



REPORT 2022

ONÇAFARI ASSOCIATION



2022 Annual Report Onçafari Association

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LETTER FROM THE PRESIDENT

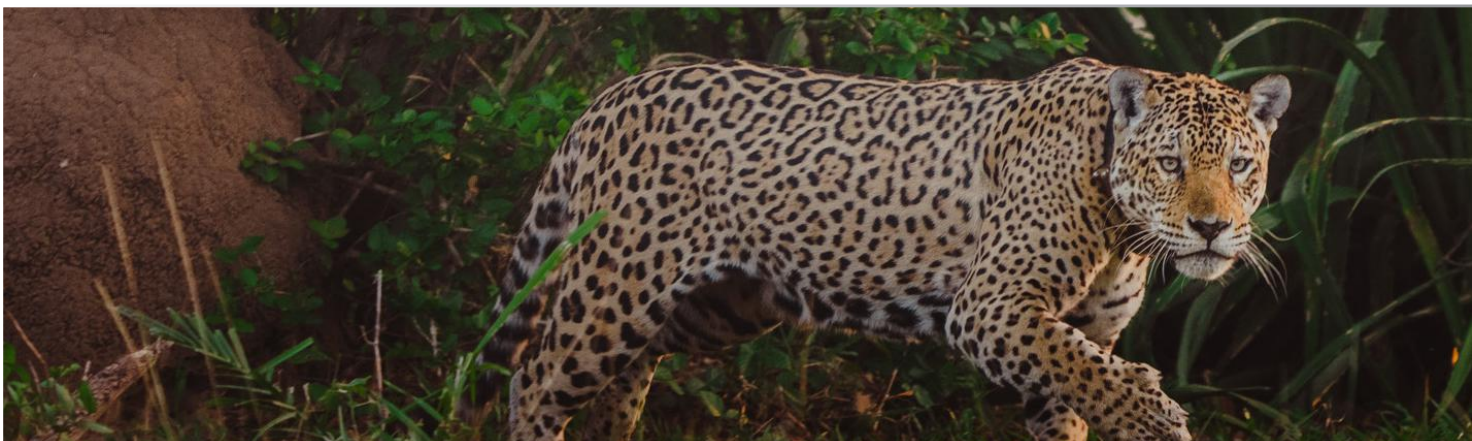
One hundred percent! We have reached the milestone of 100% jaguar sightings by Caiman Pantanal guests for the first time in the history of Onçafari! What seemed impossible has become true exactly where everything began!

I remember that when we first arrived here, with the idea of transforming nature tourism in Brazil based on the sighting of top predators, few people believed the business was feasible. People would also say that getting jaguars used to the presence of vehicles was an illusion...

I always believed in the success of this endeavor. There was no reason for the process to fall through – all it took was being careful and complying with several protocols. After all, if it works in Africa with lions, leopards and cheetahs and even in India with tigers, why would it not work with jaguars in Pantanal? We faced countless difficulties, had several learning opportunities and moments of frustration. However, thanks to our highly dedicated team, a team of people who really wear our organization's colors and who will go through blood, sweat and tears for the animals (oftentimes even literally, as everyone here involuntarily "donates" blood to mosquitoes, ticks and even leeches), we have managed to prove the success of the methodology brought from Africa and adapted for the Pantanal jaguars.

Onçafari has further expanded its knowledge on jaguars over the years, both in terms of their behavior and their psychology. Thanks to the application of such new developments in the field, we have managed to delight thousands of guests throughout our history. Caiman Pantanal has certainly become the best place in the world to see jaguars at any time of the year. It is wonderful to be able to count on and work with this fundamental partnership for our history. Together with Caiman Pantanal, we have gradually been able to change the fate of the Pantanal jaguars, which many locals increasingly see as an asset to be preserved in their farms. Thanks to green tourism, we value jaguars and all other coexisting species, and minimize the impact they may have on Pantanal cattle breeding.

Above all, habituation is not limited to Pantanal and the method may also be applied in other biomes. We are currently working in partnership with hotels and B&Bs in the Amazon, Cerrado and Mata Atlântica biomes to allow for the habituation of wild animals. Much like the idiom "one swallow does not make a summer", we also apply the method to other species, such as maned wolves, pumas and even tapirs, the largest wild herbivore in South America.



Though the spotlight is generally shun on green tourism, as it gave rise to Onçafari, 2022 also brought great results in the five other fronts in which we work, as will be further explained in this report. I would like to first focus on our Forests front.

We first set up this branch of the organization in 2019, by purchasing a small property on the margins of the São Benedito river, in the south of the state of Pará, in order to preserve the area. After all, it is very close to the so-called “deforestation belt”. This is Onçafari’s fastest growing front – we currently either own or manage over sixty thousand hectares (roughly 15,000 acres) of land.

We took possession of the farm that has now been renamed São Francisco do Perigara Reserve in 2022. The farm, in the not-too-distant past, was home to the largest number of blue macaws in the world. This reserve once had around 15% of the world’s population of the species in its fields, totaling approximately 900 birds. Unfortunately, the fires that reached and burned about a third of Pantanal in 2020 also took their toll on around 92% of the reserve. The impact on the macaws was noticeable, mainly due to the lack of fruit from the acuri palm trees, their main source of food, which stopped bearing fruit because of the fires. The macaws dispersed in search of food and, today, there are not as many animals at the reserve. We have made substantial efforts together with Instituto Arara Azul in the area, and we are now able to see the first results of our efforts. Instituto Arara Azul has worked in the area for over 20 years, and there has

never been a year in which so many fledglings have flown from nests as seen in 2022. This is certainly a record to be celebrated and which fills us with hope in terms of the restoration of the population of the endangered species.

Several plans began to materialize at the Santa Sofia Reserve, such as the payment for environmental services. In 2022, we signed a contract to certify carbon credits at our reserve together with the 5P Alliance (a group of farms that sustainably develop their land, and which currently form one of the largest wildlife corridors in the world). These credits will soon generate substantial resources that will become one of the reserve’s leading sources of funding. We are also planning a green tourism operation at the Santa Sofia Reserve – we are likely to have more information on this project shortly.

Back to our reserve in the south of state of Pará, Onçafari Reserve 1, we have taken a huge step towards the conservation of the area. Thanks to Decree No. 1944, signed by Governor Helder Barbalho, the area is now officially a Wildlife Reserve (REVIS), which translates into a much higher protection status for the local forests and rivers.

Onçafari unfortunately does not only come bearing good news. Despite the increased environmental protection brought forth by the São Benedito and Azul Rivers Wildlife Refuges, our reserve and the neighboring areas suffered a massive arson attack that devastated the region. We have pressed charges and are hopeful the persons behind the attack will be prosecuted and punished.



Above all, we hope that one day we will be able to see the beautiful Amazon rainforest in the region recovered and its fauna back.

As founder and manager of Onçafari, I am always concerned with the continuity of the organization. We have largely focused our efforts on Onçafari's governance in the past two years. Last year we opened our office in São Paulo, and this year we moved to a larger one in order to meet the organization's needs. We currently have a strong back office structure and different departments, focused on the operating, financial, marketing and communication divisions, as well as on partnerships and events. Our efforts are always focused on Onçafari's financial sustainability, especially with respect to our operating expenses. We have sought ways to cut back on such expenses through strategic partnerships; i.e., to cover for the products used in day-to-day operations, partnerships that generate funds to pay for of our expenses and green tourism-related partnerships. For instance, in 2022, Caiman Pantanal accounted for 25% of our revenue.

I could not end this text without talking about another dream come true in 2022. In addition to the rollout of Land Rover's Onçafari Defender, in celebration of our 10-year anniversary, a huge milestone for our organization, in 2022, we had the privilege of having our brand associated with the Brazilian men's soccer jersey for the Qatar World Cup. Billions of people saw the rosettes of jaguars printed on the jersey that is every Brazilian's pride, offering more "visibility" for the conservationist cause. In addition, we now have the multi-year support of Fisica, Nike's representative in Brazil.

I would like to thank everyone who supports our cause, in any way, as well as the thousands of tourists who have visited our bases in 2022, everyone who attended our 10-year celebration in November, all our team, who help us make history every day, our advisors, who help us choose the best available pathways, and all our sponsors, who believe in and increasingly encourage our endeavors. May 2023 bring even more achievements and conservation.



Mario Haberfeld
Onçafari's President and Founder



LETTER FROM OUR ORGANIZATIONAL PARTNER

Jaguar rosettes stand for grit – and it takes a lot of grit to live up to the rosettes on one's jerseys. And this was our top mission in 2022: to use the change-making power of sport to (once again) bring together Brazilians not only to support the World Cup, but also to support other causes.

After all, if soccer is capable of mobilizing the entire country towards singing the same chant, why not use its strength to promote integration and draw attention to key issues, such as environmental conservation?

The jaguar is not only the umbrella species of our biodiversity – and, is such, essential for ecosystem balance – but is also a national symbol. The claw of the largest feline of the Americas goes beyond the limits of forests and represents the resilience and strength of a nation, which is exactly what inspired Nike's collection for the Brazilian men's soccer team, launched last year, in a project developed together with Onçafari.

Though the outcome on the field was not exactly what any of us expected, we had the chance to once again experience the contagious feeling of union off the field. We had the chance to witness the fans' positive reaction to two national symbols brought together, in one: the traditional yellow jersey, locally known as amarelinha, and the jaguar rosettes. We celebrated the rollout of the new jersey in Pantanal much like we cheer to a scored goal – led by the example of soccer star Richarlison, we symbolically adopted jaguar Acerola as our mascot. We were happy to see every new piece and article published on the conservation of the species, evidencing the progress made in raising awareness, and we roared, rooted and cried with and for our team,

together, during and after the games. We also cried for the unexpected result at the World Cup, but it is undeniable that the tournament also inspired moments of pride and great hope.

These are the feelings and emotions we cultivate and renew every time we mention the incredible and leading work Onçafari develops. As a pioneer and innovative organization whose people are not only stars, but also team players who focus on fair play. This team definitely has the grit it takes to do justice to the jaguar rosettes, and to make things happen!

We are well aware that contributing towards the future of the planet (and of the sport) is a challenge-ridden and complex game, which calls for longstanding commitment. Nevertheless, we are absolutely certain that playing for Onçafari's team is the right thing to do.

We would therefore like to thank you for the honor of having us as your organizational partnership and for the opportunity to play together and help score goals that will make the difference for this and for future generations.



Bruno Teixeira

Senior Purpose Manager at
Fisia - Nike's Official Distributor in Brazil

LETTER FROM THE BOARD

Nature has always bewildered me, from a very young age. I spent most of my childhood years at a farm in the state of São Paulo, and this experience shaped my relationship with the world.

The gradual disappearance of the natural world, forests, fields, birds and animals, who we are witnessing, is a matter of great concern, though unfortunately very few people realize this sign of alert.

To me, being part of Onçafari's Board is an amazing opportunity to work for the environmental preservation cause, especially as the standards of competence, transparency and management efficiency are directly tied to the operation, which I believe are fundamental pillars for any undertaking.

Of all the fronts at which Onçafari focuses its efforts, the one I am most committed to is forest preservation. I believe it is a key conservation strategy. Visiting Esteros del Iberá in 2019, when we had the chance to see the work of the Conservation Land Trust and the Tompkins couple on the ground, was very inspiring.

We realized that we could do more than we were doing and expanded our acquisitions with the purchase of Santa Sofia and São Francisco do Perigara farms, respectively in 2020 and 2021. 2022 was an important year to consolidate the management of this land. New acquisitions are planned for 2023.

We are a fast organization with a dedicated team that is fully committed to the cause, with

complementary skills, which, together, translate into effective impact on nature preservation. We have managed to attract new organizational partners and sponsors to cover the costs of our activities.

It is my great pride and pleasure to be part of Onçafari. I would truly like to thank our CEO, Mario Haberfeld, our team and the volunteers who make everything happen. It is a real privilege to have crossed paths with all of you and to count on your partnership and company as I trail my way in this world!

May Onçafari have a bright future ahead!



Teresa Cristina Ralston Bracher
Member of the Onçafari Advisory Board

BOARD

EXECUTIVE BOARD



PEDRO CAMARGO



ROBERT BETENSON



ROBERT KOZMAN



ALEXANDRE BOSSI

ADVISORY BOARD



ANA HABERFELD



ARRI COSER



FERNANDO VON ZUBEN



GUILHERME AMARAL



LILIAN ESTEVES



MARINA COURROL



RAQUEL MACHADO



ROBERTO KLABIN



TERESA BRACHER



MARIO HABERFELD

PRESIDENT

AUDIT COMMITTEE



CRISTIANO RUSCHMANN



RAFAEL FUGANTI



FABIO PRADA

TEAM

TESTIMONIALS



BÁRBARA DIAS
BIOLOGIST AND BILINGUAL GUIDE

"Albeit challenging, 2022 also brought several achievements for our base at Pousada Trijunção, in the Brazilian cerrado. We released the maned wolves that went through the reintroduction process; we ran capture efforts, which resulted in three maned wolves captured in 24 hours; we closely follow the den of the wolf Nhorinhá and the growth of her pups; we also carried out over 200 safaris and made 318 sightings of maned wolves. In addition, we accompany film crews for long periods in the field, recording incredible behaviors and images of maned wolves to share with the whole world and bring more visibility to these very special animals and to their home, the cerrado."



LEONARDO SARTORELLO
REWILD COORDINATOR

"The January rain and the delays to import materials to the Santa Sofia Reserve, in Pantanal, called for postponing the continuation of the works on the enclosures of the Center for Wildlife Reintroduction. However, in May and June, we continued the project and managed to finish the first enclosure, for the reintroduction of large carnivores. This is where the puma Nalla currently lives, whose release is scheduled for the second half of 2023. In August 2022, we were able to finalize the enclosure for the reintroduction of primates and birds and, at the end of the year, we started the works of the passerine enclosure, which is of great importance for the rehabilitation and release of birds rescued from animal trafficking. Despite the many challenges of fieldwork in isolated areas, not a day goes by without learning something new, and one of the most important things I learned is how to deal with unforeseen circumstances using everything I have at hand: creativity and perseverance are great allies! Seeing that our work contributes to wildlife having a new chance to live freely in nature again is very rewarding for me. This is only possible thanks to the support of everyone who believes in conservation and join us on this path!"

ABOUT US

MISSION

Onçafari Association was established in 2011 to promote environmental conservation and contribute to local and regional socioeconomic development through green tourism, environmental education, work with local communities and scientific studies. We work for the conservation of biodiversity in four of the six Brazilian biomes (Amazon, Cerrado, Atlantic Forest and Pantanal), especially of jaguars, pumas and maned wolves.

OBJECTIVES

- To conserve biodiversity in the biomes where we operate;;
- To socioeconomically develop the target areas;;
- To value local culture;
- To increase scientific knowledge about jaguars, pumas and maned wolves
- To consolidate green tourism as a tool for conservation;
- To reintroduce jaguars, pumas and maned wolves into the wild.

UN SUSTAINABLE DEVELOPMENT GOALS (UN SDGs)

- Decent work and economic growth;
- Reduce inequality within and among countries;
- Climate action;
- Life below water;
- Life on land.



ONÇAFARI OPERATIONS



TEAM: 45 EMPLOYEES

Caiman Pantanal: **11**
 Refúgio da Ilha: **2**
 Pousada Trijunção: **4**
 Legado das Águas: **3**
 Reserva Santa Sofia: **7**
 Reserva S. F. do Perigara: **8**
 São Paulo - Office: **9**
 Veterinarian: **1**

♂ Male: **64%**
 ♀ Female: **36%**

Field employees: **45%**
 Biologists: **40%**
 Administrative: **15%**

OVERVIEW

2022

1178

JAGUAR SIGHTINGS IN
CAIMAN PANTANAL

1526

CAIMAN PANTANAL GUESTS
WHO TOOK TOURS

880K +

INFLUENCE IN 880,105
PROTECTED HECTARES





318

MANED WOLF SIGHTINGS IN
POUSADA TRIJUNÇÃO

11

BASES

349

POUSADA TRIJUNÇÃO GUESTS
WHO TOOK TOURS

5

SCIENTIFIC PAPERS
PUBLISHED

5580

PEOPLE IMPACTED BY SOCIAL AND
EDUCATIONAL ACTIVITIES

21

PARTNERS

MEDIA

Onçafari chooses to use media as one of the resources to promote, showcase and further develop the organization's endeavors. Media has ever the more power, especially in terms of influencing behavior, which is why we put together a marketing team to share information and increase the visibility of and awareness on conservation and the work Onçafari does across the four biomes in which it operates.

