

Barba Azul Nature Reserve Annual report 2019



Puma (*Puma concolor*): Asociación Armonía

In many respects 2019 is the year that validated our Barba Azul conservation strategies, one example being the increase in large predators like the Puma (*Puma concolor*), an indicator of a healthy habitat. This individual is showing off in front of our newly placed camera trap.

Conservation and development of the Barba Azul Nature Reserve in 2019 was supported by:



A grant from the
Neotropical
Migratory Bird
Conservation
Act



Project photos can be downloaded from:

www.flickr.com/photos/128583429@N05/albums/72157657123371838

Summary

Two thousand and nineteen was the year of validation for Barba Azul Nature Reserve. This message is heard clearly by visitors, who constantly remark on the incredible abundance and tameness of the wildlife. Casual observation and camera trap data shows an increase in predator presence like the Puma. It is clear that populations of Marsh Deer, Red-brocket Deer, Pampas Deer, Collared Peccary and Ocelots have more than doubled in the last three years.

In 2019, we completed a five-year goal to offer visitors a comfortable stay by finishing all the tourism infrastructure. Barba Azul now offers four fine-tuned cabins, an amazing dining hall, all powered by 24-hour solar electricity and high-water pressure with a new water tank. Our park guard Carlos Roca has blossomed into an excellent local guide, taking pride in his expert knowledge of Blue-throated Macaw movements, and finding the rare birds birdwatchers always want to see.

Carlos Roca observed the first Blue-throated Macaw pair showing interest in our new penthouse nestbox design. This is a tremendous result as we finally discovered how to attract them to breed on Barba Azul. Also, Armonía succeeded for the first time in history to place satellite telemetry trackers on Blue-throated Macaws. Three Macaws from the Barba Azul Nature Reserve now provide detailed information on their local movements and where they breed.

This year is also marked by Armonía officially starting “ranching for conservation” in Barba Azul East. In total 137 head of cattle are managed according an ecofriendly ranching model and already produced 3 newborn calves. We produced the first “Beni Savanna Best Practices Ranching Guide” to introduce this sustainable model throughout the Beni Savanna to safe species from extinction together with ranchers.



