

Barba Azul Nature Reserve 2022 Annual Report



A common sight in Barba Azul Nature Reserve, numerous groups of Blue-throated Macaws together. Mark van Leeuwen

We counted the highest number of Blue-throated Macaws ever, 228 individuals registered at one single roosting site. Also, the first record of the rare Bush Dog was made in our mature tall grass savanna, as well as camera trap images of a Jaguar. We received the highest number of visitors this year with 69 staying at Barba Azul. A record number of 3,871 Watch List Buff-breasted Sandpipers were found during our monitoring program. We protected the most important foraging forest for the Macaws from fire and improved our existing 45 km/28 miles firebreak system with an additional 12 km/7 miles of new firebreaks. For the first time ever, we created an experimental patch burn plot of 25 hectare/ 61-acre to improve habitat diversity for grassland species and to decrease the risk of fire reaching the forest. Barba Azul's low impact model ranch located in the eastern part of Barba Azul increased to 714 cattle, 60% of our goal and a 10% increase in comparison to 2021.

Conservation and development of the Barba Azul Nature Reserve in 2022 is supported by:



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Barba Azul Nature Reserve

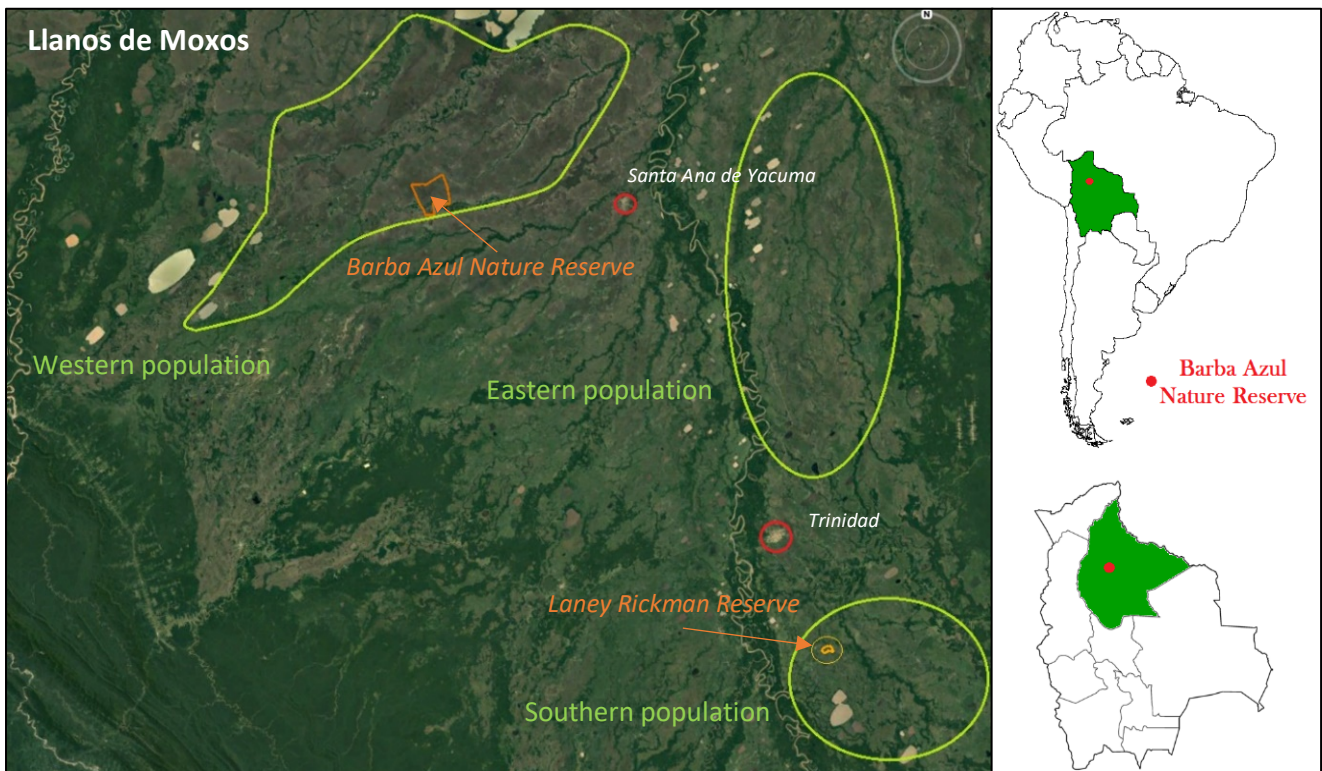


Figure 1. Light green lines indicate Blue-throated Macaw subpopulation ranges. The Barba Azul Nature Reserve is located in the western population, 75 km/46 miles west of Santa Ana de Yacuma and 213 km/132 miles northwest of the Laney Rickman Blue-throated Macaw Reserve. Armonía protects vital Blue-throated 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 2022 goals

In 2022 we set the following goals to ensure we continue with protection, research, monitoring and sustainability activities at Barba Azul Nature Reserve.

1. Improve the firebreak system established in conservation priority sites
 - Apply backburning and “black line” techniques to widen plough firebreaks
 - Construct a fire observation tower
2. Improve Blue-throated Macaw breeding habitat -penthouse nestboxes
3. Continue the savanna management work
 - Patch burn management to increase grass diversity
 - Rotational grazing in sub-paddock through electric fencing
4. Complete cattle ranching infrastructure
 - Complete worker house, deposit area and roofed tractor parking
 - Complete circular corral design
 - Increase fix paddock fencing
5. Establish livestock herd of 1,200 head of cattle
 - Manage livestock according to best practices techniques
6. Fine tune tourism needs
 - Trail signage
 - International and local promotion of Barba Azul
 - Wildlife watching vehicle
7. Improve infrastructure for tourism and management
 - Create easy access river crossing
 - Construct the staff housing
8. Experiment with Motacu Palm regeneration strategies
9. Continue long term monitoring and research
 - Blue-throated Macaw population monitoring
