

IT AIN'T EASY BEIN' GREEN

From the rain-soaked Caribbean lowlands of Costa Rica to the Pacific dry forest of Ecuador, multiple strategies emerge to save a magnificent macaw

By Brian Kluepfel



CRITICALLY ENDANGERED: A Great
Green Macaw preens its back
feathers. The species is found from
Honduras to western Ecuador.



V

isitors to Ara Manzanillo's Great Green Macaw Reintroduction Station in southeastern Costa Rica, just miles from the Panama border, are met by an unholy racket. The local flock of Great Greens has arrived for its daily snack.

If it's tropical tranquility you were seeking, forget it: The *Ara ambiguus*, among the largest of the macaws and similar in length to Bald and Golden Eagles, is no retiring wallflower. You'd have to think that the genus name derives directly from the high-decibel blasts coming from the nearby treetops — *Ar! Ar! Ar!* — heard even as we walk up the drive to the center. It's enough to drown out our guide's voice as he explains some basic parrot facts. In fact, the name comes from the indigenous Tupi language of Brazil: *a'rara*.

Some of the avian aural assault is coming from customized plastic trash bins situated 100 meters up a massive almond tree, an example of the successful artificial nests Ara Manzanillo has contrived for the birds. Since 2010, approximately 60 captive-raised birds have been successfully reintroduced, and 15 active artificial nests have been in use since 2014.

The nest box solution was a must for this critically endangered species; fewer than 1,000 individuals exist between southern Honduras and northern Ecuador, while a tiny subspecies hangs on in southern Ecuador's dry forests.

It was a challenge finding the right material for the artificial homes. Roopak Bhatt, our volunteer guide, says the sharp-billed birds went through wood boxes "like a chew toy" and that metal nests tended to rust in the damp Caribbean climate.

The nest boxes have produced positive results in the Manzanillo population: nine breeding couples and 22 chicks in the past five years. The macaws lay one to four eggs each November or December. In three to four months, the chicks are full size; however, there is an 80 percent mortality rate, and the birds don't reach breeding age until four or five years.

VANISHING HABITAT

A major concern for conservationists is the rapid disappearance of the Great Greens' preferred nesting site: mountain almond trees.

"This tree provides 90 percent of the birds' nests, but 90 percent of them in Costa Rica have been cut down,"

says Sam Williams of the Macaw Recovery Network (MRN). The loss of habitat is in part attributed to oil palms replacing native trees. "Great Greens prefer an intact forest," he notes.

One problem is that ideal nesting sites tend to fall down because of age. "The palms have to have time to age, not merely grow," Williams explains. (The artificial box we saw at the entrance of Manzanillo was attached to an almond tree more than 300 years old.)

Williams is resigned to a somewhat unnatural method of growing the macaw population. "Since the mountain almond grows slowly, I'm comfortable with the nest boxes. We have to increase the numbers any way that we can," he says.

In addition to its ample nesting cavities, the tree's almonds are crucial to the birds' diet. Great Greens use their huge, powerful bills like massive can openers. "I've tried to crack these almonds with a machete and could not," Bhatt says. The Great Green's head and jaw are enormous compared to the Scarlet Macaw, which cannot eat the same almonds. (The largest macaw, Brazil's mighty Hyacinth, is also a big fan of the hard-to-crack

RARE BIRDS: Great Green Macaws perch in a Costa Rican forest. The global population is between 500 and 1,000 birds.



almond.) Great Greens also like the monkey pot plant, which often grows near the mountain almond tree.

The idea of tree nurseries to help the macaw has come to fruition. Mario Jimenez, MRN's field leader, manages the effort. He says that while the mountain almond is crucial in providing nesting cavities and food, the titor tree can also be an important ally of the Great Green, as it provides good building material and food.

MRN's nursery project, near Cinco Ceibas reserve, hopes to produce different varieties of palm, including the non-native beach palm. "It's exotic, but it's been in Costa Rica for a while, and the macaws love it," says Jimenez. A graduate student's research in 2016 concluded that the birds used beach palm more than other trees. To further assist the macaws, MRN worked with local schoolchildren to plant 300 mountain almond trees in December 2019.

CALL OF THE WILD: RELEASE PROGRAM

Great Green chicks are brought to Manzanillo from MRN's breeding center in Islita, on the Pacific, home to 80 Scarlet and Great Green rescue birds that cannot be released and are kept only for breeding. The offspring are kept in an aviary for six to eight months, where they're raised on their wild diet — mountain almonds, beach almonds, nuts, and seeds. They also get used to the sights and sounds of the forest. "Watching them crack and eat the beach almonds and mountain almonds lets us know, 'Hey, these birds are ready to release,'" Bhatt says.

"We're trying to build a culture of reintroduction in Costa Rica," adds Williams. "There is some resistance, and it's also been shown that 120,000 birds (of all species) are still in captivity in Costa Rica. Although it's illegal to have wild animals as pets in Costa Rica, one-third of families still have had parrots as pets."

Another obstacle is a legal one: It's against the law to reintroduce animals in Costa Rica's national parks, which comprise one-quarter of the country.

