Barba Azul Nature Reserve
2025 Interim Report

Barba Azul's old-growth tall-grass savanna, flooded for eight months during Bolivia's rainy season. *Photo: Jhulian Machuca.*

With the rainy season gradually retreating, Barba Azul Nature Reserve is once again welcoming large numbers of Blue-throated Macaws returning to feed and roost, while Maned Wolves are making frequent visits near the lodge. Although prolonged rains delayed field access early in the year, they also helped reduce fire risk across the landscape. Our team continues to strengthen its wildfire preparedness through specialized training by the US Forest Service in fire behavior and safety. And a newly redesigned fire observation tower is scheduled for installation in August.

This year also marks a new chapter with the arrival of Huascar Morales as Coordinator of the Blue-throated Macaw Conservation Program, bringing renewed energy to both the Barba Azul and Laney Rickman reserves. He is joined by park ranger Richard Romero, whose experience and skills further strengthen the team. We are now investing in tourism infrastructure, with a full roof renovation of the visitor cabins underway just before the high season. Thanks to new support, we're acquiring 150 cattle and will reach our ideal herd size of 1,200 this year under low-impact management.

Weekly monitoring continues, with 114 Blue-throated Macaws already roosting in a small forest island on the recently acquired Tacuaral Ranch. For the first time in over a decade, we are preparing a full population census of this Critically Endangered macaw to assess trends across its entire range and evaluate the impact of ten years of dedicated conservation efforts.

Conservation and development of the Barba Azul Nature Reserve in 2025 is supported by:

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Barba Azul Nature Reserve

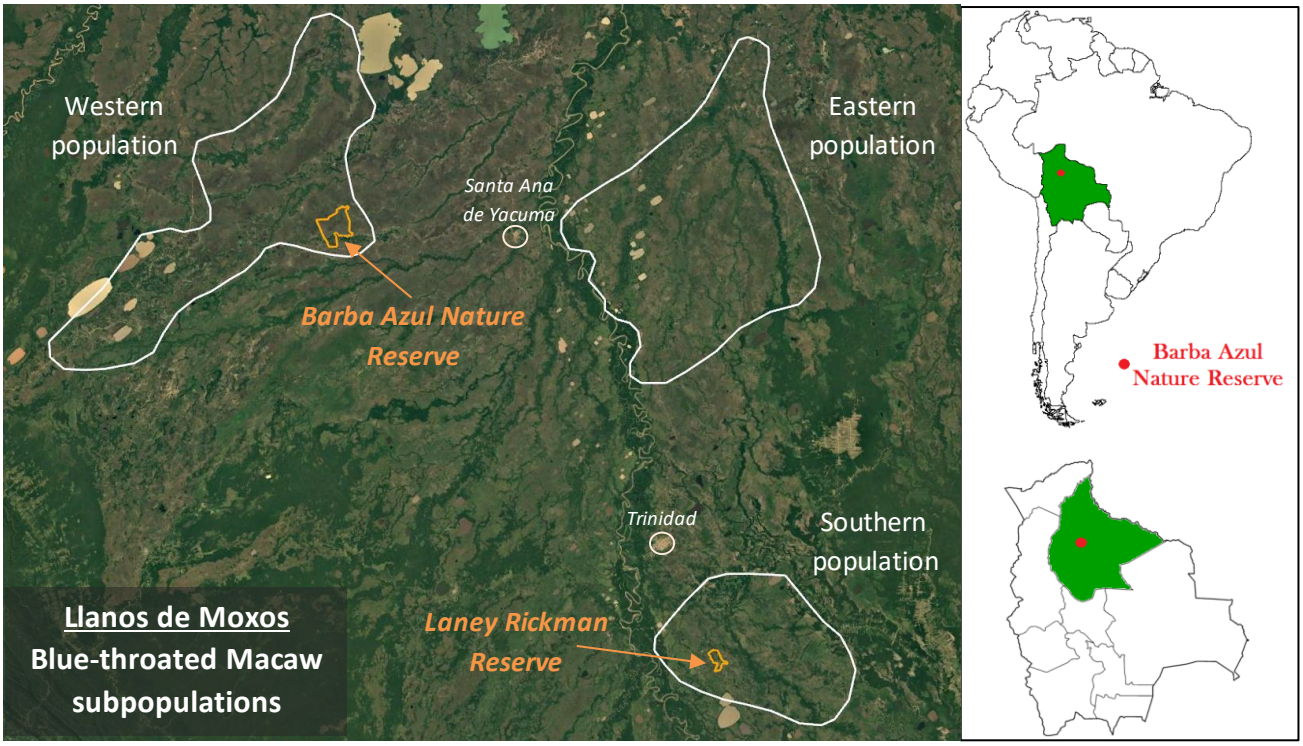


Figure 1. Three isolated subpopulations of the Blue-throated Macaw have been identified within the 120,000 km² Llanos de Moxos landscape, marked by white polygons. The Barba Azul Nature Reserve is located in the western population, 75 kilometers west of Santa Ana de Yacuma and 213 kilometers northwest of the Laney Rickman Blue-throated Macaw Reserve. Armonía protects the vital habitat of the Blue-throated Macaw in two isolated subpopulations.

