



RED ALERT IN THE THREATENED KINGDOM: INTENSIFYING ACTIONS TO SECURE THE TIGER-CAT KINGDOM AND FELID HOT-SPOT

FINAL REPORT

THE MOHAMED BIN ZAYED SPECIES
CONSERVATION FUND #232532993



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2025

OVERVIEW OF THE MBZ FUND IN MIRADOR STATE PARK:

Along the three projects supported by The MBZ Fund in Mirador State Park (MSP) – MBZ-I #182517790, MBZ-II #192522659, and MBZ-III #232532993—we have been able to vaccinate >90% of the dog/cat population for deadly diseases both in areas inside the park and outside the park that we were able to work in. These numbers are extremely satisfactory for minimizing the risk of disease transmission into wild carnivores.

Given the very high seroprevalence of the carnivore distemper virus (>84%) and leishmaniasis (>71%) in MSP (MBZ-II # 192522659), we changed the vaccination protocol from two to three reinforcing doses for first-time vaccinated animals.

In the first three years of **vaccination campaigns**, we concentrated inside park borders, but given an outbreak in a settlement just outside its borders that spilled over into the Cágados area, we found the mandatory need to cover the buffer zone around the Kingdom to more effectively protect its key population. Associated with this action, in the current project (MBZ-III) we added neutering campaigns to reduce the number of domestic dogs and cats. We neutered 95 animals in the area of Buritirana (the source area of CDV outbreak), or 52.8% of the expected dog population, a very high percentage, especially focusing on females, which are more effective in reducing the population. We also concentrated our vaccinations there.

The **neutering program** was initially slowed down to a series of postponing due to problems with our former partner, the Veterinary Hospital of Maranhão State University (UEMA). To avoid further problems, we decided to buy our own equipment and, as such, **now we have our own high-quality mobile neutering clinic**, which we call the "**Sheik Mohamed Mobile Vet Clinic**" in homage to The Fund (Mohamed bin Zayed Species Conservation Fund), from which most of the resources came. We used the same equipment and followed the same high-standard protocols as UEMA's Veterinary Hospital. Following the high standard protocols, a maximum of eight males and six females per day can be handled by a single team composed of the main surgeon, main anesthetics, and their respective assistants. We also provided medications for animal well-being following these procedures.

The most important and self-sustaining population of savanna tiger-cats (*Leopardus tigrinus*) was stable between 2013/2015 and 2018/2020 (in 2005, the population at Cágados was 0 or close to, likely due to the outbreak of the disease (de Oliveira et al., 2020). However, in late 2022/early 2023, there was an outbreak of the carnivore distemper virus in the settlement of Buritirana, just outside the park's borders in the area of Cágados. Unfortunately, this population dropped from 0.9–1.2 ind./100 trap-days from 2018/2020 to 0.21 ind./100 trap-days in 2023, subsequently beginning to recover reaching 0.39 ind./100 trap-days in 2024.

The **brand-new series of games**, brochures, and a booklet developed on the first supported project (MBZ-I #182517790) have also been used in several other conservation projects across the Americas. At this time, we had to print +1, 300 of this educational material again. Our environmental education actions have reached about 80 children inside the MSP and +1,000 on its borders, in +7 schools. We use the approach "**Learning can be fun!**" and it has been working well. Currently, instead of seeking schools to work, the municipal government invites us, and all logistics costs are covered. This felid also played a key role in the development of the MSP Management Plan and was the main argument for legal court issues against changes proposed by the Deputy of the Legislative Assembly for changes to the park's limits.

We continue the involvement of park community members in project activities and the training of wildlife conservationists from Brazil and abroad, from undergraduate and graduate schools. **Working with private landowners** is essential for the conservation of small cats in areas surrounding MSP. Three regions form a continuous block, while another is adjacent to MSP, underscoring the significance of maintaining connectivity.

To handle chicken depredation, we have been applying reimbursement with good success for confirmed chicken depredation in the area of Mirador State Park. In the Mirador area, locals prefer this option, rejecting henhouses.

The 2019/2020 **fire monitoring** showed that 510 km² (ca. 10%) of the prime tiger cat habitat was burned. This could represent the home range of 50–94 tiger cats. This time around, the 2024 fires were smaller with 156.2 km² burnt area (3.12% of the park area), but they affected considerably our monitoring sites and the area with the highest population of tiger-cats in MSP (likely the home range of 15–28 tiger-cats);

Through the actions of Mirador tiger-cat conservation project, Maranhão State Environmental Secretariat – SEMA **approved the savanna tiger-cat, or “gato-do-mato” or “pintadinho” (*Leopardus tigrinus*) to be Maranhão State symbol of biodiversity conservation**, which was submitted and approved by law by the State Legislative Assembly and sanctioned by the State Governor! The decree also determined that the 17th of September is the official savanna tiger-cat day.

Camera monitoring (science for conservation) MBZ-I-II-III showed the following results:

- Data gathered and published on savanna tiger-cat allowed for its Red List Status in Brazil and will be used for the upcoming IUCN's global Red List for the species, the first after its split from the clouded tiger-cat, *L. pardinoides*.
- The first interspecific relationships among the tiger cat, Cerrado black-footed cat (aka pampas cat), and dogs.
- A refined habitat use analysis for both felid species that changed considerably in its area of occupancy – and hence Red List Status.
- Domestic dogs and humans greatly influence the habitat use of small felids.
- Anthropogenic variables represent a conservation issue for both the felids.

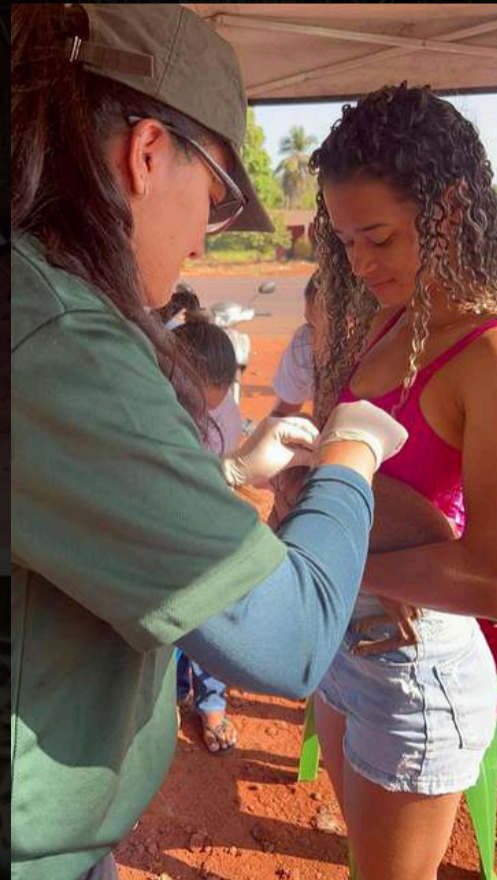


Mirador State Park - MSP

VACCINATION CAMPAIGNS



180 ANIMALS VACCINATED / **720** DOSES OF VACCINES APPLIED



NEUTERING CAMPAIGNS



95 ANIMALS NEUTERED BY THE “SHEIK MOHAMED MOBILE VET CLINIC,” 52.8% OF THE POPULATION IN THE SOURCE AREA OF THE CARNIVORE DISTEMPER OUTBREAK, JUST OUTSIDE PARK LIMITS!



HOW DISEASES SPREAD: DOMESTIC DOGS AND WILD CATS SHARING THE SAME AREAS IN MIRADOR STATE PARK!



Domestic dog



Jaguarundi



Geraldina - MSP

Domestic dog



Ocelot



Puma



Cógados - MSP

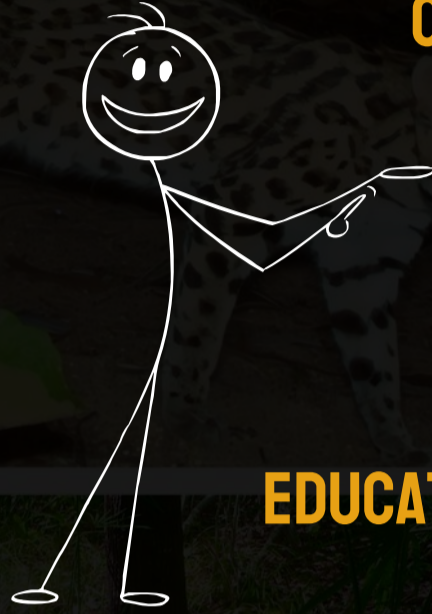


ENVIRONMENTAL EDUCATION: LEARNING CAN BE FUN!



