

# PSITTAScene

*Magazine of the* WORLD PARROT TRUST



*Autumn 2022*



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**ABOUT THE WPT**

Capture for the live-bird trade, habitat loss and other factors put wild parrots at risk. Nearly 30% of all parrot species are considered by IUCN to be at risk of global extinction.

As an international leader in parrot conservation and welfare, the World Parrot Trust works with researchers, in-country organisations, communities and governments to encourage effective solutions that save parrots.

Since 1989 the WPT has grown to become a global force that moves quickly to address urgent issues and support long-term projects. Over that time WPT has led or aided conservation and welfare projects in 45 countries for more than 80 species of parrot.

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**ON THE COVER**

Photo © Neil Bowman, Getty Images

The **Patagonian Conure** or **Burrowing Parrot** (*Cyanoliseus patagonus*) inhabits savanna, grassland, wooded valleys and cliffs in Argentina and Chile.

They forage mainly on the ground on seeds and berries, and form large flocks to roost.

Learn more on **Page 17**, *Do Wild Parrots Self-medicate?*



a message from...  
**The Editor's Desk**

Every day it seems we see and hear news about flood, drought and other extreme weather events. A result of heat, wind and lack of rain, drought can greatly exacerbate brush fires, including those in areas where parrots are found.

But help is at hand: in this issue we hear from Eric Horstman, a fire specialist and environmental consultant, whose work in different countries aims to help local people protect themselves and their native wildlife from uncontrolled fires. Giving communities the power to take positive action before and during these events is essential.

Then we talk to Alisa Davies, WPT's Wildlife Trade Specialist, on the enormity of the parrot trade in West Africa, and feature an intriguing article about how parrots medicate themselves to treat internal parasites.

Rounding up our issue is a short article on parrot longevity and vocal learning, and a review on what will become an essential workbook for all conservationists: *Effective Conservation* is a well-reasoned, thoughtfully written volume that will greatly aid the preservation of wildlife and habitat around the world.



*Desi*

Desi Milpacher  
 Publications Editor

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Visit our website at [parrots.org/legacy](https://parrots.org/legacy) or contact an office near you (see page 23.)



Great Green Macaw, Costa Rica © Artush

Leave a Legacy



© Cecilia Muñoz

By Eric Horstman

**PROTECTING MACAWS FROM THE THREAT OF FOREST FIRES**

*An experience from Bolivia*

**I have a long and very personal relationship with fire. At the age of six a house fire took the lives of my baby brother and four-year-old cousin and left me with third degree burns over 60% of my body followed by years of reconstructive surgery.**

I followed my passion for nature and conservation work later, starting my career with the US Bureau of Land Management and Forest Service in Northern California where once again

I faced the threat of fires, this time on the landscapes and local communities. I trained as a red card firefighter<sup>1</sup> and saw action on many forest fires in Northern California.

This experience served me well when I came to Ecuador in 1990 as a Peace Corps Volunteer assigned to, among other tasks, research and write a management plan for the recently declared Cerro Blanco Protected Forest, which protects 6,000 hectares of endangered Ecuadorian Dry Tropical Forest on the outskirts of the

coastal city of Guayaquil. I had heard rumours that Great Green Macaws were still found in Cerro Blanco, gloriously confirmed one afternoon as I first heard then saw two macaws feeding on the spiny seed pods of the “Amarillo lagarto,” or Yellow Alligator tree (*Centrolobium ochroxylum*). Needing a conservation symbol that would, among other things, generate public support for the recently created protected forest, I suggested the Great Green Macaw. I eventually returned there after Peace Corps to work to set up its conservation programs.

1. The Incident Qualification Card, commonly called a Red Card, is an accepted interagency certification that a person is qualified to do the required job when arriving on an incident.

I began work just as an uncontrolled fire moved slowly towards the core area of the forest where an active macaw nest had been found. I had neither resources nor personnel to fight the fire. Fortunately, early rains put it out, but the lesson was learned: organise and be prepared for the next fire season.

I went on to train and equip a group of our park guards and local community members on forest fire combat. John Little, a retired fire expert from the British Columbia Forest Service, came and helped me write our first forest fire prevention, detection and control plan, which not only included Cerro Blanco but surrounding areas as well.

We formed an interinstitutional forest fire group that included governmental ministries, two branches of the Ecuadorian armed forces, municipalities and private landowners. We carried out an extensive training program to train and equip firefighters from the different entities and coordinated actions focused primarily on prevention. I researched and wrote fire plans for the Municipality of Guayaquil as well as protected areas such as the Manglares-Churute National Ecological Reserve. This experience led to an invitation from the International Union for Conservation of Nature (IUCN) to research and write a regional forest fire plan for Ecuador, Peru and Bolivia in 2005.

In my field work centered around the Department of Santa Cruz, I heard many accounts of huge forest fires that had affected thousands of hectares and tragically had also destroyed crops, cattle and taken human lives. The need to take action was clear, and in the ensuing years institutions have begun to work in forest fire prevention, detection and control in Bolivia. Once again, I found myself there in 2019 at the invitation of the World Parrot Trust and its partner, Fundación Conservación Loros Bolivia (CLB). As work progressed I saw the forest fire threat increase dramatically in the hot and very dry summer. Some days, smoke filled the air in Trinidad in Northern Bolivia where I was based. As an avid reader of the local and national newspapers, I watched as news began to appear on forest fires both in the Beni and Santa Cruz Departments. Based on my experience in the US and

Ecuador, I wrote up a funding proposal for a community-based forest fire program, which was presented to the Shared Earth Foundation and quickly approved. I began work in the Gran Mojós Municipal Protected Area where the critically endangered Blue-throated Macaw (*Ara glaucogularis*) is found. By talking with park guards and other community members, I began to get a clearer idea of both the threat and impact of forest fires in the Beni as well as who is probably responsible for starting them.

