



# The conservation contribution of the Platinum Rhino southern white rhino Captive Breeding Organization

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The assessment represents the views of the majority of the AfRSG.

## Summary

Platinum Rhino (previously Buffalo Dream Ranch), a registered captive breeding organization (CBO) in South Africa, has built up significant biological assets in the form of about 2,000 southern white rhinos. While this is a major conservation achievement, insights and considerations of southern white rhinos and of their contributions to various values for ecosystems and people suggest that rhino conservation is not simply just about the total number of rhinos. Thriving African rhinos play key ecological roles within ecosystems, within which their evolution depends on their genetic health, not just on population numbers; they are valued by people as iconic species; and contribute to human well-being.

While these factors are generally recognized, the AfRSG perceives a variety of more specific views, values and expectations associated with rhinos and the role that this species has. The AfRSG thus relied on international guidelines on captive breeding priorities, species outcomes, species and ecosystem trade-offs and informed awareness outcomes to guide a systematic assessment of the conservation contribution of the Platinum Rhino population.

It is important to note that the varied professional views of the AfRSG's members mean that this assessment dealt with some value judgements on which the group did not have consensus. These differences arise particularly from the business rationale for Platinum Rhino. Notwithstanding these reservations, the group as a whole recognized the innovative rhino breeding practices demonstrated by the project, resulting in a significant addition to the global white rhino population, and agreed that the following rhino conservation issues are currently relevant to Platinum Rhino.

International guidelines for captive, semi-captive or semi-wild breeding projects identify intensive breeding as an important tool when a species is highly threatened.

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Southern white rhinos have an IUCN Red List “Near Threatened” conservation status, and the lowest risk of extinction of the five extant rhino species. Excluding *ex-situ* collections, there were 15,940 southern white rhinos in the global population reported at the end of 2021. The assessment of the conservation contribution of Platinum Rhino must therefore take into account: a relatively low urgency for captive breeding approaches; want of a clear conservation needs analysis at the start of the initiative; very low benefits for other species; and limited benefits for broader ecosystems. Platinum Rhino is, however, assessed as making useful contributions to education, awareness, and research, while increasing southern white rhino numbers and taking some steps to maintain genetic diversity.

Because the Platinum Rhino project was initiated without an objective conservation needs assessment, discussion, guidance or integration into broader scientific perspectives and expertise, the project managers bear responsibility for the outcome, which is clearly positive in terms of rhino numbers, but raises questions about the future of those rhinos.

The natural capital of Southern white rhino within the Platinum Rhino herd likely has significant conservation value for potential rewilding options. Options for rewilding, however, can only be fully assessed if consideration is paid to trade-offs against purchase costs of rhinos sourced from Platinum Rhino, the costs and constraints in rewilding semi-intensively bred rhinos, and the opportunity costs pertaining to other rhino conservation opportunities that may involve similar annual expenditure. The net result is that the scope for improvement in the conservation contribution of Platinum Rhino is narrow and is dependent upon it developing options for rewilding southern white rhinos effectively while enhancing “soft outcomes” by developing educational and awareness opportunities, promoting opportunities for new ownership and ownership models and further enhancing the research output.

The AfRSG will support authorities in the objective evaluation of all potential options and the contribution to outcomes for rhinos and the roles they play in ecosystems as well as values they have for people.

## Background

Platinum Rhino is a registered captive breeding organization<sup>2</sup> within South Africa. The initiative sold and removed black rhinos, some of which were reintroduced to Eswatini. The context is thus a registered captive breeding organization (CBO<sup>3</sup>) that focuses on southern white rhino at present.

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<sup>2</sup> Note that this assessment does NOT focus on compliance with CBO guidelines. The South African Rhino Lab provided Minimum Standards Guidelines: (1) Encourage larger scale initiatives whilst discouraging fragmentation of landscape with proliferation of many smaller initiatives; (2) Minimum requirements regarding water and shade; (3) Supplementary feeding should be < 50% energy needs; (4) Minimum founder number of at least 20 animals; (5) At least 50:50 sex ratio or skewed toward females; (6) Potential ECC for growth to 5%+ and preferably a population of >100; (7) Bull camp and breeding camp; (8) Minimum ratio of four females to male in breeding camp; (9) At least three bulls in breeding camp (e.g. 2 adults and 1 subadult bull); (10) Genetic data guide bull turnover frequency to mimics degree of breeding domination found in wild populations; and (11) At least 75% of adults in breeding camp are breeding females. Platinum Rhino complied to these.

<sup>3</sup> Platinum rhino qualifies as a CBO on account of its more intensive management and different from “wild” populations. The operation has a higher than natural stocking rate made possible by 1) partial supplementary feeding that for much of the year contributes just under half of the animals’ diet and 2) the use of a dual camp system where, except for bad droughts, half the area is rested over the growing season each year. While mating is natural the sex ratio in breeding camps is heavily skewed towards females who as a result have limited mate choice. The operation also has some all-male camps and an

In addition, there was also an independent assessment of the Platinum Rhino (then Buffalo Dream Ranch) southern white rhino population's genetic and demographic viability, its role in meeting South Africa's Southern White Rhino Biodiversity Management Plan, and its status in African continental rhino conservation, considering the application to register as a CBO with CITES<sup>4</sup>. At the time, the initiative fitted the definition of a semi-intensive conservation system defined in population "wildness" terms. It also fitted the definition of a "controlled environment" as defined in CITES Resolution Conf. 10.16 (Rev.), terminology point d), and is classed as CBO by the South African National Biodiversity Institute (SANBI). In addition, although no CBOs existed in the 1990s, the initiative best aligns with a semi-wild classification<sup>5</sup> in a continuum of wild to captive<sup>6</sup> and was considered as such in the most recent IUCN Red Listing assessment<sup>7</sup>.

Population level performances reported previously at an AfRSG members meeting in 2019<sup>8</sup> highlighted that Platinum Rhino is a professionally run initiative with good rhino breeding success, but which had large challenges of financial sustainability. The initiative recorded good birth rate performance while data did not suggest the presence of F1 problems typical of many intensive captive breeding initiatives.

Platinum Rhino keeps southern white rhinos in individually fenced dual-camp areas (of 200 to 573 hectares for breeding camps), supplied with supplementary feed for up to 48% of their annual dietary needs, and can use natural grazing for 52% of their diet<sup>9</sup>. Many staff provide daily rhino monitoring, camp maintenance and basic security, rhino husbandry, and veterinary needs. Ecologically the camps are monitored and managed according to ecological guidelines including full growing-season veld resting of camp-halves every alternate year and maintaining of southern white rhino below maximum allowable densities.

Between 27 and 157 southern white rhinos were introduced annually from 2008 to 2016, sourced from 98 different sites in South Africa. Of the total 957 introductions, 299 were male and 658 were female. Of the 1050 births, 183 were conceived off site before the mother's translocation. By 2018, 865 calves were conceived and born at the facility - the F1 generation. Two calves born to F1 mothers were first F2 generation. Biological management actions to ensure diverse founder genetics are undertaken through provision of a choice of 2 to 7 breeding males provided per 20-50 females per

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orphanage. The risk of inbreeding is minimised by occasional removal of breeding bulls to allow other non-related younger bulls growing up in the area to take over breeding. The rhinos are also routinely inoculated to protect them against *Clostridium* and are dehorned at intervals for security.

<sup>4</sup> Adcock, K, Knight, M.K, Emslie, R. & van Houwald, F. 2018. Assessment of the Buffalo Dream Ranch captive breeding operation's white rhino population status and performance. AfRSG, SCC IUCN. Report available from Keryn Adcock, kerynrhino@gmail.com.

<sup>5</sup> "Semi-wild" is usually in small (<10 km<sup>2</sup>) areas where rhinos live at compressed density and spacing with routine partial food supplementation with a high management intensity, but with a natural breeding system. Differentiation between captive, wild and semi-wild focuses on the intensity of manipulated breeding. At high intensity, managers control mating opportunities between individuals to achieve predetermined genetic goals using pedigree analysis. Platinum Rhino partially control mating opportunities and limit mate choice for females through skewed sex ratios in breeding camps, but use no veterinary interventions and assisted reproduction techniques. Platinum rhino appears to be best described as a form of "semi-wild" operation rather than "captive" operation on the basis of the compressed density, partial supplementary feeding with significant grazing of natural veld grasses, limited veterinary interventions (occasional clostridium inoculations and security dehorning), female biased skewed sex ratios in breeding camps but with some mate choice.

<sup>6</sup> Leader-Williams, N., Brett, R.A., Brooks, P.M., Craig, J., du Toit, R.F., Emslie, R.H., Knight, M.H., Stanley-Price, M. and Stockil, C. 1997. A scheme for differentiating and defining the different situations under which live rhinos are conserved. *Pachyderm* 23 pp24-28.

<sup>7</sup> Emslie, R. 2020. *Ceratotherium simum*. The IUCN Red List of Threatened Species 2020: e.T4185A45813880. <https://dx.doi.org/10.2305/IUCN.UK.2020-1.RLTS.T4185A45813880.en>

<sup>8</sup> Emslie, R. & Adcock, K. Unknown. Independent demographic analysis of performance of South Africa's largest white rhino CBO. Presentation to the AfRSG. Available from Richard Emslie, rhemslie@gmail.com.

<sup>9</sup> Adcock, K, Knight, M.K, Emslie, R. & van Houwald, F. 2018. Assessment of the Buffalo Dream Ranch captive breeding operation's white rhino population status and performance. AfRSG, SCC IUCN. Report available from Keryn Adcock, kerynrhino@gmail.com.

breeding camp. Managers replace breeding males periodically and remove subadults to create new sub-populations of mixed genetics in new camps. The population most likely provides the widest genetic base for southern white rhino outside of Hluhluwe-iMfolozi Park and Kruger National Park<sup>10</sup>.

