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Fiery Family

Ten red pandas were born at the Smithsonian Conservation Biology Institute in 2014. That's a record—and a reason for hope.

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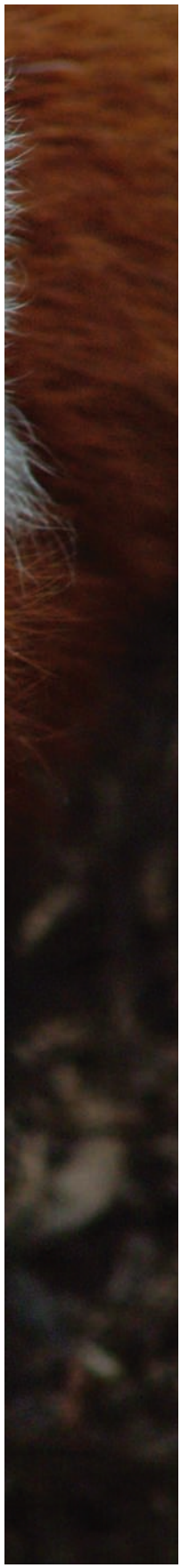
FEATURES

10 Red Panda, Burning Bright

Small, shy, and secretive, red pandas are tough to study in the remote bamboo forests they call home. That makes the Zoo's pioneering work in understanding and breeding these at-risk animals all the more vital.

BY BRITTANY STEFF



JESSIE COHEN/NZP

Red Panda Burning Bright

BY BRITTANY STEFF

MEHGAN MURPHY/NZP

They look like living plush toys. A long luxurious tail, flame-bright fur, overlarge ears, a snuggly cat-like size, and an impish mask framing expressive eyes.

For a long time, few people had heard of the red panda, also sometimes called the lesser panda or firefox. Even scientists couldn't quite place them in the animal world's family tree and argued over whether they are more closely related to bears, raccoons, or weasels, and how closely they might be related to giant pandas, who share their name and habitat.

But red pandas have transcended their obscure origins. With the increasing popularity of social media and sharing sites like Buzzfeed and Zooborns, suddenly everyone knows what a red panda is. Internet users and zoo visitors alike coo at photos and videos of red pandas and their cubs. A popular browser was even named after them, with a vibrant logo to match. With the help of the Internet, red pandas have captured human imaginations and hearts all over the world.

But despite their dramatic upswing in popularity, much about red pandas still remains a mystery.

The Original Panda

When you talk to people who study or care for red pandas, they're quick to point out that red pandas are, in fact, the "true" pandas. Red pandas were discovered by the Western world in the wilds of Nepal in the early 19th century. Unsure how to identify this arboreal animal, scientists named it *Ailurus fulgens*, meaning "shining cat-like animal," for the way its fiery coat shone in the bamboo forest. They also noted that the locals called it *poonya*, which is probably the origin of the word "panda."

Fifty years later, the Western world discovered another poonya—the black-and-white bear we know as the giant panda—and the poor red panda has been pretty much overlooked ever since.

Red **Panda** Burning **Bright**

ANN BATDORF

MEHGAN MURPHY/NZP

TOP LEFT: **Red pandas are arboreal creatures, which means they spend most of their time in trees.**

TOP RIGHT: **The red panda facilities at SCBI were recently renovated to offer the animals increased privacy.**

BOTTOM: **The Smithsonian's National Zoo was one of the first zoos to keep, breed, and study red pandas.**

FACING PAGE: **Red panda cubs often stay with their mother for a full year, only striking out on their own with the next litter is born.**

NZP ARCHIVES

Red Panda Remodel

Recent research has inspired improvements in the way zoos house red pandas, particularly females they hope will have cubs. These changes have already been incorporated into the new red panda facility at SCBI, which opened in 2012, and now it's time to update the Zoo's red panda exhibit.

The actual exhibit and the yard itself will remain the same. It still meets (and exceeds) all the requirements of red panda life.

