



Judy Avey-Arroyo cradles one of the orphaned babies taken into the sloth refuge.



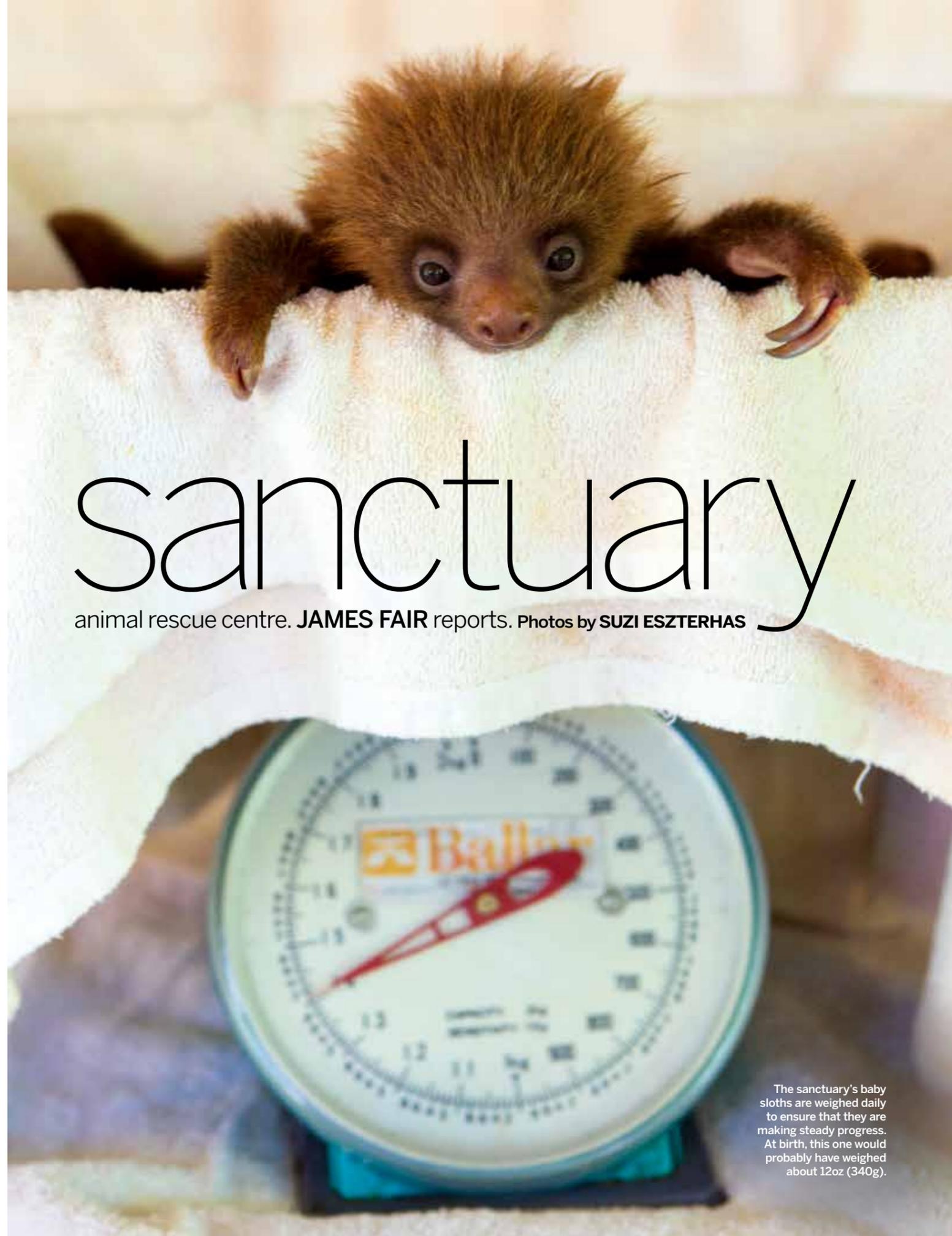
A three-toed (*Bradypus*) sloth hangs out in the sanctuary's extensive forested grounds.

Sloth

Judy Avey-Arroyo runs the world's strangest



A trio of two-toed (*Choloepus*) sloths tackle their daily meal. Slowly.



sanctuary

animal rescue centre. **JAMES FAIR** reports. Photos by **SUZI ESZTERHAS**

The sanctuary's baby sloths are weighed daily to ensure that they are making steady progress. At birth, this one would probably have weighed about 12oz (340g).