Blue-throated Macaw (*Ara glaucogularis*): Lennart Verheuvell

Barba Azul Nature Reserve

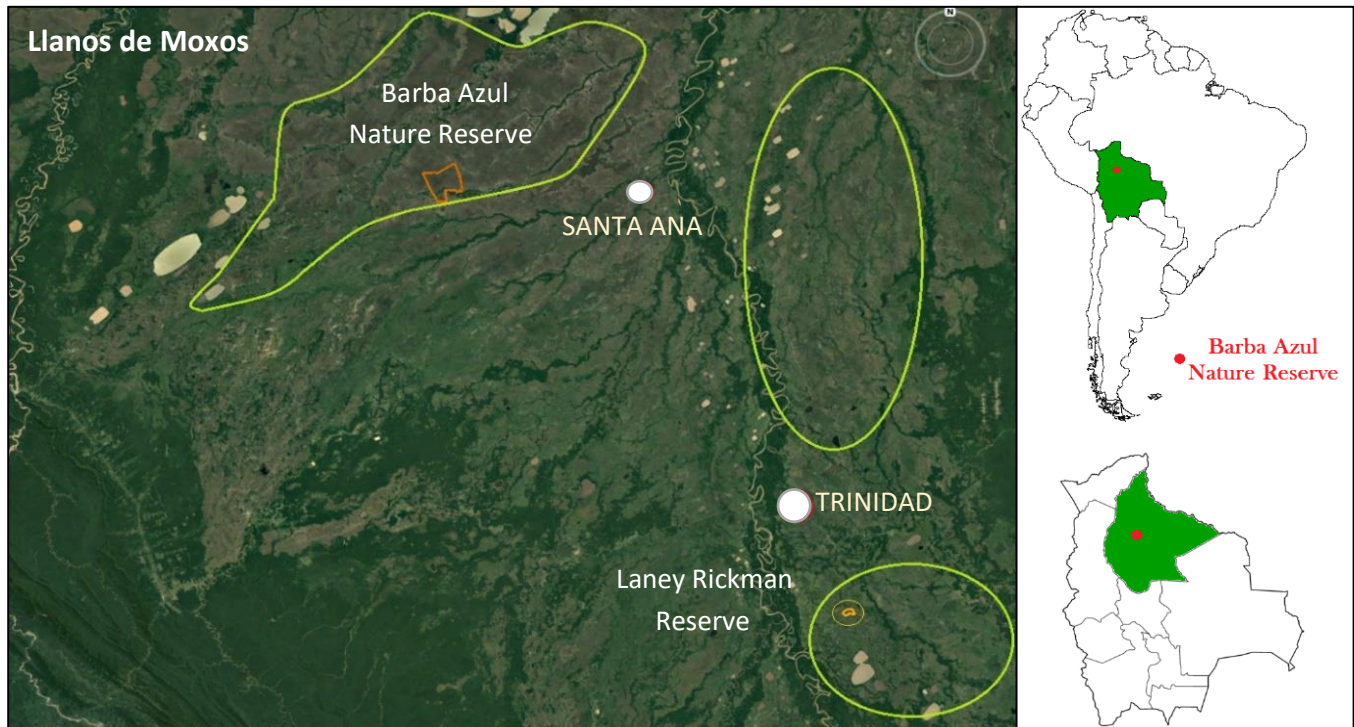


Figure 2. The Barba Azul Nature Reserve is located in the north of the Llanos de Moxos, 75 kilometers west of Santa Ana de Yacuma and 213 kilometers northwest of the newly created Laney Rickman Blue-throated Macaw Reserve. Armonía protect vital Blue-throated Macaw habitat in 2 isolated subpopulations (estimated Blue-throated Macaw subpopulation range indicated in light green circles).

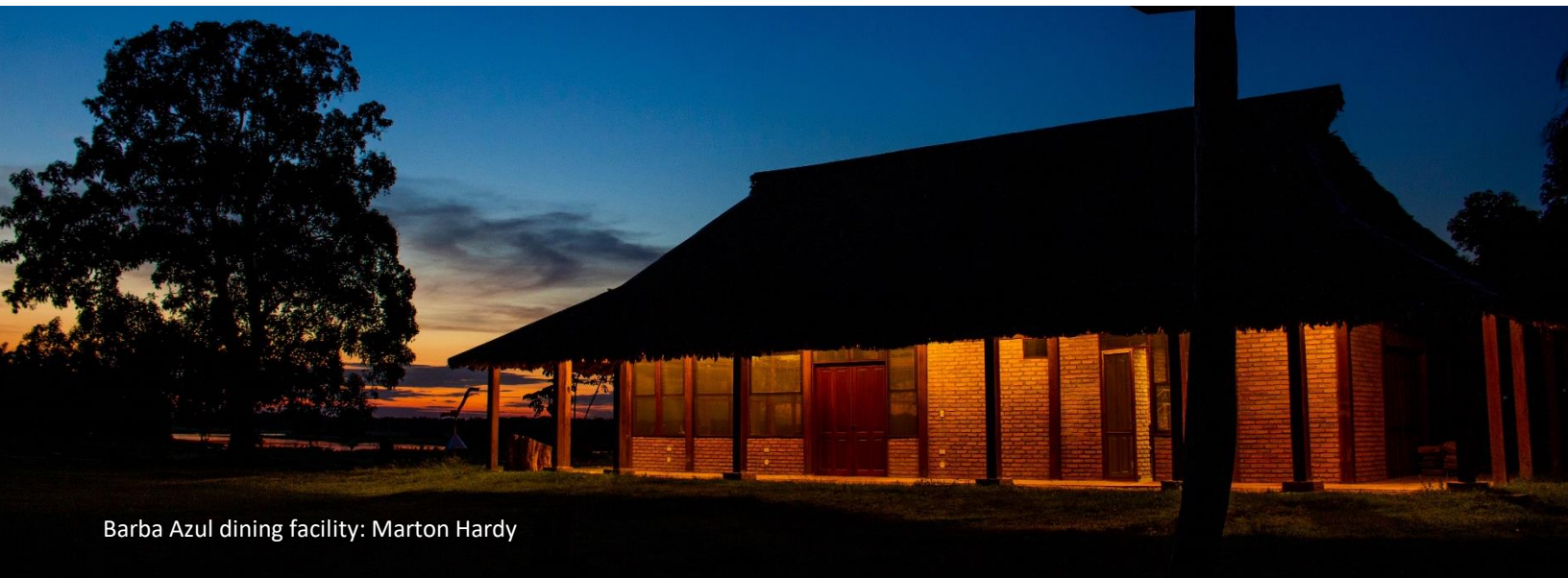


Figure 3. The Barba Azul Nature Reserve is subdivided for two main land-use zones: Barba Azul (5,000 ha) designated for ecotourism and conservation; Barba Azul East (6,000 ha) designated for sustainable cattle ranching and conservation. The Barba Azul lodge is located south of the river Omi containing 4 private cabins, field station and dining facility. The Barba Azul Ranch is located north of the river Omi where all ranching activities are implemented.

