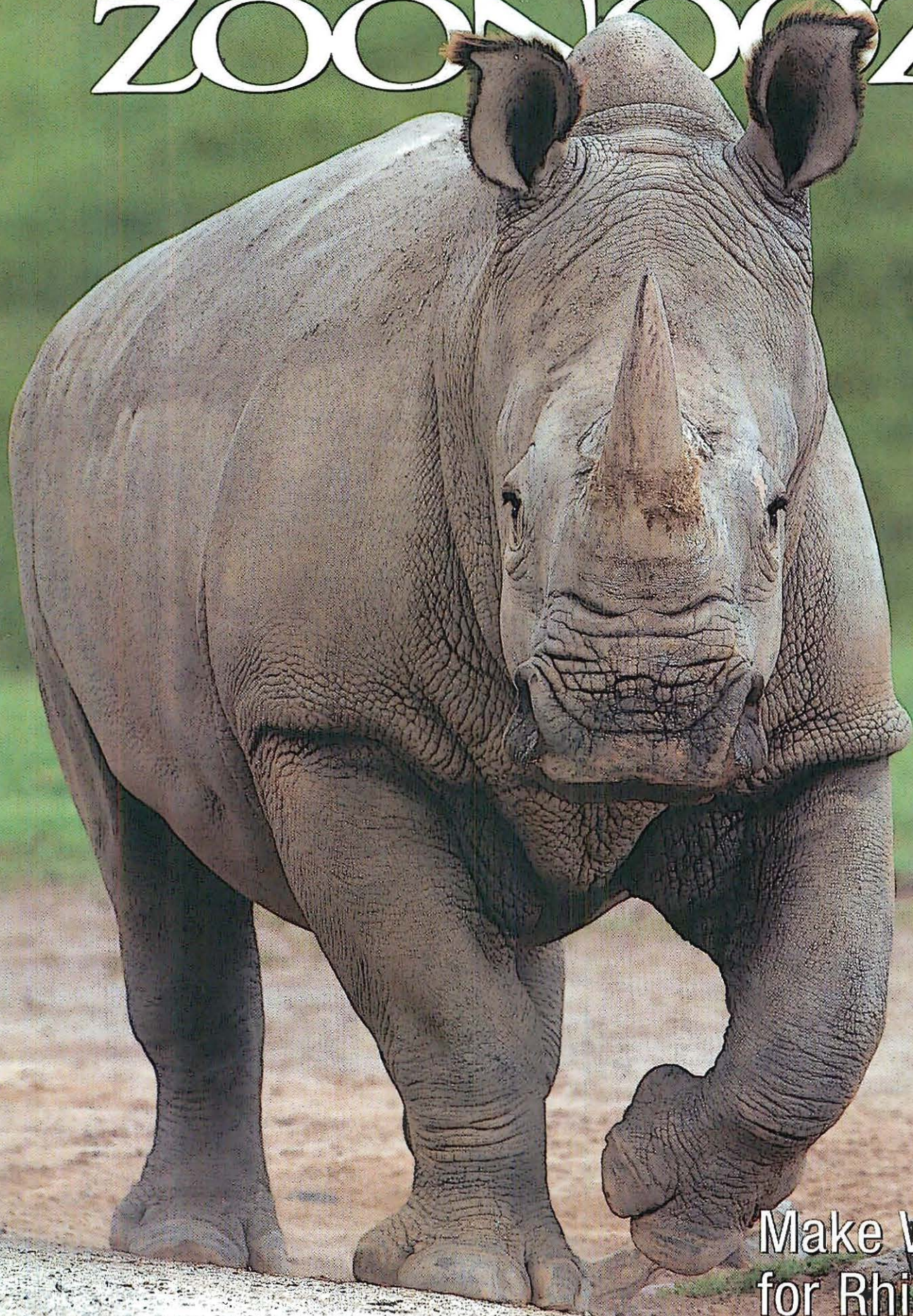