The results were incredible. 2022 was the year of the Pantanal, the year of the jaguar. Among all the events, two major milestones for the largest feline in the Americas stand out: the soap opera Pantanal, focusing on the biome, which was broadcast nationwide, on one of Brazil's leading networks; and the World Cup in Qatar, when the national team wore the jerseys with jaguar rosettes, showcasing the region to the entire world. Score!

Thanks to the soap opera, approximately 76 million Brazilian viewers opened up to listen to, become acquainted with and learn more about Brazil's smallest and most preserved biome. The exposure allowed for more people to contact nature and understand our purpose: conservation.

Organic media mostly targeted Pantanal, but our work also continued in the other biomes: Amazon, Atlantic Forest and Cerrado. The achievements, challenges and evolution of the three biomes were reported and shared in several media outlets, offering visibility to what we do for biodiversity conservation.

We shot documentaries on jaguars and wolves. We hosted Donal Boyd and Adorama, Off the Fence, BBC, Canal Off and other production companies that made rich content about the work we do with nature and conservation,

translating into amazing footage of cubs, copulations, fights, territory marking, unprecedented predation and many other moments that contribute to science, green tourism and humankind, which now has access, information and contact with wildlife. In addition, discussions have also focused on increasing social concern about climate change.

Digital influencers are also key spokespersons for our work. Thanks to their work, we have reached people who would otherwise not have access to or be familiar with Onçafari's projects. It is a great opportunity to bring together a large and diverse group of people from different parts of the conservation world. We hosted certain Brazilian influencers for safari tours at our green tourism bases in 2022, such as Juliana Paes, Victor Fasano, Richarlison, Klebber Toledo, the Desimpedidos gang, Lelê Burnier, Lucy Ramos, and other Fhits influencers.

The exposure across different media channels (magazines, TV networks, newspapers, blogs, social media, among others) translated into more followers and in greater interaction and engagement between the viewership and Onçafari.

Our larger and stronger follower base allows us to send a monthly newsletter summarizing events that took place at the bases and ongoing projects. The newsletter, Onçanews, is sent in Portuguese and English, providing international coverage for all the work done. Readership is currently of over 5,000 readers.

Onçafari mostly uses online channels, and Instagram is the main social media used for updates, to monitor our projects and share any news. Onçafari's advertising value in 2022 was BRL 26,538.633.¹

¹ Source: TopClip

OUR NUMBERS



393.000



139.000



11.000



5.200



3.200



2.400



BRL 26,538,633

Advertising Value (2022).



MEDIA HIGHLIGHTS

IN 2022



One of the stars of the national soccer team, Richarlison, went to Pantanal to see jaguars, promote Brazil's new jersey and learn more about the work of Onçafari and its founder, Mario Haberfeld

ECO A UOL



THE NORTH FACE & ONÇAFARI

VALOR ECONÔMICO



Entrepreneurs invest millions in the purchase of land to build a green corridor in Pantanal (free translation).

ESTADÃO



Exclusive report with Richarlison presenting the new jersey of the Brazilian National Team inspired by jaguars. The player lived the safari experience in Caiman Pantanal and learned more about the conservation work developed by Onçafari.

ESPORTE ESPETACULAR



B&B promotes unique experience in the Brazilian cerrado, with safari to spot manned wolves (free translation).

FORBES LIFE



Pesquisadores estudam a preservação da onça-pintada. Entrevista com Mario Haberfeld no Dia Nacional da Onça-pintada.

MATO GROSSO TV (MTTV)

Animal raro, cachorro-vinagre é visto por câmera de monitoramento durante passeio com filhotes no Pantanal

Flagrante foi feito por câmeras do Onçafari, em parceria com o Instituto Delta do Sabão (IDS) e a Pousada Refúgio da Ilha, entre Bodoquena e Miranda.

Por Débora Nicolini e Juliana Mosquera, g1 MS

14/02/2022 10h18 - Atualizado há um ano



Scientific knowledge on the bush dog is still scarce, because of its low population density and aloof habits. It is a small canid, with round ears and short legs. It was seen in Onçafari monitoring, at the base of Refúgio da Ilha in Pantanal.

G1 MATO GROSSO DO SUL



ECOTOURISM

Ecotourism is one of the main tools for conservation that Onçafari uses. Wildlife attracts tourists from all around the globe. Thanks to ecotourism, we generate jobs and income for the communities we service and promote the opportunity to live a unique experience for those who visit us. The local experience is crucial, as it makes it much easier to understand why it is so important to care for and preserve nature.

Thanks to the tourism income, the local community and the landowners actually start valuing native species and turn into key players in the conservation of the ecosystem in which they live and work.

Ecotourism is a segment within the tourism industry that uses natural and cultural heritage in a sustainable fashion, in order to preserve the environment and raise environmental awareness.

Coming across jaguars and maned wolves allow visitors to learn more about the species, become aware of the importance of these predators in nature and get involved in the conservation process. Part of the awareness work includes lectures on these species and other animals that share the biome.



Ecotourism is Onçafari's longest standing work front, and it has undergone substantial changes in 2022. The year kicked off with operations at Caiman Pantanal, Pousada Trijunção (Cerrado) and Refúgio da Ilha (Pantanal). Aside from the many amazing events, guests and sightings later, we launched a new ecotourism operation at Legado das Águas (Mata Atlântica). We also discontinued Onçafari's projects at Refúgio da Ilha, after a partnership of almost three years.

CAIMAN PANTANAL BASE

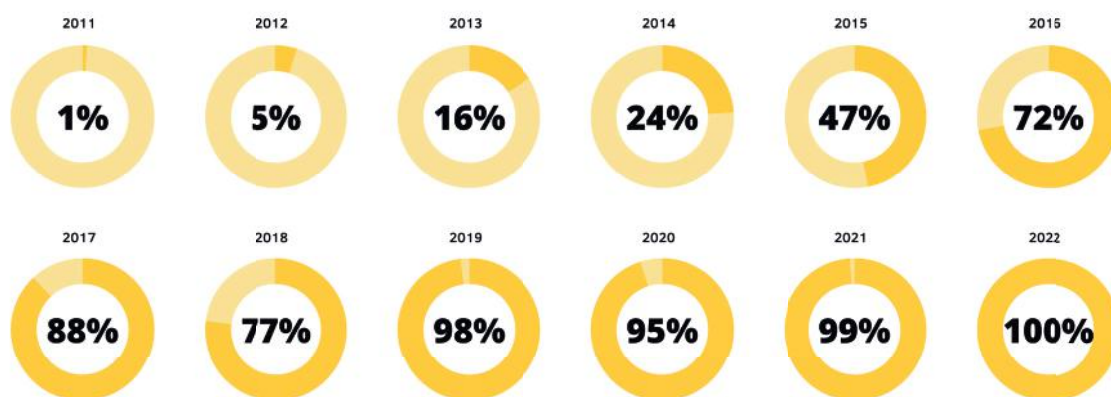
Caiman Pantanal is a 53k-hectare (+/-130k-acre) oasis whose mission is to conserve the fauna, flora and culture of the Pantanal. Caiman Pantanal was Onçafari's first base. After the habituation process*, the safari tours began for sightings of jaguars and other local animals. We have many stories to tell from the past 11 years.

O ano de 2022 foi de recorde! Chegamos a 2022 was a record year! We reached 100% of jaguar sightings – in other words, all Caiman Pantanal

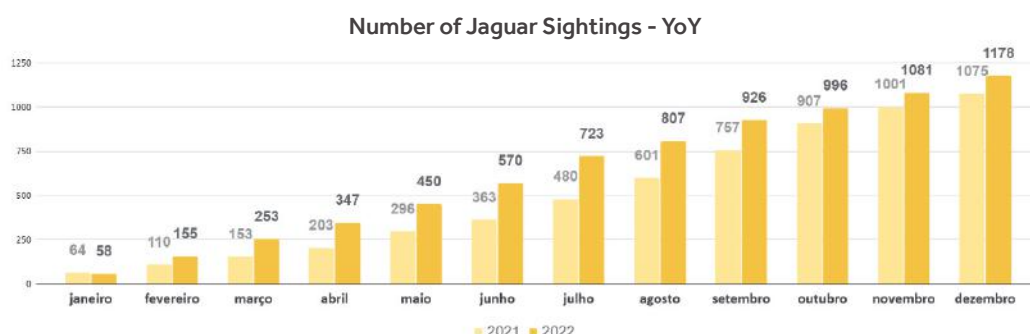
guests saw at least one jaguar during their stay. The following chart shows the growing year-on-year sightings. Back in 2011, disclosing this number was a dream that has now come true. This progress was only possible because the habituated jaguars "taught" their cubs that safari cars were not dangerous, "knowledge" which is transmitted from one generation to the next.

Monitoring and working with wild and free life does not guarantee any sighting, and this is exactly why 2022 was a milestone and an important achievement for Onçafari.

The growth of the past few months came along with the expansion of our team and facilities. We hired three new guides for our team at Caiman Pantanal, two bilingual guides and one local guide (from Pantanal). Our field guides are from Pantanal and know the region well, and the bilingual guides are biologists with expertise in fauna and flora, trained to welcome both national and international tourists.



Percentage of guests who have seen jaguars at Caiman Pantanal in recent years.



The growing number of jaguar sightings at Caiman Pantanal in 2021 and 2022. We hit our record in 2022, totaling 1,178 sightings and workshops for 1,378 Caiman Pantanal guests.

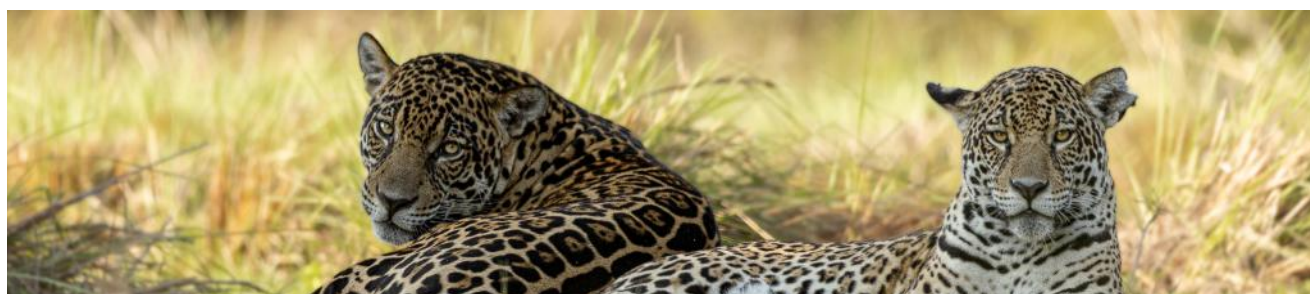
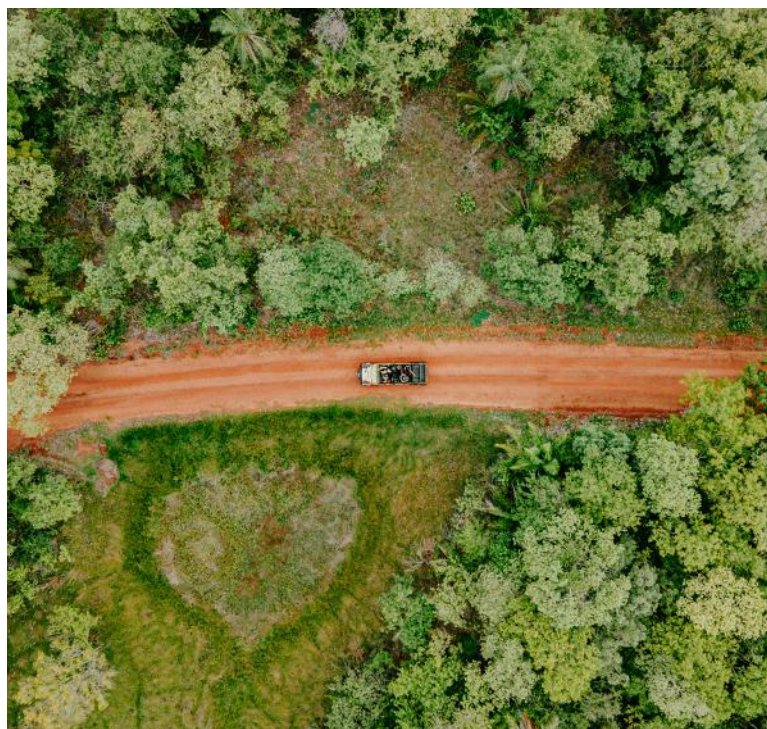
Outro importante marco foi o nascimento do Complexo Onçafari.

Another important milestone was the opening of the Onçafari Complex. The Onçafari Complex is a larger and more structured area, at Caiman Pantanal, to hold workshops, showcase pictures, skulls, videos and content about the organization's accomplishments in recent years



Thanks to the habituation process and specificities of the Pantanal biome, such as the flat terrain and low density and sparse vegetation, it is easier to come across the largest cat in the Americas.

It is easier to promote Onçafari's work as more tourists visit the area, jaguars are increasingly habituated and sightings are, therefore, more common. As a result, more guests get to know, admire and collaborate with Onçafari's work. One of the ways to contribute is by symbolically adopting a jaguar: 17 jaguars were adopted in 2022.



REFÚGIO DA ILHA BASE

Onçafari first established an organizational partnership with Instituto Delta do Salobra (IDS) and Pousada Refúgio da Ilha in March 2020, for the monitoring and habituation process of jaguars at the Salobra Delta area, in Miranda, state of Mato Grosso do Sul, one of the cities part of Pantanal. Thirty camera traps were setup at the time. We then had a fixed team at the property from May 2020 to December 2022, to monitor the jaguars in the area, on a daily basis.

Pousada Refúgio da Ilha has worked with green tourism in the area since 1997. It started with Day Use packages, then changed its structure to limited access, having managed to offer a more private experience. Today, the inn has 8 apartments, which can accommodate up to 32 guests simultaneously.

Our work has grown and become more relevant in these almost three years of partnership. Refúgio da Ilha has welcomed more guests, more educational talks on conservation have been held and, thanks to Onçafari's work, more visiting guests have seen jaguars over the years.

There were 70 sightings in 2022, 40 of which were with guests, compared to 15 sightings in 2020, 4 of which were with guests. Eight adult individuals (five males and three females) and

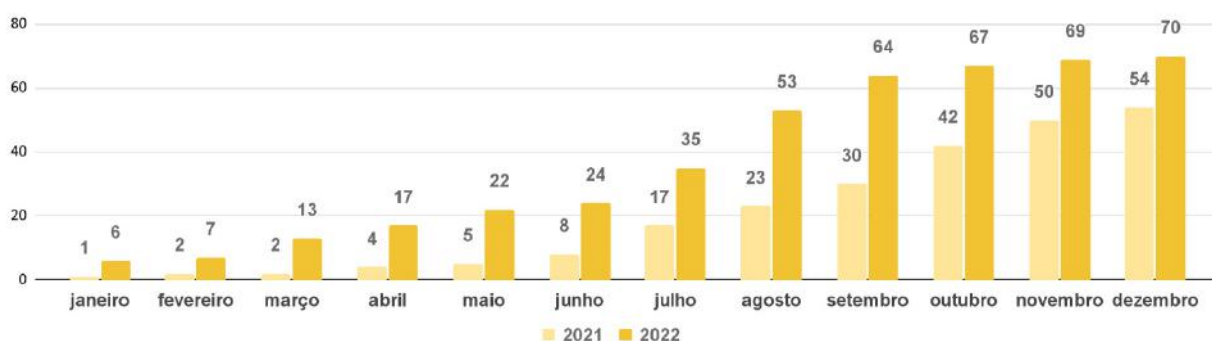
three cubs were sighted in 2022. Jaguar Kim was spotted 22 times, accounting for 31% of the sightings. In 2021, Kim accounted for 75% of sightings, which means that other jaguars were spotted in the area. One of the main highlights was spotting a male jaguar called Encontro, who was also very receptive to the habituation process and appeared in the vicinity of the inn from May 2022.

