

In Loving Memory of Emi

Found in a pit trap in 1991 Emi was the 28th of 40 rhinos acquired for a captive breeding program for the Sumatran Rhinoceros. The program was initiated in 1984 with the goal of producing a vigorous captive population of Sumatran rhinos that could serve as a back-up to the dwindling wild population. Rhino #28 (Emi) was a very young female estimated to be about three years old.

Because there were no tracks of an adult rhino in the area, it appeared the rhino calf was alone and had been orphaned. Her mother was probably killed by poachers who covet the rhinos' two small horns. The horns are crushed up and sold for top dollar on the black market as "medicine" to cure anything from headaches to arthritis to upset stomachs even though there is no scientific proof that rhino horn contains any medicinal value.

Although Emi had probably never seen humans before, when the trackers arrived at the pit and looked down on her, she did not panic. Within hours, she was eating the leafy tree branches they offered right out of their hands.

Forests of Sumatra typically are dense, but what had been Emi's home territory was rapidly disappearing due to logging. Making her potential future in the wild even bleaker was the fact that the logging roads were opening up the forests and making them more accessible to poachers. Those same roads actually helped the rhino trappers in transporting Emi out of the forest and to the coast where she boarded a ferry and crossed the ocean to the island of Java, the most populated island of Indonesia. Had she remained in that forest, Emi's fate most likely would have ended up in the hands of poachers.

Many of the rhinos captured for the captive breeding program had remained on Java, but several had made yet another long journey, this time by airplane, to the United States. Emi was the fifth of seven rhinos to come to America. She arrived at the Los Angeles Zoo in good condition and began her new life on the West Coast. Quite a transition, straight from the forests of Sumatra to the bustling city of LA, but Emi handled it all in stride. Her adaptability is one of the traits that made Emi so exceptional.

Known as the "hairy rhinoceros", the Sumatran rhino has a distinctive longhaired reddish-brown coat not seen in other rhino species. This coat is especially prevalent on young rhinos, and Emi had far more hair than any of her adult relatives previously imported to the United States. Growing up on the California coast, Emi's coat changed from reddish-brown to almost blond, but at seven years of age, it was not the colour of her hair that concerned animal managers, it was the challenge of trying to breed her.

In 1995, only three of the seven imported Sumatran rhinos were still alive, and efforts to breed the species had met only with failure. Not only was the U.S. struggling, but breeding efforts in Malaysia and Indonesia also proved fruitless. Because the only male Sumatran rhino in the U.S., Ipuh, was at the Cincinnati Zoo, and because of their reputation for breeding endangered species, Emi was transferred on breeding loan from LA to Cincinnati. A year later is when Dr Terri Roth arrived at Cincinnati Zoo and had the privilege of working with this extraordinary rhino called Emi.

Growing up around cats, dogs and cattle, people often take for granted that if you put male and female animals together, they will naturally breed and produce offspring. This scenario is far from reality when it comes to many wildlife species. Sumatran rhinos are very solitary by nature, and early efforts to breed them by housing a male with a female resulted only in aggressive battles between the two who wanted nothing to do with each other.

Because of our concern for Emi's well-being, we dared not force her into an enclosure with the male rhino if the risk of him attacking and hurting her was significant. However, our goal was to breed Emi and Ipuh, a goal that clearly could not be achieved if the animals were never in the same yard. Therefore, we decided the best approach was to study Emi and learn about her reproductive cycle so that we might be able to determine when she would be receptive to Ipuh before placing the animals together.

Science is only as good as the data that can be collected, and when working with non-domestic species, data collection can be incredibly challenging. Most folks would not expect a rhinoceros to tolerate a lot given

their reputation as tough, cantankerous animals. We were fortunate that Emi's ready acceptance of so many things allowed us to collect data by ultrasound on a regular basis (even though the procedure had to be performed rectally). Furthermore, after a conditioning period, our veterinary technicians were able to collect blood from a vein in her ear so that we could monitor hormone levels.

Like a lot of us, Emi will tolerate quite a bit if rewarded with her favourite foods, and as long as she was fed pieces of apple, banana and sweet potato, she stood quietly in her chute during these research procedures. In fact, Emi had the right of refusal every day because her entrance into the chute for this work was always voluntary and never forced. But Emi was a trooper, and always cooperated with us.

Eventually the data we collected from Emi allowed us to unravel the mysteries of reproduction in this species and provided the information we needed to determine the right time to pair her with Ipuh for mating. Emi's contribution to science and to our knowledge of her species is profound, and yet to her, it was all part of the daily routine.

Proof of Emi's tolerant demeanour was perhaps best demonstrated by her behaviour the first time Ipuh attempted to mate with her. Ipuh, having also come from the forests of Sumatra, was captured as an adult in 1990. He had spent seven years in captivity without breeding a female when suddenly he found himself in an enclosure with receptive Emi throughout the day and into the night. Ipuh attempted to mate Emi. In fact, over a 19-hour period he mounted her 47 times, and each time, Emi stood quietly. Unfortunately, Ipuh never was successful, and by morning, the exhausted pair was separated. Twenty-one days later, Ipuh got his second chance. This time Ipuh figured it out and succeeded.

Emi's first pregnancy occurred in the fall of 1997 and was diagnosed by the presence of an embryo observed by ultrasound 16 days after mating. Surprise and elation quickly spread throughout the Zoo and then extended to Emi's native land of Southeast Asia where our international partners in the effort to save this species rejoiced with us. This was the first pregnancy produced in a captive Sumatran rhino in over 100 years!