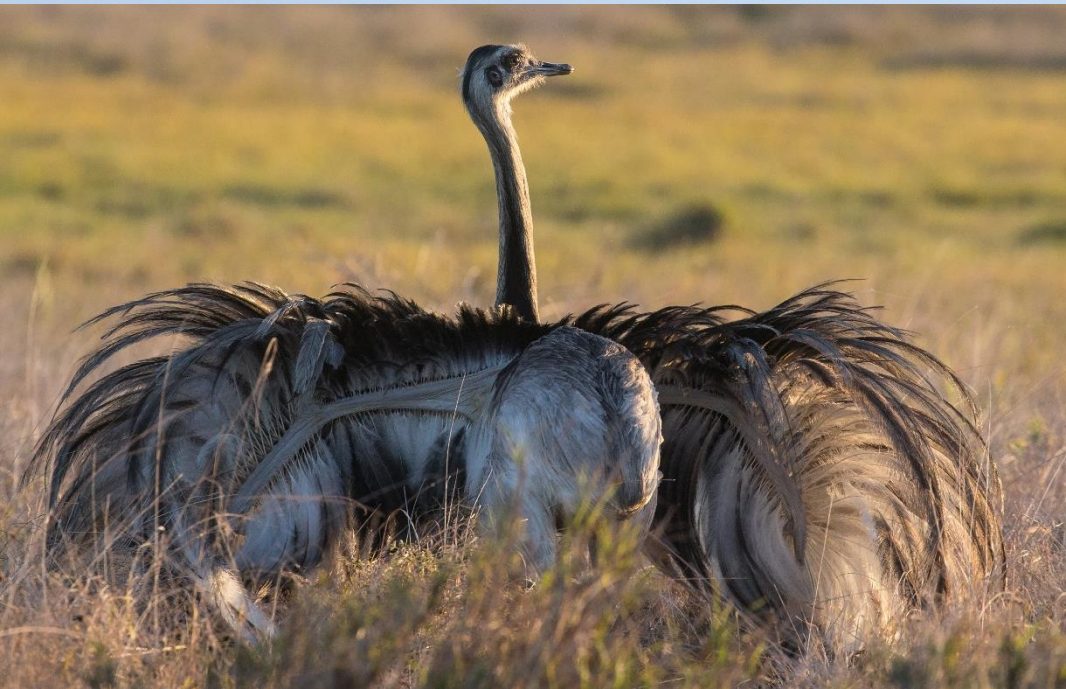
Barba Azul Nature Reserve 2019 goals

Our main goals for 2019 to ensure a continuous development of Barba Azul Nature Reserve and its infrastructure were:

1. Establish solar electricity system and underground wiring
2. Complete raised firebreak system with backburns (Barba Azul North & South)
3. Complete tourism infrastructure
 - Complete dining facility
 - Complete interior design cabins
 - New water tank with filtration system
 - Complete trail system and signage
4. Complete cattle ranching infrastructure (Barba Azul East)
 - Complete worker house, deposit area and roofed tractor parking
 - Complete corral improvements (gathering pens & gates)
 - Establish a total herd of 1,000 head of cattle
5. Establish 7-kilometer live fencing
6. Stocking rate experiment to study livestock/Buff-breasted Sandpiper relationship
7. Camera trap monitoring system in each habitat type
8. Research
 - Blue-throated Macaws (3) with GPS tracker
 - Continue savanna habitat research
 - Continue Buff-breasted Sandpiper monitoring
 - Fenced exclusion zones in each habitat



Barba Azul dining facility: Marton Hardy



Top to bottom: Jabiru, Greater Rhea, South American Kestrel, Upland Sandpiper, Buff-breasted Sandpiper, Blue-throated Macaw:
Lennart Verheuvell and Teodoro Camacho (Upland and Buff-breasted Sandpiper)

Breaking News: “A dramatic love story in Barba Azul”

In May this year, Carlos Roca brought ground breaking news. Our Barba Azul Keeper of the Wild observed three pairs of Blue-throated Macaws exploring the newly created breeding habitat in the Barba Azul Nature Reserve. These elevated “penthouse” nest boxes were placed in August 2018 and mimic the breeding habitat that Armonía discovered in 2017 (<http://armoniabolivia.org/2017/03/17/armonia-discovers-new-breeding-area-for-the-critically-endangered-blue-throated-macaw/>). Macaws are known to identify breeding cavities many months before they are ready to breed, so we kept a watchful eye on these penthouse nest boxes.

All looked extremely positive. A pair was seen daily on top and within the nest box, defending it from possible intruders. They had to quickly kickout a pair of Orinoco Goose (*Neochen debilis*) who also found this penthouse a promising nesting site. But our pair conquered. They chewed away on their entrance, the roof and the sides to prepare a soft bed of wood chips to lay their eggs. This was all too good to be true.

Terror hit Barba Azul! Weather conditions went from a peaceful hot afternoon, to a diabolical thunderstorm with horizontal rain and lightning crashing down. This is part of this extreme ecosystem and is often needed as the dry season is intensely dry. The next day, Tjalle Boorsma could not believe his eyes. Two of the penthouse nest boxes were completely shattered and pieces of timber were scattered all round the river-edge shortgrass. A pair of Blue-throated Macaws were sitting on top of the leftovers of their nest, desperate to enter their preferred new home.

Quickly a new nestbox was erected at the same location but sadly it was not as good as the so preferred nestbox they have been making their home.

