

# Occurrence of rhinoceros in the Free State, South Africa: a reassessment

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## Abstract

The last rhinoceros in the Orange Free State is believed to have been shot at Renosterkop near Kroonstad in 1842. This is one of nine farms in the present-day Free State Province with *rhenoster* (rhinoceros in Afrikaans) as a prefix in their names. These place names, and the petroglyph of a rhinoceros made by indigenous people on boulders near Rhenosterkop, indicate the occurrence of rhinos in the area in late historical times. We examined historical photographs, maps and literature to gain a retrospective view of the ecology. We conclude that the habitat could have supported small numbers of white rhinos (*Ceratotherium simum*), but that there was probably insufficient browsing vegetation for the survival of black rhinoceros (*Diceros bicornis*) at these sites. Previous evidence of fossilized black rhino skulls from the province was discounted when these were found to be those of a hippopotamus and a predator. The reintroduction of rhinos to the Province began in 1962 when a white rhino was relocated from Natal Province to the Willem Pretorius Game Reserve. Since then, rhino numbers have increased significantly, and there are currently 669 white rhinos and 11 black rhinos on state and private land in Free State Province.

## Résumé

Le dernier rhinocéros de l'État Libre d'Orange aurait été abattu à Renosterkop, près de Kroonstad, en 1842. Il s'agit de l'une des neuf exploitations de la province de l'État Libre où l'on trouve *rhenoster* (rhinocéros en afrikaans) comme préfixe dans leurs noms. Ces noms de lieux, ainsi que le pétroglyphe d'un rhinocéros fait par des autochtones sur des rochers près de Rhenosterkop, indiquent la présence de rhinocéros dans la région à la fin des temps historiques. Nous avons examiné des photographies historiques, des cartes et de la littérature pour obtenir une vision rétrospective de l'écologie. Nous concluons que l'habitat aurait pu abriter un petit nombre de rhinocéros blancs (*Ceratotherium simum*), mais qu'il n'y avait probablement pas suffisamment de végétation arbustive pour la survie du rhinocéros noir (*Diceros bicornis*) sur ces sites. Des preuves antérieures de crânes de rhinocéros noirs fossiles de la province ont été ignorées lorsqu'il a été établi que celles-ci étaient celles d'un hippopotame et d'un prédateur. La réintroduction des rhinocéros dans la Province a commencé en 1962 lorsqu'un rhinocéros blanc a été transféré de la Province du Natal vers la Réserve de Chasse Willem Pretorius. Depuis lors, le nombre de rhinocéros a considérablement augmenté et on compte actuellement 669 rhinocéros blancs et 11 rhinocéros noirs sur des terres domaniales et privées dans la province de l'État Libre.

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## Introduction

There are only two historical records of rhinoceros sightings in the region that is now the Free State

Province<sup>1</sup>, South Africa (Rookmaaker 2008, Boshoff and Kerley 2013). William Cornwallis Harris is on record as having shot a rhinoceros in a locality three

miles south of the Vaal River at Scandinavia Drift on 20 December 1836 (Harris 1839:234). In 1850, Thomas Baines visited a place called Rhenosterkop<sup>2</sup>, explaining that a rhinoceros had been killed there during the Great Trek. This record has been linked with the year 1842 supplied by Hall (1857) for the last rhinoceros killed in the region.

The species of rhinoceros was left unidentified by Harris, Baines and Hall. However, it would appear from the context that they thought that the black rhinoceros (*Diceros bicornis*) occurred in these localities (Rookmaaker 2008, Boshoff et al. 2016). In contrast, Bryden (1899) asserted, without further evidence, that these two records may have been of the white rhinoceros (*Ceratotherium simum*). Both Bigalke (1963) and Du Plessis (1969) doubted that either rhino species occurred in the Free State. Steytler (1932) pointed out that the Free State was treeless, and stated that for this reason no elephants and rhinos occurred there. This study attempts to clarify whether or not rhinos and if so, which species, occurred historically in the Orange Free State.

To this end, we identified nine farms in the Free State, which have *renoster* (rhinoceros in Afrikaans and *rhenoster* in Dutch) as a prefix in their names. We visited each of these farms to collect anecdotal evidence of the former presence of rhinos. We reviewed photographic and documentary evidence to assess the nature of the habitat in historical times and compared this with the ecological requirements of both species of rhinoceros.