 - Mammal diversity with the use of camera traps
 - Fenced exclusion zones
 - Buff-breasted Sandpiper monitoring
 - Native grassland carbon capture capacity

Introduction

This year, we counted the highest number of Blue-throated Macaws ever, 228 individuals registered at one single roosting site. Barba Azul was created in 2008 after Armonía staff discovered, at the time, an incredible and unknown concentration of Blue-throated Macaws, recording 12 individuals, at a very remote cattle ranch in the middle of the Beni Savanna. After almost 15 years since its creation, we are seeing the conservation results of the effort of Armonía staff and every person and institution who has supported Barba Azul conservation. Incredible numbers of Blue-throated Macaws were registered this year, with counts of 178 and 228 individuals during monitoring at the same sites. This means there could actually be more in the area. Habitat conservation for the species through the creation of private protected areas with a long-term vision, such as Barba Azul, are proving to be effective for the recuperation of a Critically Endangered macaw species.

As we successfully protect the diversity grasslands and savanna with multiple years of thatch build up, there are more environments for insects, which offers more food for rodents, Guinea Pigs, Agoutis, and small birds, leading to more food for predators. This year we have had two amazing new records. First, the first record of an extremely rare Bush Dog for Barba Azul, spotted and photographed by a group of tourists and a student.



Blue-throated Macaws perching on top of a Cecropia tree, one of their food options when they are flowering. Mark van Leeuwen



First record and photograph of a Bush Dog in Barba Azul Nature Reserve. Mark van Leeuwen

As we work to restore this complex ecosystem and its natural processes after a century of burning and overgrazing, we now have three canine predators (Maned Wolf, Crab-eating Fox, and Bush Dog) and five feline predators (Jaguar, Jaguarundi, Puma, Ocelot, and Pampas Cat). A Jaguar male was recently captured by Miguel's Camera trap on November 26th for the first time in Barba Azul.

Barba Azul 2022 Development and Conservation Actions

1. Habitat protection. Our fire management practices included the maintenance of 45 km of existing firebreaks and the construction of smaller firebreak grids to conduct the patch burn safely. As well, we constructed 12 km of new firebreaks in Barba Azul East to continue our grassland protection. We also completed a 2.3 km parallel backburn to create a 30-meter-wide area of reduced fuel load near one of the main ploughed firebreaks. This year

Barba Azul experienced an extended dry season, and fire threats to which our team quickly responded. At least two of registered fires were caused by lighting on open grassland. These lighting occurrences seem to be more common than we have previously thought.

