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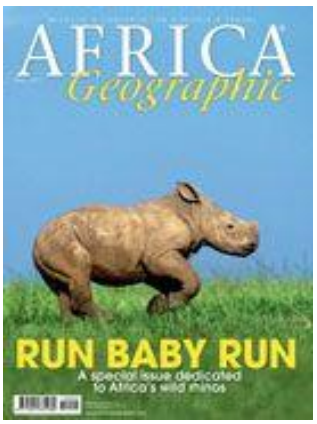

April 2012: All about rhinos

Special issue - rhinos & the poaching crisis

80 and counting…

That's the number of rhinos killed in South Africa in the first two months of 2012. We dedicate this entire issue to finding out about rhinos and their precious horn, establishing exactly what is driving the poaching onslaught and examining the pros and cons of suggested solutions.

features

All about rhinos

Find out what we know about Africa's rhino species – how many there are and where they live – and about their horns, the unique evolutionary attribute that arguably makes them the most controversial and written-about animals of our time.

A chequered past

Prior to colonial times, Africa's rhino population across all species is thought to have numbered in the hundreds of thousands, possibly over a million. From the 1800s to the present, our summary tells their story. Rhino numbers, however, remained guesswork until the 1960s – and even today there is an element of uncertainty that is compounded by secrecy for security reasons.

The crisis

Crisis? What crisis? After all, rhino numbers for both species in southern Africa are actually increasing. It sounds crazy given a poaching scenario that is seemingly so out of hand, but it is true. It doesn't mean that rhinos in the wild aren't in trouble though – they are. We unpick the inner workings of the poaching syndicates and look at what we know about the Vietnamese and Chinese consumers who are driving the demand.

The solutions

We know rhinos are in trouble. We know we want to save them. But how do we do this, in the face of such seemingly overwhelming odds? The proposed solutions are as hotly debated as they are numerous. Do we increase security and penalties, should we stop legal trophy hunting or focus our efforts on changing mindsets in Asia? We evaluate every one, including the hottest potato of them all: calls to legalise the trade in horn.

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Peter Borchert
Founder

We chose our engaging little model for the cover of this issue for two reasons: relief from the brutal images that inevitably accompany so many stories about rhinos these days, and as a message of encouragement: for as long as there are rhinos being born that will grow up in the wildest of possible circumstances, there is hope for the species. Our exhortation 'RUN BABY RUN' is, therefore, as much a call for our baby pachyderm to be the essence of what it is, as it is a call to run for its very life.

ALL about rhinos

Find out what we know about Africa's rhino species – how many there are and where they live – and about their horns, the unique evolutionary attribute that arguably makes them the most controversial and written-about animals of our time.

TIM JACKSON

RHINO SPECIES

Worldwide, five species of rhino are alive today, of which the black and the white are the two species that roam Africa. The other three live in Asia. In evolutionary terms, the rhino's closest living relatives are tapirs and horses, from which they diverged 30 million years ago. Their heyday was the latter part of the Tertiary Period, which ended about 2.5 million years ago, when there were many more species roaming the planet than there are today.

Black and white rhinos separated from their Asian relatives about 17 million years ago, and in Africa the northern and southern populations of white rhinos have evolved independently of each other for about a million years.