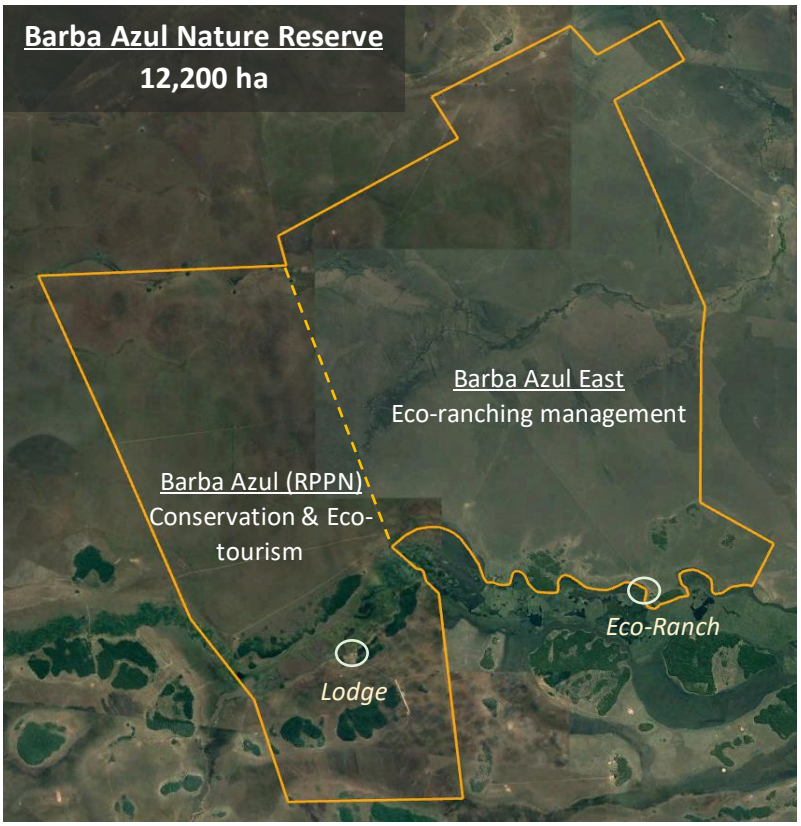


Figure 2. The 12,200-hectare (30,147 ac) Barba Azul Nature Reserve is divided into two main land-use zones: Barba Azul (5,000 ha; 12,350 ac) designated for strict conservation and declared Private Natural Heritage Reserve (RPPN); Barba Azul East (7,200 ha; 17,792 ac) where 40% is designated for sustainable cattle ranching for species and habitat conservation.

Barba Azul Nature Reserve 2025 goals

For 2025 we set the following goals to ensure we continue with protection, research, monitoring and sustainability activities at Barba Azul Nature Reserve.

1. **Expand Barba Azul Nature to protect important Blue-throated Macaw foraging habitat**
    - Seek funds to expand Barba Azul with an additional 1,000 hectares

2. **Protect habitat from wildfires**
    - Maintain and improve the current firebreak lines.
    - Carry out parallel backburns.
    - Construct a fire observation tower.

3. **Implement annual savanna management and protection activities.**
    - Create a fire management plan.
    - Continue rotational grazing in sub-paddocks through electric fencing.
    - Experimenting with silage using natural grass storage for dry-season forage.
    - Improve the river edge short grass habitat through an irrigation system.
    - Control feral pig population through Indigenous-led, traditional hunting methods

4. **Complete cattle ranching infrastructure**
    - Seek funds to construct a worker house, a deposit area and roofed tractor parking.

5. **Establish a livestock herd of 1,200 head of cattle**
    - Manage livestock according to best practices techniques.
    - Seek funds to buy 150 heads of cattle.

6. **Improve infrastructure for management and tourism**
    - Renew cabin roofs.
    - Seek funds to construct the staff house.
    - Omi River cleanup and reuse of organic material to create a new forest island.
    - Seek funds for dining hall roof replacement.

7. **Provide high-quality tourism services**
    - Train bird watching guides to provide guiding services in Barba Azul.
    - Update trail map.
    - Cabin equipment improvements.
    - Create savanna bird trail in Barba Azul South.

8. **Continue long term monitoring and research**
    - Continue monitoring the Barba Azul Blue-throated Macaw population.
    - Continue monitoring Buff-breasted Sandpipers in September.
    - Study the fruiting of the Motacú palm in Barba Azul and monitor palm restoration.
    - Record mammal diversity and presence with camera traps.
    - Support international master's students in ecology studies.
    - Barba Azul form part of the global Blue-throated Macaw population census.

Introduction

The first half of 2025 has been characterized by an extended wet season across the Beni savannas. Heavy rainfall blocked vehicle access to Barba Azul for several months, delaying key infrastructure and land management activities. At the same time, soil moisture levels stayed high well into the dry season (starting in May), lowering wildfire risk and allowing us to postpone firebreak maintenance without immediate consequences.

Barba Azul Nature Reserve field team:

In June, Huascar Morales joined Asociación Armonía as the new Coordinator for the Blue-throated Macaw Conservation Program, and Richard Romero was welcomed as a new park ranger. Together, they joined the core Barba Azul Nature Reserve flock, a committed team composed of Rocío Alanoca (Barba Azul Site Manager), Jhulian Machuca (Lead Park Ranger), Jesús Araúz (Tractorist and Ranger), and Maribel Rojas (Tourism Responsible), with the key logistic support from Yanet Cruz (Laney Rickman Reserve Site Manager). The highly experienced Barba Azul Ranching team is composed of Edson Lopez (Ranching Coordinator), Luis Suárez (Assistant Coordinator), Luis Enrique (Lead Cowboy), Kevin Rivero (1st Assistant Cowboy) and Mamerto López (2nd Assistant Cowboy).

