A Step-by-Step Guide to Giraffe Transport

In 2020, a group of rangers, community members, and nonprofit workers successfully rescued eight giraffes from a flooding peninsula in Lake Baringo, Kenya, ferrying them onto the mainland in a custom steel barge. Here's how they did it:

1. DECIDE TO MOVE THE GIRAFFE. Powerful people as far back as Julius Caesar once brought giraffes across the world, in shows of diplomacy or imperial might. Now, most giraffe transport projects are undertaken by zoos—or as rescue missions. In this case, the rising waters of Lake Baringo were trapping these giraffes on a shrinking piece of land, cutting them off from their food supply.

2. SEDATE THE GIRAFFE. As prey animals, wild giraffes see almost any approach as a threat. This team used gentle tranquilizers to sedate the giraffes long enough to put on blindfolds and rope leads.

3. UN-SEDATE THE GIRAFFE. While other large animals can handle straightforward sedation, a giraffe who stays horizontal too long risks choking on her own saliva or suffering brain damage from rapidly changing blood pressure. Veterinarians quickly provided these giraffes with an antidote so they could stand up and be led onto the barge.

4. CHOOSE A GENTLE VEHICLE. In 1829, a giraffe in an Austrian zoo died of a fractured vertebra—most likely due to its journey there, which had involved being hauled out of North Africa on camelback, sailing to Venice, and then walking across the Alps. Today, giraffe transporters tend to ferry their passengers on container ships or charter flights. The Lake Baringo team built a custom steel barge so that the giraffes could sail comfortably.

5. FREE THE GIRAFFE. Giraffes are masters of their own strange anatomy, with flexible arteries, strong hearts, and vertebrae the size of thermoses. After their quick barge trip, the giraffes of Lake Baringo walked onto the mainland with their heads held high.

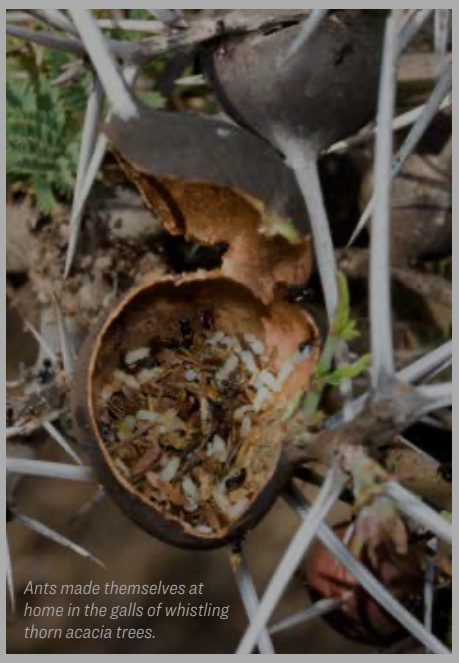
Whistling Acacias and Ants

A mutually beneficial relationship—until things get thorny

RANGE: East Africa
SPECIES: Whistling thorn acacia trees (*Vachellia drepanolobium*) and acacia ants (*Crematogaster mimosae*)

◆ In the sprawling savannas of East Africa, whistling thorn acacia trees spend their lives under siege. Elephants, giraffes, and rhinoceroses snap their branches like Twix bars, ignoring their daggerlike spines to gobble down their small green leaves. To protect themselves from these enormous browsers, the trees rely on a creature at the other end of the size spectrum: ants.

Crematogaster mimosae ants live exclusively on whistling thorn acacia trees. Once an ant colony has claimed a tree, they defend it in typical overcommitted ant fashion, greeting anyone who approaches by swarming, biting, and releasing a sharp odor reminiscent of vomit. Flipping what seems like a size disadvantage, they often bypass the tough skin of their opponents to climb up into their tender nostrils. Even rhinos will leave an acacia tree snorting in defeat.



Ants made themselves at home in the galls of whistling thorn acacia trees.