Taba, a local female jaguar, was first sighted in 2022; however, Taba was far more skittish, sightings were rare and lasted for a few minutes. The team put a GPS and VHP collar on Taba in July. Though difficult to spot, our team managed to see Taba on certain occasions, including with guests, at times. The team came close to her several times, as shown by the VHF signal, making great progress in the evolution of her habituation process.

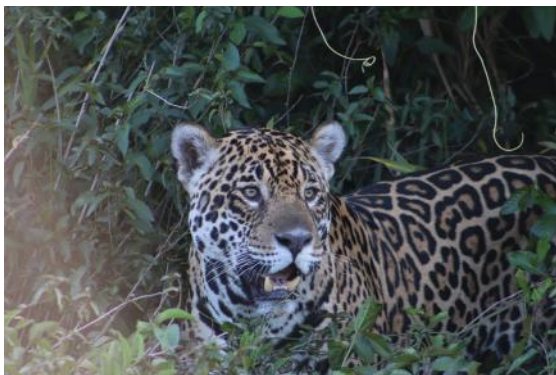
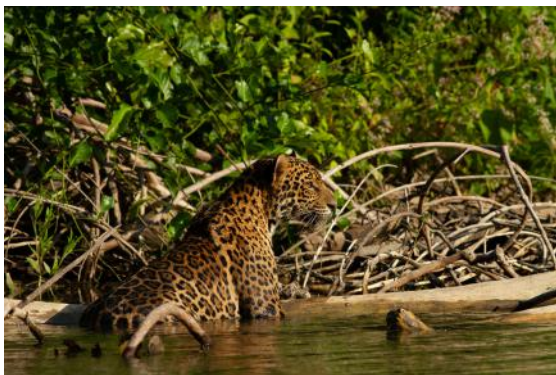
From March 2020 to December 2022, 30 camera traps were spread across an area of 3,000 hectares (+/-7.4k acres). Since then, cameras have recorded 24 individual jaguars: 13 males, 6 females and 4 cubs.

In December 2022, our partnership agreement with Pousada Refúgio da Ilha ended and we closed the green tourism operation in the area.

Number of Jaguar Sightings - YoY



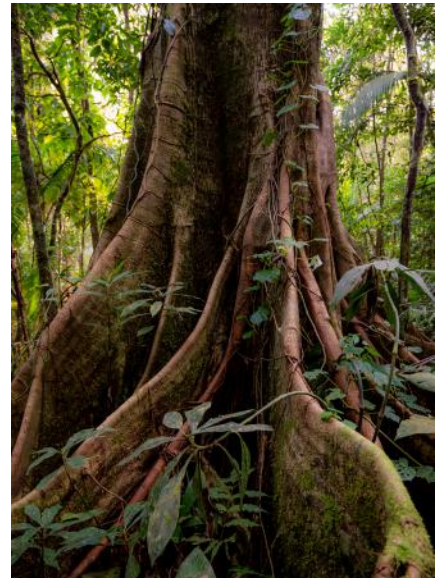
Number of jaguar sightings at Refúgio da Ilha.



Some of the jaguars the Onçafari team monitors at Refúgio da Ilha. From top to bottom: Kim, Aruaq, Taba, Terena and Encontro.



Jaguars captured by our camera traps.



LEGADO DAS ÁGUAS BASE

Legado das Águas is the largest private Atlantic Forest reserve in Brazil. Thanks to its 31 thousand hectares (+/- 77k acres) located near the cities of Juquiá, Miracatu and Tapiraí, in the Ribeira Valley, State of São Paulo, it is possible to bring together forest protection and development of scientific research with new economy activities, such as the production of native plants and ecotourism.

Founded in 2012 by companies CBA—Companhia Brasileira de Alumínio, Nexa Resources, Votorantim Cimentos and Votorantim Energia, Legado das Águas is managed by Reservas Votorantim and maintained by Votorantim S.A.



Legado das Águas first partnered with Onçafari in August 2020 and, last year, it took an important step towards green tourism. Two types of tours were launched in October: the Tikún jaguar trail and the Safari Adventure. Also, ecotourism in the Atlantic Forest is specific to the area, unlike other biomes.

The Tikún jaguar trail is a 6.5 kilometers hike in the Atlantic Forest, where it is possible to look for traces, footprints and traces of local animals. One of the experiences offered is a hike to monitor the fauna, where tourists have the chance to install and remove monitoring cameras and see the footage.



In turn, the purpose of Safari Adventure is to offer a tour in which guests can experience a night safari to spot the animals. Our biologists, equipped with their flashlights and expertise, take us to continue the search by kayak, in the Juquiá River, contemplating a magical and silent sky.

The Onçafari Expedition package includes two activities: the Tikún jaguar hike and the Safari Adventure. Guests have the opportunity to hear the sounds of the forest, its smell and experience what it is like to be a biologist, on all activities.

It is the perfect opportunity to learn more about the diversity of the local flora and fauna on the local trail, whether hiking or by car, or on a kayak, to spot animals and their tracks.

Onçafari and Legado das Águas show it is possible to carry out responsible business and keep the forest standing, ensuring local conservation.



POUSADA TRIJUNÇÃO BASE

The cerrado is the second largest biome in Brazil and is one of the most biodiverse areas in the world. It is estimated that there are over 6 thousand species of trees and 800 species of birds in the cerrado (Brazilian Ministry of the Environment and Climate Change (MMA), 2002).

It is considered Brazil's water "homeland", as the aquifers of the springs of the country's largest river basins are located in the cerrado. However, today less than 50% of the original cerrado area remains, as it has become the largest agricultural frontier and the largest irrigated area in the country.

Fazenda Trijunção, property located between the states of Bahia, Goiás and Minas Gerais, and set up in 2018, totals 33,000 hectares (+/-81.5k acres) of protected area (equal to approximately 47,000 soccer fields) works as a barrier to the advancement of soy, corn and cotton plantations, and cattle. Thirty thousand (+/-74k acres) of its 33,000 hectares (+/-81.5k acres) are dedicated to environmental

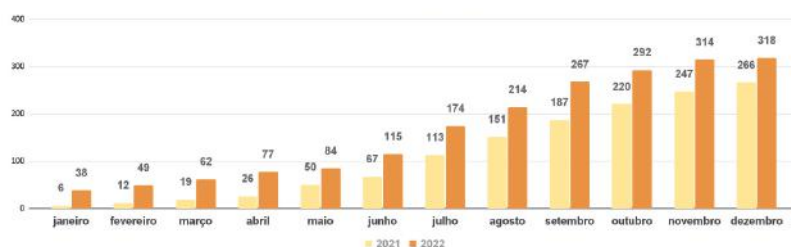
conservation and contribute to the formation of a huge green corridor, protecting substantial wildlife. In addition, the farm preserves the local veredas, wetland typical of the cerrado, which feed the São Francisco River.

Onçafari's monitoring work is focused on the maned wolf, an endangered species. Our team of biologists both monitors the fauna and carries out the safaris with the Pousada Trijunção guests. Aside from the maned wolf, sightings include deer, rheas, macaws, wild dogs and tapirs. Jaguar sightings are rare, but they do occur – pumas included.

Pousada Trijunção has a total of seven guest rooms; in the first half of 2022, 232 guests stayed at the inn, and 168 tours were organized. Year on year, the number of sightings increased by 19% in 2022. Not only does the dry weather allow for greater chances of mammal sightings, such increase also results from new collars installed in June and the growth of the Onçafari team, which allowed for increased efforts in field, in the search for maned wolves.



Number of maned wolf sightings - YoY



Number of maned wolf sightings at Pousada Trijunção.

GPS and VHF radio-collar devices are used on safari trips for maned wolf sightings. The following wolves were spotted in 2022: Nhorinha, the dominant female in the area; Buriti, a male; Savana, Caju and Mangaba, three females, and Araticum, another male. In June, all guests spotted a maned wolf, at least once. The annual average was 64.7%.

We followed the birth of four of Nhorinhá's and Buriti's pups. In the second semester, Nhorinhá expelled females Savana and Caju from the territory. Camera traps and sightings revealed intense demarcations with repeated noises. Shortly after, the pups began to more actively explore the area.

Surprisingly enough, the Onçafari team first spotted the pups when they were with Buriti, which was also the first sighting of the father and the pups ever spotted at Pousada Trijunção. The pups leave traces behind, on the roads – whether when they wander alone or with their parents – which we come across on a daily basis. At night, it is also possible to hear howls of the pups communicating with Nhorinhá and Buriti.

It is easy to see that wildlife ecotourism guarantees unexpected sightings and unforgettable scenes.





REWILD

Our Rewild front oversees the rehabilitation process of medium and large wildlife, especially jaguars, puma and maned wolves, to prepare them for the process of returning to free life in their natural habitats.

Rehabilitation and reintroduction processes are important tools for the conservation and recovery of endangered species. Since 2016, the Onçafari team has managed to rehabilitate and return eight animals to the wild. Thanks to the Reintroduction-related efforts, Onçafari was able to support the development of public policies, and, in the future, it will promote the increase of the jaguar population in the Atlantic Forest, through the reintroduction and even the translocation of animals. Aside from Brazil, Onçafari has already contributed to reintroduction efforts in Esteros del Iberá, Argentina, where jaguars were extinct for over 70 years.

Since May 2021, the Government of the State of Mato Grosso do Sul has approved the Santa Sofia Reserve as a wildlife release area. This is a very important step for the conservation and preservation of the Pantanal, as the Reintroduction work front also operates by receiving animals from the Pantanal biome to be released in the Santa Sofia Reserve.



ENCLOSURES AND ANIMALS AT CAIMAN PANTANAL

PUMA - CACAU

Cacau was the first puma part of Onçafari's reintroduction process at Caiman Pantanal, in Miranda, Mato Grosso do Sul. The female's unsocial behavior during the period at CRAS and the test results favored her choice for the process. There was yet one challenge to tackle: Cacau was already seven years old, confined in a small area.

Our team nevertheless decided to give a second chance. Cacau spent 320 days at our base up to release, which occurred in July 2021. Cacau found the open gate in the release process, and efficiently left the enclosure. Our team has spotted Cacau about fifteen times since release, in the wild, and the female puma was seen walking, resting and exploring the neighboring area of the enclosure where she was kept, currently occupied by another female puma, Nalla, whose rehabilitation process began in November 2021.

Whilst observing Cacau's development in the wild, our team found few traces of prey (bush dog, heron feathers and nine-banded armadillo) since hiding traces of prey is a natural and common behavior of the puma concolor species. Cacau remained in the wild for almost six months and had a very large exploration area, including visiting the Santa Sofia Reserve and the Porto Ciriaco Farm, in the city of Aquidauana, more than twice.

In January 2022, the signal from Cacau's collar reported the puma had died at Fazenda Estância Miranda, where she was found, collected, registered and frozen. The animal's body was sent for X-rays and necropsy at the University of São Paulo (USP), but no trace of a firearm was found. The cause of death was inconclusive, due to the advanced state of decomposition of the organs. We believe that death was due to natural causes, as Cacau showed great ability to survive in nature, behaving like a wild puma during the six months of freedom.



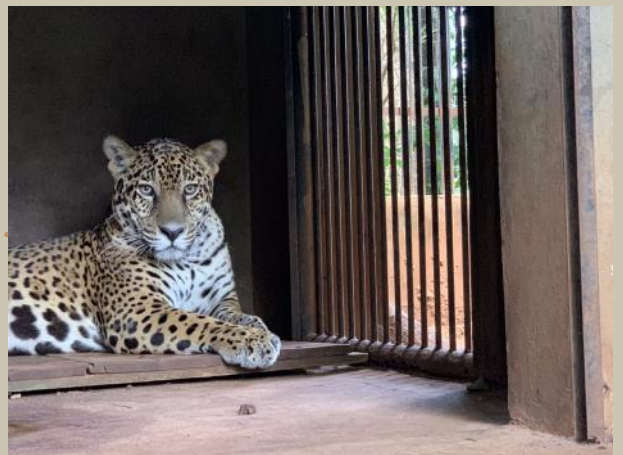
PUMA - OLIVER

Oliver is a male puma that arrived at our Caiman Pantanal Reintroduction Center in 2021. According to our estimates, Oliver was approximately 2 months of age upon arrival, as he had many dark spots on his body, coat typical of puma cubs. Oliver is a very skittish male and aloof to human presence, an excellent behavior in terms of reintroduction and return to wild life. At first, Oliver was allocated in the smaller 100 m² (+/- 328 sq ft) enclosure, but was later transferred to the larger enclosure, measuring 1 hectare (+/- 2.4 acres). Oliver is an excellent hunter and has already killed chickens, chaco chachalacas and agoutis, always with great dexterity and speed. Oliver's release is scheduled for mid-2023.



JAGUAR - JATOBAZINHO

Jatobazinho is a male jaguar rescued in 2018, close to the city of Corumbá. Jatobazinho was found wandering, rather apathetic and thin, on the outskirts of the Jatobazinho Rural School, Pantanal. The animal was very weak and, was therefore rescued and taken to the Federal University of Mato Grosso do Sul (UFMS), where he received first care. Jatobazinho made a quick recovery and, at one point, remained in an enclosure at CRAS in Campo Grande. The male jaguar arrived at Caiman Pantanal in 2019, in good health; in a few days, he started hunting live prey. Jatobazinho went through the rehabilitation process with the Onçafari team, which noted his wild and elusive behavior. Jatobazinho survived the fire that hit Caiman Pantanal in September 2019. In October 2019, Jatobazinho was sent to Esteros del Iberá, Argentina, which was once devastated and where the jaguar had been extinct for over 70 years. Fundación Rewild Argentina, in Esteros del Iberá, took over his reintroduction process, and Jatobazinho was released in January 2022. The male jaguar has since fathered at least eight cubs.



ENCLOSURES AND ANIMALS AT SANTA SOFIA RESERVE

Together with Carrefour, PremieRpet® Institute and Holtzman Wildlife Foundation, Onçafari completed the first construction phase of the Center for Wildlife Reintroduction at our base at Santa Sofia Reserve, located in Aquidauana, Pantanal of the state of Mato Grosso do Sul.

Today, the center consists of **three enclosures**:

- 1) Enclosure for the reintroduction of passerines: 2 m (+/- 6 ft 5in) high, with area of 12 m² (+/- 39 sq ft);
- 2) Enclosure for the reintroduction of birds and primates: 5 m (+/- 16 ft 5 in) high, with area of 250 m² (+/- 820 sq ft);
- 3) Enclosure for the reintroduction of large carnivores: 4.5 m (+/- 14 ft 7in) high, with area of 2,500 m² (+/- 8202 sq ft).

The enclosures are essential for Onçafari's Jaguar Reintroduction work front, as they allow for the rehabilitation of these animals and increase their chances of returning to nature. Moreover, the enclosures have the same vegetation and characteristics of the external environment, so that the animals can learn to hunt and interact with their natural habitat, while being monitored by our team. Two of the enclosures house animals undergoing rehabilitation.

The enclosure intended for large carnivores is home to the puma Nalla, who is slightly over two years old. Nalla's rehabilitation process began at the Onçafari Center for Wildlife Reintroduction at Caiman Pantanal, in Miranda, state of Mato Grosso do Sul. Nalla was then transported to



the Center for Wildlife Reintroduction at the Santa Sofia Reserve, in Aquidauana, state of Mato Grosso do Sul, in July 2022. During the time spent at Caiman Pantanal, Nalla showed friendly behavior towards humans, which is inappropriate for return to nature. The enclosure was changed and Nalla has since developed wild instincts, become more aloof to human presence and has improved hunting. Nalla is able to hunt live prey, such as rheas and capybaras, and our team observed that she hides the carcasses, behavior common to wild pumas.

For the time being, the enclosure for birds and primates houses the puma known as Chico. Siblings Chico and Tiana are two puma cubs

that rescued when they were 5 months old. They were found in a sugarcane field in the city of Costa Rica, city of Mato Grosso do Sul; after a quick visit to CRAS, in Campo Grande, the Onçafari team took them in to start the reintroduction process.

Female Tiana died after 70 days from arrival – the cause of death was inconclusive. Chico remains under the care of the Onçafari team and has been doing very well, managing to prey on live animals, including chickens and small piglets. After Nalla's release, Chico will be transported to the large carnivore enclosure to continue rehabilitation.