Once macaws have flown the coop, locating the introduced birds takes a village — or several. A local outreach program has helped Ara Manzanillo monitor the birds. "People will contact us and say, 'Hey, we saw your birds,'" says Bhatt. Reports, sometimes with digital pictures, come from neighboring indigenous reserves and across the border in Panama.

"Most often, info comes via social media," says Emily Yozell of Ara Manzanillo's board of directors. "The Great Greens are very intelligent, curious, and mischievous animals with adept articulations, so tracking devices are not viable."

A DWINDLING SPECIES

In 2020, Great Green Macaw's status on the international Red List of threatened species was downgraded to critically endangered due to "extensive habitat destruction and capture for the

cagebird trade" that has led to "extremely rapid and continuing population declines."

BirdLife International estimates the population numbers 260 mature individuals in Honduras, 130 in northern Costa Rica and southern Nicaragua, 100 in Colombia, and 35 to 50 in two separate sites in Ecuador, for a minimum of 525 macaws. An unknown number also are found in Panama, and, all together, BirdLife puts the total between 500 and 1,000 birds.

"According to this most recent census, the work of Ara Manzanillo has increased Costa Rica's population of free-flying Great Greens by 50 percent and the world population by more than 10 percent," Yozell says. "We are very proud of the impact the project is having on the recovery of this beautiful and emblematic bird."

Sarah Williams of MRN explains that the Red List status change happened "due to the data that MRN collected over the years, and MRN's collaboration with different partners across the range of the Great Green Macaw to get a better idea on the actual status. We have also found that for wild macaws, the problem isn't productivity, since we are seeing about 30 to 50 chicks fledging successfully every year pretty consistently. The problem is likely the survival of chicks and adults after the breeding season has ended, and they migrate to other areas. It is critical that we now focus our research on better understanding where they may be compromised."

In Costa Rica and Nicaragua, the breeding area covers about 1,200 square kilometers and includes four known breeding populations: near Sarapiquí, Tortuguero, and Siquirres, as well in Manzanillo, which is managed by Ara.

MRN works more with the wild populations than Ara, monitoring natural nest sites in the breeding season (December to June) and in the nonbreeding season, when the birds move to the highlands and the foothills of Braulio Carrillo National Park. The team looks for roosts and also attempts to repair nests damaged by the predation of toucans, aracarís, and the opportunistic tayra, a weasel-like rodent that scales trees. (MRN cuts vines to try to halt this activity.)

MRN is also involved in reforestation projects near Boca Tapada and in brokering peaceful relationships with owners of large properties who have macaw nests on their ranches. Lessons have been learned.

Olivier Chassot of the Great Green Macaw Research Center (GGMRC) worked in northern Costa Rica from 2006-'14 and was threatened multiple times, and his field house in Boca Tapada was burned down in 2010. "We quickly learned that

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we had to work with local communities if we were to be successful in conserving the bird," says Chassot.

PINEAPPLE PROBLEM

Costa Rica is the world's second-largest exporter of pineapples. The billion-dollar monoculture crop comes with issues of environmental degradation and abusive labor practices. The *piña* plantations are "essentially deserts to wildlife," says MRN's Sam Williams. The battle with pineapples is "not a war we are going to win. The money behind pineapples is crazy," adds Jimenez.

Ornithologist George Powell, who did groundbreaking macaw research from 1994-2000 in Costa Rica, had identified the threat even back then. Chassot summed it up: "If there's a fruit we don't eat at home, it's the pineapple!"

"Costa Rica, despite its green reputation, is the world's worst polluter in terms of agrochemical use," notes Sam Williams. Multinationals use approximately 16 pounds of chemicals per acre of pineapple. Other challenges to macaws include cattle ranching and poaching.

Local conservation activist Alex Martinez (a former park ranger in the Sarapiquí region) feels that new research isn't the priority: buying and conserving the remaining almond trees is. For Martinez, bothering the birds further by tagging them is less crucial than preserving the ever-decreasing habitat.

"It's important to remember that we (humans) aren't always the best part of the process," he says. "Actually, we can interfere with nature's own ways of restoration and balance." Habitat preservation, education, and public consciousness are crucial, he argues.

Current political and environmental unrest affecting Costa Rica's neighbors does not bode well, however. "We're terrified of what could happen to the birds in places like Honduras and Nicaragua," says Sam Williams. The massive forest fire in Nicaragua's Indio-Maiz Biological Reserve in 2018 — and that country's refusal to accept Costa Rican aid in putting it out — is a case in point.

Still, Chassot is hopeful. In 2001, he and his wife, Guisselle Monge Arias, currently the director of the Sarapiquí Conservation Learning Center, worked to establish the transnational San Juan-La Selva Biological Corridor. "This is an alliance of local organizations, NGOs, academics, and government agencies that meet to implement conservation and sustainable development projects," he says. "It is still regarded as a model in Latin America."

A SUBSPECIES ON THE BRINK

It's a brave new world in the dry coastal forests of southern Ecuador, where a group of non-governmental organizations is trying to reestablish a Great Green subspecies population numbering only a few dozen.