Huascar Morales, Armonía's new Blue-throated Macaw Program Coordinator. *Photo: Teodoro Camacho*

Large Blue-throated Macaw flock, a common sight in Barba Azul Nature Reserve. *Photo: Fabian Meijer*

2025 - The Year of the Blue-throated Macaw

This year marks a key moment for Blue-throated Macaw conservation, as we will conduct a full population census across its three known subpopulations in September (*see figure 1*). Barba Azul Nature Reserve, located in the western subpopulation, holds the world's highest counts with a record of 228 individuals, and will play a vital role in the global survey. This year, weekly monitoring in Barba Azul has already recorded 114 individuals—well before the September peak. This is the first global census since 2015, when fewer than 455 birds were estimated to survive in the wild. With Barba Azul's monitoring results and the 164 fledglings from Armonía's Laney Rickman Reserve nestboxes program (southern subpopulation), we hope to confirm population growth. This effort is essential to demonstrate the impact of Armonía's conservation strategies in preventing species extinction.

Barba Azul 2025 Development and Conservation Actions

Barba Azul Nature Reserve expansion

In 2025, Armonía continues to prioritize the expansion of the Barba Azul Nature Reserve to secure additional foraging habitat for the Critically Endangered Blue-throated Macaw. The current goal is to add 1,000 hectares south of the Omi River, bringing the largest Motacú palm forest patch under protection. This area is not only a vital feeding site for the Blue-throated Macaw (proven by our 2019 GPS tracking study), but also an important refuge for large wildlife such as Jaguars, Pumas, and other key predators, which are often hunted by cattle ranchers due to perceived threats to livestock. We actively seek support, and a reserve extension proposal was prepared.

Securing Permanent Protection

Land acquisition is only the first—and often easiest—step in conservation. In developing countries like Bolivia, the real challenge begins with the long-term management and protection of these areas. This includes securing basic infrastructure (perimeter fencing, housing, airstrips), hiring additional patrol staff, conducting ecological monitoring, and implementing fire prevention systems (building firebreaks, acquiring tractors and machinery). Without these efforts, protected areas risk degradation or illegal use. These much-needed actions are included in the acquisition proposal.

Long-term Sustainability

Sustainable management models are essential to cover these costs. Armonía aims to expand ecotourism, scale up low-impact cattle ranching, expand our "Friends of Barba Azul" supporters, and establish a "Barba Azul Endowment" to generate long-term income. Only through concrete actions and sustained investment can we ensure that newly acquired lands remain protected, restored, and safe for threatened wildlife.

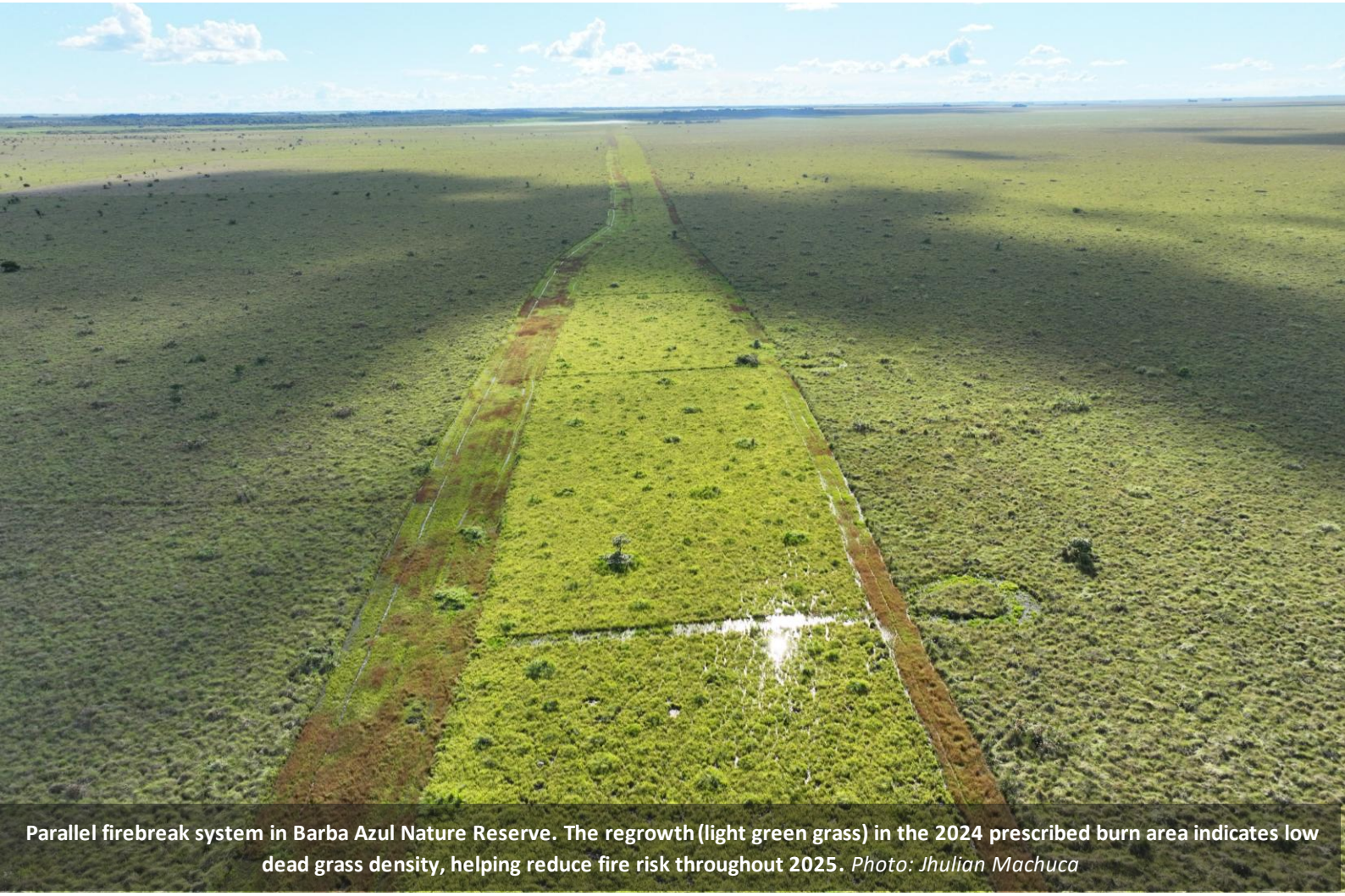
The recent 1,200-hectare extension of Tacuaral, now named the 'Daniel Robison Reserve' (2024), is monitored through routine drone surveys. *Photo: Jhulian Machuca*