The population grew on average at 8.7% per year from 2008-2018 with 32 rhinos lost to poaching over the period. Following significant additional security expenditure and upgrades the operation has not lost rhino to poaching since March 2017, contrasting patterns of poaching elsewhere in the larger wild populations<sup>11</sup>. Mortality rates excluding poaching is below 4% per year. The performance greatly exceeds that in much more intensively managed overseas captive breeding establishments. The population was rated as a Continentally Key 1 Southern white rhino population (> 100 animals and stable or increasing over the last five years), based on individuals being genetically the same as wild populations, allowing mate choice albeit from a reduced male pool, management noting largely normal social behaviours, and reasonable exposure to natural food.

The report highlighted that the population constitutes a viable and valuable contingency operation for the protection and production of southern white rhino at a time of major poaching threats. It noted the potential to help restock sites within South Africa and Africa if needed, and to supply international approved operations that wish to breed southern white rhino for approved purposes.

Note that Platinum Rhino employs over 100 specialist staff who provide the expertise to manage this complex operation including biological management, administration and implementing a highly sophisticated security system protecting rhinos.

By 2023, the general approaches at Platinum Rhino remains the same as those when the assessment of the initiative was made in 2018. At present, Platinum Rhino thus has a highly intensive and effective rhino security approach, but this comes with high costs. Biological management contributes to and are informed by regular intensive monitoring of the rhinos. Breeding rates have been enhanced by actions such as skewing sex ratios and survival enhanced through supplementary feeding<sup>12</sup> with rations adapted to the area. The sourcing of southern white rhinos from various localities helped Platinum Rhino to create a genetically diverse population<sup>13</sup> and also provided options for many owners who were looking to get rid of their southern white rhino due to the poaching risks, greatly increased costs of security and declining economic incentives to conserve rhinos<sup>14</sup>.

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<sup>10</sup> Adcock, K, Knight, M.K, Emslie, R. & van Houwald, F. 2018. Assessment of the Buffalo Dream Ranch captive breeding operation's white rhino population status and performance. AfRSG, SCC IUCN. Report available from Keryn Adcock, kerynrhino@gmail.com.

<sup>11</sup> While Platinum Rhino noted individual numbers that doubled, other large wild populations have suffered declines due to unsustainable levels of poaching. The Kruger National Park population of white rhinos has declined by an estimated 79% from 2011 to 2021.

<sup>12</sup> 75% of the supplementary feed is in the form of grass silage and grass, cut and baled from the project itself during the growth season. The remaining 15% is in the form of maize stover, lucerne, molasses and a Vitamin and Mineral Premix. Michelle Otto, Platinum Rhino.

<sup>13</sup> This is relative as all southern white rhino alive today can trace their ancestors back to what was once a single small population in what is today Hluhluwe-iMfolozi Park. Rhinos were only sourced from Kruger National Park in 2009 and Hluhluwe iMfolozi Park in 2013. The remaining rhino introduced were from other rhino custodians who chose to disinvest in rhino due to poaching and financial constraints especially in 2015/2016.

<sup>14</sup> Clements, H.S., Knight, M., Jones, P. and Balfour, D., 2020. Private rhino conservation: diverse strategies adopted in response to the poaching crisis. *Conservation Letters*, 13(6), p.e12741.

## Terms of Reference

Platinum Rhino approached the AfRSG seeking endorsement of the conservation contribution of their initiative as part of placing the entire project on the market<sup>15</sup>. The AfRSG is, however, mindful of the risks that may link to a need primarily as part of marketing the initiative. In addition, at the AfRSG Members meeting of 2022 and several subsequent workshops, a strong philosophy is developing to focus on meta-population<sup>16</sup> management and to reduce the focus on numbers alone over the next decade.

In this context, the term of references for this document is to provide an objective perspective of the conservation contribution of the Platinum Rhino initiative using a set of universally accepted criteria. The AfRSG thus first developed a draft set of criteria to guide such a perspective and then evaluated the extent to which the Platinum Rhino initiative complies with these criteria as the basis for a conservation contribution assessment<sup>17</sup>. The same approach could be applied to assess any rhino population although the standards may require further development.

Note that perspectives of specialist group members vary. The report thus captures these as different views and perceptions where appropriate.

## Conservation contributions

Expert guidance on conservation contribution criteria for evaluation is available from the Species Conservation Planning Task Force<sup>18</sup> as well as Guidelines on the Use of *Ex Situ* Management for Species Conservation<sup>19</sup> of the International Union for the Conservation of Nature (IUCN). This focuses on five steps including (1) status review and threat analyses; (2) potential role and goals of *ex situ* management; (3) *ex situ* population management and type; (4) feasibility assessments and likelihood of success; and (5) decision analyses of potential conservation objectives and actions. These aspects highlight key elements of identifying the need for captive breeding as part of a suite of activities<sup>20</sup> and what the objectives would be. It provides the basis of criteria linked to the vision of an initiative (Table 1). Note, Platinum Rhino is not *ex situ*, but as registered CBO implements captive breeding techniques, a key activity typically used as part of *ex situ* conservation approaches<sup>21</sup>.

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<sup>15</sup> <https://www.cnandco.com/worlds-largest-private-rhino-conservation-project-to-be-auctioned/>

<sup>16</sup> Note that meta-population describes populations in which interacting local groups exist in discrete habitat patches. Suitability of habitat varies across these patches, resulting in asynchronous birth and death rates between patches, colonization and extinction of species within a patch, and dispersal between local populations. This makes predictions that does not maximize population growth everywhere. See Hanski, I., 1999. *Metapopulation ecology*. Oxford University Press.

<sup>17</sup> Members that provided input: P Goodman, M Knight, D Balfour, M Hofmeyr, M Reilly, F von Houwald, K Adcock, R Emslie, N Anderson, R du Toit, J Shaw, H Dublin, M Reilly, M t'Sas Rolfes, P Jones, L Vigne & S Ferreira

<sup>18</sup> UCN/SSC (2008). *Strategic planning for species conservation: a handbook. Version 1.0*. IUCN Species Survival Commission, Gland, Switzerland. 104 pp.

<sup>19</sup> IUCN/SSC (2014). *Guidelines on the use of ex situ management for species conservation. Version 2.0*. IUCN Species Survival Commission, Gland, Switzerland.

<sup>20</sup> McGowan, P.J., Traylor-Holzer, K. and Leus, K., 2017. IUCN guidelines for determining when and how ex situ management should be used in species conservation. *Conservation Letters*, 10(3), pp.361-366. <https://doi.org/10.1111/conl.12285>

<sup>21</sup> Ex situ conservation is the technique of conservation of all levels of biological diversity outside their natural habitats through different techniques like zoo, captive breeding, aquarium, botanical gardens, and gene bank.

A key element is that a CBO programme may serve multiple purposes including (1) acting as an insurance population, preserving options for future conservation strategies; (2) temporary rescue, protecting against catastrophes or predicted imminent threats; (3) demographic manipulation; (4) source for population restoration, either to re-establish the species in part of its former range or to reinforce an existing population (demographically and/or genetically); and (5) source for ecological replacement to re-establish a lost ecological function and/or modify habitats, or for assisted colonization to introduce the species outside of its indigenous range to avoid extinction. In addition, the AfRSG has used population rating systems to identify the importance of a specific population<sup>22</sup>. A revised rating approach<sup>23</sup> recognises that larger populations with founder sizes of 20+ unrelated individuals growing at a faster rate are of greater importance than slow growing or declining small populations with only a few founders. The system recognises that the importance of different populations also varies according to their genetic diversity. These features focus on criteria that reflect the species dynamics itself<sup>24</sup> and provides the basis of criteria linked to a species outcome (Table 1).

The European Association of Zoos and Aquaria (EAZA) highlights numerous softer outcomes as elements of contributing to conservation<sup>25</sup>. This includes donating time, personnel, finances, knowledge or materials to invest in a specific cause. A key element is providing resources to a third party to invest in a specific cause aiming to secure long-term populations of species in natural ecosystems and habitats. This provides aspects such as education and awareness that addresses specific threats or constraints to the conservation of the species or its habitat, as well as research and/or training that will directly benefit conservation of the species. The AfRSG identified two criteria recognizing these soft outcomes (Table 1).

Although captive breeding is an important ingredient of species recovery initiatives<sup>26</sup> with variable successes noted for rhinos<sup>27</sup>, the focus on maximizing births and reducing deaths result in initiatives removing most threats from localities where such programmes are taking place<sup>28</sup>. Several rhino recovery initiatives, especially when establishing new populations in free-ranging conditions, had similar approaches of minimising deaths linked to management actions or poaching while enhancing births through lowering rhino densities. These can have consequences that require trade-

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<sup>22</sup> Available from Richard Emslie, rhemsle@gmail.com

<sup>23</sup> Draft process available from Raoul du Toit, r.dutoit@rhinos.org

<sup>24</sup> Akçakaya, H.R., Bennett, E.L., Brooks, T.M., Grace, M.K., Heath, A., Hedges, S., Hilton-Taylor, C., Hoffmann, M., Keith, D.A., Long, B. and Mallon, D.P., 2018. Quantifying species recovery and conservation success to develop an IUCN Green List of Species. *Conservation Biology*, 32(5), pp.1128-1138. <https://doi.org/10.1111/cobi.13112>

<sup>25</sup> <https://www.eaza.net/assets/Uploads/Guidelines/Contribution-to-conservation-definition-2015-04-Revisions.pdf>

<sup>26</sup> Mallinson, J.J., 1995. Conservation breeding programmes: an important ingredient for species survival. *Biodiversity & Conservation*, 4, pp.617-635. <https://link.springer.com/article/10.1007/BF00222518>

<sup>27</sup> In the case of Sumatran rhino - a historical focus on captive breeding rather than putting effort into consolidating outliers and properly protecting existing wild rhino and/or enhancing their habitat quality did not have desired outcomes. Of nearly 40 individuals that had been taken from the wild to stock breeding centres died. Way Kambas Sanctuary produced 3 Sumatran rhino calves in 10 years, a low breeding performance using standard demographic measures. Some reflections suggest that for southern white rhinos, less intensive semi-wild and wild operations may produce better outcomes provided animals can be protected. Black rhino in captivity have also historically had a number of problems in more intensive captive zoo situations (e.g., iron overload). Fortunately, improvements in husbandry of all rhino species have overcome these limitations.

