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Further case-studies from around the globe

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Re-introduction and supplementation of large antelopes and zebra to Debshan Ranches, Central Zimbabwe

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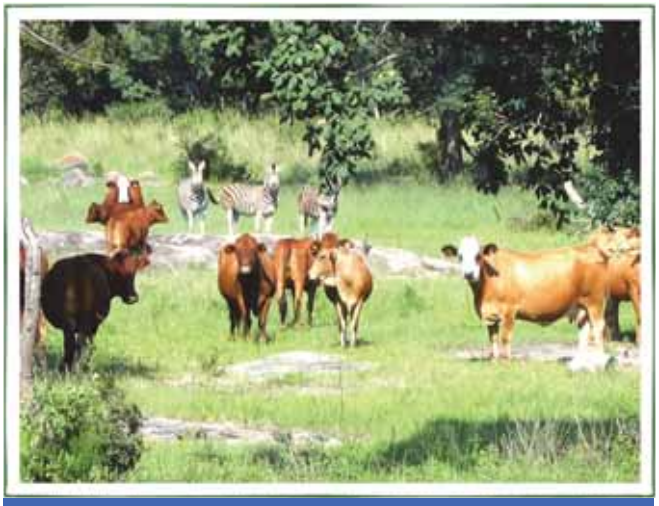
Introduction

As their habitats are reduced and fragmented by the expansion of agriculture and human settlement, numbers of many African antelopes are declining (East, 1999). In southern Africa, the economic value of wildlife, often realised through trophy hunting, has promoted conservation on private land. During 1991, Debshan Ranches initiated a project to boost small populations of wild herbivores and to re-introduce species that historically occurred there. Common eland (*Tragelaphus oryx*), wildebeest (*Connochaetes taurinus*), giraffe (*Giraffa camelopardalis*) and waterbuck (*Kobus ellipsiprymnus*) were re-introduced, and sable antelope (*Hippotragus niger*), bushbuck (*Tragelaphus scriptus*) and Burchell's zebra (*Equus quagga*) were released to supplement existing populations. The conservation status of all these species is Least Concern (IUCN Red List). Shangani Ranch (c. 480 km^2) and De Beers Ranch (c. 200 km^2) lie in central Zimbabwe. Mean annual rainfall is *c*.600 mm, with a single rainy season during November - March (Dunham *et al*., 2003). The main vegetation types are: *Terminalia sericea* woodland and wooded grassland; *Brachystegia–Julbernardia* woodland; *Colophospermum mopane* woodland and shrubland; *Acacia-Combretum* woodland on alluvial soils; and hydromorphic grassland. The ranches are used primarily for beef production, but support various wild herbivores and predators (leopard, cheetah and black-backed jackal, and occasionally lion and spotted and brown hyenas).



Zebra and cattle share range on Debshan Ranch
© Susan Swanepoel

Goals

- Goal 1: Create self-sustaining populations

Hard release of bushbuck from crate at Debshan ranches in 2011 © Susan Swanepoel

of the re-introduced species on the ranch(es) where those species were released.

- Goal 2: Create self-sustaining populations of the supplemented species on the ranch(es) where those species were released, with the post-release populations being more numerous than the pre-release populations of the same species.
- Goal 3: Increase the genetic diversity of the previously-small populations of supplemented species.

Success Indicators

- Indicator 1: Sightings of released animals in the general vicinity of release sites (indicating that freed animals had both survived and not left the ranch where they were released).
- Indicator 2: Sightings of young animals (indicating that released animals had bred successfully).
- Indicator 3: Long-term increases in the population numbers on the ranches.

Project Summary

Feasibility: The ranches were established during the early 20th century and records from early European travellers (e.g. Baines, Selous) and ranch staff showed that the species earmarked for re-introduction previously occurred there. The ranches still contained significant populations of other wild herbivores such as impala, tsessebe, kudu and warthog. Hence, it was believed that the vegetation was suitable for the re-introduced species - most likely the original populations were eliminated by excessive offtakes (e.g. to reduce competition with cattle), not by habitat changes. For the species earmarked for supplementation, it was thought that the populations were kept small by Allee effects (possibly predator-driven), not by issues of habitat suitability. Sable antelope, waterbuck, wildebeest and zebra are grazers, giraffe and bushbuck are browsers, and the eland is a mixed feeder.