Backburning to increase the width of one of the firebreaks and increase the protection from fires reaching the forest. Pedro Mejía



Funding needs:

To continue our habitat protection and fire management actions, we are seeking support of USD 35,000 which include the construction of a fire observation tower to be placed on a strategic open grassland point.



This year the drought hit harder than usual in Barba Azul and fire threats increased. Our team responded to all incidents and no major impacts occurred. Firebreaks are a great tool to fight fires from a safe line. In the photo to the left we can see a burnt area of a neighboring ranch at the right our firebreak protected the reserve from any entering fire. Miguel Martínez.

2. Improve and create Blue-throated Macaw breeding habitat: Between this and last year we have installed a total of 10 new Penthouse nest boxes across Barba Azul. Two out of the total have lightning rod systems installed. Every year, we have had lighting strikes hit different parts of the reserve and the altitude of nest boxes makes them vulnerable to strikes. As we are observing macaws staying longer than usual at Barba Azul, we are hoping they begin using them this coming nesting season. To monitor nest boxes and conduct maintenance, Miguel (Park Ranger) was trained to use climbing gear by the conservation program director Tjalle Boorsma, an experienced tree climber.



We count with 2 lightning rods on top of our penthouse nest boxes to prevent lighting reaching them. Training conducted by Tjalle Boorsma (photo) using new climbing gear. Sergio Mercado and Miguel Martinez.

3a. Fire management. A 25-hectare patch burn plot of reduced fuel load was successfully created in Barba Azul Nature Reserve. This burn plot has two functions: create a more diverse grassland habitat with different grass length and age for a wide range of grassland species, and to reduce the risk of uncontrolled fires near the Blue-throated Macaw foraging forest island. This successful controlled burn was conducted safely, considering wind direction, humidity, temperature, and fire behavior while burning. Detailed burn data was gathered and uploaded to our database. We counted with the complete team of Barba Azul rangers, local cowboys, and seasonal workers, as well as two Laney Rickman Reserve park ranger who were trained before and have increased experience in controlled burning techniques.



A patch of shorter grass to improve diversity of grasslands. Pedro Mejia



Most of Barba Azul Nature Reserve is occupied by seasonally flooded grasslands that holds many threatened bird species. Through our work with fire management and improved cattle grazing we are creating a mosaic of short and tall grass to provide habitat for a greater diversity of species. Thalia Chavez y Teodoro Camacho

4 & 5. Barba Azul Model Ranch



Cattle creates the ideal habitat for long-distance migratory shorebirds like the Buff-breasted Sandpiper when managed sustainably. Teodoro Camacho

At Barba Azul East we are using cattle to 1) help managed a diverse habitat, 2) to serve as a model ranch that does not annually burn pastures, and 3) to raise financial support for our reserve protection sustainability plan ([see this video we created on the subject](#)). When managed according to low impact ranching techniques, threatened species like the Buff-breasted Sandpiper, Black-masked Finch and Cock-tailed Tyrant benefit from livestock.

Armonía's low impact model ranch increased to 714 cattle, 60% of our ultimate sustainability goal (1,200 animals). This is a 10% increase in comparison to 2021 thanks to the support from the US Fish and Wildlife Service's Neotropical Migratory Bird Conservation Act (NMBCA) program, the US Forest Service, the Tareen Filgas Foundation and the 73 calves that were born in Barba Azul. The profit gained in 2022 from sold bulls was US\$ 12,040. Profits will increase exponentially over the coming 5 years as we will be able to sell more Barba Azul born calves when we have reached our herd size of 1,200 animals. These profits are crucial to be able to directly protect the Blue-throated Macaws of Barba Azul and to become a sustainable reserve.