Although this sounds sad, we learned a lot about this new breeding site experiment. It is clear that we need to place lightning rods or some kind of lightning deterrent to prevent this from happening again. Also, other nestboxes were occupied by bees. We noticed that our birds chewed the roof, making a hole. This would prevent bees from making it their house as they need a closed cavity. But the best news is: The Macaws showed that they like these nestboxes and were preparing to breed. We know that when

they learn to use them, proved by the successful nestbox program in the Laney Rickman Reserve, they will use them forever. We are about to achieve protecting the entire lifecycle of the Blue-throated Macaw in Barba Azul.



Pair on penthouse nest box: Luciene Carrara

Barba Azul 2019 Results

Barba Azul Nature Reserve is part of Armonía's large scale conservation program to protect the endemic and Critically Endangered Blue-throated Macaw and its habitat. This year has been very exciting as many long-term dreams have come true. So many of our goals have been met to better understand the biology of this majestic bird, the protection and improvement of its habitat, the development towards Barba Azul sustainability, and moving this conservation program way beyond the borders of the reserve to ensure landscape scale conservation.

This year was marked by hiring new personnel to make all this work feasible. Laura Velarde, our Conservation Tourism Coordinator manages Armonía's tourism logistics, but also produced many promotional products to put Barba Azul on the wildlife watching and birding map. An amazing promotional video was created by Marton Hardy (Armonía's Communication Officer) and soon will be launched to attract more visitors to this unique and hyper diverse reserve. Edson Lopez (Sustainable Ranching Coordinator) is now managing our livestock and is implementing best practices ranching to make Barba Azul the first eco-friendly model ranch in the Beni savanna. And Luz Mercado (Blue-throated Macaw Conservation Coordinator) pushed this sustainable model way beyond the protected borders of Barba Azul through the publication of the first "Beni Savanna Best Practices Ranching Guide".

1. Establish Solar electricity system and underground wiring

Through American Bird Conservancy and International Conservation Fund of Canada, Barba Azul Nature Reserve is running now on clean solar energy produced by 24 panels and stored in 16 (12V) batteries. Four cabins, dining facility, biological station and park ranger house have now 24 hours/day electricity. Also, all electric cables are underground through tubing, preventing possible damage by falling branches or trees as well as improving the view. Now that Barba Azul completed the dining facility and all kitchen furniture has been installed, we need 24-hour electricity for the fridge and freezer.



Barba Azul solar system: Tjalle Boorsma

2. Complete raised firebreak system with backburns (Barba Azul North & South)

All firebreaks in Barba Azul North and South were maintained and no fire entered the Barba Azul conservation area in 2019. We implemented the first backburn together with Jo Kingsbury, a burn management expert from the Ohio State University. This was an important learning process for the entire management team and can now be reproduced in upcoming years throughout the reserve. We hoped to complete all firebreaks with backburns though the departure of Jo and weather conditions prevented this completion. An area of 30-50 meters was burned between the main existing firebreak and a security firebreak, to create a fuel free area. When a fire hit this fuel free section, it will reduce in intensity and will completely stop upon hitting the well-maintained firebreak.



