Return of the Seychelles

Nature is getting a second chance on vulnerable islands in the Indian Ocean.

Aldabra giant tortoises escape searing daytime heat by taking refuge in caves within the rugged coral rock of the island of Grande Terre. It's a slow, cumbersome commute between the caves and the tortoises' grazing areas.

Privately owned St. Joseph Atoll was once commercially exploited for fish and coconuts but is now prized for its marine biodiversity and seabird colonies. In 2014 the island was made a nature reserve with a marine protected area. Its conservation is managed by the Save Our Seas Foundation.

By Kennedy Warne
Photographs by Thomas P. Peschak

Pitcher plants feed on insects that get trapped in their liquid-filled carafes. This endemic species survives on only two islands in Seychelles.

Nick Page, a genial New Zealander with a sunburned face and curly black hair, holds a photograph of Assumption Island's Most Wanted: a red-whiskered bulbul, a bird about the size of a cardinal with a black Mohawk crest and a fiery red tuft of feathers behind each eye. Since 2013, a team of conservation rangers have shot and netted 5,278 red-whiskered bulbuls on this four-square-mile comma of land 250 miles north of Madagascar. There is now one bulbul left.

Page has come within range of 5,279 twice, but bad luck prevented a shot. On the first occasion, a kite flew overhead, spooking his quarry, and on the second, a rainstorm struck. Such are the trials of the everyday sniper. But Page, a young conservation graduate, says that "with a bit of luck and lots of hiding," he'll nail the bulbul. He extends his thumb and grins, saying, "That's the size of the target."

Red-whiskered bulbuls are jaunty birds with a chattering song. Natives of Asia, they were brought to Assumption as pets by guano miners from Mauritius in the 1970s. Whether they escaped from their cages or were liberated is unknown, but the population exploded, and the pets became pests. The reason they're being eradicated isn't their presence on Assumption; rather it's their proximity to Aldabra, 17 miles across the Indian Ocean.

Aldabra is the westernmost of Seychelles' 115 islands and atolls and one of the world's most important nature reserves. Among its biological treasures is a native bulbul. Conservation managers fear that if the Asian immigrant colonizes the island, it will compete with the local bulbul and other native birds for limited food resources, prey on endemic invertebrates, and introduce the seeds of invasive plants.

To protect the jewels, you have to repel the invaders, eradication project leader Jessica Moumou tells me. "Red-whiskered bulbuls got to Aldabra once; they can do it again." The Seychelles Islands Foundation, which manages Aldabra, can't risk that, so it's tackling the problem at its source, on Assumption.

Bulbuls aren't the only birds the hunters have in their sights. The finchlike Madagascar fody, a bird so blazingly red it appears to be on fire, is also being extirpated. It too has a counterpart on Aldabra. In the early 2000s the foreign fody established a hundred-strong population on Aldabra before it was detected and extermination efforts began.

Killing a bird to save a bird may seem a perverse exchange—a misguided intrusion into nature's affairs. Ecological restoration of islands is sometimes criticized as being no better than the human interference that damaged island ecosystems in the first place. It plays God with nature—taking a piece out here, adding a piece back in there. (Other stories in *National Geographic*'s 2016 parks series, celebrating the centenary of the U.S. parks system, focus on the restoration theme too.)

Restoration ecologists see things differently, invoking the principle "You break it, you fix it." Humans introduced alien species, either intentionally or accidentally, and those species have altered island ecosystems, in some cases shattering them beyond recognition.

This is especially true when the newcomers are mammals. On isolated archipelagoes such as the Seychelles—and my own country of New Zealand—life evolved in the almost complete absence of mammals. (In both groups of islands, the only native land mammals are bats.) Island species cannot withstand the mammalian predation and competition that evolved on continents. Restoration seeks to level the ecological playing field. And sometimes the

Introduced as pets, ring-necked parakeets escaped into the wild and now threaten the national bird, the Seychelles black parrot, concentrated on Praslin island. Contract shooters are trying to wipe out the intruder.

only way to do that is to remove the bullies from the schoolyard.

Ten days after I met Page, he shot the last red-whiskered bulbul.

WE LIVE, WE ARE TOLD, in the age of the sixth mass extinction, a human-induced spasm of species loss, a great redacting of the story of life. How do we reverse that trajectory? We could begin by reciting the opening words of the Seychelles Constitution: "We, the People of Seychelles, GRATEFUL to Almighty God that we inhabit one of the most beautiful countries in the world; EVER MINDFUL of the uniqueness and fragility of Seychelles... [declare our unswaying commitment] to help preserve a safe, healthy and functioning environment for ourselves and for posterity."

If this sounds like a conservation manifesto, so it should, for there is much in Seychelles to conserve, especially on the granitic islands in the east of the archipelago. These islands, where most of the 93,000 Seychellois live, are the mountaintops of a submerged landmass that split off the supercontinent of Gondwana along with India and Madagascar 125 million years ago, carrying with it an ancient biota.

