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## Seasons Greetings

### from the AAZK Board of Directors and Staff

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AMERICAN ASSOCIATION of ZOO KEEPERS



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American Association of Zoo Keepers, Inc.

*The American Association of Zoo Keepers, Inc. exists to advance excellence in the animal keeping profession, foster effective communication beneficial to animal care, support deserving conservation projects, and promote the preservation of our natural resources and animal life.*

# Successful Treatment of Nail Cracks for a Black Rhinoceros *(Diceros bicornis)*

*By Caitlin Capistron, Animal Keeper I, Honolulu Zoo, Honolulu, HI*

**Introduction and Background**

Foot problems are a relatively common occurrence in captive rhinoceros, and while vertical nail cracks can resolve on their own, intervention can decrease the healing time, prevent further problems from developing, and provide for a positive training interaction for the animal (Jacobsen, 2002).

The Honolulu Zoo houses 1.1 black rhinoceros and recently housed 1.0 white rhinoceros (*Ceratotherium simum*). The black rhinoceroses are exhibited together year-round in a 1,022 square meter [11,000 square foot] compact dirt yard, and were housed separately overnight in 56 square meter [600 square foot] barns with concrete flooring. The white rhinoceros was exhibited in a 3,057 square meter [32,900 square foot] compact dirt mixed-species exhibit with 2.2 reticulated giraffe (*Giraffa camelopardalis*) and 1.1 Grant's zebra (*Equus burchelli*), and had access overnight to a 53 square meter [570 square foot] barn with concrete flooring, a 73 square meter [780 square foot] pen with compact dirt, and the exhibit.

Since acquisition of the male black rhino, Corky, in 1999, he has had periodic foot problems, specifically vertical cracking of the lateral nails. Foot problems have not been noted in the female black rhino, Satsuki, or the male white rhino, Kruger. Treatment of Corky's feet was opportunistic at best, and involved application of antiseptic solutions. Nail cracks would appear to grow out, though reoccur frequently. When cracks occurred again in June 2010 on the lateral nails of Corky's front right and rear left feet, the splitting was more extensive, and extended the full length of the nails up to the coronary band (*see Photos 1 & 2*). Honolulu Zoo Veterinarian Dr. Ben Okimoto consulted with veterinary staff at the White Oak Conservation Center, San Diego Wild Animal Park, and St. Louis Zoo to determine a treatment plan.

It was hypothesized that a primary reason that Corky was experiencing foot problems, and the other rhinos were not, was related to Corky's overnight housing. In contrast to our other two rhinos, Corky defecated in his barn then appeared to pace in his barn overnight, thereby covering his feet in wet fecal matter. Nail cracks can develop when the natural waterproof layer of the hooves (periople) is disrupted by excess moisture or dryness. We believe that excess moisture, in combination with a thinning of the nail walls caused by lying on concrete and compact dirt surfaces, compromised Corky's nails. Mineral deficiencies were also considered, but because Corky was not yet trained to accept voluntary blood draws, we were unable to pursue this possibility in the short-term.