Nalla at the Caiman Pantanal enclosure – prior to transfer to the Santa Sofia enclosure.



ENCLOSURES AND ANIMALS AT POUSADA TRIJUNÇÃO

In 2019, our Cerrado team captured a female maned wolf, Caliandra. Our team placed a monitoring collar on her, an important tool for us to understand the animal's area and habits. In 2020, Caliandra's collar signals informed the formation of a cluster. Upon checking the location, the Onçafari team found Caliandra's burrow, with five litter mates. Shortly afterwards, the collar informed that Caliandra remained in the same place for a long time, far from the burrow, and our team confirmed her death.

Our team received ICMBio-Cenap authorization to rescue the five orphaned pups, who were taken to first care at the Brasília Zoo. Following the care and healthy growth period, the puppies returned to the Cerrado. Two of them, Araticum (male) and Mangaba (female), were assigned to our team and sent to an enclosure built and reserved especially for the rehabilitation of maned wolves, at the conservationist breeding site at Fazenda Trijunção. The other pups went on to rehabilitation in other conservation projects: the male Baru and the female Seriguela went to Parque Vida Cerrado, in Luís Eduardo Magalhães, in western Bahia. The female Pequii went to Paraíso da Terra, in the Federal District, under the care of researcher Ana Raquel Gomes Faria.

Araticum and Mangaba started exploring the enclosure at Pousada Trijunção; months into their rehabilitation, the pups successfully demonstrated their instincts and natural behavior. They were able to hunt live prey and secure their own food. In addition, with the external visits of free-living maned wolves, Araticum and Mangaba further developed their skills, such as marking territory and vocalization, confirming, day after day, that they were ready to return to nature.

The Onçafari team released the pups in January 2022. Araticum and Mangaba timidly left the enclosure and they immediately set on

independent pathways in the cerrado.

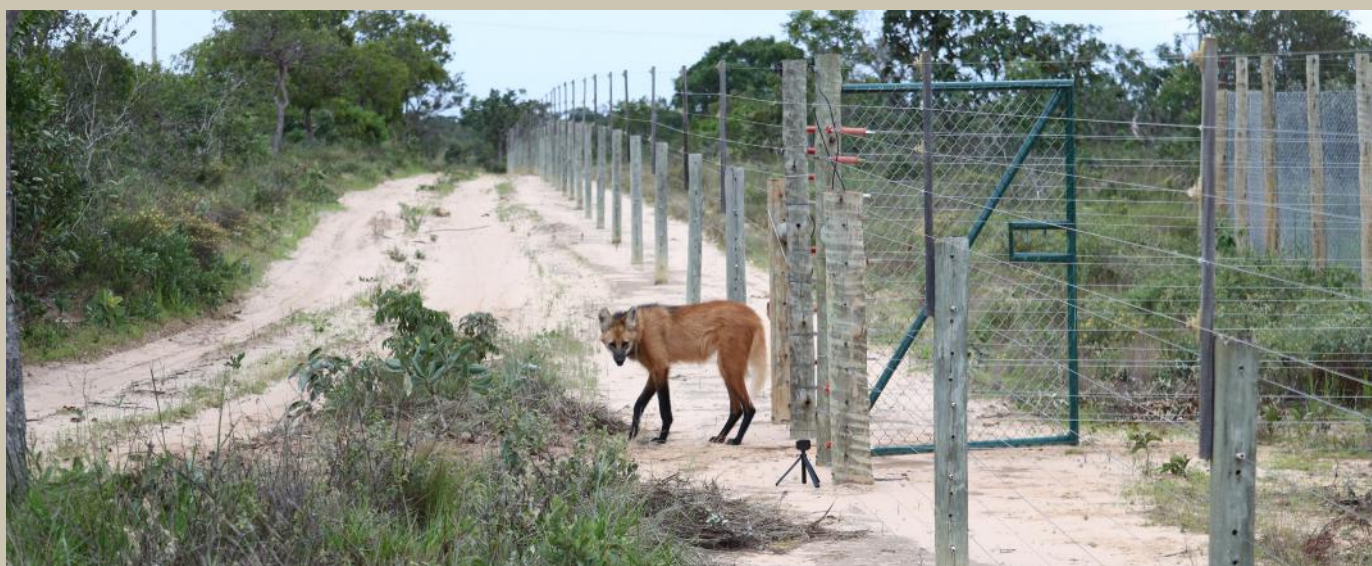
After returning to the wild, our team continued to monitor the maned wolves thanks to their collars. Araticum's death was confirmed in March. The animal's body did not show any apparent sign of cause of death and he was taken for necropsy at the University of Brasília. Unfortunately, it was not possible to determine the cause of death due to the state of decomposition of the organs.

RECAPTURE OF FEMALE MANGABA:

Maned wolf Mangaba did not avoid human interactions, failing to reintegrate into nature.

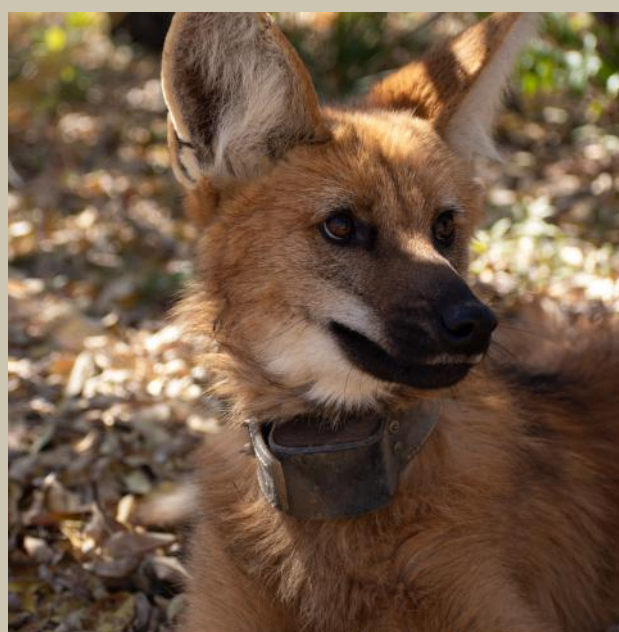


Mangaba and Araticum at the reintroduction enclosure.



Release of maned Araticum (above) and Mangaba (below).

After attempts in the field to help the wolf adapt and environmental education actions with the community, in August, it was necessary to recapture Mangaba in order to guarantee her health and wellbeing. Mangaba was taken back to the enclosure at Fazenda Trijunção. Our team is currently waiting for an answer from the National Center for Research and Conservation of Carnivorous Mammals (CENAP-ICMBio) as to which research institute will take in the maned wolf.



Mangaba at the enclosure (following recapture).



SCIENCE

The purpose of the Onçafari Science work front is to study the target species and their relationship with the environment, contributing to the protection of the biomes where Onçafari operates, whenever possible focusing on jaguars, puma, maned wolves and tapirs. It also aims to promote the scientific knowledge produced, as broadly as possible, educating society and enabling other projects to replicate and multiply conservation efforts, facilitating the protection of nature.

The data obtained on this front are shared in the form of scientific papers, book chapters and lectures at academic events, such as congresses, symposiums and workshops. In 2022, Nike sponsored the Amazon efforts of our Science work front, contributing to the purchase of new camera traps and monitoring collars to enhance the work with biodiversity conservation.



TAPIRAPÉ PROJECT

Since 2021, Onçafari has pioneered an initiative for the conservation of the lowland tapir (*Tapirus terrestris*) in Pantanal, together with Caiman Pantanal. The project uses habituation, a key element for wildlife tourism, to better understand the species and protect it.

The Brazilian tapir has already lost 14% of its original distribution and is an endangered species, as it is threatened by deforestation, hunting, road accidents, domestic animal diseases, forest fires and contamination by pesticides.

As they are very shy and elusive animals, tapirs are rarely seen and, therefore, very little research is based on observations of tapirs in their natural habitat – even experts have limited knowledge on the animals' behavior in the wild.

The first steps towards the implementation of the Tapirapé Project focused on tracking of tapirs, by observing footprints, waiting in hotspots and analyzing direct sightings in the field, in order to understand which are their

favorite paths, which sources of water and food they have contact with, to then define the places to build corrals and install camera traps.

Our first capture campaign was launched in May 2022, with the technical support of the National Initiative for the Conservation of the Lowland Tapir, represented by veterinarian Paolla Nicole. The campaign was a success, and two tapirs were captured.

Unlike the radio collars used on jaguars and maned wolves, the tapirs were equipped with small devices called tracking earrings, which emit a signal, much like the collars, allowing our team to follow the tapirs' footsteps, observe their behavior and help them become familiar with the presence of vehicles.

The first tapir captured in the campaign was the young female Marave, who was also the first to be tracked using a tracking earring. Yoti, a large-sized, dark coated, approximately 9-year-old adult male, was the second tapir captured.



The monitored tapirs formed stable pairs: they stayed together exploring the habitat and looking for food and areas to drink water. Pairs could sleep close together. When observing Marave, we noticed her pair was always there, who we named Parceiro; Yoti formed a pair with female Múpina.

The equipment proved to be good tools to monitor the animals' behavior, understand their home range and find them in the field. These results become clearer during safari tours: in July, 40% of guests who visited Caiman Pantanal were able to see tapirs in the wild.

However, Yoti's tracking earring fell out after two months and Marave's tracking earring fell after four months. The next steps of the project, therefore, are to review the position where the earrings are placed on the animals, and invest in new capture campaigns next year, moving forward with the Tapirapé project.



Marave (above) and Yoti (below) were the first tapirs captured at the Tapirapé Project.



Tapir capture corral.



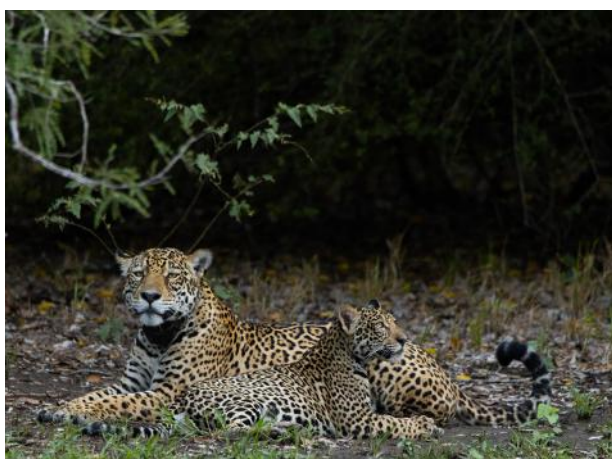
Capture campaign.



MONITORING JAGUARS

MEET LEVENTINA

Leventina is a female jaguar our team monitored at Caiman Pantanal since she was in the den, only a few days old. Leventina is part of a very remarkable lineage for Onçafari, as her mother is Ferinha and her grandmother is Fera, the first jaguar to be successfully reintroduced into nature along with her sister Isa.



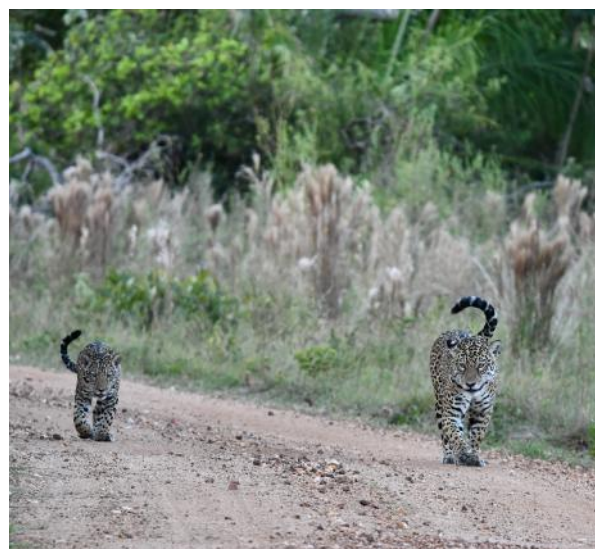
Ferinha (left) and Leventina (right) during a sighting at Caiman Pantanal.

Female cubs generally remain with their mothers for a year and a half, an essential period for them to learn several behaviors required to survive in the wild. During safaris, however, Ferinha was spotted without Leventina and always accompanied by males. This behavior caught the attention of our team and caused concern; after all, the cub had not been seen for over 15 days. We originally believed the cub had been separated from her mother, but turns out this was a rejection behavior, confirmed based on Ferinha's aggressiveness when reencountering with her daughter.

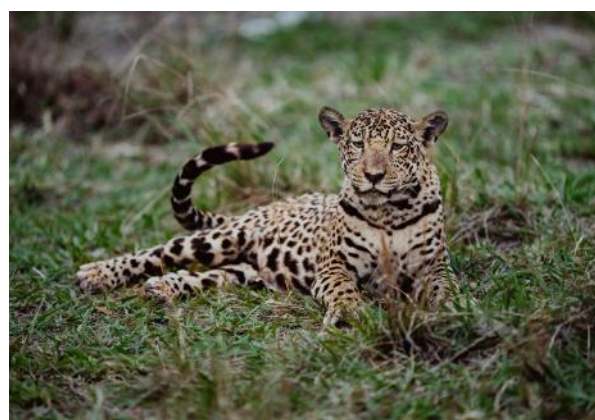
At only 8 months old, Leventina was seen alone and very thin, walking around the farm. The team was stunned by the cub's appearance and increased field monitoring to see whether she would survive. Our guides and biologists observed that Leventina was managing to

maintain itself. The cub was recorded in camera traps placed on carcasses and was often seen sharing the carcass with adult jaguars, including her grandmother, Fera, and aunt, Turi.

In September, when the cub was approximately 1 year old, our team managed to capture Leventina to check her health and we saw that she was healthy. The year ended with her developing well, whereby we expect she will continue growing, and we will continue to monitor yet another unusual and unprecedented case.



Leventina (left) and Ferinha (right) in one of the last moments they were seen together.



Sighting of young Leventina without her mother.



NEW JAGUAR CUBS

Jaguars are monitored using a combination of devices and techniques that contribute to obtaining relevant information about the species. One such device is the GPS monitoring collar, which informs the points where the jaguar has been, so that we can analyze the size of its territory, the overlapping of territories between individuals, the areas the animals use the most, etc. It was thanks to the collar that we were able to find the Fera's den and confirm that it had had cubs.

Camera traps are equally important, as they allow access to shyer jaguars living in more isolated areas. Based on the footage of the camera traps, we found that Leen, the jaguar, had become a mother.

These tools are combined with monitoring and direct in-field observation, which allow us to learn more about the species, as we are able to witness and record behaviors such as predation, dispute over territory, mating, among others.



Bushnell camera trap on the left, distributed in Brazil by Log Nature, one of our sponsors. On the right, jaguar equipped with a monitoring collar.

In addition, the work of habituating the jaguars is another important pillar in the monitoring process. A mother habituated to the presence of vehicles teaches her offspring that the presence of the team is not a threat and, therefore, extends the reach of habituation, allowing direct monitoring of maternity in the wild.

Keeping track of wild jaguars first started with Onçafari; today, however, it is no longer limited to our team members, as it is part of a great community effort. Our guides and biologists count on this support network, on the engagement of other employees and residents of Caiman Pantanal so that everyone contributes to the monitoring of jaguars.

This combination of tools and different agents to monitor jaguars has allowed us to identify the growth of eight families.



Aracy her cub Jaci (female).



Surya e her cubs Juba (female) and Jerônimo (male).



Fera and her cub Samba (male).



MONITORING MANED WOLVES

UNPRECEDENTED PREDATION

In September, our team in the Cerrado, which operates from the base at Pousada Trijunção, witnessed an unprecedented scene during one of the safaris: maned wolf Buriti was spotted hunting an adult emu (*Rhea americana*).

The emu ran, but Buriti managed to knock it down, attacking with its mouth and paws from behind the bird, which fell and did not get up again. Buriti took the animal to an opening in the vegetation and began to feed. Maned wolves are omnivorous animals, which feed mainly on vegetables, such as the fruits of the cerrado, but also on small vertebrates, such as cavies. The predation of an adult emu had never been described for the species and that provided evidence that maned wolves can feed on larger animals.

After the predation, the team managed to install camera traps on the emu carcass and obtain records of Buriti and Nhorinhá feeding on the bird for a few days. Observing the GPS points sent by the monitoring collars, the team saw that the Buriti went to the burrow and returned to the carcass twice on the night of the predation, possibly to take food for its pups.

