

PSITTAScene

Magazine of the WORLD PARROT TRUST



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ABOUT THE WPT

Capture for the live-bird trade, habitat loss and other factors put wild parrots at risk. One in three parrot species are currently threatened in the wild.

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 43 countries for more than 70 species of parrot.

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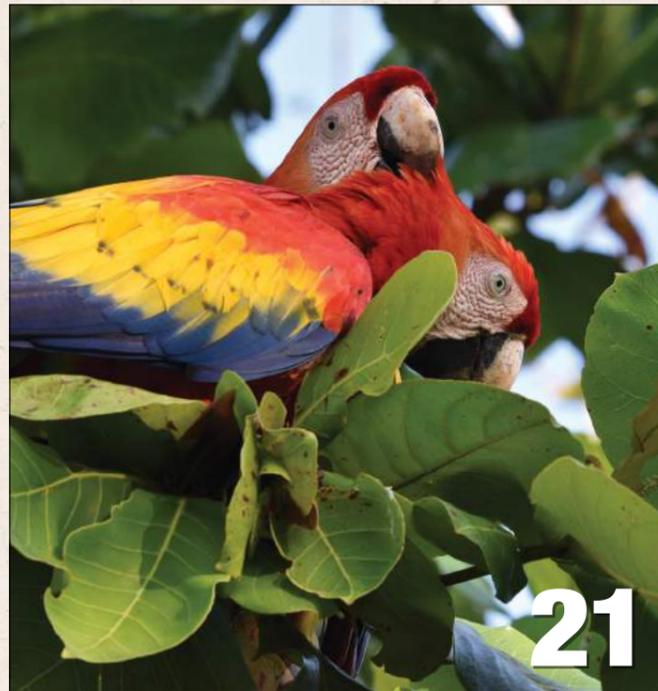
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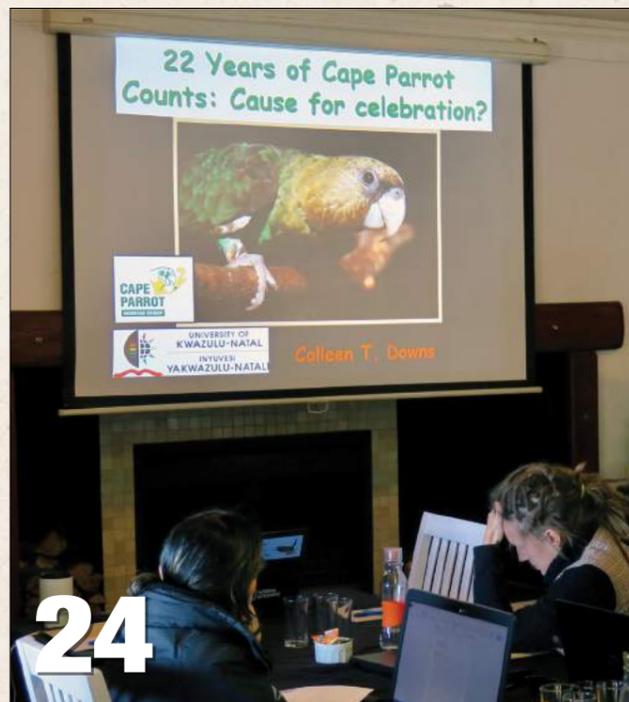
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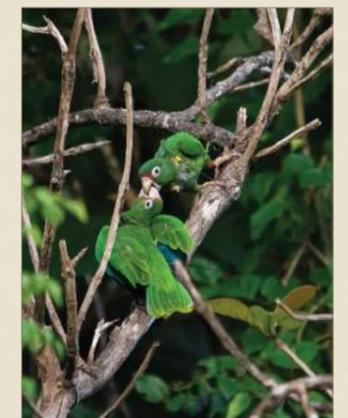
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ON THE COVER

Photo © Tanya Martínez

A Puerto Rican Amazon (*Amazona vittata*) feeds its chick in the wild at Río Abajo.

Learn the remarkable story of these birds with the first in a series of articles focusing on the Puerto Rican Parrot Project on *Page 5: On the Ground: Hurricane Maria and the Amazons at Río Abajo - Two Biologists' Stories*.



A message from... **Steve's Desk**

"May you live in interesting times." This nearly 100 year-old quote has never seemed more appropriate than in our present circumstances. For many, 2020 has so far been stressful and uncertain with the COVID-19 outbreak, but it's also been a time of resilience, hope and collaboration. Times like these can reveal who we are and what we value the most. We see it from the countless acts of kindness in our daily lives, and through the wonderful support we at the Trust witness from our global community of friends and colleagues like you.

One thing that does remain certain is our dedication to supporting in-country partners and projects, and that they remain deeply committed to their work of saving endangered parrots worldwide.

And while many of us are waiting for our lives to return to normal we want to keep you updated on this work. In this issue we feature the dedicated Puerto Rican Amazon project team, which against all odds is helping the wild and captive birds to recover and thrive. The Vulnerable Cape Parrot is receiving a lift up thanks to a collaborative effort between the World Parrot Trust and others with the launch of the Cape Parrot and Mistbelt Forest Conservation Action Plan, which is charting a course for the recovery of the species. Additionally, we feature an uplifting visit to Costa Rica to see wild parrots and the Macaw Recovery Network, and other interesting short articles.

So while you're navigating your way through these interesting times, please take the opportunity to enjoy this issue and the hope it brings.

All the best,
Steve-



Steve Milpacher
WPT Operations Director

LEAVE A **LEGACY** FOR PARROTS

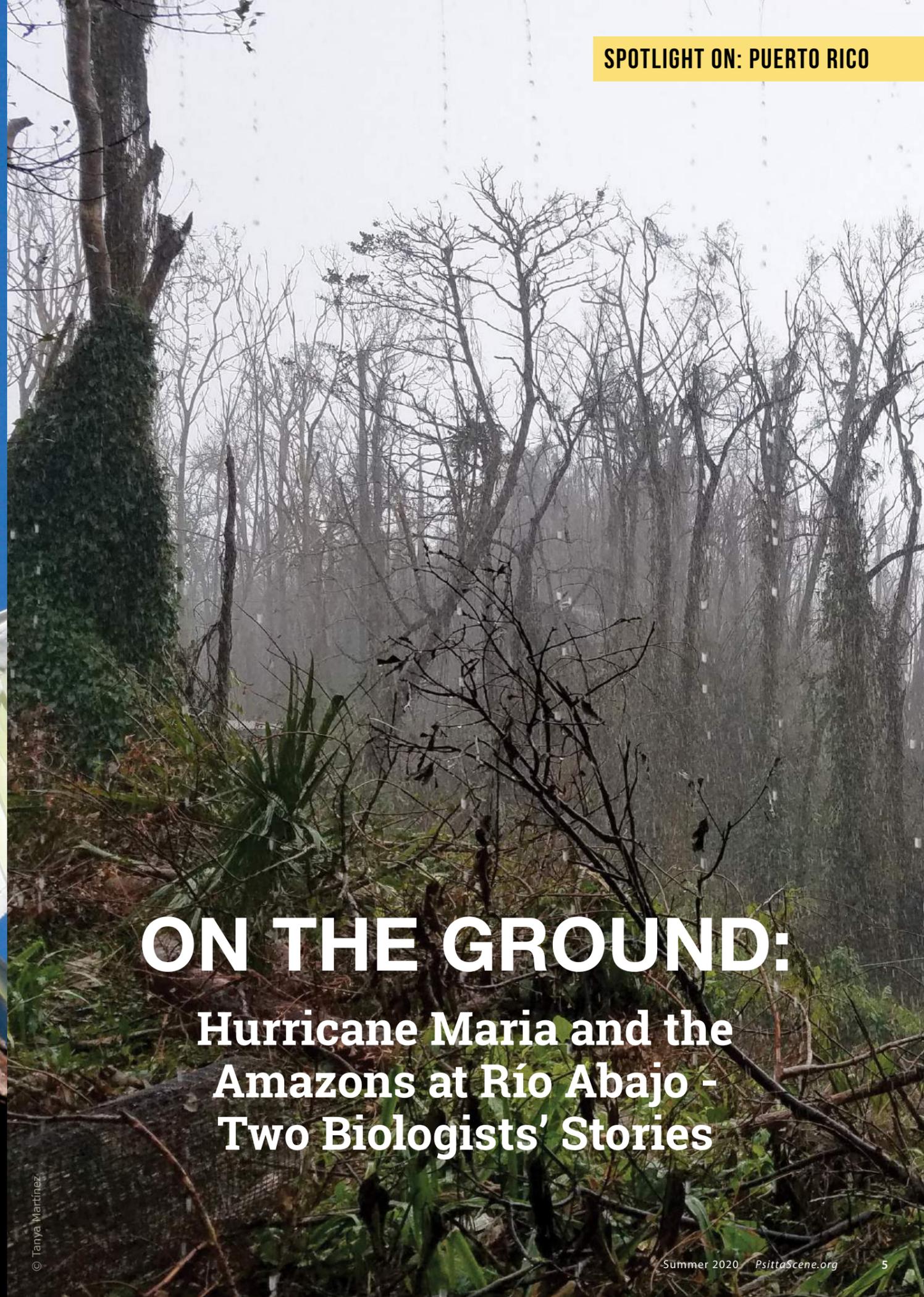
What will be your legacy?