Blue-throated Macaw habitat protection from wildfires

Wildfire protection and prevention are top priorities at Barba Azul. With savanna fires posing a recurring and increasing threat—especially due to climate change—our efforts focus on proactively managing fire risks to safeguard the Blue-throated Macaw's foraging and roosting habitats. To achieve this, we maintain a 35-mile (60 km) firebreak network throughout the reserve, which forms the backbone of our fire defense strategy.

Successful Impenetrable Firebreaks

In 2024, we successfully established a 2.5-mile (4 km) parallel backburn north of the second firebreak, creating a 50-meter-wide low-fuel zone designed to reduce fire intensity. This method has proven to be our most effective strategy for reinforcing firebreaks, ensuring that any approaching fire extinguishes upon reaching the cleared barrier. In the picture below, the light green grass indicates recent regrowth with minimal dead material, highlighting the area's low fuel load. This condition significantly reduces fire risk throughout 2025—without the need for another burn. We will only need to re-plow the permanent firebreak on the left as part of our annual maintenance efforts.



Parallel firebreak system in Barba Azul Nature Reserve. The regrowth (light green grass) in the 2024 prescribed burn area indicates low dead grass density, helping reduce fire risk throughout 2025. *Photo: Jhulian Machuca*

The extended flood period of 2025, caused by prolonged heavy rainfall, delayed essential fire management activities. Saturated soils made it impossible to carry out scheduled firebreak maintenance in July, as our plough cannot operate in waterlogged clay. These tasks are now rescheduled for August, once ground conditions have improved.

Armonía's firebreak system. In May, a fire from our neighbour was contained thanks to prepared lines and patrols by park rangers. *Photo: Jhulian Machuca*

Fire Management Training (USFS)

Additionally, three key team members—Rocío Alanoca (Site Manager), Jhulian Machuca (Lead Ranger), and Huascar Morales (New Program Coordinator)—completed two fundamental fire training courses offered by the US Forest Service: S-190 Introduction to Wildland Fire Behavior and L-180 Human Factors in the Wildland Fire Service. These trainings aim to standardize terminology, enhance safety protocols, and foster better coordination during fire response efforts. Building a shared understanding of fire behavior and team dynamics is a vital step in strengthening our readiness for future emergencies.

Fire Observation Tower

In preparation for the upcoming fire season, a newly redesigned fire observation tower is scheduled to be installed in Barba Azul in August 2025. This version incorporates important technical improvements made during the first half of the year, including a taller structure and the use of reinforced materials specifically selected for long-term durability under harsh weather conditions. The tower will be placed at a key point along the reserve's northern firebreak system, providing increased visibility across a wide section of the landscape. Once operational, it will serve as a crucial early warning platform for wildfire detection while also supporting bird monitoring.

The Long-tailed Reed-Finch (*Donacospiza albifrons*) is now a breeding resident in tall-grass savanna in Barba Azul Nature Reserve, thanks to the protection of old-growth savanna through the suppression of fires. *Photo: Rodrigo Soria-Auza*

Barba Azul Model Ranch

Thanks to additional support, we will purchase 150 head of cattle, reaching our long-term goal of 1,200 animals—the threshold identified for ensuring economic viability. Over the coming years, we will evaluate whether this is the ideal herd size, especially following the 2024 reserve extension that added the Daniel Robison Reserve section. Our dedicated Barba Azul Ranching team now includes five staff members who manage the entire herd using rotational, low-impact grazing strategies. This year we are experimenting with two new grassland and savanna management strategies:

A). Silage from Natural Savanna Grasslands

We are experimenting with mowing grass in areas frequently used by migratory Buff-breasted Sandpipers (*Calidris subruficollis*), creating ideal short grass under 6 cm. The mowed grass is then used to produce silage for livestock. During the core of the dry season (September–October), food for cattle is limited. We aim to supplement our herd with silage from natural savanna grasses—a new approach for the Beni—and, if successful, promote the practice among other ranchers.

B). ***Irrigation of River-edge Shortgrass***

River-edge shortgrass is ideal habitat for Buff-breasted Sandpipers, but recent dry seasons have failed to create the moist conditions needed by these long-distance migrants. We will therefore experiment with irrigating these grasslands to promote ideal moisture levels and ensure grass growth for livestock during the harsh dry season—a win-win for wildlife and our sustainable production model.