Unfortunately, COVID suspended my work in Bolivia for nearly two years. Finally, a window of opportunity presented itself in May of this year. After some quick consultations with CLB's Cecilia Nuñez and her staff, I put together a training program for three protected areas that included populations of Blue-throated, Red-fronted (*Ara rubrogenys*) and Hyacinth Macaws (*Anodorhynchus hyacinthinus*).

In previous training sessions in Ecuador, I taught theoretical aspects of firefighting such as the fire triangle,<sup>2</sup> and the three components needed for a forest fire, in a day-and-a-half course. Most of the emphasis was on the practical aspects of forest fire fighting, like construction of fire lines to help contain blazes and how to really put them out.

Adapting to local realities and budget constraints, we ensured that basic forest fire clothing and equipment, including leather boots, gloves, hard hats, flame-resistant pants and long-sleeved shirts, were available to community fire brigades. In addition to using locally available machetes, we demonstrated the use of fire axes, rakes, backpack water pumps and drip torches for back burning fires. At the end, we started controlled burns to train course participants to become familiar with tool use and forest fire combat on the ground.

We held the training courses in Candelaria, the northern encampment of the huge 2.9-million-hectare Area Natural de Manejo Integrado San Matias near the Brazilian border. San Matias is the second largest protected area in Bolivia and protects Chiquitano Dry Forest, flooded savannahs and part of the Cerrado Ecoregion. According to park guards, San Matias has suffered greatly from forest fires impacting about half of its 2.9 million hectares.

Below: Community members and park personnel gather amid donated protective gear and tools



Blue-throated Macaw © KKR Images



Red-fronted Macaws © Corey Raffel



Hyacinth Macaws © Patrick Gijsbers, Getty Images

2. The Fire Triangle: Each side of the triangle represents one of three components needed for a fire to exist – oxygen, fuel and heat.



Left: A lecture on tool use in fire suppression and constructing guards

Lower, top: The author

Lower, bottom: Participants at teaching sessions in Gran Mojos Protected Area

## Effective Conservation: Parks, Rewilding, and Local Development

Ignacio Jiménez

March 2022

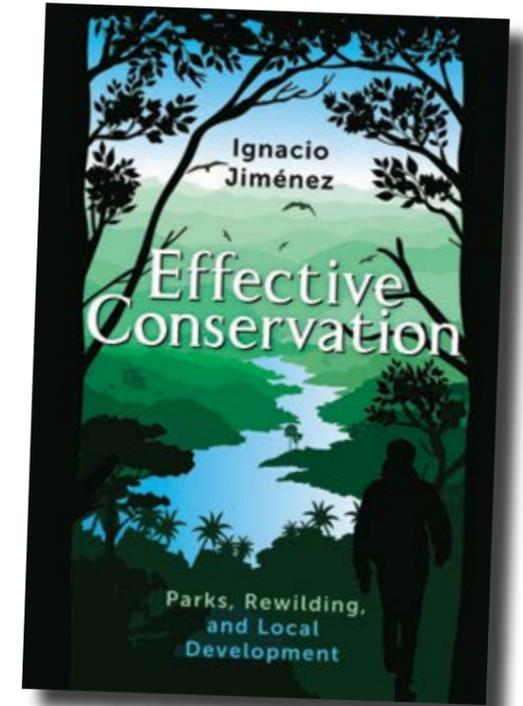
ISBN: 9781642832457

Island Press

Reviewed by:

Luis Ortiz-Catedral, PhD

Director, WPT Oceania Program



Thirty community members, including ten high school students, park guards and local ranchers, participated in the course. With the support of park staff, we formed a group of seven community fire brigade members who received donated fire equipment to continue their work. In a magical moment, after we completed the first day's training, a group of four Hyacinth Macaws came to feed on the fruits of a nearby palm tree.

We carried out the next training course at the Municipality of Loreto in the Gran Mojos Municipal Protected Area, which protects 580,430 hectares of seasonally flooded forests and savannah and serves as an important sanctuary for the Blue-throated Macaw. Twenty-eight community members participated, including cattle ranch owners and workers, Loreto municipality council members, high school students and police. We practiced controlled burning on a local rancher's land.

The final course was in the Anamal Community of the Area Protegida Municipal Jardín de Cactáceas, which protects 22,491 hectares of Interandean Dry Valleys. Twelve community members participated in fire combat training, including students from a local school where we held the session.

The protected area has a population of endangered Red-fronted Macaws. On my previous visit in 2019, I helped local community members construct a trail and build a blind on the edge of a canyon so they could view Red-fronted Macaws flying to and from feeding, nesting and roosting sites.

This wrapped up two weeks of extensive field work, which is hopefully the beginning of continued efforts to educate and train local landowners on managing agricultural land with controlled burns and forest fire control and prevention in and around some of Bolivia's stunning protected areas.

In the coming months, working in conjunction with World Parrot Trust and partner CLB, we plan to expand the initial fire training, promote forest fire prevention campaigns through local schools and community groups, and train community members as citizen scientists to document macaws and other species of interest. We will also help to establish a rapid response network via cell phones for forest fires and other threats to macaws and their habitat. 📧



*The author would like to thank Caroline Gabel and Shared Earth Foundation for their support of this project. Also, thank you to Lauren Schmaltz of World Parrot Trust for all her support and especially to Cecilia Nuñez of the Fundación Conservación Loros Bolivia for all the logistical support in Bolivia.*

The age we live in is the best and the worst of times. Never before have so many studies on wild species been available at our fingertips, yet the number at risk of extinction continues to rise. It appears that there is a mismatch between the academic advancement of conservation science and the practical application of scientific principles to conserve species and restore ecosystems. These might well be growing pains as conservation science is relatively new, but in many cases can be attributed to a lack of common language between managers, conservationists and other stakeholders.