By including the World Parrot Trust in your will, trust or beneficiary designation, you are creating a personal legacy that will have a lasting impact for parrots and the places where they live.

For more information about including WPT in your planned giving opportunities, visit www.parrots.org/legacy, or contact the branch nearest to you (see page 27).



Yellow-crested Cockatoo © Mehd Halaouate



ON THE GROUND: Hurricane Maria and the Amazons at Río Abajo - Two Biologists' Stories

© Tanya Martínez

HURRICANE MARIA HIT PUERTO RICO ON SEPTEMBER 20, 2017.

The following are personal accounts of how the Puerto Rican Amazon project team at the Río Abajo aviary and a rescue party dispatched to reach them grappled with the aftermath of the massive storm.

Alberto Alvarez: Hurricanes have always been an unwelcome but inescapable part of life for residents of Caribbean islands. Parrots are not immune to the danger. The Critically Endangered Puerto Rican Amazon (*Amazona vittata*) has had a rough history with hurricanes; San Ciprian and San Felipe are believed to have wiped out some of the ancestral parrot populations in 1900s. In 1989, Hurricane Hugo drastically reduced what was then the last remaining wild population of parrots from 47 to 23 birds. Since the start of the Puerto Rican Parrot Recovery program in the 1970s, no storm of Maria's magnitude had struck the island.

Ricardo Valentin: At 6:15 am on September 20, 2017, Hurricane Maria made landfall on the island of Puerto Rico. Maria became a Category 5 hurricane with sustained winds of 280 km/h. This made it among the 10 strongest hurricanes in the western hemisphere since record keeping began. However, when it hit Puerto Rico, its strength had decreased to a Category 4, with sustained winds of 250 km/h. It was the strongest hurricane to hit the island in 85 years.

The Puerto Rican Parrot Recovery Program has spent many years preparing for severe storms and has taken numerous steps to make sure we were ready when one hit. In the aftermath of Maria we had to deal with a lot of issues, mostly due to the enormous damage to the environment and the island's infrastructure, but it could have been worse had we not taken to heart the Boy Scout's motto: *Be prepared.*



Above: Two breeding cages damaged by the storm.

Our aviaries at the Río Abajo State Forest, the Maricao State Forest, and the El Yunque National Forest had been bracing for a storm for some time. This was so because two weeks earlier, Hurricane Irma had passed quite close to the north coast of the island. When the National Hurricane Center issued a warning for Irma, our hurricane preparedness protocols went into effect.

The facilities were stocked with food and water for the parrots as well as fuel for our generators. Fortunately, the near miss by hurricane Irma only caused a modest degree of damage in all three forests but no birds were lost in captivity or the wild. When the warning for Maria was given, all captive parrot flocks were moved to secure concrete hurricane shelters. Two members of staff from each of the captive parrot facilities (Río Abajo State Forest, Maricao State

Forest, and El Yunque National Forest) remained at each site to care for the birds throughout the storm. In Río Abajo, this daunting task was left to me and my co-worker, Brian Ramos.

By daybreak on September 20th, the wind was already strong and kept getting stronger until the eye of the storm passed over the Río Abajo aviary around 10:30 am. When the wind died out Brian and I came out of our shelter to see the destruction. We were stunned when a single parrot started calling and flying around. It moved to a forest patch near one of the buildings and went silent. After an hour and a half, the storm resumed with all its violence but with the winds coming from the opposite direction. The next day, we didn't emerge from our shelter because the winds were still strong and trees were still falling.

“The thought that decades worth of conservation effort could have been undone by a storm that lasted a day and half was unthinkable. But with so much destruction, how could a single parrot possibly have survived?”

~ Alberto Álvarez



Left: Parrots being transported to the Aviary's hurricane shelter.

Right: Staff at Río Abajo salvaging breeding cages after the storm.



On the morning of the 22nd we were amazed when, just at daybreak, we were woken up by the sounds of wild parrots calling. We came out of the shelter to a landscape of utter desolation. Moving around was difficult due to a deep layer of shredded, tangled vegetation that covered everything. Our first task was to check on the birds in the hurricane shelter. We were pleased to find that all of them were alive and well.

Alberto Alvarez: Once the winds had died down, biologist Gustavo Olivieri and I reported to the Emergency Operation Center in San Juan to begin first response operations. We were assigned the task of finding out what had happened to the biologists that had stayed behind at the Río Abajo Forest and reaching the facility if possible.

The first sight of the forest was dismal and depressing. The landscape was unrecognizable and what remained could barely be called a forest anymore. Skeletal trees raked the sky with denuded branches or lay on the ground as heaps of green and brown debris. The Aviary was inaccessible by vehicle, as the road was now an obstacle course of limbs, leaves, and landslides.

It took us close to three hours to traverse the meager one mile stretch of road that led to the Aviary. Every so often one of us would try to contact Brian and Ricardo by radio but we heard only static in response. By midday, the two of us had finally arrived at a tangled heap of chain link fence covered in tree limbs that had once marked the perimeter of the Jose Vivaldi Aviary.

After trudging our way through storm debris we finally ran into Brian and Ricardo. They were unharmed and pleased to report that all the parrots in Río Abajo's captive flock had survived the storm. We would later learn that the team members that had stayed behind at the Maricao and El Yunque Forests had also weathered the storm, along with their feathered charges.

The situation in Río Abajo became more urgent once we learned that a tree limb had caused a pipe to rupture, and most of the 10,000 gallons of water that had been stockpiled in preparation for the storm had leaked away into the earth. Brian and Ricardo had been collecting rainwater for the past few days as an emergency measure. With the drastic water situation, re-establishing access to Río Abajo became a race against time:

the road would need to be cleared so that water could be brought in by truck. However, the massive amount of debris on the steep and twisting montane road could not be removed by hand. To make matters worse, the island-wide blackout and collapse of all communications made requesting additional help extremely difficult. Messages could only be delivered in person by hiking several hours out of the forest and driving on debris-covered roads to reach the Emergency Operation Center back in San Juan.

Ricardo Valentin: In the days after the hurricane the phones were dead, we could not find any AM signal, and although our radios could pick up some stray signals, nobody seemed able to hear us. Most scary of all, the nights were extremely dark and we could not see the lights of the nearby cities, evidence that the electrical system of island had collapsed completely.