<sup>28</sup> Cohn, J.P., 1988. Captive breeding for conservation. *BioScience*, 38(5), pp.312-316. <https://doi.org/10.2307/1310732>

offs for other species as well as ecosystem functioning<sup>29</sup>. This provides the basis of trade-off criteria linked to CBOs that are *in situ* (Table 1).

The AfRSG collated information largely from published sources to evaluate how Platinum Rhino complies with standards and assigned a rating of low (score 1), medium (score 2) or high (score 3) based on the available information. When no information was available, a specific standard was not assessed.

To help calculate a “conservation contribution functionality” the vision and species outcomes criteria received a weighting of 3, the species and ecosystem trade-offs a weighting of 2 and the soft outcomes a weighting of 1. The sum of the weighting score multiplied by the rating score expressed as a percentage of the sum of the weighting score multiplied by all rating scores being 3 (or high and thus all standards were fully complied with) provided the basis of a conservation contribution functionality which could range from 33.3% to 100% using this approach. The resultant scores were rescaled so that an initiative that has all scores as ‘low’ reflect little “conservation contribution functionality” indicated by 0%. The AfRSG also considered how Platinum Rhino at present could improve their conservation contribution functionality in the context of the draft standards that the AfRSG developed as part of this assessment.

This report thus provides an assessment of these identified criteria and standards as an attempt of an objective approach to evaluating the conservation contribution of a CBO. Here, the AfRSG apply this approach to the initiative of Platinum Rhino.

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<sup>29</sup> Carruthers, J., 2008. " Wilding the farm or farming the wild"? The evolution of scientific game ranching in South Africa from the 1960s to the present. *Transactions of the Royal Society of South Africa*, 63(2), pp.160-181. <https://hdl.handle.net/10520/EJC91951>

**Table 1.** Conservation contribution criteria and standards informing the conservation contribution of captive breeding organizations linked to rhinos.

Category	Criterion	Predictions or standard required
Vision	The need for a captive breeding approach	The more threatened a rhino species, the higher the likelihood of establishing captive breeding initiatives or approaches
	Objectives are primarily conservation focused	The provision of rhinos for rewilding purposes would primarily carry non-commercial operational costs
Species Outcome	Trends in global numbers	Continental numbers of southern white rhinos should increase over time
	Genetic inbreeding effects minimized	Detailed studbooks and genetic assessments inform husbandry and interventions
		Risks of domestication is low
		Mate choice retains natural selection and evolutionary potential
		Scope for uninterrupted natural behaviour is high <sup>30</sup>
	Acting as an insurance population	Exponential population models should be consistently the best for describing time series of captive bred rhino population sizes
		Birth and survival rates should be at the high ends of the spectrum with narrow variance.
		Density dependent cascades of vital rates <sup>31</sup> would collapse in CBOs
	Acting as a source for rewilding	There should be regular, and significant and successful re-introductions in the wild or free-ranging conditions within the historical distribution of southern white rhinos
		The status of re-introduced or supplemented populations should improve – populations are increasing and/or genetic integrity should be enhancing
Importance of a population relative to other populations	More important populations should have a high population rating score within the AfrSG's population rating system	
Species Trade-offs	Other species form part of an initiative	Species with a high level of threat are part of a captive breeding initiative
Ecosystem Trade-offs	Functioning role of rhinos in ecosystems	Good ecological representation of biomes of the region with high levels of irreplaceability
		Act as an important spatial link in the conservation landscape of the region
		Robust ecological resilience <sup>32</sup> within CBO properties as indicated through natural values status in METT assessments
		Improved ecological resilience at re-introduction sites where rhinos were absent for some time as indicated by natural values status in METT assessments
Soft Outcomes	Education and awareness	Conservation contributing CBOs will have well developed education and awareness programmes with a focus on rhinos
	Research	Conservation contributing CBOs will have research strategies and demonstrated outputs

<sup>30</sup> In practical terms it means the extent to which natural behaviour of rhinos is compromised by the non-free-range circumstances of a CBO is not sufficient to cause these rhinos to lose their potential for being rewilded.

<sup>31</sup> Calf survival, then fecundity and then adult survival decrease in that sequence as density increase or environmental conditions deteriorate. Eberhardt, L.L., 2002. A paradigm for population analysis of long-lived vertebrates. *Ecology*, 83(10), pp.2841-2854. [https://doi.org/10.1890/0012-9658\(2002\)083\[2841:APFPAO\]2.0.CO;2](https://doi.org/10.1890/0012-9658(2002)083[2841:APFPAO]2.0.CO;2)

<sup>32</sup> e.g., there is a small difference between the expected biodiversity and observed biodiversity.



## Criteria to evaluate the contribution to rhino conservation

Criterion	Standards	Compliance <sup>33</sup>	Potential
Vision			
The need for a captive breeding approach <sup>34</sup>	The more threatened a rhino species, the higher the likelihood of establishing captive breeding initiatives	LOW	LOW
<p><b>Evidence</b></p> <p>Southern white rhino is the most abundant rhino species globally<sup>35</sup> and has an IUCN Red Listing status of Near Threatened<sup>36</sup>. Black rhinos are critically endangered<sup>37</sup>. Within South Africa, the sub-species southern white rhino has a regional conservation status also of Near Threatened<sup>38</sup>, whereas the native south-central as well as south-western black rhino are Endangered<sup>39</sup>.</p> <p>Rhinos performed well in free-ranging conditions in optimal sized areas where cost-efficient access control, situational awareness, proud staff with integrity, and detailed monitoring of rhinos realize<sup>40</sup>.</p> <p>Platinum Rhino focuses on the most abundant rhinos with the best relative conservation status.</p>			
<p><b>Varying Views and Perceptions</b></p> <p>Opinions for the need of captive breeding approaches varies. These originate from interpretations that conflate the need versus the purpose that can be varied<sup>41</sup>.</p> <p><i>Perspectives upholding a need for captive breeding approaches</i></p> <p>Some viewpoints highlight that although, at presently, southern white rhino is deemed the least threatened, cognisance must be taken that the majority of rhino being poached are southern white rhino. South Africa's southern white rhino population decreased from 18,213 in 2015 to 12,968 in 2021 with a large part linked to losses in the Kruger National Park, one of the strongholds for the species. Thus, initiatives such as the Platinum Rhino should therefore not be dismissed because the focal rhino species is not deemed threatened enough at present.</p> <p>Linked are views that southern white rhino could potentially come under threat again given ongoing poaching pressure albeit reducing since 2015<sup>42</sup> with demand for horn in Asian markets still existing although horns entering the illegal market</p>			

<sup>33</sup> Compliance refers to the degree that the initiative meets the standards specified for the relevant criterion.

<sup>34</sup> Captive breeding is often pre-mature and should not be employed before evaluation of costs and benefits of all alternatives as guided by the One Plan Approach of the Conservation Planning Specialist Group.

<sup>35</sup> Ferreira, S.M., Ellis, S., Burgess, G., Baruch-Mordo, S., Talukdar, B., and Knight, M.H. 2022. African and Asian Rhinoceroses – Status, Conservation and Trade. <https://cites.org/sites/default/files/documents/E-CoP19-75-R1.pdf>

<sup>36</sup> Emslie, R. 2020. *Ceratotherium simum*. The IUCN Red List of Threatened Species 2020: e.T4185A45813880. <https://dx.doi.org/10.2305/IUCN.UK.2020-1.RLTS.T4185A45813880.en>

<sup>37</sup> Emslie, R. 2020. *Diceros bicornis* ssp. *minor*. The IUCN Red List of Threatened Species 2020: e.T39321A152729173. <https://dx.doi.org/10.2305/IUCN.UK.2020-1.RLTS.T39321A152729173.en>

<sup>38</sup> Emslie R, Adcock K. 2016. A conservation assessment of *Ceratotherium simum simum*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

<sup>39</sup> Emslie RH, Adcock K. 2016. A conservation assessment of *Diceros bicornis*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

<sup>40</sup> Ferreira, S.M. and Dziba, L., 2021. Where are rhinos safest? *South African Journal of Science*, 117(9-10), pp.1-3. <http://dx.doi.org/10.17159/sajs.2021/11300>

<sup>41</sup> McGowan, P.J., Traylor-Holzer, K. and Leus, K., 2017. IUCN guidelines for determining when and how ex situ management should be used in species conservation. *Conservation Letters*, 10(3), pp.361-366. <https://doi.org/10.1111/conl.12285>

<sup>42</sup> Ferreira, S.M., Ellis, S., Burgess, G., Baruch-Mordo, S., Talukdar, B., and Knight, M.H. 2022. African and Asian Rhinoceroses – Status, Conservation and Trade. <https://cites.org/sites/default/files/documents/E-CoP19-75-R1.pdf>

were reducing by 2020<sup>43</sup>. These interpretations place high value on Platinum Rhino acting as an insurance population, a key criterium as part of evaluating species outcomes (see the assessment of acting as an insurance population later).