+1,000

**CHILDREN AND TEENAGERS REACHED
THROUGH OUR ENVIRONMENTAL
EDUCATION ACTIONS**



+1,300

EDUCATIVE MATERIAL PRINTED

+7

LOCAL SCHOOLS



In order to reach as many children and teenagers as possible in the communities within Mirador State Park and in the surrounding cities, we have updated and printed more games and other materials used in environmental education activities, as well as visited more local schools. **We believe they are the future**, so continuing actions that raise their awareness of the importance of biodiversity is like planting seeds for a better future.



TRAINING OF UNDERGRADUATE AND GRADUATE STUDENTS IN WILDLIFE CONSERVATION: THE NEW GENERATION OF CONSERVATIONISTS

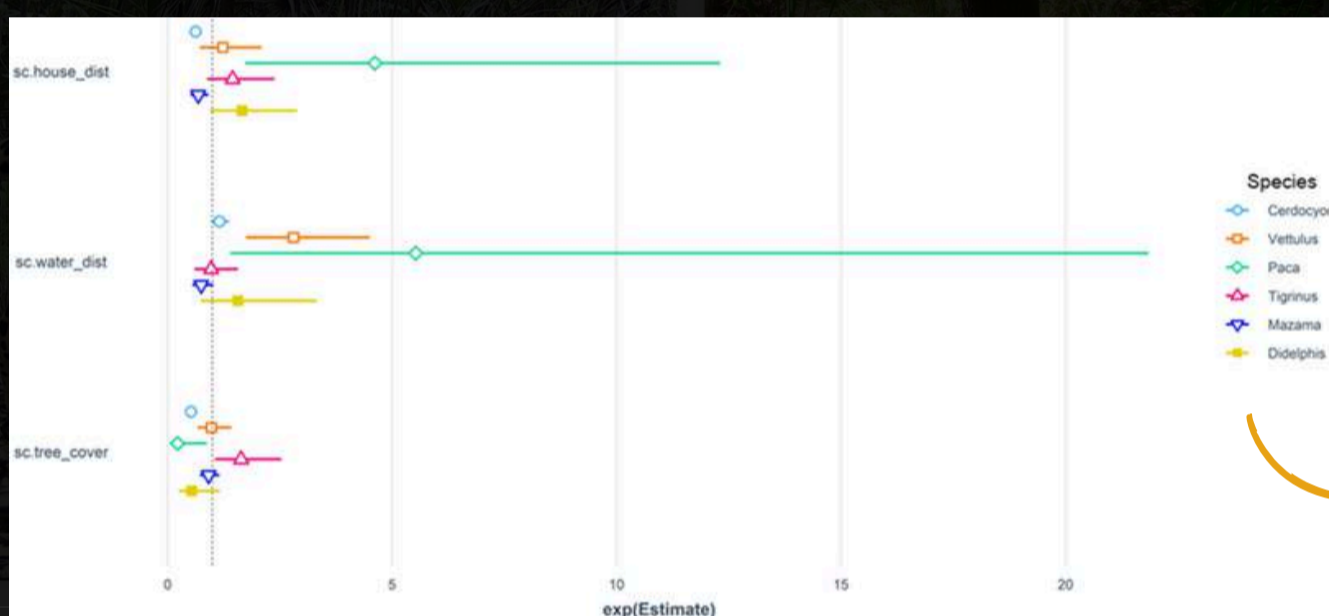
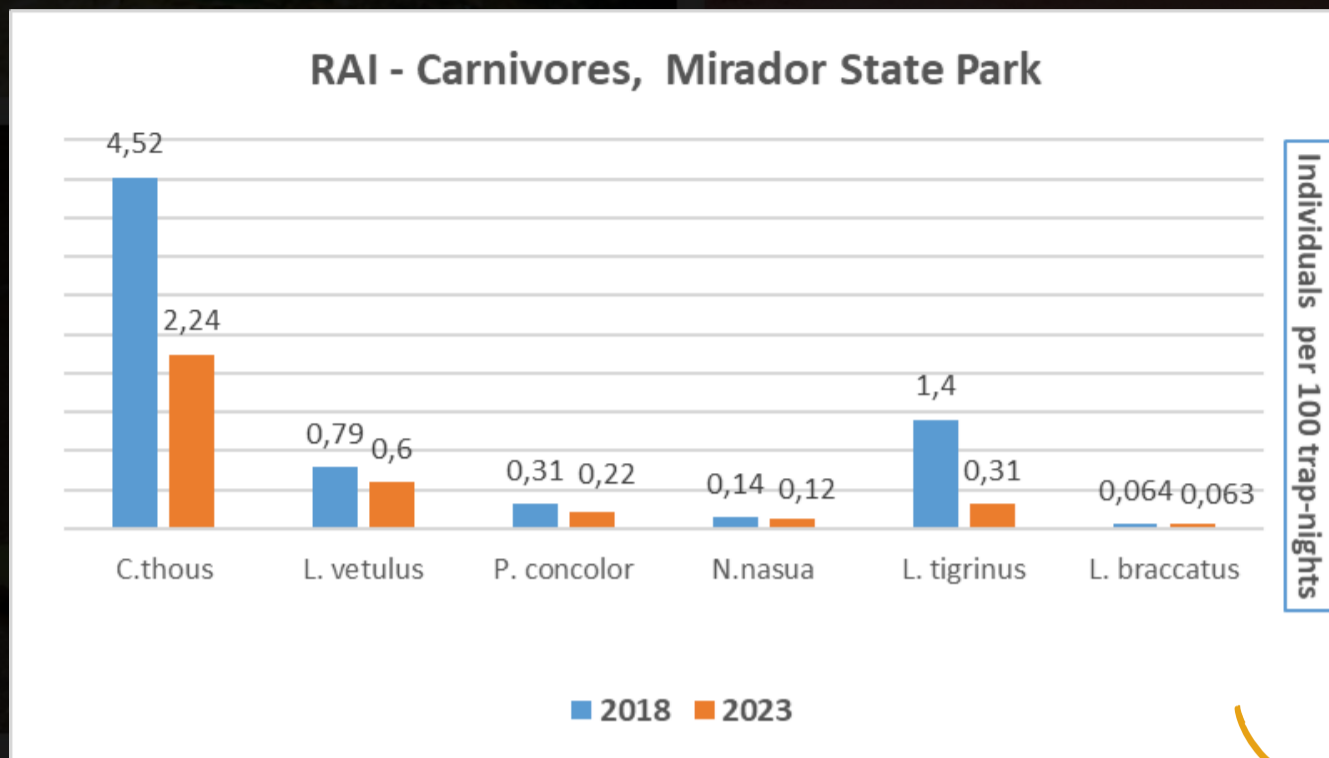