Although our connection to the power grid had been lost during Hurricane Irma, the electrical system within Río Abajo's aviary is mostly underground and was still in working order. We freed some wires from the fallen branches and in short order turned on the generator and had electricity.



Above: A staff member repairs breeding cages after the storm.

Now, we could finally turn our attention to taking care of the captive flock. It was backbreaking work that took eight to ten hours each day, mainly due to the need to carry water by hand to the birds, to wash dishes and to clean everything. Brian spent much of this time cutting branches with a chainsaw to allow us to reach the different parts of the facility.

After the access to the aviaries had been restored, we began repairing cages and moving the birds out of the hurricane shelter. The large flight cages were repaired first. They emerged from the storm in good condition, except for a few places where a heavy branch or a tree had hit them. The loss of the canopy during the storm had

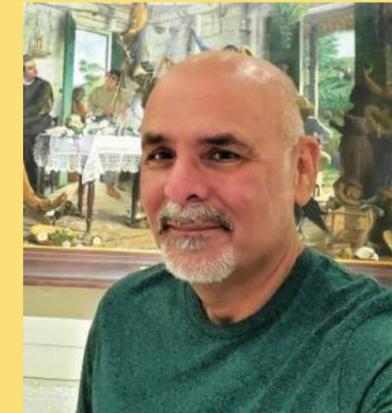
deprived all the cages of natural shade and the aluminum sheets that shielded the cages from the sun had mostly been ripped away. We had to gather fallen palm fronds to cover the flight cages and provide the birds with some shade.

While the flight cages had suffered little damage, the breeding cages were a different tale. In total almost half of Río Abajo's breeding cages were damaged or destroyed by the storm. In the months after the hurricane the staff worked hard with the cages and 90% of them were repaired in time for the 2018 breeding season. It was a monumental effort, but we were able to get the Aviary in working shape for our captive birds to begin breeding. ☐

Although the team faced serious challenges, their hard efforts would allow the birds to settle down and begin breeding again.

Find out how in the next article, **'Survivors of the Storm'**. ➡

About the Authors



Ricardo Valentin

Ricardo has worked with Puerto Rican Parrots since 1990 and is currently the Aviculturist of the Jose Vivaldi Aviary at the Río Abajo State Forest. Ricardo is responsible for maintaining the health and breeding productivity of the captive flock. Over the years, he has helped fledge over 600 chicks in captivity.



Alberto Álvarez

Alberto worked with the Puerto Rican Parrot Recovery project from 2009 to 2020. During this time, he worked actively with the management and monitoring of wild nests. He was also the primary source of technical expertise for much of the field equipment. Prior to this he worked in the conservation of endangered sea turtles and iguanas.



Article and photos: Tanya Martínez

SURVIVORS of the storm

In the forest of Río Abajo on Puerto Rico, dawn breaks to a cacophony of “caw-caw-caw” sounds that render any alarm clocks obsolete.

The owners of these discordant voices, endangered Puerto Rican Amazons, endured the worst natural disaster to strike the island in almost 100 years. Against all odds, the wild parrots of Río Abajo survived the onslaught of hurricane Maria as it ripped through the island on September 20, 2017.

But surviving the storm was just the beginning of their struggle.

HURRICANE MARIA LEFT BEHIND A RUIN OF A FOREST.

The leaves, vines, and branches that once tangled together into a lush green canopy were gone. Barely a leaf remained on any tree, and the emerald-colored feathers of the parrots stood out in marked contrast to the naked branches. In a forest without vegetation, the parrots had nowhere to hide and almost nothing to eat.

Before hurricane Maria, the Río Abajo Forest was home to more than 130 wild Puerto Rican Amazons. Unlike their captive cousins inside the Río Abajo breeding facility, the wild parrots had to face the full fury of the storm without the security of a concrete hurricane shelter. They clung to trees, were buffeted by 150 mile per hour winds, and were drenched by more than 10 inches of rain. Falling branches and flailing tree limbs likely claimed the lives of many. Despite this, we documented at least 110 survivors of the storm.

Unfortunately, the parrots faced even bigger problems after the winds and rains had ceased.

Puerto Rican Amazons are primarily fruit eaters, and few trees had managed to hold on to their precious fruits. The exception to this was the Royal palm (*Roystonea borinquena*), a native palm tree species that has been well documented to hold its ground and retain its fruits even during intense storms. However, the parrots weren't the only birds seeking sustenance from the resilient royal palms.

Other species of fruit-eating birds began competing with the parrots for the remaining food supply. It soon became clear that steps needed to be taken to keep the parrots from starving. Fortunately, the wild parrots of Río Abajo are trained to approach feeding stations. Feeders are suspended from tall branches and filled with commercial bird pellets and seeds.

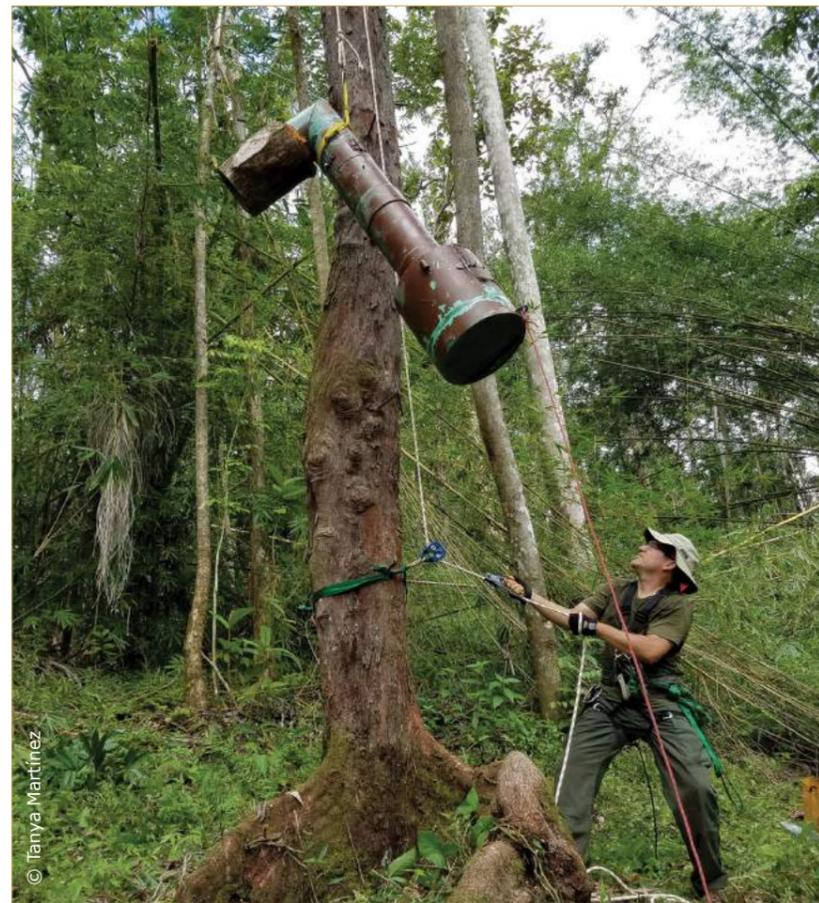


Left: A parrot eating Royal Palm after the hurricane, one of few natural food sources to survive the storm.

Top: Puerto Rican Amazons making good use of the supplemental feeding stations in the weeks following Maria.