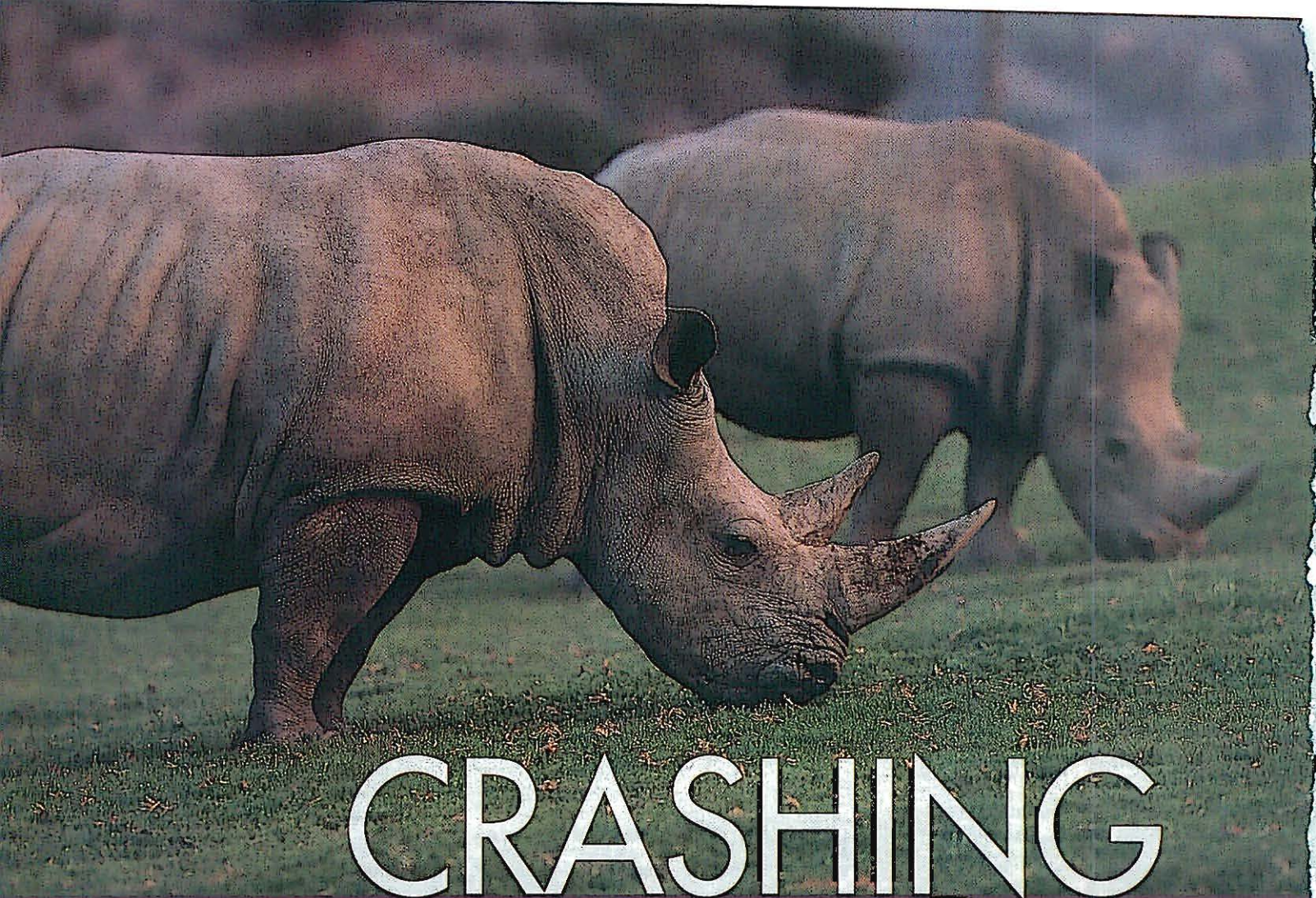