Parallel backburn firebreak: Tjalle Boorsma

3. Complete tourism infrastructure

Complete dining facility

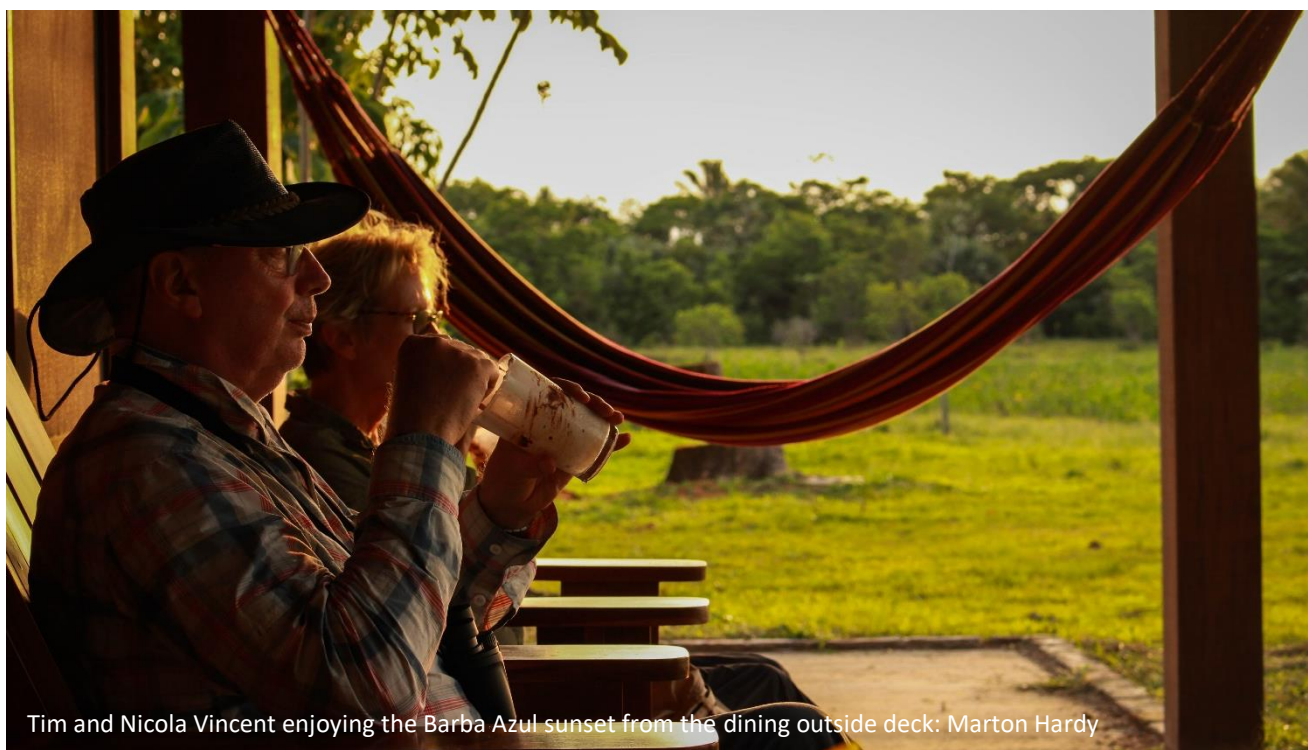
Armonía's Barba Azul Nature Reserve dining facility is completed and fully equipped to receive up to 20 visitors at a time. The building is entirely operating on solar energy assuring 24-hour electricity. Due to the tall design, its position towards prevailing winds and the Jatata roofing, "Sala Barba Azul" is the best ventilated and therefore coolest building within the Barba Azul Nature Reserve, equipped with hammocks, sofas and comfortable chairs to relax after a full day of birding, wildlife watching and photography. Thank you, American Bird Conservancy and International Conservation Fund of Canada to make this happen.



Barba Azul dining facility: Tjalle Boorsma



Barba Azul dining facility interior: Marton Hardy



Tim and Nicola Vincent enjoying the Barba Azul sunset from the dining outside deck: Marton Hardy

Complete interior design cabins

We were able to fully complete cabin improvements to the 4 Barba Azul rustic cabins. Through the support from the International Conservation Fund of Canada we constructed a deck in front of each cabin. A carpenter created 8 comfortable Muskoka chairs to enjoy the late afternoon sunset and observe the Omi river wildlife from your cabin deck. New cabin furniture, ceiling fans, artwork and missing bathroom items (shower door, shampoo rack, towel and toilet paper hanger) were installed, making the cabins your home away from home.



Cabin observation deck: Carlos Roca



Improved cabin interior design: Marton Hardy

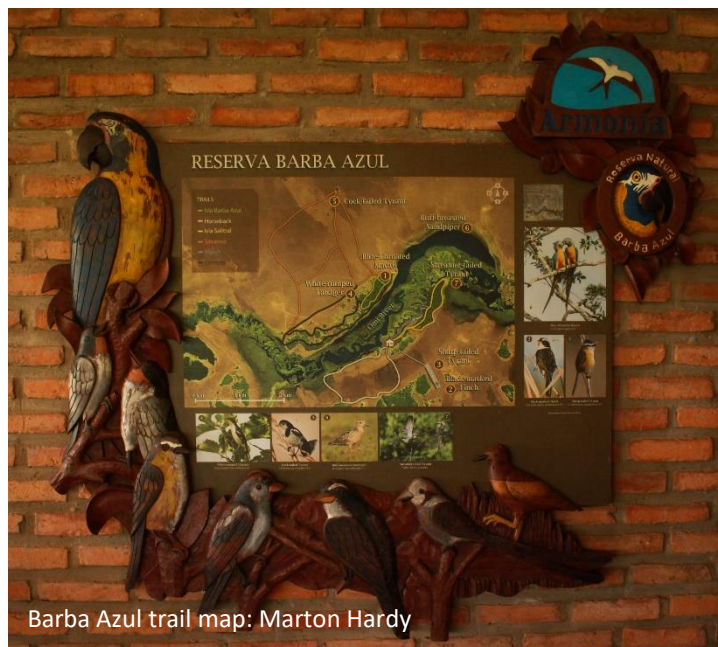
New water tank with filtration system

Thanks to International Conservation Fund of Canada we are extremely pleased to have a new water tank installed on a 10-meter high metal structure to ensure long-term durability. The tank is 10-times larger in volume than our previous tank and can now provide water for up to an entire week with all our cabins and field station occupied. The higher elevated tank also ensures stronger water pressure for the furthest most cabin. The metal tower is constructed to easily maintain and clean the tank and on a side note, works perfectly as a bird observation tower.