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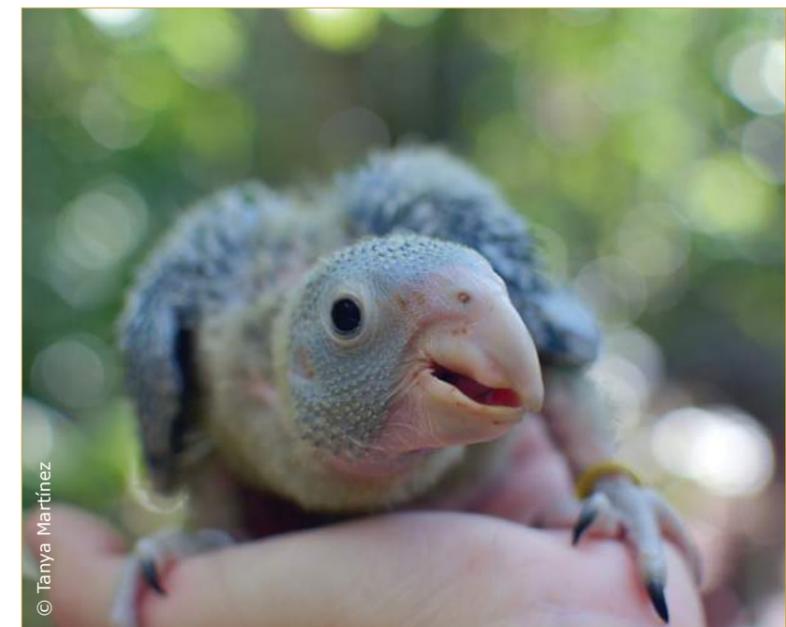
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Opposite page, far left: A female Puerto Rican Amazon peeks out of her nest cavity.

Opposite page, near left: Biologist Alberto Alvarez installs a new artificial nest cavity after the hurricane.

Current page, top: A snapshot from a camera nest monitor shows a parrot's nest being invaded by bees.

Current page, top right: Two newly hatched chicks and two eggs inside one of the artificial nest boxes at Río Abajo.

Current page, middle right: Two four-week old chicks inside an artificial nest box at Río Abajo.

Current page, lower right: A biologist examines a chick during a routine nest check.

Since the start of the release program in 2006, these feeding stations have served as reliable food sources for newly released parrots. After the storm, the feeders became a crucial lifeline for the entire wild parrot flock. The ravenous birds would descend on the feeders in groups of 60 or more, sometimes fighting amongst themselves for access to the food. During the first few weeks after the storm, our team of biologists had to increase the number of feeding stations and fill them multiple times a day just to meet the parrots' demands.

Of the 110 original survivors of the storm, only around 70 could be accounted for by the end of February 2018.

It is unclear whether the missing flock members succumbed to starvation and predators, or just moved to new areas in search of more food. By this point, the Río Abajo forest was showing tentative signs of recovery as new leaves and buds sprouted on the surviving forest

trees. Once the vegetation crept back into the canopy, the parrots could be spotted munching on the tender buds of the emerging forest growth. We now turned our attention to preparing for the oncoming parrot breeding season that hurricane Maria had done its best to disrupt. Three artificial nest cavities had been destroyed during the storm and most of the remaining nest trees had suffered damage and major defoliation.

For humans, getting around in the forest was almost impossible. Virtually every trail was blocked by the enormous tree limbs that were now piled all over the forest floor. Creeping vines began to thrive in the understory, making it impossible to walk anywhere without tripping. Before we could even think about repairing our broken nests, we had to start cutting our way to them. Trails had to be cleared by hand using mainly machetes and chainsaws. All the work took place in the blistering heat of a forest that no longer provided any type of shade.

Once the trails were cleared, our team set to work installing new artificial nest cavities and hacking dead branches away from the tops of nest trees. We also designed and installed a type of sun-shade around the nests to provide them with cover in the absence of the forest canopy.

Once the preparations were complete, it was time to wait for the parrots to breed...or not?

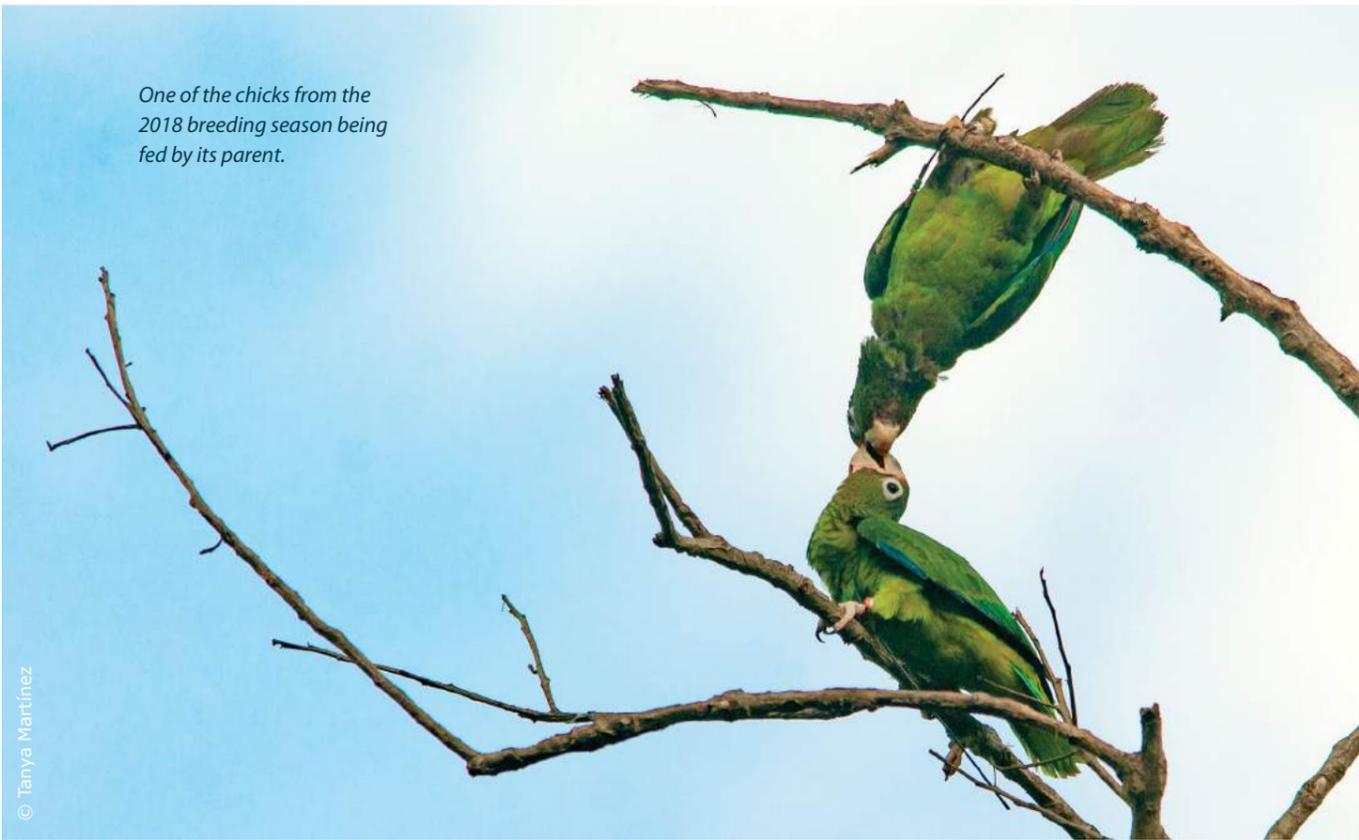
In Río Abajo, the Puerto Rican Amazon breeding season usually lasts from January to July. Wild parrots start claiming their nests at the beginning of the year and lay their first eggs by the end of February or the start of March. But with the drastically altered habitat and the lack of food, nobody was sure what to expect.

Many of our breeding pairs were among the documented survivors and we were all hopeful that at least some of these birds would attempt to breed.

