

Barba Azul Nature Reserve 2023 Annual Report



Giant Anteater mom and pup moving through the grasslands of Barba Azul. Teodoro Camacho

This year, Barba Azul Nature Reserve faced formidable challenges in protecting the Blue-throated Macaw habitat from intensified wildfires due to an unusually strong and prolonged dry season influenced by El Niño. Notably, no fires spread within the reserve, showcasing the effectiveness of our strategic firebreak maintenance and rapid response efforts, stopping two natural lightning fires. A peak of 139 Blue-throated Macaws was observed during September night roost. Additionally, our ongoing infrastructure development efforts, including the construction of a boardwalk and pontoon, which will allow independent access across the river Omi, signify our commitment to enhancing facilities for management and tourism. This has been the year with the most visitors so far, a total of 54 people came to enjoy Barba Azul and left with observations of Jaguarundi, Maned Wolf and many other species that now are more common to find. This is our second year capturing footage of a Jaguar at different spots in Barba Azul, confirming the ongoing presence of this predator. The acquisition of 147 Brahman cattle, coupled with the birth of 151 calves at Barba Azul East, signifies a remarkable 33% increase, bringing our cattle herd to a total of 900. The substantial infrastructure improvements in 2023, contributed to the success of the low-impact ranching model at Barba Azul East, evident in reduced mortality rates compared to neighbouring ranches affected by El Niño-induced drought. While this year's shorebird survey team documented 11 migratory shorebirds, they observed a decline in migrating Buff-breasted Sandpipers, attributed to the impact of this El Niño-induced drought.

Conservation and development of the Barba Azul Nature Reserve in 2023 is supported by:



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Barba Azul Nature Reserve

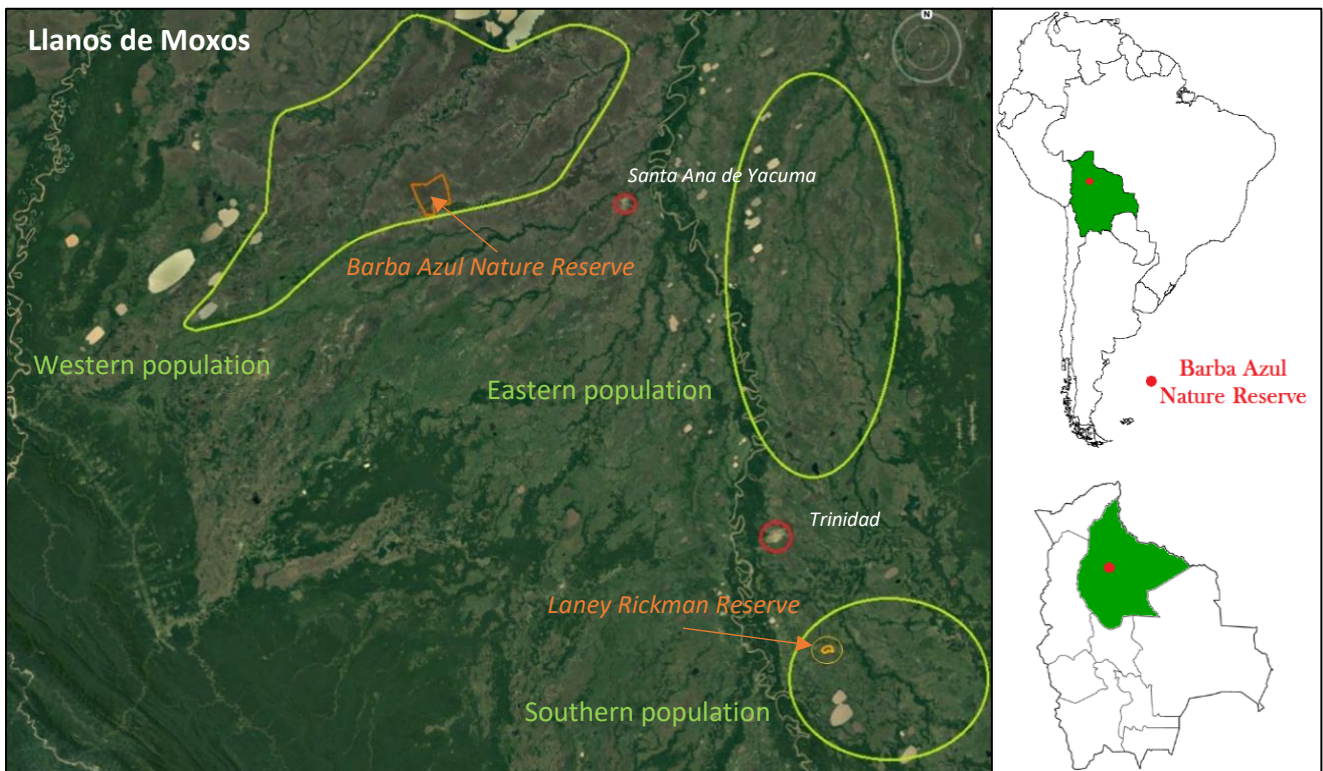


Figure 1. Light green lines indicate Blue-throated Macaw subpopulation ranges. The Barba Azul Nature Reserve is located in the western population, 75 kilometers west of Santa Ana de Yacuma and 213 kilometers northwest of the Laney Rickman Blue-throated Macaw Reserve. Armonía protects vital Blue-throated Macaw habitat in 2 isolated subpopulations.