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Make Way
for Rhinos!



CRASHING WITH WHITE RHINOS

By Ashley Bradley, Staff Writer

B EING A RHINO is about being in charge. From the choicest bits of shade to a front-and-center spot at the feeder, the white rhinos at the Wild Animal Park dominate the hierarchy, and not just because they're large animals. "The calves learn about seniority because they stay close to their mothers, and they know they can clear a feeder," says senior mammal keeper Joe Shuler. "Even the giraffes move out of the shade for them."

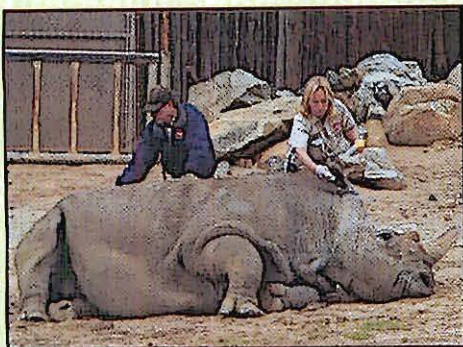
Being a white rhino is also about size, all 4,000 pounds of it. But the animal care and nutrition staff compares the rhinos to a Body Condition Diagram of an ideal rhino's shape to ensure our rhinos maintain a weight suitable for the species. This helps stave off joint problems and other issues that affect mega-vertebrates.

Great size also brings grand gestures. Keepers know that the rhinos are very aware of the trucks when they enter the South Africa and East Africa enclosures. The rhinos perk up their ears and curl their tails to show their excitement. "They can be so excited to move away, they might spin and bump another rhino into the truck, leaving a huge dent," says Shuler. The biggest concern for keepers is safety, particularly ensuring they don't get between a mother and her calf, when rhino-sized protective instincts kick in.

The rhinos at the Park are allowed free rein in the enclosures day and night. So when a keeper needs to clean up a dung pile, they're in the enclosure with a tractor, maxi dump, and the rhinos watching



In addition to grazing on grass and leaves, the rhino diet at the Park also includes hay, apples, carrots, yams, and fiber-rich biscuits.



Senior mammal keepers Joe Shuler and Jane Kennedy treat northern white rhino Nola's ears for an infection. Her feet are trimmed regularly because her natural gait does not wear them down enough.

nearby. "You're constantly looking over your shoulder to make sure nobody's coming up behind you," says Shuler. "It's a constant awareness factor you have to have. The last thing you want is a rhino making contact with you."

TRY AND TRY AGAIN

Unfortunately, the reproductive success of the northern white rhino has been poor, and now just a handful of this subspecies is left. When the northern white rhinos came to the Wild Animal Park in 1989, from Dvur Kralove Zoo in the Czech Republic, the animal care staff and CRES researchers had high hopes for births. Over the years, two males and two females had the opportunity to reproduce. But even after female hormone treatments and several matings, no calves were born. Only one male and one female northern white now live in the Park's South Africa enclosure.

In the wild, the situation is also grim. A flyover by the International Rhino Foundation two years ago in the Democratic Republic of Congo spotted five rhinos, but attempts at additional flyovers proved futile due to political unrest. In addition, active poaching by Sudanese horsemen further threatens the already critically endangered wild population.

A glimmer of hope does come from the northern white rhinos at the Dvur Kralove Zoo. There, a female born in 2000 and an older female were artificially inseminated this past June. The procedure's success should be known within a few months.

