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12 incredible facts about lemurs

From synchronized singing to 'stink fights,' these peculiar primates are full of surprises. Unfortunately, they're also disappearing.

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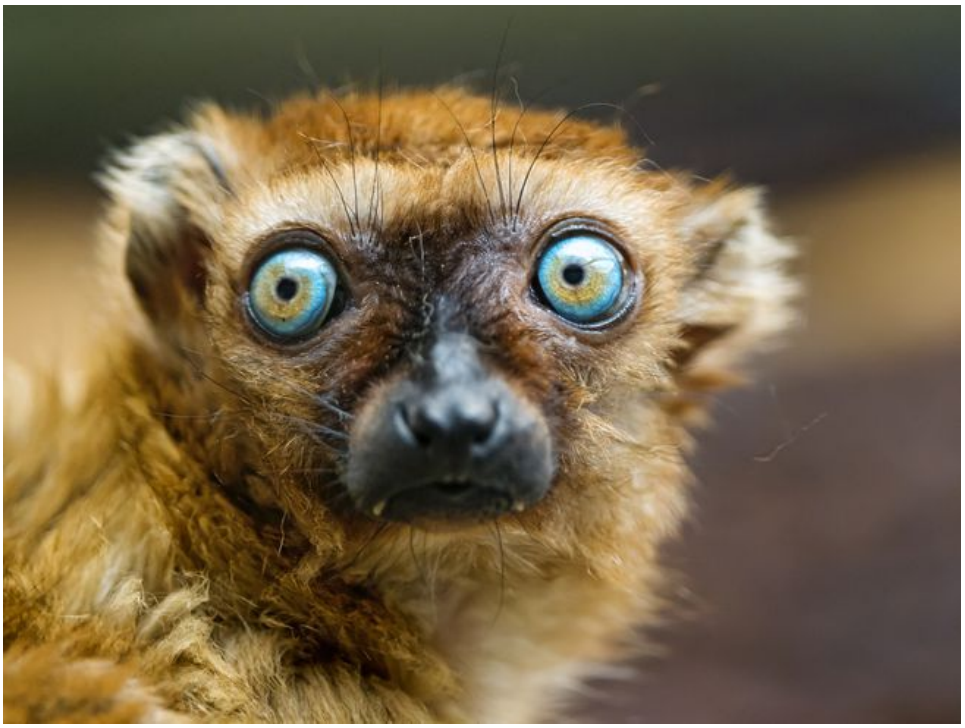


Sclater's lemur is critically endangered, having lost about 80 percent of its habitat in just 24 years. (Photo: Tambako the Jaguar/Flickr)

Lemurs are easy to love. They're cute, charismatic and oddly humanlike, which isn't just a coincidence. Lemurs are primates like us, and while they're not as closely related to people as chimpanzees and other apes are, they're still family.

Yet despite lemurs' widespread popularity, they are Earth's most endangered group of mammals, according to the International Union for Conservation of Nature (IUCN). About 94 percent of all lemur species have a threatened status on the IUCN Red List, including 49 listed as Endangered and 24 listed as Critically Endangered.

Lemurs face an array of dangers across Madagascar, the only place where they exist in the wild. Some people hunt them, or even collect babies for the pet trade — an example of why cuteness can be a double-edged sword. But the single greatest threat to lemurs is the same thing causing most wildlife declines around the world: habitat loss, driven by everything from logging and agriculture to climate change.

In light of lemurs' precarious future, here's a closer look at these amazing animals — and the habitats on which their survival hinges:

1. Modern lemurs range from 2.5 inches to 2.5 feet tall.

A pygmy mouse lemur (left) can be 12 times smaller than an indri. (Photos: Anna Veselova/Monika Hrdinova/Shutterstock)

The smallest living lemur is the pygmy mouse lemur, which is less than 2.5 inches (6 centimeters) from head to toe — although its tail adds another 5 inches. The largest living lemur is the indri, which can stand as tall as 2.5 feet (0.75 meter) in adulthood.

