The Crash

The newsletter for rhino professionals

IRKA

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In Loving Memory of Emi: By: Dr. Terri Roth

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(Article modified from that which first appeared in the Cincinnati Zoo & Botanical Garden's Wildlife Explorer magazine in Sept./Oct. 2004).

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 Masterplanning 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.

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 bought 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 Andalas 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.

Facility Focus: The Denver Zoo rhino program - the past, present and future.

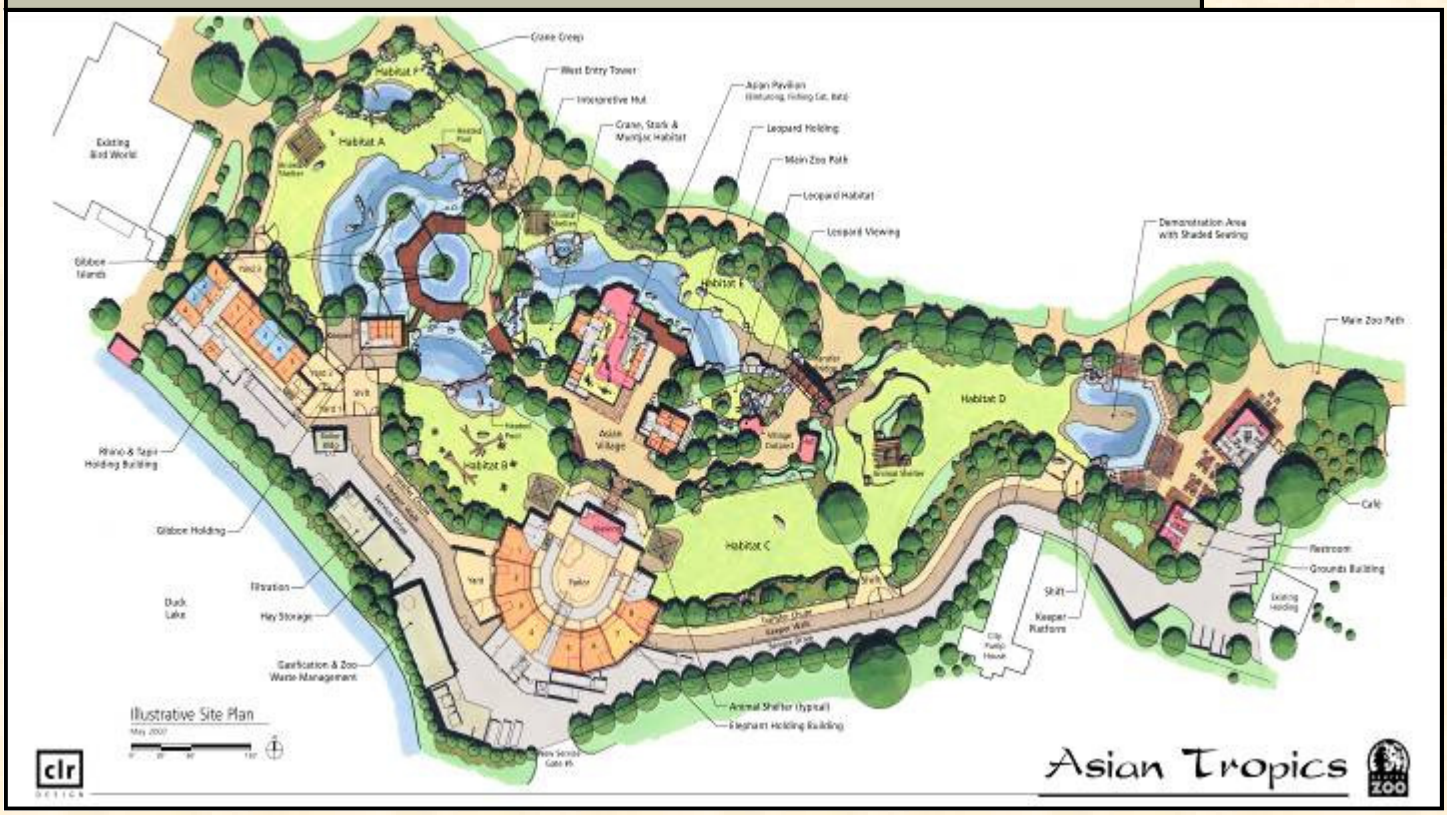
By: Christine M. Bobko, Lead rhino Keeper

The Denver Zoo began with a humble beginning in 1896 with a purchase of a black bear, since then we have grown to an 80 acre facility with 1.6 million visitors entering our gates. The rhino program began in 1959 with the construction of the Pachyderm building , and has successfully housed and managed black rhinoceros for over 50 years. In this time, we have had fourteen births and six separate pairs. Even with the age of our facility, we have accomplished many husbandry and training goals with our collection. We are proof that your facility should not determine what you can accomplish in your rhino program!