Complete trail system and signage

One of the most bird diverse habitats in Barba Azul is the Cerrado forest mixed with Motacu palm stands that form part of the Gallery forest. This mixture of forest creates a very interesting bird community. With the Barba Azul tractor we completed an extensive trail system through this habitat type, where multiple short circuits can be walked depending on the time of day. In the new dining facility, we have a trail map installed and each cabin now have additional information on the walking trails, length and the highlighted species that one can expect to see. With all the trails in place, our next step is to complete the signage along the trails.



4. Complete cattle ranching infrastructure

We are extremely grateful to the Neotropical Migratory Bird Conservation Act (NMBCA) grant from the US Fish and Wildlife Service for their long-term support and trust in Barba Azul to manage natural grasslands for the conservation of migratory species. NMBCA helped Barba Azul in 2019 to continue the ranching conservation strategy started by the March Conservation Fund and American Bird Conservancy, to manage cattle for conservation and long-term reserve sustainability. This innovative approach is crucial to provide on the ground results to show cattle ranchers in the Beni savannas that higher productivity and conservation can go hand in hand through an ecofriendly ranching model.

Complete worker house, deposit area and roofed tractor parking

The Barba Azul main need for the near future is the continuation and modernization of our eco-friendly ranching program. Funding is needed to meet all infrastructure needs to ensure a practical, comfortable and safe ranch to manage the Barba Azul livestock. In 2018, important ranching infrastructure was developed (paddock fencing and new corral) and this year we started our herd of 137 head of cattle managed by a team of trained cowboys. To ensure comfortable work conditions and modernize the Barba Azul ranch we need fundraise \$80,000 to build a worker house, deposit area and roofed tractor park.

Establish a total herd of 1,000 head of cattle

Barba Azul East, the designated ranching area within the Barba Azul Nature Reserve, is now home to 137 head of cattle and 7 work horses thanks to the Neotropical Migratory Bird Conservation Act (NMBCA) program from the US Fish and Wildlife Service, March Conservation Fund and American Bird Conservancy. We aim for a total of 1,000 head of cattle to ensure an economic profitable model, meet governmental requirements and manage the grasslands according the ecofriendly rotational grazing model. The Barba Azul biggest need for support is increasing our herd to reach economic sustainability.



Barba Azul newborn: Edson Lopez



Barba Azul new horses: Lennart Verheuvell

Complete corral improvements (gathering pens and gates)

Through the support from March Conservation Fund and American Bird Conservancy, Barba Azul constructed in 2018 a new corral where cattle can be examined, vaccinated, marked and studied. This year, thanks to the NMBCA grant, we improved the corral with a roof that provides comfortable work conditions to manage livestock. Beside safely and comfort for the cowboys, it also ensures the durability of the timber, protecting it from heavy rain and intense sun. All necessary gates have been replaced to move livestock in and out the corral. Additional funding of \$15,000 is required to make improvements to the gathering pen, changing the square model to a more livestock friendly circular design.



New roofing of the corral: Edson Lopez

5. Establish 7-kilometers live fencing

One of Barba Azul's most challenging programs is the Aliso live fencing project. This pilot project started in 2017 to plant the Aliso tree (*Vochysia divergens*) to replace fencing posts. We are extremely thankful to the World Land Trust who was willing to support this innovative idea for the Beni savanna region. Unfortunately, our transplanting success rate has not been enough to secure these live fences as a valid solution. Multiple transplanting methods; vegetative vs transplanting, dry vs wet season, small vs large trees; were tried to evaluate successfulness, though the expected survival rates were unsatisfactory. The extreme and annually fluctuating flooding and drought conditions of the Beni makes proper planning difficult and complicated our project.

As cattle ranching is the main economy of this region, there is no other approach than to find a model that generates a win-win situation for ranchers and conservationists. This living fence post program where ranchers benefit from trees that provide refuge for livestock and lower fencing maintenance costs as well as providing a food source for the Blue-throated Macaw, perfectly fits within this strategy. For a program like this to be feasible to implement on a large landscape scale, it must be costs effort affective. We will continue to seek a solution for this problem.



6. Stocking rate experiment to study livestock/Buff-breasted Sandpiper relationship

To move forward in adaptive management approaches like cattle ranching for conservation, scientific experiments are needed to study the impact of livestock on biodiversity and the successfulness of a sustainable ranching program. Six years of shorebird migration data, thanks to the support of the Neotropical Migratory Bird Conservation Act (NMBCA) grant, proved the importance of the Beni grasslands for long distance migrating shorebirds like the Buff-breasted Sandpiper (*Calidris subruficollis*) and Upland Sandpiper (*Bartramia longicauda*). These species use the Barba Azul Nature Reserve as a critical stopover site and is therefore recognized as Bolivia's only Western Hemisphere Shorebird Reserve Network (WHSRN) site of regional importance.

To meet this goal, more livestock is needed to scientifically study the impact of different stocking rates of cattle on the Buff-breasted Sandpiper preferred habitat. We hope to implement this program in the near future when we are able to acquire more livestock.