Once weaned, sloths at the sanctuary dine on a wide range of fruit and vegetables, as well as foliage.



In the wild, baby sloths cling onto their mothers most of the time; at the sanctuary, they are given stuffed toys as substitutes.



Young sloths sleep in incubators normally used for human babies – up to four can share a single ‘cot’.

“Sloth is the lowest term of existence in the order of animals with flesh and blood,” wrote the French naturalist Georges Buffon in his 18th-century masterpiece *Histoire Naturelle*. “One more defect would have made their existence impossible.” In his case for the prosecution, he cites sloths’ small eyes, their lack of incisors and canines, hair that resembles dried grass, short legs and excessively long nails.

But most contemptible of all in Buffon’s view were their laziness, slothfulness and sheer, utter wretchedness.

As the scientist Stephen Jay Gould observed in one of his natural-history essays, Buffon’s somewhat ungenerous spirit is alive and kicking today. The mammal is called sloth in English, *perezoso* in Spanish, *pareseux* in French and *pigrizia* in Italian – all words meaning indolent. It is the only creature named after one of the Seven Deadly Sins.

CHOLOEPUS SLOTHS POSSESS 23 PAIRS OF RIBS. LIVING WICKER BASKETS, THEY SIMPLY BOUNCE WHEN THEY HIT THE GROUND.



A toothbrush mimics the grooming of a sloth mother.

FINGERS FOR TOES

Few visitors to Judy Avey-Arroyo’s sloth sanctuary, near the Caribbean port of Limón in Costa Rica, will leave with such negative impressions. Most people today probably recognise that you cannot ascribe moral attributes to animals, but it helps that Judy clearly loves sloths, doesn’t believe that they are lazy and is keen to spread the word.

Judy is correcting other myths, too. Two species of sloth are found in Costa Rica: the brown-throated three-toed *Bradypus variegatus* and Hoffmann’s two-toed *Choloepus hoffmanni*. But all sloths have three toes on their feet – the difference is in their hands – so Judy calls them two- and three-fingered. It’s a small distinction, but it matters.

The two genera are believed to have diverged 55 million years ago. Both evolved from giant ground sloths but independently developed an almost identical arboreal lifestyle. (*Bradypus* eat nothing but leaves; *Choloepus* also feed on fruits and flowers.) Judy says that it’s about time that we found new common names for each genus, ones that don’t imply they are the wildlife equivalents of benefit scroungers.

Judy’s love of sloths can be demonstrated by many stories, though the one I like best begins with her staring up at a wild male sloth who was trying to mate with an

unreceptive female. Knowing that in such situations males frequently lose their grip, Judy prepared for the inevitable. “I instinctively threw my arms out to break his fall,” she recalls. “I heard a huge crack, and was relieved to see that he was okay. But I wasn’t – my hand was hanging at a crazy angle and it hurt.” The sloth (later named Randy) climbed back up his tree, while Judy was driven to hospital and had two titanium plates and seven screws inserted in her wrist.

In fact, sloths *can* survive falls of up to 27m. *Choloepus* possess 23 pairs of ribs – more than any other mammal – turning them into living wicker baskets, so they simply bounce when they hit the ground. Or so I’m told.

JUNGLE GYMS AND POTTY TRAINING

Like many other 65-year-old grandmothers, Judy enjoys watching natural-history TV. But, unlike most women her age, she currently has 13 baby sloths to feed.

“It’s how I wind down,” Judy tells me. “I love watching them, learning their personalities. Every infant is different. Some grab the milk-filled syringe I’m holding, some take my finger and

Judy cradles one of the almost 600 residents to have benefited from her sanctuary.



FACT FILE

HOFFMANN'S TWO-TOED SLOTH

Choloepus hoffmanni

► LENGTH

54–70cm.

► WEIGHT

4–8kg.

► ID TIPS

Dull brown coat with a pale throat; pig-like snout with widely spaced nostrils; two claws on each hand.

► DIET

Leaves, fruit and flowers.

► LIFE-CYCLE

Solitary: the sexes meet only to mate. Female gives



birth to a single young after an 11-month gestation; it is suckled for 5–6 months but starts eating leaves from 12 days old; independent at about 9 months.