### *Perspectives questioning a need for captive breeding approaches*

Perspectives highlight risks that when captive breeding is proposed, especially with a poor track record, then removing rhinos from the wild, if not just the unviable isolated animals, may push a wild population over the edge when perhaps, if not depleted, it may recover with better habitat management and protection. Interpretation reflects that the more difficult it is to protect rhinos in the wild and the greater the poaching losses the higher the need for some form of insurance breeding in situations where the animals can be better protected. Like the above, see the criterium on acting as an insurance population.

The above view highlight risks and how it relates to future values<sup>44</sup>. The willingness to pay the 'premium' lies largely with the risk<sup>45</sup>. No formal assessments of latent extinction risks of rhinos are available, but it is likely that southern white rhinos will have the lowest latent extinction risk.

Some risks link to disinvestment on cost-efficient optimally sized areas for free-ranging rhinos that could further lead to opportunity costs for other conservation initiatives. As part of evaluating cost and benefits of all approaches to rhino conservation, a key element is to consider the likely impact in the absence of a captive breeding initiative. It is likely that the impact would be small as, for instance, a viable total population in the former southern African range of southern white rhino would still be achieved by existing wild populations, provided they are large enough.

An additional consideration is priorities<sup>46</sup> and additional conservation outcomes. For instance, national authorities would consider whether investing costs of captive breeding initiatives in the numerous marginally sustainable private and state populations of wild rhino, found on land with a much higher conservation value, and important populations of other endangered species, and which form important links in South Africa's conservation estate may provide broader conservation outcomes. See later aspects on ecosystem outcomes.

In this context and in the absence of formal needs assessment in collaboration with rhino expertise, Platinum Rhino was a high-risk investment in southern white rhino captive breeding that was of lower priority compared to other rhino species discounting technical challenges.

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<sup>43</sup> Ferreira, S.M., Ellis, S., Burgess, G., Baruch-Mordo, S., Talukdar, B., and Knight, M.H. 2022. African and Asian Rhinoceroses – Status, Conservation and Trade. <https://cites.org/sites/default/files/documents/E-CoP19-75-R1.pdf>

<sup>44</sup> Cardillo, M., Mace, G.M., Gittleman, J.L. and Purvis, A., 2006. Latent extinction risk and the future battlegrounds of mammal conservation. *Proceedings of the National Academy of Sciences*, 103(11), pp.4157-4161. <https://doi.org/10.1073/pnas.0510541103>

<sup>45</sup> e.g., Willingness to pay medical aid premiums increase as a person age and the likelihood of some death threatening disease or injury increases. Young and fit people's willingness to pay the premium for future medical security is low. Similarly, young, and fit car drivers only carry 3rd party insurance, but as people get older, less capable and many more cars on the road, they carry comprehensive insurance.

<sup>46</sup> A key challenge link to cost-effectiveness to achieve rhino reproduction – trade-offs need to weigh up what would be achieved at a captive breeding facility compared to the outcome of the same investment elsewhere. Although stated costs for running Platinum Rhino varies, the AfRSG Working Group on Buffalo Dream Ranch reported back at the AfRSG Members meeting (20 May 2022) that the monthly expenditure is US\$400,000, while a recent media article (14 February 2023) presented \$280,000 per month. Based on these, the production costs per calf range from \$16,800 to \$24,000 per annum. Adding the costs of translocations and other aspects of "rewilding" may not compare well with the opportunity costs of putting the same expenditure into Intensive Protection at localities for natural breeding of white rhinos with spin-offs for other species including black rhino.

Criterium	Standards	Compliance	Potential <sup>47</sup>
Vision			
Objectives are primarily conservation focused	The provision of rhinos for rewilding purposes would primarily carry non-commercial operational costs	LOW	LOW
<p><b>Evidence</b> No southern white rhinos have been rewilded. Black rhinos were rewilded after being sold.</p>			
<p><b>Varying Views and Perspectives</b></p> <p><i>Perspectives upholding objectives as being primarily conservation focused</i> The mission of Platinum Rhino includes “In order to save the rhino, we need to breed better and protect better”, a goal that has been admirably achieved. After establishment, Platinum Rhino engaged with community leaders, DEFF, WWF, SANParks, Peace Parks and African Parks to start re-introducing southern white rhino back into the wild but did not received interest in an investment of a joint CBO venture that acts as a source (see the assessment of acting as a source for rewilding). This links to an additional goal of making the project financially self-sustaining given the costs of breeding and protecting rhinos within CBO approaches. Platinum Rhino generated income through live sales of surplus rhino, like what Kruger National Park and Hluhluwe iMfolozi Park have done. Platinum Rhino tried to sell rhino horn within South Africa but had very little interest from potential buyers. Some views thus reflect these aspects as covering operational costs.</p> <p><i>Perspectives questioning objectives as being primarily conservation focused</i> Although a strong focus on conservation outcomes is part of the narrative for captive breeding organizations, perceptions remain that the Platinum Rhino initiative was set up to capitalize on the booming live rhino trade even though the live trade market was reducing with many owners disinvesting in rhinos at the time, or produce rhino horn and F2 generation captive-bred animals to enable horn trade, both nationally and internationally, as part of the development of viable commercial models aimed at sustainable utilization of southern white rhino. Part of this is fueled by court cases in South Africa where private owners including Platinum Rhino challenged government policy interventions linked to moratoriums on national rhino horn trade. At the last three CITES Conferences of the Parties, the appetite for international trade in rhino horn has dwindled substantially amongst Parties and remains an unrealistic commercial objective to help achieve overall rhino conservation at present. See some additional perspectives under assessing the opportunities for rewilding.</p> <p>These reflections highlight that by virtue of its biological and ecological management practices, Platinum Rhino was not on a trajectory considered optimal priority for white rhino conservation. A key opportunity is to consider meaningful potential conservation value on offer in one secure place at present. A risk that can realize at disposal of the initiative is widespread dispersal following a fire sale of live animals with uncertain costs including opportunity costs.</p>			

<sup>47</sup> Note that this criterium does not reflect on the technical ability of rewilding rhinos, but rather the intend and purpose. The technical ability is high and captured in the criteria of acting as a source population.

Criterion	Standards	Compliance	Potential
Species outcomes			
Trends in global numbers	Continental numbers of southern white rhinos should increase over time <sup>48</sup>	HIGH Qualified <sup>49</sup>	HIGH
<p><b>Evidence</b></p> <p>Since 2015, southern white rhino numbers decreased from 20,378 to 15,942 in Africa by 2021. There were a further 1,077 southern white rhino ex-situ outside the African continent across the Globe. Within South Africa, southern white rhino numbers were 18,796 in 2010 and declined to 12,968 in 2021. The contribution of southern rhinos owned privately to South Africa's national population increased from 25% in 2010 to 53.4% in 2021<sup>50</sup>. Platinum Rhino made a significant contribution to the private contribution<sup>51</sup>, and this increased over the last decade. Platinum Rhino contributed to offsetting declines elsewhere.</p> <p><b>Varying Views and Perspectives</b></p> <p>Whilst there has been some analysis of the population performance that indicated that the population performed well, the assessment approaches<sup>52</sup> have not been fully discussed and agreed on by the AfRSG.</p> <p><i>Perspectives upholding contribution to trends in global numbers</i></p> <p>The size of the southern white rhino population held by Platinum Rhino is relevant as the contribution to offset poaching elsewhere changes - the more rhinos lost on the continent to poaching, the more important the populations in semi-wild captive breeding facilities become. Continental poaching rates, however, changed from 5.2% in 2015 to 2.4% by 2021<sup>53</sup> with these trends largely reflecting the trends in South Africa where 90% of poaching activities took place primarily in KNP. Part of this trend may be COVID related – e.g., national lockdowns resulted in an 80% reduction in poaching in Kruger National Park<sup>54</sup>.</p> <p>Platinum Rhino has been a successful breeding model for southern white rhinos in terms of adding to the global population of the species through intensive management during a period when thousands of rhinos have been lost from some other large wild populations. The magnitude of rhinos generated, whether a captive breeding approach was needed or not, will provide opportunities that could place the population in an important category (see also the assessment of population importance using the AfRSG population rating system).</p> <p>Some opinions focus on protecting and sustaining viable breeding populations as key and vital for the continued existence of the species. Varied interpretation of concepts such as meta-populations<sup>55</sup> pose some risks. For instance, some</p>			

<sup>48</sup> Note that it is unlikely that a single project may lead to continental rhino numbers increasing. Projects should be contributing to continental rhino number increases, or to slowing down their declines

<sup>49</sup> The rating is qualified because the global population is not increasing, while that of Platinum Rhino increased during the same time. The global decline could have been worse.

<sup>50</sup> Ferreira, S.M., Ellis, S., Burgess, G., Baruch-Mordo, S., Talukdar, B., and Knight, M.H. 2022. African and Asian Rhinoceroses – Status, Conservation and Trade. <https://cites.org/sites/default/files/documents/E-CoP19-75-R1.pdf>

<sup>51</sup> Furstenburg, D., Otto, M., Van Niekerk, P. and Lewitton, D., 2022. Contribution of private game ranching and captive bred operations in South Africa to white rhino *Ceratotherium simum* species survival conservation. *bioRxiv*, pp.2022-09.

<sup>52</sup> Adcock, K, Knight, M.K, Emslie, R. & van Houwald, F. 2018. Assessment of the Buffalo Dream Ranch captive breeding operation's white rhino population status and performance. AfRSG, SCC IUCN. Report available from Keryn Adcock, kerynrhino@gmail.com

<sup>53</sup> Ferreira, S.M., Ellis, S., Burgess, G., Baruch-Mordo, S., Talukdar, B., and Knight, M.H. 2022. African and Asian Rhinoceroses – Status, Conservation and Trade. <https://cites.org/sites/default/files/documents/E-CoP19-75-R1.pdf>

<sup>54</sup> Ferreira, S.M., Greaver, C., Simms, C. and Dziba, L., 2021. The impact of COVID-19 government responses on rhinoceroses in Kruger National Park. *African Journal of Wildlife Research*, 51(1), pp.100-110.

