

PROJECT UPDATES

**EFFECTS OF FIRE ON BAT
DIVERSITY AND
OCCUPANCY IN THE
MEGADIVERSE BRAZILIAN
SAVANNAS**



Chapada dos Guimarães National Park - Cerrado

Visual identity

To highlight the progress and impact of our project, we've developed a compelling visual identity, renaming it "Ké Jorureu," which translates to "fire bat" in the Bororo indigenous language.

Our logo features the *Molossops temminckii*, celebrated for its aerial prowess and unique echolocation calls. The blue and red color scheme, inspired by spectrogram patterns, enhances the depth and significance of our project. Notably, the logo was thoughtfully designed by a team member using watercolor, adding a personal and creative touch to our identity.



Follow our project to stay updated
<https://linktr.ee/kejorureu>

Search for shelter

In the Pampas ecoregion, we visited different structures and human dwellings, where we found roosts of species such as *Histiotus velatus*, *Molossus currentium*, *Molossus rufus*, *Eumops bonariensis*, *Tadarida brasiliensis* and *Myotis albescens*, showcasing the harmonious coexistence between bats and people.



Mimon bennettii

In the Cerrado, we identified a resting and a feeding roost for the species *Mimon bennettii*. These locations are continuously monitored by our team.



Myotis albescens

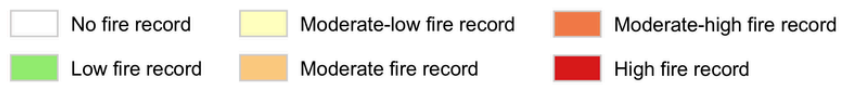
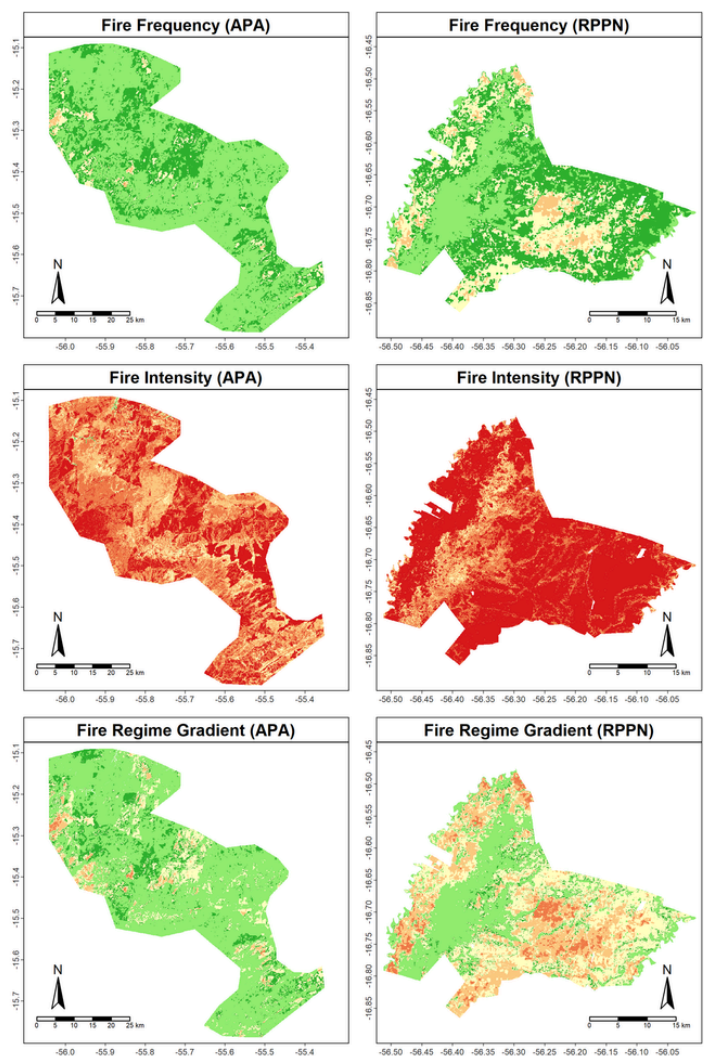


