

The magnificent black rhino once thrived in the Ngorongoro Crater and on the Serengeti Plains, but over the years, poaching and disease have taken their toll, and its numbers are now vastly reduced. Is there a future for black rhinos in one of the world's most famous wildlife-viewing destinations? Researcher **Guy Castley** reports on the status of these iconic pachyderms. ▶



RHINOS ON THE EDGE

Text and photographs by Guy Castley



Scanning the crater floor over 600 metres below, I cast my mind back to the 1960s, when more than 100 black rhinoceroses roamed the caldera of Tanzania's Ngorongoro. At the time, about 700 of these amazing creatures would also have been found wandering throughout the larger Ngorongoro Conservation Area (NCA) as well as the adjacent Serengeti National Park. The Ngorongoro Crater is currently rated as one of the world's premier destinations for viewing rhinos but, as I searched left and right, I knew that my chances of seeing one of these pachyderms in peril were greatly diminished.



ABOVE The Ngorongoro Crater is the world's largest unbroken caldera, or collapsed volcano, and has been described by some as the eighth wonder of the world. An aerial approach from the north provides unique views of Lake Magadi and the Lerai Forest in the distance.

OPPOSITE The black rhinos in the crater spend much of their time in the open. Although cows and calves are frequently seen together, larger social groups are not uncommon.

PREVIOUS PAGE Monitoring of the rhinos in the crater is facilitated by the distinctive horns of each one. This eastern subspecies, *Diceros bicornis michaeli*, is known for having longer, more curved horns than the two southern subspecies.

By the early 1990s, their population had plummeted to 10 individuals, and in the Serengeti National Park numbers fell to just two. The park's total was boosted to three with the arrival of a bull, but there's no doubt that black rhinos are still critically endangered here.

The observation post I'm using is equipped with binoculars, a bed and the barest of essentials. Others like it are dotted around the rim of the crater at critical vantage points, while two mobile units periodically shift their positions in the bowl of the crater. These are homes away from home for the committed rangers of the Ngorongoro Conservation Area Authority (NCAA), who search each day for signs of the resident black rhinos in order to record their positions, social

