

The Rarest Rhinoceroses in Captivity

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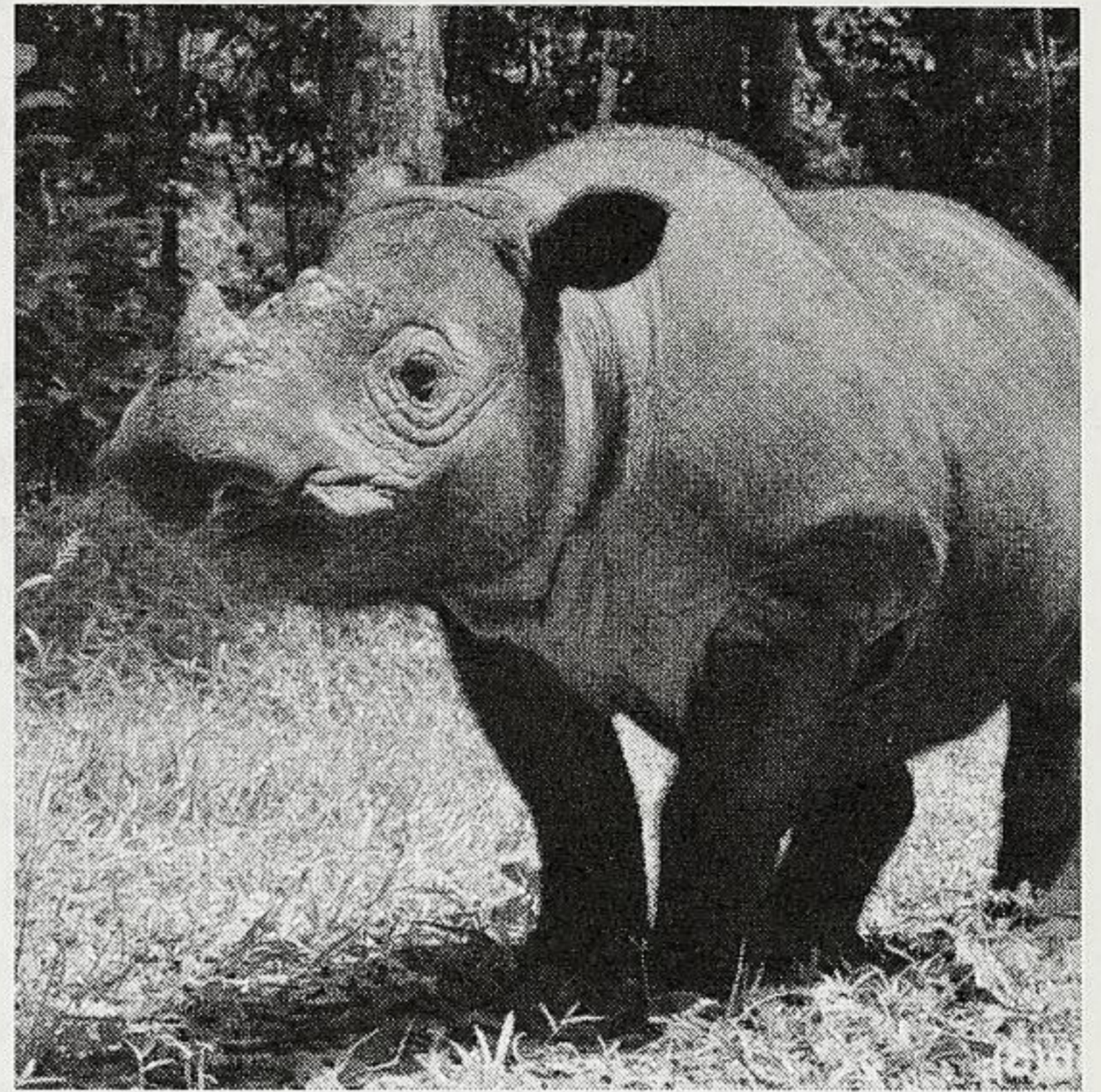
The Sumatran rhino (*Dicerorhinus sumatrensis*) is by far the rarest rhinoceros in captivity. More than 500 white rhinos (*Ceratotherium simum*) are maintained in accredited zoos and special breeding centers on all continents except Antarctica. Black rhino (*Diceros bicornis*) numbers in captivity total another two hundred or so and greater one-horned rhinos (*Rhinoceros unicornis*) around 170 animals. The long-term prospects for captive populations of the three largest rhino species, in fact, are relatively good. By comparison, there are only a tiny handful of Sumatran rhinos spread out among almost an equal number of institutions in three different countries, and not a single Javan rhinoceros (*Rhinoceros sondaicus*) exists in captivity anywhere in the world.