Further evidence of the presence of rhino in the area is provided by a petroglyph, apparently of a white rhino, made by early inhabitants of the area. We probed the identity of these early inhabitants, in order to clarify when and by whom the petroglyphs were made. We also visited two farms in the province where black rhino skulls

had allegedly been found (Boshoff and Kerley 2013) to confirm these findings. Finally we compiled a brief history of the reintroduction of rhino to the Free State Province and collected data on current population numbers.

## Methodology

We examined literature on the subject at the National Museum in Bloemfontein and the old Nature Conservation Library of the current Department of Environment, Small Business, Tourism and Economic Affairs (DESTEA), as well as at municipal libraries in various towns including; Bultfontein, Hoopstad, Theunissen, Kroonstad, Koppies, Vredefort, Parys, Viljoenskroon, Lindley, Frankfort, Vrede, Cornelia, Memel and Sasolburg.

We visited the Department of Agriculture to identify all farms in the Free State that occurred with the prefix *rhenoster*. A Windeed (Deeds Office Property) search yielded the same results. A rhino farm map was drawn with ArcGIS version 9.2.

We visited all these *rhenoster*-prefix farms and interviewed each current owner (or occupant), in order to gather unrecorded information regarding the name of the farm, and anecdotal evidence of rhinos and ecological change in the area. Boshoff and Kerley (2010) show how the usefulness of written historical records of the occurrence of species can be enhanced if these are combined with other information, particularly regarding ecological requirements of the species concerned. Therefore, to determine whether or not rhino could have occurred in the Free State, we examined historical survey maps of all the *rhenoster* farms, as well as a number of historical photos, in order to obtain a retrospective view of the habitat in historical times, and compared this to modern knowledge of the habitat requirements of black and white rhino. Specifically we attempted to determine whether or not there was sufficient browsing vegetation for black rhino and/or sufficient grazing habitat and shelter for white rhinos to survive. The field research was carried out by the first-named author.

## Place names referring to rhinoceros in the Free State

Place names like Rhenosterkop and Rhenosterspruit suggest the presence of rhino in the Free State Province

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<sup>1</sup>The Orange Free State was an independent “voortrekker” republic until 1902, when it was conquered by British forces at the end of the Second Anglo-Boer War. In 1910 the area was established as the Orange Free State Province of the independent republic of South Africa. In 1994 it was renamed the Free State Province. In general we use “Free State” when referring to records from before 1910 and “Province” when referring to later records.

(Van der Merwe 1921, Giliomee 1969) but give no indication which species might have occurred. Cornwallis Harris claimed to have killed a rhinoceros in 1836 at the Vaal River crossing between Potchefstroom and Viljoenskroon (Skead 1987); "... for the last time, seen and destroyed the rhinoceros", (Boshoff and Kerly 2013), making it locally extinct. This is located three miles (4.8 km) south of Scandinavia Drift, close to the confluence of the present-day Renoster River and the Vaal River at Renovaal. It is possible that the current name Renoster River was derived from this rhinoceros that Harris shot.

We identified nine registered 'Rhenoster-prefix' farms, at six locations in the Province (Fig. 1; see colour plates: page ii, also Table 1 below). The outcome of our visits to these farms in the course of 2018 and the examination of contemporary survey maps is given below.

**1. Rhenosterkop—nos. 1434 and 277 (Hoopstad)**

Rhenosterkop is situated 10 km south of the border of the Northwest Province. We visited the

farm and interviewed the owner's wife. All that she could recall was that the adjacent farm, Graspan, was initially part of Rhenosterkop, and that Graspan historically had thousands of springboks on the grassy plains. We inspected the kop (hill) of Rhenosterkop, which was found to be a rocky area, slightly elevated above the surrounding sandy, grassy plains. The hill is currently populated by trees and shrubs, (but with fewer on the eastern side), including karee (*Searsia lancea*), buffalo thorn (*Ziziphus mucronata*), puzzle bush (*Ehretia rigida*), cross-berry (*Grewia flava*), sweet thorn (*Acacia karroo*), candle thorn (*Vachellia hebeclada*), camel thorn (*Acacia erioloba*) and bushveld asparagus (*Asparagus laricinus*).