In 2003, we were honored to host the 3rd Rhino keeper Workshop which brought in over 80 delegates from across the country and several foreign countries. The highlight of our workshop was the free standing reproductive ultrasounds performed on both of our males by Dr. Robert Hermes. The delegates were able to observe in real time, the procedures on a wide screen projection system in the building lobby. It was at this workshop, that the birth of the idea of our own rhino keeper organization was formed!

On December 2, 2009, the Denver Zoo held it's ground breaking for our new exciting and progressive exhibit called Asian Tropics. This 10 acre, 50 million dollar facility will allow us to house a second species of rhino at our zoo, the Greater one-horned rhino along with being the first zoo to attempt to house multiple bull Asian elephants. Our current plans are for the development of a successful breeding program with one pair of GOH. The unique layout of this facility will allow us to move the rhinos into any of the six large yards on the site including several that have heated pools that the rhinos can utilize in the winter.

We are very passionate and excited about this new exhibit, and the management, husbandry and conservation efforts that we can contribute in the future.



Denver Zoo Breeding History

BLACK RHINOCEROS (Diceros bicornis)

HOUSE NAME	SB#	ISIS #	DAM	SIRE	DATE OF BIRTH	SEX	ORIGIN	DISPOSITION
TOMBO	124	456	wild	wild	2/15/1957	M	Kenya	loan GardenCity 1984; died 1987
MOMBA	125	458	wild	wild	2/15/1955	F	Kenya	loan GardenCity 1984; died 1990
male	640	660801	458	456	1/10/1966	M	stillbirth (84.0#)	stillbirth
female	126	680103	458	456	1/20/1968	F	birth	trade Memphis 02/25/69
Lij	163	459	458	456	1/6/1971	F	birth	death 02/20/95
Spock	204	460	458	456	10/31/1974	M	birth	sale Zoohandler 12/01/75
RHINESTONE	161	457	SB#75	SB#74	1/1/1972	M	purch SanFran 1973	death 1/23/95 (salmonella)
LIJ	163	459	458	456	1/6/1971	F	birth (00458/00456)	death 2/20/95 (necrotizing pleuritis)
Nancy	246	2723	459	457	8/25/1977	F	birth	death 02/07/78 (drowned)
Shakti	279	4305	459	457	11/3/1979	F	birth	death 12/26/79
unknown	304	810101	459	457	7/9/1981	U	aborted fetus	aborted fetus
Onyx	328	6258	459	457	11/15/1982	F	birth	death 09/11/96
Pete	376	10522	459	457	5/7/1987	M	birth	sale Portland 06/27/88
Jasper	432	11902	459	457	10/31/1989	M	birth	loan Busch Tampa 08/20/91
Mshindi	516	930808	459	457	11/13/1993	M	birth (87.5#)	
GEORGE (Akeem)	332	7986	SB#180	SB#247	11/1/1983	M	purch Cincinatti 1984	
ONYX	328	6258	459	457	11/15/1982	F	birth (00459/00457)	death 9/11/96 (multiple problems)
Kwanza	460	12399	6258	7986	10/4/1990	F	birth (h/r)	death 01/30/92
Tony	458	920056	6258	7986	3/26/1992	M	birth (74.0#)	sale Honolulu 01/31/94
LUANA	190	980332	SB#17	SB#16	11/26/1969	F	loan SanAnt 09/23/98	death 02/18/00 (euth-gen health)
SHY-ANNE	331	A00272	SB#190	SANTILONI	12/11/1982	F	loan SanFran 10/03/00	
male		A01125	A00272	7986	5/14/2001	M	aborted fetus (5-mo gest)	aborted fetus
JASPER	432	11902	459	457	10/31/1989	M	birth	loan Busch Tampa 8/20/91 (BG54806)
Gery	786	A00384	11902	BG56126	8/29/2000	M	birth on loan at Busch	loan Busch Tampa 08/29/00
Kayin	864	A01364	11902	BG52154	7/29/2001	M	birth on loan at Busch	loan Busch Tampa 07/29/01

It's a BOY!