NEW MANED WOLF PUPS

Maned wolves Nhorinhá and Buriti continued to care for the pups born in 2021, having remained as a pair and copulated again in 2022.

In June, Nhorinhá had four pups and Buriti continued to father the pups, visiting the den, sleeping nearby and bringing food to the family.

Our team found the burrow by reviewing data from Nhorinhá's monitoring collar, which indicated that the female remained in the same place for more than three days. From then on, the team continued the close monitoring activities, and the exact location was found by crossing data from GPS points and signals obtained in the field, using the radio collar.

In August, our camera traps recorded footage of the pups for the first time, when they were still very young, and our field team spotted them in November. The team suspects that out of the four pups, only two survived. The last record of the three together was in December 2022.



Camera trap record of the maned wolf Buriti preying on rhea.



Record of one of the puppies of the couple Buriti and Nhorinhá.

SCIENTIFIC PAPERS

Wildfires disproportionately affected jaguars in the pantanal - Barros et al. (2022)

Abstract: Pantanal is the home to the second largest population of jaguars in the world. Coupled with changes in climate and land use, the recent mega fires in Pantanal may pose a threat to the long-term survival of jaguars. In order to put such growing threats into perspective, the study addressed the range and intensity of fires that have affected jaguar conservation in the Pantanal region over the past 16 years. The 2020 fires were the most severe in the annual series, burning 31% of Pantanal and affecting 45% of the estimated jaguar population (87% of which are located in Brazil). Displacement, hunger, dehydration, territorial defense and lower fertility rate are among the effects that may harm the abundance of the species. Such issues will likely affect other less mobile species and therefore the ecological stability of the region. The solution to prevent the recurrence of mega fires lies in fighting the anthropic causes behind draught intensification, such as implementing actions to protect springs, increasing the number of protected areas, regulating the use of fire and assigning firefighters before the dry period.

Collaborative behaviour and coalitions in male jaguars (*Panthera onca*) - evidence and comparison with other felids - Jędrzejewski et al. (2022)

Abstract: Most big cats are classified as solitary species, and only lions (*Panthera leo*) and cheetahs (*Acinonyx jubatus*) show social and collaborative behaviors. In this papers, the authors present evidence of coalition formation by male jaguars (*Panthera onca*), based on data from five studies conducted with camera traps, GPS telemetry, and direct observations in the Venezuelan Llanos and Brazilian Pantanal.

Reintroducing the America's apex predator: the jaguar (*Panthera onca*) - Rampim et al. (2022)

Abstract: This paper describes the experiences of Onçafari Association, together with the National Center for Research and Conservation of Carnivorous Mammals (CENAP), in the rehabilitation and reintroduction of jaguars in three different projects: the first of which started in 2014, at Caiman Pantanal, state of Mato Grosso do Sul, and resulted in the release of jaguars Isa and Fera in 2016; the second occurred in 2018, with the rehabilitation and release of sisters Pandora and Vivara, which



took place at Reserva do Cachimbo, a protected area in the state of Pará; and the third, based on the same methodology, began in 2019 with male Jatobazinho, who underwent the rehabilitation process at Caiman Pantanal and was released at Esteros del Iberá, Corrientes, Argentina, where the jaguar had been extinct for over 70 years.

All three projects are based on the Onçafari rehabilitation and reintroduction methodology, which includes seven main steps:

1. Minimal human contact with jaguars;
2. Offering live wild prey;
3. Fasts to stimulate hunting activity;
4. Visual and olfactory contact with free-living jaguars (the enclosures are built at the release sites. In so doing, animals undergoing rehabilitation are visited by external inhabitants, which can help in the acceptance of new individuals in the local populations);
5. Large enclosures (to avoid sedentary animals);
6. Soft release; in other words, enclosure gates remain open for three months, without offering prey, whereby animals can return to the enclosure, if they wish to do so;
7. Animals determine the time and stages of the process.

communications biology

ARTICLE

Wildfires disproportionately affected jaguars in the Pantanal

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Júlio Roberto de Aguiar, Rogério Gonçalves de Moura, Christen Fleming, Renato Peres, Luiz Gustavo R. Oliveira-Santos, Waldir M. Torres, Daniel L. Z. Kante, Fernando R. Tortato, Carlos Eduardo Frazão, Fernando C. Azevedo, J. J. Jeffrey J. Thompson, S. L. & Paulo Sérgio Pinheiro

The Pantanal wetland harbours the second largest population of jaguars in the world. Alongside climate and land-use changes, fire is a major threat to the Pantanal. We assessed the reach and intensity of fires that have affected jaguar conservation in the Pantanal over the last 20 years. We found that the Pantanal was the most severely affected, burned 22% of the Pantanal and affected 42% of the estimated jaguar population (87% of those in Brazil). 70% of the home range areas, and 50% of the protected areas within home ranges, from conserved areas, habitats, and jaguar survival, the Pantanal's open pastures. Displacement, injuries, dehydration, nutritional deficits, and lower fecundity are among the impacts that may affect the abundance of the species. These impacts are likely to affect other less mobile species and, therefore, the ecological stability of the region. A solution to prevent the recurrence of mega-fires lies in combating the anthropogenic causes that intensify drought conditions, such as riparian deforestation to protect crops, increasing the number and area of protected areas, regulating fire use, and allocating fire brigades before dry seasons.

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Behavioral Ecology and Sociobiology (2023) 74:122

<https://doi.org/10.1007/s00265-023-03250-3>

ORIGINAL ARTICLE

Collaborative behaviour and coalitions in male jaguars *Panthera onca*—evidence and comparison with other felids

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Abstract

Most large felids are classified as solitary species, with only lions (*Panthera leo*) and cheetahs (*Acinonyx jubatus*) exhibiting social, collaborative behaviours. Herein, we present evidence of the formation of male coalitions in jaguars (*Panthera onca*), based on data from two studies conducted with camera trapping, GPS telemetry, and direct observations in the Neotropical Llanos and Brazilian Pantanal. Out of 7062 male records obtained with camera traps or visual observations, we detected 105 cases of male–male interactions, of which we classified 18 as aggressive, nine as tolerance, 70 as cooperation/coalition, and eight as unclassified. In two studies, two male jaguars formed stable coalitions lasting over 7 years each. In the Llanos, each coalition male paired and mated with several females. For male jaguar coalitions, we documented similar behaviours as recorded earlier in lions or cheetahs, which included patrolling and marking territory together, invading territories of other males, collaborative chasing and killing other jaguars, and sharing prey. However, different from lions or cheetahs, associated male jaguars spent less time together, did not co-sleep with females, and did not hunt cooperatively together. Our analyses indicate that male jaguar coalitions were more likely to form when females had small home range size, a group of females concentrated within a home range, the male group size was directly correlated with the female group size. Similarly, locally concentrated access to females may drive formation of male coalitions in cheetahs. We conclude that high sociality and aggregation of prey are likely drivers of sociality in felids.

Significance statement

The division into social and solitary species in large felids has so far seemed unambiguous, with only lions and cheetahs classified as social species, in which male coalitions also occurred. Our data show that, under certain conditions, male coalitions may also form in jaguar populations. Factors that drive formation of male coalitions in lions and cheetahs, but not in other species of large cats, have not been clear until now. Our analyses indicate that in jaguars, lions, and cheetahs, the concentration of females in a home range plays the most important role. In jaguars, the probability of male coalition occurrence is highest in populations with the highest mean female home range size and thus likely high local density of females, while in lions, male group size is most strongly correlated with female group size.

Keywords Large felids · Carnivores · Cheetah · Group living · Lion · Reproductive behaviour

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Introduction

Felids comprise a taxonomic group that is considered largely solitary (Simpson and Steward 2013). The term "solitary" is generally understood as a social system in which females occupy exclusive home ranges that are usually overlapped by larger territories of males. Reproductive relations are based on aggression, and there is no collaboration or participation.



THE WILD FELID MONITOR

The Newsletter of the Wild Felid Research and Management Association

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Using the epiphyseal cartilage to index tubercle age classes

Jaguar space use via novel application of spatially explicit capture-recapture

Records of melanistic onyx (Lepus griseus) in Monteverde Cloud Forest Reserve, Costa Rica

Wild cats richness in Monteverde Cloud Forest Reserve, Costa Rica

The jaguar reintroduction center: a tool to bring jaguars back to Argentina

Reintroducing the America's apex predator: the jaguar (*Panthera onca*)

WFA website: www.wildfelid.org

CAPTURE CAMPAIGNS

The campaigns are the time when our team prepares itself to capture the animals in order to check the health of the individuals and, in some cases, equip them with monitoring collars. During the process, the team records data such as size, weight, body measurements, teeth, while collecting blood, urine and hair samples and ticks for future analysis. This entire procedure is essential for the development of scientific research, as it expands knowledge about the target species of our work, and is performed with great care, so that there is the least possible impact on the lives of animals.

There were seven capture campaigns in 2022, focused on jaguars, pumas and maned wolves:

REFÚGIO DA ILHA

The first capture campaign of the year took place at Refúgio da Ilha, between March and April. Pança, one of the monitored males, approached the traps, but was not captured. In the second campaign, which took place at the site in July, the team captured two male pumas, named Boca and Orelha, and a female jaguar, Taba, monitored by the team since October 2020, when she appeared for the first time in the camera traps.

POUSADA TRIJUNÇÃO

In June, the capture campaign took place at the base of Pousada Trijunção, in the cerrado.



The campaign was held for three days, which resulted in the capture of three maned wolves, which were equipped with GPS monitoring collars: the first captured was Nhorinhá, female, already known by the team and monitored since 2018. During measurements and analysis of the wolf, the team noted well-developed lactating breasts, indicating the presence of pups. The second animal captured was a female, Savana, who is Nhorinhá's pup from the 2021 litter and has been monitored by the team since her birth. This was Savana's first capture.

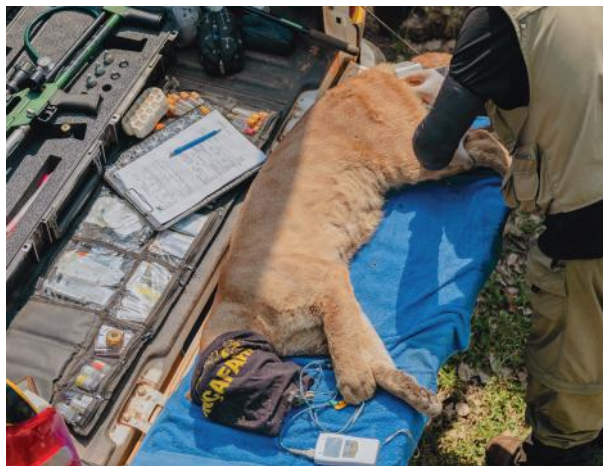
Another female was captured towards the end of the campaign, which was neither known to nor monitored by the Onçafari team. She was later named Caju.



CAIMAN PANTANAL

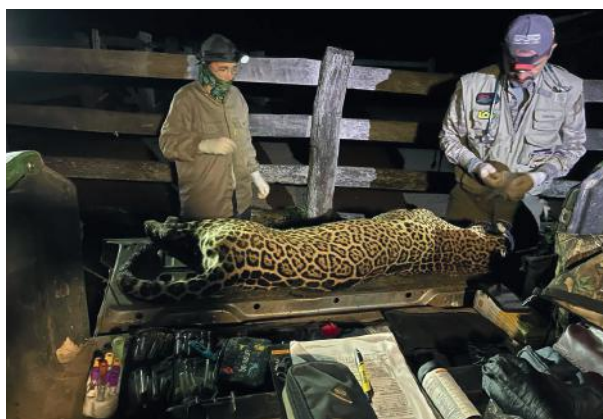
The capture campaign at Caiman Pantanal occurred between the months of August and September. The campaign was held for 16 days, which resulted in the capture of 3 jaguars: female Surya, monitored by our team since 2018; male Mango, monitored since 2020; and the young female Leventina, monitored since her birth in 2021. The first two were equipped with GPS and VHF monitoring collars. Leventina, still very young and in the growth phase, was captured for the collection of biological material

and biometrics. The campaign also included the chemical containment of Oliver, a male puma, who is in the process of rehabilitation. Biological material was collected and he was moved to the larger enclosure.



SANTA SOFIA RESERVE

The capture campaign was held in October and November. Two jaguars were captured: female Estrela, who did not receive a monitoring collar because she was young and growing, and male Guarani, who was equipped with a monitoring collar.



LEGADO DAS ÁGUAS

The capture campaign was held in June and July, but no animals were captured.

POUSADA THAIMAÇU

The capture campaign took place in December, but no animals were captured due to low movement around the traps. Camera trap monitoring during the month of December confirmed that there was little movement of predators in the area.



NAME: Taba
SEX: Female
WEIGHT: 82,7 kg



NAME: Boca
SEX: Male
WEIGHT: 52,1 kg



NAME: Orelha
SEX: Male
WEIGHT: 54,6 kg



NAME: Nhorinhá
SEX: Female
WEIGHT: 27,7 kg



NAME: Savana
SEX: Female
WEIGHT: 28,1 kg



NAME: Caju
SEX: Female
WEIGHT: 25,6 kg



NAME: Surya
SEX: Female
WEIGHT: 83,2 kg



NAME: Leventina
SEX: Female
WEIGHT: 29,4 kg



NAME: Mango
SEX: Male
WEIGHT: 103 kg



NAME: Oliver
SEX: Male
WEIGHT: 25,4 kg



NAME: Estrela
SEX: Female
WEIGHT: 44 kg



NAME: Guarani
SEX: Male
WEIGHT: 110 kg



SOCIAL

The purpose of Onçafari's Social work front is to promote the development of the local communities where our bases are located, by empowering and engaging people in the field of environmental conservation. We offer awareness activities and lectures on the importance of nature, in addition to training to encourage the development of professional activities in green tourism. Our team also donates materials, supplies and equipment to families, schools and local partner institutions.

The biodiversity conservation work does not end at the direct work with the animals; it takes joining efforts with our guides, biologists, employees and locals living at the bases, in addition to the entire neighboring community, to effectively protect the target species and the biomes in which we operate.

In 2022, Onçafari carried out 86 different activities in the Social work front, impacting 1,354 people, focusing on recurring activities, such as the Aprendizes da Mata project, and the approximation and strengthening of links between our team and the indigenous communities located close to the our bases.



INITIATIVES PERFORMED

REFÚGIO DA ILHA

Participation in SEBRAE's Pro Pantanal Project

The project consisted in bringing together owners of small hotels and tourism businesses operating in Pantanal to share knowledge and good practices. The Onçafari team represented Pousada Refúgio da Ilha, and made a presentation about the non-profit, the organization's work fronts and the work performed in the Delta do Salobra area.

Presentation of 2021 Results to All Employees

The Onçafari team presented the 2021 results to the employees and owners of Pousada Refúgio da Ilha, such as the increase in the number of visiting guests who saw at least one jaguar during their stay, the number of guests that attended the Onçafari workshop and the results of the monitoring carried out at the property, using camera traps.



Visit and Presentation to the Salobra Community, with IDS and IPEDI

The Onçafari biologists, together with representatives of the Delta do Salobra Institute (IDS) and the Intercultural Diversity Research Institute (IPEDI), visited the Salobra community, close to the base of Refúgio da Ilha, in order to further engage with local residents and community leaders, to evaluate possible projects with the community, such as community-based tourism, production of local arts and crafts, training of guides, among others. Undergraduate Geography students and professors of the Federal University of Mato Grosso do Sul (UFMS), Dourados campus, also joined the visit and had the chance to meet the community.



Workshop on the Biology Career and Monitoring of Jaguars, for Students of the Carmelita de Miranda State School, MS

Onçafari biologists held a presentation for Elementary School 2 and High School students at Carmelita State School, to which they were invited by biology teacher Érica Peixoto. They addressed the importance of jaguar conservation as a factor in income generation and jobs in various industries in the region. In addition, they explained Onçafari's work and the different fields in which biologists work.

Presentation of the Onçafari Project to Undergraduate Students of the Geography Course at the Federal University of Mato Grosso do Sul (UFMS), Três Lagoas Campus

The Onçafari team presented the work the non-profit does to students of the Geography course of Professor Frederico Gradella (partner of the Delta do Salobra Institute—IDS), who carries out geographic characterization research, such as evaluation of the soil, vegetation and water in the area. The group went on a field trip along the river after the presentation, for the recognition of the area.