The month of February came and went, then so did March. Each of our weekly nest checks ended in disappointment. By mid-April our hopes had almost vanished. Finally, on April 23rd we got the news we had all been hoping for. One of our wild breeding pairs had laid an egg! More pairs laid eggs that same week and a total of 12 pairs nested during this unlikely year. It was the latest start to a breeding season in Río Abajo's history.

The delay in egg-laying was only the first of the breeding season's challenges. Parrots weren't the only cavity dwelling species to struggle after the storm. A few weeks after the birds started nesting, they found themselves plagued by swarms of bees. The invasion of honey bees into parrot nests can have deadly consequences. Swarming bees can cause a mother parrot to abandon or break her eggs in distress. Bees can also kill chicks still inside their nests. Our biologists had to closely monitor the nests and intervene whenever bees invaded a cavity, sometimes climbing the nest tree in the middle of a swarm! Bee attacks in one parrot's nest were so severe that the eggs had to be removed and artificially incubated.

One of the chicks from the 2018 breeding season being fed by its parent.



© Tanya Martínez

Still more challenges arose once the chicks started to hatch. During a year when many of the parrots were having trouble finding enough food for themselves, feeding their young was also a struggle. It soon became clear that not all the parrot chicks were thriving. Three chicks died of hunger inside their nests. We had to remove two other chicks from their nest and raise them in captivity after their mother disappeared (we believe she was taken by a predator). We closely monitored the development of the all the remaining chicks and occasionally climbed the nest trees to provide some supplemental hand feeding to chicks that were struggling to gain weight.

Despite the harsh habitat conditions, 18 chicks managed to fledge from wild nests. These fledglings were a welcome addition to the wild population, which had declined so drastically since the storm. They were also the only boost to the wild parrot population in 2018. The badly degraded habitat and damaged infrastructure resulted in a halt to all parrot release efforts that year.

Two years after the storm, the wild parrots of Río Abajo have made an impressive comeback.

Twenty-three parrots were released from captivity in the summer of 2019 and 37 chicks fledged from wild nests during the 2019 breeding season. During our last wild parrot count we estimated that the wild flock had again risen to pre-Maria numbers, a tremendous feat considering the terrible habitat conditions endured by the parrots for most of 2018.

The resilience of the parrots following this natural disaster is a testament to the amazing conservation program and all the people, partners, and government agencies that labor every day to bring this species back from the brink of extinction. It is a story of despair and devastation but also of hope and new life. Despite the setbacks suffered by the species during this difficult time, we have faith that the parrots will continue to recover and thrive in the future. Much as we have faith that the people of Puerto Rico will follow their example. 📍

About the Author



Tanya Martínez

Tanya is the current project leader for the DNER's Puerto Rican Parrot Recover Project. She developed a passion for parrots from a young age. She has worked in fields related to parrot rescue, research, or conservation for the past 15 years. She enjoys documenting the lives of the wild parrots of Río Abajo through photography.

© Tanya Martínez

Thank you!



In September 2017, the Puerto Rican Parrot Recovery Program was reeling from the impact of Hurricane Maria. The forests where the birds lived had been ravaged by the storm, many wild parrots had been killed, crucial infrastructure had been damaged or destroyed, and the captive breeding facility at the Río Abajo State Forest had no power or running water. Amidst all this chaos, I received an email from the World Parrot Trust informing me that the organization wanted to start a fundraising campaign to help the project in Río Abajo recover from the storm.

By December of that same year, the campaign had raised over \$30,000 for the benefit of our recovery efforts. We were thrilled by the outpouring of support from the public and amazed that so many people had come together to help our beloved parrots during

these terrible events. Since this time, the World Parrot Trust has supported the Puerto Rico Department of Natural and Environmental Resources in initiatives related to the Puerto Rican Parrot Recovery Project. This has included everything from an emergency power and water delivery system which were crucial to stabilizing operations in the early days after the hurricane, to advanced training in tree climbing and nest box installation.

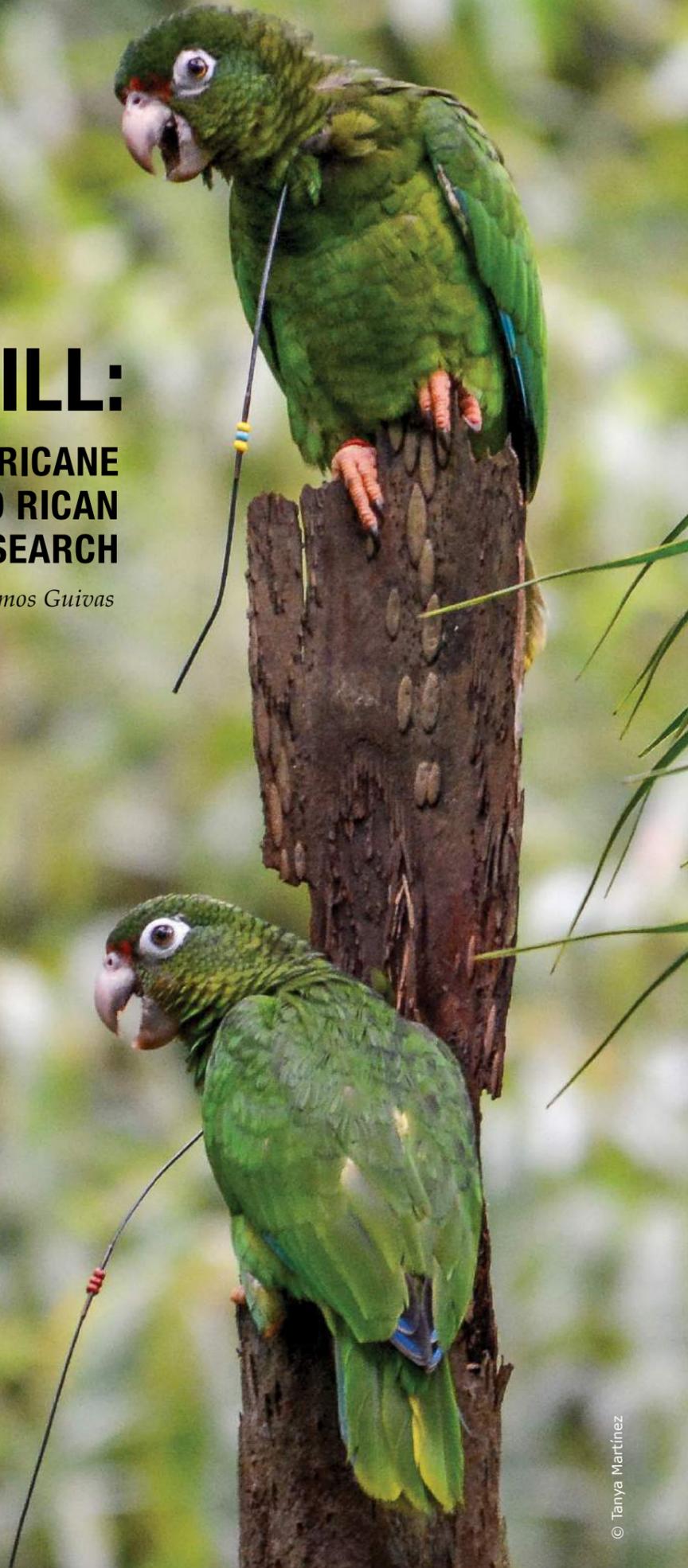
WPT has also facilitated the exchange of scientific knowledge between biologists from our project and those from parrot conservation projects in other parts of the world. We are extremely grateful to the WPT and all its collaborators and donors for their generous contributions. With your continued support, we will endeavor to fill the skies above Puerto Rico with even more squawking green parrots! ~ Tanya Martínez

A TEST OF WILL:

THE EFFECTS OF HURRICANE MARIA ON THE PUERTO RICAN AMAZON AND ITS RESEARCH

by Brian Ramos Guivas

Parenting is tough for a lot of species. But imagine being a parent on an island recently hit by a hurricane, which passed over your home and decimated most of the habitat you depend upon on for food. This is what happened to the Puerto Rican parrots when Hurricane Maria rampaged through Puerto Rico.