Eons of evolutionary isolation coupled with occasional injections of new biological capital have produced a cast of curiosities that includes frogs smaller than a fingernail and giant tortoises that weigh a quarter of a ton, a palm with a nut so large it would crush your skull if it fell on you and a tree whose seedpods look like jellyfish, a scorpion with praying mantis arms that whip out and snatch prey in a death grasp and land crabs the size of cats.

The easternmost of the granitics is Frégate, a privately owned island with a luxury resort and several creatures for which this island is a last resort. One of those species is the Seychelles magpie-robin, whose chic black-and-white plumage and inquisitive disposition have made it a local favorite. It was once widespread, but by the mid-1960s there were fewer than 15 alive, all on this island of less than a square mile. Conservationists launched a recovery program. Feral cats were eradicated. The robins were provided with nest boxes and supplementary food to boost their breeding chances. As numbers grew, birds were shifted to other predator-free island sanctuaries to spread the risk, and today the population has been coaxed up to several hundred.

No less important in Frégate's pantheon of relics are giant millipedes: glossy black, finger-thick, six-inch-long arthropods that cluster in knots on the trunks of trees and cross the island's roads with impunity. "I Brake for Millipedes" would make a good bumper sticker for the golf carts that resort guests use. The magnificent crawlers are most active after dark, so I joined Tanya Leibrick, the resort's conservation manager, for a night stroll through the forest. It was a slow walk, each step placed with care to avoid a fateful crunch. Scientists have calculated that one-fifth of the leaf litter that falls in the forest every 24 hours is consumed by hungry millipedes. In one spot we saw a dozen feasting on a fallen mango, like piglets at a trough.

Scanning a nearby log, our headlamp beams settled on a solitary gray-brown beetle with bumps on its abdomen like Braille and two tiny grappling hooks at the tip of each leg. I had been hoping to meet this insect, one of the world's largest tenebrionids. (Continued on page 100)

Aldabra has one of the last healthy populations of coconut crabs in the western Indian Ocean. Elsewhere, the world's largest terrestrial arthropod, with a leg span of three feet, has been eaten to extinction by humans.

Giant millipedes (above) and flightless beetles (top, numbered by scientists) were threatened when rats reached the island resort of Frégate in the mid-1990s. An international response restored the island to a rodent-free sanctuary. In Vallée de Mai, a World Heritage site on Praslin island, slugs (right) congregate to feed on the flowers of the coco-de-mer, a majestic native palm that bears the largest seed of any plant.

A white tern flits through regenerating native forest on Cousine, a private island off the coast of Praslin and one of Seychelles' ecological restoration successes. A luxury resort helps pay for the island's conservation projects.

or darkling beetles, found in the wild only on Frégate.

It's a wonder that this placid giant (over an inch long) survives. In 1995 an island conservationist's worst nightmare came to pass: Rats arrived on Frégate. The Seychelles name for the big beetle is *bib arme*, armored spider, but no amount of skeletal armor would have protected it—or the whip scorpions, snails, and other native invertebrates—from rodent teeth. In four years the beetle population plummeted by 80 percent.

An urgent call went out for international help to prevent an ecological collapse, and in 2000 Frégate was successfully de-ratted. Some of my countrymen were part of the effort, and the memory of that narrow escape, mingled with the sultry darkness of the forest, the whistling and cackling of noddies and terns in the treetops, the rustling of millipedes in the leaf litter, and this lone beetle, illuminated, seemed like an amazing grace.

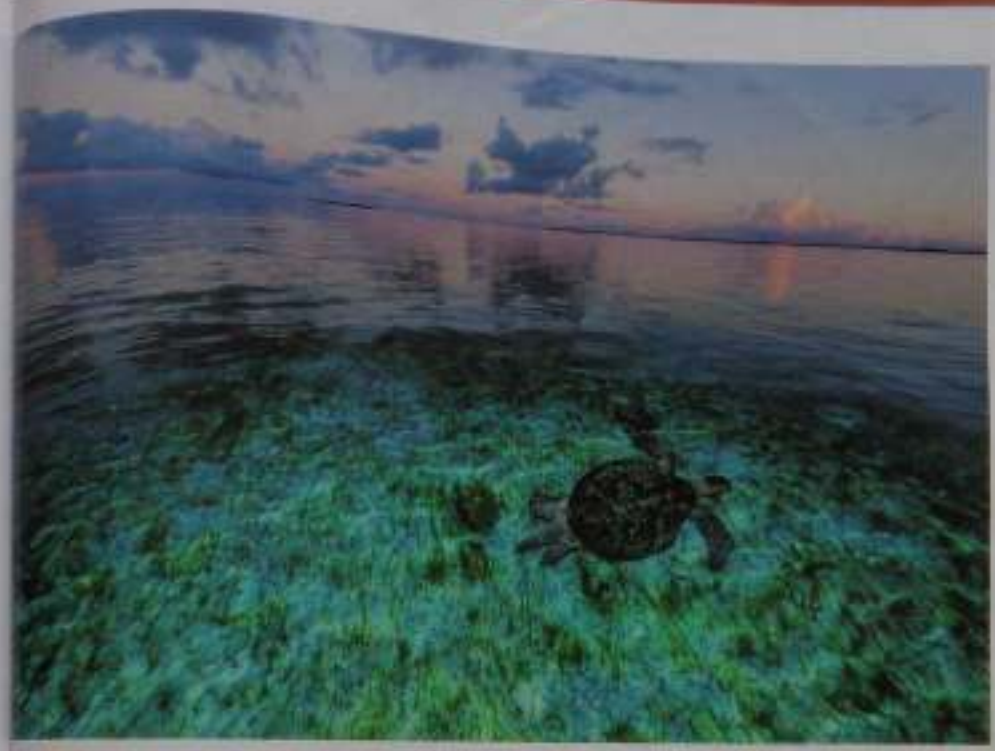
A thin, pale blue snake showed itself at our feet, and Leibrick pulled away some leaves to reveal not a snake but a limbless amphibian called a caecilian, another Seychelles specialty. The pointy-headed animal whipped its body in violent twists and retreated into the safety of its burrow. Caecilians are thought to be part of the Seychelles' original cargo—creatures that made the long-ago raft trip from Goodwana. Such species are known as deep endemics, because their genetic lineage reaches back into ancient time. They make Seychelles very special indeed.