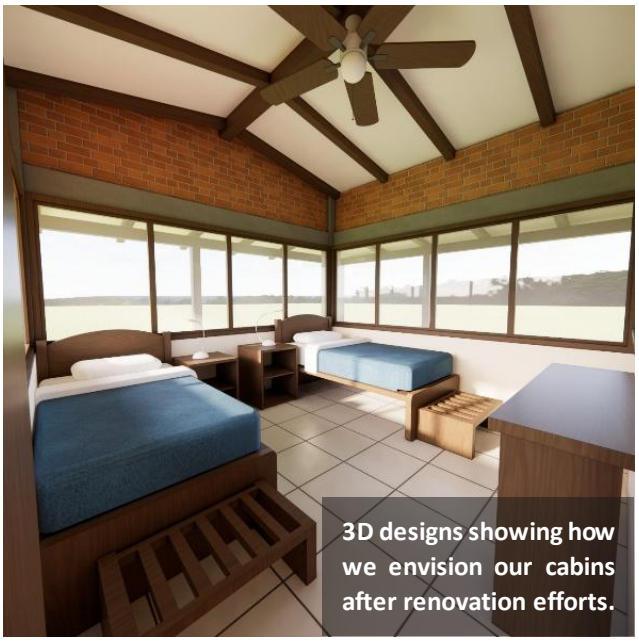
Barba Azul Model Ranch will experiment with river-edge shortgrass management techniques to create habitat for long-distance migratory shorebirds, specifically the Vulnerable Buff-breasted Sandpiper. *Photo: Rodrigo Soria-Auza*

Tourism Infrastructure Development and Tourism Services

Improving infrastructure at Barba Azul remains a key priority, not just to strengthen reserve management but also to improve the quality of services we provide to visitors. This year, we are taking necessary steps to renew and expand our capabilities in both areas.

Visitor Cabin Renovations

The first half of the year focused on renovating our tourism cabins through the complete replacement of their thatch roofs. Due to the extended flooding season, our team faced numerous challenges to begin the work, including transporting construction materials by boat and tractors that frequently got stuck in the flooded savannas. Despite the setbacks, we managed to start construction in time to complete the roof replacements before the busy tourism season. Seizing the opportunity, we're going beyond basic repairs by investing in a full redesign of the cabins—updating interiors, adding new furnishings, and improving equipment—to significantly enhance the visitor experience.



3D designs showing how we envision our cabins after renovation efforts.

New Savanna Trail at Barba Azul South – Now Include all Savanna Specialist Birds

As part of this visitor experience focus, we have begun designing a new bird observation trail in the southern section of the reserve. With the recent discovery of the Cock-tailed Tyrant (*Alectrurus tricolor*), Barba Azul South now hosts all threatened and noteworthy tall-grass savanna specialist birds: Black-masked Finch (*Coryphaspiza melanotis*), Iberá Seedeater (*Sporophila iberaensis*), Sharp-tailed Tyrant (*Culicivora caudacuta*), Long-tailed Reed-Finch (*Donacospiza albifrons*), and Grass/Pampas Wren (*Cistothorus platensis*). The new trail will be clearly marked and included in an updated map showcasing the network of tourist routes and attractions across Barba Azul. This will facilitate self-guided visits and support local guides in delivering high-quality interpretation.

Black-masked Finch along Barba Azul South savanna bird observation trail. *Photo: Mark van Leeuwen*

Barba Azul Staff House

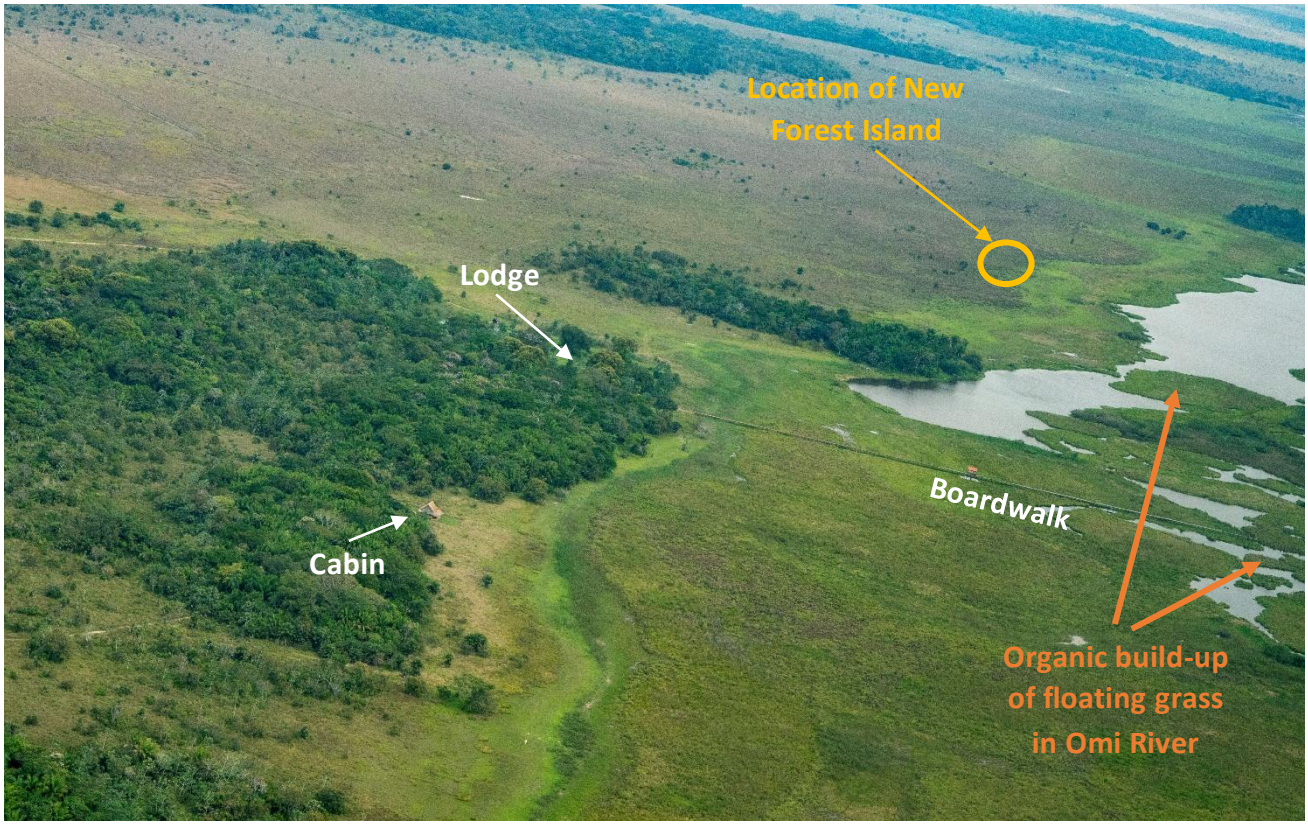
We started the year with great news: we successfully secured the remaining funds to build the Barba Azul Staff House. This future facility will provide essential living space for our growing team. Construction is scheduled to begin in 2026, once funds become available. We will benefit from the experience gained through the same building model already implemented at our Laney Rickman Blue-throated Macaw Reserve, where construction is nearly complete. This foundation will allow us to approach the project with confidence and efficiency.