APPROACHES TO CHICKEN DEPREDATION A HAPPY ENDING STORY



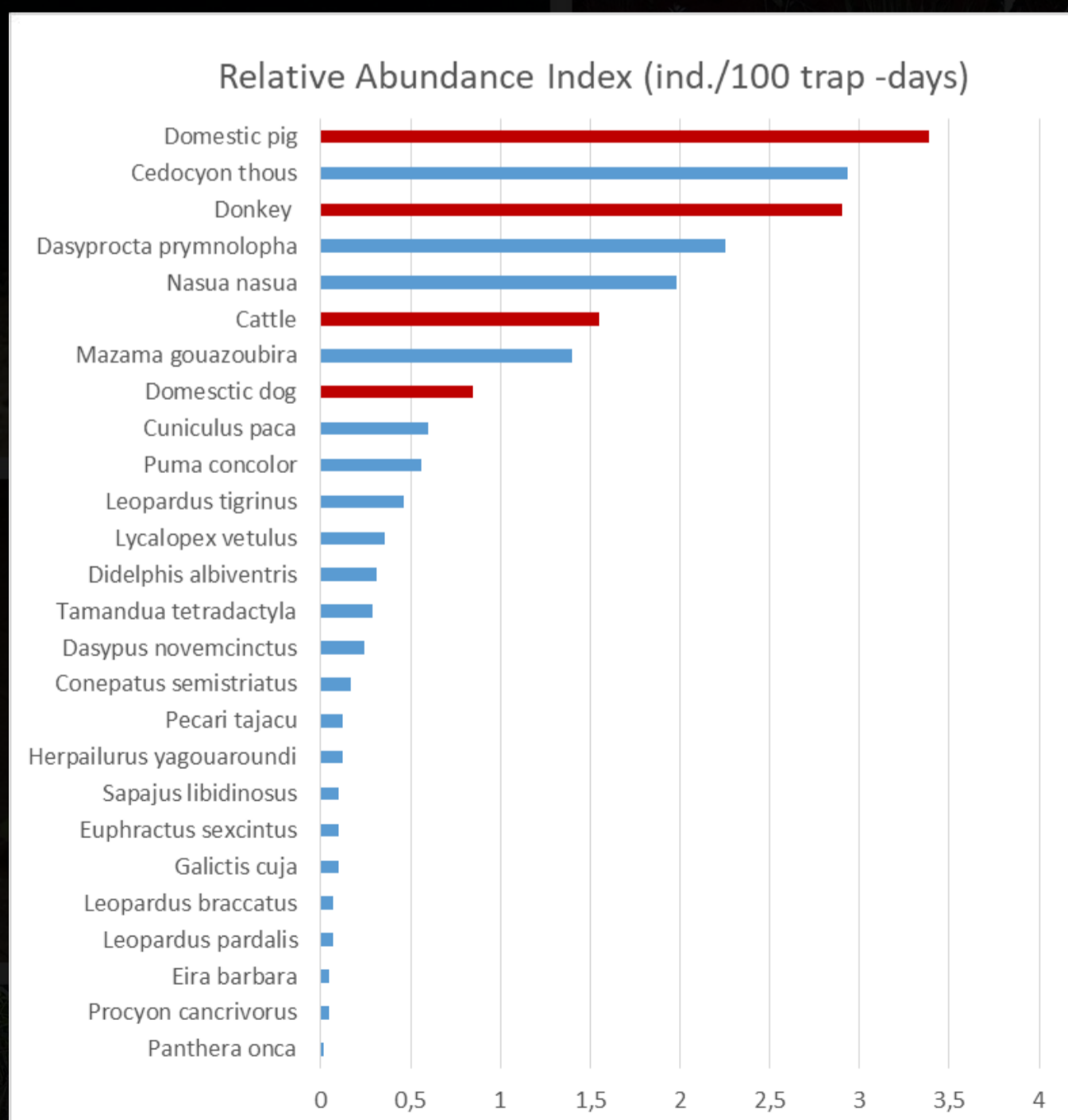
Chicken depredation in the Mirador State Park area is not high enough to become a problem. Locals reported that most depredation is due to hawks and refused to adhere to the henhouse concept. However, the **reimbursement** approach (for confirmed cat depredation) is well received and has been in place since 2023. In early 2024, just outside the park's border, the small property of "Senhor Manuel," the largest chicken owner in the area, sustained six losses without the cat (the culprit caught on our camera in the property) being slaughtered for it's **6 chicken preyed**. The tiger-cat remained alive and the proprietor was happy. Unfortunately, his two dogs broke loose and killed all the remaining 30+ chickens. Nevertheless, a happy ending story for the tiger-cat.

POPULATION MONITORING



Comparing the previous monitoring to those following the outbreak of carnivore distemper virus CDV that spilled over from just outside park borders, where no vaccination had been done at the time, there was a considerable population drop for all 6 species we managed to be able to assess. **Savanna tiger-cat** dropped astonishing **-77.9%**, followed by crab-eating fox **-50.4%**, puma **-29%**, and hoary-fox **-24.5%**. Only the Cerrado black-footed cat, whose population at the area monitored is very low, dropped only **-1.6%**. At that time, all other records of tiger-cats (tracks and visualizations) were considerably reduced too.

In the Mirador region, the presence of tiger-cats was most positively affected by habitat with denser cover, while proximity to human households had a negative impact.



Relative abundance Index (RAI ind./100 trap-days) of the mammalian biodiversity at Mirador State Park, Brazil. **Red bars - domestic animals**

Ocelot, jaguarundi, Cerrado black-footed cat, savanna tiger-cat.

POPULATION MONITORING



margay



ocelot



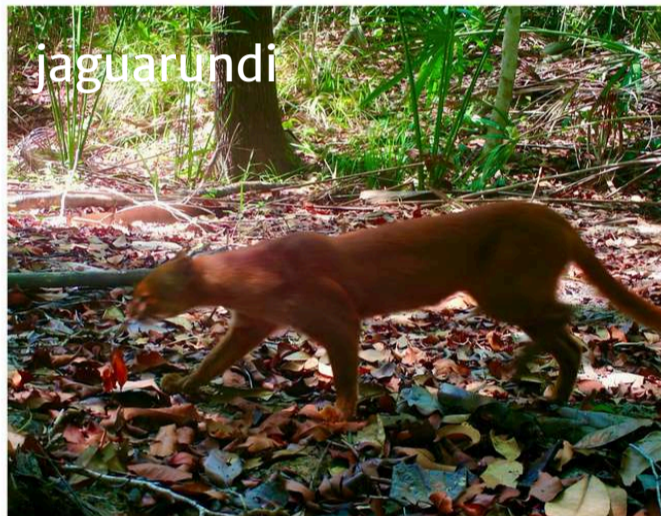
Cerrado black-footed cat



savanna tiger-cat



jaguar

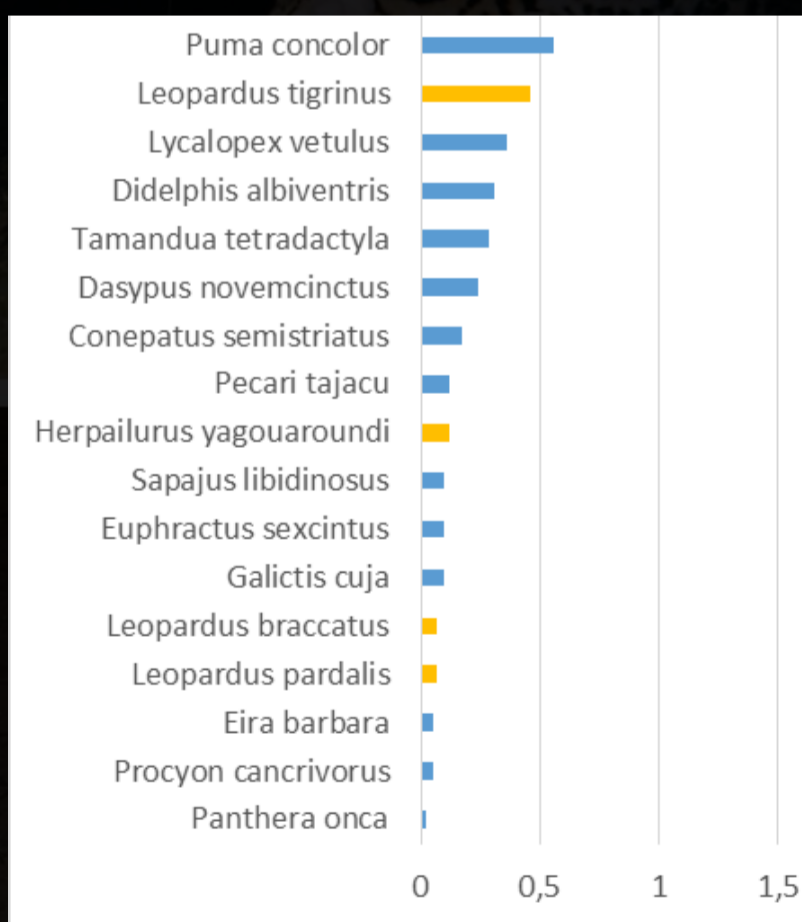


jaguarundi



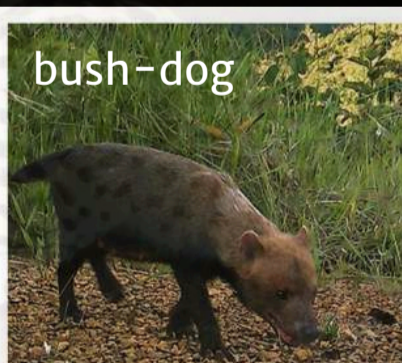
puma

The **Mirador 7**. Mirador State Park has the **highest felid diversity** anywhere in one single protected area throughout the **American continent**.