**2. Rhenosterdraai—no. 443 (Koppies)**

According to the two registered owners of the farm Rhenosterdraai (*draai* = bend), this farm was probably named after the Rhenoster River, which makes an oval bend just before it enters the Koppiesdam Nature Reserve. They could not recall any anecdotes of rhinos in the vicinity.

Table 1. Farms (with subdivisions) in the Free State with rhenoster as a prefix. Areas are given in hectares except where otherwise shown. n/a = not available.

No.	Farm Name	Town Name	Farm Number	Portion	Area
1	Rhenosterkop	Hoopstad	1434	0	462.9
			277	1	428.2
2	Rhenosterdraai	Koppies	443	0	190.8
				1	572.3
				2	561.5
				3	800 DUM
				4	11.2
				5	381.5
				6	267.8
3	Rhenosterkop	Kroonstad	347	0	845.9
4	Rhenosterspruit	Kroonstad	632	0	640.3
5	Rhenosterhoek	Kroonstad	1291	0	462.8
				1	256.9
				3	428.2
				4	312.5
6	Rhenostervlei	Kroonstad	1352		1113.8
7	Rhenosterfontein	Theunissen	26	0	381.8
8	Rhenosterpoort	Vredefort	108	0	262.2
				1	256.9
9	Rhenosterspruit	Bloemfontein	2631		n/a
			320		n/a

### 3. *Rhenosterkop*—no. 347 (Kroonstad)

The owner stated that his father had told him that the hill called Renosterkop was originally divided into 12 farms, each starting from the highest point of the *kop* and portioned outward. This was done so as to give each farmer a portion of the hill, so that everybody had access to firewood and wild olive tree poles (*Olea earopea africana*) to use for anchor poles to fence off their farms. His father also told him that Renosterkop was the only place in the vicinity that has trees such as *olienhout* (wild olive) and sweet thorn trees. He added that there is an engraving of a rhino among other images on a rockface on Renosterkop. Note that this is not the same as the more well-known engraving at the nearby farm, Rooihooft, which is discussed in more detail below. On an “Amended Survey” of the farm Renosterkop dated 26 September 1879, the surveyor made sketches of trees of Renosterkop from the summit to the base indicating possible habitat for rhino. There is no indication on the sketches as to which tree species were present.

### 4. *Rhenosterspruit*—no. 632 (Kroonstad)

The current owner told us he believed that this farm received its name from Rhenosterspruit<sup>3</sup>, a creek (*spruit*) that rises on Vista Farm, some 3 km upstream, runs through his farm, and flows into the Valsch River some 15 km downstream.

### 5. *Rhenosterhoek*—no. 1291 (Kroonstad)

The owner did not know the origin of the name. He stated that his father-in-law had told him that the camphor bush (*Tarchonantus camphoratus*) was introduced to Renosterkop by the previous owner, who bought cattle from the Vryburg district, in the Kalahari region, and released them on Renosterkop. Since then this farm’s portion of Renosterkop has been dominated by this plant community. The owner also said that the Anglo Boer War hero, Captain Danie Theron, hid at Renosterkop for a few weeks because of the availability of trees and shrubs. Lord Roberts labelled Theron “the chief thorn in the

side of the British”. The legend is confirmed in the book by Serfontein (1990). This anecdote confirms the presence of trees and shrubs as possible habitat during historic times.

### 6. *Rhenostervlei*—no. 2132 (Kroonstad)

The previous owner of the farm Rhenostervlei changed its name to “Môregroet no. 2474” in 1966. The new owner did not know the reason for this name change. The four *rhenoster* farms bordering Renosterkop are currently characterised by plant vegetation such as bushveld asparagus, camphor (*Tarchonantus camphoratus*), sweet thorn (*Acacia karroo*), mountain karee (*Searsia leptodictya*), karee (*Searsia lancea*), wild olive (*Olea earopea africana*), cross-berry (*Grewia occidentalis*), puzzle bush (*Ehretia rigida*), bluebush (*Diospyros lycioides*), mountain sage (*Buddleja dalviifolia*) and common spike-thorn (*Maytenus heterophylla*).