© Tanya Martínez

It was close to 11:00 am on Sept 21 — the day after Maria — when we came out of the hurricane shelter to overwhelming devastation.

We immediately went to check on the parrots at their hurricane shelter and were very relieved to see that all captive birds were alive and well. These feelings were short lived, however, because we were still worried about the wild birds. Close to noon, we saw a flock of about 16 wild parrots flying around the aviary. But these were only 16 of the estimated 134 parrots in our wild population before Hurricane Maria hit. As the birds flew south, I thought this was the end of my 18 years working to save this species.

But then, as I was standing close to the entrance of the facilities around 4 pm, still stunned by the devastated forest around me, 25 birds came flying from the southwest. I made a noise to communicate my presence that I use occasionally with the captive birds, and all 25 birds landed on the top of the few remaining trees around me. It was a very emotional moment, first taking in the wreckage of the forest and subsequently realizing that some birds had been able to survive.

Out of devastation, a new opportunity

During my 18 years working with the Puerto Rican parrot program, I have never faced such difficult conditions as those we experienced during the Category 5 hurricane and its aftermath. A biologist in the program, Ricardo Valentin, and I had spent both Hurricanes Irma and Maria at the facilities. Irma did not wreak much havoc in the forest, but Maria was a different monster.

Afterward, our team spent almost four-and-a-half months preparing the facilities for the breeding season, every day working with chainsaws and machetes, and fixing cages. During the preparation,

I managed to get in contact with my mentor at New Mexico State University. Besides being worried about my health and safety, he saw the hurricane as a unique opportunity to compare the parrots' reproductive success before and after such a catastrophic and stressful environmental event. I was exhausted by the months of hard work in the aftermath of Maria, but my curiosity as a scientist to know more about the breeding behavior and reproductive success of the parrots was stronger.

One of the questions I've thought about for years is why wild Puerto Rican parrots produce more chicks per nest than their captive counterparts, which have unlimited access to food and other resources, not to mention protection from environmental catastrophes. Imagine most of the of the wild food source for the parrots having been removed. Even though we provide pellets to wild birds, these last only a short time in the morning; it is like breakfast for them. After they have eaten the pellets provided, they must fly long distances to forage for wild food.

Captive birds have food available all day, meaning they do not have to fly long distances to forage and be worried about predators and competitors. But captive conditions can modify behaviors in various species of animals, including mammals, fish and birds. It has been found that wild-caught animals reproduce better in captive conditions than captive-reared animals. In the Puerto Rican parrot program all captive breeders are captive-reared birds.

The natural questions to ask are: how different will the nest successes before and after a catastrophic Category 5 hurricane be for the wild and captive birds, and will there be any difference in nest success between captive and wild birds?



Above: Wild breeding birds defend their nest cavity.

As a complementary study, I am also asking how stress is related to nest success in captivity. In the captive breeding population, some pairs can raise more than one chick every year while some pairs raise a single chick, and others are not successful. It is possible that some captive individuals might be more stressed than others, which may lead to the wide variation in reproductive success that we observe in the captive population. Stress may play a large role in parental care behavior. Puerto Rican parrot females rely on the male for food during incubation and while chicks are young and being reared. A stressed male may provide less food to his mate, in which case their nesting attempt could fail.

Our preparation for the hurricane conditions in 2018 may have induced high levels of stress in the captive population. We had to capture birds and place them in a hurricane shelter during Hurricane Maria, and the birds had to stay in this shelter for weeks. Prior to Maria, we had to move the captive birds into the shelter during Irma, although they stayed less than a week. These handling events and time spent in an unfamiliar place may have stressed the captive birds more than the captive conditions they experienced in previous years.

Challenges

We lost power after Hurricane Irma and, unfortunately, the power could not be restored before Maria touched land. Hurricane Maria damaged all the power systems across Puerto Rico. Due to the remote location of our facilities, restoring power here remains a major challenge. Without power, I relied on a battery or a power plant as a source of electricity. We had a strict schedule to save energy. We had to limit electricity to 6:00 – 8:30am, 11:30am - 1:30pm, and 6:00pm - 10:00pm. Luckily, we avoided this electricity shortage for my study with the wild population.

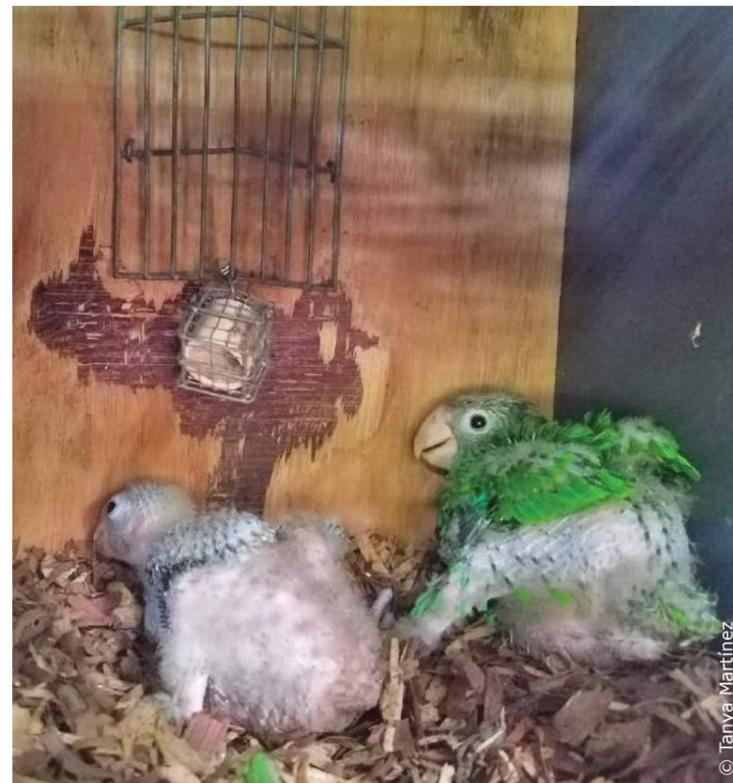
In the previous years, I came up with a battery-driven system to power one infrared camera and one portable DVR, which can record up to 5 days in a row with a 32gb memory card. For research with the wild population, I only had to set up the system once or twice a week. On the other hand, it was still a challenge to find the right batteries at an affordable price.

The story was different for the captive population. We depended on the powerplant to supply energy to the facilities, but I could not record when the power plant was off. I was using a regular surveillance system, and

the battery-driven system I had set up for the wild population would not be enough. The surveillance system included one DVR recorder, a 24-inch monitor and 13 cameras. I was able to jury-rig some small solar panels together with an inverter, which gave me about 2.5 hours more power on a sunny day in addition to the power plant schedule, for the full breeding season that started in late February until late June.

To measure the stress levels on the birds, I collected faecal samples to test for corticosteroids before and during the breeding season. Before the breeding season I collected samples from the males and the females, but during the breeding season only for the males. To collect the samples, I used a PVC plank that was 4 feet long and 6 inches wide. I placed these planks under the cage where the birds perched during the night.

After every breeding season all pairs are removed from their breeding cages and placed in smaller cages until the next breeding season. After the storm we had fixed these small cages (called retention cages), and placed the birds in them. Each bird had its own cage next to its mate. Before the breeding season started I went almost every day at about



Left: A temperature sensor attached to the wall of a captive breeding nest box.
Right: A fledgling parrot sports a radio collar.



