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Wildlife-friendly Fence at Middelpunt Wetland

Progress Report

The White-winged Flufftail Conservation Project

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Introduction

Linear infrastructure has become an important feature of anthropogenically influenced landscapes, particularly within South Africa. Fences are one example of the vast network of linear infrastructure which divides up millions of hectares of the terrestrial landscape. Livestock fences can be a useful management tool, especially for controlling herbivory regimes, but the current standard design of five barbed strands is detrimental to wildlife moving through the landscape. It presents either an impassable obstacle that fragments the landscape or poses the risk of injury and even fatality through entanglements and snags. Numerous studies have shown that fences can create challenging barriers for wildlife, and in particular, birds, which face a risk of entanglement or damage through collision that can result in injury or death, particularly if the top strand of the fence is barbed. It is imperative that a more wildlife-friendly design be tested and implemented in South Africa to reduce the impact of these structures on the threatened biodiversity navigating the landscape.

Barbed-wire fences pose a risk of injury or fatality through collision and entanglement for wildlife. This often happens along fences intercepting wetlands as animals frequently move between these highly productive ecosystems and the surrounding grassland matrix (Figure 1). To reduce the risk of entanglement and increase permeability for wildlife while still excluding livestock, a wildlife-friendly fence was designed based on literature (namely stemming from the grasslands of the USA) and expert advice from local farmers for adaptation to the South African context. This included a smooth wire 30 cm above the ground followed by three strands of barbed wire and a smooth top strand 30 cm above the barbed wire directly beneath (Figure 2). The height of the smooth bottom strand allows for smaller mammals to move underneath without the risk of snags while excluding cattle and their calves. The distance between the smooth top strand and barbed strand below it should be sufficient to prevent birds from becoming entangled as the two strands loosen over time.

The wildlife-friendly fence design was piloted at Middelpunt Nature Reserve with installation taking place from September to December 2022 after the seasonal burns were completed (Figure 3). The estimated cost of installing the fence was roughly R230,000 based on three quotes. A donation of fencing material reduced the cost to R115,000, saving 50%.

Figure 1: Wetland bird species are common victims of barbed fence entanglements.

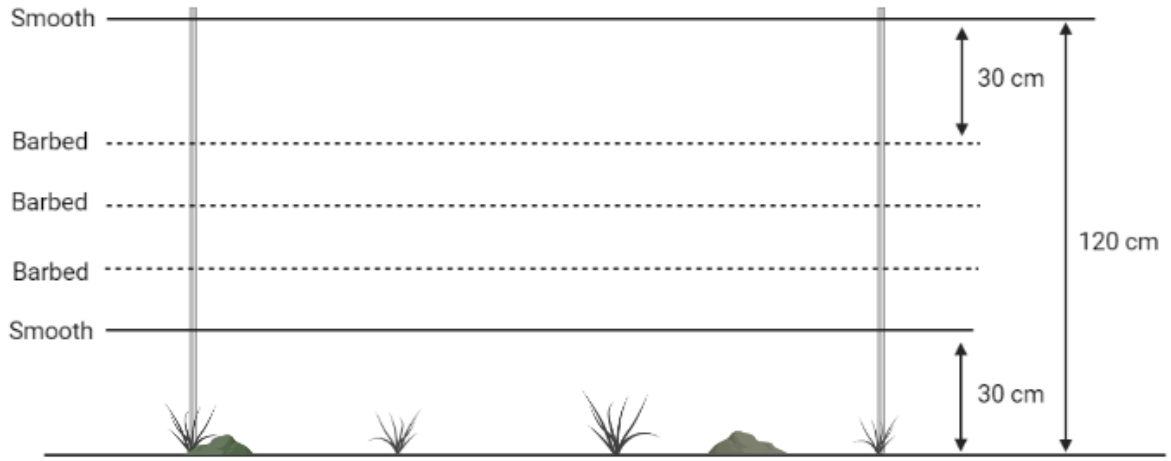

Figure 2: The wildlife-friendly fence design erected at Middelpunt Nature Reserve (Created with BioRender.com).

Figure 3: The position of the wildlife-friendly fence erected along Middelpunt Wetland.