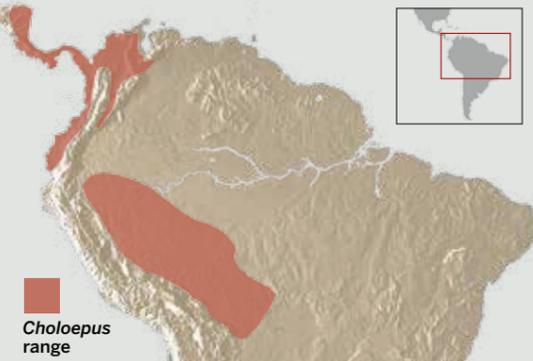
► HABITAT

Humid tropical forests; more numerous than three-toed at higher altitudes.

► STATUS

Of Least Concern; threats as in *Bradypus* (see opposite).

WHERE IN THE WORLD



Resident vet Dr Marcelo Espinoza examines a wild *Bradypus* sloth that's just been brought in. Note the algae growing on its head.



Young sloths are fed goat's (not cow's) milk – they appear to find it easier to digest.



Mmm! Cecropia leaves – our favourite. Like cows, sloths have big, multi-chambered stomachs to break down plant matter.

FACT FILE

BROWN-THROATED THREE-TOED SLOTH

Bradypus variegatus

► LENGTH

40–77cm.

► WEIGHT

2.5–5.5kg.

► ID TIPS

Grey-brown coat; dark eye masks; pale forehead; small, dark snout; 'smile'; three claws per hand. Male has orange patch on back.

► DIET

Exclusively leaves.

► LIFE-CYCLE

Male and female socialise

only during the mating season, though territories may overlap. Female gives birth to a single offspring; gestation period unknown, estimated at 10–11 months.

► HABITAT

Humid tropical forests; found at up to 2,400m.

► STATUS

Of Least Concern; threats include deforestation and capture for the pet trade.

WHERE IN THE WORLD



some do nothing at all. I don't think there's ever been a time at the sanctuary when I haven't had a baby sloth to feed."

The sanctuary is the only one of its kind. It currently has about 135 'guests' and nearly 600 animals have passed through its doors. Of those, 97 have been reintroduced into the wild, but this is an expensive and difficult thing to do.

Also living and working at the sanctuary are Judy's daughter, three of her grandchildren, 14 employees and up to 10 volunteers. The best job must surely be that of taking the baby and juvenile sloths to the 'jungle gym', where they hone their climbing skills on a small network of branches. From there, once a week they go to the potty hole, where the young slothlets are given all-important bathroom training.

Yes, strange as it may sound, sloths – as Judy puts it – "pee and poop" just once a week. Not only that, but each will climb all the way down to the base of its tree to do its business, something that a wild baby sloth is taught by its mother. An orphaned sloth therefore has to be shown how.

And it gets stranger still: before defecating, a *Bradypus* sloth makes a small depression in the leaf litter with its stumpy tail, while the *Choloepus* does what Judy describes



'Randy' has twice fallen out of trees near the sloth sanctuary: the first time he broke Judy's arm, the second his own.

as a 'poo dance'. "He bounces up and down, trampling the vegetation," says Judy. "They are two distinctly different styles, but they both achieve the same result." So it's not just a sloth sanctuary, but a sloth school as well.

The reason why sloths come down to the bottom of their trees to urinate and defecate has been the subject of much speculation. The consensus is that they're fertilising the tree – and the most accurate way to do that is by delivering the nutrients exactly where they're needed. Given that *Bradypus* sloths rely on just 7–12 individual trees for all of their nutritional needs, and that trees are 'handed down' from mother to offspring, this is not as implausible as it seems.

PATIENT ZERO

The sloth sanctuary was founded in 1992, when a young girl living nearby brought Judy and her husband Luis Arroyo a baby *Bradypus* sloth whose mother had been killed by a car. "We were the crazy gringos across the street," says Judy (who grew up in Alaska). "So they brought her to us."

Judy rang around a couple of zoos, but no one knew much about raising sloths. Looking inside the baby's mouth, Judy found that her teeth were black, and concluded that she was already eating leaves. Knowing that all sloths are partial to cecropia foliage, Judy went out and gathered some. "She tucked into it straight away."

They called her Buttercup and she thrived in their care. Judy and Luis started to gain a reputation as the people

to whom injured sloths should be taken. But their next patients, two tiny *Choloepus* sloths, quickly died. Again, intuition told Judy that cow's milk had given them diarrhoea. Knowing that goat's milk is easier to digest, Judy offered some to the next sloth to arrive. Gita, a *Choloepus*, is still flourishing today, nearly two decades later.

In the intervening years, Judy has become an unlikely sloth expert. Becky Cliffe, a zoology student who has worked at the sanctuary and starts a research project there next year, has pored over all of the literature about these mammals. But, Becky tells me, "within 10 minutes of meeting Judy, I realised she knows more about sloths than anyone else".