<sup>55</sup> Note that meta-population describes populations in which interacting local groups exist in discrete habitat patches. Suitability of habitat varies across these patches, resulting in asynchronous birth and death rates between patches, colonization and extinction of species within a patch, and dispersal between local populations. This mak

interpretations result in a perception of many places being only males and that the loss of breeding potential through a diminished population of viable adult females, will lead to the compounding effect of loss of future calves due to the gestation period of 16 months. Such interpretations then focus on concerns that if adult breeding cows are not deemed significant for protection now, the lag effect on the metapopulation growth will become relevant quite soon, and hence argue that the breeding population of Platinum Rhino should be recognised as playing a significant role in South Africa's rhino conservation potential and retained as an important CBO.

*Perspectives that are cautious about contribution to trends in global numbers*

A key requirement is asking how many rhinos within a captive breeding approach is enough from a demographic and genetic perspective and is there space to place them in the country (given the constraints facing rhino conservation) or outside. The AfSRG considered these previously through a task force and suggested the temporary stopping of breeding to reduce costs while considering various options<sup>56</sup>. This included an assessment of the population and optional space (and opportunities) to understand if rhinos can be placed at all, where and how many<sup>57</sup>. Note that, the role of a species in ecologically functional ecosystems is a key consideration (see the criterium on ecosystem outcomes as well as rewilding).

Offset value of captive breeding populations carry accentuated disease risks for rhinos. The Platinum Rhino population has highlighted potential health issues/risks that have arisen in such circumstances (e.g., clostridium<sup>58</sup>), as well as other free-ranging small populations<sup>59</sup>, which requires developing and maintaining mitigation measures. In some large wild populations, disease risks also realized – e.g., bovine tuberculosis in southern white rhinos pose little risk to the populations, but Kruger National Park is under quarantine which place large constraints on using rhinos from the park as sources for elsewhere given disease regulations<sup>60</sup>.

In addition, developing meta-population concepts<sup>61</sup> will likely identify populations that are key to the future of a viable national herd and those that are “additional” or “surplus” but not essential – it is not clear that the Platinum Rhino population would be key in this regard and are more likely to fall into the “potentially nice to have” category – but see the assessment of “acting as an insurance population”, “providing rewilding options” and “population importance” using the AfRSG population rating system. Whether this is also true from the international perspective is not clear.

es predictions that does not maximize population growth everywhere. See Hanski, I., 1999. *Metapopulation ecology*. Oxford University Press.

<sup>56</sup> Balfour, D. 2019a. John Hume Working Group Meeting Minutes. Available from Dave Balfour, [environ1@mweb.co.za](mailto:environ1@mweb.co.za).

Balfour, D. 2019b. Buffalo Dream Ranch Discussion Group feedback to plenary, Power Point Presentation. Available from Dave Balfour, [environ1@mweb.co.za](mailto:environ1@mweb.co.za).

Balfour, D. 2019c. Perspectives on the conservation future of the white rhino at Buffalo Dream Ranch. 3 September 2019. Dave Balfour, [environ1@mweb.co.za](mailto:environ1@mweb.co.za)

Balfour, D. 2020a. Perspectives on the conservation future of the white rhino at Buffalo Dream Ranch. 16 April 2020. Dave Balfour, [environ1@mweb.co.za](mailto:environ1@mweb.co.za)

Balfour, D. 2020b. Perspectives on the conservation future of the white rhino at Buffalo Dream Ranch. 22 May 2020. Dave Balfour, [environ1@mweb.co.za](mailto:environ1@mweb.co.za)

<sup>57</sup> Adcock, K, Knight, M.K, Emslie, R. & van Houwald, F. 2018. Assessment of the Buffalo Dream Ranch captive breeding operation's white rhino population status and performance. AfRSG, SCC IUCN. Report available from Keryn Adcock, [kerynrhino@gmail.com](mailto:kerynrhino@gmail.com)

<sup>58</sup> <https://africanconservation.org/35-rhino-die-from-blackquarter-bacteria-on-mega-rhino-farm-in-south-africa/> Note: Clostridium has affected some wild populations, The vaccine developed at Platinum Rhino in response to the threat could benefit populations elsewhere.

<sup>59</sup> e.g. black rhinos, Ndeereh, D., Okita-Ouma, B., Gaymer, J., Mutinda, M. and Gakuya, F., 2012. Unusual mortalities of the eastern black rhinoceros (*Diceros bicornis michaeli*) due to clostridial enterotoxaemia in OI Jogi Pyramid Sanctuary, Kenya. *Pachyderm*, 51, pp.45-51.

<sup>60</sup> Miller, M., Michel, A., Van Helden, P. and Buss, P., 2017. Tuberculosis in rhinoceros: an underrecognized threat?. *Transboundary and emerging diseases*, 64(4), pp.1071-1078.

<sup>61</sup> Note that meta-population describes populations in which interacting local groups exist in discrete habitat patches. Suitability of habitat varies across these patches, resulting in asynchronous birth and death rates between patches, colonization and extinction of species within a patch, and dispersal between local populations. This makes predictions that does not maximize population growth everywhere. See Hanski, I., 1999. *Metapopulation ecology*. Oxford University Press.

Criterion	Standards	Compliance	Potential
<b>Species Outcomes</b>			
Genetic inbreeding effects minimized	Detailed studbooks and genetic assessments inform husbandry and interventions	HIGH	HIGH
	Risks of domestication is low	-	-
	Mate choice retains natural selection and evolutionary potential	MEDIUM	MEDIUM
	Scope for uninterrupted natural behaviour is high	MEDIUM	MEDIUM
<b>Evidence</b>			
<p><i>Studbooks:</i> Platinum Rhino make detailed observations of behaviour and mating to help backtrack dates of births to specific conception dates and likely male rhino that sired the calf. Managers later re-check and confirm relatedness using genetic results and manage rhinos to maximize heterogeneity in the entire population<sup>62</sup>.</p> <p><i>Domestication:</i> A key aspect is the appearance of tameness. No evidence readily available and this standard was not assessed.</p> <p><i>Mate choice:</i> Management provides a choice of 2 to 7 breeding males provided per 20-50 females per breeding camp<sup>63</sup>. Some opportunity for mate choice is thus provided.</p> <p><i>Natural behaviour:</i> No formal study has been conducted, but management interventions seek to discourage over-familiarity with humans. In addition, individuals have space to roam albeit constrained, feed partly on natural grasses, defend calves, and are exposed to natural weather conditions and some other species and small predators.</p>			
<b>Perspectives</b>			
<p>Platinum Rhino has a large genetically diverse and viable breeding population of southern white rhino produced at a time when many reserves recorded population declines or were disinvesting in rhinos<sup>64</sup>. A key aspect of uncertainty is various perceptions of the value of this population linked to the genetic health of these intensely managed rhinos as the practice of 2 to 7 males per 20-50 females may introduce inadvertent selection.</p> <p>Although several traits of domestication of mammals focuses on various anatomical aspects<sup>65</sup>, the key trait shared by all domesticated species is tameness or docility<sup>66</sup>. Management, for instance, focuses on getting orphans as wild as possible as quickly as possible. During the 2018 assessment, management indicated a desire to keep the animals as wild as possible. Management approaches thus most likely keep domestication risk low. There are, however, no formal measures of the symptoms of the domestication syndrome at Platinum Rhino – no assessment was done for the domestication standard.</p> <p>Note, that it is unclear what types of mate choice levels are available in typical free-ranging conditions for comparative purposes.</p>			

<sup>62</sup> Personal Communication, Michelle Otto, Veterinarian, Platinum Rhino.

<sup>63</sup> Adcock, K, Knight, M.K, Emslie, R. & van Houwald, F. 2018. Assessment of the Buffalo Dream Ranch captive breeding operation's white rhino population status and performance. AfRSG, SCC IUCN. Report available from Keryn Adcock, kerynrhino@gmail.com.

<sup>64</sup> Clements, H.S., Knight, M., Jones, P. and Balfour, D., 2020. Private rhino conservation: diverse strategies adopted in response to the poaching crisis. *Conservation Letters*, 13(6), p.e12741.

<sup>65</sup> Wilkins, A.S., Wrangham, R.W. and Fitch, W.T., 2014. The "domestication syndrome" in mammals: a unified explanation based on neural crest cell behavior and genetics. *Genetics*, 197(3), pp.795-808. <https://doi.org/10.1534/genetics.114.165423>

<sup>66</sup> Sánchez-Villagra, M.R., Geiger, M. and Schneider, R.A., 2016. The taming of the neural crest: a developmental perspective on the origins of morphological covariation in domesticated mammals. *Royal Society open science*, 3(6), p.160107. <https://doi.org/10.1098/rsos.160107>

