

NC STATE Veterinary Medicine

The

Oath

TEACH • HEAL • DISCOVER

FALL/WINTER 2016

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A photograph of two men sitting in a room with a large rhino skull on a table in front of them. The man on the left is wearing glasses and a blue shirt, while the man on the right is wearing a red and white striped polo shirt. The background is a wall with some decorative elements.

EXTRAORDINARY PURPOSE

Into the Wild

College of Veterinary Medicine researchers hope to help stem the tide of rhino poaching deaths

A few days before colleagues and close friends Anthony Blikslager and Mathew Gerard began research that could save hundreds of threatened rhinoceroses, Gerard saw one in the wild for the first time.

The next day, he saw one that had been slaughtered.

In June, he was in the game reserves surrounding Kruger National Park in South Africa. To Gerard, an anatomy professor at the North Carolina State University College of Veterinary Medicine (CVM), it was constantly rewarding, just being here. He and wife Dr. Wendy Simpson, also a veterinarian, had never had a safari experience.

Gerard saw the dead rhino on one of the safari drives. It was laying on its side under a tree, its eyes open, the front portion of its face hacked off by poachers. Its ears and the back of its head were also missing. The wounds were fresh and raw.



BY THE END OF 2015, THE NUMBER OF AFRICAN RHINOS KILLED BY POACHERS HAD INCREASED FOR THE SIXTH YEAR IN A ROW, WITH AT LEAST 1,338 RHINOS SLAUGHTERED. LAST YEAR, AN ESTIMATED 1,175 RHINOS WERE POACHED IN SOUTH AFRICA.

The Perfect Team

Gerard and Blikslager had never studied or worked with rhinos before but they ended up uniquely suited to a task almost two years in the making: mapping the paranasal sinus anatomy of the white rhinoceros, believed to be the first project of its kind.

They planned the trip to visit Johan Marais, an equine and wildlife surgeon at the University of Pretoria who is dedicated to helping poached

rhinos as part of the nonprofit Saving the Survivors, which he co-founded in 2012. Blikslager first visited the university in 2014 to continue a study on equine colic that had started at NC State. Soon, the conversation turned to rhinos.

“It’s incomprehensible to me that someone, anyone, could go in and destroy these animals in the way that it is happening.”

~ Mathew Gerard

“He said, ‘I’m really interested in wildlife, particularly rhinos and you probably don’t have any interest in that,’” says Blikslager, a professor of equine surgery and gastroenterology at the CVM. “So I said, ‘Why don’t you show me?’”

What Marais showed Blikslager were the wounds he was left to deal with on poached rhinos his team rescued. But Marais wasn’t exactly sure of what he was looking at.

“Currently, we are losing more than 1,000 rhinos a year, and nobody knows how to treat these rhinos or knows the anatomy,” says Marais.

Blikslager connected Marais with Gerard, an equine surgeon now focused on teaching anatomy. They communicated with Marais over Skype for 18 months before the June visit.

They got to work right away on the trip sponsored by NC State. Over four days they faced the massive head of a cadaver rhino, dissecting, documenting and discussing the anatomy.

When a rhino’s horns are hacked away — either by machete or axe or hand saw — the paranasal sinuses are always

“It’s incomprehensible to me that someone, anyone, could go in and destroy these animals in the way that it is happening,” Gerard says. “I’ll never understand that side of it.”

In a few days Gerard and Blikslager would be meeting in Onderstepoort, near Pretoria, South Africa, to study these majestic animals quickly vanishing from the Earth because someone desires their horns.

There was something specific that needed to be done to help these animals. It was something they could do.

exposed. Until Blikslager and Gerard's research, no one had any idea what cavities they were looking at and how they were interrelated.

What was needed was an accurate description of the trauma the sinuses sustain during horn removal, where the accumulated fluid drains to the nasal cavity and where, perhaps, surgeons could create new holes to help facilitate sinus drainage of blood or other fluid during long-term treatment.

“There are some sources that suggest that by 2024... there won't be any more rhino left in the wild.”
~ Mathew Gerard

“The numbers in the wild are diminishing so quickly that there has to be efforts to keep alive any and all rhinos left,” says Gerard.

At the Onderstepoort Veterinary Academic Hospital, they meticulously used a bandsaw to section the head and see the length and breadth of the sinuses, and used a blue dye to determine pathways between the spaces.

“We thought it would be really important to find out where the sinus space opens,” says Blikslager. “And we were trying to ask questions like, ‘Do you ever see a problem with the sinus filling and not being able to drain?’”

Gerard and Blikslager passed an endoscope through the nasal passage and into the newly discovered sinuses to confirm where they drained. They determined that treatment can include opening up areas of the sinus wall to reestablish drainage for an infected sinus.

“Literally, before we started looking at this cadaver together, Dr. Marais didn't know there was this hole coming out of that sinus space. None of us knew that,” says Gerard. “You could almost see a sense of relief in his face when we showed him the opening because he suddenly felt like, OK, at least I now know it's this big space that gets filled up with blood but has a way to drain.”