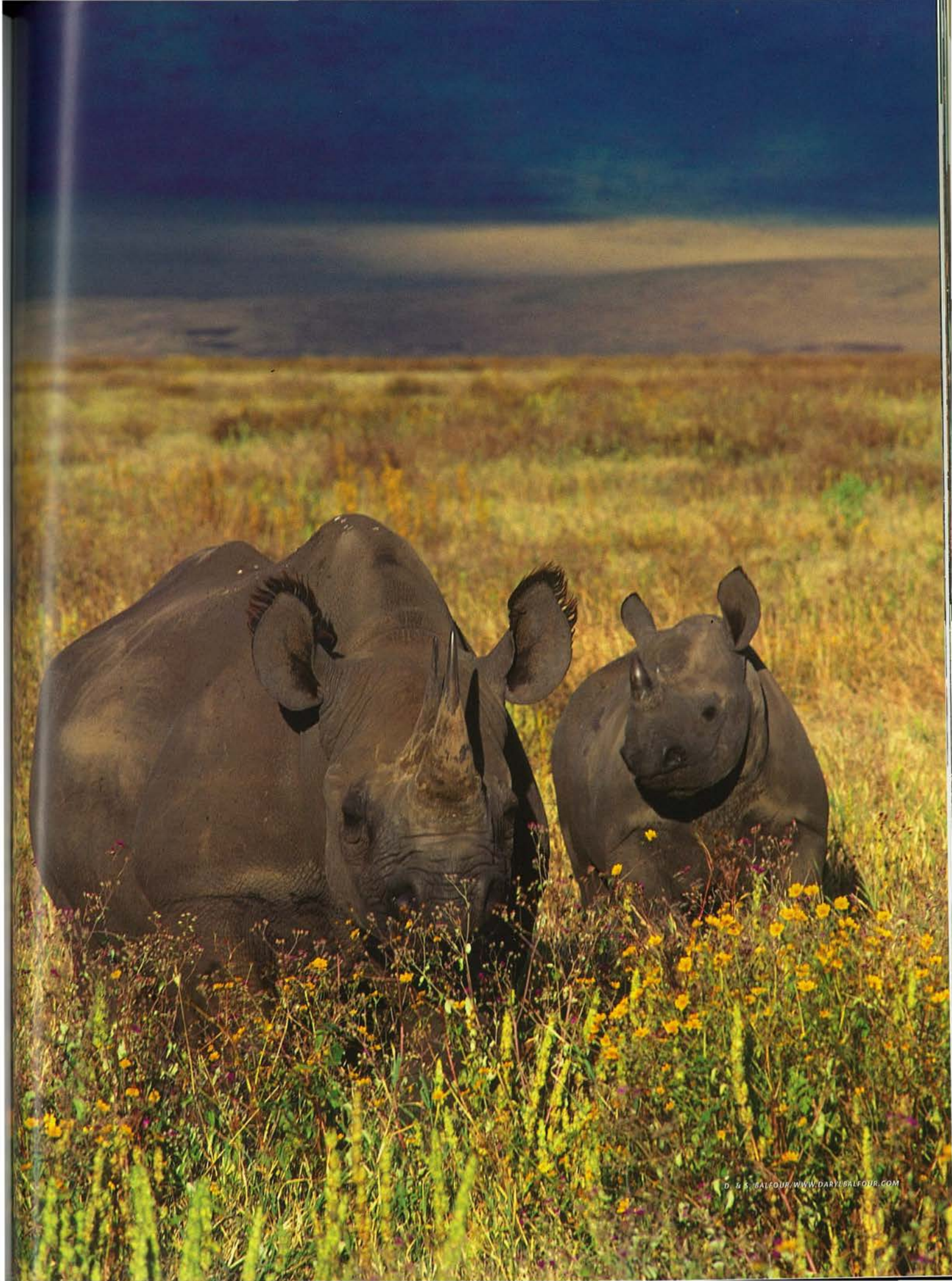
behaviour and general activity, while keeping an ever-watchful eye for any indication of poaching.

Sightings of rhino are not guaranteed, so when I see one in the far distance through my binoculars, my heart skips a beat. I'm told by a ranger, who is intimately acquainted with these rhinos, that the animal in my sights is F2, or female number 2, identified from this distance by her unique horns, stature and distinguishing ear and tail features. All of the rhinos in the crater have been named, some after key players in the conservation effort, and F2 is the adult female Fausta which, at 40 years of age, has impressive horns that immediately set her apart from the others.

Luck also favours us the following day when, driving in the crater bowl, we spot another two rhinos in the distance, not far from the Lerai Forest in an area called *Shamba ya kifaru* (meaning 'rhino farm'), where I had seen the lone female the previous day.

The crater's rhino population is the focus of a number of conservation projects run collaboratively by the NCAA and the Frankfurt Zoological Society (FZS). My rendezvous with the animals is thanks to Dr Pete Morkel, head of the FZS's Protection Programme for Black Rhinos in the crater, who had requested that I assist with the analysis of rhino monitoring records collected during the past few years. The aim was to develop a better understanding of the seasonal ranging patterns of every rhino in the crater. I needed little persuading. The combination of potential black rhino sightings, exploring a World Heritage Site, masses of wildlife and a cultural experience second to none proved irresistible, and I packed my bags.

The FZS, renowned for the sterling efforts of German zoologist Bernhard Grzimek and his son Michael (whose 1962 film *The Serengeti Shall Not Die* remains the only conservation film to have won an Oscar) has been involved with rhino conservation in East Africa and monitoring efforts in the NCA since 1995. Pete took over the reins of the project in 2002. A veterinarian and renowned rhino specialist, he has worked extensively throughout southern Africa, first with the Namibian Ministry of Environment and Tourism and then with South African National Parks (SANParks). ▶





When I arrived at Kilimanjaro International Airport, the FZS's Cessna 185, with Pete at the controls, was there to meet me. He narrated a history of the area as we flew low over the dramatic volcanic landscape, and before long I was rewarded with my first view of the crater as we crested its northern rim. I could just make out the ant-sized buffalo and wildebeest far below.