After the CDV outbreak, we noticed an increase in some carnivores on cameras higher than before, including jaguar, puma, jaguarundi, tayra, and lesser grisons. Could this be related to the continuous vaccination campaigns for three years in a row, going to its 4th? We would expect so! **Yellow bars – small cats**

Mirador State Park and its surroundings house 10 other species of carnivores, which makes it have a **high diversity of Carnivora**, with **17 species!**



bush-dog



hoary fox



maned wolf



coati



crab-eating fox



hog-nosed skunk



tayra



crab-eating raccoon



lesser grison



Neotropical otter

POPULATION MONITORING



jaguarundi



jaguar



savanna tiger-cat



tayra



Cerrado black-footed cat



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Recently several carnivores are becoming ever more detected than before in MSP. These include the black and red forms of jaguarundi, melanistic and standard forms of Cerrado black-footed cat, tayra, lesser-grison, crab-eating raccoon, puma, maned wolf, and even the mighty jaguar showed up on camera. The savanna tiger cat is recovering in the CDV outbreak area, but at other areas of the park their numbers are higher!

MAMMALIAN DIVERSITY OF MIRADOR STATE PARK

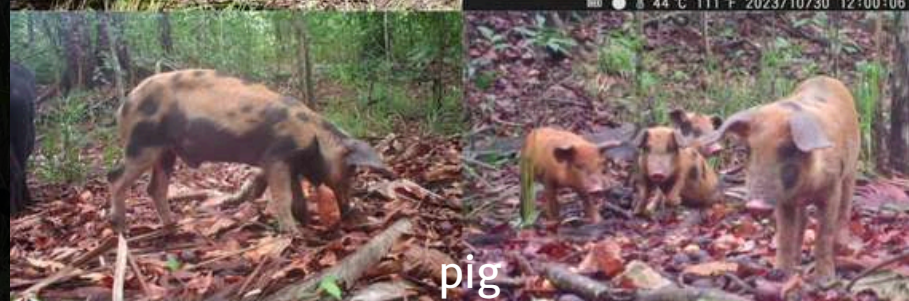


collared peccary

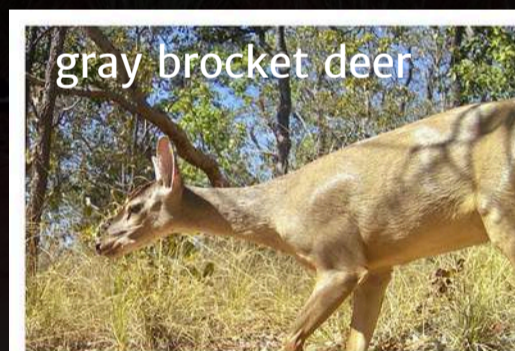


donkey

cow



pig



gray brocket deer



tayra



crab-eating fox



South American coati



Southern tamandua



white-eared opossum



paca



yellow armadillo



hog-nosed skunk

Unfortunately, Mirador SP harbors too many domestic animals roaming free.



HABITAT MONITORING



HABITAT MONITORING:
MONITORING THE EXTENT OF THE 2020 FIRES.
MONITORING VEGETATION LOSS VIA SATELLITE IMAGERY.

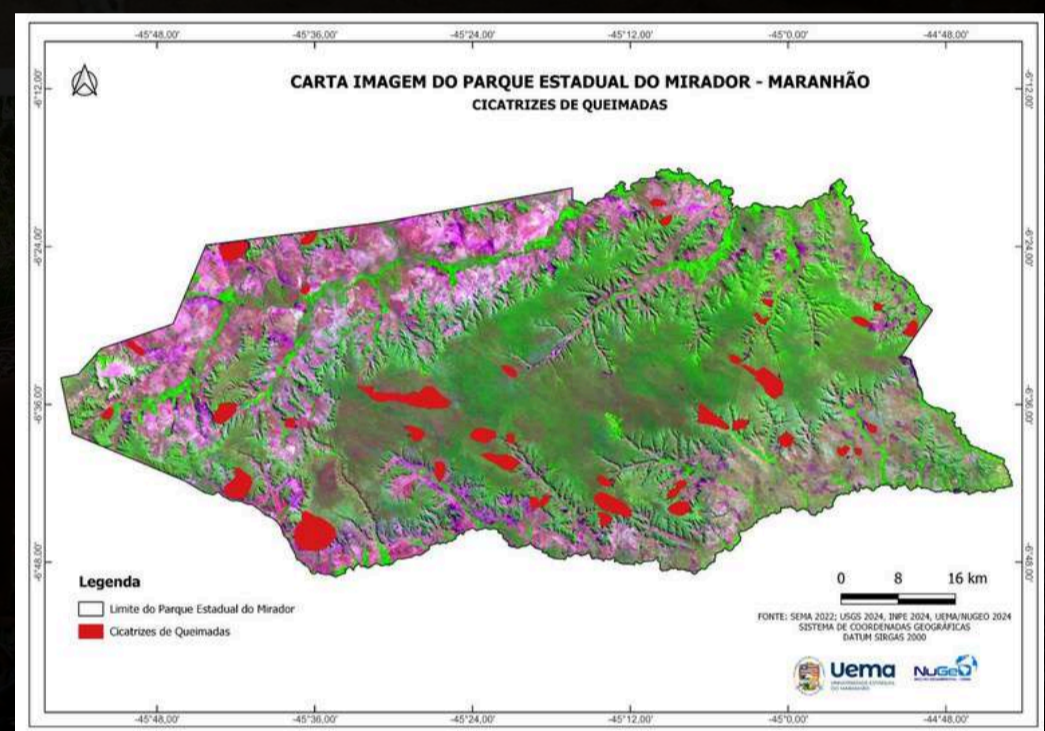
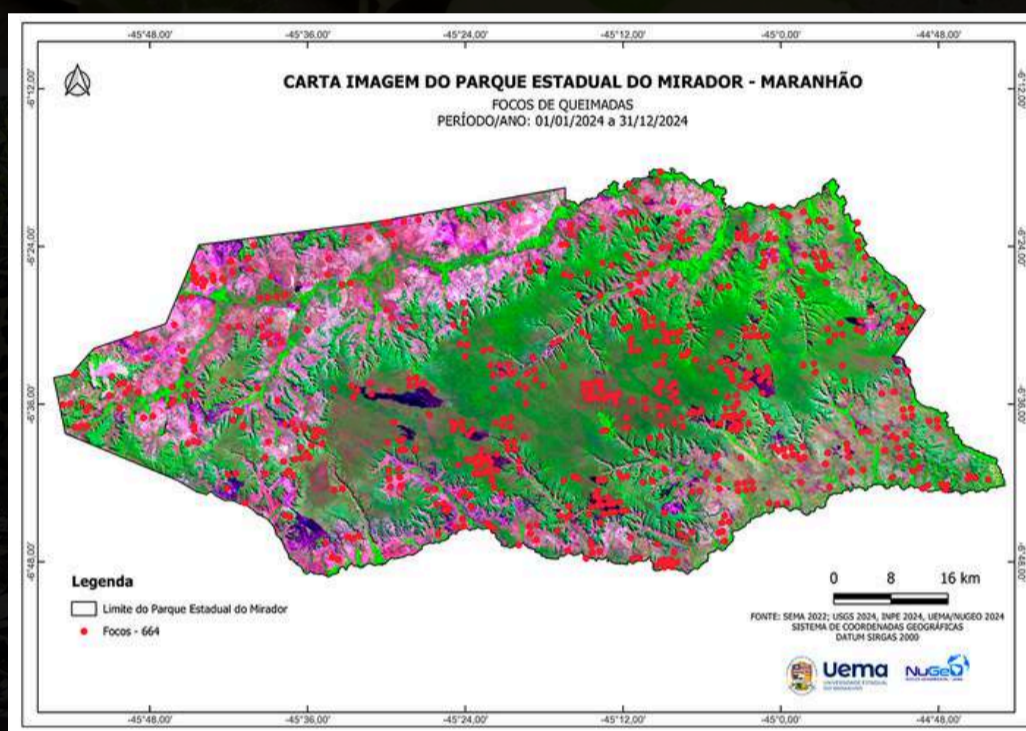


FIRE MONITORING MIRADOR STATE PARK 2020 - BURNT AREAS IN SHADES OF PINK



RED DOTS BURNED SITES

MOST OF THE BURNT AREA COMPRISED PRIME LEOPARDUS TIGRINUS HABITAT



Burnt sites of the fire outbreaks of 2020 (top left) and the fire spots (left) and burnt areas (fire scars – right) of 2024 in Mirador State Park: **664 fire spots**, with the total extent of burnt areas at **156.7 km²**, which represented **3.12%** of the total park area.