Instead, all the updates to the red panda exhibit will be to the holding facility—the structure behind the red panda exhibit. Up until now this has been entirely off-exhibit and invisible to visitors. This will soon change.

Improvements will include:

- Climate-controlled dens where red pandas can cool off in D.C.'s summer heat, but remain visible to the public.
- More space behind the scenes, which will allow animal care staff to manage red pandas separately if necessary.
- Separate "suites" with private entrances, which will give each red panda the opportunity to have its own space.

Both giant and red pandas live in the temperate cloud forests of Asia, where they subsist primarily on bamboo even though both evolved as carnivores. Rather than being limited to China, as giant pandas are, red pandas spill over into Nepal, Bhutan, India, and Myanmar. Red pandas eat only the youngest, most tender shoots and leaves of bamboo. They chew their food carefully and spend almost 13 hours a day eating. To compensate, their metabolism is incredibly slow, barely faster than a sloth's.

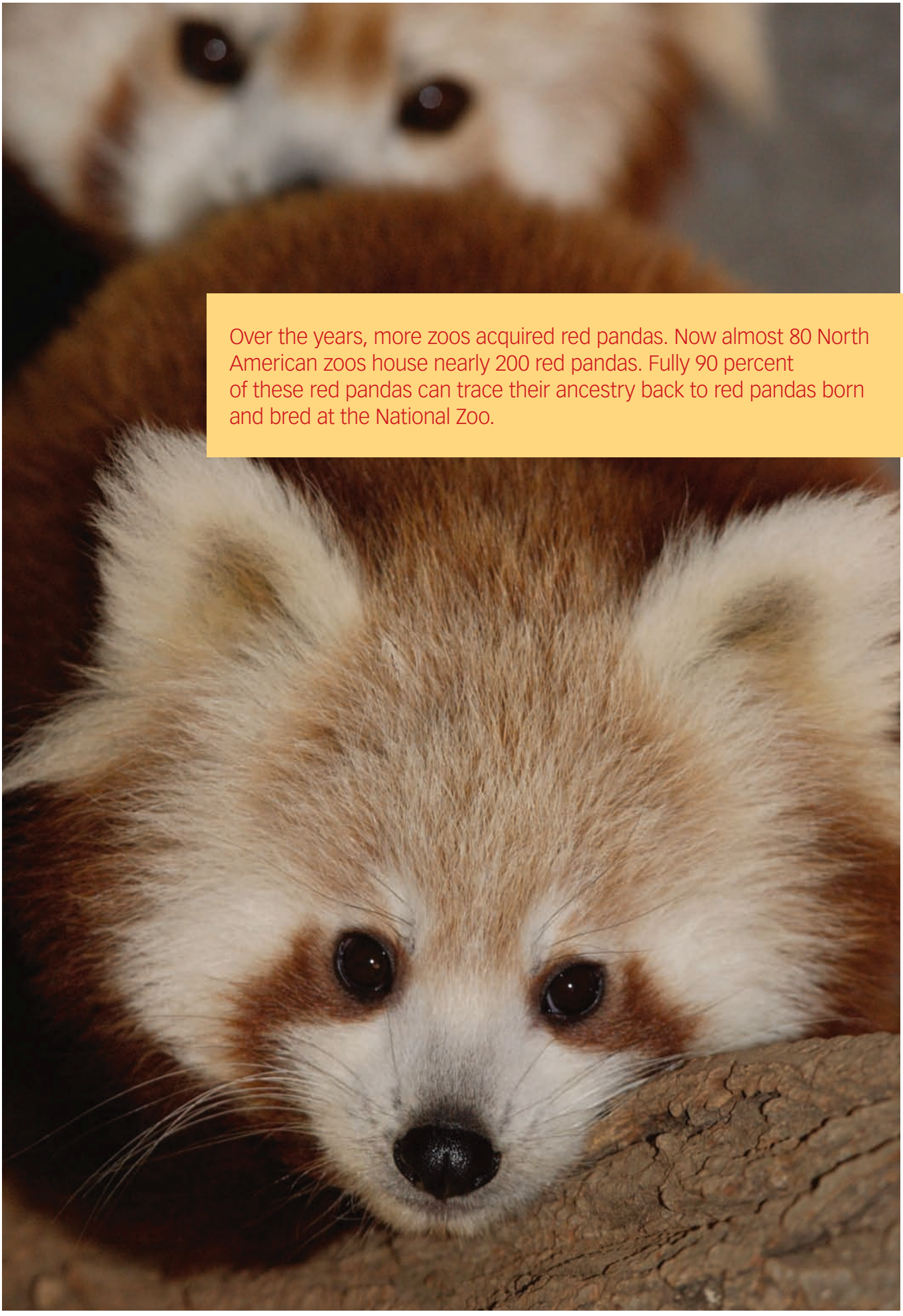
Red pandas' diets dictate their lifestyles. They have large home ranges for such small animals, and they give birth in the late spring and summer when bamboo plants are the youngest and most appetizing. The young grow up slowly and stay with their mothers for almost a year.

