AUTHORS:
Sam M. Ferreira[1,2]
Luthando Dziba[3]

AFFILIATIONS:
[1]Scientific Services, SANParks, Skukuza, South Africa
[2]Department of Conservation and Marine Sciences, Cape Peninsula University of Technology, Cape Town, South Africa
[3]Conservation Services Division, SANParks, Pretoria, South Africa

CORRESPONDENCE TO:
Sam Ferreira

EMAIL:
sam.ferreira@sanparks.org

HOW TO CITE:
Ferreira SM, Dziba L. Where are rhinos safest? S Afr J Sci. 2021;117(9/10), Art. #11300. https://doi.org/10.17159/sajs.2021/11300

ARTICLE INCLUDES:
☐ Peer review
☐ Supplementary material

KEYWORDS:
rhinoceros, private owners, provincial reserves, community owners, national parks

PUBLISHED:
29 September 2021

Where are rhinos safest?

During 2020, South Africa reported 394 poached rhinoceros (rhino) carcasses – 34 at private properties and 360 at state properties.[1] Poaching since 2008 has degraded South Africa's rhino populations. By the start of 2020, South Africa had 14 410 southern white rhinos (*Ceratotherium simum simum*) and 1900 black rhinos, mostly south-central (*Diceros bicornis bicornis*) and south-western black rhino (*D. b. minor*) sub-species and a few non-native eastern black rhinos (*D. b. michaeli*) (Table 1).

Rhinos occur in national parks managed by SANParks, reserves managed by provincial conservation authorities and non-state areas comprising private and communal ownership. Of these, the Kruger National Park (Kruger) has experienced the highest number of poaching losses reported for state land. Kruger has an operational area the size of Israel (approximately 2 000 000 ha). In contrast, privately owned nature reserves containing rhinos in South Africa have a national average of 10 000 ha (1 300 000 ha distributed across 132 properties studied[2]). Therefore, privately owned reserves are, on average, approximately 200 times smaller than the size of Kruger. National parks other than Kruger, provincial and communal reserves are also smaller relative to Kruger, with the other national parks averaging approximately 33 000 ha, excluding Addo Elephant National Park (Addo), which is 173 000 ha. Addo, however, has five disconnected sections, three of which have rhinos present.

The recently released report by a Ministerial High-level Panel on the management and use of lion (*Panthera leo*), leopard (*P. pardus*), elephants (*Loxodonta africana*) and rhinos made several explicit recommendations.[3] Key aspects reflect on a preference for disinvesting in captive rhino breeding operations and investing in secured, restored, and rewilded natural landscapes containing, amongst others, thriving rhino populations, despite a considerable diversity of concepts of wild and rewilding.[4]

What lessons can South Africa derive from different successes across the different scales, management approaches and land uses associated with rhinos? Size of the area may be a key factor that influences the ease of poachers finding rhinos to poach and rangers finding rhinos to protect. A meaningful evaluation of safety for rhinos may be to compare national parks (other than Kruger) with both provincial reserves and private reserves. The average size of reserves in these three categories is comparable, thus allowing direct assessment of consequences of anti-poaching activities and rhino conservation.

Enriching our understanding of rhino protection could further benefit from scaling carcasses by the number of rhinos living within these different categories of land uses and management authorities (Table 1). All three categories – national parks other than Kruger, provincial reserves and private reserves – do much better than does Kruger itself. When comparisons account for rhino population sizes, poaching rates in Kruger were 6.1%, the lowest since 2013[5], but 2.4 times as high as those in provincial reserves (2.6%), 13.6 times higher than those for non-state reserves (0.5%) and 20.4 times higher than in national parks excluding Kruger (0.3%) during 2020. These results directly contrast the statement from the Private Rhino Owners Association leadership recently reported in the media[6]:

> *In South Africa, if you are a rhino on a state reserve, your chances of getting whacked by a poacher are about nine times greater than if you roam a private one.*

The size of focal areas does play an important role. For instance, the number of rhinos poached per population per unit area in Kruger is higher than that in other national parks (4.1 times) and non-state reserves (7.8 times).