The fires outbreaks of 2020 were more intense than those of 2024, however the current ones affected harder than before the area of the park with the highest density of tiger-cats and that also suffered from the spillover of carnivore distemper virus (CDV) of late 2022/early 2023, that significantly **reduced all carnivore populations, especially that of the endangered savanna tiger-cat in its worldwide kingdom, MSP.**

FIRES CAUGHT ON OUR CAMERA-TRAPS AT MIRADOR STATE PARK



The fires at our camera sites (especially in the Cágados area) should have affected the outcome of the abundance indexes presented, as usage of burnt areas requires some recovery before being used again by wildlife.

SAVANNA TIGER-CAT TAKING CENTRAL STAGE IN THE ELABORATION OF MIRADOR STATE PARK MANAGEMENT PLAN.

▪ O “gato-do-mato/pintadinho” (*Leopardus tigrinus*)

Figura 8 RVF *Leopardus tigrinus* (gato-do-mato/pintadinho)



Legenda: (A) *Leopardus tigrinus* (pintadinho ou gato-do-mato-pequeno).
Fonte: Tadeu Oliveira (Pró-Vida Brasil).

O Parque Estadual de Mirador detém posição estratégica mundial na conservação do gato-do-mato/pintadinho (*Leopardus tigrinus*), uma espécie globalmente ameaçada de extinção. É a única unidade de conservação do mundo capaz de sustentar, por si só, populações ecologicamente viáveis a longo prazo (1.000 anos) desta espécie. Nenhuma outra unidade de conservação brasileira apresenta a mesma relevância para a conservação de quaisquer espécies de pequenos felinos no país. Assim sendo, o Parque Estadual de Mirador em condições ambientalmente adequadas funciona como uma “apólice de seguro” contra a extinção desta espécie.

estão em unidades de conservação. Já uma nota da Secretaria do Meio Ambiente e Recursos Naturais do Maranhão (Sema/MA), de setembro, afirma que ela é crucial para o gato-do-mato-pintadinho (*Leopardus tigrinus*).

“A espécie está na lista brasileira de espécies ameaçadas de extinção. O Parque Estadual de Mirador é a unidade de conservação mais importante do mundo para essa espécie, pois é a única área capaz de sustentar, por si só, populações ecologicamente viáveis a longo prazo”, diz o [documento](#).

SAVING THE PARK

área capaz de sustentar, por si só, populações ecologicamente viáveis a longo prazo”, diz o [documento](#).



O *Leopardus tigrinus* está na lista brasileira de espécies ameaçadas de extinção. Foto: Animalia/Tambako the Jaguar/Creative Commons.

The **savanna tiger-cat** is being used as a **flagship species** in the legal action of Maranhão State Environmental Secretariat and the state's Legislative Assembly, in order to prevent the proposed changes of a Deputy to alter the boundaries of Mirador State Park, by using as one of the main argument of **the park as the area of greatest relevance for the worldwide conservation of this endangered small cat**.

SAVANNA TIGER-CAT AS SYMBOL SPECIES FOR BIODIVERSITY CONSERVATION!

GATO-DO-MATO / PINTADINHO
LEOPARDUS TIGRINUS

MUNDIALMENTE AMEAÇADO

ESPÉCIE SÍMBOLO DA CONSERVAÇÃO DO ESTADO DO MARANHÃO!

For the first time in the world, a globally threatened small felid is officially chosen as a **symbol species for biodiversity conservation!**

Maranhão takes the lead and recognizes the ***Leopardus tigrinus*** as its representative!

ESTADO DO MARANHÃO
ASSEMBLEIA LEGISLATIVA
PALÁCIO MANUEL BECKMAN
DIÁRIO DA ASSEMBLEIA

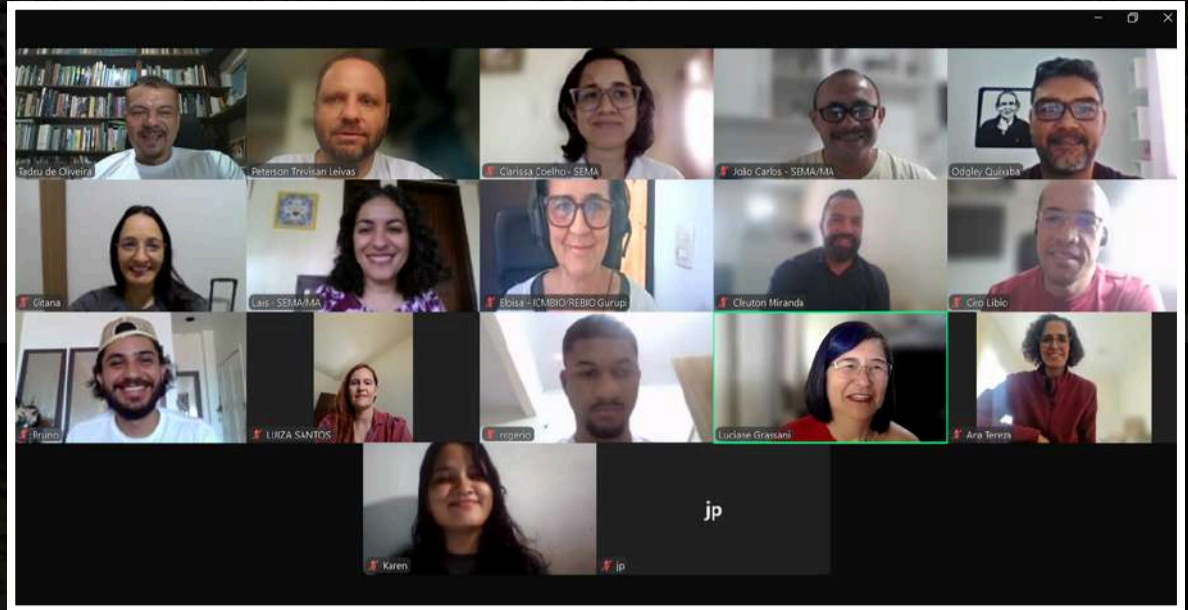
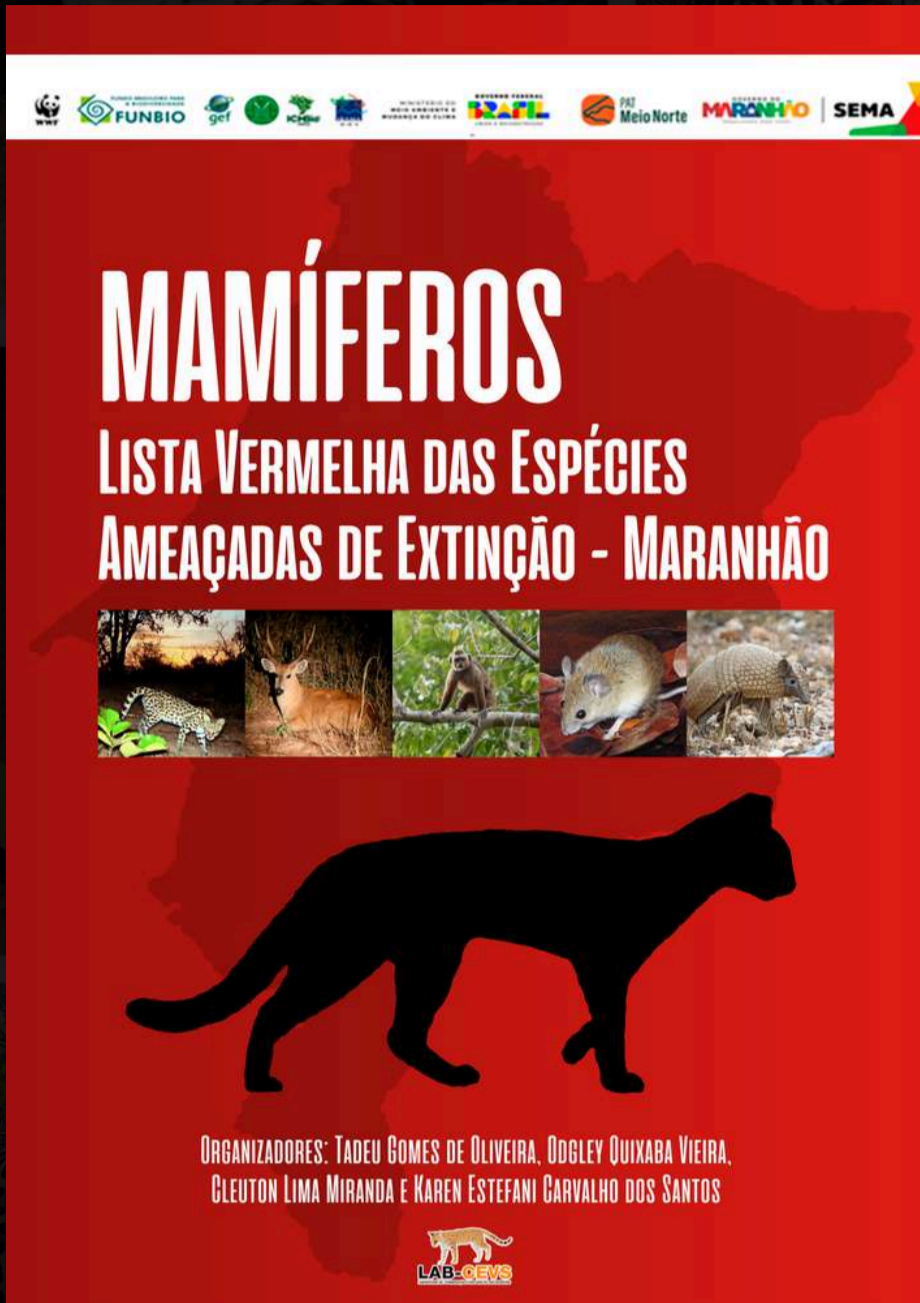
ANO LI - Nº 194 - SÃO LUÍS, QUARTA-FEIRA, 23 DE OUTUBRO DE 2024. EDIÇÃO DE HOJE: 71 PÁGINAS
189º ANIVERSÁRIO DE INSTALAÇÃO DA ASSEMBLEIA LEGISLATIVA DO ESTADO DO MARANHÃO
95.ª SESSÃO ORDINÁRIA (HÍBRIDA) DA 2.ª SESSÃO LEGISLATIVA DA 20.ª LEGISLATURA