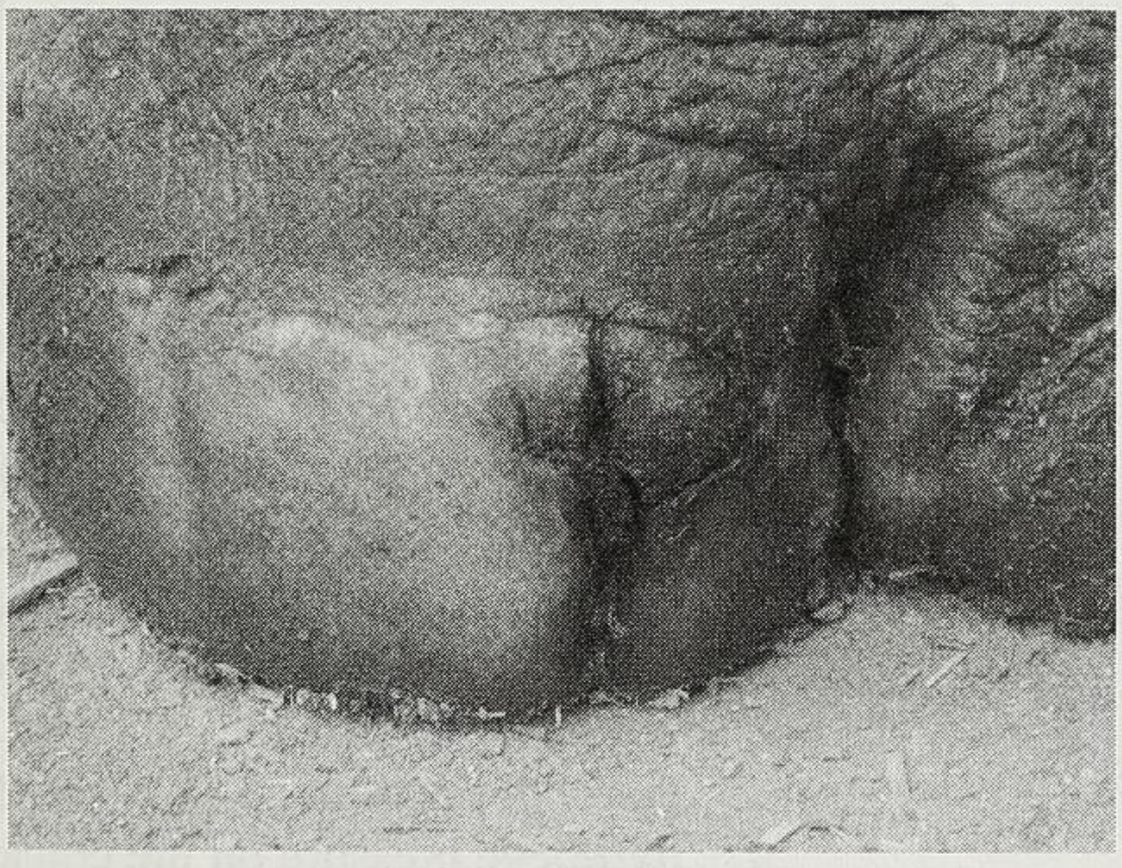

Photo 1: Front right nail, June 2010

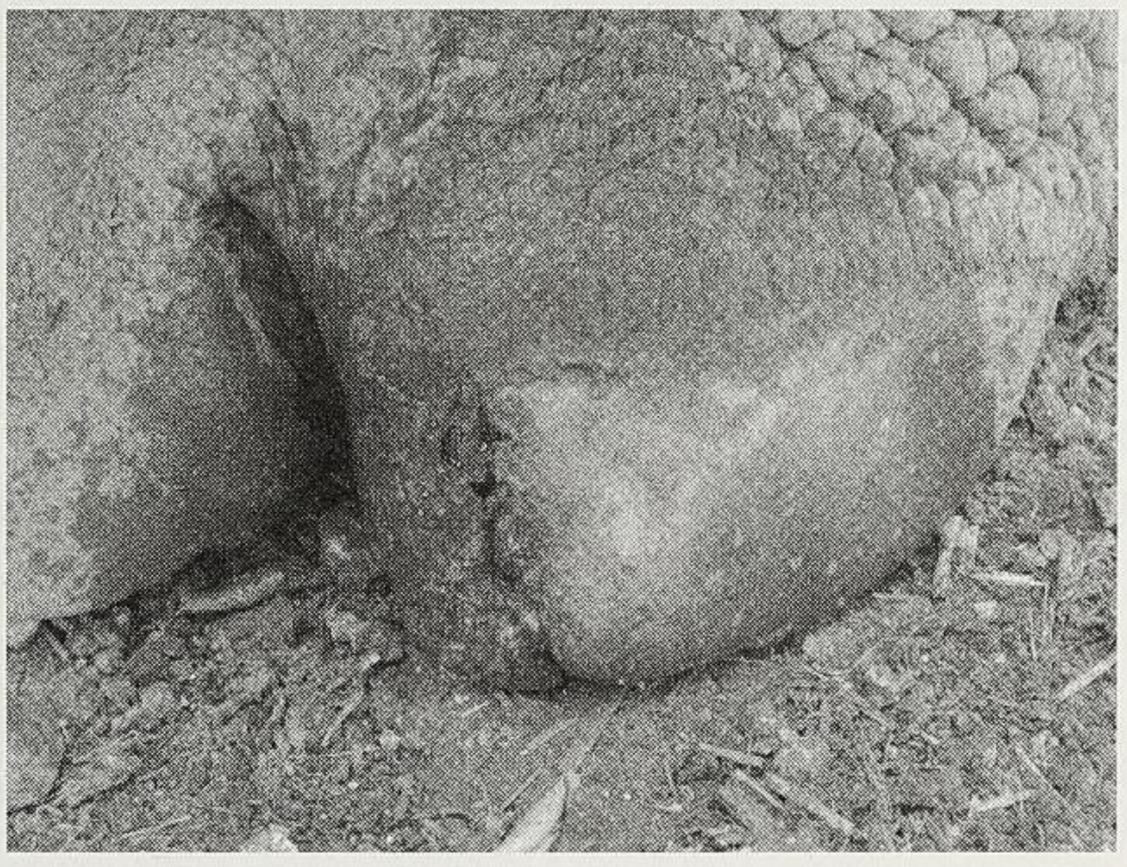

Photo 2: Rear left nail, June 2010

**Husbandry and Treatment**

Starting in November 2010, Corky's overnight routine was changed. He was given access to one 28 square meter [300 square foot] barn stall, but rather than locking him into the barn, he was given overnight access to the exhibit yard and a 40 square meter [485 square foot] pen with compact sand. It was noted immediately that not only was Corky not pacing overnight in fecal matter in the barn, but also he was calmer overall.