Unintended messaging may have had a boomerang effect on rhino conservation initiatives[7], such as exposing critical security intelligence utilised by poaching syndicates. For instance, media framed the translocation of rhinos to strongholds outside Kruger as a 'rhino evacuation'[8]. Poaching soared in the weeks that followed as traffickers sought to cash in before the opportunity to do so diminished. Conservation agencies always battle with the democratic rights of citizens to information and many authorities have limited experience in managing sensitive intelligence. Similarly, a recent media report in 2021 implied broadscale incompetency in state conservators of rhinos in South Africa.[2] Such misleading messaging is an even greater challenge, and flaunts basic standard practices for media reporting such as providing balanced perspectives and giving affected parties the right to comment.[9] For instance, the report on state incompetency in rhino conservation noted one source of information, and the reporter did not provide responses from alternative sources to get other perspectives that would have allowed richer engagement with the information available in the public domain.

Our brief analyses highlight that responsible and balanced media reporting could facilitate lessons stakeholders can collectively learn by looking at, for instance, what makes non-state reserves, provincial reserves and small national parks more successful compared to Kruger in managing the threat of poaching to rhino populations. The low poaching rates may reflect key aspects of small national parks and non-state reserves – the latter typically well resourced, usually at own cost by private industry[3], but importantly may have optimal operational areas that allow operational efficiency in situational awareness, access control, staff integrity management and intensive monitoring of the rhino assets themselves in addition to standard anti-poaching operations. Small provincial reserves may have optimal sizes, but have limited resources and/or have challenges in operational efficiency that may compromise situational awareness, access control, integrity and knowledge of the rhino asset. Kruger is well resourced, but is extremely large beyond the optimal size to gain effective anti-poaching control. The large operational area most likely constrains Kruger's ability to achieve operational efficiency in situational awareness, access control, integrity management and individual level knowledge of the rhino assets despite impressive anti-poaching operations.

Combining local insight into successes in rhino safety with insights gained from similar conservation areas with rhinos elsewhere in Africa should enhance interventions that result in low poaching rates.[10] These continental insights highlighted features like leadership and integrity management as well as intensive monitoring of rhino assets. In-depth reflection on comparable poaching rates suggest that South Africa could benefit from approaches that innovatively distribute resources appropriately through various means to those places that are of optimal sizes with all associated operational efficiency benefits. Identification of mechanisms to generate funds for rhino protection initiatives typically suffers from restrictive arguments for international trade in horn[11] when few protected areas and agencies make use of the full suite of conservation-funding models and incentives[12].

Another key insight is that authorities may improve rhino safety by 're-sizing' Kruger into rhino zones of reduced size, closer to the optimality of private, provincial and other state parks. At present, Kruger has administrative sections that mismatch rhino distribution. The definition of different zones based on environmental characteristics, such as rhino safe havens and ecological traps[13], may thus re-ignite the benefits of the Intensive Protection Zone, Joint Protection Zone and Composite Protection Zone initiated when Kruger had 10 000 rhinos[14].

Global analyses predict that governance capacity may actually dictate biodiversity conservation success[15], similar to recent media reports[2]. Using this approach in our analysis shows that provinces with low poaching rates (excluding Kruger) actually showed variable governance success as indicated by the 2018–2019 audit status of provincial level municipalities[16] (Table 1). Provinces with substantially higher poaching rates, such as the North West, Limpopo and Mpumalanga, had generally lower governance success. KwaZulu-Natal provided the greatest contrast with patterns in governance challenges – despite relatively high indicators of governance success, the poaching rates were the highest in the country excluding those of Kruger. A more useful outcome would be an analysis of which factors allow the achievement of low poaching rates despite governance challenges in certain provinces, to allow their replication in other areas.

Although South Africa embraces human democratic rights-based conservation ideologies[17], explicit mandates introduce different risks to private industry, a key element of non-state ownership of rhinos, and state-managed reserves and parks. Private industry does not carry the burden of a constitutional mandate that imposes an explicit requirement to protect South Africa's heritage, irrespective of state resources available. The private sector possesses impressive business acumen, but business outcomes of their rhino conservation efforts depend on the broader business environment. The onslaught of poaching imposes significant costs on private industry and has been recognised as one of the main drivers of disinvestment in rhinos – by 2018, 21% of private rhino owners were disinvesting[3]. Between 2012 and 2017, ten state reserves lost or removed white rhino and an additional three lost or removed black rhino.[18] Removals to alternative safer state reserves, however, did not divorce state agencies from their constitutional mandate of rhino conservation. For many detractors, these trends of disinvestment could fuel a claim that 'A rhino living in a private reserve has a higher chance of a forceful eviction from home than one on a state reserve'. Yet, translocation of animals to safer areas is a rational response in the face of the poaching onslaught driven by the criminal activity of horn trafficking. Dealing with trafficking remains a national and international law enforcement challenge.