2. A lemur that looked like Alf went extinct about 500 years ago.

An artist's rendering of *Megaladapis edwardsi*, an extinct species of giant lemur. (Photo: FunkMonk/Wikimedia Commons)

As a reminder of what's at stake for modern lemurs, some of the group's most unusual members have already died out in recent centuries. At least 17 giant lemur species have gone extinct since humans reached Madagascar, according to the Duke Lemur Center, ranging in weight from 10 to 160 kilograms (22 to 353 pounds).

One notable example is *Megaladapis edwardsi*, a giant lemur that weighed up to 200 pounds "and was the size of a small adult human," according to the American Museum of Natural History. One of its most distinctive features was its robust muzzle, which "evidently supported a large, fleshy nose." That may have created an Alf-like appearance, at least as interpreted in the illustration above.

Fossil evidence suggests the Alf lemur was still around when Europeans reached Madagascar in 1504, and it bears a resemblance to the Malagasy legend of the *tretretretre*, which was described in 1661 by French explorer Etienne Flacourt:

> "The tretretretre is a large animal, like a calf of two years, with a round head and the face of a man. The forefeet are like those of an ape, as are the hindfeet. It has curly hair, a short tail, and ears like a man's ... It is a very solitary animal; the people of the country hold it in great fear and flee from it, as it does from them."

3. Lemur society is run by females.

In ring-tailed lemur society, one top-ranking female usually calls the shots 'and is the focal point of the rest of the group,' according to the U.S. National Primate Research Center. (Photo: Berendje Photography/Shutterstock)

Female dominance over males is rare among mammals, including primates. But it's the norm for lemurs, researchers noted in a 2008 study, "occurring in all lemur families regardless of mating system." And that dynamic is often comically apparent, as Duke University biologist Robin Ann Smith wrote in 2015.

"It's not uncommon for lady lemurs to bite their mates, snatch a piece of fruit from their hands, whack them in the head or shove them out of prime sleeping spots," she wrote. "Females mark their territories with distinctive scents just as often as males do. Males often don't take their share of a meal until the females have had their fill."

4. The smarter a lemur, the more popular it is.

While it's been known for years that primates can learn new skills faster by studying their peers, a 2018 study reveals that lemurs actually do it backward. The more a lemur performs a new skill, the more popular the lemur becomes.

The study involved 20 lemurs that had to try and retrieve a grape from a plexiglass box by opening a drawer. If a lemur was successful in getting the grape, it received more attention from other lemurs. "We found that lemurs who were frequently observed by others while solving the task to retrieve the food received more affiliative behaviors than they did before they learned," says study co-author Ipek Kulahci.

Affiliative behavior is how primates show affection toward each other — such as grooming, touching and sitting close.

"I was quite impressed that the frequently observed lemurs received more affiliative behaviors, such as grooming, without adjusting their own social behavior," Kulahci says. "In most primate species, grooming tends to be mutual; it relies on reciprocity between the groomer and the individual being groomed. ... So it is a pretty striking pattern that the frequently observed lemurs received lots of grooming without providing more grooming to others."

5. Indri lemurs sing together as groups ... mostly.

Not many primates sing, aside from humans, and indris are the only lemurs known to do so. Living in small groups across Madagascar's eastern rain forests, they belt out songs that play a key role in group formation as well as defense. Both males and females sing, and research has shown that group members carefully coordinate their chorus by copying each other's rhythms and synchronizing notes.

Here's a video of an indri singing at Andasibe-Mantadia National Park:

According to a 2016 study, some younger, lower-ranking indris show a "strong preference" for singing in antiphony — or out of synch — with the rest of their group. This might be adaptive, the study's authors suggest, letting the less prestigious indris draw more attention to their individual talents.

"Synchronized singing doesn't allow a singer to advertise his or her individuality, so it makes sense that young, low-ranking indris sing in antiphony," co-author Giovanna Bonadonn explains in a statement. "This lets them advertise their fighting ability to members of other groups and signal their individuality to potential sexual partners."