The first Sumatran rhinos recorded in a zoo collection were either acquired by the Zoological Garden of Hamburg in 1868 or received by the London Zoo in 1872. One of the two London Zoo animals, a female named Begum, was captured in Chittagong four years earlier, lived at the zoo until 1900 and still holds the captive longevity record for this species – 38 years. Begum was also the type specimen of the northernmost Sumatran rhino subspecies, *Dicerorhinus sumatrensis lasiotis*, which ranged all the way to northern India and may have been sympatric with both Javan and greater one-horned rhinos in the foothills of the Himalayas. The subspecies ultimately went extinct, but not before a female at the Calcutta Zoo gave birth in 1889. Throughout the next century, however, not a single Sumatran rhino birth occurred in captivity.

That doesn't mean that attempts weren't being made internationally to launch captive breeding programs. Between 1984 and 1996, several dozen wild Sumatran rhinos were captured and sent to zoos and sanctuaries throughout the world, but these efforts were largely uncoordinated and unsuccessful. Half of the captured animals died in captivity, including all eight animals at a



SRS rhino being tended to by a keeper. Photo courtesy of Yayasan Badak, Indonesia



(Left) Andalus with his mother, Emi, at the Cincinnati Zoo, photo courtesy of the Cincinnati Zoo and Botanical Garden. (Right) SRS rhino, Ratu, now 12 months pregnant. Photo courtesy of Yayasan Badak Indonesia (YABI).

Malaysian sanctuary, which were felled by a Trypanosome infestation. By the mid-1990s, only three of the seven rhinos that had been brought to the United States remained, a male at the Cincinnati Zoo and two females, one at the Bronx Zoo and the other at the Los Angeles Zoo. The decision was made to bring all three animals to Cincinnati. At that point, Emi, the female from Los Angeles, had already been pregnant five times since her arrival at Cincinnati, but had failed to deliver a live calf. However, with the help of special hormone therapy, her mating with Cincinnati's male, Ipuh, produced the first Sumatran rhino baby in captivity in 112 years. The last one had been born at the Calcutta Zoo in 1889. Ipuh's and Emi's male offspring, Andalus was born in September 2001, and was eventually followed by a female calf, Suci in July 2004 and another male, Harapan in April 2007. That same year, Andalus, who had been transferred to the Los Angeles Zoo a few years before, was sent to his native Indonesia for breeding.

It's important to note that Sumatran rhino breeding at the Cincinnati Zoo was a collective and very expensive effort. Key to its success was the introduction of browse to the daily diet, about 75 pounds of *Ficus* cuttings per animal per day. The *Ficus* came all the way from San Diego, cut fresh each day by zoo personnel there and flown halfway across the country to be combined with a hay mixture of alfalfa and orchard grass, as well as a variety of fresh produce including bananas, apples, carrots, pears and papaya. In all, each rhino consumed about 100 pounds of food per day.

The IUCN Species Survival Commission's Asian Rhino Specialist Group recommended that captive breeding become a more significant part of efforts to safeguard the future for Sumatran rhinos, with experts agreeing that natural conditions and large enclosures would enhance successful reproduction. The first managed propagation center was the 100-hectare Sumatran Rhino Sanctuary (SRS), situated within Indonesia's Way Kambas National Park and operated by Yayasan Badak Indonesia (the Indonesian Rhino Foundation). The sanctuary had received its first resident rhino in 1998, but held only a pair of non-reproductive animals for a number of years. The arrival of Andalus in 2007 brought the number of animals to five, including Torgamba, an aging male, and three females – Bina, Rosa and Ratu. Torgamba, however, died last year.