To welcome their protectors, the trees transform themselves into leafy bed-and-breakfasts, converting some of their spines into swollen, hollow galls called domatia to house the ants and their larvae and producing a rich nectar for them to drink. The tiny entry holes ants bore into their gall condos sing when the wind rushes through—giving the trees their name, "whistling thorn acacias." The ants become attached to their specific acacia home and will battle any interloping colony to the death.

In a balanced ecosystem, both species benefit from this arrangement. But as with any relationship, context is key. When elephants, giraffes, and other grazing mammals disappear—from local extinction, declining populations, or

Saharan Silver Ants

The fastest ants in the world are in a lifelong race against the sun.

RANGE: Deserts of North Africa and the Arabian Peninsula
SPECIES: Saharan silver ant (*Cataglyphis bombycina*)

◆ Saharan silver ants live in one of the most punishing deserts on Earth. To avoid hungry lizards, they forage at midday, when the sun is high and the sand is 140°F (60°C)—as blistering as a beach parking lot during a heat wave. With each journey out of the nest, they expose themselves to temperatures that should, by all rights, denature their proteins like an egg in a pan.

Instead, on every grocery trip, these little hellions outrun, outstep, and outwit death. The fastest known ants, Saharan silvers can blaze across 3 feet (1 m) of desert—more than 100 times their own body lengths—every second, a rate comparable to a cheetah keeping pace with a Boeing 747. To stay this quick on shifting sands, they gear into what's called an "aerial phase," in which not a single one of their half-dozen legs touches the ground—a neat trick when the sand wants to burn you alive.

As these ants motor along, they make efficient navigational decisions, ensuring they don't spend a second more out in the open than is absolutely required. They do this by combining three tactics: counting every step, remembering every landmark, and wayfinding using the sun's ultraviolet light, which appears to them as recognizably patterned arcs across the desert sky. No matter how far and wide they may travel—some journeys take them hundreds of meandering feet—they can rocket back to their nest with barely an inch of error.

Their anatomical equipment helps, too. The shiny, prism-shaped hairs that cover most of their bodies form a heat shield, reflecting visible and near-infrared light. These hairs also absorb mid-infrared heat energy from the ants' bodies and release it into the air. To avoid the absorption of similar heat energy that radiates from the scorching sand, the ants' undersides are actually bald.

These adaptations shave precious degrees from their internal thermometers. There's also innovation under the hood: the ants' hemolymph (that is, bug blood) is packed with heat-shock proteins that protect their cells, countering the sun's murderous efforts.

Silver ants beat the heat with extreme speed.

What would happen if any of these fail-safes faltered? The answer lies in the silver ants' dinner. As they sprint across the sand, they're gathering and eating sun-dried arthropods—all the desert bugs that were less skilled, less lucky, and less well built. › **How to see them:** Look for freakishly fast ants dashing across the North African desert in the midday sun. Some say they resemble droplets of mercury.

Painted Lady Butterflies

One of the world's longest known insect migrations includes a 3,000 mile-dash across the desert.

RANGE: The migration circuit goes from subtropical Africa and the Sahel, across the Sahara and the Mediterranean, and into Europe.
SPECIES: Painted lady butterfly (*Vanessa cardui*)

◆ You're planning a trip from Europe to Africa. The journey will start during the British summer and reach Chad at the tail end of the rainy season. You'll spend a number of days over the Mediterranean Sea and yet more crossing the Sahara Desert. How will you even begin to pack?

If you were a painted lady butterfly, you'd manage it with just the wings on your thorax. Famously well traveled—they've been spotted close to both poles—these delicately spotted orange-and-gray athletes spend their lives on the wing, completing one

Small-Town Hippos

A South African suburb is the country's only remaining hippotopia.

RANGE: Scattered areas across Africa, south of the Sahara
SPECIES: Hippopotamus (*Hippopotamus amphibius*)

◆ In February 2020, cars at a gas station in St. Lucia, South Africa, were joined by another large commuter seeking to fuel up: a hippopotamus. Video on the local news showed onlookers tickled, but not necessarily surprised. Pretty much every night, these two-ton mammals emerge from the wetlands near the small town to graze on inhabitants' lawns and gardens.