Species	Black or hook-lipped rhino *Diceros bicornis* 	White or square-lipped rhino *Ceratotherium simum* 
Subspecies	South-western black rhino *D. b. bicornis*; southern–central black rhino *D. b. minor*; eastern black rhino *D. b. michaeli*; West African black rhino *D. b. longipes*.	Northern white rhino *C. s. cottoni*; southern white rhino *C. s. simum*.
Population	4 800.	Approximately 20 700.
IUCN status	Critically Endangered (CITES Appendix I).	Near-Threatened. In 1977, white rhinos were listed on CITES Appendix I. The South African population subsequently increased and in 1994 was partially downlisted to Appendix II, giving the go-ahead for trade in live animals to 'approved and acceptable destinations' and for the export of hunting trophies. Under similar terms, Swaziland's white rhinos were downlisted to Appendix II in 2004.
Population trend (Source: IUCN African Rhino Specialist Group)	↑ Increasing.	↑ Increasing.
Main conservation threats	Poaching for the horn trade.	Poaching for the horn trade, exacerbated by the involvement of organised international criminal syndicates. Habitat loss.
Weight	Males 850–1 600 kg (an individual weighing 1 800 kg has been recorded); females are smaller than males.	Males typically weigh 2 000–2 300 kg (the heaviest individual recorded weighed 4 600 kg); females 1 600 kg.
Shoulder height	150–175 cm.	Males up to 200 cm; females up to 177 cm.
Horn size	The front horn typically measures about 50 cm (the rear horn of the south-western black rhino is usually longer than the front one). The world-record horn length is 136 cm.	The front horn (average length 90 cm) is larger than the rear horn. The world record is held by a female with a front horn 158 cm long and 76.5 cm in circumference and a back horn measuring 133 cm.
Lifespan	40–45 years.	40–45 years.
Social organisation	Mostly solitary; the bond between a mother and her calf lasts a few years. The home ranges of neighbouring individuals often overlap.	Lives in small groups that comprise a dominant bull, subordinate bulls, cows and their offspring. Dominant bulls defend their territory against intrusion by other males.
Breeding	Females typically breed from 7 years and males from about 8 years. A single calf is born after 15 months. A new calf is produced every 23–44 months, by which time the previous offspring has become independent.	Females can breed from 4 years, whereas males hold territories only from about 12.5 years. A single calf is born after a 16-month gestation period. Calves are weaned after a year and become independent at 2–3 years.
Communication	Dung deposits on latrines as well as throughout its home range mark a rhino's presence, as does the spraying of urine. Several individuals may use the same latrine. Vocalisations are also used.	Based largely on the sense of smell, although urine and dung are also used. Dung middens are used to demarcate territories. Vocalisations and behavioural displays characterise direct contact between individuals.
Feeding	Browsers. The prehensile upper lip is used to gather leaves and twigs (especially those of acacias, grewias and euphorbias), as well as small forbs at ground level.	Grazers, preferring to feed on short or leafy grasses.

COUSINS

Indian rhino *Rhinoceros unicornis*

Alternative names Greater one-horned rhino; great Indian rhino.

Distribution India and Nepal.

Population Approx. 2 900 (recovering from <200 in the early 1900s).

Range <20 000 km^2.

IUCN status Vulnerable.

Population trend Increasing.

Main conservation threats Habitat degradation, poaching for horn, possible damming of the Brahmaputra River.

Overall, populations are increasing because of strict protection, although conflict has resulted in declines in Nepal and parts of north-eastern India. Some 70 per cent of the population lives in Kaziranga National Park; the remainder is highly fragmented and the animals' long-term survival is threatened by continued habitat decline.

Sumatran rhino *Dicerorhinus sumatrensis*

Distribution Sumatra (Indonesia), Malaysia, possibly northern Myanmar.

Population size <220.

IUCN status Critically Endangered.

Population trend Declining.

Main conservation threats Poaching for rhino horn and other body parts, reduced population viability leading to reduced breeding, lack of political will and funding by key range states.

Until the early 1990s, numbers declined by more than 50 per cent every decade; this has now slowed due to better protection, although the decline is still rapid.

Javan rhino *Rhinoceros sondaicus*

Distribution Indonesia.

Population size <45.

Range Confined to the Ujung Kulon National Park in western Java, Indonesia.

IUCN status Critically Endangered.

Population trend Has started to decline.

Main conservation threats Disease, poor management, poaching of horn and other products for medicine.

The last Javan rhino in Vietnam was killed in 2011. The species is now Extinct in that country.

TIM JACKSON

THE SUB STORY

3 subspecies of **BLACK RHINO** survive today.

1 South-western black rhino = 2 000 (90% in Namibia).

2 Southern–central black rhino = just over 2 200 (southern Africa, reintroduced to Botswana, Malawi, Swaziland and Zambia).

3 Eastern black rhino = 740 (80% in Kenya).

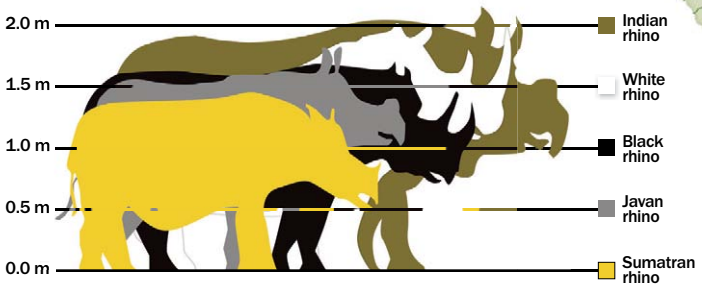
X West African black rhino = 0 (declared extinct in 2011).