Ngorongoro's black rhinos have a somewhat chequered past. The crater, at about 264 square kilometres, forms only about three per cent of the NCA, but this relatively self-contained ecosystem is a sanctuary for wildlife. Since the 1960s, a precipitous decline in black rhino numbers in the crater has reflected similar trends throughout Africa, where figures plummeted from 65 000 in the 1970s to around 2 500 in 1990. Poaching and the illegal trade in rhino horn fuelled the decimation, and current surveys indicate that just a few isolated pockets with low numbers of animals remain.

Organised poaching by hunters, often in collaboration with park rangers and officials, was by far the main threat, but

Maasai pastoralists, who were relocated to establish various national parks (notably the Serengeti) in Tanzania and Kenya, were undoubtedly accountable for a small percentage of the killings. Much animosity existed between officials and communities during the consolidation of conservation areas and black rhinos certainly bore the brunt of the fallout. Today, thankfully the 8 300-square-kilometre NCA is a multiple land-use area in which Maasai and wildlife coexist in a fine balance between conservation and human needs. However, it may not take much to tip these delicate scales as there are still contentious issues around the cooperative management of the crater.

Despite having rights and access to water in the western part of the crater near the Seneto Springs, the Maasai are not legally permitted to graze their livestock within the crater itself, as research indicates that this would not benefit the livestock significantly and would contribute to a decline in rhino numbers. Instead, pastoral and limited cultivation activities take place on the adjoining grasslands. Tanzanian wildlife policies need to address the complexities



THE NGORONGORO CRATER IS CURRENTLY RATED AS ONE OF THE WORLD'S PREMIER DESTINATIONS FOR VIEWING RHINO

associated with meeting both social and conservation objectives. Success, and the shaky existence of the crater's rhinos, may hang in the balance.

This concern was realised when, after many years without any sign of poaching activities, the adult female Amina, a breeding cow, was killed in 1995. Although no further incidents have been recorded, the continued efforts of rhino custodians such as Pete Morkel, the NCAA rangers and the Maasai are needed to ensure the population's survival.

Amina's loss occurred when the population numbered only 16 animals, and highlighted the fragility of the rhino's existence here. Disaster struck again in 2001 when four rhinos, of a population of just 17 animals, died after being infected by a debilitating blood parasite (babesiosis). The outbreak of the disease occurred during a period of extreme drought, when a large number of other species, especially buffalo, died

in the crater. Fortunately, the parasite was brought under control, and the population has grown steadily, reaching 24 individually identified animals, with five calves being born since January 2005.

Thankfully, conservation efforts in many other areas have also been successful, and the latest Africa-wide population estimates of black rhinos indicate that they number 3 610.

The increase in the crater's rhino population in recent years is certainly an achievement, but its continued survival is not assured and nobody understands this more than those fighting for its future. A number of critical issues were highlighted during a workshop facilitated by the FZS in 2003 to identify possible solutions to some of these complex problems. Considering the global interest and tourism benefits that accrue as a result of the more than 250 000 wildlife enthusiasts who flock to the crater each year, one would ▶

ABOVE Black rhinos in the crater are often seen at a distance as they are ever vigilant to potential threats. *Shamba ya kifar* ('the rhino farm') may provide tourists with fantastic views of rhinos, but being so exposed may not be conducive to the animals' survival.

OPPOSITE The Ngoitokitok Springs and Gorigor Swamps on the eastern edge of the crater provide fresh water and habitat for rhinos and other megaherbivores. However, run-off from the crater rim to these swamps is being diverted and could be one of the reasons that the Lerai Forest is receding.