Criterion	Standards	Compliance	Potential
<b>Species Outcomes</b>			
Acting as an insurance population <sup>67</sup>	Exponential population models should be consistently the best for describing time series of captive bred rhino populations	HIGH	HIGH
	Birth and survival rates should be at the high ends of the spectrum with narrow variance.	HIGH	HIGH
	Density dependent cascades of vital rates <sup>68</sup> would collapse in CBOs	-	-
<b>Evidence</b>			
<p><i>Growth models:</i> The population increased exponentially since establishment. Increase was at an average of annual growth of 7.5% in the last five years<sup>69</sup>.</p> <p><i>Vital rates:</i> Average calving rates were 20% and biennial calving 37% of adult females calving per year. Females had a median age of 83.2 months at first calving (IQR 72.9–110.7) and calving intervals of 29.2 (IQR 24.6–34.8) months<sup>70</sup>. The age of first calving of 6.9 years (6.1 – 9.2 years) is like other populations at 6.5 years but have far less variance (4.1 - 13.5 years) than elsewhere. The calving interval of 2.4 years (2.1 – 2.9 years) is within the lower distribution of that noted elsewhere at 2.9 years (1.7 – 5.0 years) and have a narrower range<sup>71</sup>.</p> <p>Mortality rates since the start of the Platinum Rhino project were 3.61% per year overall up to mid-2018 and c.3% in last several years<sup>72</sup>. Elsewhere natural mortality rates vary between 1% and 5% annually depending on age and environmental conditions amongst influences.</p> <p><i>Density-dependence:</i> No information is readily available. The criterion was not assessed.</p>			
<b>Varying Views and Perspectives</b>			
<p>This criterion aligns strongly with the criterion on the need for semi-wild captive breeding approaches. The insurance concept is context specific.</p> <p><i>Perceptions upholding captive breeding operations acting as insurance populations</i> Poaching disrupted rapid exponential growth of southern white rhino dynamics in Kruger. Historically, rapid exponential growth kicked in at about 2,700 southern white rhinos. In the last decade, total loss rates exceeded birth rates<sup>73</sup> predicting 1350 by 2030. If authorities have another 1350 somewhere by 2030, they can retain the re-entering a phase of rapid exponential growth and move southern white rhinos</p>			

<sup>67</sup> Wild populations may experience excessive pressures where the causes of declines have not been removed yet. CBO Practices attempt to reduce all threats (e.g., disease, poaching, predation), limitations (e.g., environmental variability) and regulation (e.g., density-dependence). Practices seek to maximize vital rates.

<sup>68</sup> Calf survival, then fecundity and then adult survival decrease in that sequence as density increase or environmental conditions deteriorate. Eberhardt, L.L., 2002. A paradigm for population analysis of long-lived vertebrates. *Ecology*, 83(10), pp.2841-2854. [https://doi.org/10.1890/0012-9658\(2002\)083\[2841:APFPAQ\]2.0.CO;2](https://doi.org/10.1890/0012-9658(2002)083[2841:APFPAQ]2.0.CO;2)

<sup>69</sup> Furstenburg, D., Otto, M., Van Niekerk, P. and Lewitton, D., 2022. Contribution of private game ranching and captive bred operations in South Africa to white rhino *Ceratotherium simum* species survival conservation. *bioRxiv*, pp.2022-09.

<sup>70</sup> Ververs, C., van Zijl Langhout, M., Hostens, M., Otto, M., Govaere, J., Durrant, B. and van Soom, A., 2017. Reproductive performance parameters in a large population of game-ranching white rhinoceroses (*Ceratotherium simum simum*). *PLoS one*, 12(12), p.e0187751.

<sup>71</sup> South African Scientific Authority. 2019. Non-detriment finding for *Ceratotherium simum simum* (southern white rhinoceros). Government Gazette 650, No. 42660. [https://www.dffe.gov.za/sites/default/files/gazetted\\_notices/nemba\\_nondetrimentfindings\\_whiterhinog42660gn1105.pdf](https://www.dffe.gov.za/sites/default/files/gazetted_notices/nemba_nondetrimentfindings_whiterhinog42660gn1105.pdf)

<sup>72</sup> Personal Communication, Keryn Adcock, kerynrhino@gmail.com.

<sup>73</sup> Ferreira, S.M., Greaver, C., Simms, C. and Dziba, L., 2021. The impact of COVID-19 government responses on rhinoceroses in Kruger National Park. *African Journal of Wildlife Research*, 51(1), pp.100-110. <https://hdl.handle.net/10520/ejc-wild2-v51-n1-a10>

into Kruger if security risks are under control to help recover the gains lost since 2008<sup>74</sup>.

### *Perceptions questioning captive breeding operations acting as insurance populations*

The perception that the sustainability challenges that Platinum Rhino experience can be corrected so that the initiative act as insurance options for what is perceived as State-managed failures carry risks. For one, successes may primarily associate with factors linked to sizes of properties<sup>75</sup> and partnerships managing those<sup>76</sup>, with no demonstrated practice by Platinum Rhino to support acting as insurance populations and a contributor to the needs of wild populations of southern white rhinos elsewhere yet.

Some reflections suggest that exponential growth may not always realize especially if there is no demand currently for rhinos for rewilding as there are no or inadequate incentives and lack of suitable secure funded homes for them. In such a case maximising production won't be the main goal as the initiative will end up with an oversupply. This concern was the basis on which the AfRSG advised the immediate stopping of breeding when asked for advise previously in 2019<sup>77</sup>.

Note that a previous assessment reported 8.7% annual growth from 2008 to 2018<sup>78</sup>, reduced to an average annual growth of 7.5% in the last five years<sup>79</sup>. The population at Platinum Rhino complies with exponential models explaining recent trends, while these exponential growth rates fall within the range noted for some free-ranging large wild populations in the absence of poaching effects – e.g., between 1990 and 2010, Southern white rhino numbers grew at 10% per annum (9.9%, 95% CI: 2.1% - 17.9%) in Kruger National Park<sup>80</sup>.

Some aspects need considerations – the auction documents listed 178 calves under the age of 20 months and 693 breeding age cows. In this context, 25% cows have produced a calf in the last 20 months suggesting a longer calving interval than reported in the literature<sup>81</sup>.

<sup>74</sup> Ferreira, S.M. and Dziba, L., 2023. Rhinoceros accounting in Kruger National Park, South Africa. *Journal for Nature Conservation*, p.126359.

<https://doi.org/10.1016/j.jnc.2023.126359>

<sup>75</sup> Ferreira, S.M. and Dziba, L., 2021. Where are rhinos safest? *South African Journal of Science*, 117(9-10), pp.1-3.

<http://dx.doi.org/10.17159/sajs.2021/11300>

<sup>76</sup> Ferreira, S.M., Ellis, S., Burgess, G., Baruch-Mordo, S., Talukdar, B., and Knight, M.H. 2022. African and Asian Rhinoceroses – Status, Conservation and Trade. <https://cites.org/sites/default/files/documents/E-CoP19-75-R1.pdf>

<sup>77</sup> Balfour, D. 2019a. John Hume Working Group Meeting Minutes. Available from Dave Balfour, [environ1@mweb.co.za](mailto:environ1@mweb.co.za).

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<sup>78</sup> Adcock, K, Knight, M.K, Emslie, R. & van Houwald, F. 2018. Assessment of the Buffalo Dream Ranch captive breeding operation's white rhino population status and performance. AfRSG, SCC IUCN. Report available from Keryn Adcock, [kerynrhino@gmail.com](mailto:kerynrhino@gmail.com).

<sup>79</sup> Furstenburg, D., Otto, M., Van Niekerk, P. and Lewitton, D., 2022. Contribution of private game ranching and captive bred operations in South Africa to white rhino *Ceratotherium simum* species survival conservation. *bioRxiv*, pp.2022-09.

<sup>80</sup> Ferreira, S.M., Botha, J.M. and Emmett, M.C., 2012. Anthropogenic influences on conservation values of white rhinoceros. *PLoS One*.

<https://doi.org/10.1371/journal.pone.0045989>

<sup>81</sup> Ververs, C., van Zijll Langhout, M., Hostens, M., Otto, M., Govaere, J., Durrant, B. and van Soom, A., 2017. Reproductive performance parameters in a large population of game-ranched white rhinoceroses (*Ceratotherium simum simum*). *PLoS one*, 12(12), p.e0187751.



Criterion	Standards	Compliance	Potential
<b>Species Outcomes</b>			
Acting as a source for rewilding <sup>82</sup>	There should be regular, and significant and successful re-introductions in the wild or free-ranging conditions within the historical distribution of southern white rhinos.	LOW	HIGH
	The status of re-introduced or supplemented populations should improve – populations are increasing and/or genetic integrity should be enhancing	-	-
<p><b>Evidence</b></p> <p><i>Incidences of reintroduction:</i> No southern white rhinos have been rewilded from the Platinum Rhino population yet. There is a very good opportunity to use Platinum Rhino as a source for rewilding, supplementary re-introductions and establishing populations with the historical range of southern white rhinos.</p> <p><i>Targeted populations:</i> No populations available for assessing the criterium given no introductions yet.</p>			
<p><b>Varying Views and Perspectives</b></p> <p><i>Perspectives upholding captive breeding approaches acting as sources for rewilding</i> Managers in South Africa have taken southern white rhinos from many small properties to larger ones with no apparent biological problems. In addition, many individuals at Platinum Rhino came from Kruger and have shown adaptability to new environments. The reverse is very likely to apply. Eswatini has successfully released hand raised southern white rhino calves into free-ranging populations without problems and where some individuals have bred. Eswatini also successfully introduced more difficult black rhino from the Platinum Rhino to their reserve.</p> <p>Platinum Rhino does have the potential to contribute to wild rhino conservation outcomes through rewilding the rhinos, since the survival rate of the bred rhinos, when released into a relatively secure free-range situation with adequate security, is likely to exceed their mortality rate as suggested by the AfRSG in 2019.</p> <p><i>Perspectives that are cautious about sources for rewilding</i> Rewilding options are limited financially, logistically or for lack of opportunity. The current costs of the initiative are unsustainable. In addition, it is not clear what the “rewilding market” is for domestic bred southern white rhino, particularly given that there is an abundance of wild bred rhino available given the patterns of density-dependent effects noted across several populations on the continent<sup>83</sup>.</p> <p>The key additional aspect is considering whether the rhinos at captive breeding initiatives like that of Platinum Rhino are “rewildable” not just biologically, but also acceptability within society as a whole and if so, are there any constraints to be considered.</p>			

<sup>82</sup> Captive breeding operations can potentially supplement, rewild, restore etc., individuals into the wild with the purpose of contributing to population dynamics in the wild – i.e., captive bred individuals would be reproducing in the wild.

