger, a catfish endemic to the Atlantic forest and headwaters of the Itapemirim River, in southern Espírito Santo state, Brazil.

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Conservation Action Plan for two endemic and threatened tree species in Brazilian biodiversity hotspots

The Brazilian flora comprises > 35,000 native plant species, of which c. 20,000 are endemic (The Brazil Flora Group, 2022, *Taxon*, 71, 178–198). The extinction risk of c. 7,500 of Brazil's plant species has been assessed and, of these, 3,209 species are currently categorized as threatened on the National Red List. Amongst these, the Atlantic Forest and Cerrado biomes in Brazil are home to two tree species categorized as Endangered because of habitat loss and fragmentation, urbanization and a low number of adult individuals: *Dimorphandra wilsonii* (faveiro-de-wilson) with 441 known adult individuals, and *Dimorphandra exaltata* (faveiro-da-mata) with 451 individuals.

The Brazilian National Centre for Plant Conservation (Centro Nacional de Conservação da Flora) of the Rio de Janeiro Botanical Garden Research Institute (Instituto de Pesquisa Jardim Botânico do Rio de Janeiro), together with collaborators and institutions from various sectors, has developed a conservation Action Plan for threatened faveiros species, including faveiro-de-wilson and faveiro-da-mata. The Action Plan is a national management and public policy instrument designed to define and guide actions for the conservation and recovery of threatened species. Its development occurs through workshops involving stakeholders from various sectors of society (NGOs, civil society, universities, Indigenous people and traditional communities, the private sector and government) whose activities are directly or indirectly linked to the conservation targets. These stakeholders are committed to the development of the Action Plan and the implementation of the defined conservation actions and strategies.

The Action Plan aims to expand the conservation and recovery strategies for populations of faveiros and their habitats. It comprises 25 conservation actions, with four specific objectives among research, monitoring, capacity

building, communication, management and public policy topics. Approximately 56 stakeholders from 21 institutions are engaged in contributing to the implementation of these conservation actions. The Action Plan will have a 5-year cycle, which started in June 2023, with annual monitoring. It has been approved by Rio de Janeiro Botanical Garden and formalized through Ordinance N°14 of 12 May 2023, published in the Federal Official Gazette. This initiates the implementation stage, which includes the execution of conservation strategies through actions to mitigate impacts on the target species and their habitats.

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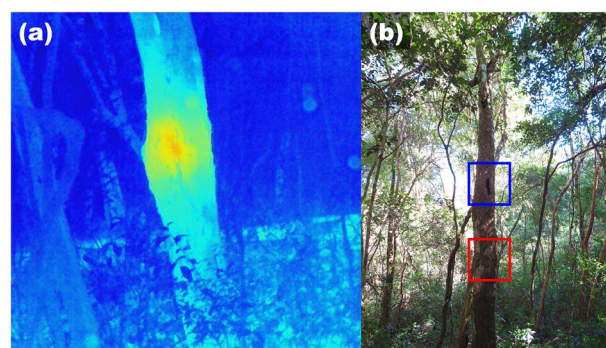
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Thermal sensors as a potential tool for studying Endangered lion tamarins

Lion tamarins are small frugivorous and insectivorous primates endemic to the Brazilian Atlantic Forest that live in family groups of 2–8 individuals. All four species of the genus *Leontopithecus* are categorized as Endangered on the IUCN Red List because of habitat loss and fragmentation, and poaching for the wildlife trade. Their behaviour of hiding and sleeping in tree hollows protects them against predators and other adversity but hinders the study of them. However, technological advances are providing new tools for field research, including thermal cameras (Melo, 2021, *Oryx*, 55, 171).

To investigate the potential of using thermal cameras to study lion tamarins, we tested the detectability of a group hidden inside a tree hollow in a 33,845-ha forest fragment, in Teodoro Sampaio, São Paulo. We have monitored a group of black lion tamarins *Leontopithecus chrysopygus* comprising three adult males, one adult female and two juveniles (one male and one female) monthly since December 2022. They entered a hollow in a 9-m tall *Plinia rivularis* tree of 22.3 cm diameter at breast height (DBH) at 18.00 on 12 March 2023. The hollow was 2.2 m above the ground and 45 cm below the lowest external opening of the hollow. On the following morning we recorded this group at 6.00 inside the same hollow using the thermal camera on a drone, which had its thrusters off and was held in the hand. Because of the terrain and weather conditions, we were only able to test detection at distances up to 30 m. At this distance the heat contrast of the group inside the hollow remained distinguishable from the temperature of the surrounding environment.



(a) Group of black lion tamarins detected inside a tree hollow using a thermal camera, and (b) the hollow where the group was recorded (lower box) and the external opening of the hollow (upper box) in a *Plinia rivularis* tree. (Readers of the printed journal are referred to the online article for a colour version of this plate.)

At 9.00 one juvenile left the hollow and vocalized, emitting the species' typical long calls.

We recorded the group again on 28 March 2023 in the same tree hollow, confirming the frequent use of this site. On 25 May 2023 we obtained an additional record with a thermal camera of the same group but in a different tree hollow, 6 m above the ground in an unidentified 11-m tall tree of 45.2 cm DBH. These observations indicate the potential use of thermal sensors in lion tamarin research and management.

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Largest known cat geoglyph in Chile identified as the Endangered Andean cat

Prehistoric art is one of the earliest ways in which early humans transmitted messages. Geoglyphs are believed to represent important beliefs in ancient cultures. With respect to Andean cultures, however, colonization often erased evidence of traditions, hindering interpretation.

In February 2023, the largest known geoglyph depicting a felid was discovered in the Atacama Desert in northern Chile. This geoglyph is located at a site known as Cerro Unitas, an important ceremonial site that includes the so-called Atacama giant, an anthropomorphic geoglyph (Briones & Alvarez, 1984, *Estudios Atacameños*, 7, 296–305). First recorded in a drone video, the felid geoglyph