Our first breeding pair of black rhinos was Momba and Tombo. These animals were brought in from Kenya in the 1950's, and later went to Garden City on a breeding loan. Before they left, this pair produced a total of four calves. Both died in their thirties at Garden City in 1987 and 1990.

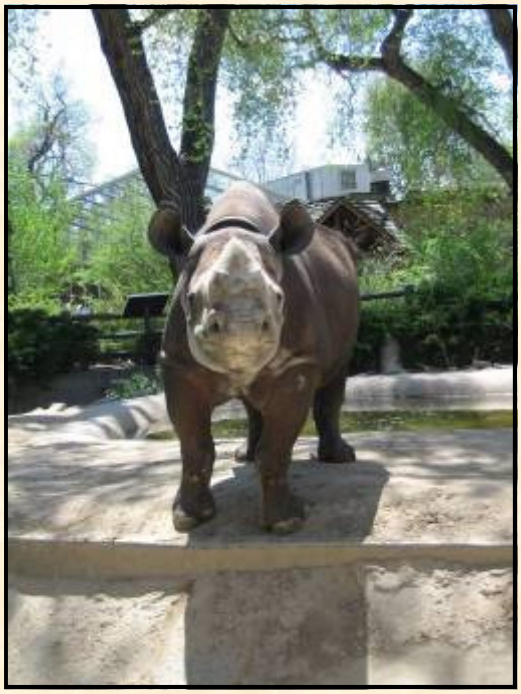
Our next breeding pair consisted of our first pairs daughter Lij, and a big beautiful male from San Francisco named Rhinestone. This great pair gave Denver Zoo a total of six calves before their deaths in January and February of 1995. Mshindi is the last calf that this pair produced and he remains at our facility to this day!

The third pairing we have had consisted of Lij and Rhinestone's daughter Onyx who was the first third generation calf to be born in captivity. She was paired with a male named Akeem brought in from the Cincinnati Zoo. Upon arrival Akeem's name was changed to George. This pair produced two calves, one a female, which was diagnosed with luekoencephlomalacia and died at 15 months of age. This pair remained together until Onyx's death on Sept. 16, 1996.

After the death of Onyx, our program had been devastated and we were left with two remaining males for several years. In 1998, we brought in a 29 year old female that I had ironically worked with at San Antonio Zoo. Luana was then introduced to George with no success at pregnancies. When Luana died due to complications from tooth disease at the age of thirty, we were left once again with no females. In 2000, we brought in another female from Cheyenne Mt. Zoo. Shy-anne is the daughter of Luana (she is just as feisty as her mother…!), and she was put with George which produced a pregnancy in 2001. Unfortunately, she aborted a 5 month old male fetus that May. After this, with the approval of SSP, we put her with our younger male Mshindi. To this date, she has gotten pregnant several times, but no viable calf has been produced. At this point, she will be 27 this year, and hopes of producing a calf have been lost.

Over the years, our rhino program has experienced many of the black rhino disease syndromes. Due to this we have taken a positive approach to learning from these experiences, and preparing for future problems. We are currently managing an aging population of black rhinos, and are diligent in the husbandry of aging animals and the special needs that arise from this population. We continue to strive to make contributions to the captive black rhino population through research and conservation efforts!

Denver Zoo Rhinos



Shy-anne: SB # 331

27 years old and weighs 2800lbs

Curious, smart and easily agitated with sudden movement or loud noises especially in barn.

Finished Behaviors: Blood, mouth, weights and line up

Denver Zoo Diets:

We recently made a major change in our grain supplementation due to the continued weight loss in our older male George. We had been using the White Oak Browser pellet, but switched over to Mazuri wild herbivore in the late summer. Since then, George has gained 90 lbs. and made dramatic improvement in overall physical health.

Per rhino daily:

4-5 flakes alfalfa

2-3 flakes hay

6 pounds Mazuri wild herbivore

10 cc's Vit. E supplementation on bread

Males on daily phosphorous supplementation in banana

Six apples and carrots

Treats include extracts and applesauce on grain, browse and peanut butter

Black rhino

George: SB # 332

26 years old

2560 lbs

Calm, sweet disposition (except around females). Can be worked free contact.

Finished behaviors: blood draw, weigh board, line up and pee.

Mshindi: SB # 516

16 years old

2500 lbs

Very smart, playful and sweet. (the second love of my life after my husband…) Can be worked free contact

Finished behaviors: foot, over, back, line up, blood ,urine ,weights, shake head yes or no, painting and fetch.