With the support from the NMBCA grant and the Tareen Filgas Foundation, we improved our old corral to become more cow friendly and we placed 9 km of wildlife friendly fencing (without barbwire) to subdivide large tracks of savanna into sub-paddocks. We are now rotating our herd between 9 different areas where we closely evaluate food availability to prevent overgrazing and undergrazing. This intensified management results in lower impact on soil, better cattle health and creates a diverse habitat of different grass length for a wide range of grassland specialist birds.

Funding needs:

To meet our goals to become a sustainable model ranch where ranchers can observe practical management solutions to convert to a profitable ecofriendly ranch, we seek funding for an additional 486 cattle (@ 600 US\$/animal)

6. Tourism development and promotion: After a very slow period during covid, it appears as tourism has returned to normal. We had our highest visitation year to date with a total of 69 visitors, who had a great experience closer to nature in one of the most remote parts of Bolivia. Each group left the reserve with fauna observations many could dream of experiencing, like the first record ever of a Bush Dog (*Speothos venaticus*) for Barba Azul. Our team had been doing their best to welcome and provide quality service to all the groups that arrived so they would have felt welcomed and left with many amazing stories to share. Barba Azul raised a total gross revenue of USD 26,314 in total this year.



Beautiful location!

Great birding activity, lots of macaws and excellent staff.

Home cooking was fantastic!



All our visitors left Barba Azul with great birdwatching experiences and unique fauna observations. Teodoro Camacho

To make sure our visitors were comfortable during their stay, we placed a large effort on maintenance, repairs and improving spaces to receive larger groups at Barba Azul. The work started before the high season for tourism with the maintenance of the solar energy system and water heating system for the cabins. We were able to equip the field station to enable more rooms for visitors and group guides. We carried out general infrastructure repair to the cabins and moved forward with many improvements for all the facilities, including a new trail map, a large screen to present an introduction video on Barba Azul, a small fridge so visitors have access to cold beverages, a coffee machine, a saddle room and storage, ceiling fans, and many other needed items. We presently have four cabins, but it is obvious we will have to construct at least another 2 more cabins to accommodate larger groups.



All our visitors left Barba Azul with great birdwatching experiences and unique fauna observations, including the first record and photograph of a bush dog (Mark van Leeuwen). Visitors at Barba Azul (Teodoro Camacho)

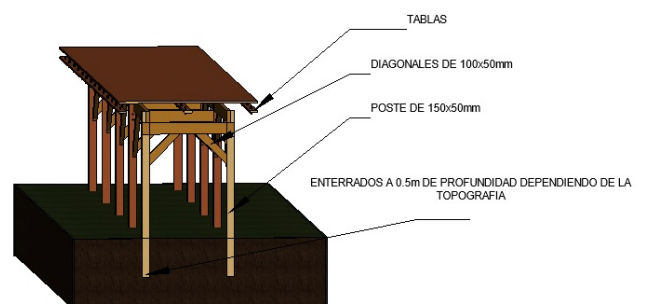
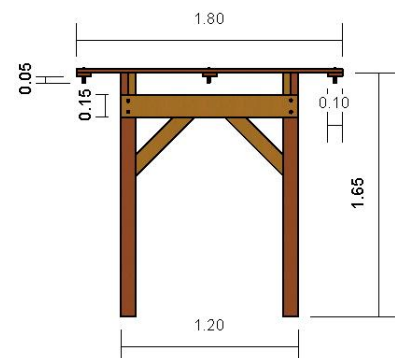
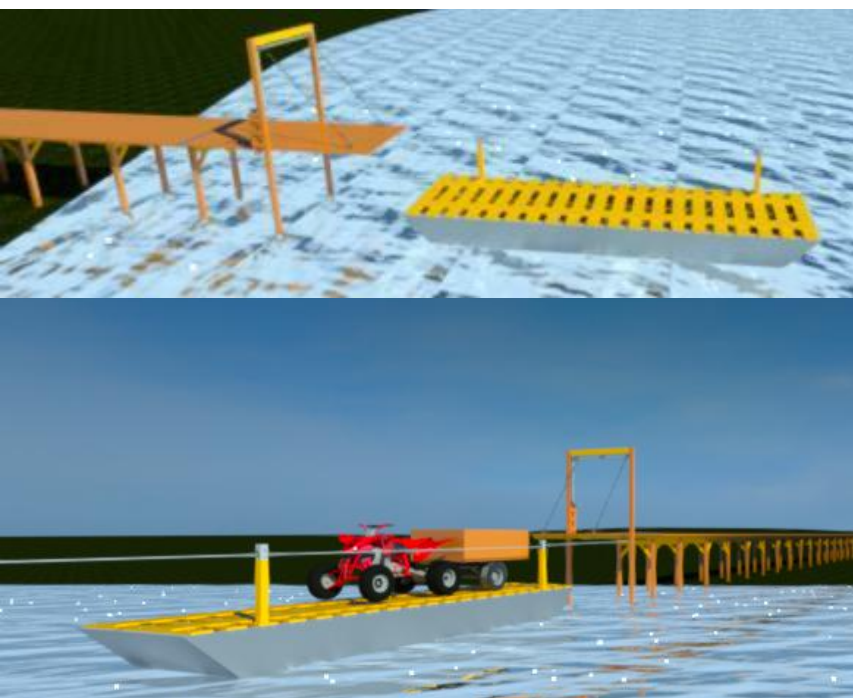
7a. Construct the Barba Azul staff house: The design for the Barba Azul staff is finished and the costs calculations refined to help us seek funding for this important infrastructure. With a growing team in Barba Azul, we have the responsibility to provide a comfortable housing environment for them. Therefore, we hope to get the support to start the construction of this needed infrastructure for Barba Azul operations.