### 7. *Rhenosterfontein*—no. 26 (Theunissen)

We interviewed the farmer who currently rents this farm. He mentioned that the previous owner (Sophia le Roux) had told him that her great-grandmother had made sketches of rhinos when she was nine years old, which must have been in the 1850s. He believed that she sketched the rhinos when they came to drink water near the *fontein* (fountain). It is not known what happened to the rhino population or to the drawings. Some older farmers around Rhenosterfontein were consulted, but could not confirm the existence of the rhinos. On the ‘Amended Survey’ of the farm Rhenosterfontein, dated 23 December 1897, the surveyor made sketches on the farm map of trees along the *spruit* near the *fontein*, indicating possible habitat for rhino. There is no indication on the surveyor’s sketches as to which species were present. Today the vegetation around Rhenosterfontein contains a range of indigenous species, including karee (*Searsia lancea*), bluebush (*Diospyros lycioides*), sweet thorn (*Acacia karroo*), wild currant (*Searsia pyroides*) and buffalo thorn (*Ziziphus mucronate*), together with exotic trees and shrubs such as weeping willow (*Salix babylonica*), sering (*Melia azedarach*), silver poplar (*Populus alba*) and cypress (*Cupressus sempervirens*). Exotic species were widely planted from the early 19<sup>th</sup> century, when they were promoted by the government for use as timber for fencing and for fuel (Bennet, 2010).

<sup>3</sup>Rhenosterspruit should not be confused with the Rhenoster River that is located some 25 km north and flows into the Vaal River at Renovaal.

### 8. Rhenosterpoort—no. 108 (Vredefort)

We interviewed a few older inhabitants of the Vredefort district, but they could not recall any anecdotes of rhinos in the district.

### 9. Rhenosterspruit—no. 2631 and 320 (Bloemfontein)

This farm is located in the vicinity of Maselspoort near Bloemfontein. According to Van der Merwe (1921), this was the place from where the father of Martinus Theunis Steyn, president of the Orange Free State, often appeared to inspect the farming activities at Suurfontein, where his two sons were farming. We could find no evidence in the area of a farm with the name Rhenosterspruit. According to Windeed (<http://search.windeed.co.za>) the farms “Rhenosterspruit no. 2631 and 320” in the Bloemfontein district “no longer exist”. Hillegard Muller Steyn, the owner of the present-day farm Maselspoort is a great-granddaughter of President M.T. Steyn’s brother. She stated that they were not aware of any farm by the name Rhenosterspruit.

In summary, only two survey maps, i.e. of Rhenosterkop near Kroonstad and Rhenosterfontein, provides evidence of the presence of trees on the farm. Taking account of evidence from the farm visits, it may be surmised that rhinos possibly occurred at the following farms: Rhenosterspruit, Rhenosterkop (Kroonstad), Rhenosterfontein, Rhenosterhoek and Rhenosterpoort. At the other four farms we found no evidence to suggest the historical occurrence of rhinos.

## Descriptions of vegetation by European settlers

Early European settlers began to occupy the Province in the early 1800s. Gerdener (1924) described how the Voortrekker leader Sarel Cilliers lost an eye as he was chopping wood near the Vaal River after traveling for at least 100 km from his farm in the Kroonstad district, where wood was scarce. This indicates how rare trees were in the interior of the Free State in the mid-19<sup>th</sup> century. Today this farm is called Doornkloof, and it is dominated by sweet thorn trees (*Acacia karroo*). On the morning of 25 May 1900, a British soldier in the Anglo Boer War wrote in his diary (Reckitt 1972) that “The scenery was not interesting—an expanse of grass veldt from one horizon to the other, slightly undulated and only relieved by the railway.” (The diary entry was probably made near Willem Pretorius Game Reserve, as the soldier describes spending the night next to the Sand River on the way from Bloemfontein to another town named Kroonstad). Playne (1912: 499) described the Free State as: “virtually a grass steppe, which is interspersed with small shrublets.” Hattersley (1969) mentions that the Free State had huge stretches of grassland, overrun with game of every description.