Figure 2. The Barba Azul Nature Reserve is divided into two main land-use zones: Barba Azul (5,000 ha; 12,350 ac) designated for pure conservation and declared Private Natural Heritage Reserve (RPPN); Barba Azul East (6,000 ha; 14,820 ac) where 40% is designated for sustainable cattle ranching for species and habitat conservation.

Barba Azul Nature Reserve 2023 goals

In 2023 we set the following goals to ensure we continue with protection, research, monitoring and sustainability activities at Barba Azul Nature Reserve.

1. Protect Blue-throated Macaw habitat from wildfires
 - Maintain and improve the current firebreak lines.
 - Create new firebreak lines in Barba Azul southern area.
 - Respond to fire emergencies during the dry season.
 - Seek funds to construct a fire observation tower.
2. Implement annual savanna management and protection activities.
 - Carry out patch burn activities to increase grass diversity.
 - Conduct a fire environmental impact study on grasslands.
 - Continue rotational grazing in sub-paddock through electric fencing.
3. Complete cattle ranching infrastructure
 - Seek funds to construct worker house, deposit area and roofed tractor parking.
 - Increase number of rotational paddocks through fencing.
4. Establish livestock herd of 1,200 head of cattle
 - Manage livestock according to best practices techniques
 - Seek funds to buy 450 head of cattle
5. Improve infrastructure for management and tourism.
 - Construct an 1,870-feet (570 meter) boardwalk and pontoon.
 - Purchase a 4WD truck for the program
 - Enable a camping area with restroom facilities.
 - Seek funds to construct the staff house.
6. Provide high-quality tourism services.
 - Train new staff on tourism costumer services techniques.
 - Train local bird watching guides to support guiding services in Barba Azul.
7. Continue long term monitoring and research.
 - Continue monitoring the Blue-throated Macaw population numbers.
 - Continue monitoring Buff-breasted Sandpiper presence during September.
 - Record mammal diversity and presence with camera traps.
 - Monitor fenced exclusion zones for restoration.
 - Support international master students on ecology studies.

Introduction

In the face of unexpected challenges, the Barba Azul Nature Reserve has persevered in its commitment to safeguarding the Blue-throated Macaw habitat from wildfires. The onset of an unusually strong and extended dry season, intensified by El Niño conditions, heightened the risk of fires. Despite this, our park guards, both trained forest firefighters successfully averted all threats. Strategic firebreak maintenance, creation of new defense lines, and prompt responses ensured that no fires spread significantly within the reserve. This year, our team's vigilance and the equipment garnered throughout the years thanks to the support of various donors played a crucial role in mitigating the impact of wildfires.

In parallel, our focus on savanna management and protection unfolded as a key activity. Executing patch burn activities in August, supported by experienced firefighters, we strategically burned a 20-hectare grassland patch to enhance habitat diversity and mitigate fire risks. Simultaneously, we initiated an environmental impact assessment to understand the effects of grassland burning on the ecosystem, aiming to formulate recommendations for improved practices.

Advancements in infrastructure development underscore our dedication to improving facilities for management and tourism. This year we were able to begin the construction of an 1,870-feet (570 meter) boardwalk and pontoon, acquire a 4WD truck for our program and make sustainable accommodation improvements for tourism. Our long-term monitoring efforts continue, exemplified by our improved efforts in Blue-throated Macaw population monitoring, camera trap surveillance capturing elusive Jaguars, and collaborative master's research shedding light on the impact of cattle ranching on savanna and forest fauna. Year after year, our growing team consistently dedicates themselves to the hard work in the field, committed to the conservation and sustainable management of Barba Azul Nature Reserve.



Our objective of protecting the habitat of the Blue-throated Macaw was fulfilled despite the intense dry conditions and the risks of fire. Alejandro de los Rios

Barba Azul 2023 Development and Conservation Actions

1. Blue-throated Macaw habitat protection from wildfires

This year has brought some unexpected challenges to Barba Azul, especially when it came to dealing with wildfires. Due to El Niño conditions, we faced an unusually strong and long dry season, which led to a higher risk of fires compared to the previous year. Despite these tough conditions, our team managed to keep the situation under control, largely due to the preparedness of our park guards and the resources and equipment we have been obtained thanks to the support of many people organizations throughout the years.

This year, our reserve guards, Jhulian Machuca and Raul Rojas, who are trained firefighters, played a crucial role in preventing fires from spreading within the reserve. Two fires caused by lightning strikes were quickly tackled—one in a grassland area, monitored from our firebreak lines until it was put out, and the other dangerously close to the Blue-throated Macaw main foraging forest island, which our guards and tractor operator managed to control. Only 9 acres (3.7 ha) of Cerrado and 73 acres (29.4 ha) of grassland was affected.



Jhulian and Raul, with the support of the tractor operator Jesus, extinguished a fire caused by a lightning hitting near the forest. Jhulian Machuca

Our proactive measures included maintaining and improving existing 24 mile (40 km) firebreak lines and creating 3.7 miles (6 km) of new firebreak in the southern part of Barba Azul. Despite the challenging circumstances, we successfully contained fire emergencies originating from neighbouring ranchers, preventing any harm to the reserve. Throughout these trials, our commitment to **securing funds for a fire observation tower (35,000 USD)** remain unwavering. Such a tower would greatly enhance our ability to detect and respond to fire threats promptly.