6:30pm, placing the plank under the cages and picking it up next day before 6:00am. Once the breeding season started and egg laying began, I repeated the same procedure but now with the birds in their breeding cages. During the breeding season I focused only on the males, as only females incubate, which means that the male is the only one outside the cage at night. Therefore, it is easier to identify which individual has produced the sample.

Final remarks

It was a long, long, season. Since we were without power for a year and five days after Maria, it was a challenge to maintain the normal routine; even resting was difficult, since without electricity, there are no fans to provide some reprieve from the hot, humid weather. But one thing that I have taken away from this experience is that my drive to use science to continue helping the Puerto Rican parrot is stronger than the hurricane's devastation. By the end of the 2018 breeding season, I did manage to finish collecting the data for my PhD. It seems that the parrots' corticosteroid levels were higher right after the hurricane during the pre-breeding period than the breeding season of 2018.

What causes these levels to be high during the pre-breeding than the breeding seasons? We do not know the answer yet; it could have been related to the amount of human activity during that time or due to natural fluctuations for the species. I am still working on the videos and hopefully soon to have all the information analyzed. I think it is going to be really exciting information of how parental care is for normal conditions and after a Category 5 hurricane. ☐

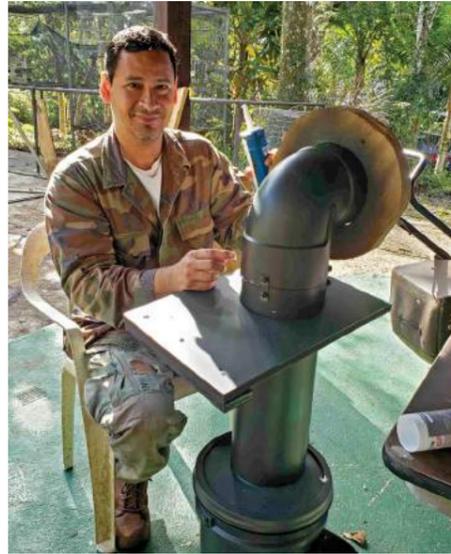
About the Author



Brian Ramos Guivas

Brian began working for the Puerto Rican Parrot Recovery Project in December 1999. He is captivated by reproductive behavior. He is playfully known as the parrot "sex therapist" because of his ability to identify successful breeding pairs.

He is currently studying parrot reproductive behavior for his PhD at New Mexico State University.



From left: Tomás Medina, Brian Ramos Guivas, and Mauricio Cuevas building and installing nest boxes. Photos © Tanya Martínez



Update from Río Abajo:

Puerto Rican Amazons receive much-needed nestboxes

BY TANYA MARTÍNEZ

As part of the ongoing conservation efforts for the Puerto Rican Parrot, biologists from Puerto Rico Department of Natural and Environmental Resources install nest boxes in the canopy of the Río Abajo State Forest.

This forest is home to the largest surviving population of Puerto Rican Parrots, with a population in Río Abajo estimated at more than 120 wild parrots. The parrots are obligate secondary cavity nesters, which means that they don't build their own nest structures and instead depend on natural cavities inside trees to be able to lay eggs and rear their young. Natural cavities are usually only found in very old trees. Because Puerto Rico suffered so much deforestation in the first half of the 20th century, many of the forests don't have mature trees with

plentiful natural cavities. Fortunately, the parrots take well to artificial structures. These nest boxes are built from PVC pipe and 5-gallon buckets. Parrots prefer to nest up high, so biologists have to climb 40-50 feet into the canopy to install the artificial nests. The nest boxes are painted so that they can blend in with the tree. The long structure simulates the depth of a natural cavity and provides the parrots with a safe and dry place to lay their eggs. A small door at the bottom of the nest allows biologists to access the eggs and chicks.

The World Parrot Trust donated the materials used to build these nest boxes. WPT also flew in Biologist Mauricio Cuevas, to assist with the installation of the artificial cavities. Between 2019 and 2020 we installed 10 new nest boxes in the Río Abajo Forest. ☐

THE SOUNDS AND SIGHTS OF



Photos and article © Cheryl Rutherford

"Bird watching depends a lot on bird listening", I thought to myself as I stood on the side of a dirt road in the Costa Rican province of Guanacaste, peering up into a rather scraggly looking tree with little black prickly fruits poking out from between the leaves. I could hear a quiet, very satisfied grunting coming from somewhere in the middle of the foliage.

I craned my neck upwards, searching the dappled leaves and trying to pinpoint the indistinct rustling.

Finally my perseverance was rewarded and I spotted two Orange-fronted parakeets (*Eupsittula canicularis*) a few feet away from me, serenely gnawing on the small, spiky nuts.

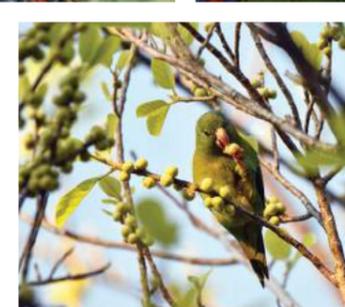
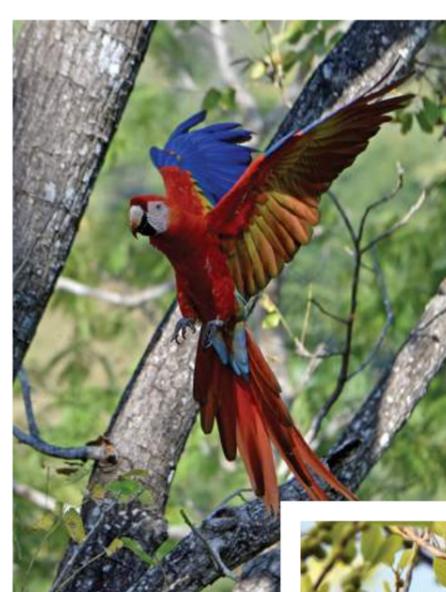
I watched the parakeets for ten minutes, and the whole time they ate, they made little satisfied sounds that could only be parrot for "Yum!" I later learned this was a guácimo tree (*Guazuma ulmifolia*), a member of the same family to which the Cacao tree belongs. (Yes, the chocolate one!) Apparently the nuts are used in indigenous Mayan chocolate drinks because of their sweet flavour and pleasant, spicy scent. Learning this, I completely understood the sounds the birds were making as they enjoyed their tasty breakfast!



Earlier in the week, my ears had led me to a golden fig tree situated on the side of yet another dirt road. Reaching the point of the ruckus, I was rewarded with the sight of some twenty Orange-chinned Parakeets (*Brotogeris jugularis*) feasting on blueberry-sized fruits high in the sun-streaked branches of a Higuérón tree (*Ficus sp.*). The loquacious birds held the fruit up to their beaks like wee yellow apples and munched contentedly on the food.



Top left: A Scarlet Macaw peeks out of a natural nest cavity. **Top right:** A macaw perches high in the canopy. **Lower right:** A pair inspects an artificial nest box.



Top left and right: Wild Scarlet Macaws.
Inset: An Orange-chinned Parakeet dines on wild fruit.

While spotting any wild parrot will always be a thrill, a visit to Costa Rica without seeing the macaws would be remiss, and this was why we found ourselves in Samara Beach. After driving the 4.5 hours from San Jose, we were within a short drive to Punta Islita. This is where WPT Partner Project Macaw Recovery Network is located, run by Dr. Sam and Sarah Williams.

MRN works with its partners to boost wild populations of the Scarlet and the Great Green Macaw through breeding and reintroduction programs, in addition to spearheading education and reforestation projects.

In planning our visit, Sam helped facilitate an excursion into the field, as well as a photography tour. For the first excursion, I joined MRN Assistant Bird Manager Carey and volunteers Kylie and Lauren during their early morning field observation rounds. The team picked me up before dawn when the Howler Monkeys were still ominously calling through the forest. Kylie expertly managed the 4x4 as we drove the bumpy, potholed roads towards Punta Islita. Our first destination was a nest box that had been installed in a forested area where there were two dead palm trees the birds were inspecting.