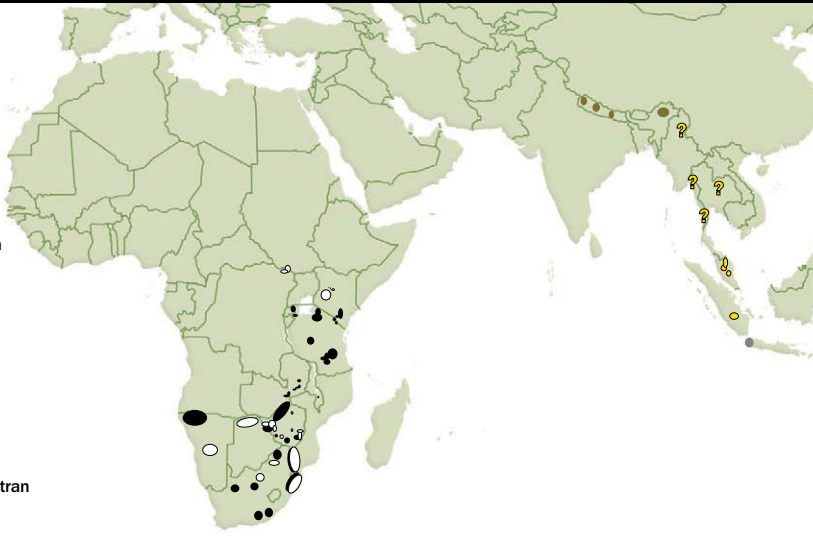
There are **2** subspecies of **WHITE RHINO**

1 Northern white rhino = 4 (in closely guarded paddocks in Kenya). There are unconfirmed reports of sightings in South Sudan.

2 Southern white rhino = ±20 000 (93% in South Africa, where 5 500 are under private ownership in 430 populations; the rest are in Namibia, Botswana, Zimbabwe, Swaziland and Mozambique).

SHADES OF WHITE Southern white rhinos have been introduced to Kenya, Zambia and Uganda – outside their known range, which historically extended probably as far north as the Zambezi River. Before the relocations, white rhinos last occurred in Kenya some 3 000 years ago, although a new report puts forward that they may have been present in that country far more recently. Fossil records and cave paintings suggest that the white rhino's range may have been continuous until the last ice age; genetic analyses propose that the two subspecies may have divided anywhere from 600 000 to one million years ago.





TIM JACKSON

5 WAYS RHINOS USE THEIR HORNS

1 DEFENCE The horns of female rhinos are generally longer and more slender than those of males, and they are used to defend themselves and their calves against predators (female black rhinos have even been known to kill lions). When threatened by a predator, sub-adult white rhinos commonly cluster with their backsides pressed together and their horns facing outwards. Adult male rhinos don't seem to use their horns in this way.

2 ATTACK Male rhinos use their large front horns as weapons when fighting each other for supremacy. These battles can be fatal.

3 FEEDING Black rhinos are browsers and are known to use their horns to break branches and gain access to better browsing.

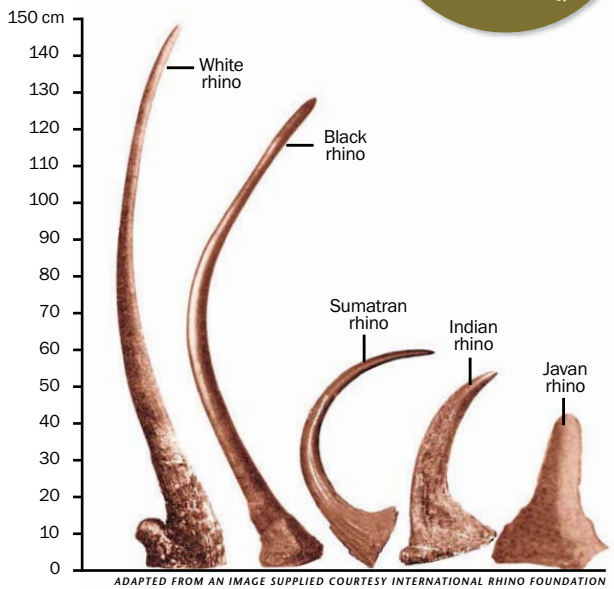
4 GREETING Black rhinos often rub horns as a form of greeting one another.