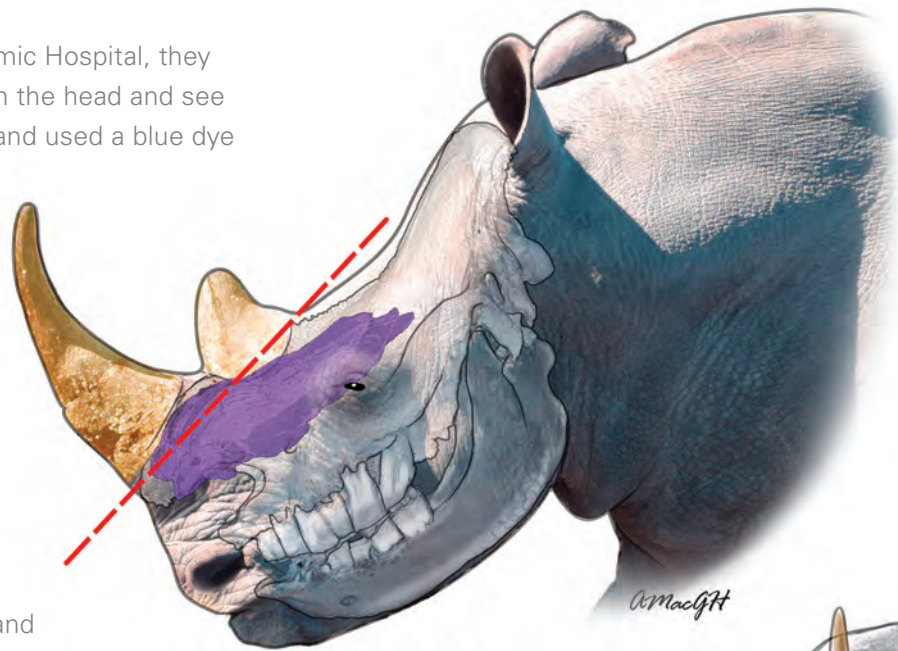
Marais agrees that Blikslager and Gerard's research is already having an effect on how his team treats injured rhinos.

“Just by touching the area where the horn was hacked off, the rhino would react violently,” says Marais. “So by using the CT software and working out where the infraorbital nerve exists, we got landmarks on the live animal. We then started blocking this nerve before working on the animals. It turned out to be very effective.”

“My only complaint,” adds Marais, “was that Mat and Anthony were not here long enough.”

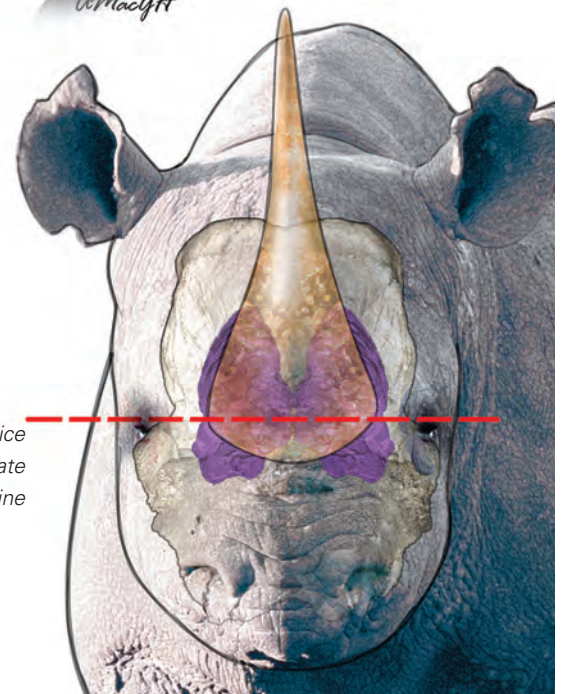
Blikslager and Gerard's lives have intertwined for more than two decades at NC State. Gerard arrived as a resident in equine surgery in 1994, the year Blikslager completed his surgery residency. Gerard says that from the day he started at the CVM, Blikslager has been a valued mentor.

“This recent trip was two old mates getting a bit of time away,” says Gerard. It was also so much more, of course. According to Saving the Survivors, 1,338 rhinos were



When a rhino horn gets removed, a large section of their face gets hacked off. Chances of survival are poor.

Medical illustration by Alice MacGregor Harvey/NC State Veterinary Medicine





AT THE BEGINNING OF THE 20TH CENTURY, THERE WERE 500,000 RHINOS IN AFRICA AND ASIA. TODAY THERE ARE JUST 29,000 IN THE WILD. MORE THAN 3,500 GREATER ONE-HORNED RHINOS, FEWER THAN 100 SUMATRAN RHINOS AND ABOUT 60 JAVAN RHINOS.

poached in 2015. Just six years ago, that number was 125. Since its founding, Saving the Survivors says it has saved more than 200 rhinos.

“There are some sources that suggest that by 2024 there won’t be any more rhino left in the wild,” says Gerard. “They will all be captive rhino at the current rate of poaching.”

“To some degree it feels a little bit like you’re on the edge of such a massive problem. It’s like being on the edge of a giant chasm,” says Blikslager. “I think everybody wants to know that some place in the world there is a thing that’s called the wild, with wild animals in it. We just want to know that,” says Blikslager.

A Rhino Called Hope

Toward the end of their trip, Blikslager and Gerard went into the wild to meet Hope (above).

Hope has undergone several procedures to repair the damage to the top of her head, cleaved off by unidentified poachers. A white rhino living in an enclosure, Hope sports a swath of bandages and elastic bands, stapled into place at the top of her head.

Blikslager and Gerard’s work could help determine further treatment for Hope and the other Saving the Survivors rhinos.

“We’re in this experience with this massive animal, touching her skin, looking at the skin on the rest of her body,” says Gerard. “You stop and look at yourself and think about what you’re doing. This is literally this massive wild animal in front of you. That was surreal in many respects.”

During the course of this interview, the two went from saying they generally would like to go back to South Africa, possibly with CVM students, to saying it could likely happen in two years to definitely telling each other that they wanted to go back in a year — that they needed to go back.

“It’s a privilege to be a part of helping them. That’s the way I look at it,” says Gerard. “If Marais called up and said, ‘Mat, I need you on a plane tomorrow and we want you out in South Africa for two years to help us work on these animals,’ I’d probably jump on the plane without thinking too hard.”

~ Jordan Bartel/NC State Veterinary Medicine

The full version of this story is at cvm.ncsu.edu/rhino-discovery.