FAZENDA VELOCITTA

In June, we organized activities at the Coronel Joaquim Leite de Souza Municipal Elementary and Middle School, with 137 students from the 1st to the 9th grade, and at the Dr. Carolino da Motta e Silva Technical School, with 153 juniors and seniors of technical courses in Agriculture and the Environment.

The educational institutions are close to Fazenda Velocitta, one of Onçafari's operating bases in the Atlantic Forest. The purpose of the activities was to help students become more familiar with Fazenda Velocitta, the work Onçafari does in ecology and the importance of the habitat of both pumas (*Puma concolor*) and maned wolves (*Chrysocyon brachyurus*), two species our team works with at Fazenda Velocitta and, which are also likely spotted by the local community.

In order to do so, the Onçafari team offered presentations on the non-profit, adapting it to each age group and then carried out the "Treasure Hunt" activity, a playful dynamic in the form of a quiz, whose questions addressed

previously presented scientific topics, such as Brazilian biomes, the food chain and threats to large carnivores.





LEGADO DAS ÁGUAS

Aprendizes da Mata

Our Social work front organizes project Aprendizes da Mata (or Forest Learners), which seeks to support the development of local communities in line with environmental conservation. The initiative was set up to teach Vale do Ribeira youth about the relationship between environmental health and human health, promoting sustainable and low-cost practices that can be implemented to improve quality of life in their communities, and to inspire them to pursue careers that promote sustainable development in the region.

This particular group was chosen because the Ribeira Valley has the largest remnant of Atlantic Forest in Brazil, but it also has the lowest HDIs in the state of São Paulo. As a result, youth generally leave the area in the pursuit of better opportunities in large urban centers.

The project results from the relationships established between Onçafari Association and eight other institutions and professionals

working in the environmental area. They came together to share their knowledge with high school students from a public school in the city of Juquiá, São Paulo.

Topics included: the relationship between environmental health and human health, deforestation and the proliferation of diseases, the differences between organic agriculture and conventional agriculture, waste treatment by composting, ecological sanitation using biodigesters, and green tourism as a tool for conservation.

In addition to the lectures, Onçafari held two workshops for students to learn how to make organic vegetable gardens and worm farms, to implement these practices in their homes and teach other people in the community. The vegetable garden was planted in the school area, so that the vegetables produced there will be part of the school lunch.

The initiative also offered four other activities, including:

- A dynamic activity to show the web of ecological interactions existing in nature and how a negative action against the environment can trigger a series of consequences for our survival;
- Two vegetable garden workshops were held at two other schools, and students themselves planted the vegetable gardens. At such occasions, they had the chance to teach younger children the entire process of starting an organic garden;
- A workshop on socio-environmental entrepreneurship for students to learn how to work with sustainable practices;
- A visit to Legado das Águas, a 31,000-hectare (+/- 77k acres) Atlantic forest reserve, when the students had contact with different experts working towards conservation, thanks to research and green tourism.

The project has thus been able to show the importance of nature for the Aprendizes da Mata. The students became multipliers of conservation knowledge, learned how much it is possible to generate development, awareness and income when the forest still stands.



OTHER ACTIVITIES

At Legado das Águas, Onçafari's Social work front also offered a workshop given by our vet to the reserve's employees and a group of students of the Smart Forests program, on "Integrated Health and the Presence of Pets in Natural Areas". In line with the work carried out by the Guardiões da Mata Atlântica (or Guardians of the Atlantic Forest) program, developed by Legado das Águas, our team organized three activities on "Atlantic Forest Cats" at the Municipal Elementary School Juquiá-Guaçu and at the Professor João Hirotaka Kayó Municipal School, located close to the reserve, in the cities of Juquiá and Miracatu, respectively. In turn, in September and October, the team tested the new green tourism activities for the first time, with employees of Legado das Águas and, in November, our team offered the "What jaguar is this?" activity with employees, in celebration of the National Jaguar Day. As the final activity of 2022, our team chose the winners of the fauna observation contest for the second semester – an initiative to encourage the recording and sharing of photos and videos of the fauna, for the reserve's employees.



SÃO FRANCISCO DO PERIGARA RESERVE "Pemega, Perigara?"

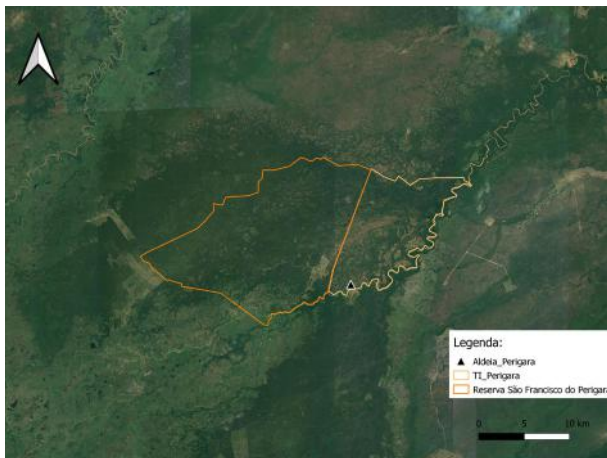
The Perigara indigenous community is located at the Perigara Indigenous Land, on the margin of the São Lourenço river, in the city of Barão de Melgaço, state of Mato Grosso. The Perigara Indigenous Land was ratified, by law, on December 26, 1991, and is property of the Bororo indigenous group. It borders the São Francisco do Perigara Reserve, base of Onçafari's operation in North Pantanal.

Since 2022, Onçafari has worked together with Instituto Centro de Vida (ICV) and the indigenous people of Perigara to understand the needs of the community, in a project intended to support the Bororo people in organizing themselves, as a collective, so that they can participate of bids and other funding opportunities, to increasingly improve the community in itself, as well as environmental and territorial management and quality of life.

The project developed with ICV is called Pemega, Perigara?, an expression of the Bororo people that means "Is everything ok, Perigara?". The project is structured around four pillars:

1. Fostering medicinal, traditional and health knowledge;
2. Production for food safety and sovereignty and income generation;
3. Institutional, infrastructure, sustainability and environmental strengthening;
4. Surveillance, monitoring, territorial and environmental management and fire prevention.

Onçafari and Instituto Centro de Vida have joined efforts to support and foster the Bororo indigenous people, so that they can continue cultivating their values and culture, thereby remaining as one of the strong conservation centers in Pantanal.



CAIMAN PANTANAL

The region of Miranda and Aquidauana, in the state of Mato Grosso do Sul, is home to several indigenous peoples of different ethnic groups, and is one of the last remnants of the Terena culture in Brazil. The Onçafari team developed several activities throughout the year at the Limão Verde Indigenous Land, together with the Pascoal Leite Dias Indigenous State School, at the Limão Verde community. The activities were developed at the community, but concentrated in this village, but also included children and youth of other communities, living on the same Indigenous Land. Our team presented the work performed to youth and adults of the community at visits to the Limão Verde community and at the school, which is located near the Caiman Pantanal base. In April, the team was invited to participate in the celebration of the Indigenous Peoples Day, in order to honor and value the Terena culture. After the many activities throughout the year, in December, students from the Limão Verde community school visited the Caiman Pantanal base and took a safari tour with our team, when they were able to become acquainted with our work in practice and see a jaguar face to face.

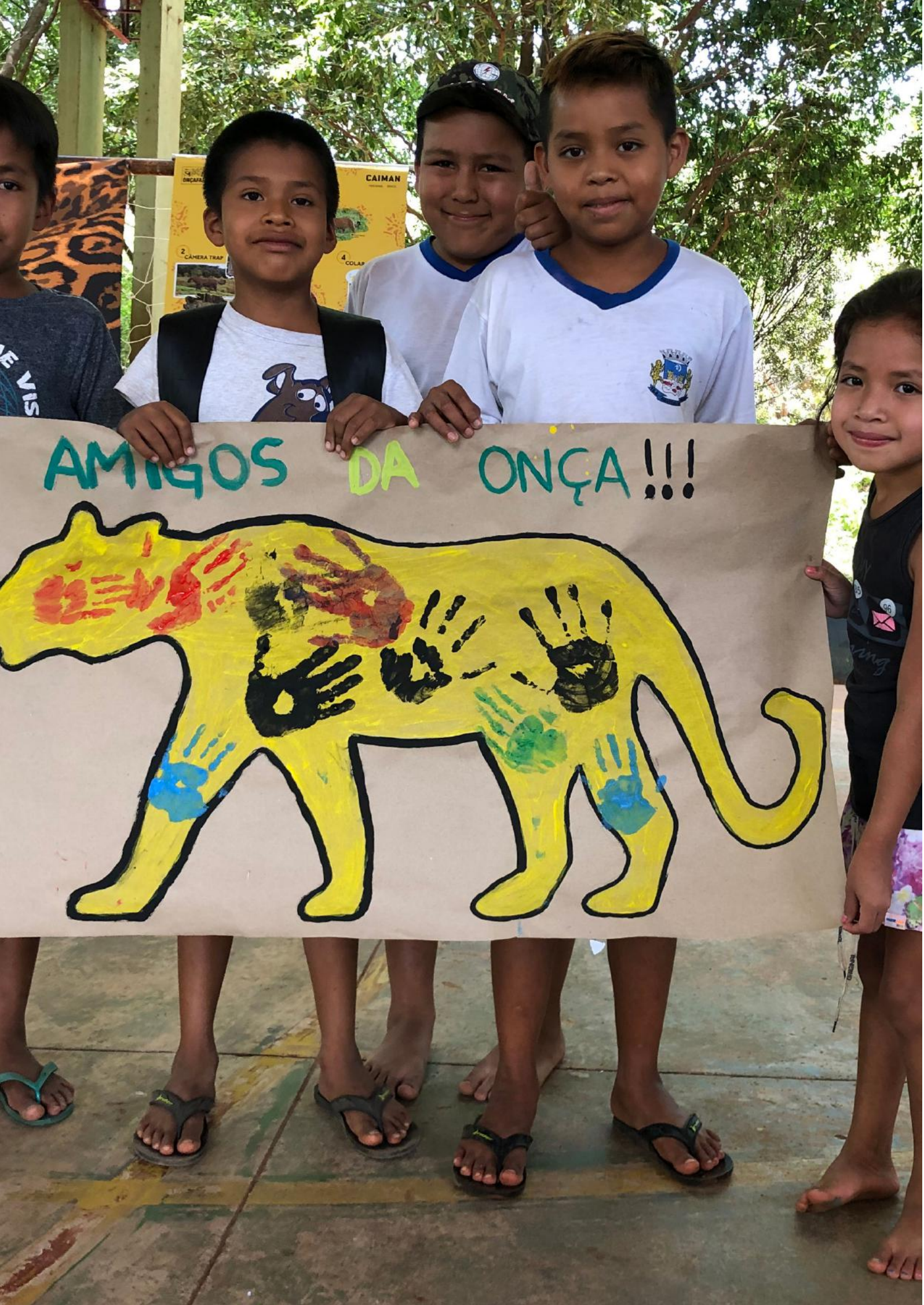


The team also participated of school activities and celebrations in the city of Miranda during the year, building a closer relationship with the community and engaging in the education of the local youth. Our team held a institutional lecture for the youth of Dona Rosa Pedrossian State School, in Miranda, as well as for the elementary and high school students of Nossa Senhora do Carmo School. Our team also set up a stand with Onçafari material during the Environment Week, to promote our work in the community and environment, at the main square in Miranda, MS.

POUSADA TRIJUNÇÃO

In order to promote and further exchanges, the Onçafari team carried out different activities with the Pousada Trijunção employees in 2022. Such activities included a workshop on the non-profit's work to the 64 employees of the hotel and the breeding center at Pousada Trijunção, as well as a workshop on the "Review of Habituation and Sighting Methods of Large Carnivores in the Cerrado" to the local guides. In addition, the Onçafari team carried out trips and field trips with certain employees of the breeding site, the hotel and the city of Santa Luzia. These actions with the local community of Pousada Trijunção are key for the community to effectively become familiar with and understand the work of the Onçafari biologists, and to bring together the teams working towards the conservation. The team expanded its activities to the neighboring area of Pousada Trijunção in November, in celebration of the National Jaguar Day in the city of Mambai with 8th grade students of Sebastião Moreira da Silveira Elementary School and Valter Moreira dos Santos Elementary School, raising awareness among 70 teens.





AMIGOS DA ONÇA!!!



EDUCATION

The purpose of the Onçafari Education work front is to raise awareness on the importance of biodiversity conservation, by means of lectures, field activities, participation in events, TV shows, pieces, production of documentaries, publication of books and constant social media presence.

Offering diverse activities helps attract people to join efforts to protect jaguars, wolves and the environment in general. Our workshops are offered either in person or remotely, in different places in Brazil as well as in other countries, taking Brazilian biodiversity and Onçafari's work to different sectors of society.

In 2022, we filmed documentaries at different bases, promoting our work to nature lovers from different countries. In addition, we developed 28 actions on the Education work front, which reached a wide audience of schools, universities, companies, congresses, among others. The activities reached a total of 4,226 people.



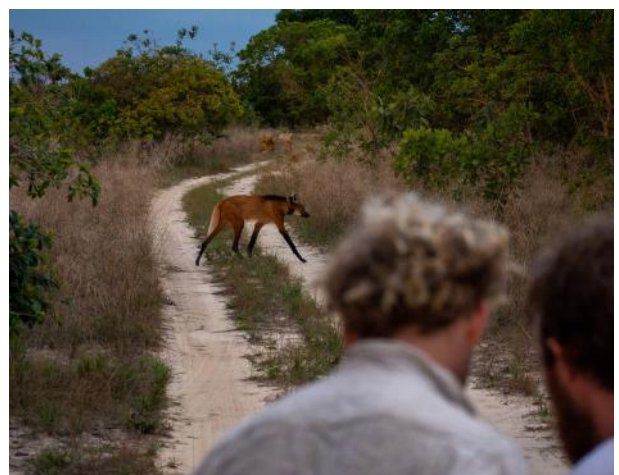
HIGHLIGHTS



- Participation in the Environment Week of Pantanal Biopark, in Campo Grande, state of Mato Grosso do Sul. A total of 2,151 state school students came by our booth over the two days of the event, where we promoted Onçafari's jaguar conservation efforts.
- Participation at the Biologists Day at Mackenzie Presbyterian University, with a workshop by Giulia Nigro, who is a former student and currently a biologist at Onçafari.
- Institutional workshop for Land Rover employees, as part of the company's sustainability week.
- Participation at the Pantanal Complex Symposium, where we discussed the different activities carried out by field vets working with jaguars.
- Participation at the São Paulo Biology Congress, with a workshop on the

Conservation of Large Brazilian Carnivores and their Habitats.

- Workshop on Onçafari's work for undergraduate Biology students at UNESP Rio Claro, in a field course at Passo do Lontra.
- Participation in the IX GEAS Brasil Academic Journey, at the São Paulo Zoo, with a presentation by the institution.
- Institutional lecture for the Google Cloud team.
- Participation in the XI Brazilian Congress of Mastozoology, in Fortaleza.
- Participation in the Workshop held by WWF, which brought together Pantanal researchers to discuss the coexistence between jaguars and humans in Pantanal.
- Joining a film crew to record documentaries.





FORESTS

The purpose of this work front is to protect strategic natural areas, always aimed at environmental conservation. Strategic means that, in general, they have high biodiversity, and a vocation to form extensive ecological corridors, thus sustaining the different ecological processes and ensuring the feasibility of natural populations, and areas that are under some threat of destruction, such as deforestation, forest fires, hunting, among others.

Nowadays, the Onçafari Forest work front preserves 60,000 hectares (+/- 14.8k acres) of natural areas, in the Amazon and Pantanal biomes. We manage the Onçafari 1 Reserve in the Amazon, totaling 250 hectares (+/- 618 acres). In turn, in Pantanal, we manage the Santa Sofia Reserve, totaling 35k hectares (+/- 86k acres), and the São Francisco do Perigara Reserve, totaling 25k hectares (+/- 61.8 acres).