Unfortunately, our euphoria came to an abrupt end when, at day 42 of gestation, Emi lost the pregnancy.

Over the next two years, Emi became pregnant four more times, but lost every pregnancy within the first three months of gestation. Of course, Emi was completely unaware of the optimism and excitement her pregnancies inspired nor the heart-wrenching disappointment her miscarriages brought, it was an emotional roller coaster for those of us involved, and I started to envy Emi and her state of blissful ignorance.

Through it all, Emi appeared perfectly healthy and content, once again, taking everything in stride. Little did she know that she was a primary topic of conversation during a Sumatran Rhino Master-planning Workshop in Southeast Asia that was sponsored by the International Rhino Foundation. The recommendation coming out of that workshop was to supplement Emi with the hormone, progesterone, the next time she conceived to see if that might help her sustain a pregnancy to term.

When Emi became pregnant for the sixth time in May of 2000, she was prescribed a daily dose of oral progesterone. The rhino keepers diligently ensured Emi received the entire dosage of liquid hormone every morning by injecting it into a stack of bread and then feeding Emi the hormone soaked slices of bread while she stood in the chute. Always interested in food, Emi quickly became accustomed to her morning bread treat, and would stand in position in the chute waiting for it even if the front door of the chute was wide open.

One afternoon, 474 days after mating with Ipuh, Emi came into the barn for the evening and just wasn't acting quite herself. She spent most of the night pacing between her stalls, vocalizing, frequently lying down and getting back up and spraying urine. In fact, in the 12 hours leading up to Emi's delivery, she sprayed urine an amazing 69 times! We knew this because our Zoo Volunteer Observers were watching her on monitors and recording her behaviours all night long at the Linder Centre for Conservation and Research of Endangered Wildlife (CREW).

In the early hours of the 475th day, Emi appeared to be going into labour, but about that time Head

Keeper Paul Reinhart arrived and suddenly Emi's interest shifted to her breakfast. Keeping us all waiting in suspense, Emi proceeded to eat almost her entire breakfast before returning to the task of delivering her calf, which she then did relatively quickly and without complications. With this successful delivery, Emi became the first Sumatran rhino in 112 years to produce a calf in captivity and brought international attention to herself, CREW and the Cincinnati Zoo & Botanical Garden. The birth of this calf was a spark of hope for the future of the species. But none of this concerned Emi, she was busy caring for her newborn calf.

Despite the fact that Emi had been orphaned young and raised in captivity her natural instinct was strong and Emi proved to be an ideal mother from the very start. True to form, Emi calmly accepted the new arrival, cleaned him, watched nearby as he struggled to stand and then helped guide him to nurse. Her first calf, named "Andalas" thrived in Emi's care. At one year of age, a robust Andalus was weaned, and attention turned once again to Emi.

Our attempt to produce a second calf from Emi and Ipuh was initiated in October of 2002. Using the same management protocol that had produced the previous pregnancies, Emi and Ipuh were paired for mating when our scientific data indicated Emi would be receptive. The two had not forgotten what to do, but it took six consecutive matings before Emi became pregnant. This time, no hormone soaked bread was offered to Emi and, finally, she carried a pregnancy to term successfully on her own.

In the very early hours of July 29th, Emi became restless. She proceeded to pace, paw, rub her horn, vocalize and spray urine almost continuously for 36 hours before finally lying down and having serious contractions. Within 45 minutes of starting those contractions, Emi's second calf "Suci" entered our world 477 days after it was conceived. This one, a female with a unique white sock on her right front leg, was every bit as big, vigorous and healthy as her brother had been.

April 2007 saw the arrival of Emi's third and last calf – a male "Harapan". Emi is the only Sumatran rhino in history to produce more than one calf in captivity. With the captive population plummeting to just eight

animals prior to these births, and the wild population now hovering at about 200 rhinos, the species is in an unprecedented state of crisis.

Emi the orphaned rhino calf from Sumatra became a shining star in the struggle to save her species from extinction. With every calf she produced, Emi moved the world one rhino further away from losing the species, and in her calm and unassuming way, gave us hope and provided inspiration. Whereas I once envied Emi and her blissful ignorance, now I wish she could somehow comprehend all she achieved and just what she meant to her species and to all of us who are fighting for its survival against all odds.

On September 5, 2009, Emi passed away in her sleep at the age of 21. The Veterinary staff had spent months conducting a battery of diagnostic tests, consulting numerous rhino and veterinary experts and administering various treatments, but they could not save her in the end.

On the day of her death a thorough post mortem exam was performed and the liver appeared to be the problem. Tissue samples were submitted to veterinary pathologists and the results indicated Emi died due to liver failure caused by iron storage disease (hemochromatosis).

Considered the most endangered of all rhino species and perhaps the most endangered mammal species on earth, it is estimated that at least 60 percent of the Sumatran rhino population has been lost in the last two decades. The primary cause is conversion of rhino habitat for agriculture, even in some national parks, and poaching for its horn which some Asian cultures believe contains medicinal properties.

Today, there are only ten Sumatran rhinos living in captivity worldwide and fewer than 200 animals exist in isolated pockets of Sabah, Malaysia and the island of Sumatra in Indonesia. Sumatran rhinos can live 35-40 years.

Article: Dr Terri Roth

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