2. Savanna management and protection

One of our key management activities this year was the execution of patch burn activities in August, where our team, supported by nine experienced firefighters, conducted a prescribed burn covering a 20-hectare patch of grassland adjacent to one of our firebreaks. The primary goals were twofold: firstly, to boost habitat and bird species diversity by creating different age groups of grasses, and secondly, to mitigate the risk of intense fires reaching the Cerrado and forest areas by strategically reducing accumulated dry matter. Prior to the burn, we implemented tractor defense lines around the designated perimeter and cleared the area of dry matter, ensuring a controlled and secure burn.



20-ha controlled burning in Barba Azul. A 5-day intensive work with a team of 15 people. Juan Carlos Catari, Yanet Cruz & Richard Davalos

Simultaneously, we initiated a comprehensive environmental impact assessment of grassland burning, collecting soil and vegetation samples before and after the prescribed burn. This study aims to provide valuable insights into the effects of fire on the ecosystem. Our goal is to analyze this data and formulate recommendations for improved burning practices, contributing valuable knowledge for ranchers in the region. This holistic approach aligns with our broader vision of sustainable land management.



The positive impact of our management strategies is evident in the encouraging results observed in recent years. Our sustainable ranching practices, including planned rotational grazing, have proven effective in promoting biodiversity. Notably, our recent observations indicate a surge in the presence of hummingbirds, the discovery of tall grass species previously unregistered in the area, such as the endangered Ibero Seedeater (*Sporophila iberaensis*), and the increasing records of Giant Anteaters (*Myrmecophaga tridactyla*), Maned Wolves (*Chrysocyon brachyurus*), Brazilian guinea pigs (*Cavia aperea*), along with recent sightings of rare small predators like the Pampas Cat (*Leopardus colocola*) and Bush Dog (*Speothos venaticus*).



3 & 4. Barba Azul Model Ranch

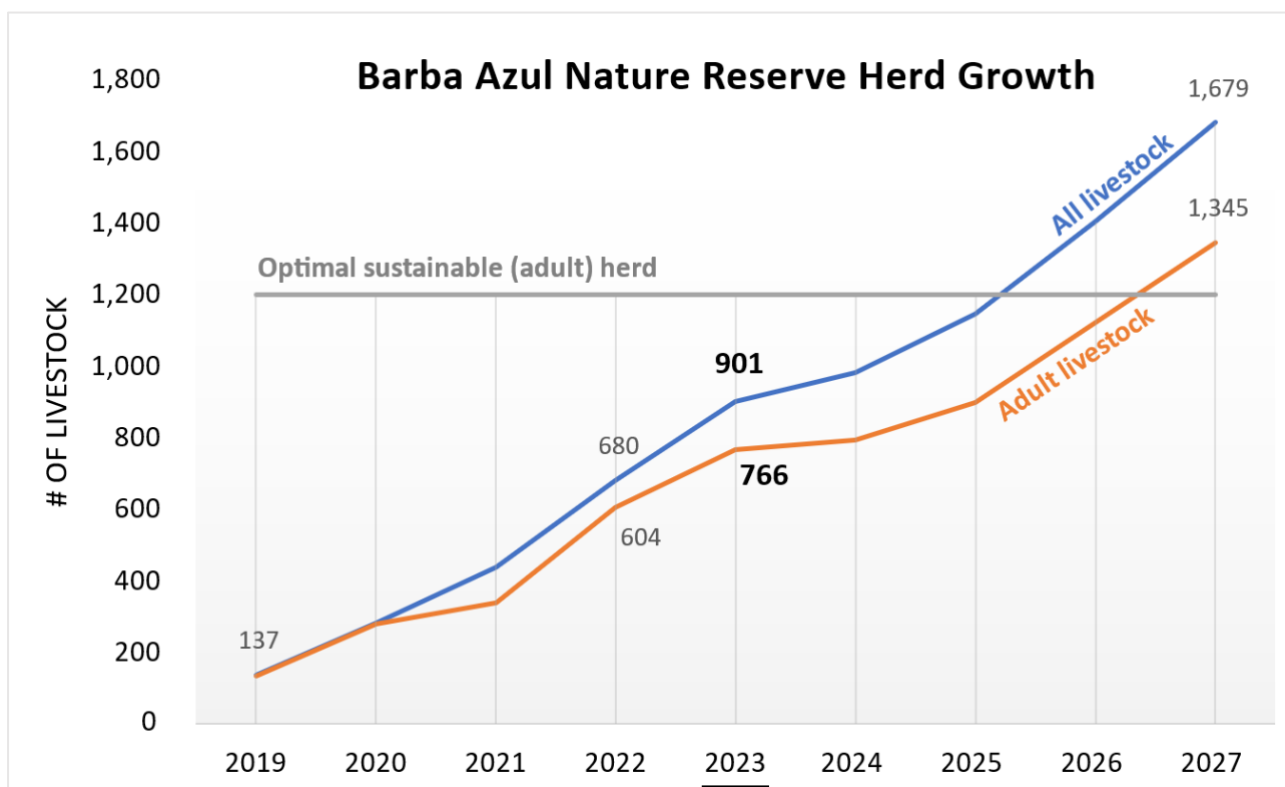
Why is Barba Azul engaging in cattle ranching?