In his new book "Effective Conservation: Parks, Rewilding, and Local Development" Ignacio Jimenez describes the elements of successful conservation initiatives and highlights missed opportunities to preserve habitats and species. But this book is much more; it contains reflections on philosophy, sociology and even psychology. It discusses why conserving species and restoring their ecosystems involves much more than science and management: it is a complex landscape that involves, politics, religion, indigenous participation and economics. The book contains anecdotes from Ignacio's travels across the globe and inspiring stories of community participation and ambitious ecological restoration programs. It narrates how human passions (greed, ego, envy) often get in the way of conservation initiatives. But beyond being a fascinating read written with wisdom and humour, this book is also a manual of sorts.

The core theme of the book is "Full Nature", which Ignacio describes as a virtuous cycle where local development, parks, ecosystems and restorative

economy interplay, effectively bringing wealth, functioning ecosystems and well-managed parks and species wherever the model is implemented. Conserving an individual species is a small component of the Full Nature framework and so are environmental education and eco-tourism activities. Linking these individual elements to a functioning whole is the end game, or as Ignacio puts it, the "conservation boat" that takes us to the port we all desire: more populations of threatened species, more parks effectively managed, greater local community participation, and restored ecological networks and ecosystem services.

Ignacio also discusses the importance of leadership and the qualities of effective conservation leaders. For me, this book gave an opportunity to reflect on my experiences, and also practical advice on how to approach more complex scenarios. Ignacio demonstrates that conserving biodiversity is no longer an imaginary bell jar placed upon a "pristine" environment or habitat, but rather a shifting relationship between humans and nature. We all have limited time on the conservation boat and a moral obligation to participate effectively. We might not see the shores of the desired port, but can certainly play an important role so that future crews dock safely.

Overall, I believe this book is an essential read for conservation graduates, wildlife managers and anyone with an interest in biodiversity conservation.

**Get your copy:**

<https://islandpress.org/books/effective-conservation>

# interview

Millions of wild birds have been trapped and exported from West Africa for the global live bird trade. This trade has devastated wild populations of endangered parrots, yet efforts to tackle it are hampered by a lack of information. Which species are traded? Where to and by whom?

Recently, WPT scientists Alisa Davies and Dr. Rowan Martin teamed up with researchers from the University of Exeter and Oxford to use social media to conduct new research on the international trade in wild birds from Africa. In this study, they monitored a number of wildlife traders on social media and gathered data on posts promoting wildlife trade.

We caught up with Alisa, who led this study, to ask her a few questions about the research.

**Q To begin, could you give us a one sentence summary of what you did in this study?**

Ooh, it'll be a long sentence but I'll give it a shot. We collected and analysed data – text, comments, species, number of likes - from four years of social media posts created by bird traders from West Africa so that we could understand what species are popular, what welfare and disease issues there might be and where they're going.

**Q Well done. Is there a lot of wildlife trade on social media then?**

Yes, absolutely. Just like so much of the way we communicate has shifted online in the last decade, it has also given wildlife traders new and fast ways of connecting to thousands of potential buyers all over the world. There is a real mix of legal and illegal trade across different platforms; the scale is mind-boggling. A number of similar studies in recent years have looked at everything from gibbons to tortoises to otters, as well as our own research led by Dr. Rowan Martin on Grey Parrots published in 2018.

**Q So, what was the impetus for looking specifically at birds from West Africa? How did it begin?**

It initially developed out of that research on Grey Parrots (*Psittacus erithacus*), which showed us the large numbers of birds being advertised online for sale and export. The same traders who were advertising Grey Parrots were also advertising large numbers of other birds, which raised concerns about the scale of trade in other species and the impact this might be having.

The thing is, we have very little data on recent trade in birds besides parrots from West and Central Africa. While almost all parrot species are protected by CITES, which means that signatory countries must report how many are traded internationally, many bird species are not protected, with only 1.4% of songbirds (Passeriformes) currently listed on the CITES

Appendices. We know that some of these un-listed species were traded in incredibly vast numbers in the late 20<sup>th</sup> century to early 2000s. However, following a collapse in the international bird trade linked to the 2007 EU ban on wild bird imports, many of these species were de-listed from CITES so we don't really know what has happened since.

I got the opportunity to investigate this question through my Masters Dissertation, where I got to collaborate with Rowan Martin from the WPT as well as Dr. Ana Nuno, a researcher at the University of Exeter and Dr. Amy Hinsley, a researcher at the University of Oxford. It was a brilliantly rewarding collaboration where we got to explore the different kinds of data available in social media posts and what questions they could answer.

**Q It sounds like you really enjoyed the process. What was the trickiest part of the research for you?**

Identifying species was the first big hurdle because most of the species were completely new to me. Not only that but some of the videos would be up to 12 minutes long, filming holding cages with large numbers of different bird species flitting about together – not to mention the video quality wasn't always great. Fortunately, I had the amazing help of two experts on birds from the region, Nik Borrow and Benedictus Freeman, who double checked my judgements of identification and were happy to give a second opinion on any cases I was particularly stuck on. Inevitably, some cases were too ambiguous, so we identified the bird at a genus or family level, which still provided valuable information.

From a research design perspective, we were also faced with the challenge of deciding which posts to record. Many similar studies collected data from explicit advertisements – meaning that the post made it clear an animal was for sale, usually by writing 'for sale' or giving a price in the text. However, when we first started looking at what traders were posting, most of



In a study of West African traders, social media posts revealed enormous numbers of birds involving over 80 different species being trapped and exported, with birds headed to countries across the Middle East and South Asia. Among them were a number of parrot species, including endangered Grey Parrots (*Psittacus erithacus*) and Timneh Parrots (*Psittacus timneh*), as well as large numbers of Senegal Parrots (*Poicephalus senegalus*), Ring-necked Parakeets (*Psittacula krameri*) and Red-headed Lovebirds (*Agapornis pullarius*). Besides parrots, there was a vast trade in a wide variety of finches, starlings, doves, weavers and turacos.



the posts weren't like this. Many didn't make it clear in the text that birds were for sale, instead just showing a photo or a video of birds with no text. The intent to promote trade was made clear by the context of other posts and the overall profile, which might describe the user as a trader/exporter.