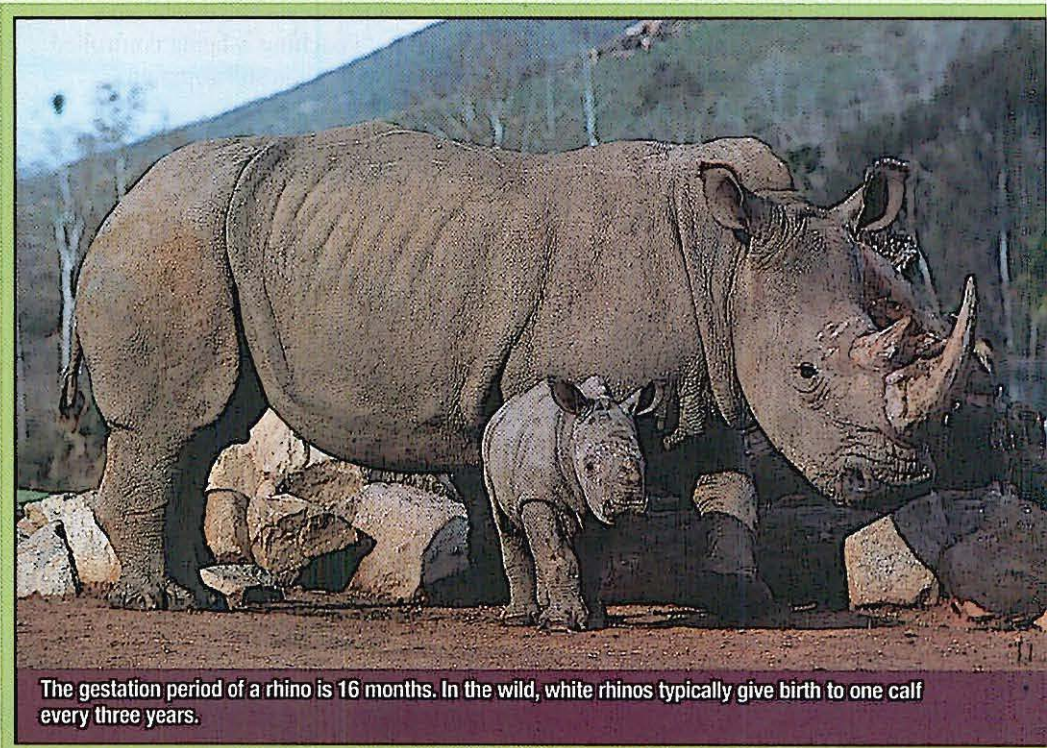
THEN THERE WERE TWO

One of the notable things about the Park's northern white rhinos is how manageable they are. This makes it easier for staff to take care of them. Keepers can walk right up to Nola when she's lying down, and feed her pieces of apples and yams while another keeper trims the nails on her feet. Occasionally, there's another keeper standing guard to keep the ostriches and giraffes away.

"We don't have to rely on the veterinary staff to do everything. We can give good health evaluations and the veterinar-

HOPING FOR ONE GOOD EGG

With such a small population of northern white rhinos, our animal care staff, veterinarians, and CRES researchers decided to attempt to remove an ovary from Nola this past spring, hoping to collect and freeze any eggs the 32-year-old rhino might have left. A well-orchestrated team of technicians and keepers assisted in the first-ever rhino surgical laparoscopy. Veterinarians specializing in large-mammal surgery made a small incision near Nola's back right leg, used rib spreaders to hold back the skin, and inserted a