"NOT EVEN A HANDFUL of island groups have what Seychelles has," says conservation ecologist Christopher Kaiser-Bunbury. "Galápagos is a big name because of Darwin, but Seychelles is in no way inferior." I was climbing with Kaiser-Bunbury to look for jellyfish trees on Seychelles' main island, Mahé. As with many ecologically damaged islands, to find relict species you go high—to the mountaintops, beyond the reach of agriculture and habitation. We were scaling one of the granite outcrops known to scientists as inselbergs and to Seychellois as *glacis*, domes of reddish-gray rock, sculpted by the rainfall of millennia, that jut nakedly above the verdant forest.

Plants get a foothold in clefts and fissures in the granite, and much of what lives here is endemic, including the jellyfish tree, *Medusagyne*. Fewer than two dozen reproducing individuals of this singular species have been recorded—and only here, on the granite, where most other plants find the baking heat and scouring rain intolerable. For reasons no one is sure about, the seed rarely germinates in the wild—a big liability for a critically endangered plant. The specimen we found looked healthy but had just a few of the trademark pods that hang like tiny jellyfish amid shining green leaves. It will be a long road to recovery for the beleaguered species, here on the glacis—islands within an island, refuges for remnants from long ago.

LOWER DOWN THE MOUNTAIN, where glacis meets rain forest, we encountered a work crew slashing invasive vegetation and wrenching out young coco plum, guava, and cinnamon plants—which germinate only too easily—to help endemics such as carnivorous pitcher plants regain a foothold. Kaiser-Bunbury explained that the goal of restoration is rebuilding ecosystem integrity and functionality, not reverse-engineering a landscape that existed a hundred, or a thousand, or ten thousand years ago. It's not about slavishly re-creating the picture on an old jigsaw puzzle box, but letting the living pieces of a fragmented system reconnect themselves and recover their historic trajectory. "We help the system get back on track," he said. "We're not just gardening."

It's an idea whose time has come, just as biologist E. O. Wilson, the "father of biodiversity," predicted almost 25 years ago, saying this century would be "the era of restoration in ecology." It is capturing the imagination of Seychellois too. As realization of the country's biological richness sinks in, enthusiasm to protect it rises. Wildlife clubs are thriving in schools. "The young generation is getting into it," Terence Vel, the clubs' coordinator, told me. "Twenty years we've been working with the schools to pass those messages to them. We take them snorkeling and on field trips to show that we have a fragile ecosystem and must look after it for the next generation."



High tide in Aldabra lagoon finds green turtles grazing on sea grass. Here and on other Seychelles islands, exploitation by humans has given way to admiration and a desire to protect and restore.

Some older Seychellois have been walking the restoration road for a while. On the granite slabs of Mahé, park ranger Terence Valentin, a Rastafarian who wears a T-shirt on his head to contain a mass of dreadlocks, told me: "I'm 19 years with the environment, brother. Ya, man. I am connected to the Earth!"

On Aldabra, the staff live that connection daily, on sea, on land, even inside their homes. Sunbirds build their nests on light fittings and shower rails, and steal the occasional necklace to decorate the nests. One giant tortoise that lives near the scientific station has figured out how to clamber up the steps for a drink of water.

Aldabra has more tortoises than Seychelles has people. Everything about these behemoths seems ancient, even the sound of their movements, which is like the creak of a leather saddle. Endemic birds called drongos hitch rides on their backs, watching for insects disturbed by the giants' lumbering passage. At night I listened to the sea breathing in the rocks and the tortoises snoring under the floorboards. "This place changes your life," Jude Brice, a boat skipper, said. "You see things differently."

On a hillside in Victoria, Mahé's historic center, stands an unusual church clock that chimes twice—once on the hour, then again a few minutes later. I think of it as a metaphor for Seychelles: a second chime for a second chance, ringing out the rescue of robins, beetles, pitcher plants, and palms, a celebration of nature restored. □

Watch a video featuring Seychelles' native animals and the people working to protect them at ngm.com/more. Explore National Geographic's yearlong parks initiative at nenpeo.com/parks.