The vegetation types in the early eighteenth century, when rhinos roamed the Province, are of importance for determining which species of rhino is more likely to have occurred in the Province. According to Somerset Playne (1912), no recognized botanical investigation was ever made of the flora of the Free State Province. Thus these descriptions of early settlers provide an important insight into the environment in late historical times. The only means to observe the vegetation types of a century ago are photos, including those taken before and during the Second Anglo-Boer



Figure 2. (Left) A picture taken of neighbouring farmers at Rhenosterkop in 1922/23. The caption reads: “RHENOSTERKOP PIC-NIC DEC 29<sup>TH</sup> 1922–JAY 2<sup>TH</sup> 1923”. Picture courtesy of *JPS Geldenhuys*. (Right) Photograph of approximately the same site taken in 2017.



Figure 3. (left) shows a contemporary stereograph of the Koppies railway bridge. The caption reads: “The construction of an improvised bridge over the Rhenoster River, Orange Free State.” The photograph of the railway bridge (Fig. 3, right) shows that the area is now dominated by exotic invaders.



Figure 4. Stereographs of British forces, led by Lord Roberts crossing the Valsch river during the Anglo–Boer War. The captions read (left) “Lord Roberts rides into Kroonstad through the Valsch River” and (right) “Robert’s ride into Kroonstad with his cameras poised to capture the occasion”.



Figure 5. The railway bridge at Kroonstad (left) during the Anglo–Boer War and (right) in 2016.

War (1899–1902) by war journalists as well as private family photos. Although the war pictures were taken approximately 60 years after the last record of rhino in the Free State, they still provide an indication of the surroundings at the time when rhino roamed the Province.

We compared historical photographs with contemporary images of areas surrounding the specific sites where rhinos probably occurred. The comparisons show the contrast between the vegetation at the same sites now and more than a hundred years ago. Figure 2 shows the only available historical picture of Renosterkop, alongside a picture taken in 2017. The historical photo was taken in late 1922 or early 1923. The previous owner of the farm Rhenosterkop told us that neighbouring farmers camped every year from Christmas to New Year in tents at Renosterkop, as it was the only place in the district with enough trees to give shade. The photo taken in 2017 of approximately the same site shows the change in the vegetation some 94 years later.

Figure 3 (left) shows the Koppies railway bridge over the Rhenoster River, taken during the Anglo–Boer War (1899–1902). It suggests that very few, if any, trees or shrubs occurred along the Rhenoster River during the war. On the right, a photograph of the same location, taken in 2017.

Figure 4 shows two images of the Valsch River valley near Kroonstad, taken during the British offensive led by Lord Roberts during the Anglo–Boer War. The left-hand image shows a site where sweet thorn trees grew on the banks of the Valsch River. In the right-hand image, Robert's forces are crossing the river at a different site where no trees are present. Currently the area around the Valsch River railway bridge is covered with indigenous trees and exotic invasive species, very similar to those found at the Rhenoster River railway bridge.

Figure 5 shows vegetation changes at the railway bridge at Kroonstad over time. Similar to the Rhenoster and Valsch Rivers, the pictures from the Anglo–Boer War and today show some major differences in the vegetation. Historically, most rivers in the area appear to have been grassy *dongas* (ravines) while present-day river valleys are covered with woody vegetation, including both exotics and native trees and shrubs.

## Suitability of habitat for of white and black rhinos

White rhinos are grazers that prefer savannah areas and open grassland (White et al. 2007). A previous study by Jordaan et al. (2015) suggests that the ecology of the Free State Province is suitable for white rhinos where there is sufficient palatable short grass and water and the presence of some woody species to give protection from extreme cold and heat. Black rhinos are browsers. Morgan et al. (2009) argue that black rhinos are driven by resource availability and individuals will therefore select habitats with a higher quality and abundance of feed. Kotze and Zacharias (1993) found that tall grass detracts from browse value, while gentle slopes enhance habitat suitability; they conclude that forest verges provide important black rhino feeding areas.

The vegetation map of South Africa, Swaziland and Lesotho published by Mucina et al. (2005) divides the area into plans regions with different vegetation characteristics. The two (existing) plant regions of the Free State where rhino are most likely to have occurred are GH 6 and GH 11. GH 6 Central Free State Grassland includes Rhenosterfontein at Theunissen and the four Rhenosterkop farms near Kroonstad and is described as follows: “Undulating plains supporting short grassland, in natural condition dominated by *Themeda triandra* and *Eragrostis* grass in degraded habitats. Dwarf karoo bushes establish in several degraded clayey bottomlands. Overgrazed and trampled low-lying areas with heavy clayey soils are prone to *Acacia karoo* encroachment”. GH 11 Vredefort Dome Granite Grassland, which includes Rhenosterhoek at Vredefort, is described as “*Themeda triandra*-dominated grassland on granite”.