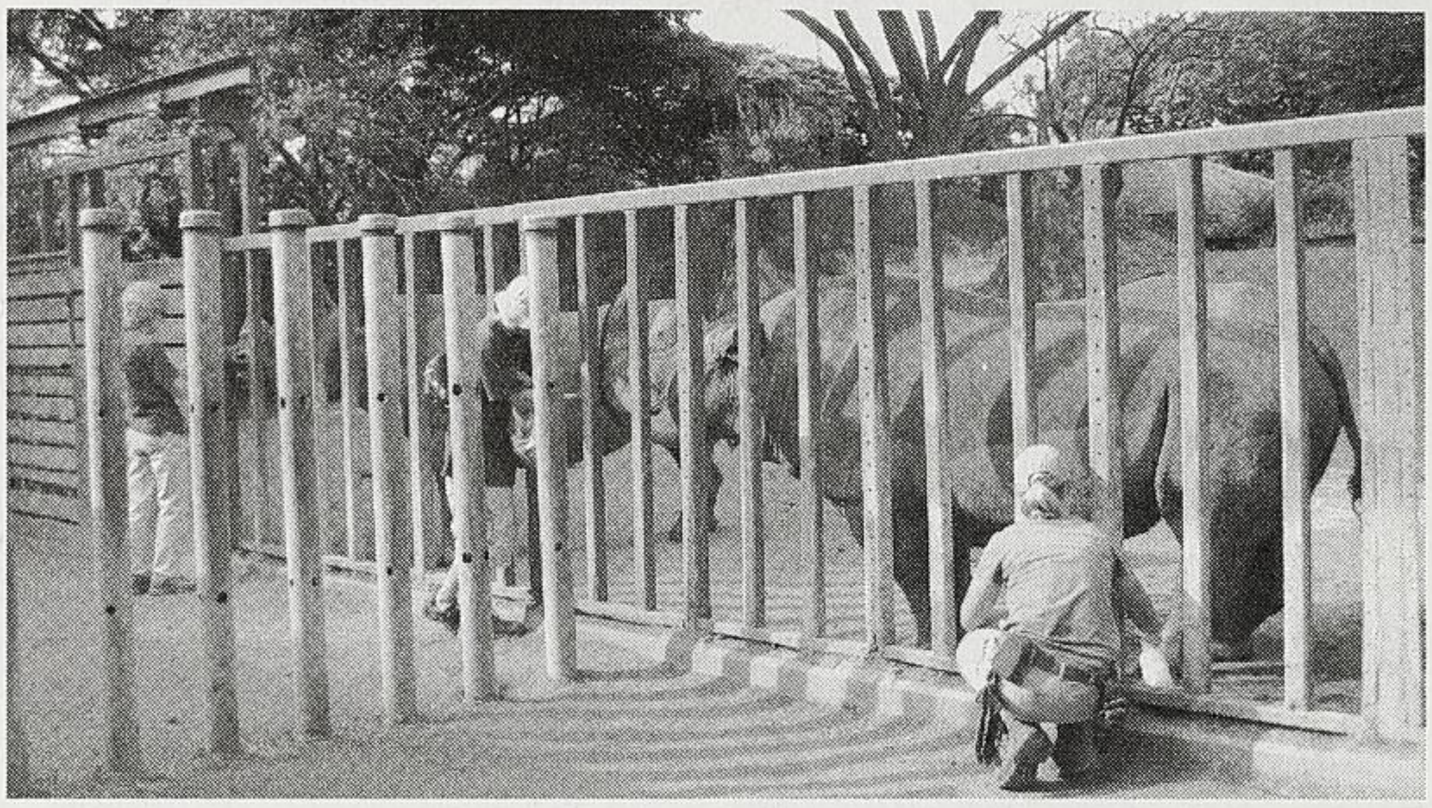

Photo 3: The author treats Corky's foot at rear of the exhibit, with help of volunteer Kevin Kaneko. Volunteer Barbara Luckner-Loveless feeds Satsuki.

For all foot treatments, a minimum of two people was utilized. Usually, a volunteer focused on feeding Corky his daily produce ration while a keeper worked on Corky's nails. In most cases a third person, usually a volunteer, fed Satsuki at some distance from Corky and attempted to keep her from interrupting with Corky's treatment. Our set-up to work with the black rhinos consisted of nine meters [30 feet] of vertical bars placed about 0.2 meter [nine inches] apart at the rear of the exhibit (*see Photo 3*). While we had some success with stationing Satsuki perpendicular to the bars at one end and stationing Corky parallel to the bars at the other end, this arrangement required the rhinos to be in close proximity to one another. Additionally, in order to access both sides of Corky, he was required to turn around and reposition, and brought him in even closer proximity to Satsuki. This often resulted in Satsuki bullying Corky away from the area to monopolize treats and attention. To address this issue, the decision was made to repair a door to a four square meter [41 square feet] chute that up until this point had not been utilized by rhino keeper staff. Once the chute door was repaired, Corky could then enter the chute from the rear of the exhibit, and a set of vertical bars placed 0.3 meter [one foot] apart on both sides would allow staff to access both sides of Corky's body (s*ee Photo 4*). Additionally, since there was no need for Corky to reposition and be near Satsuki, it reduced negative interactions with Satsuki and the overall time the treatment took. While Corky was nervous at first to enter the chute, staff was careful to work at Corky's pace and keep his experience with the chute a positive one. Once Corky was comfortable entering and stationing calmly in the chute, one person fed Satsuki at one end of the exhibit bars while another two people worked with Corky positioned in the chute.