7. Camera trap monitoring system in each habitat type

Thanks to Idea Wild, Barba Azul successfully placed 6 brand new Browning Strike Force camera traps in different habitat types and strategical congregation sites. We placed them along our newly created Cerrado trail, at a waterhole in open savanna habitat, a natural saltlick, strategical site at the forest edge near the Omi river and two in the largest Gallery forest stand. This has resulted in amazing videos footage and photos of: several Puma individuals, Ocelot with cub, Howler Monkey family coming down to eat minerals, numerous Giant Anteaters, the threatened Marsh Deer and the elusive Maned Wolf.



8. Research

Blue-throated Macaw (3) with GPS tracker

On the 31st of August, Lisa Davenport together with Luciene Carrara, Lucas Carrara and Tjalle Boorsma finally succeeded in capturing the first Blue-throated Macaw in the Barba Azul Nature Reserve for Armonía's satellite telemetry tracking study. These trackers give crucial insight in the species local movements and finding their breeding sites. In total we succeeded in capturing four Blue-throated Macaws of which three Macaws were equipped with a tracker (project had 3 satellite telemetry trackers). From all four individual's, basic anatomical information was collected, as well as blood samples for future DNA analysis. Now we start to know where our Barba Azul birds fly to in the rainy season. Another mystery solved.



Lucas Carrara releasing first ever Blue-throated Macaw with telemetry tracker: Tjalle Boorsma

It took us three years to finetune the capturing technique sufficiently bird friendly and logistically feasible within the vast savanna landscape. We studied typical flight patterns and discovered perching sites. Studying these perching sites, we observed their behavior to evaluate the best capturing technique. We have collected more than 90 days of movement data which will soon be published in a scientific journal. This project was in the past supported by the American Bird Conservancy and the Mohamed Bin Zayed Species Conservation Fund. We would like to specially thanks Lisa Davenport for her incredible perseverance and willingness to complete this project with her amazing Brazilian team (Luciene and Lucas Carrara) who made this a big success.

The 2019 effort were covered by Lisa Davenport, Friends of Barba Azul Nature Reserve and the Neotropical Migratory Bird Conservation Act (NMBCA) grant.

Continue savanna habitat research

Jo Kingsbury from the Ohio State University finished her PhD field work this year in Barba Azul where she collected vegetation and bird data in plots, she burned in a controlled manner in 2018. She is comparing grassland bird abundances between various years, between unburnt vs burnt and between grazed vs un-grazed along the Cerrado-Savanna gradient. This work is crucial to have baseline information of Barba Azul East, from which we can evaluate our eco-friendly cattle ranching model related to habitat and bird conditions.



Cock-tailed Tyrant (*Alectrurus tricolor*): Lennart Verheue

Continues Buff-breasted Sandpiper monitoring

Armonía has collected through the support from the Neotropical Migratory Bird Conservation Act (NMBCA) grant from the US Fish and Wildlife Service, six years of shorebird data in Barba Azul of North American migratory as well as resident shorebirds. Through the gathered information, Barba Azul Nature Reserve was declared a WHSRN site of regional importance in 2015, and has put the Bolivian Beni Savannas on the Western Hemisphere map for shorebird importance.

This year we increased monitoring effort from 15 to 30 days (1st to 30th of September), based on migration period estimates gathered between 2016 and 2018. The maximum day count of Buff-breasted Sandpipers in 2019 was 119 individuals. We estimate over 1,100 individuals to have migrated through Barba Azul. Most of them migrated through in the second half of September. A total of 14 different

species of shorebirds were observed of which 10 long distance North American migrants. The two most abundant migratory sandpipers were Buff-breasted and Upland Sandpiper.



Shorebird monitoring team (Wendy Buheza, Fabiola Baya, Jazmin Quiroz, Teo Camacho, Sandro Gomez: Teo Camacho)

Tjalle Boorsma and Marcia Salvatierra presented these shorebird results during the 8th Western Hemisphere Shorebird Group meeting in Panama City. Armonía will partake in the Mid-Continental Flyway initiative that intend to protect shorebird in all habitats throughout their lifecycle. Armonía's grassland conservation program fits this strategy.

Fenced exclusion zones in each habitat

Experimenting with enclosure zones in different habitats to study the impact of grazers and browsers on the environment is high on our wish list. We have not yet been able to implement these activities due to an occupied schedule. Now that Barba Azul has the most important development actions in place, in 2020 we can focus on new experiments to further improve habitat.

Students and volunteers

A total of 5 master students visited the Barba Azul Nature Reserve for their thesis projects (4 students from the Wageningen University Netherlands (NL) and 1 from the Imperial College London).

Motacu Regeneration

Christiaan Spencer (NL) studied the regeneration of Motacu (*Attalea princeps*) in permanent sample plots established in 2016. He looked at a wide range of factors determining the survival rate of seedlings, including the impact of bruchid beetles on the germination and recruitment capacity of Motacu. Therefore, he cracked open over 400 seeds to study beetle infestation.