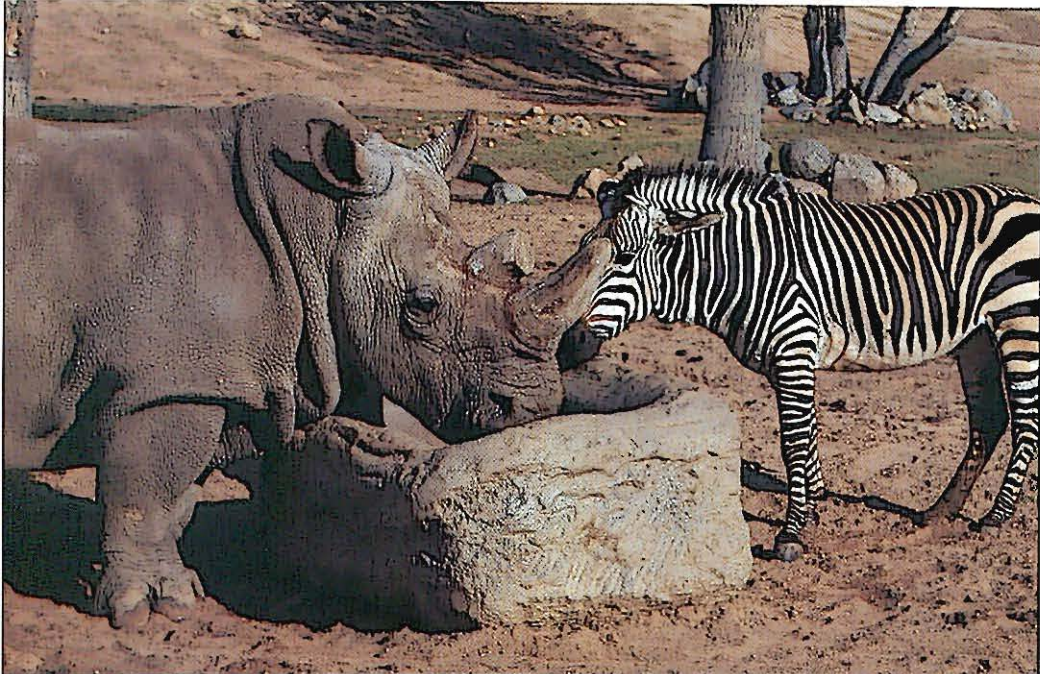


The gestation period of a rhino is 16 months. In the wild, white rhinos typically give birth to one calf every three years.

ians can conduct procedures without chemical immobilization," says Shuler. Because the male rhino, Angalifu, is one of just three male northern whites left in managed care, the staff collects semen from him to store in the Frozen Zoo®. "We want to bank as much genetic material as we can in the hope that the science will catch up with the samples we have," says the Park's Curator of Mammals Randy Rieches.

camera into the abdomen to find and extract the ovary.

While Nola made a quick recovery—in part because she was receptive to keepers cleaning the incision regularly—a dissection of the removed tissue found no viable eggs, only adipose (fat) cells. However, adipose tissue is known to be a rich source of stem cells, which may be useful for reproductive and health studies as technology in this field advances. During



Out of my way: While many animals move away from the feeder when a white rhino approaches, this Hartmann's mountain zebra *Equus zebra hartmannae* stays put.

the procedure, Barbara Durrant, Ph.D., and her reproductive physiology team also rushed hair and skin samples back to CRES for storage in the Frozen Zoo®.

SOUTHERN EXPOSURE

In sharp contrast to northern white rhinos, the southern white rhino population is strong and genetically diverse. Our herd at the Wild Animal Park has been the most reproductive in the world. Since the Park opened in 1972, 92 calves have been born here, which have moved on to other zoos. Currently, there are two southern white males and eight females at the Park; two of the older females are in the South Africa enclosure with the northern white rhinos. One female, Dumisha, has an irritable disposition and is aggressive towards trucks that enter the East Africa enclosure, even though they may be delivering food. Most of the other southern whites, however, are docile. "You don't ever get out of the truck and walk right up to them," says senior mammal keeper Jane Kennedy, "but one of the positive things we do is let rhinos be rhinos."

In southern Africa, white rhinos boast the largest population of any of the rhino species, more than 11,000, distantly followed by black rhinos, nearing 3,600 individuals. But these strong numbers do not mean that the southern white rhino population is safe. "You need to watch the population because the environmental

factors and threats still exist," says Rieches. "Poaching is being controlled right now, but it is still going on."

NEXT STOP, NEW ZEALAND

The Park's success in southern white rhino reproduction means that many calves have been placed in zoos around the world, enhancing genetic diversity and increasing awareness for conservation. Several years ago, Animal Care Supervisor Lance Aubery escorted three white rhinos to Orana Wildlife Park in Christchurch, New Zealand—by way of a cargo ship.