In the end, we realised that there were many ways that traders could use social media posts to promote and facilitate trade, all of which could provide useful information. Because we already knew that the users were bird traders, we decided to record any post that either showed or mentioned West African birds. We explored and discussed the issue of inferring intent using contextual information in greater depth in a separate paper that was published in Conservation Biology.

### **What to you were the most interesting or surprising findings?**

The sheer number and diversity of birds that were being shown was initially the most surprising and shocking thing. There were holding enclosures with over a hundred birds of over a dozen species flying around and hundreds of parakeets and parrots kept in the same relatively small enclosures. That was one of our key concerns about the trade: keeping different species housed together without the right biosecurity measures creates the right conditions for diseases to spread and to jump between species. While avian zoonotic diseases such as highly pathogenic Avian Influenza (H5N1) pose a risk to humans, these conditions also pose a risk to captive and wild parrot populations. Previous research involving WPT has revealed how the global spread of Psittacine Beak and Feather Disease has been linked to the international pet trade and WPT's screening has found PBFDF among trafficked parrots seized from bird export facilities like the ones we monitored.

The other most interesting findings were centres of demand that we previously hadn't been aware of, specifically India. We were able to



identify where the most demand for trade came in users commenting on posts based on comment text and what country commenters came from. India has a rapidly growing exotic pet market but has reported very few official imports of exotic birds in the last decade. This finding has prompted further investigations and research to understand the trade routes between Africa and India, and has shone a light on the rampant trafficking in exotic birds across land borders of neighbouring countries such as Nepal or Bangladesh.

### **So how are the findings from this research going to help protect parrots and other birds? What comes next in terms of the work of WPT and others?**

One of the most important outcomes is that it draws attention to the fact that large-scale trade from the region is still ongoing and with it, risks linked to the spread of infectious diseases and overexploitation. Without data like this, it is hard to identify where problems exist and where to direct conservation efforts. It opens up opportunities for us to collaborate with other researchers and practitioners working in the region. For example, it's enabled us to restart conversations with the Senegalese government over policies for permitting wild bird exports and we've just started formally collaborating with the CITES Management Authority on an exciting new

project so watch this space! It also helped us identify potential cases of trafficking which we've shared with law enforcement groups.

The research has also directed our attention and activities to the parrot and bird trade in South Asia, specifically Bangladesh and India. To understand more about how these birds were getting to India we began looking at import permits published by the Bangladesh Forest Department and we quickly began to notice concerning patterns in trade. For example, we noticed that Timneh Parrots (*Psittacus timneh*) repeatedly appeared on permits without the correct CITES authorisation. This species is threatened with extinction by trade and through a collaboration with undercover investigators working with the BBC, we were able to establish how weaknesses in the permitting system were being exploited by traffickers. Fortunately, once alerted the relevant authorities immediately stopped issuing permits for the species, thus closing that trafficking route.

We are excited to be developing our relationship with the Bangladeshi authorities even further. In August, I travelled to Bangladesh to help deliver training on CITES, bird identification and how to identify unusual trade in import permits in collaboration with USAID, ICITAP and the US Department of Justice. 

# Can You Teach an Old Parrot New Tricks?

## Studying Parrot Lifespan, Aging, and Vocal Learning

Bushra Moussaoui with Jessica Brinegar

**Parrots have exceptional lifespans. In fact, it is not uncommon for pet parrots to outlive their owners when well-cared for. Generally, larger animals live longer, a trend explained by larger-bodied organisms having a slower metabolism. Parrots, however, doubly defy this physiological link, being a tiny fraction of an average human's weight and exhibiting a high, flight-adapted metabolic rate, yet living a half century or more.**

While we may never definitively know how long the oldest parrot has lived—whether due to elusiveness in the wild or the lack of hatch date information for a captive bird who seems to have been around forever—carefully kept zoo records confer the title to a 92-year-old Salmon-crested or Moluccan Cockatoo (*Cacatua moluccensis*)<sup>1</sup>. Other similarly large parrots such as macaws and Amazons have also been recorded to live into their fifties and sixties.

These impressive maximum lifespans may be explained by

parrots' well known complex cognitive capabilities—innovative problem solving and vocal imitation to name a few. In a recent study investigating the evolutionary drivers of parrot longevity, researchers estimated life expectancy—a more comprehensive measure of longevity than the maximum recorded age of an outlying individual—from zoo records for 244 parrot species (about two-thirds of all species) and tested for a correlation with brain size as a well-established proxy for cognitive flexibility<sup>2</sup>.

This comprehensive study was led by Simeon Smeele, a doctoral student at the Max Planck Institute of Animal Behavior, who collaborated with scientists from a diversity of institutions, including the Max Planck Institute for Evolutionary Anthropology, New Mexico State University and the Species360 Conservation Science Alliance. They found that species with larger relative brain sizes also have longer lifespans and tested two possible explanations for this pattern: either having more brain power confers a

survival advantage in navigating life's challenges, or an extended developmental time afforded by a long life allows for a heftier **neural investment**. Statistical modeling of these hypotheses led to the conclusion that larger brains in fact promote longer lives.