Blue-throated Macaw

Tiemen van Engelenhoven (NL) studied the difference in group composition, group size and perching site preference of two most abundant Macaw species in Barba Azul: Blue-throated Macaw vs Blue-and-Yellow Macaw.



Tjalle Boorsma and Tiemen van Engelenhoven talking about Macaws: Kasper Albeda

Small and Medium Sized Mammals

Kasper Alberda (NL) looked at how differences in landscape, anthropogenic disturbance and forest patch quality affect the diversity and abundance of small to medium sized mammals. He placed camera traps in the permanent sample plots that were established in 2016.

Forest Composition

Michon Fleer (NL) studied the forest composition of non-palm species in the same permanent sample plot. Over the years many different types of data have been collected in these sites to evaluate which factors drive the forest composition in Barba Azul Nature Reserve forests.

Best Practices Ranching

Luciano Simonetti (UK) conducted face-to-face interviews with around 40 ranchers to better understand actual ranching practices and study the willingness to move towards more sustainable practices. Luciano was partially assisted by Luz Mercado visiting neighboring ranches of the Barba Azul Nature Reserve. The first results of the study show that all the participants perceive positively the initiative on sustainable cattle ranching.

Volunteer Program

Alba Fernandez, a graduated master's student from Spain, started her volunteer work studying small to medium sized mammals in March. She compared different gallery forest as well as different age classes of savanna for mammal's diversity and abundance. Her camera trap locations will be used for long term monitoring. Lennart Verheuvell from the Netherlands continued her mammal research and helped monitoring the camera traps and provided Armonía with amazing wildlife footage.



Crab-eating Fox (*Cerdocyon thous*): Alba Fernandez

9. Barba Azul Nature Reserve Tourism

A total 20 tourist visited the Barba Azul Nature Reserve in 2020. Seven tourists had to cancel their trip in November during the 21-day national strike protesting the election fraud. Their comments have been amazing and with the new dining facility and improved cabins, we are ready for professional tourism. Laura Velarde created an evaluation, where 100% of the forms in 2019 had stated accommodation and service were excellent. It was made clear that Carlos Roca and Yuri Vaca (tourism service) are an amazing team who made visitors truly feel at home.

“A great place for birds and birders. We had a wonderful time and saw all species: Blue-throated Macaw, Cock-tailed Tyrant, Sharp-tailed Tyrant, Black-masked Finch. Excellent food and warm hospitality” Rita and Ron from Belgium.

“Such a paradise! Thank you for a wonderful experience. A very peaceful natural place with amazing wildlife” Tim and Nicola Vincent from England guided by Ramiro from Peru.

“A wonderful stay with the songs of birds all day! Many thanks to the kind staff! Just great! Long live the wildlife” Gerard, Evelyne and Brice from France guided by Raul from Bird Bolivia.



Ramiro, Tim and Nicola Vincent: Marton Hardy

Many of the Barba Azul expenses are supported by a very special group of individuals that form the Friends of Barba Azul Nature Reserve. To increase this special support group, all visitors receive information at their cabin to become part of this Friends group, supporting long-term conservation at the Barba Azul Nature Reserve. Thank you, James Muchmore from Muchmore Design for creating this promotional material and the new Barba Azul Nature Reserve logo.

Barba Azul Nature Reserve 2020 Goals

In 2020, Armonía continues the successful Blue-throated Macaw conservation program in three main areas: 1) Barba Azul Nature Reserve, 2) Laney Rickman Blue-throated Macaw Reserve where we continue our long-term nestbox program and 3) the Yata region to work closely with cattle ranchers on sustainable ranching practices. We intend to organize a follow-up second Eco-friendly Ranching Meeting, after Armonía's successful meeting in 2016.

For 2020, we will continue to conduct protection, research, monitoring activities and working towards the sustainability of the Barba Azul Nature Reserve. We have set the following goals to ensure the continuous development of Barba Azul.

1. Back burn firebreak system established in conservation priority sites
 - Raised firebreaks and trails for quick fire inspection
2. Improve Blue-throated Macaw breeding habitat (refine nestbox program)
3. Savanna Management implemented
 - Patch burn management to increase grass diversity
 - Complete fire observation towers
 - 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 1,000 head of cattle
6. Fine tune tourism needs
 - Trail signage
 - International and local promotion of Barba Azul
 - Finetuning service
 - Implementing missing furniture
 - Wildlife watching vehicle
7. Create easy access river crossing
8. Research
 - Fenced exclusion zones in each habitat
 - Buff-breasted Sandpiper monitoring
 - Blue-throated Macaw DNA study between subpopulations



Top to bottom: Puma, Giant Anteater, Yellow Armadillo, Pampas Deer, Manded Wolf: Asociación Armonía (Puma), Lennart Verheuvél (Yellow Armadillo) and Teodoro Camacho