"The worst time for all of us was the first couple of days, with bad weather and rough seas," says Aubery. "They didn't want to eat, I didn't want to eat, but eventually we got into a routine, feeding them, giving them water, and cleaning out their

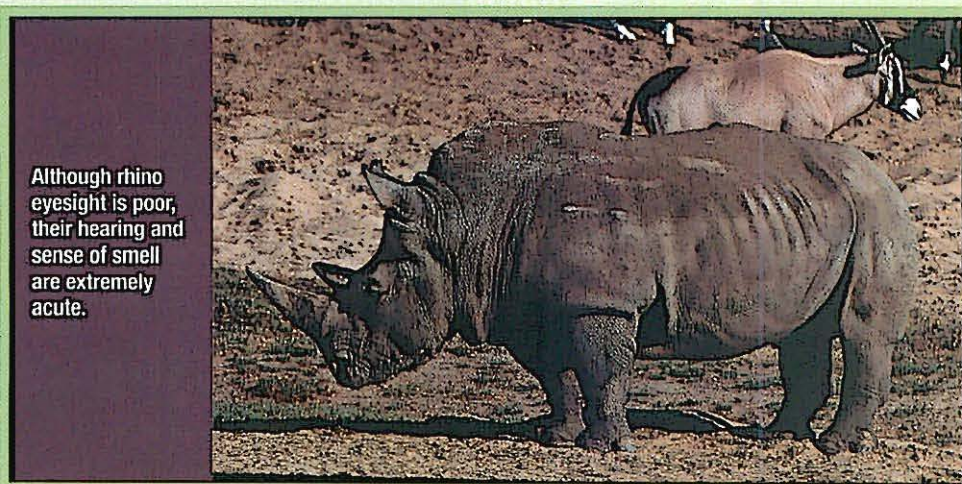
crates." He had to perform the duties of a keeper but also be prepared to address issues from a veterinarian's perspective. He had to make sure they were hydrated so they wouldn't become constipated, which could pose serious health concerns during the long-distance transport.

The male rhino settled into the routine well. Aubery was able open the ends of his crate every day and he remained calm. The two females, however, attacked the crate at the sight of a human, and never appeared to get very comfortable throughout the journey. Twenty-one days and multiple port stops later, Aubery and the rhinos arrived safely, and the three rhinos adapted to their new environment. The females still live at the park in New Zealand. One produced a calf in 1999, but neither has reproduced since. The male is now in a sanctuary in Australia.

BRINGING IN REINFORCEMENTS

Although the wild-born generation of southern white rhinos at the Wild Animal Park produced a large number of calves, the first generation (F1) of white rhinos born at the Park have not reproduced as well. Several studies have focused on the causes of poor reproduction and have eliminated hormone suppression and irregular mating behavior as issues.

Ron Swaisgood, Ph.D., Division Head of Applied Animal Ecology, and researchers Lisa Nordstrom, Ph.D. and Shannon



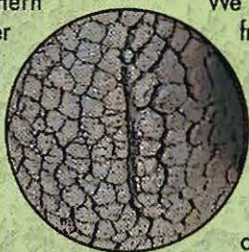
Although rhino eyesight is poor, their hearing and sense of smell are extremely acute.

THE INSIDE TRACK

By Jane Kennedy, Senior Keeper, Wild Animal Park

TO VISITORS, the job of a Wild Animal Park rhino keeper sounds both exciting and dangerous. It certainly is, but it also entails aspects you might not think about. Every day we are required to monitor the health of all of our animals and help evaluate our charges for the veterinary staff. This was crucial after the surgery attempting to remove an ovary from Nola, a northern white rhino, and Dumisha, a southern white rhino. Often, the keeper staff is in charge of post-opera-

Nola's healed incision, five months after surgery.



tive treatment for large field exhibit animals like rhinos.