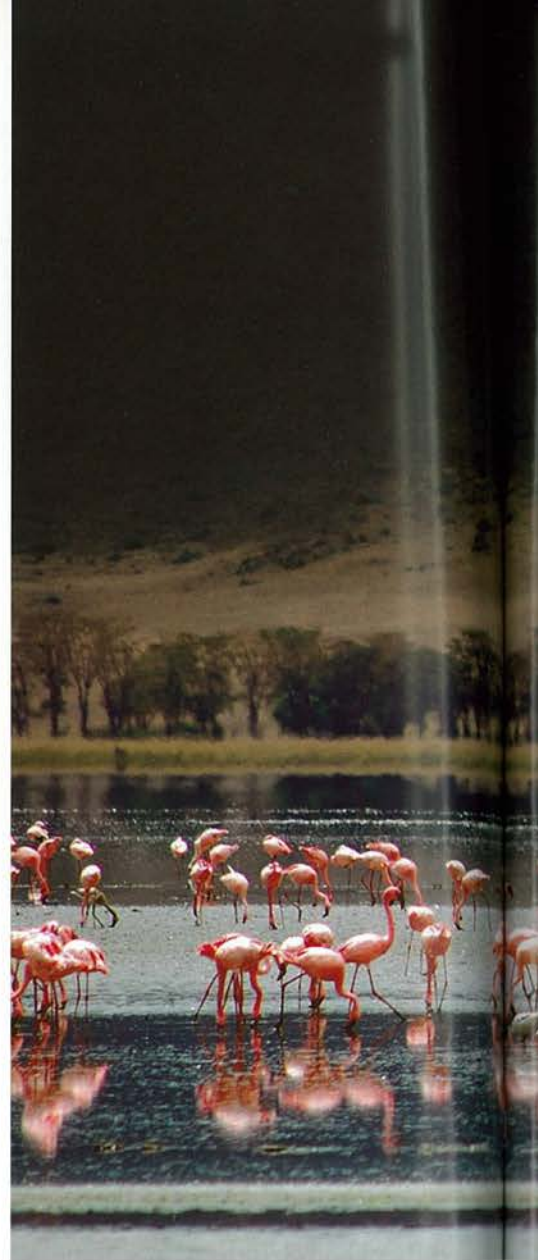


Once lush, the Lerai Forest has become fragmented, reducing both forage and refuge resources for rhinos, particularly calves.

hope that sufficient active management interventions will be taken so that the children of generations to come will still be able to experience this wilderness wonderland.

Ironically, greater numbers of tourists also cause considerable disturbance to rhinos, particularly when cows have young calves in attendance, and a strategy to minimise such threats must be investigated. Potential solutions could include implementing a system similar to that used by the whale-watching industry, where tourism operators are restricted from approaching animals too closely. If necessary, fines could be imposed on lodge operators who do not adhere to such guidelines. Any such effort should also be coupled with an ongoing education programme to draw the plight of the rhino to the attention of tourists, and perhaps even the tourism operators.

A small rhino population, such as that in the Ngorongoro Crater, is faced not only with the risk of local extinction by some unforeseen event, such as the disease which struck in 2001, but also inbreeding. Thankfully, the animals that survived the poaching pressures were not closely related and sufficient genetic differentiation among individuals remains, but there is the possibility that the population may become severely inbred in the not-too-distant future. Even though the population has reached its highest level in 30 years, the effective breeding population numbers only about 13 animals.



Key to their survival will be the speed at which they are able to break out of the ecological restrictions imposed by their population size. Rapid reproduction is one mechanism but, sadly, the black rhino's relatively slow natural growth rate, compared to that of wildebeest, for example, may exacerbate this situation. Another mechanism would be to increase the survival of the various age groups, particularly young calves; another is to maintain genetic diversity within the population.