Despite their apparent similarities, red pandas are not close cousins of the black-and-white bear with which they share a name. In fact, red pandas are so unusual they belong in their very own family—Ailuridae. They do, however, belong to the superfamily Musteloidae, which includes ferrets, otters, weasels, and others. Giant pandas, in contrast, belong to the bear—Ursidae—family.

Prioritizing Red Pandas

Red pandas are elusive, enigmatic creatures. But unfortunately, research-wise, they seem to be overshadowed by their black-and-white giant counterparts. A few dedicated scientists continue to study them, though, primarily in zoos. Especially at the National Zoo.

Stacey Tabellario, a keeper on Asia Trail who works with red pandas,



Over the years, more zoos acquired red pandas. Now almost 80 North American zoos house nearly 200 red pandas. Fully 90 percent of these red pandas can trace their ancestry back to red pandas born and bred at the National Zoo.

MEHGAN MURPHY/NZP

explains, "One of the great things about red pandas at the National Zoo, a lot like the bison, is that they're a big part of our history. When you go back and talk to people about red pandas, the National Zoo is really the place that started work and research with them."

Much of what science knows about red pandas—their metabolism, their behavior, their communication—comes from research done at the National Zoo in the 1980s. At the time, few zoos had housed pandas. The National Zoo did, both at the Zoo and at the Smithsonian Biology Conservation Institute (SCBI) in Front Royal, Virginia, which can accommodate larger populations and better facilitates research.

Two Zoo researchers—Miles Roberts and Frank Kohn—spearheaded these efforts, conducting much of the foundational research about red pandas. They also wrote the first animal care manual for the species, pioneered the Red Panda Species Survival Plan for the Association of Zoos and Aquariums, and did their best to encourage zoos around the country to exhibit red pandas.

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The most visible sign of the Zoo's ongoing commitment to red panda research is at SCBI, where ten cubs were born this year—more than have ever been born in a single year. Of those ten, seven survived. That's actually a very good ratio; half of all red panda cubs don't live past their first year. Researchers aren't sure whether that mortality rate holds true in the wild because red pandas are so difficult to study in their native habitat.

SCBI red panda keeper Jessica Kordell explains: "We don't know a lot about them in the wild. They're so secretive, and they prefer mature, overgrown forest, which is dense and hard to get to. It's just inaccessible to humans. They're very difficult to study. We just don't know much about red pandas in general. Most of our theories about their reproductive system are just that—theories based on what we've seen. There's a lot of room for studying."

Kordell studies hormones in red pandas. She's measuring levels of reproductive hormones in feces, and comparing those levels to red panda behavior in an attempt to detect whether a female is pregnant or predict when a pregnant panda will give birth. She's also investigating a fundamental question about red panda reproduction: Are they delayed implanters like giant pandas? In delayed implanters, a fertilized egg can float around the uterus for an extended period before implanting and continuing development. Scientists suspect that red pandas are delayed implanters, given their unusually long gestation period, but no one has yet been able to confirm this.