We are always on the lookout, so as to expand the number of natural areas protected by Onçafari and our organizational partners. After all, based on our practical experience, we can safely say that our approach in the Forests work front – acquisition and management of Reserves to protect nature – proves to be extremely effective.



25% of all animal and plant species in the world are threatened with extinction, most due to human action

Source: Arpa/WWF

15% of the World's Biodiversity is in the Amazon

Source: UN

In general, the Onçafari Reserves are well-preserved properties, covered with native vegetation - forest or otherwise -, donated by philanthropists to the Association. We started to protect them, ensuring shelter and a green corridor for wild fauna.

Onçafari also acts in the creation of new Conservation Units, both private (Private Natural Heritage Reserves – RPPNs) and public (federal, state or municipal), providing technical studies that make them feasible and engaging key actors in the process.

However, acting in the conservation segment is also quite challenging (there are countless reasons that determine this situation). Because of this difficulty, unfortunately, in 2022 the Onçafari Reserve 1 (located in the Amazon, state of Pará) seriously suffered from the issue of forest fires. This Reserve was profoundly hit by the arson that affected the region. The fire started on a neighboring farm, by an owner linked to the soy industry, who irresponsibly set fire to carry out soil management on his own property, and the fire spread. Certain of our role in conservation and outraged by what happened, Onçafari Association sought lawyers to deal with the matter in the best possible fashion. The appropriate measures were taken and we are waiting for the assessment of the case.

Forest fires, especially illegal ones, as well as deforestation, are among the main causes of nature destruction. Between January and December 2022, a total area of 10,267 km² (+/- 25k acres) was destroyed in the Amazon (PRODES-INPE). With the increase in deforestation and large fires in recent years, the Forests work front has become increasingly known both within and outside of Onçafari.

Repeating patterns observed for years in the different Brazilian biomes, especially since 2019, when they became more severe, in 2022 forest fires continued to be one of the greatest challenges for conservation. Onçafari made several investments towards these efforts, including substantial financial and human resources. Nonetheless, considering the seriousness of the crime that occurred at Onçafari 1 Reserve, our team decided to hire a specialized consultancy.

In order to avoid new events at our Reserves, we have increased the priority of dealing with large fires. Our team decided to engage the consultancy, in order to strategically structure Onçafari for the control, mitigation and firefighting challenge.

The work of consultancy is extremely important and encompasses strategic planning, including different projects and actions to prepare against fire, such as the environmental licensing of the Reserves to allow for the mitigation activities to be carried out, such as prescribed burning; inventory and acquisition of personal protective equipment (PPE) and firefighting equipment; the selection, qualification and training of fire brigades; remote and real-time monitoring of the Reserves, via satellite; preparation of the emergency plan, for when the fire has already started; territorial articulation, in order to engage the main actors of the territory in the fire agenda.

Highlights are positive in Pantanal. We made investments in infrastructure at the Santa Sofia Reserve. The IMASUL inspectors also visited the Santa Sofia Reserve, exclusively to review and reactivate the Pata da Onça Private Natural Heritage Reserve (RPPN), totaling almost 8k hectares (+/- 19.8k acres). The RPPN's registration was revoked following reports of

jaguar hunting (before Onçafari purchased the property).

RPPN: Private Natural Heritage Reserve, a type of Nature Conservation Unit, for Sustainable Use, provided for in the National System of Nature Conservation Units (SNUC).

"The National System of Nature Conservation Units (SNUC) provides for the possibility of setting up a protected area, among the categories of Conservation Units, to be managed not by the government, but by private persons interested in environmental conservation. Such category is the Private Natural Heritage Reserve (RPPN)."

Source: Federal Law No. 9,985/2000.

Onçafari has also structured projects to generate carbon credits. We have kicked off the 5P Alliance carbon credit project, which covers two of Onçafari's operational bases: the Santa Sofia Reserve and Caiman Pantanal. The urgency of containing global warming has driven carbon credit transactions. It will be a long-term project, both due to the complexity and the number of actors involved, mediated by consultancy.

The 5P Alliance carbon project, which includes the Santa Sofia Reserve, aims to generate funds to promote the conservation of native vegetation that resisted and remains "standing". Carbon credits generate financial resources for landowners and organizations that manage reserves for conservation purposes, such as Onçafari, which effectively protects natural areas. This process is called Payment for Environmental Services (PSA). In doing so, we not only win by avoiding greenhouse gas emissions, but also by contributing to the preservation of important species of flora and fauna. In particular, our jaguar.

The consulting company engaged to structure this project develops carbon credit certification processes, and therefore is a strategic partner

for such complex projects.

We are starting negotiations at the São Francisco do Perigara Reserve, in Pantanal, to generate carbon credits, to protect the thousands of hectares of native vegetation on the property.

Investments in the São Francisco do Perigara Reserve do not stop there. We have invested in the Reserve's facilities, including the purchase of a truck to transport key inputs, which generally need to come from Cuiabá; we moved forward with the works, having completed the sawmill; and we defined the supplier that will rebuild the landing strip.

As for the environmental projects, we have moved forward with the preparation of the Management Plan for the Perigara Reserve, including the definition of the attendees for the Participatory Workshop, to take place in January 2023. In addition, we have maintained the partnership with the Arara Azul Institute, to continue monitoring the macaws, which we have done since the purchase of the property.

The impacts caused by the 2020 fires resulted in the dispersal of part of the hyacinth macaw population in the area. The number of eggs and hatchlings increased in 2022, when compared to previous years. This result reflects the team's efforts in monitoring, handling and installing nests in the region.

Our team installs artificial nests as a way to mitigate the effects of fires and has proved to be very important for the fauna. Activities of macaws and other animals were recorded in 100% of the installed nests, which were used both for reproduction and for other purposes (shelter, foraging, etc.).

In December 2022, we started planting manduvis (*Sterculia apetala*) and bocaiúvas (*Acrocomia aculeata*) on the property. This action was funded by partners supporting the Onçafari 10+1 event, held in celebration of Onçafari's 10th anniversary.

PROJECTS

JERSEY OF THE BRAZILIAN NATIONAL SQUAD

Nike, by means of Fisia, the official distributor of the brand in Brazil, part of the SBF Group, has entered into partnerships with three national organizations to fight the negative effects of climate change, helping to preserve the environment and contributing to development of the community through sport, especially in the Amazon.

The brand committed to support SOS Amazônia, Onçafari Association and Instituto Esporte e Educação (IEE). The goal is to further advance efforts to protect the future of the planet and, consequently, the future of sport.

Soccer is a national passion and the World Cup year is always special for Brazilians. During the 2022 World Cup, the Brazilian team entered the field wearing the famous and much-loved Canarinho shirt bearing jaguar "rosettes".

Nike dedicated efforts to design the Brazilian jersey, represented the tireless drive that moves every Brazilian. The jaguar is the largest feline in the Americas, is a symbol of Brazilian biodiversity and was the animal chosen as a source of inspiration for the uniform.

"From extreme weather to poor air quality, athletes around the world face climate-related barriers to exercising and playing sport every day. With the impacts of climate change on athletes and the planet, sustainability is a top priority for Nike, which is why we have set bold, science-based goals to help reduce our environmental impact and also make kids more active," explained Bruno Teixeira, Senior Purpose Manager at Fisia.

Onçafari Association, in turn, was founded 10 years ago to develop green tourism and preserve Brazilian biodiversity. The partnership with Nike will enable initiatives to help protect jaguars, by increasing research and monitoring the species in four different biomes, especially in the

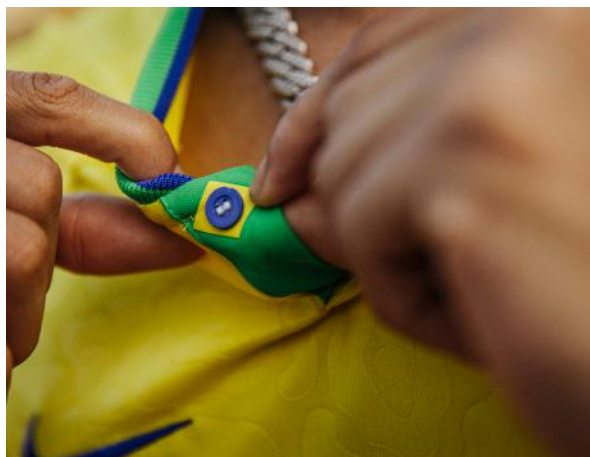


Amazon, over the next three years. The jaguar is considered a kind of “umbrella” for the Brazilian fauna, and its monitoring is an important marker of environmental preservation.

“Brazil is deemed the leading country for the conservation of the species, as it has the largest population of jaguars on the planet. However, it is estimated that, in the past 27 years, there has been a 30% reduction in the jaguar population in the country and a decline of more than 30% is projected in less than three decades*. Having the conditions to strengthen our operations in the Amazon, thanks to the partnership with Nike, is key to reverse this projection, since it is the region with the highest concentration of the species in the world. Therefore, it is crucial to promote good preservation practices, reduce conflicts and spread information about the species, which is the symbol of our biodiversity”, says Mario Habermeld, founder of Onçafari Association.

Soccer star Richarlison came to Caiman Pantanal to launch the new jersey of the Brazilian team. The forward has committed to social and environmental causes for a while.

*Fonte: Zimmermann, et al. 2005.



Richarlison fell in love with Pantanal, the jaguars and everything else he saw on the safari tour with our team. This trip resulted in the initiative to symbolically adopt a jaguar, which is one of the ways to contribute towards conservation.

Richarlison named and adopted **Acerola**, a male jaguar that Onçafari has monitored since 2020.

Though Brazil did not win the World Cup, the love for the green and yellow jersey and the Brazilian determination were there. The jerseys had record sales and showed the world one of the greatest treasures of Brazilian fauna: the jaguar.

In general, jaguar males disperse and move to new territory when they stray from their mothers, but Acerola remains in the Caiman Pantanal and has been sighted frequently, free and wild, in his natural habitat. He is a young male, just over 2 years old, who is part of a very special lineage for Onçafari. He is the grandson of Esperança, one of the first jaguars to be habituated and monitored by our team when the project first started in 2011. Like his grandmother, he is well used to the presence of safari vehicles and rests or walks quietly during sightings. He is free, wild and a great explorer of the area!



GRANDE SERTÃO VEREDAS NATIONAL PARK

In January 2022, Onçafari started the Black Jaguar project at the Grande Sertão Veredas National Park (PNGSV), a conservation unit with area of 230k hectares (+/- 56.8k acres), located in the cerrado biome, between the states of Minas Gerais and Bahia. A total of 34 camera traps were installed in two grids, according to a sampling design to estimate populations of large carnivores and their wild prey, population dynamics and activity patterns. Onçafari initially partnered with researchers from the University of Brasília (UnB), but Onçafari has taken over full management of the project. The Park team helps with logistics and field support, essential during expeditions. The data obtained by the project is being compared with the data collected by Onçafari at Pousada Trijunção since 2018, where there is already a well-established tourism, evaluating similarities and differences between areas, in order to plan a tourism model that is appropriate for the needs of the Grande Sertão Veredas National Park.

Since the beginning of the Black Jaguar project, we have recorded at least 38 species of mammals and 52 species of birds in the camera traps, including rare and endangered species such as the pampas cat, the small wild cat, the three-banded armadillo, the giant armadillo and the jaguar. As for the jaguars, we have footage of at least 16 different individuals, 10 of them with the yellow color pattern and black rosettes and at least 6 with melanic coloration, also called black jaguars. This number could be even higher, since it is very difficult to identify jaguars of the melanic variety, especially when images are recorded during the day, when the animals' coat is uniformly black, making it impossible to see the rosettes to individualize the jaguars.



Melanic jaguars are jaguars (*Panthera onca*) with black coloring, a strong characteristic caused by melanism, a genetic mutation that increases the production of melanin, one of the proteins responsible for the dark pigmentation of skin and hair. Like the yellow jaguars, the melanic jaguars have a unique pattern of rosettes, which allows the identification of each individual.

COEXISTENCE BETWEEN JAGUARS AND HUMANS IN PANTANAL

The jaguar is vulnerable to extinction in Brazil and, even today, the conflict with livestock is a reality. One of the main threats to this feline is retaliatory hunting caused by predation on farmed animals such as cattle.

With this reality as a backdrop, in 2022 we started the project Transforming Conflict into Coexistence: Strategies to Reconcile Jaguar Conservation and Livestock in Pantanal, together with BrazilFoundation and funded by Fundo Luz Alliance.

The project is being developed at our Caiman Pantanal base, in Miranda, state of Mato Grosso do Sul. Together with the farm's livestock team, we defined the locations to develop the study and selected wintering areas (fenced pasture areas), next to each other, with similar-sized herds and management conditions.

Our team tested two anti-predation methods after choosing the wintering areas: a 1-hectare (+/- 2.47 acres) wintering area, with a nocturnal closing corral, in which the cattle will be closed daily at night in a reduced area and released the following morning to pasture, and a 137-hectare (+/- 338 acre) area with an electrified fence, which keeps the cattle in a larger area for long periods, without the need to handle the herd on a daily basis.

In addition, we tested different materials to implement "artificial eyes" (eyespot) on the cattle, a method based on an evolutionary strategy that occurs in different prey species that have spots or structures on the body similar to large eyes, capable of intimidating and scaring off predators.



Artificial eyes (eyespot) on the cattle.

At the end of the project, we hope to have a more efficient and cost-effective strategy that can be replicated in order to promote greater coexistence between cattle ranchers and jaguars in the Pantanal, reducing the number of farmed animals slaughtered by the species.



Jaguar footprints near the fence.



Electric fence to close the cattle



©Edu Fragoso





JAGUAR PARADE

"The Jaguar Parade is an artistic movement with a great purpose: to raise funds and make people aware of the urgent need to conserve the jaguar and its habitat. All this through an exhibition with dozens of sculptures of jaguars, customized by talented artists and displayed at places with a lot of traffic.

The works awaken curiosity and reflection of the public wherever they come by, reaching millions of people. The first edition took place in São Paulo, between October and November 2019, and was considered the largest outdoor art exhibition in the history of the city. Approximately 10 million people have seen jaguars in the streets and parks of the capital."

Source: Jaguar Parade

Since then, the initiative has gained more and more space and expanded its work in Brazil. In 2022, art and socio-environmental awareness came together in full force in the first international edition of the Jaguar Parade in New York. Around 40 jaguar sculptures were displayed in iconic locations around the city, such as Central Park Zoo, UN Plaza, Tavern on the Green, Times Square, World Trade Center Station, among others. ISA CTEEP, FairFax and Nike were the companies supporting Onçafari's presence at the 2022 Jaguar Parade.

The sculptures were auctioned and 100% of the net income was donated to jaguar conservation projects, including Onçafari Association at the end of the exhibition period.

The 4th edition of the Jaguar Parade will be held in 2023, in the city of Florianópolis, while preparing to take international flights again in 2024 and continue expanding the conservation message of these big cats.



Photos: Jaguar Parade Archive.

I'M A FRIEND OF THE FAUNA

Brazil, as one of the countries with the greatest biodiversity in the world, is one of the main targets of animal trafficking. Our forests, our savannas, our rivers and our seas are home to approximately 13% of the life on the planet. Trafficking is a lucrative illegal trade and is the third most revenue-generating clandestine activity, second only to drug and arms trafficking. The lack of supervision and punishment further facilitates the action of trafficking.

Animal trafficking occurs with the removal of animals from their natural habitats and their commercialization. The destinations of these animals are zoos, collectors, laboratories for the manufacture of medicines, or death, as occurs with jaguars and alligators, whose skin or other body parts are removed and sold.

According to the Brazilian Environment Agency (IBAMA), approximately 90% of wild animals die shortly after being removed from their natural habitat. Tamarins, parrots, macaws and ornamental fish are the most sought after and sold. There is variation in value, the rarer the more expensive it will be.

"According to inspection agents, animals in Brazil are taken mainly from the states of Bahia, Piauí, Pernambuco, Maranhão, Paraíba and Ceará. The main consumer centers are the states of São Paulo and Rio de Janeiro. Approximately 90% of the animals captured in Brazil are sold within the national territory."

In view of the foregoing scenario, non-profits Onçafari, AMPARA, SOS Pantanal and Instituto Libio joined efforts and set up the Sou Amigo da Fauna initiative. The purpose of the initiative is to contribute to the fight against the trafficking of wild animals, illegal hunting and fishing on two fronts: environmental education and training to expand the scope of inspection and prevention actions.