St. Lucia is right next to the iSimangaliso Wetland Park. This large protected area contains the continent's largest estuarine lake, Lake St. Lucia, which funnels into a roughly 12-mile (19 km) channel to the ocean known as the Narrows. It's a perfect spot for hippos, who spend about 16 hours each day relaxing in the water. After centuries of hunting and poaching, these wetlands are the only place in South Africa that supports a sustainable hippo population, which currently numbers about 800.

The dynamics of St. Lucian ecology—in particular, the carefully maintained lawns of residential housing tracts—give the neighborhood a unique appeal. Around dusk, the hungry hippos take to their network of "hippo paths"—well-worn grass walkways that resemble monorail tracks, carved into the town's outskirts. (Locals avoid these seemingly ideal footpaths, as hippos who feel threatened use them to barrel toward the water at terrifying speeds.)

They then get to munching, keen to hit their quota of roughly 100 pounds (45 kg) of vegetable matter per day. Especially in times of drought, when more untamed foraging areas become limited, these man-made lawns can serve as a welcome smorgasbord. The hippos bring their bounty back to the estuary, where their poop provides an influx of nutrients and organic matter for the rest of the aquatic food web.

Hippos might not seem well tailored for suburbia. Generally considered one of the world's most dangerous mammals, they are thought to be responsible for hundreds of human deaths each year. In St. Lucia—where the hippos are a huge tourist draw—public signs and hotel proprietors educate guests on how to maintain a carefully calibrated atmosphere of mutual respect. › **How to see them: In St. Lucia, take one of the town's famed estuary boat tours, where guides will give you details about each hippo family. Then, at night, wait and see if any of your new friends come into town.**

A hippo takes a stroll in St. Lucia.

Kākāpō

These special parrots are hanging on by a techno-mediated feather.

RANGE: Codfish Island (Whenua Hou), Little Barrier Island (Te Hauturu-o-Toi), Chalky Island (Te Kākahu-o-Tamatea), and Anchor Island (Pukenui), New Zealand
SPECIES: kākāpō (*Strigops habroptilus*)

◆ On a handful of isolated islands off the coast of New Zealand, an adorable clan of flightless parrots lives a life that seems ripped from a science fiction anthology.

On the one hand, kākāpō don't have to worry about much. Rats, stoats, cats, and other introduced predators with a taste for these Pomeranian-sized birds have been eradicated from their islands by conservationists. Trackers and remote activity monitors—kākāpō Fitbits—allow scientists to intervene if they get very sick.

On the other hand: the "spermcopter."

Kākāpō once thrived in the forests of mainland New Zealand. Years of relatively isolated evolution shaped them into a collection of unusual traits—they are nocturnal, can live for up to 90 years, and (uniquely for parrots) cannot fly, instead using their claws to climb trees and their wings to finesse things when they fall out. They also have elaborate courtship rituals, which involve all-night male calling competitions and large quantities of a specific fruit, the vitamin-rich rimu berry. The aforementioned introduced mammals made short work of most of the kākāpō by the 1980s.

Alarmed, conservationists turned to the last surviving outpost of birds, on Stewart Island (Rakiura). The population numbered only a few dozen, and inbreeding had become rampant. This spurred concern about a fitness-reducing genetic bottleneck, even after the birds were moved to a wildlife refuge on nearby Codfish Island. Luckily, the surprise discovery of a kākāpō on the mainland—given the name Richard Henry, after an Irish ex-hunter who tried and failed to create his own kākāpō island refuge in the 1890s—provided an injection of desperately needed genetic novelty.

Over the years, through chick-monitoring and matchmaking, researchers with what's known as the Kākāpō Recovery Programme have brought the total number of kākāpō to more than 200. Now spread over four islands, the parrot population lives surveilled by scientists, who balance their desire for the birds to live a relatively natural life with the mandate to intervene when a need (or an opportunity) presents itself.

New Zealand's historic lack of large mammals led to the evolution of many unusual birds, including the kākāpō.