**Neural investment:**  
*Allocation of energy and resources to the development of brain tissue.*

Particularly, as highly social flock-living birds, having an increased cognitive capacity can help parrots better navigate social relationships, a task largely facilitated by learned vocal communication. In some species, parrots develop individually distinct vocal signatures useful for recognizing or localizing specific group members. Also, pairs or groups of birds can converge on shared calls by imitating each other, facilitating the coordination of behaviours at multiple social levels. Unlike most songbirds who learn to produce new sounds only as nestlings or juveniles, parrots perform such vocal learning feats during their adult lives, and



thus are classed as open-ended vocal learners. How 'open' such open-ended vocal learning is, however, remains unclear. That is, does adult **vocal plasticity** persist throughout the lifespan with largely the same fidelity or does it deteriorate with age?

**Vocal plasticity:**  
*Ability to modify one's vocal repertoire, such as humans learning new words or birds learning new songs and calls.*

I am currently conducting a study surrounding this very question as part of my Masters program in Biology at New Mexico State University. Under the mentorship of Dr. Timothy Wright, one of the collaborating researchers who identified cognitive capacity as a driver of longevity, I designed an experiment in which I tracked vocal plasticity in naturalistic flocks of male budgerigars (*Melopsittacus undulatus*), where flock members

were either all young adults (6 m – 1 yr) or older adults ( $\geq 3$  yrs). The budgerigar is a highly gregarious nomadic Australian parakeet and also the most popular pet store parrot (with a life expectancy of 4.5 years in captivity). In the wild, flocks can range from just a handful of birds to flurries of hundreds or thousands of individuals when heavy rainfall boosts seed abundance. Unsurprisingly, this tremendous flexibility in flock membership is accompanied by swift vocal flexibility.

Captive experiments have found that in attempting to attract a mate, adult male budgerigars readily imitate the calls of females. Additionally, in response to joining new social groups as adults, both males and females rapidly converge on the same contact call types—these vocalizations help them stay in touch when separated in flight or hidden in the trees.

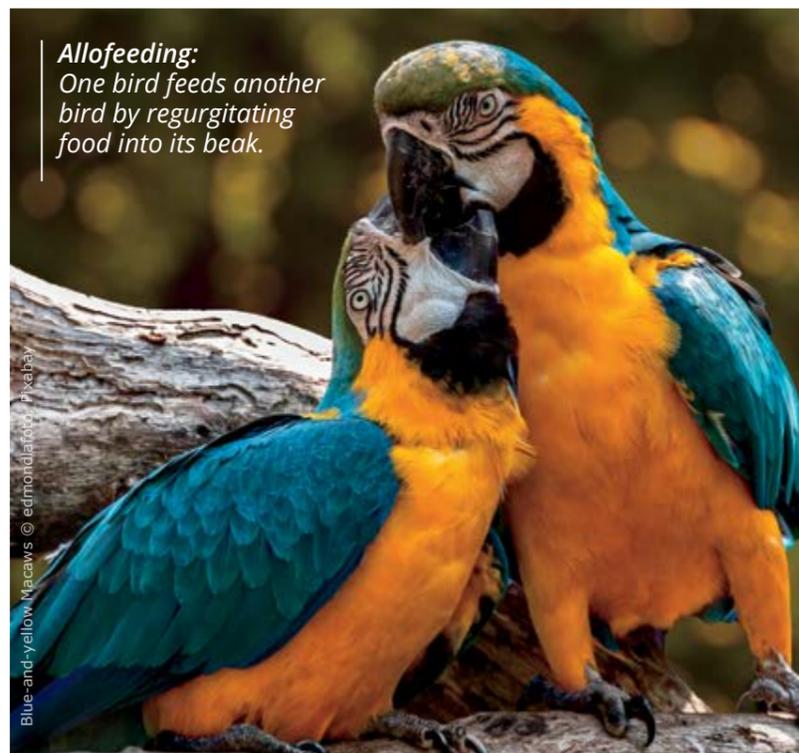
In my study, prior to placing budgerigars in novel flocks with similarly aged but socially unfamiliar birds, I audio-recorded individuals to gather their initial vocal repertoires and then recorded them in their new groups over a 20-day learning period.



I then created an acoustic map wherein calls that sound like each other cluster together in space. Within this map, individuals whose calls travel farther over time are more vocally plastic and similarly, individuals whose calls greatly overlap with those of their flockmates are more adept at vocal matching.

Since new contact calls are born in a social context—and sociality is prone to aging—I also video-recorded social interactions between flockmates. I scored videos for the frequency of affiliative interactions (i.e., friendly behaviours such as head bobs, beak-to-beak touches, **allopreening** and **allofeeding**) and agonistic interactions (i.e: aggressive behaviours such as bill thrusts, kicks, and rejected interaction attempts). Understanding whether parrot social landscapes exhibit age-related eccentricities may better colour our understanding of any existing vocal differences.

Data analysis is in progress and I look forward to what may be revealed regarding aging, parrot open-ended vocal learning and sociality. If parrots do indeed maintain this complex cognitive behaviour into old age, this can open up avenues into researching what factors drive this resilience, including sociality. And, insights gleaned from these colourful & charming birds may even help scientists better understand the relationship between senescence and speech in another species that talks—us. 📺



**Allofeeding:**  
One bird feeds another bird by regurgitating food into its beak.



**Allopreening:**  
One bird preens the feathers of another bird, helping with the removal of molting feathers and assisting in general feather maintenance.

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## Do Wild Parrots Self-medicate?

By Juan F. Masello and Alejandro Balbiano  
Justus Liebig University Giessen, Department of Animal Ecology & Systematics, Germany

A Burrowing Parrot eating piquillin berries (*Condalia microphylla*) © Fabián Llanos

**Psittaciformes (parrots and cockatoos) consume foods containing plant secondary metabolites with preventive or therapeutic effects that can reduce the parasite load.**

### A bit of history

A long time ago, in 1999, my wife (Petra Quillfeldt) and I (JFM) visited Katharina Misof, a colleague of ours who was conducting research at the Institute of Zoology in Bonn, Germany. That was the second year of the Burrowing Parrot Project, and we were eager to learn about an exciting research technique that Katharina was employing. Thanks to her, we learned to detect the eggs of intestinal parasites that affect

many birds and can be found in fecal samples. Two years later, we visited our friend Santiago Merino at the Natural History Museum in Madrid, Spain, and learned from him to detect parasites in blood samples from birds. Soon we put these techniques to practice using samples obtained during our research on wild Burrowing Parrots - also known as Patagonian Conures (*Cyanoliseus patagonus*) - from El Cóndor in northeastern Patagonia, Argentina.