First tourist in 2025 at Barba Azul Nature Reserve. *Photos: Jhulian Machuca and Richard Romero*

In May, we welcomed the first visitor of the year to Barba Azul, marking a symbolic return to ecotourism after months of rain-imposed isolation. Their visit reflects growing interest in the reserve and validates our ongoing investments in infrastructure, guiding, and conservation-based tourism.

Omi River Cleaning will Create New Forest Islands

We are developing a new approach to manage organic buildup in the Omi River, which sometimes blocks access along our boardwalk and pontoon system. The plan is to collect and move this material to a designated site, gradually creating a raised bed that could become the foundation of a new forest island. Inspired by ancient human-made islands in the Llanos de Moxos region—formed over centuries by organic accumulation—this strategy could eventually support forest regrowth within the wetland, improving habitat structure and connectivity in this historically modified landscape.



Diverse Savanna Ecosystems in Barba Azul Nature Reserve. *Photos: Mark van Leeuwen*

Control feral pig population through Indigenous-led, traditional hunting methods

As in most wild areas around the world, Barba Azul Nature Reserve has feral pigs roaming the landscape, competing with native wildlife that is now thriving under almost 2 decades of protection. These pigs have a strong impact on the ecosystem, disturbing river-edge shortgrass habitats through rooting behaviour disrupting soil and vegetation structures, and acting as potential vectors for disease. The feral pigs originate from neighbouring ranches and are remnants from previous landowners. Their population needs to be controlled.

Help from Indigenous communities

Hunting with firearms is strictly prohibited in Barba Azul, as the reserve offers a safe refuge for native wildlife, and we aim to avoid frightening or disturbing it. We explored other control methods, but they proved either logistically difficult, inhumane, or prohibitively expensive. As a solution, we initiated—for the first time—a collaborative effort with members of the Tsimané Indigenous community.

The Tsimané live in the lowland tropical forests of Bolivia's Beni Department, primarily along the Maniqui River. A group of five Tsimané hunters visited Barba Azul in July and successfully hunted six feral pigs using traditional bow and arrow techniques—minimizing disturbance to native wildlife. The meat will be sold locally, creating mutual benefits. The Tsimané expressed interest in returning two to three times a year to support Barba Azul Nature Reserve in reducing the feral pig population using the least invasive and most culturally respectful method available.

Tsimané hunters help control the feral pig population in Barba Azul using traditional hunting methods. *Photos: Rocio Alanoca*