Bina was captured in 1991 and is now the oldest captive Sumatran rhino in Indonesia. Only Ipuh at the Cincinnati Zoo is older; Emi died in 2009. Bina is also one of the last Sumatran rhinos to be captured and relocated within Indonesia. She came to the sanctuary from southern Sumatra's Bengkulu province, where human settlements, a large oil palm plantation and a logging concession left little habitat for rhinos and other native wildlife. Bina tends to be shy and solitary.

Rosa came to the sanctuary in 2005 from Bukit Barisan Selatan National Park, where she had been routinely observed by local villagers walking along roads and browsing vegetation on the protected area's perimeter. A special rhino protection unit was assigned to observe and protect her, as there were serious concerns regarding her safety. Eventually, it was decided to bring her into captivity. Because she is habituated to humans, Rosa enjoys walks in the forest with sanctuary staff. She is a particularly vocal rhino who appears to enjoy "singing" when wallowing in the mud.

Ratu is something of a local girl whose home range bordered Way Kambas National Park. Like Rosa, she began coming into contact with villagers but, instead of being tolerated, she was attacked as a potential food item and barely managed to escape. In response, a team of rangers and veterinarians were forced to capture and remove her to the safety of the sanctuary in 2005.

Prospects for reproductive success increased significantly in early 2008 when an analysis of fecal testosterone levels indicated that Andalas had reached sexual maturity. Since arriving at the sanctuary he has been gradually introduced to the three females, but only Ratu has been receptive to date. Her receptivity paid off in January 2010 when she was mated by Andalas and became the Sumatran Rhino Sanctuary's first pregnant rhinoceros. Unfortunately, Ratu's first pregnancy resulted in a miscarriage after only a few months. Her second pregnancy, the result of breeding that July, was even shorter. In March of 2011, Andalas bred Ratu a third time and it was decided that special treatment should be administered to increase chances for success. Working with Indonesian veterinary colleagues Dr. Dedi Candra and Dr. Adriansyah, Dr. Terri Roth (Director of the Cincinnati Zoo's Center for the Reproduction of Endangered Wildlife) decided to administer a hormone supplement (progesterone) that had helped Andalas' mother carry her first pregnancy to term after suffering five miscarriages in earlier attempts. Ratu takes the oral medication without any fuss and recently entered the 12th month of what is typically a 16-month gestation.

Ratu's daily care is the job of three Indonesian keepers: Sugiyono, Iswanto and Gocek. Her paddock, like those of all the resident rhinos, is connected to a large natural enclosure in which she can wander and feed at liberty. Each day she is fed some cultivated foods such as bananas and melons, but the bulk of her diet consists of forest plants and fruits that are gathered by keepers or that she is able to browse. Ratu's favorite foods supplied by her keepers are types of breadfruit (*Artocarpus* spp.) known locally as *bendo* and *nangko*, fruits of the genus *Dillenia*, which are also favored by elephants, and *kecapi* (*Sandoricum kucapi*), a fruit that can be used in cooking or from which marmalade can be made. In the forest, Ratu consumes an eclectic variety of leaves, twigs and roots in addition to fruits. Keepers at the sanctuary have now tallied more than two hundred plant species consumed by Sumatran rhinos.

With another four to five months to go before Ratu is expected to deliver, all signs appear good. Since the most critical time has passed without incident, staff at the sanctuary is cautiously optimistic that she will carry this baby to term. If she does, it will be the first Sumatran rhino born in captivity in Indonesia and the first in the world sired by an animal that was itself captive-born. The birth of one individual might not seem significant on the surface, but the Sumatran rhino is so critically endangered – as were species like the Arabian oryx (*Oryx leucoryx*), California condor (*Gymnogyps californianus*) and black-footed ferret (*Mustela nigripes*) – that without a successful captive breeding effort, it will certainly continue on the path to extinction.