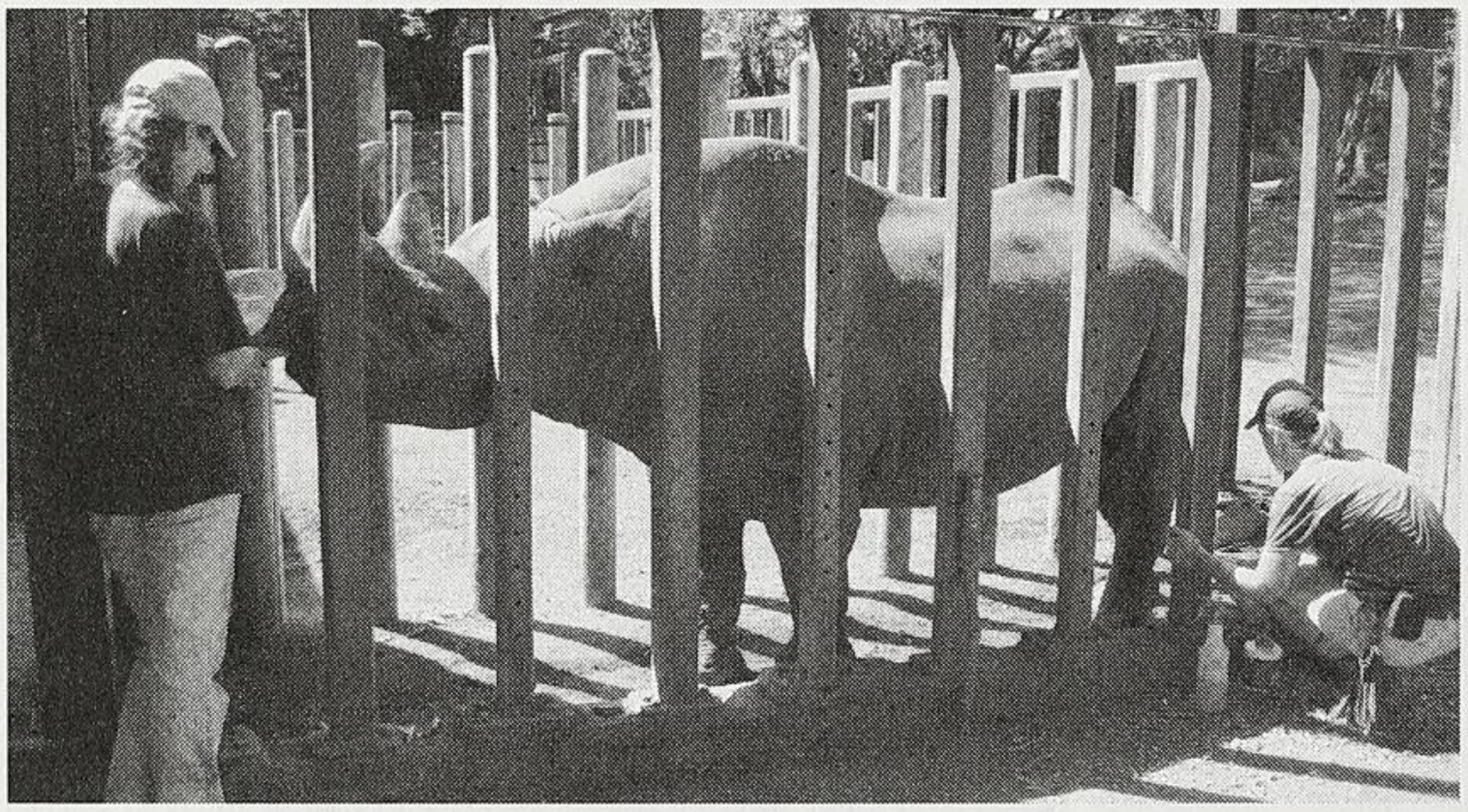

Photo 4: The author treats Corky's foot in the chute, with help of volunteer Toni Pennini.