However, contrary to what we expected, the Burrowing Parrots had neither intestinal nor blood parasites. How could this be possible? We published the results of our investigations in a 2006 scientific paper, where we hypothesized that the apparent

absence of these parasites might be explained by a strong *innate immune response*<sup>1</sup> in parrots. A few years later, in 2010, we presented these ideas as part of a talk I gave at the International Ornithological Congress in Campos do Jordão, Brazil. During the discussions at that conference, several colleagues and I concluded that the explanation for the absence of these parasites was not likely and that other factors may well play a role. Also, during that congress the Parrot Researchers Group was founded ([parrotresearchersgroup.org](http://parrotresearchersgroup.org)).

One of the aims of this group is to promote parrot research, and trying to find the reasons for the frequently reported absence of blood parasites in

“Why do parrots have so few haemoparasites, if any, while other birds like songbirds have so many?”



Burrowing Parrot © Dr. John A. Horsfall, Getty Images

parrots soon became one of its joint research projects.

### Haemoparasites

Parasites can be external (ectoparasites) or internal (endoparasites). Intestinal and blood (or haemo) parasites belong to the latter. Haemoparasites affecting birds include avian malaria (*Plasmodium*), intra (or within) cellular haemosporidians (*Haemoproteus*, *Leucocytozoon*), single-celled flagellated (or tailed) protozoa (*Trypanosoma*) and early life cycle stages of some parasitic nematodes (roundworms) known as microfilariae. Generally, haemoparasites are transmitted by dipteran, or true fly, vectors<sup>2</sup> such as mosquitoes and black

flies, and blood-sucking insects such as midges, horseflies and louse flies. But, why do parasites matter? Research has shown that parasites can strongly affect an individual's condition, survival, nestling growth, reproductive success and even the expression of sexual ornaments in birds and other animals. These effects can have important consequences, in some cases negatively affecting the viability of wild animal populations.

Haemoparasites are common in birds, however, not all orders<sup>3</sup> of birds or even species within an order are affected with the same intensity. What do these differences depend on? Several factors may explain the differences in infection in different groups of birds, such as habitat, climate, host density,

presence of vectors, life history and immune defense. The presence of certain food items in the diet may also be a relevant factor. The latter has been little studied.

### The study

We, a group of researchers from all over the world formed at the PRG, sampled 19 Psittaciformes species from 25 localities covering a wide range of habitats and climate types in the Philippines, New Caledonia, New Zealand, the Chatham Islands, Venezuela, Bolivia, Brazil, Chile and Argentina. Habitats included rain forests, dry forests, mountains, steppes, bushy steppes, grassland and farmland, while climate types ranged from tropical to cold temperate.

Using sophisticated and precise molecular methods in the laboratory, we found haemoparasites in only two of the 19 species sampled. This result confirmed, with more precise methods than previously used, that Psittaciformes is an order of birds where haemoparasites are indeed rare. But why do parrots have so few haemoparasites, if any, while other birds like songbirds have so many? Why were only two of the sampled parrots infected?

During a brainstorming after the laboratory results were available, Prof. Michael Wink suggested that certain food items in the investigated parrots' diets might explain the rare presence of haemoparasites in Psittaciformes. More specifically, he suggested that certain secondary metabolites, or breakdown products, present in the parrots' diet might answer our questions.

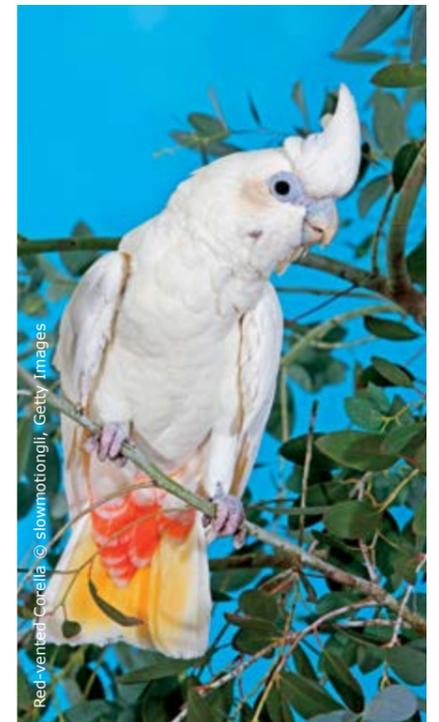
Next, we looked in detail at what our 19 parrot species feed on. Using a large database gathered and maintained by Prof. Wink at the Institute of Pharmacy and Molecular Biotechnology of Heidelberg University in Germany, we also explored the secondary plant metabolites present in the diets of our study birds. To our surprise, we found that 11 of the 19 parrot species regularly consumed foods that included secondary

metabolites known to have antiparasitic activity, including antimalarials, antifungals, leishmanicides, trypanocides, anthelmintics<sup>4</sup>, insecticides and even mosquitocides. The species included Philippine Cockatoo or Red-vented Corella (*Cacatua haematuropygia*), Coconut Lorikeet, (*Trichoglossus haematodus deplanckii*), Blue-and-yellow Macaw (*Ara ararauna*), Blue-throated Macaw (*Ara glaucogularis*) and Burrowing Parrot.