Funding needs:
Our goal is to raise 90,000 USD for the staff housing construction.



Staff house design for Barba Azul staff. Ana Maria Underlasttaeter

7b. Create easy access river crossing: A boardwalk/ ponton river crossing design has been created reviewed and priced. This is extremely important to allow equipment fast access across the river for fire control. We decided on a cost-effective design that will give us quick access, but not make Barba Azul a focal point for cattle drive river crossing in the area.



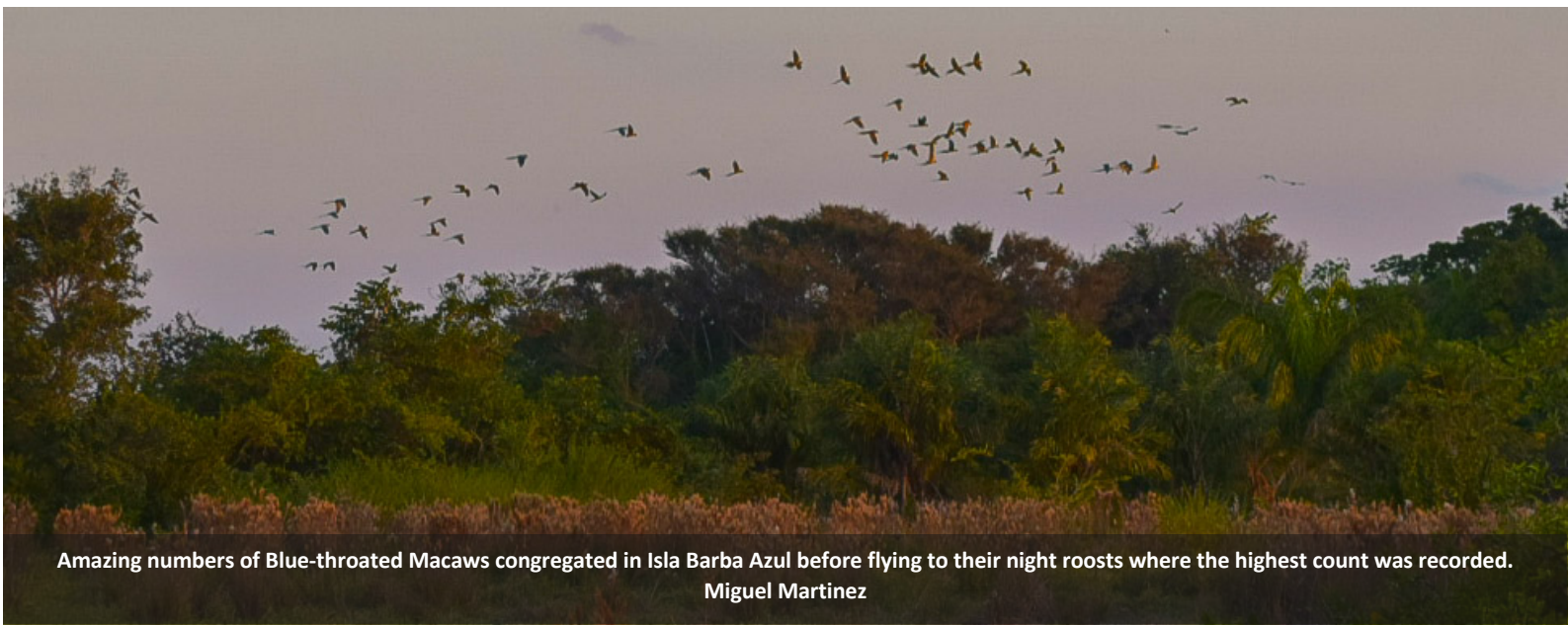
Design of wooden boardwalk for Barba Azul Nature Reserve. EA Servicios