The literature, photographic evidence, and the two survey maps of Rhenosterfontein and Rhenosterkop (Kroonstad) examined prove that the landscape of the Orange Free State consisted of open grassland even along rivers and creeks, except for occasional encroachment of *Acacia* trees and small shrubs. The on-site visits to the rhenoster-farms confirm that the present-day habitat of the *rhenoster* farms in the Free State Province is still mainly open grassland, with limited presence of trees. If abundant woody vegetation had occurred around these farms in historical times the region would have been described as a type of bushveld and more remnant trees would be present today. The comparison between the

Table 2. Present and historical occurrence of ecological requirements for rhinoceros at the five rhenoster farms in the Province where evidence was found for the historical occurrence of rhinos.

Farm Area	White Rhino				Black Rhino			
	Open Grassland		Savannah		Bushveld		Forest	
	Present	Historical	Present	Historical	Present	Historical	Present	Historical
Rhenosterspruit	x	x	x					
Rhenosterkop (Kroonstad)	x	x	x	x				
Rhenosterfontein	x	x						
Rhenosterhoek	x	x	x					
Rhenosterpoort	x	x	x	x	x			

ecological requirements of the two rhino species and historical and present-day habitats shown in Table 2 indicates that, historically, the Free State possibly provided suitable habitat for white rhinos, but no areas were suitable for black rhinos. Today the situation is very similar, with very limited occurrence of habitat suitable for black rhinos.

### Rock art in the Free State

Moodley and Kriek (2005) investigated rock art on the farm Rooihoochte (near Rhenosterkop) in the Kroonstad district. They found a rock engraving with microdots and pecks clearly indicating an image of a rhinoceros (Figure 6). This image, with its hump, heavy shoulders and large head, appeared to be of a white rhino. On the same farm Rooihoochte, they also discovered an engraved Morabaraba game board. This board



Figure 6. Image of a rhino engraved with microdots which was discovered on a boulder at the farm Rooihoochte in 2005.

game of Sotho origin is still played in South Africa today (Nkopodi and Mosimege 2009). Walton (1965) describes how the Ghoya people (the name given to the Sothos in the Orange Free State) occupied the flat hill-tops bordering the Valsch, Rhenoster, Wilge, Sand and Vaal rivers from the mid-15<sup>th</sup> century until they were conquered by the Taung people in 1810–1812. This marked the start of a period of widespread chaos and warfare among indigenous ethnic communities in southern Africa that lasted until 1840. The arrival of Boer farmers following the Great Trek in 1836 initiated a further period of conflict, this time between the indigenous inhabitants of the region and the newly-arrived settlers. It seems most likely therefore that the game board and rhino rock engravings in the vicinity of Rhenosterkop were carved by Ghoya inhabitants of the northern Free State during the preceding period of relatively social stability, i.e. sometime between 1450 and 1812. This provides compelling evidence for the presence of white rhinos in the region in the period before the arrival of European settlers.

### The alleged black rhino skulls at Letitia and Telegraafsfontein

Lynch (1991) stated that two black rhino skulls were discovered in the Free State Province and donated to the National Museum in Bloemfontein. One of these was found in 1958 in the Vals River (Vals is an Afrikaans word for the Dutch word Valsch) on the Letitia Farm and another was discovered on the Telegraafsfontein Farm. Letitia Farm borders the Vals River in the Kroonstad district. A creek called Liebenbergspruit flows through the farm and into the Vals River just west of the farmstead. We interviewed the previous owner of the farm, who told us that





Figure 7. The tooth of the hippopotamus discovered at Letitia Farm in 1956.

her brother (Mr Bester) discovered a skull of a hippopotamus in 1958 at the confluence of the creek and the river following some heavy rains. They donated this hippopotamus skull to the National Museum in Bloemfontein. In 1956, Mr Bester also discovered a tooth of a hippopotamus in the Vals River not far from the hippo skull (Figure 7). According to the owner, the story of

the discovery of the complete hippo skull was then published in the local newspaper, *The Northern Times*.