4 TERÇA-FEIRA, 19 DE NOVEMBRO DE 2024

IV - PROJETO DE LEI EM DISCUSSÃO E VOTAÇÃO
1º TURNO – REGIME DE PRIORIDADE

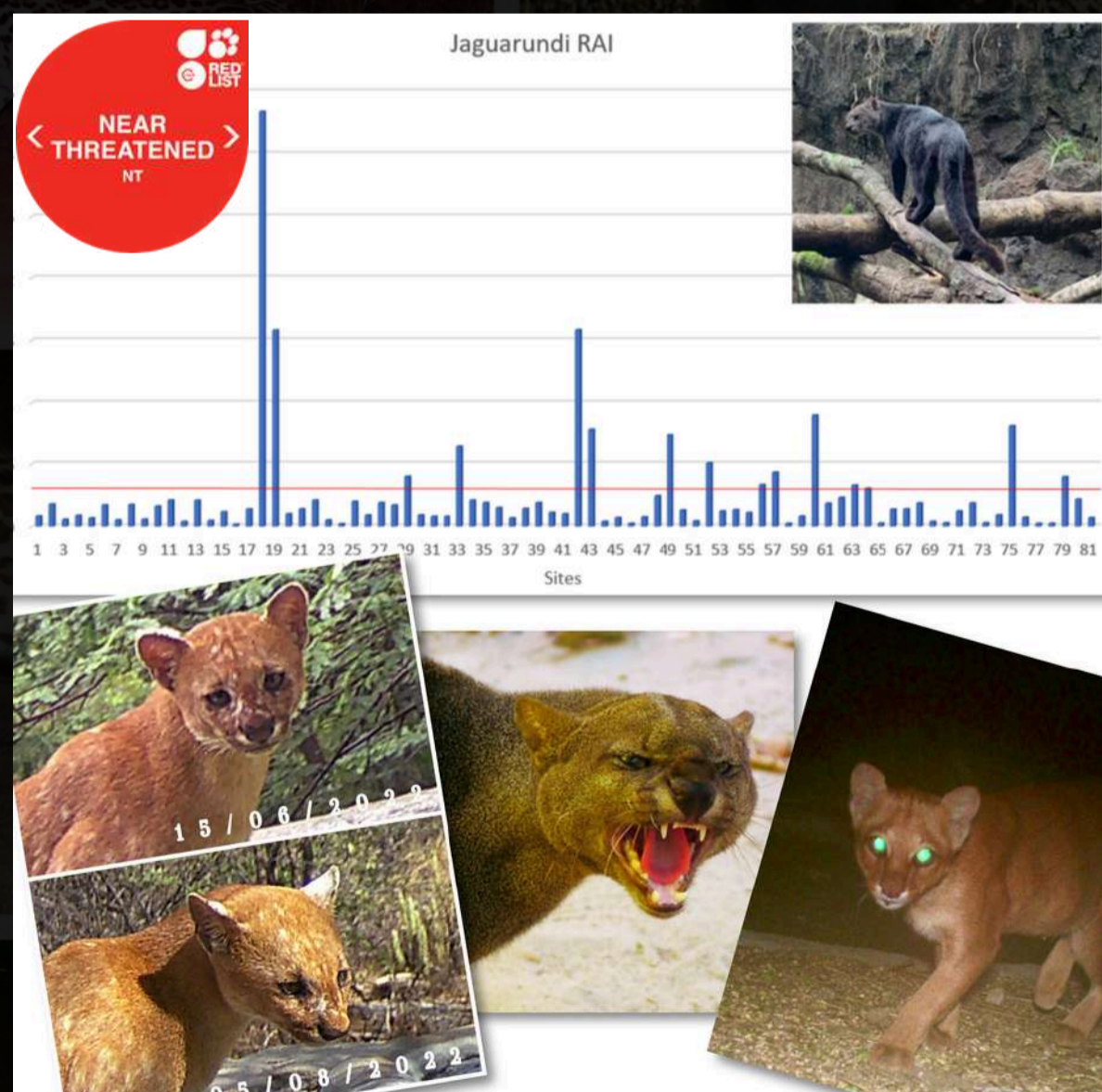
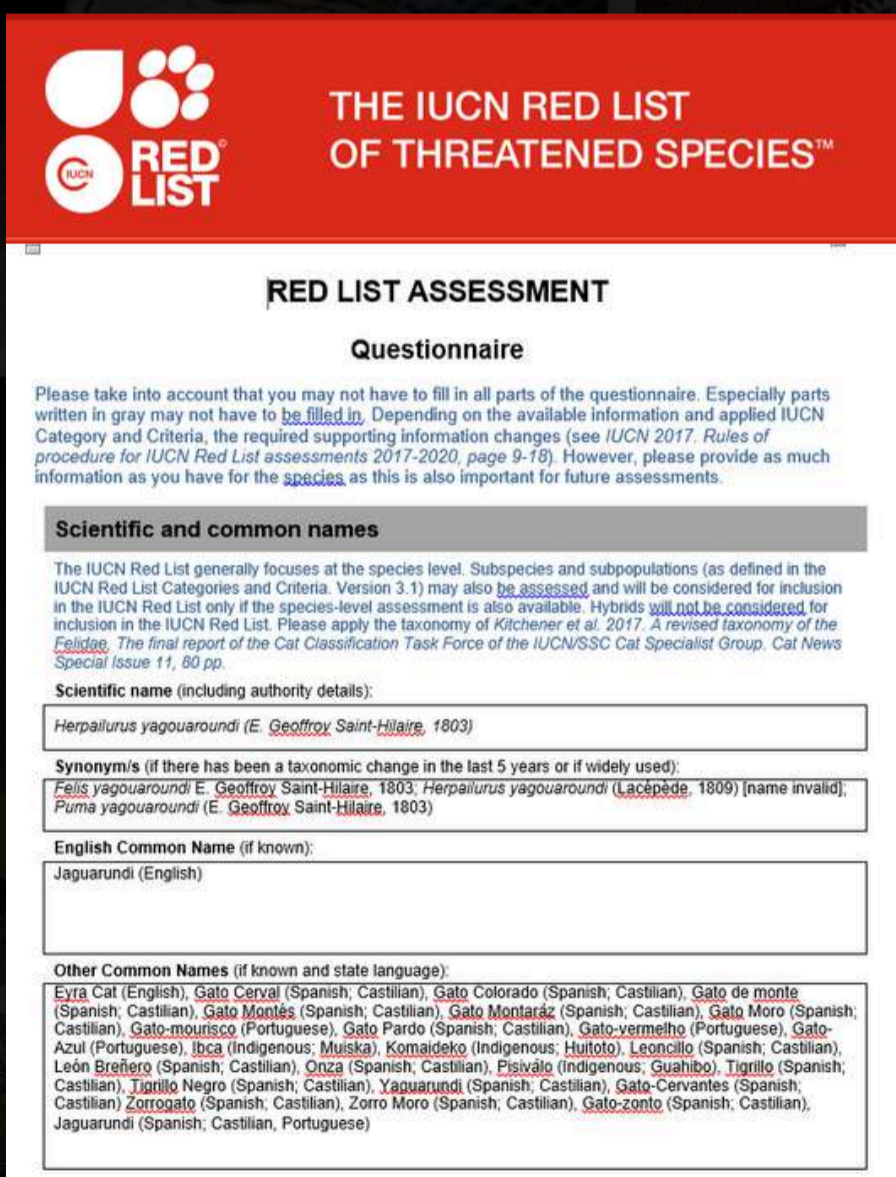
10. PROJETO DE LEI Nº 411/2024, DE AUTORIA DO PODER EXECUTIVO, QUE RECONHECE O LEOPARDUS TIGRINUS COMO ESPÉCIE SÍMBOLO DA CONSERVAÇÃO DA BIODIVERSIDADE DO MARANHÃO E INSTITUI O DIA 17 DE SETEMBRO COMO O DIA DO LEOPARDUS TIGRINUS, NO ÂMBITO DO ESTADO DO MARANHÃO. COM PARECER FAVORÁVEL DAS COMISSÕES DE CONSTITUIÇÃO, JUSTIÇA E CIDADANIA – RELATOR DEPUTADO ARISTON.
http://sapl.al.ma.leg.br:8080/sapl/sapl_documentos/materia/52700_texto_integral