In spring and summer, they give special food to ensure healthy breeding. A stoat patrol catches any mustelids that may attempt to swim to the islands. Annual check-ups ensure they can catch and treat the occasional case of cloacitis, aka "crusty bum." And when it's time to make more kākāpō, they may at times call in the spermcopter—a delivery drone that whisks a viable sample away to a (relatively) distant first cousin in 10 minutes flat. › **How to see them: The Kākāpō Recovery Programme hosts up to 200 volunteers per breeding season, which doesn't happen every year. If you can't make it, try checking out the New Zealand Department of Conservation's online Kākāpō Cam.**

Kākāpō Matchmaking Interventions

Scientists attempting to square the inflexibility of the kākāpō's natural mating instincts with the need to guarantee their continued existence have hit upon some interesting ideas.

One early attempt to obtain sperm took the form of "Chloe." Named as a pun on the all-purpose cloacal orifice, this "female" kākāpō puppet roamed the islands on the back of a remote-controlled toy car. Although meant to seduce male parrots, the uncanny valley honeypot attracted precisely zero suitors.

Another was the "ejaculation helmet," a pragmatic albeit undignified crown of condoms. A male kākāpō in a certain mood will attempt to mate fairly indiscriminately, including, occasionally, with a researcher's head. The helmet seemed like a good way to use this tendency to everyone's advantage. It was discarded after the realization that the kākāpō coupling style—notoriously intense and long-lasting—might also come with risk of head trauma.

Researchers now obtain kākāpō sperm manually, via skilled massage, before flying it off in the spermcopter. Artificial insemination in general has successfully produced at least four chicks, impressive for a technique that rarely works in free-living wild birds. And despite their lackluster performances, both Chloe and the ejaculation helmet now hold places of honor in New Zealand's national museum.

THE WILD LIFE OF A Predator-Removal Conservationist

■ As the operations and research lead for Predator Free Rakiura, Kevin Carter is helping to attempt the world's largest predator removal project on Rakiura (also called Stewart Island). While the project is still in its very early stages, the goal is to eradicate and keep out four introduced predators—rats, European hedgehogs, possums, and feral cats—in hope of eventually reintroducing native species, including kākāpō .

• **What's it like up in the alpine tops of Rakiura?**

Being in the middle of the national park, you do a 360-degree look around and you just can't tell that humans have been present.

It's everything from these beautiful alpine turfs, down through subalpine scrub vegetation, then forests and the river valley. Then you've got a wetland sequence, a dune habitat, and then you're down to the coast. You get this real sense of wilderness and untouched landscapes.

I find those kinds of moments really motivating. You go, "Okay, this is why I work in conservation, because I want to do everything I can to protect places like this."

• **What's one of your favorite memories with the wildlife on Rakiura?**

I was doing some New Zealand sea lion pup tagging. As I was going through the bush looking for some, I heard pup calls. I popped out and there was this amazing backdrop of huge granite domes on the landscape.

There were these two little sea lion pups hanging out on a rock. They were looking out at the view. Then one little guy put his flipper up and over the other one's back. And I was imagining a conversation they might have been having, like, "Hey, bro, isn't this the greatest thing you've ever seen?" That's one of those really cool moments.

• **If the project is successful, what would that mean on a bigger scale?**

We're trying to redefine what's possible. Ten years ago there was a feasibility assessment on the project and it said, "You can't achieve it for these reasons." But in that time, technology has moved forward. We've got new science and new tools.

When we're able to deliver and make Rakiura predator-free, it's going to redefine what's possible. Then hopefully the mainland [of New Zealand] and other places are going to say, "If you could do it, we can do it too."

• **Why does this project matter so much?**

One of the things about Rakiura is that we've got a whole bunch of endemic species that are found only here. We've got highly endemic invertebrates, reptiles, birds, and plants.

So in terms of global biodiversity, those species will be safe, whereas if we lost them, they wouldn't be lost only from New Zealand, they'd be lost from the whole world. So those are the stakes. ■