The taxonomic validity of the *Ara ambiguus guayaquilensis* subspecies has been debated, but its narrower bill, unique habitat, and geographic separation differentiate it from the nominate subspecies, whose range ends in northern Ecuador.

In 2017, Jocotoco Foundation, in partnership with Loro Parque and Fundación Jambeli, started to release captive-raised birds into the wild. Jambeli's breeding program began with birds taken from zoos and pet owners.

So far, Jocotoco has released Great Greens four times at its Ayampe and Las Balsas reserves in western Ecuador. Nineteen birds have been liberated, and initial reports lend a glimmer of hope; one released bird has been observed nesting with a mate from the wild population.

About one-third of released birds were fitted with GPS collars, allowing Jocotoco to track their movements. The remote mountain habitat of Santa Elena province, where the last wild population exists, isn't easy to cover. Ayampe is about 50 kilometers north of Las Balsas, and at least one bird has flown between the two reserves, creating dreams for a "green corridor."

Ultimately, conservationists would like to link the dry forest of Cerro Blanco, just outside of Guayaquil, to this corridor. It would somehow be fitting if the bird deemed Guayaquil's "emblematic species" in 2005 returns to live there. A local mall is even home to a huge 12-meter statue of the *papagayo de Guayaquil*, a splendid creation composed of more than 70,000 ceramic tiles.

Community involvement in mountain villages like Guala, El Pital, and Matapalo — 60 educational visits in all — has definitely saved at least one Ecuadorian Great Green. An individual released in 2017 flew just 12 km in a torrential downpour and was found on the ground by a family, whose daughter had been part of an educational program about macaws. The family contacted Jocotoco, and the bird was saved. "Previously, it probably would've ended up on the illegal market," says Jocotoco conservation manager Michaël Moens.

Where to see Great Greens in Costa Rica

Great Green Macaws populate the Caribbean coast of Costa Rica. During our trip, we saw them near Boca Tapada (Maquenque Lodge), Tortuguero National Park, Yatama Lodge near Sarapiquí, and in Manzanillo. You can visit the Ara Manzanillo project for the daily 3 p.m. arrival of a mostly wild flock of Great Greens that come for an afternoon snack. And on the Pacific coast, you can visit Ara's breeding center at Punta Isleta to see a raucous released group of Scarlet Macaws.

A RAINBOW OF FEATHERS: In flight, a Great Green displays its many colors that are less noticeable when the bird is perched.



DEATH BY A THOUSAND CUTS

Eric Horstman worked in southern Ecuador's Cerro Blanco forest for three decades, first as a Peace Corps volunteer and then as director of Pro-Forest Foundation (Fundacion Pro-Bosque). He was enchanted from the outset by the magnificent macaws.

In conservation terms, dry tropical forests aren't sexy — they "suffer an image problem," Horstman says. He needed a flagship species to create public awareness.

"One afternoon, I saw a pair of Great Greens fly into the crown of an *amarillo lagarto* (*Centrolobium paraense*) and begin to eat the spiny-covered nuts," he says. "I was enthralled to see the macaws fly off, vocalizing, with long tails streaming behind them. I decided that day the species would be Cerro Blanco's conservation symbol."

Horstman took up the cause of replanting dry forest trees that the macaws fed upon, or, in the case of the Pijjo tree (*Cavanillesia platanifolia*), they nested in. He saw macaws frequently in the reforestation zone, in groups of 9 to 11 during the rainy season.

His work brought people together: In one instance, an alliance of the Ecuadorian Army, park guards, and biology students traded round-the-clock shifts in a field tent at the base of a tree, saving a nest from machete-bearing poachers. As a bonus, the first scientific nesting data on Great Greens in Ecuador was recorded.

"A big problem is habitat fragmentation," says Horstman. "In Cerro Blanco, we successfully restored 647 hectares. The biological corridor ... needs leadership from the authorities, and the planned road through Cerro Blanco will only complicate matters."

Lack of a nationwide vision is also a hindrance, he notes. "Everyone wants to do things on their own, so efforts will

continue to be isolated. The most pressing need is to protect its habitat. The macaws are experiencing a death by a thousand cuts for all the deforestation of their natural range."

Indeed, Chassot says that he feels the Ecuadorian population "seems doomed by its limited range and increasing human demographics."

COLLABORATION REQUIRED

The beautiful psittacine's fate hinges on the six nations in its home range. Chassot calls the effort in Costa Rica a success, but adds, "the wider Great Green Macaw population will only thrive if countries agree to be more collaborative in transboundary conservation issues." Positive community work in Honduras has been negated by the violent drug trade, and NGO work in Nicaragua has come to a screeching halt. Colombia's Great Green population, perhaps the largest, is the least known of all.

Despite the challenges, efforts on the bird's behalf are vital. The species doesn't unfold its subtle beauty all at once. But once you've seen a Great Green Macaw open its wings and tail feathers in a burst of green, yellow, blue, and red, you'd be hard-pressed to name a more stunning bird. 🦜

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