At the 5,000-hectare Barba Azul East, our strategy is centered around finding the right balance between rewilding the natural tallgrass savanna while simultaneously fostering biodiversity-friendly working lands. This is achieved through employing low-impact ranching techniques carefully chosen to benefit threatened species by creating their ideal environmental conditions. At Armonía's model ranch our objective is to depart from conventional ranching practices, such as annual burning which lead to the degradation of grasslands. This year is remarkable for its significant investments in development, yielding tangible management outcomes that further solidify our commitment to the harmonious management of cattle within the savannas. These results are vital as they serve as the foundation to develop comprehensive criteria for sustainable ranching at a landscape scale.

For more insights, we invite you to explore our video on this subject: [Watch video here](#)

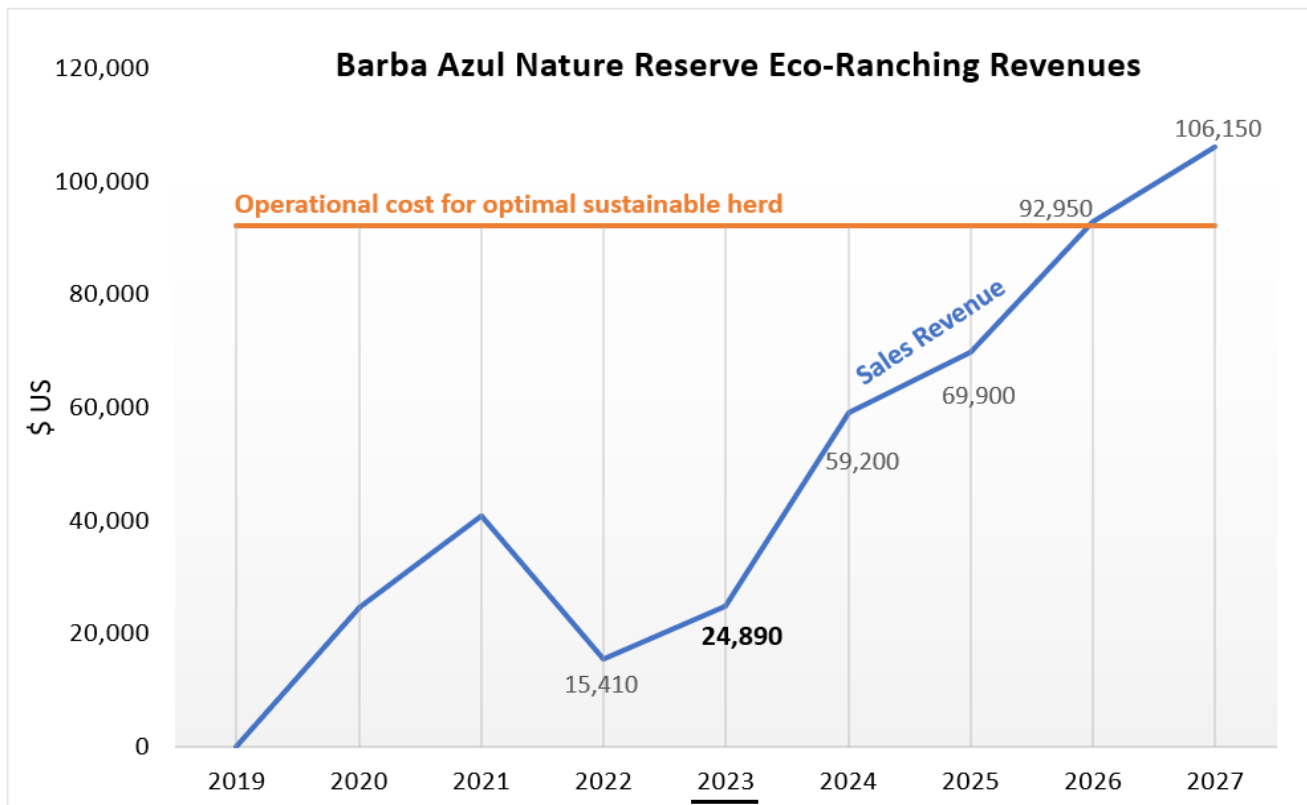
We are getting closer!

In 2023, our total cattle herd expanded to over 900, including recently born calves. The acquisition of 147 adult reproductive Brahman cattle, coupled with the birth of 151 calves at Barba Azul East, marks a noteworthy 33% increase from the previous year. Currently, we manage 64% (766 adult cows) of the optimal sustainable adult herd (1,200 adult cows). Looking ahead, without additional financial support for acquiring more animals, we will achieve a fully sustainable adult herd by 2027. Supplementary support for livestock acquisition is indispensable in achieving our model ranch goals and ensuring the long-term viability of our conservation efforts promptly. In the upcoming 2 years, 84 female calves are anticipated to reach maturity, contributing to the growth of the adult herd to 850. Consequently, we are actively seeking support to acquire an additional 350 cows.



When will we reach sustainability!