Funding needs:
We are currently seeking funds to build a 157 m/515 ft wooden boardwalk (US \$105,000)

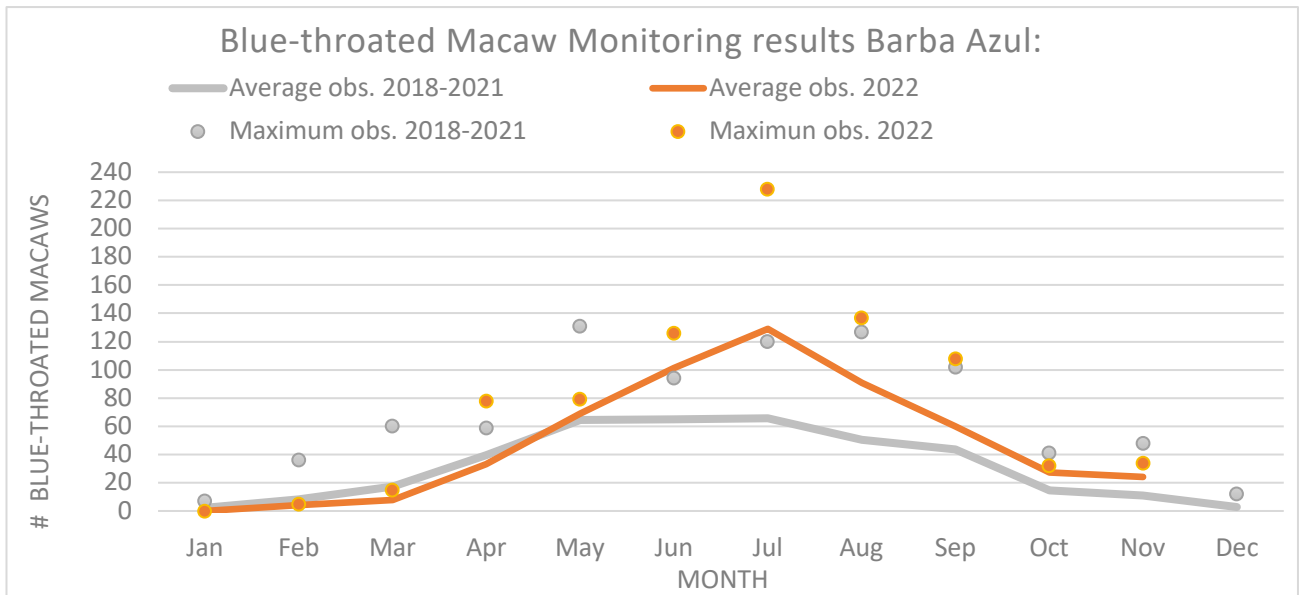
8. Develop Motacú regeneration strategy: The Motacú palm tree fruit is the main food source for the Blue-throated Macaw and currently it is severely threatened by the unsustainable use of forest islands across the Beni Savanna ([see video for more info](#)). As we plan to upscale our sustainable management practices in Beni, we need to develop cost-effective measures to promote Motacú regeneration in degraded forest islands across the landscape. With the help of Wageningen University master student, Mark van Leeuwen, we have set up plots within fenced islands with different treatments to test restoration methods and find the best option to regenerate Motacú faster.