Unintended messaging may further serve to demotivate state and private reserve managers working hard under varying constraints. It is an extraordinary achievement of private industry to be playing such a major role in the conservation of rhinos and in protecting large fractions of South Africa's rhinos (Table 1; black rhino – 23.7%, white rhino – 48.6%).

Table 1: Population sizes at the beginning of 2020 and poaching rates within four categories of land uses associated with rhino protection in South Africa during 2020. Rates within provinces contribute relatively differently to countrywide poaching rates associated with the four categories of land uses related to rhino protection. When we focus only on poaching in a province, incidences do not associate with an index of governance quality.[15]

	Kruger National Park (KNP)	Other national parks	Provincial reserves	Private properties	Rhino properties excluding KNP	Municipal governance index[a]
Number of black rhinos[b]	270	315	865	450	1630	
Number of white rhinos[c]	3550	360	3500	7000	10 860	
Poaching rates	6.12%	0.30%	3.10%	0.50%	1.30%	
Free State			0.000%	0.000%	0.000%	56.0%
Northern Cape		0.000%	0.000%	0.015%	0.009%	58.6%
Eastern Cape		0.000%	0.000%	0.000%	0.000%	67.7%
Gauteng			0.000%	0.029%	0.018%	82.2%
Western Cape		0.000%	0.000%	0.015%	0.009%	87.6%
North West			0.466%	0.029%	0.166%	38.8%
Mpumalanga	6.073%		0.110%	0.132%	0.114%	58.9%
Limpopo	0.047%	0.300%	0.027%	0.250%	0.175%	65.0%
KwaZulu-Natal			2.496%	0.029%	0.814%	71.3%

[a]Provincial indices based on a weighted average derived from the complete audit qualification of municipalities during 2018–2019. We assigned each municipality with values reflecting the audit outcome as follows: 0 – Outstanding audits, 1 – Disclaimed with findings, 2 – Adverse with findings, 3 – Qualified with findings, 4 – Unqualified with findings, 5 – Unqualified with no findings. By averaging these scores per province excluding municipalities with outstanding audits, and expressing the result as a percentage of 5, we obtained an index of municipal governance quality.

[b]Summary of black rhino data extracted from the SADC Rhino Management Group that provided estimates for 2015 and 2017 separated into national parks, provincial and private reserves. See Emslie et al.[18] We used the trends in provincial and private reserves between 2015 and 2017 to predict likely numbers at the beginning of 2020. For national parks, the estimates were based on formal survey records at the end of 2019.

[c]Summary of white rhino data provided by the Scientific Authority.

Indeed, South Africans should celebrate and acknowledge the outstanding work that both private sector and managers of some state properties are doing under trying circumstances and constraints. Society, however, should support all reasonable conservation efforts and dissuade those that distract South Africans from complex conservation challenges. An open environment that does not restrict learning and that supports developing new insights into how best to respond to these challenges can change the plight of rhinos and the future of South Africa's biological heritage. We do hope that those who want to tell the latest rhino stories would also do their best to report them in a responsible manner. The lesson is not about who keeps rhinos safest. It is about what is the safest way to keep rhinos. Even so, multiple approaches associated with rhinos can provide beneficial outcomes to support South Africa's rhino conservation initiatives and reputation.

Acknowledgements

This Commentary benefited from discussions with Jo Shaw, Johan Jooste, Danie Pienaar, Danny Govender and Stef Freitag-Ronaldson.

Competing interests

We have no competing interests to declare.