Our foot care routine consisted of cleaning the nail cracks at least once daily: rinsing any mud and fecal matter off with water, then flushing the crack with hydrogen peroxide, then flushing the crack with Nolvasan®, then applying Betadine® to the crack and surrounding area. Approximately every two weeks, or as staff time allowed, corrective trimming was used to relieve pressure on the crack and to facilitate its correct growth. Fortunately, one of our

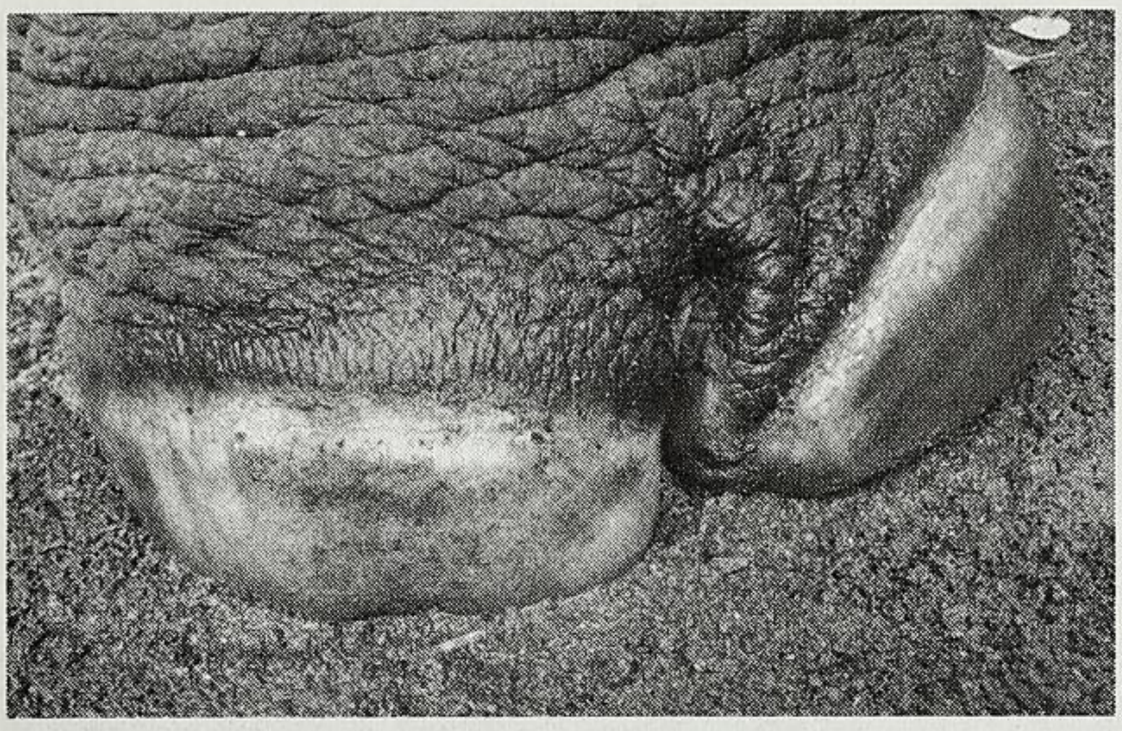

Photo 5: Front right nail, March 2011

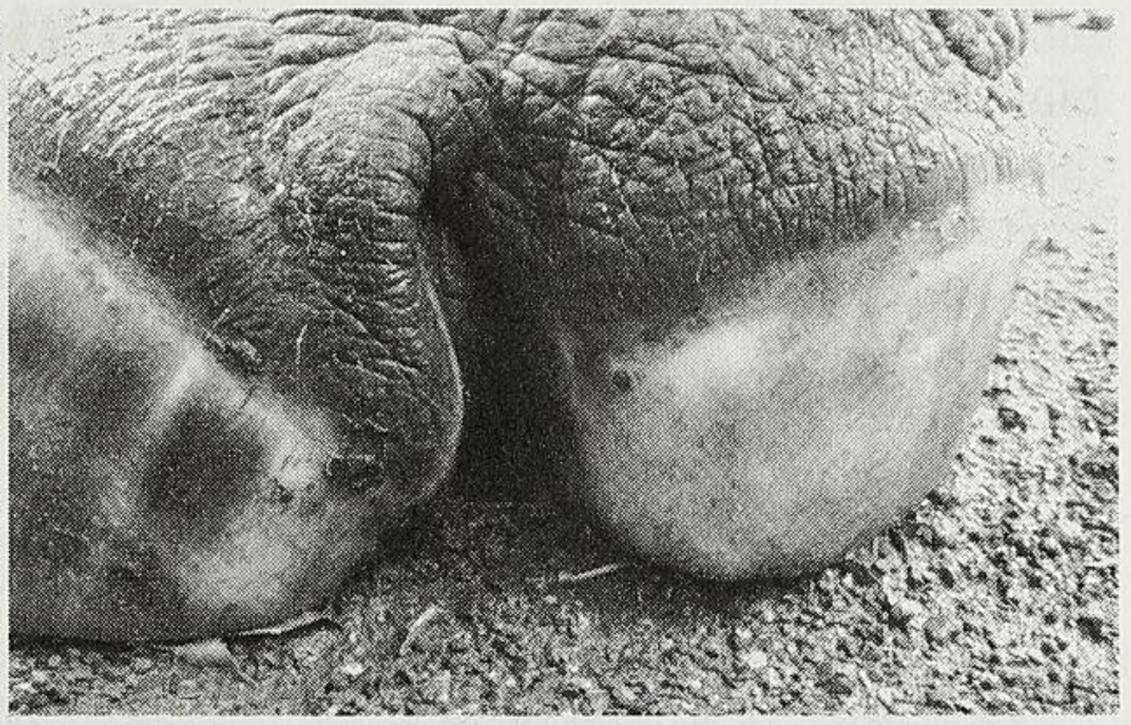

Photo 6: Rear left nail, March 2011

Mammal Department supervisors was previously a skilled elephant keeper and experienced in elephant foot care, including corrective trimming of nails. Corky was already familiar with this keeper, and therefore comfortable with her presence. All tools and treatment implements were introduced slowly in order not to frighten Corky. Also, Corky required little desensitization to work on his feet, since he was already accustomed to being touched and brushed.

Our husbandry and treatment plan was not without challenges. On many occasions, short staffing left the rhino keeper alone in the section and unable to perform Corky's foot treatments single-handedly. Thankfully, a wonderful group of volunteers were usually able to fill in the gaps, and provide for near daily treatment. Additionally, poor exhibit design and drainage problems led to frequent flooding and consequent muddy conditions in the rhino chute during Hawaii's rainy winter months. Treatments were suspended until staff was able to pump out and clear the treatment area.