<sup>83</sup> Ferreira, S.M., Ellis, S., Burgess, G., Baruch-Mordo, S., Talukdar, B., and Knight, M.H. 2022. African and Asian Rhinoceroses – Status, Conservation and Trade. <https://cites.org/sites/default/files/documents/E-CoP19-75-R1.pdf>

Even so, risks when implementing rewilding could realize. Platinum Rhino provides approximately half of rhinos' food source and particularly through the dry season. Removing experience to adapt to seasonal variations/constraints through the dry season may result in less behaviour adaptive capacity to harsh veld conditions should the rhinos be left to fend for themselves in the wild. An additional risk is the unintended introduction of a health issue due to the high density of CBO rhinos compared to a wild locality. At present, no formal assessment of immediate and lag effects of rhinos produced through captive breeding approached re-introduced into former ranges or existing populations exists.

The above context may provide limited opportunities. For instance, there may only be one viable immediate option with large scale suitable habitat that can remove the risk to the industry, bolster conservation outcomes and force conservationists and government to work together. Improving the security situation collectively in Kruger National Park and moving all animals for release after a good rainy season could help reverse the loss experienced, while requiring SANParks and government to address the security issues and having long-term funding available to continue to address the direct and indirect threats. It could provide additional elements such as community donations, ownership, and co-responsibility as a complimentary model in large areas where access, control situational awareness, integrity and detailed knowledge of individual rhinos are hard to achieve as key requirements for the traditional security approaches.

In addition to the reflection on northern Kruger National Park, the AfRSG has highlighted not a shortage of rhinos, but a shortage of safe space for them. This necessitated a strategic shift towards good metapopulation management of evolutionary significant units that occur across a fragmented landscape and not just maximising growth for rhinos continentally anymore. This realization carries risks as not all, including rhino scientists, have accepted these types of responses to new challenges as populations will have different growth rates with some not increasing at all.

These points highlight that the costs and complexities of re-wilding animals may outstrip the costs and complexities of a similar *in situ* investment. It is also then unclear if the current options are cheaper if captive breeding approaches stops.

Criterion	Standards	Compliance	Potential
<b>Species Outcomes</b>			
Importance of a population relative to other populations	Highly important populations should have a high population rating score within the AfRSG's population rating system	HIGH	HIGH
<b>Evidence</b>			
The most recent IUCN Red List Assessment <sup>84</sup> considered the Platinum rhino population as semi-wild and formed part of the national population of South Africa included in official national totals. The Platinum population has been stable or increasing over the last 3-5 years comprising more than 100 rhinos making it a Key 1 population of continental importance.			
<b>Perceptions</b>			
Recently, the AfRSG developed an improved population rating system <sup>85</sup> that considers population growth after poaching and population expansion potential. Rhino production scores are downweighted if there is no population expansion potential. The proposed system also recognises that the importance value of different populations also varies according to their genetic diversity, a function of population growth that affects rates of loss of genetic diversity due to genetic drift, population size, effective founder numbers and whether there is a degree of unnatural manipulation of rhino breeding opposing natural selection. Importance is higher if it is a large, growing and genetically diverse population rather than a small, declining and genetically less diverse one. In addition, if the precision of the population estimate is low, then the scores are downweighted. While still in progress, the proposed improved rating system applied to the Platinum Rhino population based on the current situation (approximately 2000 southern white rhinos) as well as what the situation was 5 years ago provides further insight.			

<sup>84</sup> Emslie, R. 2020. *Ceratotherium simum*. The IUCN Red List of Threatened Species 2020: e.T4185A45813880. <https://dx.doi.org/10.2305/IUCN.UK.2020-1.RLTS.T4185A45813880.en>

<sup>85</sup> Draft process available from Raoul du Toit, [r.dutoit@rhinos.org](mailto:r.dutoit@rhinos.org). Briefly, the first step is to calculate an unweighted Future Rhino Production Score based on primary demographic factors – namely current population size, recent biological growth rates and poaching rates. The last two give you the next growth rate of a population which is used to modelling 3 to 5 years of future biological growth/decline to produce an estimate of rhino numbers in the population in the future (3 to 5 years ahead). The net growth rates used in modelling are usually based on the recent last three years' actual net population growth/decline rates after poaching.

The next step is to down-weight the estimate of future rhino numbers (rhino production score) according to quality of the data and the biological management of the species. The latter averages down-weights for overstocking risk and genetic status. The result after down-weighting provides an adjusted FV rhino production score. A population with 1) very reliable data (population estimate likely to be +/-5%) 2) where there is population expansion potential (either there is sufficient carrying capacity for the population to grow beyond the next two years or there is a firm destocking plan to maintain productive densities or the poaching rate exceeds biological growth rate) and 3) where the current number of rhinos exceeds 25 and the population was founded with 20+ founders and 4) mate choice is entirely natural would constitute a high conservation quality population. In this case, FV rhino production scores would not be downweighted.

FV production scores would be down-weighted if the reliability of the data is not as good, the population would be overstocked in 2 years or is already overstocked and/or is genetically less than ideal in terms of its current rhino numbers and numbers of founder rhino and founders and/or if mate choice is controlled to some degree (as is the case with Platinum rhino) or if inbreeding is likely in the population.

A proposed modification is to in effect convert quality weighted Future Value (FV) rhino production scores to quality weighted Present Value (PV) rhino production values. A PV (rather than a FV) quality down-weighted rhino production score is more directly comparable to current rhino numbers and dividing the down-weighted PV score by current rhino numbers also provides a quality score per rhino.

Traditionally a net 5% annual growth has been set as a minimum growth target in many national rhino plans. This rate was therefore chosen as the effective discount rate to apply to determine PVs. In effect the more predicted net population growth is higher than 5% (as it was up to 2018 at Platinum rhino) the more this will boost the PV production score. On the other hand, the more projected future net growth/decline falls below the +5%/annum target rate the greater the reduction in PV population production score. To calculate unweighted PV scores, one simply models future growth of estimated net growth rate minus 5%. To better model the important contribution time makes when compounding growth, it has been proposed that modelling should project FVs up to 5 rather than 3 years into the future. The resultant PV score is then down-weighted exactly the same as is done when calculating a FV rhino production score. If the population is of the highest conservation quality and is growing in excess of 5% per year the final PV value can exceed current rhino numbers. However, if the rhino production scores have been down-weighted and/or growth rates are less than 5% then PV scores are likely to be lower than current numbers. The ratio of current numbers to down-weighted PV values therefore provides an index of the conservation quality of rhinos making up that population.

During 2018 the population was 1,615 and had been growing at an average net 8.7% per annum with room for growth over the next two years. The current lack of future growth potential (in the absence of further addition of new land or opening up of translocation and re-wilding opportunities to reduce densities to productive levels) means that despite there being an estimated ~2,000 by 2023, the weighted Present Value Score value has declined by almost a quarter from 1,743 in 2018 (Quality score per rhino of 1.08) to 1,315 today (Quality score per rhino of 0.66). Even so, few southern white rhino populations in the world have similar scores and the population would clearly qualify as a Continentally Key1 population if the same >100 threshold is applied to the population's Present Value score. Despite being downweighed on population expansion potential and because mate choice is controlled to some degree, the current Population Value for rhino production score for would be higher than Kruger National Park on account of the latter's declining numbers and reduced expansion potential because of disease quarantine requirements.

The decline in Platinum Rhino's Population Value and rhino quality scores over the last five years is due to the population going from a net growth of +8.7%/annum up to 2018 with the potential to grow beyond the next two years to the probable current situation of limited or no growth potential (which lowers the average Biological Management Weighting from 0.95 to 0.9 or 0.85, depending on whether the operation would be overstocked in two years or as modelled above is considered already overstocked). Calculated Future Value production scores would also show a decline over the last five years if growth has slowed, and population expansion potential is limited at current densities.

Platinum rhino however still scores highly on account of the very large number of rhinos it conserves and its large founder number and high reliability and precision of its rhino estimates. Its Present Value rhino production score at present is downweighed by biological management considerations, its current limited population expansion potential and due to mate choice being controlled to some degree.

The declining Present Value scores highlight the challenge of finding suitable homes for surplus rhinos. The conservation value of the operation would be significantly greater if significant additional funding were also available to secure and manage new or existing areas where surplus rhinos could be rewilded, protected and managed (see the assessment of acting as a source for rewilding).

Apart from the above formal present value scores, the importance of the population can also be reflected by the potential unintended consequences of winding up the project and thus influence future values. For instance, a large-scale auction could result in the live market price of a southern white rhino collapsing with individuals dispersed to multiple buyers, many of whom may not be able to provide suitable secure habitat capable of generating new viable sub-populations. There are perceptions of risks that many individuals may experience welfare constraints, abuse or get poached based on behavioural economic research - the less people pay for something, the lower they will perceive its value to be, and hence the less they will look after it. A third concern links to perceptions of risks of the broadening of rhino crimes beyond the current more focused professional poaching syndicates as dispersed easy pickings may attract new entrants into the poaching market. A fourth would include the reputational risk to the country.

The economic pre-conditions perceived by many stakeholders, manifests in a concern that the opportunity to exert greater control over the supply of rhino horn

(irrespective of whether future policy might involve legal trade or not) will be substantially reduced, and the enforcement burden and associated costs on the South African government substantially increased. This will have knock-on effects far beyond southern white rhino management: it will extend to black rhino conservation, the SA conservation and protected area estate budget in general, and potentially even to rhino conservation efforts worldwide.

In addition, an interpretation of strategic metapopulation management opportunities reason that the species would be severely undermined by the dispersal of this population of animals into multiple small populations with transactions costs of reassembling future genetically viable wild populations rising.