In 2023, we successfully sold 53 cattle, generating sales revenues of nearly US\$ 25,000. With a consistent annual increase in the number of calves, we anticipate a substantial rise in revenues. Under the current model, accounting for the entire costs associated with the optimal sustainable herd (1,200 adult cows), we project coverage of operational expenses by 2026. Beyond this point, starting from 2027, our low-impact ranching model is anticipated to generate financial income for our conservation efforts. Ideally, we aim to accelerate this process by securing additional financial support to acquire the necessary 350 cows and promptly attain the optimal herd size.



Management result become final apparent!

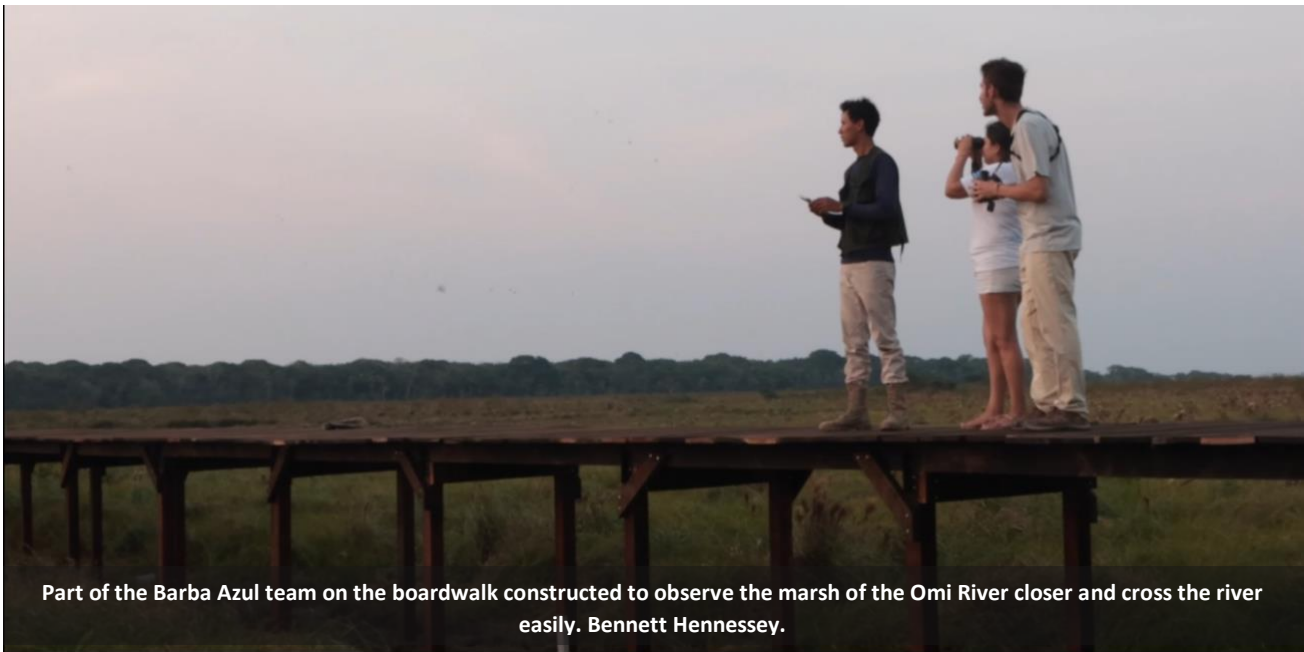
The year 2023 stands out with a notable emphasis on infrastructure investment to enhance our low-impact ranching management. Thanks to the support from the US Forest Service, Tareen Filgas Foundation, and ARTIS Zoo, we've successfully expanded our facilities, including the creation of additional paddocks (approximately 9 km of fencing), the fencing of five Motacu forest islands, and the establishment of three freshwater drinking holes equipped with solar-driven water pumps. These investments have proven pivotal, as we've achieved a remarkable reduction in mortality rates through our innovative management model. While neighbouring ranches grappled with an average 20% mortality rate due to the severe El Niño caused drought, Barba Azul experienced a mere 2.6% mortality rate.

Presently, our focus is on studying the impact of our management practices on biodiversity, aiming to fine-tune our approach (refer to section 7). Notably, our shorebird research underscores that Buff-breasted Sandpipers show a preference for sites with livestock and grass length between 4-6 cm.



5. Infrastructure development

In our ongoing efforts to improve infrastructure for both management and tourism at the Barba Azul Nature Reserve, substantial progress has been achieved over the past year. The construction of an **1879 ft (570 m) boardwalk and pontoon** has seen significant advancements, with contractors successfully completing the southern side, encompassing 885 ft (270 m) of the boardwalk, and finalizing the pontoon aluminum base. The project is currently underway on the northern side of the Omi River. This construction not only enhances visitor experiences by providing a better access of the marsh and riverine habitat but also facilitates effective management and monitoring of Barba Azul.



Part of the Barba Azul team on the boardwalk constructed to observe the marsh of the Omi River closer and cross the river easily. Bennett Hennessey.

Moreover, a crucial addition to our program is the acquisition of a **Toyota Hilux Worker** model considered the top 4WD in the Bolivian market. This robust vehicle, along with field implements we are adding to it, will significantly improve our team's mobility to both Blue-throated Macaw nature reserves and ensure a more efficient fieldwork and transport resource management.



The new Barba Azul Program truck with a Blue-throated Macaw design. Luz Natalia Mercado (coordinator).