6. Ring-tailed lemurs settle disputes with 'stink fights.'

Smell plays a huge role in the lives of ring-tailed lemurs, from olfactory communication and scent marking to the nonviolent 'stink fights' that break out between rival males. (Photo: Gudkov Andrey/Shutterstock)

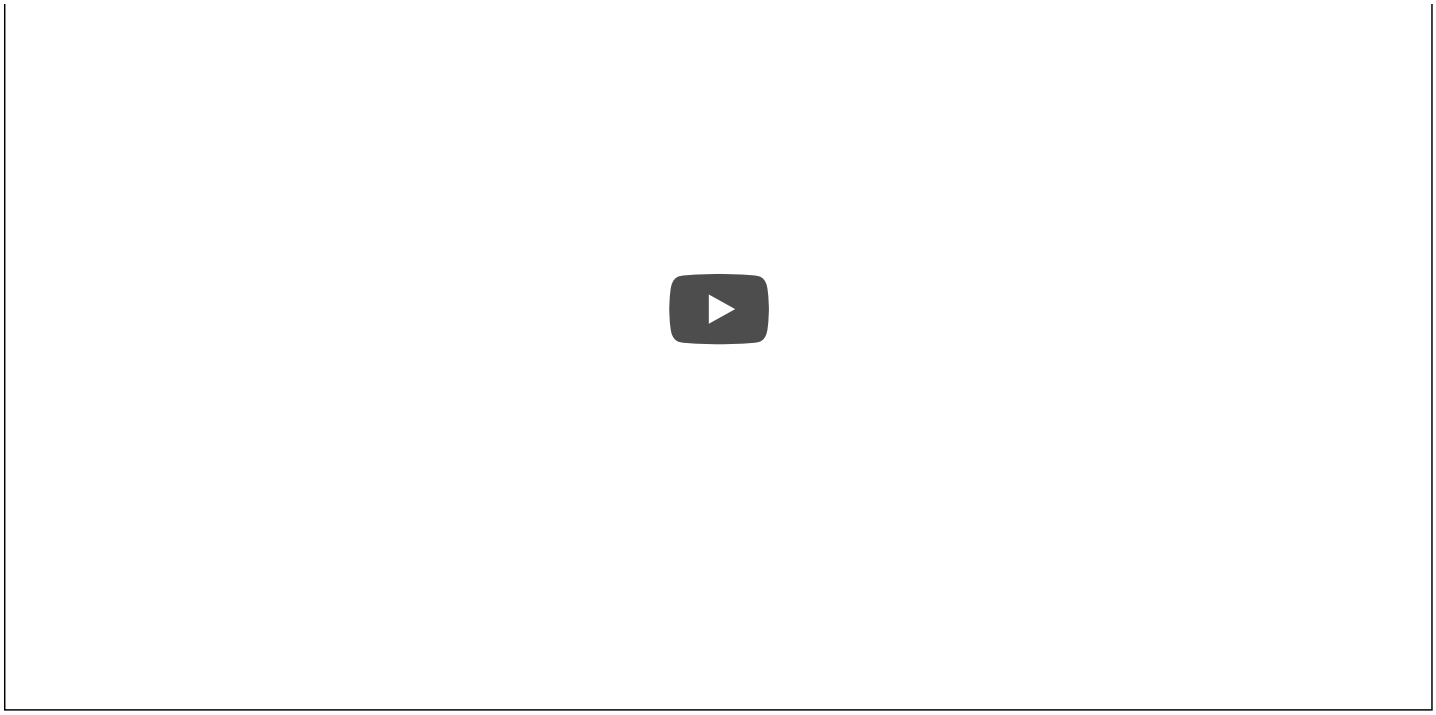
Ring-tailed lemurs must compete with each other for limited resources like food, territory and mates, and competition grows especially fierce among males during breeding season. It sometimes leads to physical brawls, but those are dangerous for animals with such sharp claws and teeth. And, luckily for ring-tailed lemurs, they've developed a safer way to settle their disputes: "stink fights."

Male ring-tailed lemurs have scent glands at the wrists and shoulders, and using their long tails, waft scents into the air for intimidation. Their wrists produce a volatile, short-lived odor, according to the Duke Lemur Center, while their shoulders offer a "brown toothpaste-like substance" with a longer-lasting scent. When a stink fight begins, two rival males pull their tails through these glands so the fur absorbs the smell. (They also mix scents to make richer, more persistent fragrances.) Then they wave their tails at each other, throwing pungency instead of punches.