By early March 2011, keepers observed that there were very little cracks left to treat on Corky's feet. Our veterinarian confirmed what keepers had thought – our plan had worked and Corky's nails had finally healed! (*See Photos 5 & 6*). In order to maintain the health of Corky's nails and prevent more cracks from developing, keepers now clean all of Corky's nails once weekly with water for a good visual inspection, and then apply Farnam Rain Maker™ hoof moisturizer and conditioner. We continue with the changed husbandry routine for Corky, allowing exhibit access overnight.

## Conclusion

Although it seemed from the onset that Corky's nails would never heal, we were so glad that changes in husbandry and treatment seem to have corrected this problem. While we had some frustrations along the way, our persistence and Corky's willingness to cooperate won out in the end. This case served as a wonderful example of one of the benefits of having a positive, trusting relationship with our animals. Not only did all these positive interactions with Corky enable us to treat his feet, it also gave us the ability to subsequently easily train him to accept blood draws from the ears and hand-inject vaccinations, as he was already accustomed to close interactions with multiple people. We plan to continue with Corky's training, and additionally are now focusing on Satsuki to facilitate foot care, blood draws, and injections with her.

## Acknowledgements

Mahalo (thank you!) to Honolulu Zoo Veterinarian Dr. Ben Okimoto, Animal Keeper II Tyris Perreira, Mammal Specialist Robert Porec, Honolulu Zoo Director Emeritus Paul Breese, and all the wonderful M-5 volunteers who gladly took on the role of "keeping Satsuki happy".

## References

Jacobsen, J. 2002. A Review of Rhino Foot Problems. *Proceedings of the 2nd Rhino Keepers' Workshop 2001*, 56-59. San Diego Zoological Society, San Diego, California, U.S.A.

## Photo Credits

All photographs were taken by article author.