9. Long term monitoring and research



A) Blue-throated Macaw monitoring: Incredible numbers of Blue-throated Macaws were registered this year during monitoring. The highest count was of 228 individuals at one of their night roosting islands in July. The highest count at the weekly monitoring point near Isla Barba Azul was 178 individuals. Both numbers can be a great indicator of a potential population increase for the species and results of the long-term conservation work made by Armonía in Barba Azul. These are motivating numbers to keep working on protecting habitat for the Blue-throated Macaw at a landscape level. Thanks to regular monitoring we are able to detect a trend that hopefully we will see at a total population level.



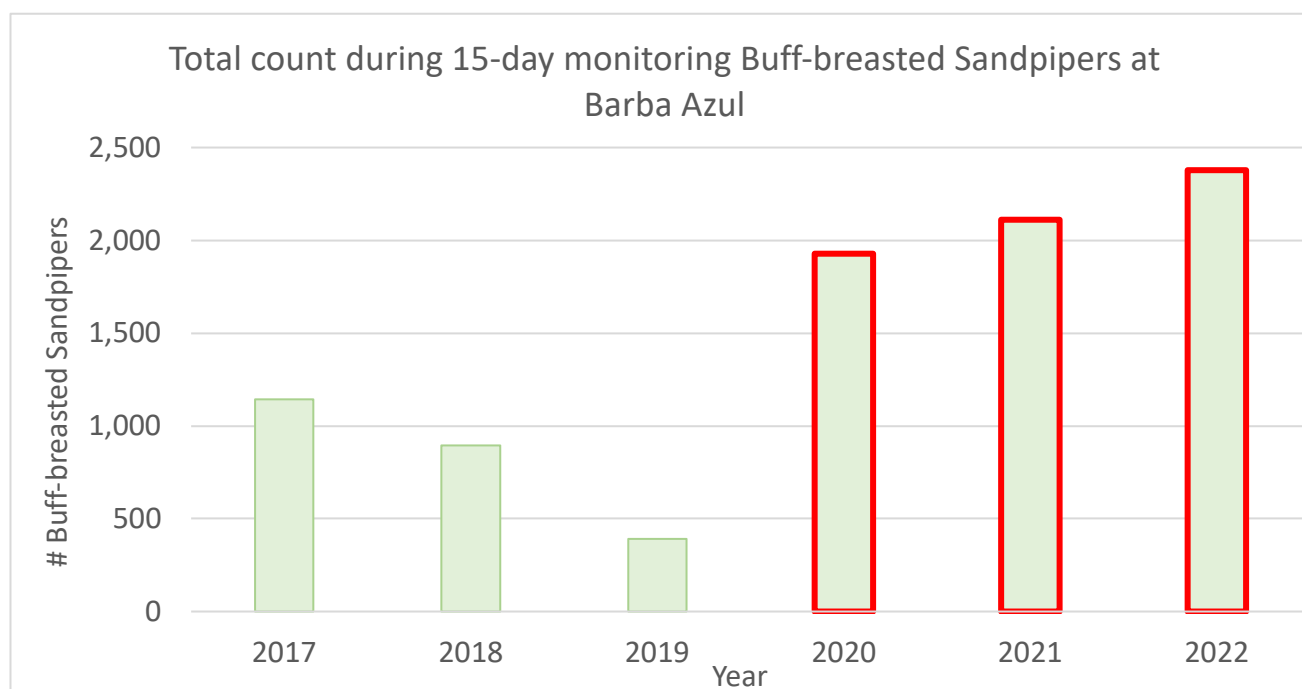
Graph 1. Blue-throated Macaw monitoring results systematically collected at the weekly observation point near Isla Barba Azul in the Barba Azul Nature Reserve. The gray line represents average Blue-throated Macaw numbers per month based on weekly Blue-throated Macaw data gathered between 2018 and 2021. The orange line represents average Blue-throated Macaw numbers per month for 2022. Dots represent the highest single count observations per month between 2018 and 2021 (gray), 2022 (orange).