The owner of the Telegraafsfontein Farm (Mr S. van der Merwe) stated that his family had occupied the farm since 1862. He was raised on the farm and he could not recall the discovery of a black rhino skull. However, a fossil mandible was found and donated to the National Museum in Bloemfontein. They received feedback that it was a mandible of an unknown predator. It is therefore unlikely that black rhino skulls were in fact discovered at Letitia or Telegraafsfontein. These findings can therefore not be used as evidence that black rhinos once occurred in the Province.

### The re-establishment of rhino in the Free State

Willem Pretorius Game Reserve was established in 1956 by the provincial government as a replacement for the de-proclaimed Summerville Game Reserve. In 1962, this Reserve became the first in the Province to reintroduce white rhinos (Bourquin 1973). On 14 March 1962, the first white rhino, named Ondini (Figure 8), was relocated to the Reserve by the Natal Parks Board as part of their translocation program. In 1969, Dr J.G. van der Merwe was the first farmer in



Figure 8. The white rhino Ondini before being released into the Willem Pretorius Game Reserve. The caption reads: "Ondini, the first of the white rhino to arrive at the Willem Pretorius Game Reserve in a boma 1962/3/14". This picture is currently hanging in an office at Willem Pretorius Game Reserve.

the Province to buy rhino. He purchased some animals from Umfolozi Game Reserve in what was then known as the Natal Province to stock on his farm at Heilbron in the northern Free State. Since the 1990s the private sector in the Province, as elsewhere in Southern Africa, has invested heavily in endangered wildlife species as an alternative to marginal game species such as antelope. Rhino are seen as high-value animals and a good investment proposition, and this has helped to increase their numbers.

In 1980, there were 34 white rhinos in the Orange Free State Province. A survey in 1985 indicated that there were 49 white rhinos in the Province, of which 15 were privately owned and 34 State owned. A census in 1990 showed a decrease in the number of rhinos to 37, of which farmers owned 15, whilst the State owned 22. There were no black rhinos in the Province in 1990. By 2010 the Province had a total of 214 white rhinos, of which 153 occurred on private land, and 61 on State-owned land. In 2010 the State owned four black rhino bulls, whilst private farmers owned three black rhino bulls (Jordaan 2010).

During 2017, the researcher compiled a questionnaire and visited all 46 rhino breeders in the Province. Results from the questionnaire revealed that at that time there were 599 white rhinos on private land, and 70 in government nature reserves, making a total of 669 white rhinos. There were a total of 11 black rhinos, ten on private land, and one in a nature reserve. Thus in 2017 there were a total of 680 rhinos in the Free State Province. In recent years, new and existing private rhino owners in the Free State have bought many rhinos from owners elsewhere in the country, where rhinos are under threat from poaching, and this has been the main reason for the sudden increase in numbers.

## Conclusion

The nine *rhenoster* farms visited are situated at six localities in the Province; however, we found no further evidence of rhino occurrence at four of these locations. The possibility of former occurrence of rhinoceros at Rhenosterkop near Kroonstad is supported by the suitability of ecological conditions, the existence of

four neighbouring *rhenoster*-prefix farms and the petroglyph of the white rhino, which was probably made by the Ghoja people who roamed the area before 1812. That rhinos also occurred at Rhenosterfontein is suggested by anecdotal evidence that a previous owner had made drawings of rhinos in the middle of the 19<sup>th</sup> century, and the ecological suitability of habitat on this farm. The only written evidence of rhino occurrence in the Province is the rhino hunted (to local extinction) by Captain Cornwallis Harris in 1836 near Scandinavia Drift.

While there is no direct evidence as to which species of rhino may have occurred in the area, the ecological habitat is and was more suitable for white rhinos than black rhinos. The tree (browse) line of the rivers and creeks that occur in the natural distribution areas of black rhinos are limited or absent throughout much of the Free State. Of the nine survey maps of *rhenoster* farms, only those of Rhenosterkop near Kroonstad and Rhenosterfontein show a few trees, which could have been sweet thorn, karee and wild olive, and trees are also largely absent from the historical photos examined. From an ecological perspective, it is doubtful that black rhino would have survived in these treeless conditions, as they are browsers. The alleged black rhino skulls from Letitia and Telegraafsfontein were found to belong to other mammals.