Stink fights are resolved when one lemur backs off, and although many end quickly, they've been known to last an hour. They take place any time of year, not just breeding season, and aren't necessarily limited to lemurs. Humans' sense of smell isn't strong enough to detect the odors, but ring-tailed lemurs don't know that, so they sometimes try to stink fight zookeepers or other people who irritate them.

The body language alone can be hard for us to pick up without the scent. In the video below, a male ring-tail at the Duke Lemur Center subtly stink fights with a camera:

A lemur uses his stinky tail to tell a camera to beware



7. The word 'lemur' is Latin for 'evil spirit of the dead.'

"Lemur" was coined in 1795 by Carl Linnaeus, the founder of modern taxonomy, who took it from Latin. *Lemures* were "evil spirits of the dead" in Roman mythology, according to the Online Etymology Dictionary, and while the origin is hazy before that, it might date back to an ancient, non-Indo-European word for malevolent spirits.

The reference isn't hard to understand: Lemurs have eerily humanoid bodies, move around with ghostly grace and tend to be active at night. Still, the "evil" part is a little unfair. Linnaeus may not have meant it literally, but certain lemurs — namely the endangered aye-aye — are still haunted by people who do.

8. To some people, the aye-aye lemur is a monster.

The aye-aye uses its long finger to tap on tree bark and grab hard-to-reach insects underneath. Legend suggests it can also curse people to death by pointing at them. (Photo: Anna Veselova/Shutterstock)

Aye-ayes inspire deep superstition in parts of Madagascar, largely because of their spooky looks — not just the gremlin face, but also their spindly fingers. Aye-ayes have long, thin hands in general, but the third digit on each hand is even spindlier than the rest, and a ball-and-socket joint lets it swivel 360 degrees.

This finger evolved for "percussive foraging," a hunting technique in which the aye-aye taps on tree bark, listening for the sound of cavities where insects might be hiding. When it finds one, it tears a hole in the wood with its sharp teeth, then uses its long fingers to reach inside. As the wildlife charity Wildscreen points out, "this primate occupies a niche that is filled by woodpeckers elsewhere."

Unfortunately, some myths in Madagascar portray the aye-aye as a monster. One suggests it curses people to death by pointing at them with its long finger, part of a system of taboos in Malagasy culture known as *fady*. Another contends aye-ayes sneak into houses at night, using that same finger to puncture human hearts.

Aye-ayes are sometimes killed by people who believe they're dangerous, although fear can also protect them by compelling people to stay away. Either way, superstition isn't their only problem: Aye-ayes are also threatened by people hunting them as bushmeat or altering their habitats for other purposes like agriculture.

9. Lemurs are the only non-human primates with blue eyes.

Of all primate species, just two are known to have blue eyes: Sclater's lemurs and us. (Photo: Edwin Butter/Shutterstock)

Blue eyes are relatively rare among mammals, especially primates. Scientists have documented more than 600 primate species so far, yet only two are known to sport blue irises: humans and blue-eyed black lemurs, also known as Sclater's lemurs.

Sclater's lemur wasn't identified as a species until 2008, but according to a recent study, it could be extinct in about a decade due to "severe habitat destruction" like slash-and-burn agriculture. The species has a very limited range on the Sahamalaza Peninsula, as well as in a narrow strip of forest on the adjacent mainland, where deforestation has left its population highly fragmented. It has lost about 80 percent of its habitat in just 24 years, according to the IUCN, and it's also hunted for food and pets. A 2004 study found up to 570 traps per square kilometer in parts of its range.

10. Lemurs are surprisingly intelligent.

The endangered Coquerel's sifaka is a sophisticated communicator, using a mix of auditory and visual signals — including barks, wails and 'silent laughs' — as well as olfactory messages. (Photo: kkaplin/Shutterstock)

Lemurs branched off from other primates about 60 million years ago, and until recently, many scientists didn't think they were even close to the well-studied cognitive skills of apes and monkeys. Yet research has begun to reveal surprising intelligence in lemurs, forcing us to rethink how these distant relatives think.