On the tourism front, our commitment to providing comfortable and sustainable accommodations is evident. We've established a **new camping area with restroom facilities** and **two glamping tents** to comfortably accommodate larger groups of visitors. Furthermore, the **extension of our solar panel system** ensures an independent electric supply for cabins and camping area, guaranteeing 24/7 functionality.

One of the two glamping tents built to accommodate more guests at Barba Azul. Alex Gimenez



Additionally with these important advancements, we are actively **seeking funds for the construction of a staff house (USD 120,000)** recognizing the importance of creating a comfortable living environment for our dedicated team.

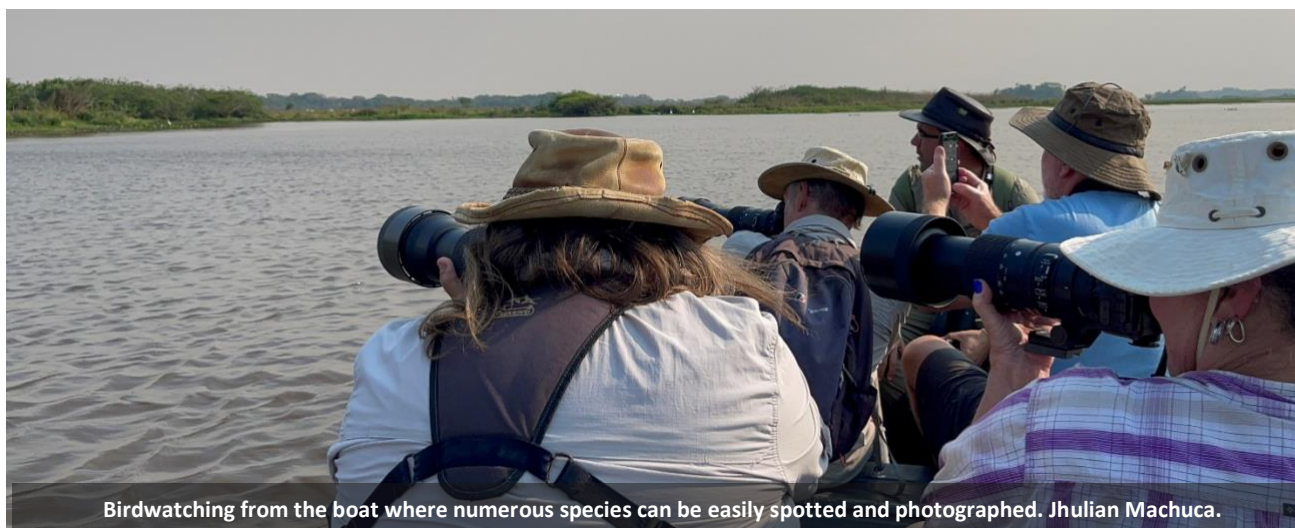


Staff house 3D design for Barba Azul Nature Reserve.

6. High quality tourism services



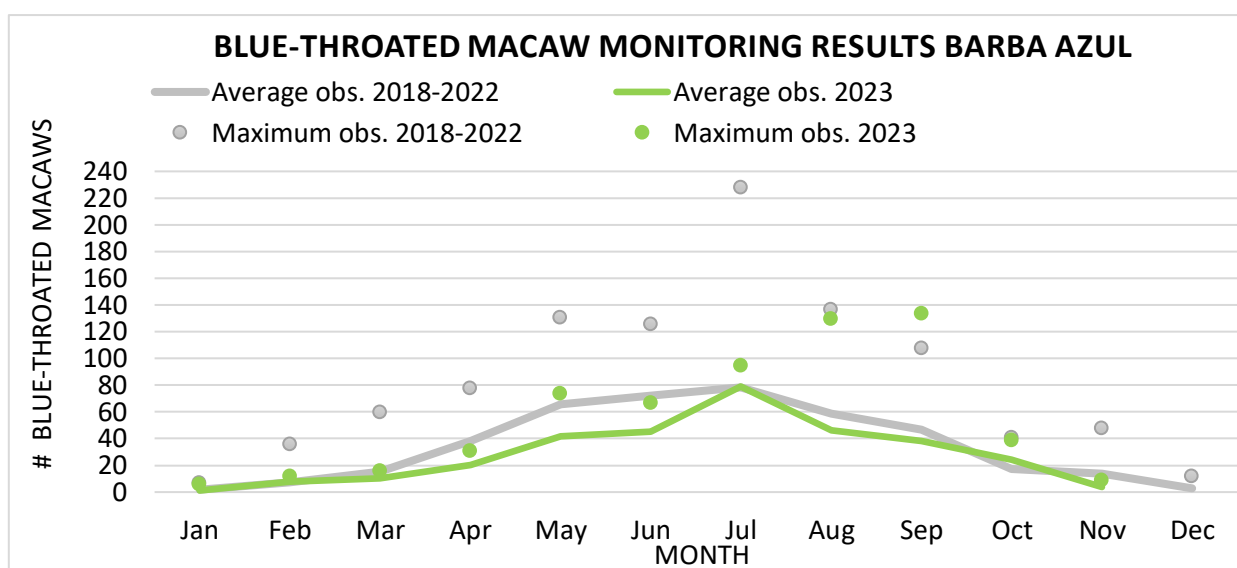
In 2023, the Barba Azul Nature Reserve welcomed 54 visitors through 20 bookings, including 18 external guides registering 275 bird species in total. Noteworthy observations enriched these visits, such as a memorable encounter with a group of 8 Blue-throated Macaws on one of the islands, engaged in feeding on flowers and fruits of palm trees and other vegetation during a captivating sunset. Another unique experience occurred in early September when a group discovered a dead mammal, and to their surprise, a King Vulture lingered nearby—an uncommon sighting of this species. The same group, later that afternoon, ventured across the river to witness a stunning display of nature as a flock of 60 Macaws adorned the landscape, creating a vibrant spectacle with their synchronized flight and distinct vocalizations. Additionally, in September, another group crossing the Omi River encountered a Jaguar strolling along the riverbank, providing an exceptional and rare wildlife observation. **We also created a [tourism video](#) on YouTube to help prepare and show Barba Azul Nature Reserve to potential guests.**