RED LIST - LOCAL: STATE OF MARANHÃO



We coordinated all **155 mammalian species** and assessed most of the medium-large mammals known to be found in the state of Maranhão, where all felids were found to be threatened (1 Vulnerable, 6 Endangered). **Our biodiversity monitoring being conducted in Mirador State Park and supported by The MBZ Fund contributed enormously to assess many species' status!**

RED LIST - GLOBAL: IUCN



We are on the review process for the RLA of the jaguarundi (2024/2025) and have started to work on the global assessments of margay, savanna tiger-cat, clouded tiger-cat, and Atlantic Forest tiger-cat in 2025/2026.

TIGER CATS TAKING THE WORLD BY STORM!



nature
SCIENTIFIC REPORTS

Article metrics | Last updated: Mon, 27 Jan 2025 22:46:21 Z

Ecological modeling, biogeography, and phenotypic analyses setting the tiger cats' hyperdimensional niches reveal a new species

Access & Citations

20k Article Accesses	4 Web of Science	5 CrossRef
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Citation counts are provided from Web of Science and CrossRef. The counts may vary by service, and are reliant on the availability of their data. Counts will update daily once available.

Online attention

864

- 109 tweets
- 101 news outlets
- 60 Mendeley
- 4 blogs
- 1 Redditors
- 4 Facebook pages
- 7 Wikipedia page

Altmetric calculates a score based on the online attention an article receives. Each coloured thread in the circle represents a different type of online attention. The number in the centre is the Altmetric score. Social media and mainstream news media are the main sources that calculate the score. Reference managers such as Mendeley are also tracked but do not contribute to the score. Older articles often score higher because they have had more time to get noticed. To account for this, Altmetric has included the context data for other articles of a similar age.