Long term monitoring and research

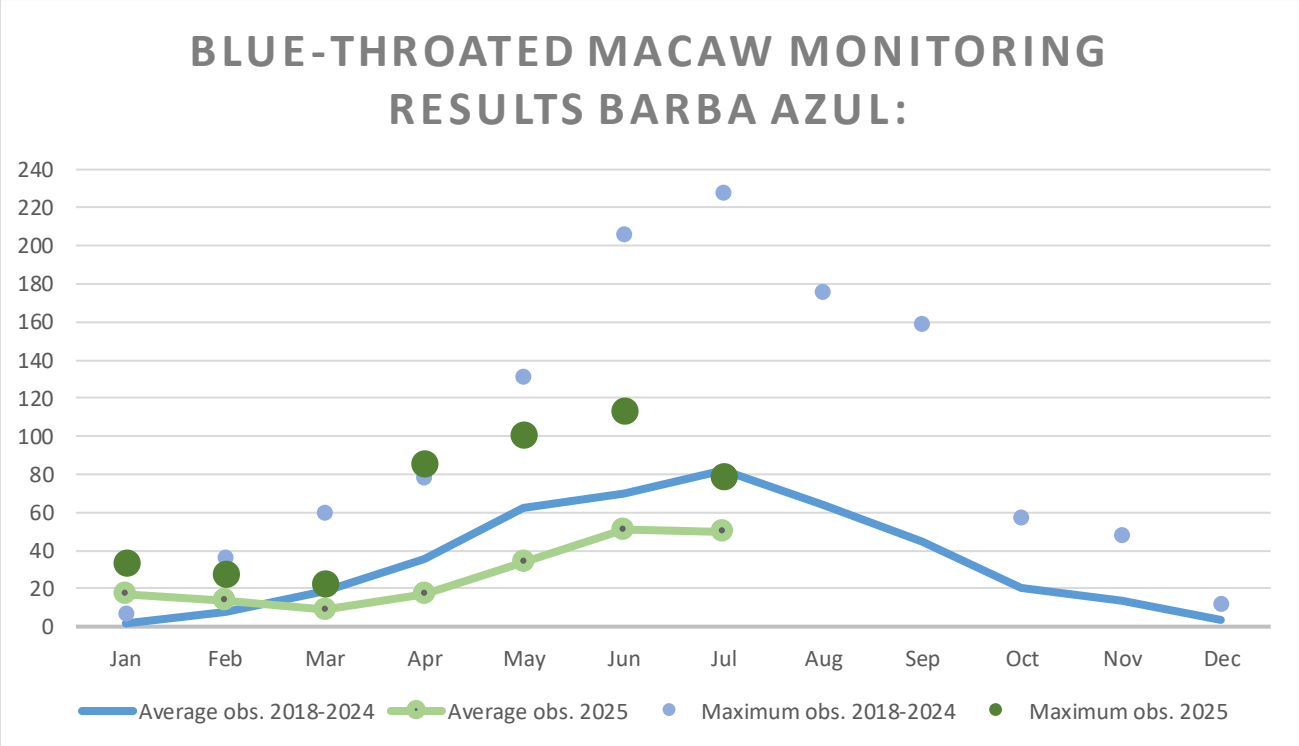
Long-term ecological monitoring continues to be a cornerstone of our conservation work at Barba Azul. By collecting systematic data across different taxonomic groups and ecological processes, we can evaluate habitat quality, detect trends in wildlife presence, and inform adaptive management across the reserve.

Blue-throated Macaw Monitoring Results:

Monitoring of the Blue-throated Macaw continued throughout the year despite the flooding. Weekly observations are carried out at established monitoring points: Isla Barba Azul and the communal roost. In June 2025, a peak count of 114 individuals was recorded at the main roost, while a separate count at Isla Barba Azul documented 81 individuals foraging on the same day.

Important Change in Blue-throated Macaw Behaviour

Reviewing our annual monitoring data, we observed below-average sightings at the fixed Isla Barba Azul monitoring point and lower peak counts at the traditional roosting site. While this trend may initially appear concerning, it is explained by changes in foraging and roosting behaviour. Since Barba Azul East (ranching section) came under protection in 2014, ongoing habitat restoration has led to notable shifts in Blue-throated Macaw activity. Increasing numbers are now foraging within the ranch's gallery forest, and significantly, individuals have begun roosting there—indicating that this area is now perceived as a safe habitat. We are currently considering the inclusion of the ranch as a third monitoring site, although this will require logistical adjustments in staffing and effort.



Graph 1. Blue-throated Macaw monitoring results were systematically collected at the weekly observation point at Isla Barba Azul in the Barba Azul Nature Reserve. The blue line represents average Blue-throated Macaw numbers per month based on weekly Blue-throated Macaw data gathered between 2018 and 2024. The green line represents the average number of Blue-throated Macaws per month for 2025. Dots represent the highest single-count observations at the main roost per month between 2018 and 2024 (light blue) and 2024 (dark green).

Blue-throated Macaw Global Population Census

Preparations are underway for the 2025 Blue-throated Macaw Population Census, a coordinated effort involving five teams in the Beni savanna. the project aims to conduct the second population census of the Blue-throated Macaw (*Ara glaucogularis*) to reassess its status of this endemic and Critically Endangered macaw. This census will replicate the survey carried out by Asociación Armonía in 2015, which estimated 312 to 455 individuals in the wild. A decade on, the new census will help evaluate the effectiveness of past and ongoing conservation initiatives.

Lead ranger Jhulian Machuca heading out to monitor Blue-throated Macaws at the nighttime roost. Jhulian will lead one of the teams in the upcoming census *Photo: Rocío Alanoca*

This census will adhere strictly to the same methodology used in the 2015 population survey to ensure comparability and facilitate analysis of population trends after a decade of conservation efforts. Five experienced teams, each comprising a leader and two assistants, will conduct simultaneous surveys at five key Blue-throated Macaw regions representing the three known subpopulations across the Beni Savanna, covering approximately 60,000 km². The survey will span 25 days in September, including 21 days of active surveying and 4 days for travel, during the dry season when detection and access are optimal.

Buff-breasted Sandpiper monitoring

Monitoring of migratory Buff-breasted Sandpipers will resume in September, when peak migration occurs. These birds are closely associated with shortgrass areas along the Tiniji and Omi River, especially in paddocks managed through rotational grazing. Observations and habitat condition data will once again be compared with previous years to evaluate the impacts of our ranching management on shorebird foraging conditions.