The initiative is intended to increase visibility to the issue and reduce the alarming numbers that we have in the current scenario. In 2022, we set up website souamigodafauna.com.br and offered training to the Socicam team, which owns 26 airport terminals.

The movement started with airports and intends, in 2023, to expand its operations to bus stations, urban terminals, ports, car rental companies, car app companies, private planes, roads, etc. Wild animal are not pets!



TRAFFIC NUMBERS:

23 billion dollars a year

400 species of native birds are targets for traffickers

80% a 90% of seizures are of birds

Source: souamigodafauna.com.br



Photo: nstituto Libio Archive.



ONÇAFARI 10+1 ANOS



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ONÇAFARI 10+1

Onçafari celebrated its tenth anniversary in 2021, in the middle of the pandemic. Such a milestone, after so many achievements, had to be celebrated. Our team organized Onçafari 10+1, a celebratory and charity event held on November 17, 2022 at the Rosewood Hotel in São Paulo. Sponsors included companies such as Itaú Private Banking, Nike, Premierpet®, BTG Pactual, Fairfax, Grand Cru, ONE CTEEP, C6 Bank, United Airlines and Mula Preta.

We were also supported by brands such as Rosewood, Chivas 18 – Pernod Ricard, Cachaçaria Sítio São José, APTK Spirits, Callie Chocolats, Ara Vartanian, Ellus, Caiman Pantanal, Pousada Trijunção, Anavilhanas Jungle Lodge, Trousseau, Aigai Spa and NB Steak.

Curator Denise Mattar, who has already received several awards and is one of the most important names in visual arts curatorship in Brazil, having worked in institutions such as the Museu da Casa Brasileira (SP), the São Paulo Modern Art Museum (MASP) and the Rio de Janeiro Modern Art Museum, was responsible for the exhibition on Onçafari at the entrance to the event, which was divided into three sections:

1. Onçafari: including our published books, telemetry and monitoring equipment, photos of our team, animal skulls and footprints, etc.;
2. The fire in the Pantanal: camera traps damaged by the fires and the pictures of the fires, provided by renowned photographers Araquém Alcântara, José Medeiros and Lalo de Almeida;
3. The achievements: showcase of our day-to-day partners and the Brazilian men's soccer team jersey Nike designed for the 2022 World Cup, our The North Face field uniforms, the Bushnell binoculars, used for sighting jaguars on safaris, among other items.

Life-size images of jaguars, puma, maned wolves and tapirs were also displayed at the

entrance, and we set up a small shop with Onçafari items and souvenirs for sale.

The main hall was in a festive mood, beautifully decorated by Titina Leão (one of the leading Brazilian party planners), with a bar serving drinks made by our sponsors, including a large jaguar of the Jaguar Parade, and six huge screens with images of the biomes in which we operate, and the camera traps.



While walking around the hall, guests had the chance to hop on our Land Rover passenger car, take a photo on the Royal Enfield motorcycle, shoot a video on the Spinner 360° and take pictures in front of our sponsors' backdrop.

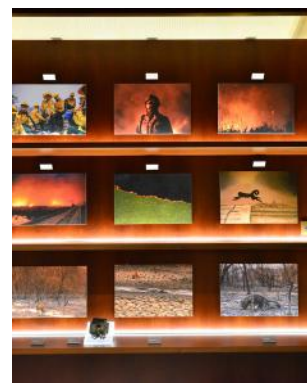




The opening of the event took place with Mario Haberfeld, founder of Onçafari, who presented the organization and honored biologists Leonardo Sartorello and Lilian Rampim who have been with us since the beginning. Roberto Klabin and Teresa Bracher, advisers and great supporters of Onçafari, were also honored.

An emotional moment was when a group of teenagers and children volunteers told the audience about how Onçafari Influenced and brought more purpose to their lives.

We hope that more moments of celebration and many collections will come. We thank all supporters and volunteers, such as the DJ, photographers, film crew, in addition to our production team at Coordinare, which ensured a successful event.





FINANCIAL

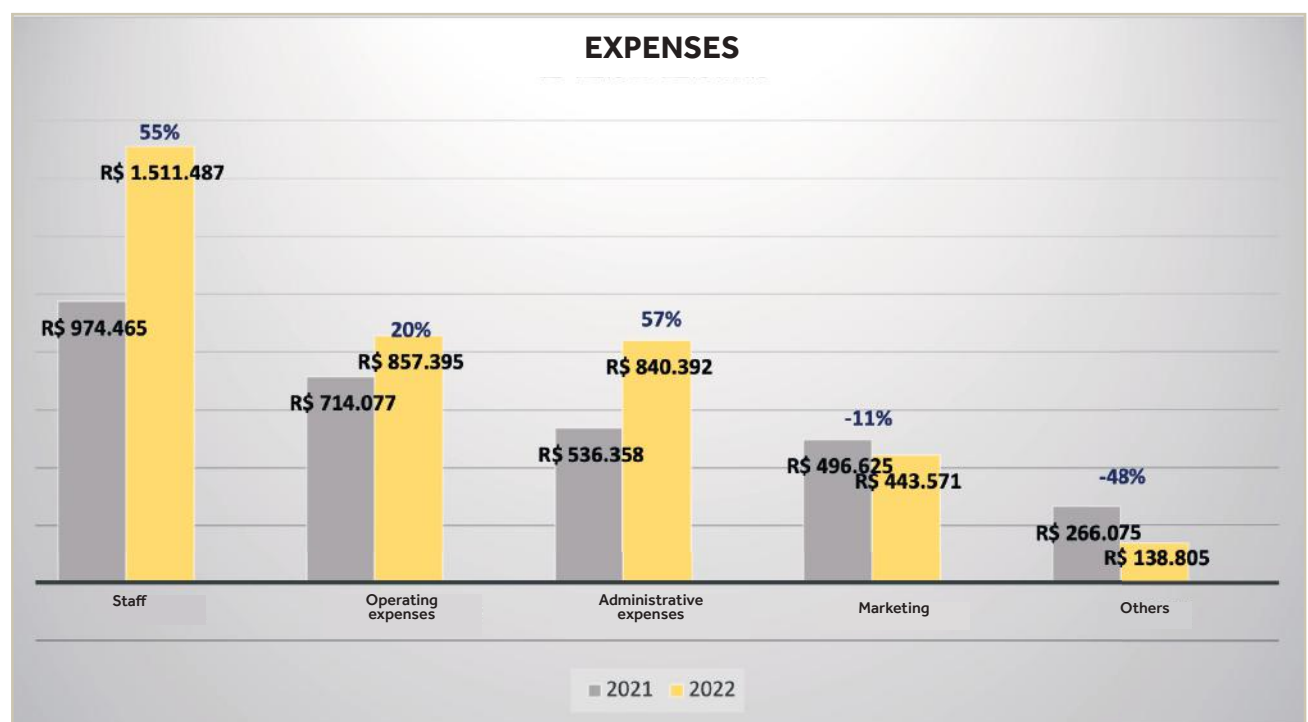
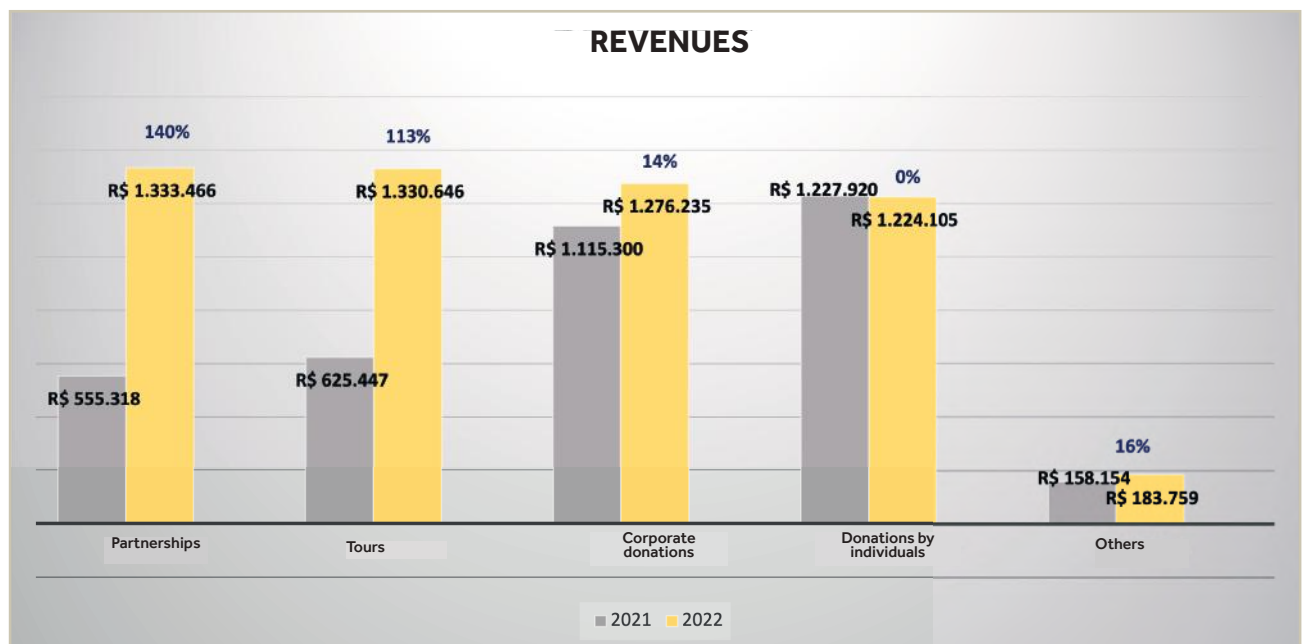
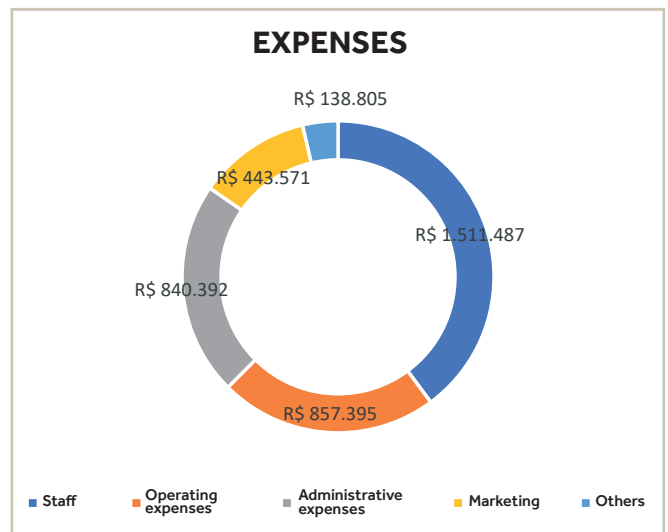
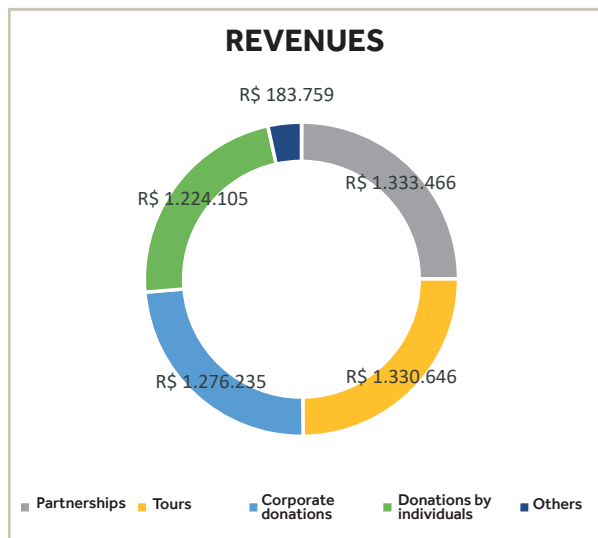
In 2022, our financial results were positively impacted mainly by new partners and green tourism tours. As a result, Onçafari's total revenue grew 45% compared to the previous year.

Revenue from tours increased 113% in comparison to 2021. Partnerships grew 140% compared to the previous year, which explains the significant increase in total revenue from 2021 to 2022.

Although our costs increased, especially with the 50% increase in our HR team, compared to the previous year, and with the rise in operating bases, we were able to maintain our efficiency in expenses, which grew only 26% compared to 2021.

In 2022 we had a surplus of R\$1.556 million, accounting for a 124% growth when compared to 2021.





ORGANIZATIONAL PARTNERS

Environmental, social and governance (ESG) issues have constantly appeared on the agendas of large companies. ESG is the acronym for Environmental, Social and Governance, a set of good environmental, social and corporate governance practices related to the management of companies and the way they position themselves in the market, which is used as a sustainability parameter.

"In a world marked by conflict, power outages, high inflation and the threat of recession, this year's study showed that CEOs no longer believe the world is as resilient to crises as we had hoped. Business continues to be heavily impacted," says Sanda Ojiambo, Assistant to the UN Secretary-General and CEO of the Global Compact.

According to the 12th CEO Study of the UN Global Compact with Accenture, 98% of leaders agree that sustainability is the main issue in their positions. 2,600 CEOs from 128 countries, working in 18 different sectors, were interviewed. With this finding, the opportunities

of the environmental agenda are increasingly present at companies.

An important tool to maintain Onçafari's work are the partner companies. With them, we raise financial resources and/or contributions of products and services used in our operations. With our conservation projects, we create value for society, for consumers of these brands and for the audience that follows Onçafari, thus reinforcing our position and that of the supporting company.

The main purpose of our organizational partnerships division is to build long-term relationships with companies that are aligned with the organization's purpose and that seek to work towards the conservation of biodiversity.

In 2022, ten new companies started to support Onçafari, to wit: Gol, United Airlines, Nike, Royal Enfield, Pinheiro Neto Advogados, Manacá Partners, EXEC, BrazilFoundation through the Luz Alliance fund, Holtzman Wildlife Foundation and Foundation Segré.



PARTNERS OF THE ECOTOURISM INITIATIVE

- Vehicles
- Uniforms
- Tires
- Binoculars
- Salary
- Vehicle maintenance



PARTNERS OF THE SCIENCE INITIATIVE

- Animal monitoring
- Biologists
- Trips
- Collars
- Antennas
- Camera traps
- Transportation
- Performance of scientific studies



PARTNERS OF THE WILDLIFE REINTRODUCTION INITIATIVE

- Building and maintenance of enclosures
- Animal monitoring, feeding and care
- Transport within farms





PARTNER OF THE FOREST INITIATIVE

- Management plans
- Team
- Access road maintenance and improvements
- Equipment



PARTNER OF THE SOCIAL INITIATIVE

Social development in the communities surrounding our bases



INSTITUTIONAL SUPPORT PARTNERS

- Insurance
- Legal services
- Airline tickets
- Salary
- Consulting



COLLABS

Collabs are one-off product sales actions in which a percentage of the sales value is reverted to Onçafari. We collaborated with The North Face, Ellus, Pacco, Mais Pura, Tuc Glasses and Sy&Vie brands. All the money collected was applied directly to Onçafari's conservation projects.



The North Face: sale of a model of women's T-shirt and a model of men's T-shirt on International Earth Day;



Ellus: Onçafari clothing line launched in August with t-shirts and caps;



Sy&Vie: clutch Onçafari.



Tuc Glasses: line of sunglasses with three models representing three jaguars monitored by Onçafari: Fera, Turi and Oriba;



Pacco: line of aluminum water bottles for the National Cerrado Day;



Mais Pura: popcorn offered to safari guests;

ONÇAFARI TEAM MEET



In order to start planning for the future, we held the first Onçafari Team Meet. In December, all Onçafari members met up in Pantanal to celebrate the achievements, advances and learnings of 2022 and to design the next steps on the 6 fronts of action.

When we look at Onçafari's governance, we are evolving every day, every year. We introduced our board, our financial, operational, administrative structure and the results. We closed 2022 with a team of 45 people.

There were 4 days with important team building work, increasing the sense of belonging. The meeting had moments of integration, sharing routines with discussions and the design of strategies and future plans for Onçafari.

The team left feeling successful at the end of the year, united and excited to continue working towards the conservation of biomes in 2023.





Support our cause:



@oncafari
www.oncafari.org



Become a Friend of the Jaguar
www.amigodaonca.org