Our research also showed that parrots that had exclusively herbivorous diets were free of haemoparasites, while those with omnivorous diets (vegetables plus invertebrates, marine mollusks and animal carrion) were infected with haemoparasites. The infected species in our sample were the Austral Parakeet or Conure (*Enicognathus ferrugineus*) from Patagonia, and the Red-fronted Parakeet (*Cyanoramphus novaezelandiae*) from Raoul and Little Barrier islands in New Zealand. We thus concluded that the consumption of food items known for their secondary metabolites with antiparasitic properties, as well as the higher proportion of infected species among omnivorous parrots, could explain the low prevalence of haemoparasites reported in parrots and many other vertebrates.



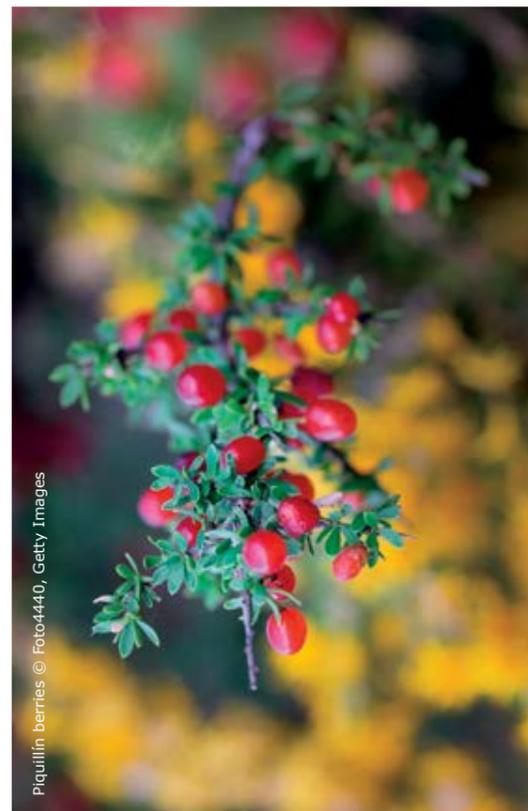
Blue-and-Yellow Macaw © Andre Mouton



Red-vented Corella © slowmotingli, Getty Images



Blue-throated Macaw © Matthew Clemente, Getty Images



## Burrowing Parrots and Austral Parakeets

Burrowing Parrots feed on fruits, seeds and buds of the plants of the Monte, a dry bushland in Argentina. In particular, the El Cóndor colony in northeastern Patagonia breeds and forages in arid and marine environments, which usually have less vectors that transmit blood parasites. By contrast, the Cachaña or Austral Parakeet, which lives on forested Patagonian Andes slopes and has an omnivorous diet, has haemoparasites. The Cachaña also does not consume any antiparasitic food items.

Forests have greater numbers of vectors. Previous studies have shown that birds living in forests are more likely to be infected with haemoparasites than those living in open, non-forest habitats.

## Wild vs. captive parrots

Haemoparasites appear to be common among zoo and companion parrots, while generally wild parrots lack them. One possible explanation for this difference is that captivity-caused stress may lower birds' defences or reduce their ability to avoid vectors commonly present in these places. In addition, many parrots in the wild feed on toxic fruits, seeds or buds with antiparasitic properties, whereas in captivity they are fed foods that usually do not contain them.

## El Cóndor colony

A different but important note: the Burrowing Parrots colony at El Cóndor in the province of Río Negro, NE Argentina, is an outstanding and unique biological phenomenon. More than 70% of

the species' population lives here, and overall only in Argentina and Chile. The sensible thing to do would be to protect it, but as time goes on this hasn't happened. With financial support from the WPT and other institutions and donors, the Burrowing Parrot Project has been researching these parrots for 24 years and for most of that period has sought to create a Natural Protected Area. Unfortunately, the colony is still only under the care of nature and some enthusiastic and dedicated neighbours.

The colony is subject to a number of threats: urban development is encroaching on the site. In 1998-2000, we reported that the highest density of nests was observed along the first (easternmost) kilometer of the colony. Now it is along the second kilometer.

The birds' displacement could be related to high levels of human disturbance in the first kilometer closest to the El Cóndor village.

In recent years, a garbage dump has opened just behind the easternmost kilometer of the colony and is not only a pollution and disease threat, but also creates a pitiful spectacle that is not intended to attract tourists to the area.

Today the Monte ecosystem is under threat, with clearance of the area's natural vegetation around the colony causing a food shortage for the birds. The average annual rate of Monte clearance is 3.7%, higher than the Amazonas. Another serious threat to the El Cóndor colony is construction close to the cliffs, which accelerates the processes of natural erosion. An additional

danger is tourism development, with people using the cliff and the beach below as an amusement park: kite-surfing, parasailing, paragliding and rappelling on the cliff walls. 

For further details, visit: [lorosbarranqueros.blogspot.com](http://lorosbarranqueros.blogspot.com)

### Footnote references:

1. *Innate immunity*: the defense system an organism is born with
2. *Vector*: a living organism that transmits an infectious agent from an infected animal to another animal.
3. *Order*: a group of similar families of species
4. *Leishmanicides* and *trypanocides*: agents against one-celled parasites. *Anthelmintics*: agents against worms

### Recommended further reading:

Masello JF, Choconi RG, Sehgal RMN, Tell LA & P Quillfeldt (2006) *Blood and intestinal parasites in wild Psittaciformes: a case study of Burrowing Parrots* (Cyanoliseus patagonus). *Ornitología Neotropical* 17: 515-529.

Masello JF, Martínez J, Calderón L, Wink M, Quillfeldt P, Sanz V, Theuerkauf J, Ortiz-Catedral L, Berkunsky I, Brunton D, Díaz Luque JA, Hauber ME, Ojeda V, Barnaud A, Casalins L, Jackson B, Mijares A, Rosales R, Seixas G, Serafini P, Silva-Iturriza A, Sipinski E, Vásquez R, Widmann P, Widmann I & S Merino (2018) *Can the intake of anti-parasitic secondary metabolites explain the low prevalence of hemoparasites among wild Psittaciformes?* *Parasites & Vectors* 11: art357.