Expanding Shorebird Monitoring efforts

This year, we will replicate shorebird monitoring efforts at three additional ranches to evaluate stopover abundance across the broader Beni Savanna landscape. Preliminary findings suggest this region functions as a critical stopover area of hemispheric importance. These efforts aim to strengthen the case for recognizing the Beni Savannas as a key site on the global shorebird conservation map.

Camera trap and monitoring

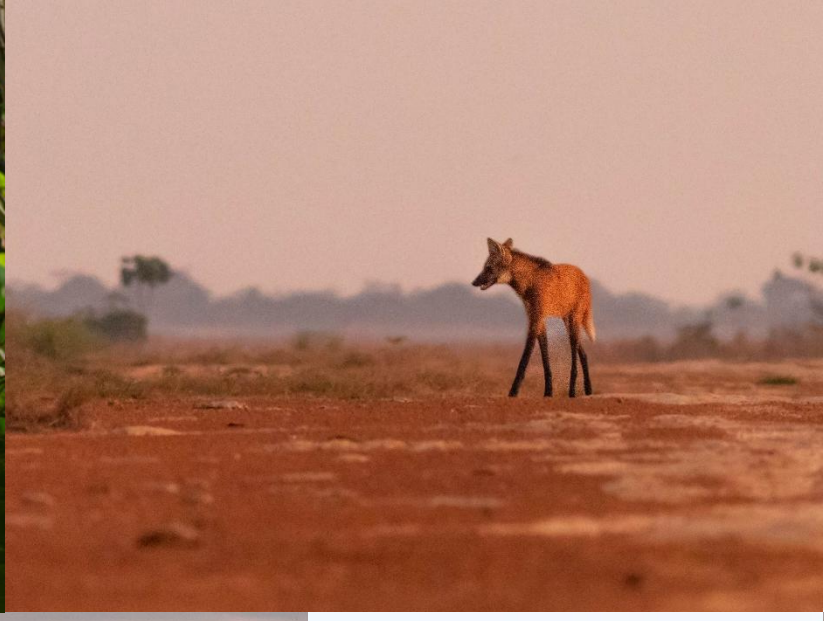
Our camera trap network continues to operate across a range of habitats in Barba Azul, providing ongoing insight into mammal diversity and activity patterns. Routine monitoring this year yielded a rare and notable sighting: the reappearance of a leucistic Brown Agouti *(Dasyprocta variegata*), an individual with a completely white coat and dark eyes. This anomalous coloration, previously documented in Barba Azul and published in a 2024 article (READ HERE), suggests the persistence of unique genetic traits within the reserve's mammal population and highlights Barba Azul's role as a refuge for rare biodiversity. This rare coloration—marked by a fully white coat and dark eyes—highlights the genetic uniqueness of Barba Azul's mammal populations.

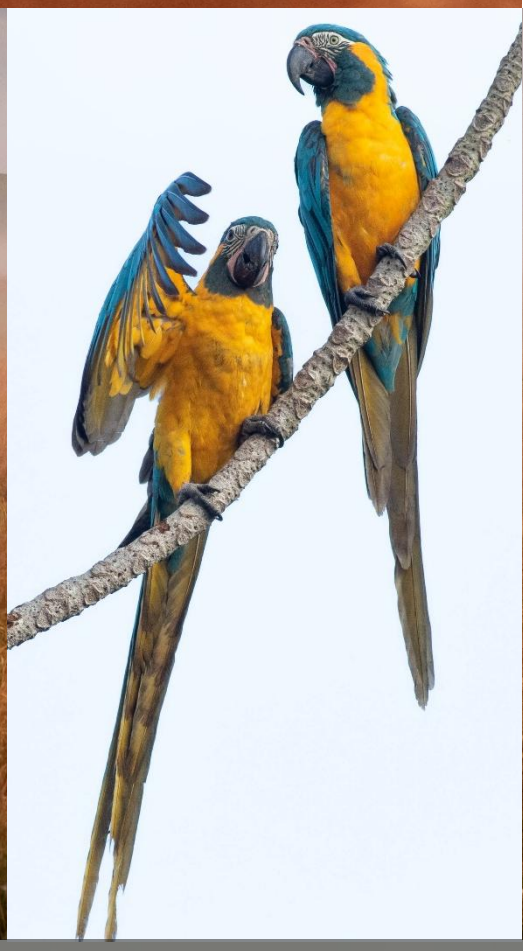
Left: Leucistic Brown Agouti (*Dasyprocta variegata*) photographed in 2023 by Steffen Reichle. Right: Possibly the same individual, recorded again in 2025 by Richard Romero.

Students research

We also continue to support academic research in the reserve. Luz Natalia Mercado, a PhD student and former Barba Azul field coordinator, is currently developing a study that explores ecological dynamics within forest islands and the surrounding savanna matrix. Her work not only contributes to science but also provides us with valuable insights into how species interact with the heterogeneous landscapes we manage. Supporting early-career researchers remains a key part of our strategy to build knowledge and capacity for conservation in Bolivia, highlighting the vital role of research in effective conservation practices.

Left: Jhulian Machuca with a doctoral candidate Luz Natalia Mercado (ex-Barba Azul Coordinator) conducting field monitoring. Right: Blue-throated Macaws perched on top of a tree. *Photos: Richard Romero*





F.L.T.R. – Southern Tamandua (*Tamandua tetradactyla*) – Maned Wolf (*Chrysocyon brachyurus*) – Tallgrass Savanna, Barba Azul South – Blue-throated Macaws (*Ara glaucogularis*) – South American Coatis (*Nasua nasua*). *All photo's thanks to Marc van Leeuwen*