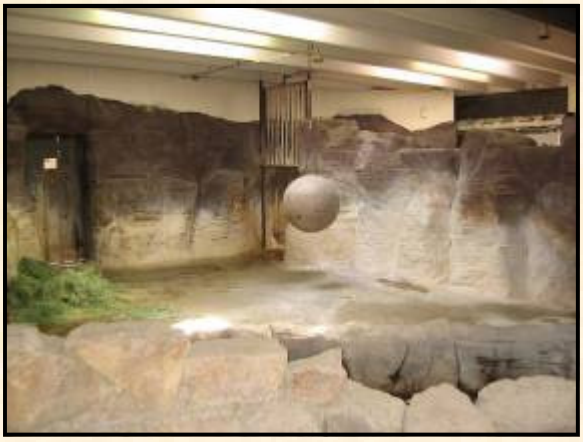
Black rhino housing

The rhino facility has indoor holding areas that include one public exhibit and three back holding stalls. We have one outdoor yard that is shared by all three rhinos during different shifts through out the day. The yard is used throughout the year, and the rhinos are confined to the indoor exhibits only when temperatures are below 25 degrees and snow. Our rhinos love the snow, so access to the yard is given on most days for at least an hour. The exhibit yard is 120 ft in length and 40 ft in width with the majority of the yard covered in an infield mix soil, and surrounded by a sloping dry moat. There is a concrete walk way that wraps around the building, and a 4 ft. deep pool that is filled during the summer months. A ring of rocks is at the center of the yard which is referred to as "rhinohenge". This is where we perform rhino demonstrations during the summer months with our youngest male "Mshindi".

LET IT SNOW!!!

Out door enclosure

Off exhibit stalls



Inside exhibit display

"Rhinohenge" - public demos

Rhino Training Program

Blood draw ear or leg vein

Training

The Denver Zoo implemented an operant conditioning program with our rhinos in the early 90's. At first our goal was blood collection from the ear or leg vein, and then it grew into various behaviors for mental stimulation and enrichment. Since that time, we have been able to accomplish various medical procedures such as free standing rectal ultrasounds on both of our males, weights, and foot work. All of this has been done without the use of a chute or restraint device. Along with medical practices, we have also been able to develop a great protected contact rhino demonstration that educates the public on the unique nature and personalities of our rhinos. Our goal is to have guests walk away caring about rhinos, and therefore more inclined to want to help protect and save these animals. Of course, we have developed some behaviors that are really fun not only for the rhino, but us as well!

Mouth

Foot work

Free contact weighing and tail treatment

Sit, Down and rollover

The enrichment program at our zoo incorporates food, toys, scents, training and husbandry methods.

Boomer balls and cylinders of all shapes and sizes

Bamboo chimes and logs, and cardboard boxes

Food extracts sprayed on grain (vanilla, banana, raspberry and root beer!) Apple sauce and mashed bananas mixed into grain.

Scents: essential oils including citronella, lavender, sweet basil, peppermint, and eucalyptus.

Browse: cotton wood, linden, crab apple, ash, mulberry and elm.

We use an enrichment chart which logs the daily use of enrichment so that a variety is used on a weekly basis.

Public Demonstrations

Our protected contact rhino demonstration is performed in the area known as "Rhinohenge". We really strive to make our visitors walk away with a different perspective and appreciation for rhinos. Along with demos, we give many behind the scenes tours where our guests get to meet up close and personal some of our rhinos. " Mshindi" is our best ambassador, and can be worked through his behaviors to the amazement of the visitor.

We have incorporated some new behaviors of shaking his head yes or no to include great conservation question that "Mshindi" answers to the delight of our audience. Our basic message is that RHINOS ROCK!!!!!

Institutional Supporters

The Supporting Institutional Membership is for any conservation organization , or zoological institution which supports rhino conservation in accordance with the objectives and purpose of the IRKA. These memberships are available for $100, $200, $500 and $2000. Why should your zoo be interested in joining on this level? If your institution contributes on the $500 level then all rhino keepers membership fees at your zoo are waived! It is important that as the IRKA grows that we continue to garner the support from all facilities that are responsible for the protection and management of all species of rhinoceros. We would like to extend our appreciation for this substantial support to the following institutions, and hopefully we can add your zoo to this growing list! If you have questions about institutional memberships or any other questions please contact us at

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