7. Long term monitoring and research

• Blue-throated Macaw monitoring:

The ongoing long-term monitoring of the Blue-throated Macaw population remains a pivotal aspect of our conservation efforts at Barba Azul. Our reserve guards conduct weekly assessments at a specific Isla Barba Azul spot where macaws gather before flying to their night roost at different forest islands scattered in the open grasslands and monthly observations close from those night roost, providing valuable insights into the local population's dynamics and movement. This year, we observed a notable shift in the highest macaw counts, with September registering the peak at the night roost, totalling 139 macaws. This deviation from the usual peak in July emphasizes the importance of continuous monitoring to understand the seasonal variations in macaw numbers. By collecting and analysing long-term data, we aim to decipher trends and patterns, facilitating informed conservation strategies for the Blue-throated Macaw local population at Barba Azul.



Graph 1. Blue-throated Macaw monitoring results systematically collected at the weekly observation point near Isla Barba Azul in the Barba Azul Nature Reserve. The gray line represents average Blue-throated Macaw numbers per month based on weekly Blue-throated Macaw data gathered between 2018 and 2022. The green line represents average Blue-throated Macaw numbers per month for 2023. Dots represent the highest single count observations per month between 2018 and 2022 (gray), 2023 (green).

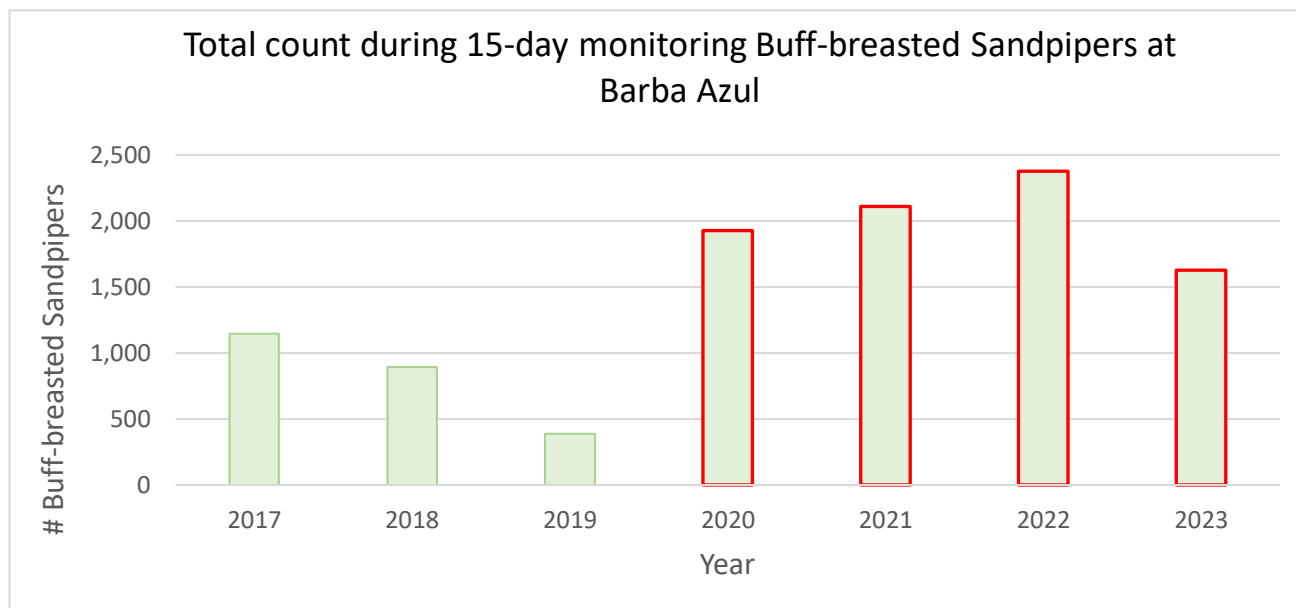


- **Buff-breasted Sandpiper monitoring:**

The survey work on Buff-breasted Sandpipers and long-distance migratory shorebirds in Barba Azul, supported by the US Fish and Wildlife Service's Neotropical Migratory Bird Conservation Act (NMBCA) program and the US Forest Service, serves not only to gather essential long-term data on their stopover behaviour but also to inform our shortgrass management practices involving livestock. By carefully regulating grass length between 4 to 6 cm through livestock use, we have created optimal conditions for Buff-breasted Sandpipers.