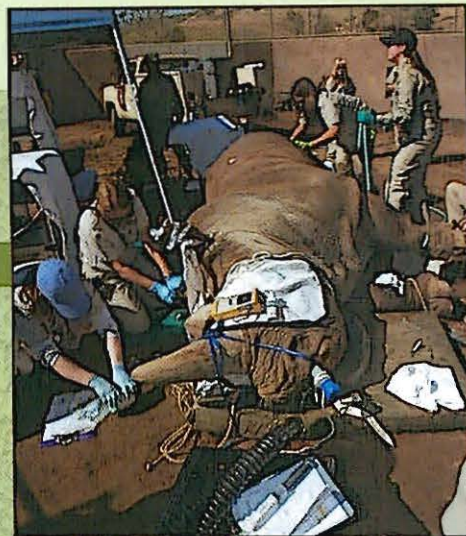
Daily, the keeper team needed to approach the rhinos to check their incision sites that were several inches long and deep. Because Nola is such a tractable animal, it was easy to look at and clean the area, as long as we had some apples or a brush to scratch her with! Over the course of 10 weeks, we were able to examine her wound

and treat it as necessary, and now it has completely healed.

With Dumisha, we had to take a different approach. Because she is an intractable animal and can get testy with us, we had to use other methods to evaluate her. We tried using her favorite foods like alfalfa hay to lure her into a position where we could get a close look at her incision, but she didn't cooperate.

We then used binoculars to focus in on her from a distance and get a good look, but this wasn't as effective as we needed it to be. Eventually, she had to be immobilized several times for follow-up treatment. Her recovery has taken longer than Nola's, but now she too is back with her fellow rhinos and seems back to normal.

One of the many things I also get to do as a senior keeper is represent the Zoological Society at conferences. At the International Rhino Keeper Association (IRKA) Workshop in Melbourne, Australia, last May, I had the opportunity to share what we learned from our attempts at ovary removal in white rhinos. This global network not only shares manage-



The procedure to remove one of Nola's ovaries was a coordinated effort between many staff members.

ment ideas but also the latest in rhino conservation and research projects. The Zoological Society of San Diego provides funds to help support the IRKA.

My talk focused on how, even though we did not recover any eggs from our rhinos, this type of procedure holds great promise. Hopefully, we will attempt a similar procedure in the future on other candidates. By recovering an entire ovary we may have the potential for cryopreserving thousands of eggs, not just a handful as is done with other egg recovery procedures. Considering that there are only eight northern white rhinos left in zoos, and likely none in the wild, this possibility may be instrumental for their future survival.




While rhino skin is thick, it is also very sensitive. Rolling in mud protects rhinos from sunburn and insect bites.

Chapman, spent the last year researching managed white rhino populations worldwide to find out if this low reproduction is an issue in all zoos and on private reserves in South Africa. The International Rhino Foundation funded the study, an organization that the Society is actively involved with for the conservation of all rhino species.

CRES scientists are still working through the data, but diet may be one factor contributing to low reproductive success in zoo-born rhinos. In most North American and European zoos, white rhinos are fed a nutrient-rich diet of hay and pellets consisting of a large percentage of alfalfa. While rich in protein and other nutrients, alfalfa also contains compounds that can mimic the effect of estrogen in some species. Exposure to these compounds during embryonic development and while nursing can cause irregular ovulatory cycles and reproductive tract problems later in life.

CRES endocrinologist Matt Milnes, Ph.D., is conducting research to determine if white rhino estrogen receptors are particularly sensitive to compounds in the diet offered in captivity. To further

test this theory, Park curators are considering bringing in zoo-born southern white rhino females whose diet has never included alfalfa. They will be introduced to our southern white males for breeding.

On behalf of both northern and southern white rhinos, the Society continues to follow the guidance of the Association of Zoos and Aquariums' Taxon Advisory Group and the Species Survival Plan for white rhinos. The Park is working to rebuild the southern white rhino population in a way that may encourage reproduction among the first generation of zoo-born offspring. "The Park is known worldwide for successfully breeding rhinos, but we still don't know it all," says Rieches. "Our CRES scientists have the best opportunity to find answers, not only for us, but for all of the world's rhinos." 

The Zoological Society of San Diego would like to thank Dr. Helen Ranney for her generous support of CRES's white rhino reproduction study.