References

1. South African Department of Forestry, Fisheries and the Environment (DFFE). Environment, Forestry and Fisheries report back on rhino poaching in South Africa in 2020 [webpage on the Internet]. c2021 [cited 2021 May 21]. Available from: https://www.gov.za/speeches/environment-forestry-and-fisheries-rhino-poaching-south-africa-2020-1-feb-2021-0000#
2. Clements HS, Knight M, Jones P, Balfour D. Private rhino conservation: Diverse strategies adopted in response to the poaching crisis. Conserv Lett. 2020;13(6), e12741. https://doi.org/10.1111/conl.12741
3. South African Department of Forestry, Fisheries and the Environment (DFFE). The High-level Panel of Experts for the review of policies, legislation and practices on matters of elephant, lion, leopard and rhinoceros management, breeding, hunting, trade and handling: High-level Panel report [document on the Internet]. c2020 [cited 2021 May 21]. Available from: https://www.parliament.gov.za/storage/app/media/Pages/2017/october/High_Level_Panel/HLP_Report/HLP_report.pdf
4. Bühne HST. Pettorelli N, Hoffmann M. The policy consequences of defining rewilding. Ambio. 2021. https://doi.org/10.1007/s13280-021-01560-8
5. Ferreira SM, Greaver C, Knight GA, Knight MH, Smit IP, Pienaar D. Disruption of rhino demography by poachers may lead to population declines in Kruger National Park, South Africa. PLoS ONE. 2015;10(6), e0127783. https://doi.org/10.1371/journal.pone.0127783
6. Stoddard E. In the war on rhino poaching, data shows private parks are doing a better job. Daily Maverick. 2021 February 09. Available from: https://www.dailymaverick.co.za/article/2021-02-09-statistics-show-rhino-poaching-in-south-africa-plunged-33-in-2020/
7. Glenn I, Ferreira SM, Pienaar D. Communication on rhino poaching: Precautionary lessons about backfires and boomerangs. S Afr J Sci. 2019;115(3–4), Art. #5585. http://dx.doi.org/10.17159/sajs.2019/5585
8. British Broadcasting Corporation. S Africa rhinos to be evacuated from Kruger National Park. BBC News. 2014 August 12; Africa. Available from: https://www.bbc.com/news/world-africa-28758910
9. Jennings M. The evolution and devolution of journalistic ethics. Imprimis. 1999;28:1–4. Available from: https://imprimis.hillsdale.edu/wp-content/uploads/2016/10/Imprimis-The-Evolution%E2%80%93-and-Devolution%E2%80%93-of-Journalistic-Ethics-Jul-1999.pdf
10. Ball M, Wenham C, Clegg B, Clegg S. What does it take to curtail rhino poaching? Lessons learned from twenty years of experience at Malilangwe Wildlife Reserve, Zimbabwe. Pachyderm. 2019;60:96–104. Available from: https://pachydermjournal.org/index.php/pachyderm/article/view/39
11. Eikelboom JA, Nuijten RJ, Wang YX, Schroder B, Heitkönig IM, Mooij WM, et al. Will legal international rhino horn trade save wild rhino populations? Glob Ecol Conserv. 2020;23, e01145. https://doi.org/10.1016/j.gecco.2020.e01145
12. Lindsey P, Allan J, Brehony P, Dickman A, Robson A, Begg C, et al. Conserving Africa's wildlife and wildlands through the COVID-19 crisis and beyond. Nat Ecol Evol. 2020;4(10):1300–1310. https://doi.org/10.1038/s41559-020-1275-6
13. Le Roex N, Dreyer C, Ferreira SM. Poaching creates ecological traps within an iconic protected area. Anim Conserv. 2020;23(3):250–259. https://doi.org/10.1111/acv.12532
14. Shaw M, Rademeyer J. A flawed war: Rethinking 'green militarisation' in the Kruger National Park. Politikon. 2016;43(2):173–192. https://doi.org/10.1080/02589346.2016.1201379
15. Smith RJ, Muir RD, Walpole MJ, Balmford A, Leader-Williams N. Governance and the loss of biodiversity. Nature. 2003;426(6962):67–70. https://doi.org/10.1038/nature02025
16. Auditor General, South Africa. Auditor-general releases municipal audit results under the theme – "not much to go around, yet not the right hands at the till". Pretoria: Auditor General, South Africa; 2020. Available from: https://www.agsa.co.za/Portals/0/Reports/MFMA/201819/Media%20Release/2020%20MFMA%20Media%20Release%20Final.pdf
17. Madzwamuse M, Rihoy E, Louis M. Contested conservation: Implications for rights, democratization, and citizenship in southern Africa. Development. 2020;63(1):67–73. https://doi.org/10.1057/s41301-020-00237-1
18. Emslie RH, Milliken T, Talukdar B, Burgess G, Adcock K, Balfour D, et al. African and Asian rhinoceroses – Status, conservation and trade. A report from the IUCN Species Survival Commission (IUCN SSC) African and Asian Rhino Specialist Groups and TRAFFIC to the CITES Secretariat pursuant to Resolution Conf. 9.14 (Rev. CoP17). COP18, Doc 83.1, Annex 2 [document on the Internet]. c2018 [cited 2021 May 21]. Available from: https://www.traffic.org/site/assets/files/12220/african-asian-rhinos-iucn-traffic.pdf