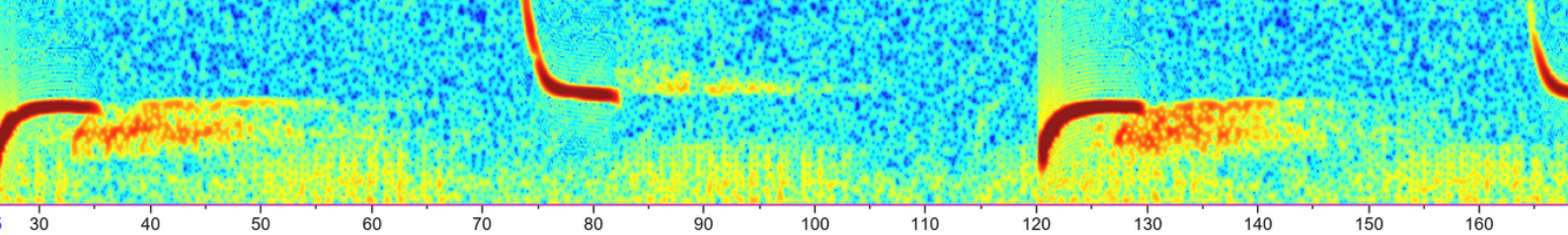
Sandbanks of the São Lourenço River, Pantanal, Mato Grosso, Brazil

Temporal assessment of fire severity

We developed an open-source code on Google Earth Engine to generate maps representing different fire regime gradients, combining data on frequency and intensity for two Brazilian regions characterized by savannah environments: the Chapada dos Guimarães Environmental Protection Area and the SESC Pantanal Private Natural Heritage Reserve. Using data from Mapbiomas Fire from 1985 to 2020 and fire indices such as NBR and dNBR, extracted by Sentinel-2A (2017-2023).

The main results of this code are discussed in a scientific article that has been submitted for publication and should be published soon.





Bat bioacoustics

We've mapped out the Chapada dos Guimarães Environmental Protection Area using 40 ultrasonic recorders, strategically placed at least 2.5 km apart. These recorders stay active from dusk till dawn for five nights in a row, capturing valuable data. In addition, we've set up data loggers to track temperature and humidity at each location. So far, we've successfully completed three of the four planned campaigns in the Cerrado ecoregion.



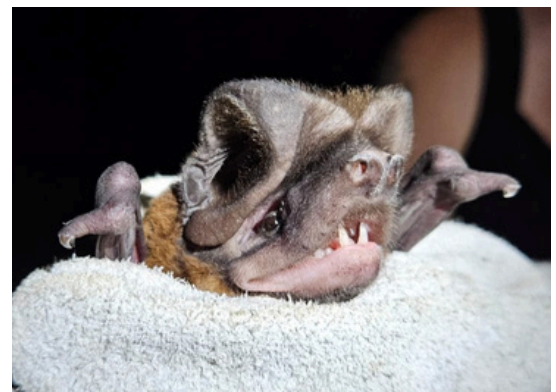
All aerial insectivore species captured in roosts or mist nets are recorded in a flight tent to register their echolocation calls, thus enriching our acoustic library of Brazilian bats.





Mist nets

We set up mist nets along trails in native vegetation areas and near water sources. From the 40 sites chosen for acoustic monitoring in the Cerrado, we selected five sampling units. Each site is sampled for two days, with about six hours of activity per day. During this time, we record the capture time of each bat, measure forearm length, determine sex, weigh them, and identify the species using specialized guides. We also collect tissue samples, feces, pollen, saliva, and ectoparasites, storing them in Eppendorf tubes with 70% alcohol. Additionally, we photograph all captured bats to create a detailed image database.



Eumops perotis





Cave Sampling

We've chosen to sample caves in the region, including the Aroê Eiari cave complex in the Chapada dos Guimarães APA and the Quebó Duct in Nobres.

Our exploration of these caves focuses on studying the host-parasite relationship between bats and their ectoparasitic flies. On average, we capture around 30 bats per campaign, mostly species like *Anoura geoffroyi* and *Carollia perspicillata*, in various reproductive stages, such as scrotal males, pregnant females, lactating females, and post-lactating females.



Anoura geoffroyi



People and training

An exciting aspect of our project is the exchange of knowledge between experienced team members and newcomers, fostering an environment of mutual learning. In this setting, young scientists receive training in the proper and ethical handling of animals in the field. What truly sets us apart, however, is our commitment to building connections with landowners and local communities in our sampling areas.

In the Pampas, for example, landowners guided us to known bat roosts. More recently, in the Cerrado, we had the chance to collaborate with tourism guide students in Chapada dos Guimarães, offering training on bats and their ecological importance. These guides, who frequently encounter caves and bat roosts, are in a unique position to share this knowledge with the over 300,000 tourists who visit Chapada dos Guimarães National Park and the town of Nobres each year. Both locations are famous for their spectacular limestone caves and crystal-clear water flotation activities