So, if the adjective 'lazy' doesn't describe a sloth, what does, I wonder? Well, 'tough', certainly.

Many of the sloths that come to the sanctuary have been given serious burns by power lines. (To a sloth, a pylon is just a tree without branches, the lines part of the canopy.) An adult male *Bradypus* had to have his arm amputated, Judy says. "But within 20 minutes of waking, he was happily eating leaves. We named him Toyota – sloths just keep on going. They're survivors." ▶

Three-toed sloths may be the cutest baby animals of them all. Sadly, if they are brought to the sanctuary when younger than six months old then they can never be returned to the wild.



A BRADYPUS SLOTH NEEDS TO EAT VERY LITTLE – 192G OF FRESH LEAVES A DAY. THAT'S THE LIFE OF AN ASCETIC MONK, NOT AN IDLE SLACKER.



Dr Marcelo Espinoza gently reintroduces an adult *Choloepus* sloth into the wild.



A female *Bradypus* sloth studied by Becky Cliffe shows off the 'Daily Diary' datalogger attached to her back.



Young sloths stay with their mothers for six to nine months, during which time they learn exactly which trees to forage from.



One wild sloth arrived at the sanctuary by bus after it was rescued by a driver working for a tour company.

One female *Choloepus* sloth lost both of her arms to a power cable two weeks, Judy estimates, before she was brought to the sanctuary. She had survived all that time on the ground, unable to feed and at the mercy of predators. "It broke our hearts to euthanise her," Judy says, "because she wanted to live. But it would have been a horrific life for her."

According to Professor Rory Wilson, an expert in foraging ecology based at Swansea University, sloths should

be called 'careful' rather than 'lazy'. Their main enemy, he explains, is the harpy eagle. A sloth could never outmanoeuvre such a bird – so instead it simply doesn't move. Together with the camouflage provided by the green algae growing on its fur, you have a near-perfect anti-predator adaptation.

Some animals, such as antelopes, respond to the threat posed by a predator by demonstrating how fast they could run should they need to, Rory adds. "Sloths, by contrast, have taken completely the opposite path."

DID YOU KNOW...

- ▶ **A sloth takes** up to 30 days to digest a leaf meal.
- ▶ **Sloths expend** energy (mostly either climbing or scratching) for just 13 per cent of each 24-hour period. They aren't asleep the rest of the time – they're just not moving.
- ▶ **So strong is** the grip of a sloth's claws (*below*) that there are records of animals keeping hold of branches after death.
- ▶ **A sloth can lose** a third of its body weight during its weekly trip to the toilet.
- ▶ **Bradypus sloths** have one extra neck vertebra compared with most other mammals, enabling them to swivel their heads through up to 270°.
- ▶ **Sloth hair** parts on the stomach to allow rain to run off – an adaptation to upside-down living.
- ▶ **The algae on** a sloth's coat host the sloth moth *Bradipodicola hahneli*. It spends its life in the fur – and lays its eggs in the sloth's faeces.
- ▶ **Choloepus** sloths eat earth when on the ground, perhaps to neutralise toxins in their diet.



MONKISH HABITS

There is no denying that sloths look weird: those strange, goofy faces; that matted, coarse fur; the long, hook-like claws. But they are remarkably successful, occupying much of the Neotropics from Nicaragua to Brazil. Indeed, because sloths have the coldest body temperature of any mammal (in *Bradypus* sloths it averages 30–34°C, and can fall a lot lower) and a lifestyle that minimises energy expenditure, they need to eat very little – 192g of fresh leaves a day for a *Bradypus*, according to Becky's initial research. That's the life of an ascetic monk, not an idle slacker.

Stephen Jay Gould said that we find it hard to imagine what it's like to be a sloth, since their ponderousness is so alien to us and apparently indicative of a greater, moral malaise. So Judy isn't only improving the lives of the sloths in her sanctuary and contributing to the conservation of Costa Rica's two species – she's also helping to expose the lazy, not to say slothful, thinking that created this caricature of the sloth in the first place. 🐼

FIND OUT MORE

For more information about the Sloth Sanctuary of Costa Rica, and for details of how to visit, see www.slothrescue.org. See footage of sloths at www.bbc.co.uk/nature/life/Brown-throated_Sloth



ON OUR WEBSITE

Enjoy more unforgettable, heart-warming pictures of the rescued sloths being rehabilitated by Judy and her team.

www.discoverwildlife.com