While dead palms are attractive to macaws (barring natural tree cavity options in an area), they are dangerous and can flood in the rains and drown the occupants: the dead trees have no canopy of leaves for protection. Our luck was with us and we quickly spotted the bonded pair of house-hunting Scarlet Macaws flying between the palms and the nest box.

They were clearly interested in all three, although a nesting Kiskadee pair drove them off rather loudly from one of the dead palms. The macaws spent a good deal of time checking out the nest box – and us! – while the three conservationists discussed further refinements (such as adding more perching options) to make it even more attractive to the birds.

The team decided to return that afternoon to tear down the unoccupied dead palm, leaving the Kiskadees in the in the other as a natural deterrent and the nest box as the only local option for the macaw pair.

The next field destination was right in the middle of the little town of Punta Islita. The natural nest cavity was in a tree located between the edge of the main road and the side of a children's soccer field.

While we didn't see the male macaw this particular morning, we did finally observe the female poking her head out of the cavity looking for her breakfast delivery. The male was the one who tidied up the cavity for her last year and he is in charge of foraging during egg incubation. Interestingly, he occupied a nest box that was installed in the tree about ten feet above the natural cavity where the female resided.

Our second excursion was the "Breakfast with the Macaws Photography Tour" hosted by Visitation Manager Abi at MRN's Punta Islita Wild Macaw Reserve. 50+ Scarlet Macaws have been successfully released into the wild at this site (the Great Green Macaws are released further north, in the province of Heredia). While we waited for the macaws to arrive for their breakfast, Abi enthusiastically discussed with us the work that MRN is doing, as well as future plans: in addition to the macaws, the Endangered Yellow-naped Amazon (*Amazona auropalliata*) may soon be added to the breeding and release program.

As we talked, avian squawking and chattering – and a bit of friendly bickering – filled my ears. Scarlet Macaws were arriving, flying over the trees and perching on branches in anticipation of the feast. Preening between pairs could be observed, catching-up amongst birds was ongoing and the photo opportunities kept appearing one after the other. There was even a pair practically right above our heads! Their red feathers contrasted vibrantly against the green leaves, and flashes of primary yellow and blue flickered throughout the trees.

Finally, Abi went to draw up the natural-looking feeding station and breakfast was served, with great gusto. There was upwards of a dozen birds all taking turns at the buffet, some politely, some with a bit more feistiness or shyness (depending on their place in the social hierarchy). Croaks, rattles, sudden squawks and growls made it quite apparent the macaws were having a full-fledged conversation: "Hey! That nut is mine!" "Wow, the oranges are sweet this morning!" "Get your tail feathers

out of my face!" "You're kinda cute!" "So, what's everyone doing today?"

After I satisfied my appetite for watching the birds (though really, is that ever possible?), we went back into the Visitor Centre to take a look at the macaw-related art in the Gift Shop. The art was created by well-known artists and locals; providing this venue for the artists helps build and reinforce pride in having wild macaws flying about and the sales benefit both MRN and the artisans.

I nabbed a few treasures I had to bring home, then we said goodbye. Walking out to the parking lot, avian conversation ringing in my ears, I had some colourful photos in my camera and wonderful memories in my heart. 'Til next time, Costa Rica! I can't wait to see – and hear – you again! ☐

Learn how you can help support the conservation efforts of the Macaw Recovery Network by visiting their website: www.macawrecoverynetwork.org

CAPE PARROT

A plan for recovery is launched

by Rowan Martin PhD, WPT-Africa Programme Director

The conservation of one of Africa's most threatened parrots has received a boost with the launch of the "Cape Parrot and Mistbelt Forest Conservation Action Plan". The plan is the result of many hours of collaborative effort and charts a course for the recovery of the species.

Cape Parrots (*Poicephalus robustus*) are found only in South Africa, with populations scattered across fragments of mistbelt forest. Until recently, their status as a distinct species was hotly debated. But in 2017, following a re-evaluation of the evidence, these charismatic 'green and gold' parrots were recognised as separate from the Brown-necked Parrot *Poicephalus fuscicollis*, which is widely distributed in Africa and found as far away as the Gambia.

Although surveys conducted in recent years suggest Cape Parrot numbers are fairly stable, their small and fragmented population leaves them exposed to a diversity of threats. Following recognition as a distinct species, Cape Parrots were categorised by the IUCN as globally 'Vulnerable' to extinction.

Among the greatest threats is the loss and degradation of the mistbelt forest habitat on which they depend. Cape Parrots, like many parrots, feed on a diversity of foods, but are particularly reliant on the fruits of *Podocarpus* sp. trees, which are characteristic of the mistbelt forest. They also need cavities in large, mature trees, or dead snags in which to nest. These resources continue to shrink as growing human populations and the pressures of development encroach on remaining forested areas.



Male Cape Parrot © Anton Kruger



Intense discussions for Cape Parrot conservation. Photos © Rowan Martin



A thriving population of Cape Parrots acting as a flagship for the protection and recovery of indigenous forests in South Africa, for the shared benefit of people and nature.

Effective and impactful conservation is often best achieved through careful and inclusive planning and in recognition of this, in September last year, 48 people gathered together in Hogsback, South Africa. These included representatives of provincial and national government, landowners, forestry companies, conservation organisations, community groups, bird guides, students, academics and other stakeholders.

The workshop involved two days of intense discussion, which ran late into the evenings. There was a huge amount of ground to cover but by the end of the workshop a draft plan was in hand with the finer details ironed out over subsequent months through collaboration with those unable to attend. The plan had a strong emphasis on habitat protection and restoration, which is reflected in its title, but actions to monitor and

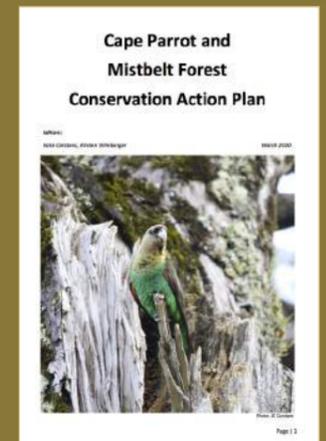
address multiple additional threats were included. Among these are the impacts of Beak and Feather Disease Virus, the risk of disease 'spillover' from expanding populations of invasive Ringneck Parakeets (*Psittacula krameri*) and the threats to native forests posed by a recently established 'borer' beetle.

Looking forward, implementation of the plan will be coordinated by a committee made up from representatives of different regions and areas of expertise. This coordination will be led by Dr. Jess Leaver in a position generously funded by the Wild Bird Trust.

One of the first activities is to see the plan gazetted by the South African government as a national 'Biodiversity Management Plan', a vital step to secure long term commitments at the highest level to protect one of Africa's most remarkable birds. 

Acknowledgements:

The World Parrot Trust's Africa Programme Director, Rowan Martin, worked with a small team from the Cape Parrot Project, Cape Parrot Working Group, BirdLife South Africa, the Endangered Wildlife Trust and IUCN Conservation Planning Specialist Group to coordinate the workshop and produce the action plan. We are grateful for donations from several generous supporters who made this workshop possible.



Cape Parrot and Mistbelt Forest Conservation Action Plan, online: tinyurl.com/cpsg-cpap

PARROTS IN THE WILD:

Blue-headed Parrot

(Pionus menstruus)

A fledgling Blue-headed Parrot peeks out of a nest cavity in its native Colombia. Found in South America, this small parrot lives at altitudes up to 1100m (3608 ft) in lowland tropical forest, including rainforest, deciduous and savanna; subtropical formations, cultivated areas, plantations, clearings with trees, secondary growth forest, and seasonally in dry caatinga forest.

Photo © Corey Raffel



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