5 GUIDING When a rhino calf precedes a cow, the adult may use its horns to guide the younger rhino.

? There is no explanation for the use of the (generally) smaller back horn on African rhinos.

female rhinos more horny than males

Female rhinos tend to possess longer horns than their male counterparts. Males' horns on the other hand are broader at the base and thicker than those of females.



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ask us!

SCIENCE EDITOR

Tim Jackson

answers your questions about Africa's wildlife.

Q How big do rhino horns get? And how fast do they grow? *Caroline Atkinson, South Africa*

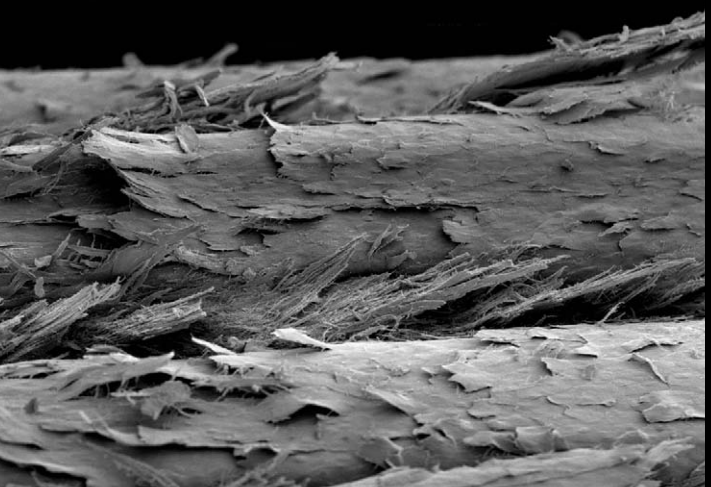
A Measurements show that the larger front horn of black rhinos grows at a rate of about six centimetres a year, with the back horn extending more slowly at 2.7 centimetres a year. The smaller horns of juveniles regrow at about twice the rate of those of adults.

In white rhinos, the base of the rear horn continues to expand for about 15 years, and the front horn for 20 years. In females, the mass of horn that regrows peaks at eight years; in males, at over 30 years. The front horn of adults grows at about 5.5 centimetres per year and the smaller back horn at two centimetres.

An inspection in a laboratory of the banding patterns, length and growth rates of a horn typically represents the product of about eight years of growth. Throughout most of the rhinos' lives, the males' horns grow at twice the rate of the females', regenerating more than 1.3 kilograms of horn every year once the animals are older than 20 years.

Caroline Atkinson wins a pair of Lynx Series-18 8x32 binoculars worth R2 910. With their high-grade, black leather covering, these small-bodied binoculars are ideal for wildlife enthusiasts and birdwatchers. Their Bak4 porro-prism glass and multi-coated optics provide excellent image clarity.

IMAGE SUPPLIED COURTESY TOBIN HIERONYMUS AND WITMERLAB



HORNY FACTS

1 Rhino horn is composed largely of the protein keratin – the main component of hair and fingernails – but it is closer in structure to the hoof of a horse.

2 Unlike the horns of most animals, which are made of a relatively thin sheath of keratin surrounding a bony core, the horn of a rhino is unique in that keratinised cells run through the entire structure.

3 Despite their common element, the structure of hair and rhino horn is quite different. Hair grows continuously from follicles embedded in the skin, whereas the horn attaches to the skull via a short, bony knob on the nasal bone. The cells that make up the horn are produced constantly on the surface of the bony protrusion.

4 As the new cells develop, they push the older growth upwards, where they die and form the hard horn (see image below, left).

5 The keratin in rhino horn comprises very slender tubes packed so tightly that they are squashed into an oval shape. The tiny spaces between the tubes contain a mixture of substances, including melanin and calcium.