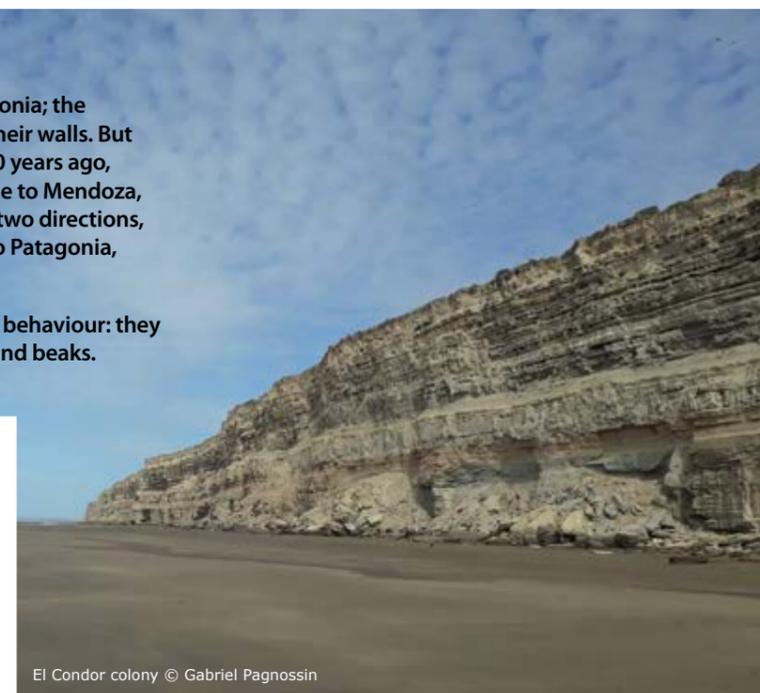
## El Cóndor Colony

The cliffs are a distinctive "trademark" of Patagonia; the geological history of this region is written on their walls. But there is also a biological history. About 120,000 years ago, Burrowing Parrots crossed the Andes from Chile to Mendoza, Argentina and began to colonize Argentina in two directions, towards the riverbanks of the northwest and to Patagonia, where they live in cliffs by the sea.

The Burrowing Parrot derives its name from its behaviour: they build burrow-nests on cliffs, using their claws and beaks.



Burrowing Parrots in cliff nest © Dr. John A Horsfall, Getty Images



El Condor colony © Gabriel Pagnossin

NEWS

**Yellow-shouldered Amazons' turbulent breeding season ends on Bonaire**

WPT Field conservationist Jack Haines has been on hand at Echo for the past three months monitoring the breeding efforts of the wild Yellow-shouldered Amazon (*Amazona barbadensis*), known locally as Lora. From May to August, a total of 67 nests were monitored. Over the



Yellow-shouldered Amazon chick in nest © Jack Haines

course of the season, 20 of these nests were actively used and eggs were laid in them.

Sadly, the Loras had a rough year in 2022 with six of the active nests predated by presumably cats or rats. Thankfully, poaching has not been observed this season, and out of the remaining nests 19 chicks fledged successfully. Echo wants to increase their monitoring next year in the hopes of better understanding how invasive species are affecting Lora reproductivity.

As of mid-September, the last two chicks of the season, with the support of their parents, have fledged the nest into the dry Bonaire forest. Over the next few months they all will learn vital skills such as self-care through preening, socialising with other birds, finding shelter, evading predators and most importantly where to find food ahead of the changing season.



Yellow-shouldered Amazon chick © Jack Haines

The Yellow-shouldered Amazon's breeding season on Bonaire generally occurs from May to August, two-week variations either at the start or the finish. A full report compiled by Jack and the team on the season's progress is due shortly.

**UPDATE: Congo Grey Parrot Journey**

63 Grey Parrots (*Psittacus erithacus*) rescued from traffickers have been released in Kahuzi-Biéga National Park in eastern DRC. Among this group were parrots seized last September on a runway in Sankuru province. Fortunately local NGO ConservCongo acted quickly to intervene and the "cargo" was seized by law enforcement officers. Instead of being loaded on to a plane headed for Kinshasa and onwards to Asia, the parrots embarked on a remarkably different journey back to freedom. With support and guidance from WPT they travelled by motorbike, plane and boat to Lwiro Primate Rehabilitation Centre where they received expert veterinary care and rehabilitation in purpose-built aviaries.

This is the second release in Kahuzi-Biéga National Park, following a group of 39 released in late 2020. Read more about the parrots' journey and WPT's long running efforts to counter parrot trafficking in the DRC in *Psittascene Summer 2021* and *Psittascene Winter 2021*.

**WPT Trade Specialist Delivers Training on Combatting Illegal Trade**

World Parrot Trust's Wildlife Trade Specialist Alisa Davies travelled to Bangladesh to deliver training on combatting illegal wildlife trade in collaboration with USAID, ICITAP and the US Department of Justice. The three-day training course (8th - 10th August) was attended by members of the Forest Department, Customs, the Department of Livestock and the Police.

During the training, Alisa led sessions on CITES, the exotic bird trade in Bangladesh and how to identify key bird types such as parrots and hornbills in trade. As part of this, she presented the results of her research into the exotic bird permitting system and ways



to identify suspicious shipments. In other sessions, participants received training in national legislation and intelligence gathering to aid them in rooting out illegal wildlife trade at airports. At the end of the training, each department was gifted with a copy of *All the Birds of the World* to assist them in identifying birds caught in illegal trade.



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**PARROTS IN THE WILD:**  
**Little Corella**  
*(Cacatua sanguinea)*

Young Little Corellas beg for food in a tree at Herdsman Lake in Perth, Western Australia.

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