Criterion	Standards	Compliance	Potential
<b>Secondary species outcomes</b>			
Other species form part of an initiative	Species with a high level of threat are part of a captive breeding initiative	LOW	LOW
<p><b>Evidence</b></p> <p>Previously, Platinum Rhino had black rhino with a global status of critically endangered<sup>86</sup> and a South African status of endangered<sup>87</sup>.</p> <p>The African Buffalo globally has a near threatened status<sup>88</sup> and a South African status of least concern<sup>89</sup>.</p> <p>Sable has a least concern global status<sup>90</sup> and a South African status of vulnerable<sup>91</sup>.</p>			
<p><b>Perspectives</b></p> <p>The criterium focus on secondary options as CBO facilities often provide opportunities for captive breeding of other species that may benefit from practices within <i>ex situ</i> approaches.</p>			

<sup>86</sup> Emslie, R. 2020. *Diceros bicornis* ssp. *minor*. *The IUCN Red List of Threatened Species* 2020: e.T39321A152729173. <https://dx.doi.org/10.2305/IUCN.UK.2020-1.RLTS.T39321A152729173.en>

<sup>87</sup> Emslie RH, Adcock K. 2016. A conservation assessment of *Diceros bicornis*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. *The Red List of Mammals of South Africa, Swaziland and Lesotho*. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

<sup>88</sup> IUCN SSC Antelope Specialist Group. 2019. *Syncerus caffer*. *The IUCN Red List of Threatened Species* 2019: T21251A50195031. <https://dx.doi.org/10.2305/IUCN.UK.2019-1.RLTS.T21251A50195031.en>.

<sup>89</sup> Tambling C, Venter J, du Toit J, Child M. 2016. A conservation assessment of *Syncerus caffer caffer*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. *The Red List of Mammals of South Africa, Swaziland and Lesotho*. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

<sup>90</sup> IUCN SSC Antelope Specialist Group. 2017. *Hippotragus niger*. *The IUCN Red List of Threatened Species* 2017: T10170A50188654. <https://dx.doi.org/10.2305/IUCN.UK.2017-2.RLTS.T10170A50188654.en>.

<sup>91</sup> Parrini F, Koen J, Dalton D, Eksteen J. 2016. A conservation assessment of *Hippotragus niger niger*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. *The Red List of Mammals of South Africa, Swaziland and Lesotho*. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

Criterion	Standards	Compliance	Potential
<b>Ecosystem outcomes</b>			
Functioning role of rhinos in ecosystems <sup>92</sup>	Good ecological representation of biomes of the region with high levels of irreplaceability	LOW	LOW
	Act as an important spatial link in the conservation landscape of the region	LOW	LOW
	Robust ecological resilience <sup>93</sup> within CBO properties as indicated through natural values status in Management Effectiveness Tracking Tool assessments <sup>94</sup>	-	-
	Improved ecological resilience at re-introduction sites where rhinos were absent for some time as indicated by natural values status in Management Effectiveness Tracking Tool assessments	-	-
<b>Evidence</b>			
<p><i>Ecological representation:</i> The land and the surrounding landscape are transformed originating from previous farming practices<sup>95</sup>, and Platinum Rhino is contributing to restoration of the land from previous practices. Other Protected Areas in the surrounding area provide representation of the region's biomes<sup>96</sup>. The 2016 NPEAS review categorized the locality in and near Platinum Rhino as "Ecosystems where targets for protection are not met". Although the locality could contribute to meeting targets for protection of the Vaal Grassland ecosystem, it did not fall into a Priority Focus Area for protected area expansion<sup>97</sup>.</p> <p><i>Ecological corridors:</i> The area is not part of a conservation corridor or planned linkage.</p> <p><i>Ecological resilience of CBO:</i> Not assessed to the standard.</p> <p><i>Ecological resilience of targeted areas:</i> Not assessed to the standard.</p>			
<b>Perspectives</b>			
<p>Using a purist conservation planning lens only can be limiting given it focuses on the habitat. Irreplaceability of the habitat should consider patches and networks. For instance, SANParks had considered establishing a protected area not far from the locality of Platinum Rhino given the importance of poorly conserved Banken veld. Several other political priorities limit satisfactory progress. NOTE that it is not clear how suitable METT assessments could be to inform two standards and alternative approaches maybe required. It does not impact the present assessment as these standards were not assessed.</p>			

<sup>92</sup> Rhinos play key roles in functioning ecosystems. CBO properties remove all limitations on vital rates more easily done in smaller areas.

<sup>93</sup> e.g., there is a small difference between the expected biodiversity and observed biodiversity.

<sup>94</sup> Stolton, S. and Dudley, N., 2016. METT handbook: A guide to using the Management Effectiveness Tracking Tool (METT). WWF-UK, Woking.

<sup>95</sup> Adcock, K, Knight, M.K, Emslie, R. & van Houwald, F. 2018. Assessment of the Buffalo Dream Ranch captive breeding operation's white rhino population status and performance. AfRSG, SCC IUCN. Report available from Keryn Adcock, kerynrhino@gmail.com.

<sup>96</sup> North West Department of Rural, Environment and Agricultural Development (READ), (2015) North West Biodiversity Sector Plan. North West Provincial Government, Mahikeng. December 2015. [https://conservationcorridor.org/cpb/READ\\_2015.pdf](https://conservationcorridor.org/cpb/READ_2015.pdf)

<sup>97</sup> Adcock, K, Knight, M.K, Emslie, R. & van Houwald, F. 2018. Assessment of the Buffalo Dream Ranch captive breeding operation's white rhino population status and performance. AfRSG, SCC IUCN. Report available from Keryn Adcock, kerynrhino@gmail.com.

<b>Criterion</b>	<b>Standards</b>	<b>Compliance</b>	<b>Potential</b>
Soft outcomes			
Education and awareness <sup>98</sup>	Conservation contributing CBOs will have well developed education and awareness programmes with a focus on rhinos.	MEDIUM	MEDIUM
<p><b>Evidence</b> Focus is on regular student visits from these institutes as well as Onderstepoort at the University of Pretoria, Tswane University of Technology and Ecolife. This focus is on veterinary aspects, sustainable use and conservation husbandry management<sup>99</sup>.</p>			
<p><b>Perspectives</b> The facility may provide some opportunities for broader awareness. Note that the initiative has had large media coverage globally and drawn attention to the poaching threat to rhinos – in that regard it has had educational and awareness value. In addition, Platinum Rhino participated in numerous workshops, meetings, discussions and congresses, including the Rhino Management Group and AfRSG meetings contributing to the development of national rhino policies including Non-Detrimental Findings and CBO registration regulations.</p>			

<sup>98</sup> CBOs typically link to education and awareness of environmental and conservation programmes with the gold standard likely to be some measure of zoo initiatives.

<sup>99</sup> Personal Communication, Michelle Otto, Veterinarian, Platinum Rhino.

Criterion	Standards	Compliance	Potential
Research	Conservation contributing CBOs will have research strategies and demonstrated outputs	HIGH	HIGH
<b>Evidence</b>			
Platinum Rhino is part of the International Rhino Reproduction Collaborative <sup>100</sup> linked to the University of Ohio and the University of Illinois and produced several scientific outputs from data originating from the CBO <sup>101</sup> .			
<b>Perspectives</b>			
The facility provides numerous opportunities to conduct focal research activities that could support delivering on South Africa's Rhino Research Strategy <sup>102</sup> particularly within the biological management theme and considering veterinary aspects. This may help inform rhino management in areas beyond South Africa.			

## Conclusion

Assessing 16 of the 20 standards, for which evidence is available, resulted in a present conservation contribution functionality score of 51.3% for Platinum Rhino. It would be useful to evaluate conservation contribution functionality of other approaches to land management and of different land uses. Although the key contribution of Platinum Rhino to southern white rhino conservation comes through contributing to global numbers and options linked to that, the conservation contribution degrades when considering trade-offs of other initiatives as an alternative. As a result, the key criterium of a need for a semi-wild captive breeding approach for southern white rhinos carries a low priority at present as well as in the short (5 years) to medium (10 years) terms. The four other rhino species carry significantly higher requirements for captive breeding approaches, although these may be substantially harder due to their life-history features.

The net result is that the scope for improvement in the conservation contribution of Platinum Rhino is narrow and dependent upon it developing options for rewilding southern white rhinos effectively while enhancing “soft outcomes” by developing educational and awareness opportunities, promoting opportunities for new ownership

<sup>100</sup> <https://www.facebook.com/IntRhinoCollab/>

<sup>101</sup> Badenhorst, M., Ganswindt, A., Otto, M. and Van der Goot, A.C., 2016. Stress steroid levels and the short-term impact of routine dehorning in female southern white rhinoceroses (*Ceratotherium simum simum*). *African Zoology*, 51(4), pp.211-215. <https://hdl.handle.net/10520/EJC199970>

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<sup>102</sup> Department of Environmental Affairs. 2013. *National Rhino Research Strategy of South Africa*. Department of Fisheries, Forestry and the Environment, Pretoria, South Africa.



and ownership models and further enhancing a good research output. If these are achieved, this could result in a future conservation contribution functionality of 59.2% which is stronger but still does not form an overwhelming case for captive breeding approaches of southern white rhino.



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Knight, M., Adcock, K., Anderson, N., Balfour, D., Dean, C., du Toit, R., Dublin, H., Emslie, R., Gaymer, J., Goodman, P., Hofmeyr, M., Jones, P., Rademeyer, J., Reilly, M., Shaw, J., t'Sas Rolfes, M., Vigne, L., von Houwald, F. & Ferreira, S. 2023. *The conservation contribution of the Platinum Rhino southern white rhino Captive Breeding Organization*. Biological Management Working Group, African Rhino Specialist Group, Species Survival Commission, International Union for the Conservation of Nature. Available from the programme Officer: Keitumetse Mosweu, [mosweukm@yahoo.com](mailto:mosweukm@yahoo.com)