The dominance hierarchy within the adult bulls could have significant implications for the genetic integrity of the population. For example, it is possible that dominant bulls could mate with their daughters in as little as six years. The crater population appeared to be heading down this road, with every indication suggesting that the dominant

Africa Geographic
Special
PLACES

CHADA KATAVI
GREYSTOKE MAHALE
SAYARI CAMP
LUNGA CABINS
RIVERTREES COUNTRY INN

www.africageographic.com/expeditions



MUCH OF THE CRATER'S CAPACITY TO SUPPORT RHINOS IS DETERMINED BY THE SUITABILITY OF THE HABITAT

bull, John, would soon be breeding with his eldest daughters. If John were to be usurped by Mikidadi, his son and one of the other adult bulls in line to the throne, he would potentially breed with his mother as well as his sisters and half-sisters. Fortunately, this potential threat may have been averted as another male, Chausi, appears to have taken control from John in the past few months and is currently using the prime habitats, displacing John into more marginal areas.

Another potential solution to the inbreeding problem is the periodic exchange of bulls with other populations nearby. Black rhinos in the Moru

Kopjes region of the Serengeti could be included as part of the metapopulation in Tanzania as there may have been some natural mixing between these areas historically.

The long-term vision includes the re-establishment of links with the Masai Mara National Reserve in Kenya, where another remnant population persists. Supplementing these populations with adult females from other areas is yet another alternative. Such initiatives have already been undertaken, with two black rhino cows from the Addo Elephant National Park in South Africa successfully introduced into the crater in 1997. ▶

Flamingos at Lake Magadi. The lake may also have contributed to the die-back of the Lerai Forest as periodic inundation since the 1960s, coupled with reduced flushing by natural run-off, has led to an accumulation of salts.



International conservation bodies have focused their attention on the black rhinos in the Ngorongoro Crater in an effort to protect them. These rhinos comprise almost half the population of Tanzania's eastern subspecies.

Guy Castley is a terrestrial ecologist with an interest in threatened species, conservation biology and wildlife management. After nine years as wildlife ecologist with SANParks, he now lectures at Griffith University on Australia's Gold Coast, where he continues to pursue his research interests. His visit to the Ngorongoro Crater was sponsored by the Frankfurt Zoological Society. His accommodation was provided by Estelle and Pete Morkel, who also provided comments on an earlier draft of this article.

Much of the crater's capacity to support rhinos is determined by the suitability of the habitat which, in turn, influences their distribution within the crater. The preferred areas are undeniably the Lerai Forest, Mandusi and Gorigor swamps and Ngoitokitok Springs, as well as the thickets on the slopes of the crater wall. Even so, there are some individuals that spend considerable time during the day on the open grasslands. *Shamba ya kifarua* to the east of Lerai Forest is especially popular, particularly during the wet season when there are plentiful dwarf shrubs to please the palate.

Over the years, herbivore pressure, with elephants being the dominant drivers, has altered hydrological patterns and an influx of saline water from the highly alkaline Lake Magadi into some areas has taken its toll on woody vegetation. The characteristic fever trees *Acacia xanthophloea* of the Lerai Forest are now appreciably denuded and the forest understorey is non-existent in places, offering unobstructed views of the open plains.

The Ngorongoro Crater may be one of the most productive ecosystems

in Africa, but there seems to be little regrowth in these forests. This loss of wooded habitat, combined with the increased food requirements of other large herbivores such as elephants, and buffalo, suggest that the crater would be unable to support rhinos at historical densities. In fact, estimates reveal that, at most, only about half of the earlier numbers are possible.

The resurgence of ungulates in times of plenty also attracts the upper echelon of the food chain, bringing other dangers. Rhino calves, in particular, are prone to predation by spotted hyaenas and lions, with up to 40 per cent being lost to these predators. The high density of hyaenas is the single biggest threat to rhinos here, but an easy solution is not immediately evident as there is a high tourism demand for these carnivores. Such predation risk, coupled with habitat restrictions, genetic instability, drought, possible extinction, disturbance by tourism (on occasion up to 150 vehicles jostle for places in the crater) and the omnipresent threat of poaching make it alarmingly evident that these rhinos are leading a tenuous existence 'on the edge'. ■