6 There is more melanin and calcium in the core of the horn than at its outer surface, evident in the larger horn (below). Calcium makes the horn harder and stronger, and melanin protects it from breakdown by the sun's UV rays.

7 Rather like the annual growth rings in trees, horn growth shows seasonal cycles. These can be seen as a series of dark bands when a horn is viewed in cross-section under fluorescent light (see the smaller horn in the image below).

8 Rhino horn is constantly worn away, partly because rhinos rub their horns on the ground and other surfaces and partly due to degradation by sunlight (although, as mentioned, the melanin component helps slow the latter process as the horn becomes exposed towards its tip). This uneven wear helps hone each horn into its distinctive conical shape. Males wear their horns away more than females. The horns of white rhinos are characteristically straighter, less rounded and bigger than those of black rhinos.

One horn or two?

Africa's rhinos have two horns and so does the Sumatran rhino. The other Asian species have only one. For this reason it was debated that the Sumatran rhino might be more closely related to the African species, though genetic evidence now suggests otherwise.

RHINO HORN UNDER FLUORESCENT LIGHT

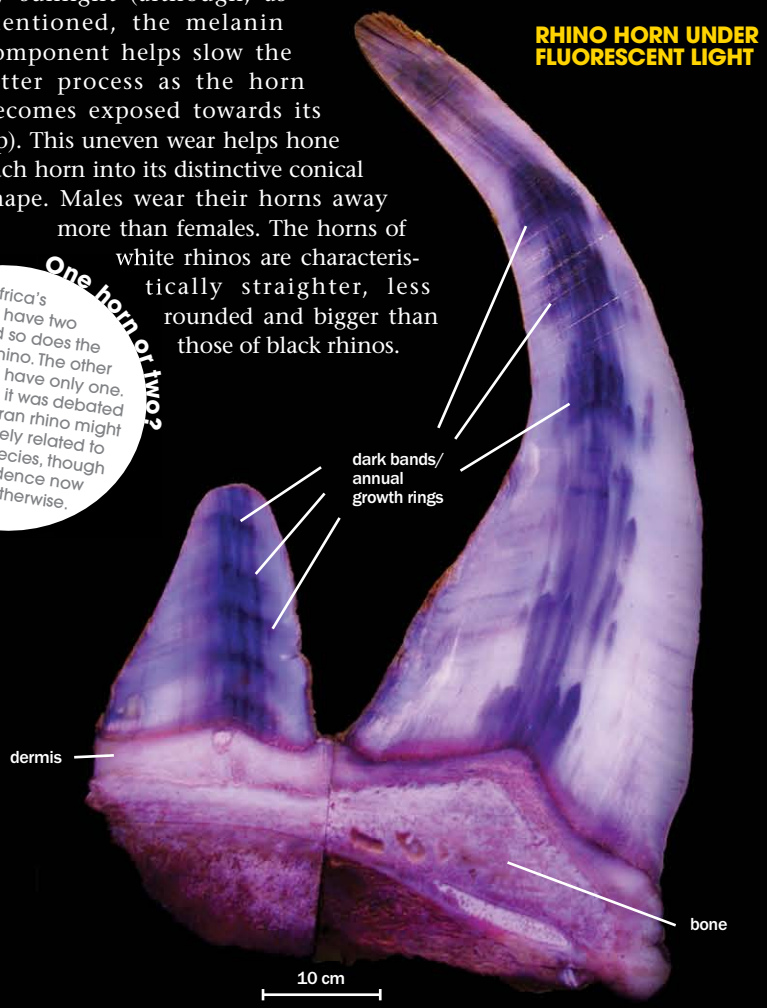


IMAGE SUPPLIED COURTESY VETERINARY GENETICS LABORATORY

For an animal so large and powerful the rhino is alarmingly vulnerable. Dwindling populations, poachers and other factors all contribute to the status of this enigmatic animal as endangered. The Black Rhino Project is one of 29 supported by the Mazda Wildlife Fund. The Fund was started in 1990 and, by supporting Mazda, you are supporting all the work that we and our partners do. In 21 years, we've invested R27.5 million in worthy causes aimed at protecting our planet and the animals and plants that live here. Furthermore, we've committed R1.5 million a year going forward. The projects we partner with range from research to education to conservation. Because at the Mazda Wildlife Fund, we believe passionately that everyone can make a difference.

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