Using their noses to tap a touchscreen, for example, lemurs have shown they can memorize lists of images, type them out in the correct sequence, identify which are larger and even understand basic math. Some species also have complex ways of communicating, from subtle growls and meows to loud howls and barks, not to mention inaudible signals like facial expressions and scents.

Lemurs in larger social groups perform better on social cognition tests, according to a 2013 study, which found that group size predicts their scores more than brain size. Other research has shown distinct personalities in mouse lemurs, which vary from shy to bold to "mean as sin." And given how much knowledge wild lemurs must keep straight — like where and when to look for various kinds of fruit, or how to navigate the nuances of lemur society — we've probably just scratched the surface.

11. Lemurs are important pollinators.

A black-and-white ruffed lemur hangs out in Andasibe-Mantadia National Park. (Photo: Arto Hakola/Shutterstock)

When many people think of pollinators, small animals like bees, butterflies or hummingbirds come to mind. But a wide variety of creatures play big roles in plant pollination — including ruffed lemurs, considered Earth's largest pollinators.

Ruffed lemurs come in two species: red or black and white, both of which inhabit tropical rain forests in Madagascar and are connoisseurs of its native fruit. The traveler's palm tree, for example, relies primarily on black-and-white ruffed lemurs to pollinate its flowers. Both ruffed species get pollen all over their noses as they eat fruit and nectar, and thus spread pollen to other plants as they forage. Due to their close relationships with native trees — including hardwoods prized by logging interests — ruffed lemurs are seen by scientists as key indicators of forest health.

12. Lemurs are running out of time.

The critically endangered Alaotran gentle lemur exists only in marshland around Madagascar's Lake Alaotra. Loss of this habitat has reduced the entire species to about 2,500 individuals. (Photo: belizar/Shutterstock)

At least 106 lemur species are known to science, and nearly all of them face a realistic risk of extinction by midcentury. As IUCN lemur expert Jonah Ratsimbazafy told the BBC in 2015, their environment is crumbling all around them.

"Just as fish cannot survive without water, lemurs cannot survive without forest," said Ratsimbazafy, noting less than 10 percent of Madagascar's original forest remains. "I would believe that within the next 25 years, if the speed of the deforestation is still the same, there would be no forest left, and that means no lemurs left in this island."

Lemurs' problems largely boil down to human poverty. More than 90 percent of people in Madagascar live on less than $2 a day, and at least 33 percent suffer from malnutrition. This drives many to squeeze income from the island's already-stretched natural resources, often with a type of slash-and-burn farming known as *tavi*, which torches forest to make room for crops, or by hunting lemurs for food.

On top of all that, lemurs also face growing pressure from climate change. Of 57 species examined in a recent study, more than half are likely to see their suitable habitats decrease 60 percent in the next 70 years — and that's just from the effects of climate change, excluding other factors. Plus, without wildlife corridors to link fragmented forests, lemurs rarely have the option to move somewhere new.

Andasibe-Mantadia National Park covers 155 square kilometers (60 square miles) in eastern Madagascar, providing at least some refuge for about a dozen different lemur species. (Photo: Tsepova Ekaterina/Shutterstock)

One way to help lemurs, therefore, is to do something that's also in our own species' best interest: Use fewer fossil fuels. Another is to fight poverty — yet without razing what's left of Malagasy forests. That's already being done in other parts of the world with eco-tourism, which has shown many communities that wildlife is more valuable alive than dead. Research suggests lemurs haven't benefitted much from tourism so far, but there are hints of hope. The Duke Lemur Center has a program in the Sambava-Andapa-Vohemar-Antalaha region, for example, that supports jobs in fields like fish farming and park maintenance, and offers ecological education and family planning to ease pressure on resources. Farther south, Anja Community Reserve is managed by local residents to attract tourists while protecting lemurs, and has reportedly become the most visited community reserve in Madagascar.

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Lemurs don't just come in lots of shapes, sizes and colors; they range from adorable to eerie, curious to cantankerous and stubborn to resourceful. Despite having grown apart for 60 million years, one look at a lemur can remind us how much we still have in common — and how lucky we are to still have such a big, weird family.

Editor's note: This article has been updated since it was originally published in October 2016.

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