The answers to these questions will allow zoos without reproductive hormone labs—most zoos other than the National Zoo—to better prepare for red panda cubs, with the hopes of boosting cub survival.

Project Panda Cam

Working on cub survival from another angle is SCBI researcher Elizabeth Freeman. With grant money from George Mason University, she's recently outfitted all the red panda nest boxes at SCBI with webcams. Freeman explains, "The cubs stay in the nest box up to three or four months of age, and we really don't have much data about what's going on in the nest box. The cameras will give us insight into mother-cub interactions and help us change management to improve cub survivorship."

Research at SCBI is reaching across international borders. Freeman and SCBI head veterinarian Copper Aitken-Palmer are working with Chinese colleagues to make health assessments and compare management strategies with the large population of red pandas that live there.

Tale of **Two Pandas**

Despite their similar names, red pandas and giant pandas are not related. But their shared habitat, name, and a handful of similar characteristics led scientists to believe for years that they were close cousins.

- The word "panda" probably comes from a Nepalese phrase—*poonya*—meaning "bamboo-eater."
- Both giant pandas and red pandas are carnivores whose digestive systems have adapted to a diet almost entirely of bamboo.
- Both live in cool, temperate forests in the mountains of Asia that are similar to the forests of the Pacific Northwest.
- Both pandas have false "thumbs," which are actually extensions of their wrist bones that help them climb trees and manipulate bamboo.
- Both have severely circumscribed breeding seasons. Females are fertile only a couple of days each year.
- Both species are mainly solitary. Males and females generally come together only to breed.
- Due to the low nutrition value of bamboo, both pandas grow up slowly. Their young typically stay with their mothers for at least a year.

JESSIE COHEN/NZP

Researchers also hope to expand studies to animals in the field in Nepal and China, in order to compare information gleaned from Zoo-living red pandas with wild red pandas.

Field research is especially vital as fewer than 10,000 red pandas remain in the wild, and their populations are decreasing due to habitat loss and poaching.

According to Freeman, "The more we learn about red pandas, the more we discover they're a black box. Red pandas are cute and so charismatic, but we know so little about them. They are an amazing species because they are so different from other species. They're in their own family group. We cannot assume knowledge about giant pandas or raccoons can transfer to red pandas."

Renovations on Asia Trail

Research is important to advance knowledge, and to save species in the wild. But it's also important to use that knowledge to improve the lives of animals in the Zoo. All the most recent research, including all of the National Zoo's contributions, have just been published in a new version of the animal husbandry manual released by the Association of Zoos and Aquariums. The manual helps all zoos give their red pandas the best care possible.

Recently, improved knowledge about what red pandas—especially pregnant pandas and new mothers—need led SCBI to build new panda enclosures that give their red pandas more secluded areas. Research shows that cortisol—a stress hormone—is higher in red pandas with more than two sides of their exhibit open to the public. This suggests that offering females more opportunities for privacy may reduce their stress levels and increase their breeding success.

Having completed these improvements at SCBI, the Zoo is now turning its attention to the red panda exhibit—currently empty—on Asia Trail. While the exhibit is unoccupied, the animal care and exhibit teams will update it to reflect some of what they've learned in the past seven years since the exhibit was first built.

Improvements to the exhibit will focus on the "holding" area near the back of the yard. The updates will create more space for red pandas and their keepers, including access to more areas with air conditioning where the animals will still be visible to the public.

Tallie Wiles, a red panda keeper on Asia Trail, sums it up best: "We want to do what's best by the animals. We have to evolve as our knowledge evolves. We've learned a lot, and we hold ourselves to the highest standard. The bar has been raised since we built Asia Trail, so we're going to raise the bar of our exhibit." SZ

—BRITTANY STEFF *is an editor for the Zoo's website and a veteran contributor to* Smithsonian Zoogoer.