

## The white rhino can again be a conservation success

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Across the planet, the loss of large ‘mega’ herbivores is almost complete. Only in Africa is there still a functionally complete suite of free-ranging large herbivores. As Shrader (2022) notes, these large herbivores have always been vulnerable to overharvesting, but demand for the horns of rhinos has made them particularly susceptible to exploitation. Yet, against the odds, by the mid-2000s the conservation and recovery of the white rhino (*Ceratotherium simum*) had become one of the world's greatest conservation success stories (Amin *et al.*, 2006). More recently, this success has morphed into a well-documented struggle, as an epidemic of rhino poaching has accelerated across Africa. Accordingly, Selier & Di Minin (2022) suggested that our finding in Nhleko *et al.* (2022) that the world's largest population of white rhino (Kruger National Park, South Africa) has declined and may continue to do so due to poaching was unsurprising. This assertion, however, misses the major findings of our research. Our paper documented three major findings: (1) there was a compound effect of poaching females, where the loss of one poached female leads to a loss of 5.3 future offspring; (2) poaching losses were exacerbated by climate patterns that are projected to accelerate in the coming decades; and (3) there is still hope that future declines may be abated with rapid management actions (Nhleko *et al.*, 2022). Moreover, there are immense ecological consequences for the future losses of white rhinos projected in Nhleko *et al.* (2022). As ecosystem engineers, the loss of white rhinos and their grazing lawns will certainly alter the composition of species and ecological processes within Kruger National Park (Cromsigt & Te Beest, 2014).

While there is little doubt that the white rhino population is threatened by poaching, there has been considerable debate over the approaches needed to curb the threat of poaching (Derkley *et al.*, 2019). To protect females in Kruger National Park, in Nhleko *et al.* (2022) we suggest several tractable actions that could be implemented by management. These actions include dehorning, translocating, and manipulating the behavior of female white rhinos, coupled with harsher punishments for poaching them. While Shrader (2022) and Selier & Di Minin (2022) agree with these suggested management actions, Selier and Di Minin argue for additional slower, longer-term, and more contentious policy-based solutions that consider the global population of white rhino.

While it will likely do little good for the Kruger's population of white rhinos, Selier & Di Minin (2022) suggest that private landowners should play a critical role in the conservation of all white rhinos. One of the reasons for the apparently better anti-poaching outcomes on private lands compared with public ones is the size of the areas. Smaller private lands, as well as smaller state-protected areas, have several advantages for combatting poaching, such as heightened situational awareness, controlled access to the lands, easier opportunities to maintain high staff integrity, intensive rhino monitoring, and sufficient resources (Ferreira & Dziba, 2021). One way to apply these advantages to larger protected areas with vast expanses of wilderness may be to break them into small semi-autonomous management zones (Ferreira & Dziba, 2021). By leveraging the anti-poaching successes of smaller protected areas, the world may be better positioned to maintain intact complements of megaherbivores across the few vast tracks of wilderness that are rarely found left on the planet, much less on private lands (Young *et al.*, 2016).

Additionally, Selier & Di Minin (2022) argue for a controversial policy to legalize the trade of rhino horns. One argument they make for legalization is that it may generate funding for the local communities surrounding the areas with rhino populations. We believe that the long-term viability of large conservation areas, with or without rhino populations, necessitates the creation of more inclusive models of conservation that increase ownership rights and strengthen the livelihoods of the communities surrounding them (McCleery *et al.*, 2020). In our opinion, the need to expand the responsibilities and benefits of conservation areas to the adjacent communities should not be predicated on or tied to a legal trade in rhino horn.

Despite any difference in our approaches to conserving white rhino populations in Kruger National Park, as Shrader (2022) and Nhleko *et al.* (2022) point out, there are reasons to believe that this population can begin to grow again. Although potentially masked by governments' global response to the COVID-19 pandemic, there is currently some evidence that poaching is decreasing in Kruger National Park (Ferreira *et al.*, 2021). This is highly encouraging given our finding that with a 50% reduction in poaching from 2019 levels, the population should begin to recover (Nhleko *et al.* 2022). Accordingly, as asserted by Selier & Di Minin (2022), it is now the time for bold actions to combat the decline of white rhinos. For these reasons, while fierce policy debates continue (Derkley *et al.*, 2019), we advocate for the rapid on-the-ground management strategies suggested in Nhleko *et al.* (2022), as well as the implementation of smaller semi-autonomous management zones in Kruger National Park that will improve operational efficacy. These actions should be implemented, rigorously assessed, and recalibrated; not crippled by the theoretical debates and infighting that can stymie the conservation of iconic wildlife like rhinos (Velho *et al.*, 2012). Management actions should also be paired with broader long-term efforts to include local communities in the governance and benefits of conservation areas. By taking swift and practical actions that are within the control of local managers, there is real hope that the white rhino can again become a conservation success for Africa and the planet.

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