Evaluation study

A study has been initiated to evaluate the effectiveness of the wildlife-friendly fence in allowing wildlife to move through while reducing risk of entanglement and keeping livestock out. Motion-detected camera traps were used to observe the interactions between animals and the fence. Five cameras were deployed on the wildlife-friendly fence (Figure 5) and five on a standard cattle fence (i.e., the control; Figure 4) running on opposite sides of Middelpunt Wetland in December 2022. The position and perspective of the cameras on the fence posts were determined through a pilot study conducted in August 2022. Cameras were spaced evenly along the fences at approximately 100-200 m intervals. The habitat type of the surrounding vegetation (either seep or grassland) was recorded for each camera. Cameras are serviced every two months to replace batteries, swop SD cards, clear vegetation, and right camera alignment. Preliminary results show that wildlife is interacting with the wildlife-friendly fence with no entanglements observed thus far (Figures 6 & 7). The study will continue for at least one year with the sorting of the camera trap images taking place simultaneously.

Figure 4: Camera traps placed on the standard cattle fence at Middelpunt Nature Reserve acting as a control for comparison to the wildlife-friendly fence (Photos: Marlize Muller).

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Figure 5: Camera traps placed on the wildlife-friendly fence to monitor animal movement at Middelpunt Nature Reserve (Photos: Marlize Muller).

Figure 6: Sequence of images showing a Grey Crowned Crane (*Balearica regulorum*) jumping over the wildlife-friendly fence without difficulty (Photos: Kyle Lloyd).

Figure 7: Sequence of images showing antelope passing underneath the wildlife-friendly fence without difficulty (Photos: Kyle Lloyd).

Concerns

There are some concerns about the implementation of the wildlife-friendly fence (Table 1). These concerns need to be addressed to ensure that the fence functions adequately. Unfortunately, the contractor is not willing to make these corrections. An alternative contractor will be sourced should the funding resources become available.

Table 1: Concerns about the installation of the wildlife-friendly fence that need to be addressed.

	Concern	Description	Reference photos
1	Fence design	The fence has not followed the specified design for sections between the northernmost cattle gate and the property boundary	20230207_150916.jpg 20230207_150914.jpg
		The fence has not followed the specified design for sections between the fence running between the dam and the main fence line	20230207_165902.jpg 20230207_165850.jpg 20230207_170047.jpg
2	Loose strands	The fence strands need to be tightened between the cattle gate at the blue gum tree avenue and next closest straining post.	20230207_160933.jpg 20230207_161006.jpg 20230207_161015.jpg
3	Pole height	There are several instances along the fence where the Y-standard stakes and dropper poles are higher than the specified 1.2 m above ground. They need to be sawed off to the correct height as they could cause serious harm to wildlife jumping/flying over the fence, especially at night.	20230207_171404.jpg 20230207_164134.jpg 20230207_152716.jpg 20230207_151926.jpg
4	Top strand connection	There are several instances along the fence where the top strand is not connected to the Y-standard stakes and dropper poles.	20230207_163210.jpg 20230207_163103.jpg
5	Cattle gate	There is no cattle gate in the fence between the dam and the main fence line despite designs indicating that a gate is to be positioned here. This is crucial for managing the movement of cattle between camps. Given that the 3m cattle gate at the southernmost end of the fence is likely too narrow for a vehicle with a trailer to pass through from the adjoining fence's gate, it is suggested that this 3m cattle gate be moved to the fence between the dam and main fence line and replaced with a 5m cattle gate.	20230207_170019.jpg
6	Scrap fencing material	Scrap wire was collected and positioned at the southernmost end of the fence for collection.	20230207_170704.jpg
		There are other areas where fencing and construction material needs to be collected (and holes beside straining posts filled).	20230207_150847.jpg 20230207_150945.jpg
7	Disconnected top strand	There is one instance of the top strand being disconnected from the straining post.	20230207_165041.jpg
8	Positioning	Because the southern section of the fence did not follow the firebreak that was burnt for the purposes of directing the fence line, the fence is still too close to	

		the wetland and goes through many lateral seeps. This has implications for fence management, livestock movement and trampling, and fence lifespan. I suggest that the fence be moved further away from the wetland edge by making a straight line between the straining post opposite the "rugby poles" (20230207_172424.jpg) and the southernmost straining post (20230207_170743.jpg). This will also make for a shorter distance between the two points with no corners. The resulting excess fencing material can be used to address point 1.	

Acknowledgements

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