This year's survey team, led by Teodoro Camacho and including members Erick Zeballos, Nicole Avalos, Ruth Marquez, and Rodrigo Cortez, documented the presence of 11 long-distance migratory shorebirds. Notably, the accumulated count of Buff-breasted Sandpipers in 2023 was lower than that of the past three years. We attribute this decline directly to the severe drought conditions caused by the El Niño year in Bolivia. In collaboration with Richard Lanctot, a Buff-breasted Sandpiper expert from the USFWS who GPS-tracked Buff-breasted Sandpipers this year, we observed a significant delay in their departure from the state of Texas to South America.

Armonia conducted the first-ever Amazon River Shorebird Survey in Bolivia, revealing substantial numbers of Buff-breasted Sandpipers on sandbanks well into October, thereby supporting the theory of a delayed migration. This discovery adds valuable insights to our understanding of the impact of environmental factors on the migratory patterns of this species.



Graph 2. Buff-breasted Sandpiper monitoring results since 2017 based on detections at 5 fixed monitoring locations surveyed for 15 days from the 1st until the 15th of September. Since 2019, Armonia has been gathering 30-day survey data from the 1st until the 30th of September, but to demonstrate standardized results only detections from the 1st until the 15th of September are presented. Red bordered bars are years with Armonia livestock management.



Buff-breasted Sandpipers in flight at Barba Azul. Teodoro Camacho

- **Camera trap monitoring:**

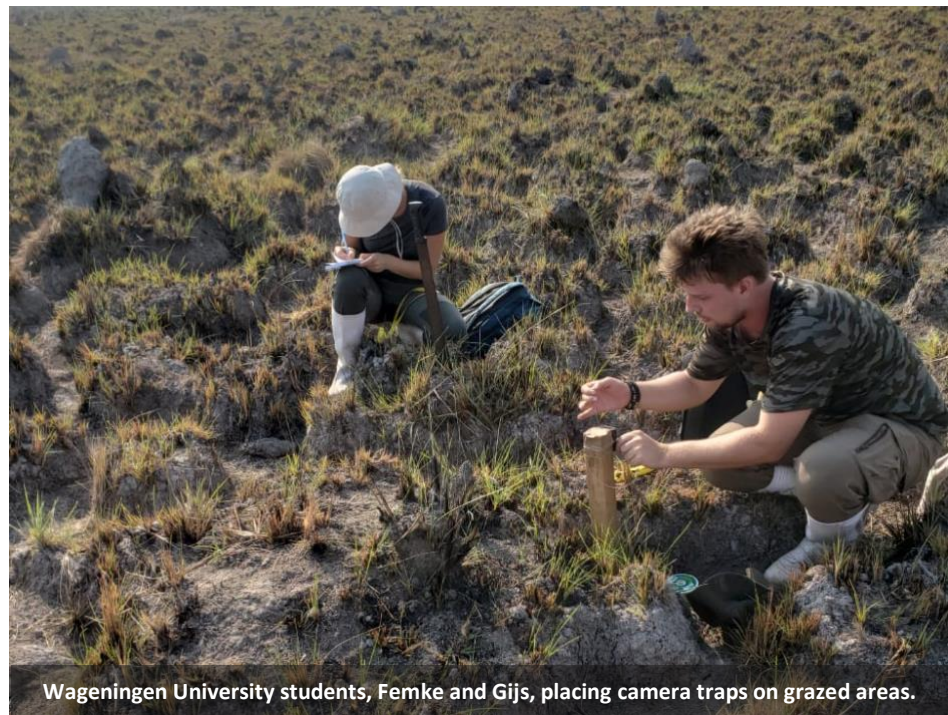
Following the momentous capture of the first Jaguar on camera, we have continued to document the presence of this majestic species throughout the year. These sightings affirm the success of our conservation efforts in providing a habitat conducive to the thriving of this predator. As we register diverse species through the camera traps, including a new photo record of an Agouti Paca (*Cuniculus paca*), we celebrate the role of Barba Azul Nature Reserve as a haven for many threatened animals, promoting biodiversity and preserving the delicate balance of the ecosystem. The documentation of Jaguars adds a significant chapter to our understanding of the reserve's ecological richness and underscores the importance of our ongoing protection and restoration activities.



Jaguar records from September and October. One individual seems to be getting comfortable at Barba Azul. Students and reserve's camera traps

- **Master research**

This year we also hosted two master's students from Wageningen University conducting research on the understudied impact of cattle ranching on savanna mosaic landscapes. Focusing on grasslands, forest islands, and the Omi River, the students gathered data to assess the impact of our cattle grazing systems on animal species diversity and vegetation. Their study will explore birds, mammals, and fish—seasonally dependent and relatively unknown groups—to unravel the complex relationships between cattle grazing and wildlife. The research will also evaluate key vegetation characteristics. This study will provide to us valuable insights to inform our sustainable cattle ranching strategies and practices.



Wageningen University students, Femke and Gijs, placing camera traps on grazed areas.

"Our stay at Barba Azul until so far has been great, such a nice landscape, and every day we find special. One moment you stand in a dense jungle forest and the other moment on a dry and vast savanna, amazing!" – Gijs van Beilen, Wageningen University student.



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Pumas, ocelots, and a very elusive Agouti Paca. Femke and Gijs' camera trap footage at Barba Azul for their master's thesis.