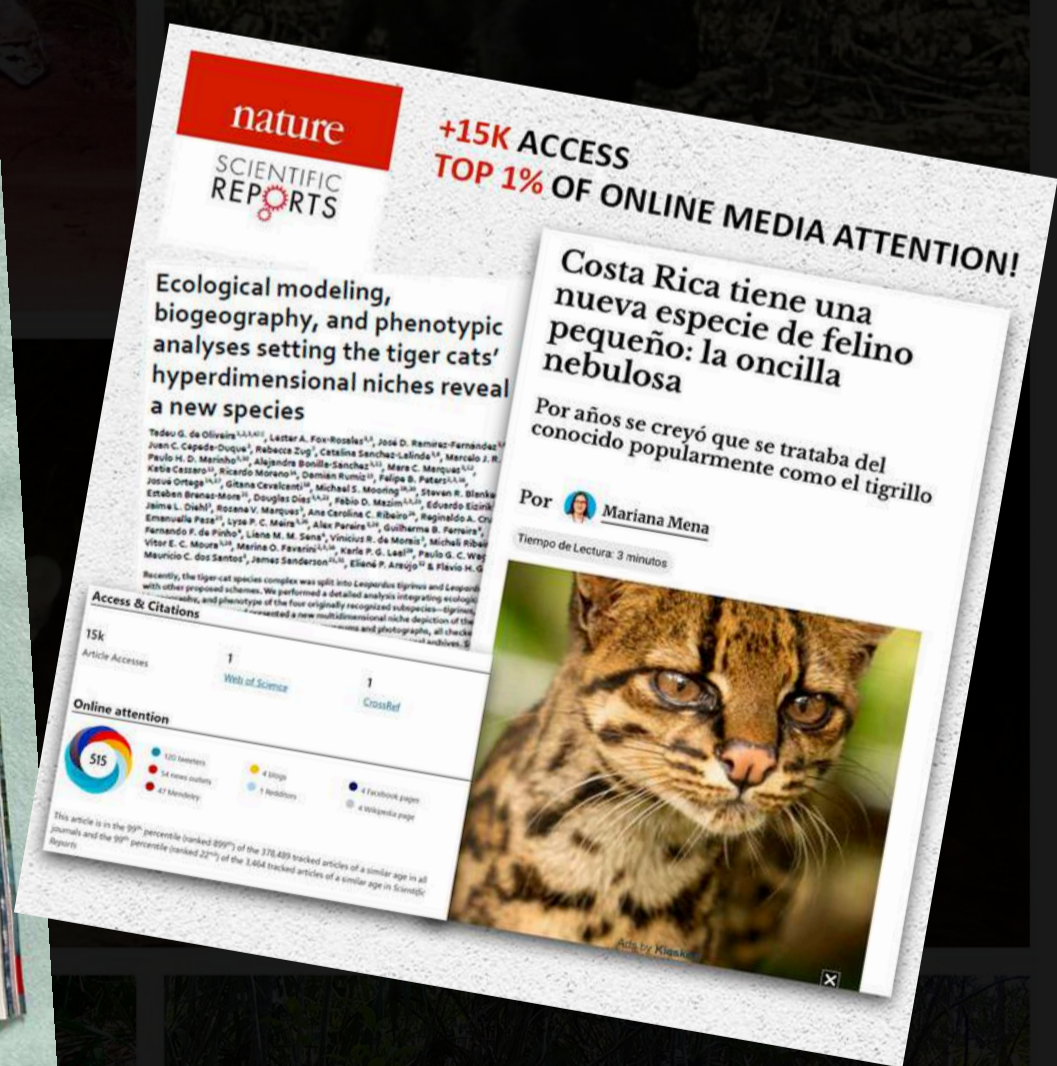
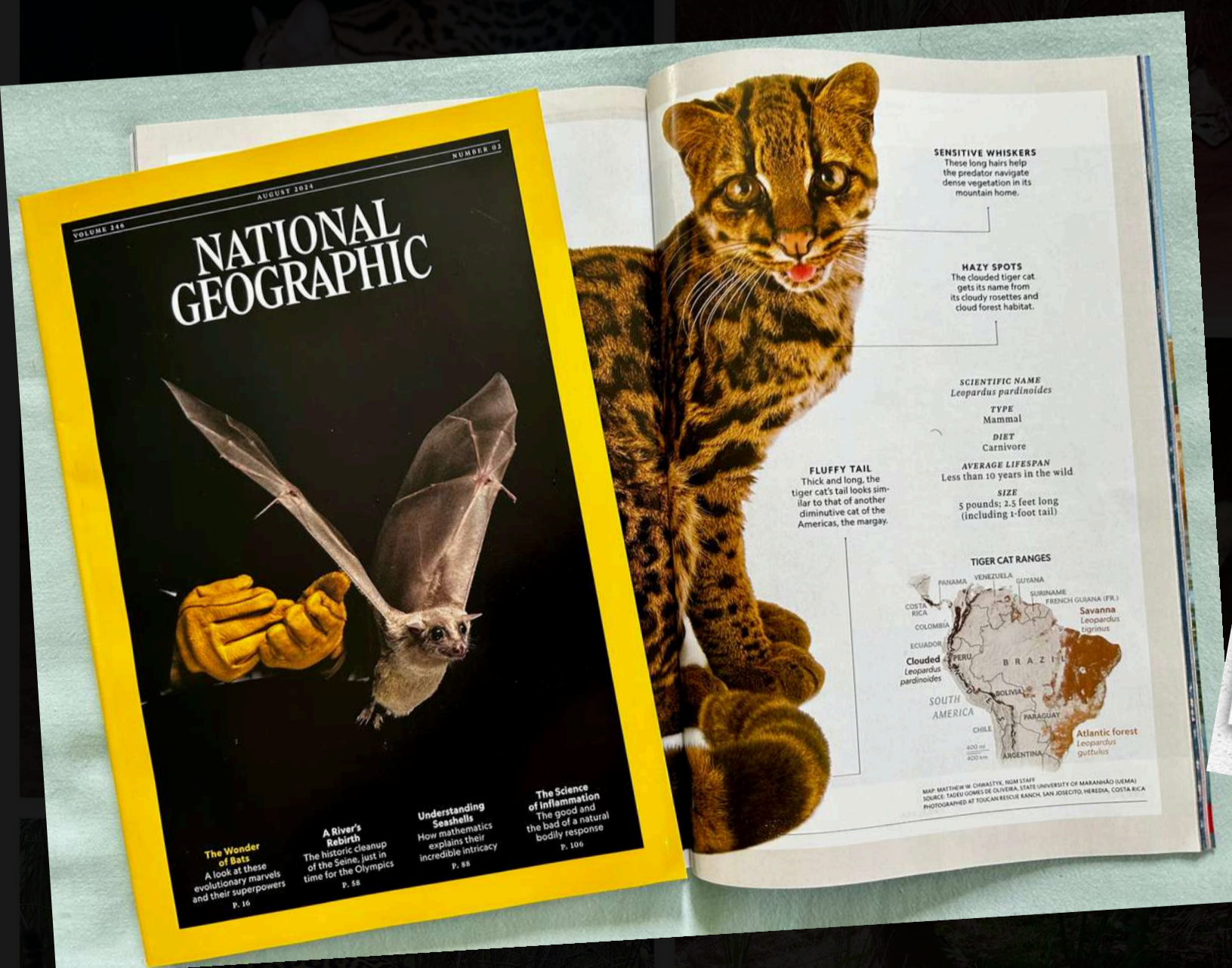
Top 1% do mundo!

This article is in the 99th percentile (ranked 467th) of the 406,766 tracked articles of a similar age in all journals and the 99th percentile (ranked 11th) of the 3,474 tracked articles of a similar age in Scientific Reports

<https://www.nature.com/articles/s41598-024-52379-8>

Published on January 29, 2024, our paper on the tiger cat species complex formally introduced a new felid species to the world and showed that all tiger-cats are in dire conservation needs, having already lost >50% to >68% of their original area. One year later, according to Nature.com's website, we reached the top 1% of media attention of all papers published since Altmetrics was established (all-time ranking #11 in Nature's Scientific Report), with >20,000 visualizations, most of which by the general public, far more than academics! News media around the globe (printed and online) literally on every continent. From newspapers such as Miami Herald to the pages of Mongabay, Terra da Gente, Ladera Sur, Sci News, Revista da FAPESP, Punnett's Square, and on and on, reaching the web and printed pages of National Geographic! However, that was not all, trending topic on Tweeter/X, being presented in a cat exhibit in Osaka, Japan by the Kitakyushu Museum of Natural History; the pages of National Geographic, US National Public Radio. In all, the conservation message was very clear and straightforward, and was beautifully caught by most media outlets.

This is conservation science!



SPREADING TO THE WORLD



The adorable clouded tiger-cat is brand-new to science—and already under threat
<https://www.nationalgeographic.com/animals/article/clouded-tiger-cats-new-species-latin-america>



De subespécie à espécie: pesquisadores identificam novo gato-selvagem
<https://g1.globo.com/sp/campinas-regiao/terra-da-gente/noticia/2024/02/19/de-subespecie-a-especie-pesquisadores-identificam-novo-gato-selvagem.html>

O belo gato-nebuloso é uma descoberta para a ciência, mas já está sob ameaça
<https://www.nationalgeographicbrasil.com/animais/2024/08/o-belo-gato-nebuloso-e-uma-descoberta-para-a-ciencia-mas-ja-esta-sob-ameaca>



Conservationists unite to tackle Latin America's dog threat to wild cats
<https://news.mongabay.com/2023/04/conservationists-unite-to-tackle-latin-americas-dog-threat-to-wild-cats/>



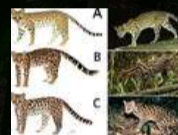
A tiger cat gains new species designation, but conservation challenges remain
<https://news.mongabay.com/2024/04/a-tiger-cat-gains-new-species-designation-but-conservation-challenges-remain/>



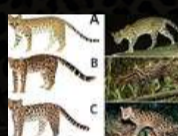
Wissenschaftler identifizieren kryptische neue Arten der Tigerkatze
<https://germanic.news/wissenschaftler-identifizieren-kryptische-neue-arten-der-tigerkatze/>



Elusive jaguarundi inspires biologists to share data across Latin America
<https://news.mongabay.com/2024/05/elusive-jaguarundi-inspires-biologists-to-share-data-across-latin-america/>



Une nouvelle espèce de chat-tigre découverte !
<https://www.caminteresse.fr/animaux/une-nouvelle-espece-de-chat-tigre-decouverte-11192526/>



Controversy of the Tiger Cats
<https://www.punnettssquare.com/2024/04/controversy-of-tiger-cats.html>



'Cryptic' creature lurking in cloud forests of Colombia is an 'enigmatic' new species
<https://www.caminteresse.fr/animaux/une-nouvelle-espece-de-chat-tigre-decouverte-11192526/>

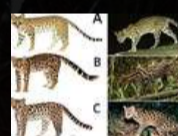


Scientists Identify Cryptic New Species of Tiger Cat
<https://www.sci.news/biology/leopardus-pardnoides-12649.html>

<https://www.miamiherald.com/news/nation-world/world/article285094257.html>
<https://www.islandpacket.com/news/nation-world/world/article285094257.html>



Gatos-do-mato dos Andes e da América Central são diferentes dos brasileiros
<https://revistapesquisa.fapesp.br/gatos-do-mato-dos-andes-e-da-america-central-sao-diferentes-dos-brasileiros/>



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INTERVIEWS



THANK YOU FOR YOUR SUPPORT!