B) Buff-breasted Sandpiper monitoring:

Barba Azul Nature Reserve is a hotspot for Buff-breasted Sandpiper migration and is yet again reflected with a record count of 3,871 Buff-breasted Sandpiper detections during our annual 30-day Buff-breasted Sandpiper monitoring program. Armonia started collecting migratory shorebird data since 2014 and since 2017 we have a solid and standardized database (graph 2). Thanks to the long-term support from the US Fish and



Wildlife Service's Neotropical Migratory Bird Conservation Act (NMBCA) program and support from the US Forest Service we are managing our grasslands with cattle since 2020 to improve stopover habitat for the near-threatened Buff-breasted Sandpiper (graph 2 - bars with red border). The survey sites where Armonia is managing livestock have the largest numbers of Buff-breasted Sandpipers as cows maintain the grass at a favourable length (6 cm) and cow dung provide additional food.



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.

Two rare migratory shorebirds for Bolivia discovered at Barba Azul Nature Reserve!

Our shorebird monitoring team discovered the Semipalmated Plover (*Charadrius semipalmatus*) and Least Sandpiper (*Calidris minutilla*) of which only a handful observations of both species are known in Bolivia. Barba Azul Nature Reserve was declared a Western Hemisphere Shorebird Reserve Network (WHSRN) site for regional importance in 2015 as it the most important stopover site for Buff-breasted Sandpipers in Bolivia. But not only Buffies us Barba Azul as this year we observed 14 migratory and 4 resident shorebirds including the Upland Sandpiper (*Bartramia longicauda*), American Golden-plover (*Pluvialis dominica*), Hudsonian Godwit (*Limosa haemastica*), American Golden Plover and large numbers of Pectoral Sandpipers (*Calidris melanotos*).



Two new migratory shorebirds found in Barba Azul Nature Reserve: Least Sandpiper (*Calidris minutilla*) and Semipalmated Plover (*Charadrius semipalmatus*). Álex Giménez

C) Camera trap monitoring. Since Miguel Martinez started working with us as the main Park Ranger, he continues to improve the camera trap monitoring system at Barba Azul ([See Miguel's puma encounter](#)). After more than a year of data gathered, he has finished a study that is going to be presented at the IX Bolivian Congress of Mammalogy this year. He evaluated the diversity and relative abundance of mammals with the aim of carrying out future planning and management of wildlife in the Reserve. He collected information and sampled in the different vegetation units between May 2021 and July 2022 with 25 photo-trapping stations.

The results include the record of 33 species of mammals, belonging to 8 orders and 17 families, with Carnivora being the order with the highest species richness recorded (10 spp). With a sampling effort of 1,450 days/trap, he obtained 1,086 independent records. The most represented species through the relative abundance index were, Agouti (*Dasyprocta variegata*), South American Coati (*Nasua nasua*), Capybara (*Hydrochoerus hydrochaeris*), and Collared Peccari (*Pecari tajacu*). Samples showed the presence of large mammals sensitive to habitat change, such as Maned Wolf (*Chrysocyon brachyurus*), Giant Anteater (*Myrmecophaga tridactyla*), South American Tapir (*Tapirus terrestris*), Marsh Deer (*Blastocerus dichotomus*) and the recently recorded Jaguar (*Panthera onca*). These are an indicator of conservation management carried out since the creation of the reserve, where the human pressures prior to its establishment have been partially or totally eliminated, allowing natural habitat regeneration for the resurgence of mammal populations that in the past were depleted by hunting pressure, unsustainable cattle ranching and burning, highlighting the potential value of private protected areas for the conservation of habitats and threatened species.

First camera trap record of a Jaguar (*Panthera onca*) for Barba Azul Nature Reserve.



D) Grassland carbon capture: With the support of local cattle ranchers and landowners we will be testing carbon capture capacity under different cattle management systems in private cattle ranches and in Barba Azul East. We expect to know which practices are better for the soil and the grasslands and the possibility of offsetting emissions with improved management.