In summary, after assessing evidence from visits to farms, survey maps, literature and photos, and taking account of the ecological requirements, we conclude that small populations of rhinos, probably white rhinos, might have occurred in the northwest of the Province at Rhenosterkop (Kroonstad), Scandinavia Drift and Rhenosterfontein during historical times. However, the limited availability of suitable habitat, even for white rhinos (i.e. trees for shelter), suggests that rhino numbers were always low and this is perhaps the reason why explorers did not find them in the former Orange Free State.

Reintroduction of rhinos began in 1962, when a white rhino from Natal was translocated to the the Willem Pretorius Game Reserve. The first purchase of a rhino by a farmer in the Province occurred in 1969. In 2017, there were over 600 rhinos including several blacks in the Free State Province of South Africa.

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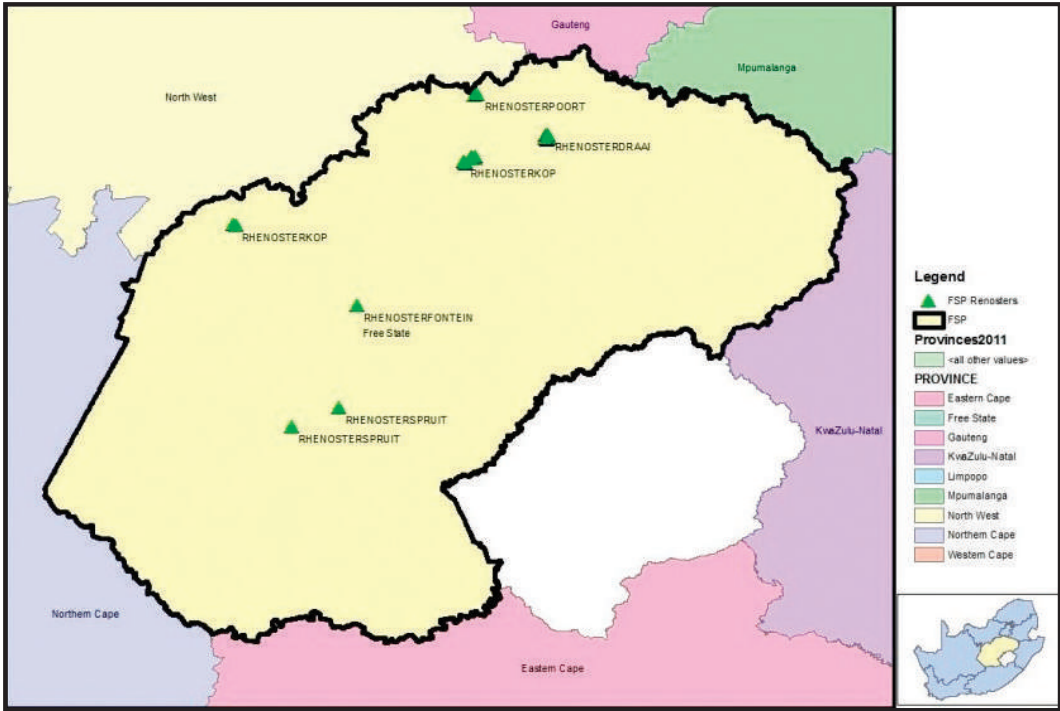
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**Above.** Jordaan et al. *Occurrence of rhinoceros in the Free State, South Africa: a reassessment.* pp. 67-77  
 Figure 1. Map of the Free State Province, South Africa indicating all the registered farms with rhenoster as a prefix to their name. (Map courtesy of Mr. W van Zyl, Department of Agriculture).



**Below.** Vezina et al. *A neglected aspect of human–elephant conflict: fence damage by elephants in the Trans Mara, Kenya.* pp. 78-87  
 Figure 1. Examples of local fences. Rudimentary fence (**centre left**), livestock *boma* fence (**centre right**), barbed wire fence (**below left**) and live fence (**below right**), used by households in the Trans Mara