Implementation: All the released animals were purchased through private sale or game auctions, from ranches in Zimbabwe. For all the species, there is only a single subspecies within Zimbabwe (Lorenzen *et al.*, 2012) and so the main concerns about moving animals around the country were veterinary ones. What was available for purchase placed some limitations on the size and age/sex

composition of the groups released. Prices varied between species and high prices limited the numbers of the rarer species that could be released. National regulations for controlling foot-and-mouth disease required that the animals came from areas where both the disease and potential carriers (e.g. buffalo) were absent (the 'green zone'); or, for those captured elsewhere, that they were tested for foot-and-mouth disease by the veterinary authorities after capture. The animals came from southern Zimbabwe, the Midlands, or Doma in north-east Zimbabwe. Except for animals from auction sales, most were transported to their release site immediately after being caught by professional game capture teams, usually during the cooler dry-season months. Bushbuck were individually crated during transport, but other species travelled in groups. At the release site, the animals were freed into a *boma* (pre-release pen) with high (approximately 2 m) sides of black, opaque plastic sheeting, and measuring c. 50 m x 50 m. The initial groups were kept in the *boma* for up to 14 days, during which they were given food (commercial game pellets and cotton seed) and drinking water. They were freed by removing part of the boma side and letting them find their own way out. After the apparent success of the early releases, and given the difficulty of confining large antelopes in even high-sided bomas (some jumped the sides), later release groups were confined to the *boma* for just one night, to prompt group cohesion, before release. Later still, some less financially-valuable animals (zebra) or solitary species (bushbuck) were freed immediately on arrival at the ranch ("free-released").

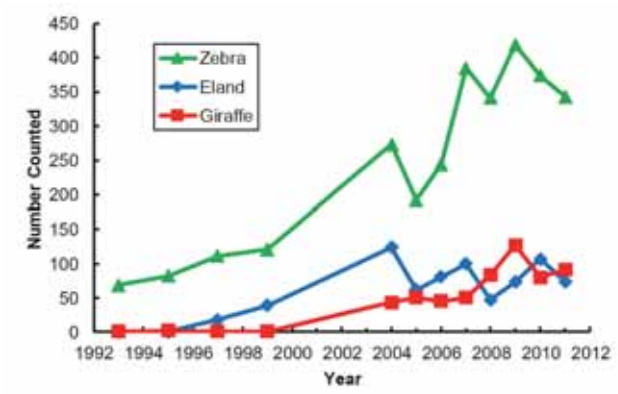
More valuable species (waterbuck and sable antelope) were released in Shangangwe game-fenced enclosure of c. 20 km^2 on De Beers ranch. Although it contained cattle, this enclosure was surrounded by a 2 m, 10-stand, electric fence that served to prevent the wild herbivores leaving the ranch, and to facilitate their

Table 1. The total numbers of each species released on the two ranches, the range of group sizes and the years when the releases occurred (R = Re-introduction; S = Supplementation)

Species	Release Ranch				Number in release group	Years of releases
	Shangani		De Beers			
Zebra	101	S	89	S	8 - 25	1991 - 1997
Eland	94	R	102	R	10 - 41	1991 - 1997
Wildebeest	0		30 *	R	7 - 23	1998 - 1999
Giraffe	6	R	0		6	1997
Sable antelope	5	S	28 *	R	5 - 18	1993 - 1998
Waterbuck	0		43 *	R	2 - 15	1995 - 1998
Bushbuck	0 58	S	5 24 *	S S	-	1997 2011

* Released in the Shangangwe enclosure of c.20 km^2

Fig. 1. The numbers of zebra, eland and giraffe counted during total-area counts from a helicopter of the wildlife on Shangani Ranch, Zimbabwe.



monitoring. Wildebeest were also released here in order to contain them, because wildebeest may carry a virus that causes malignant catarrhal fever, which is potentially fatal to cattle.

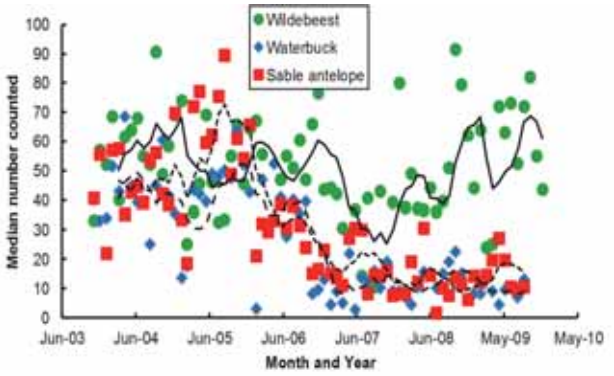
Post-release monitoring: There were three forms of post-release monitoring. First, there were incidental observations of groups of re-introduced or supplemented species during cattle management operations. Sightings provided information about the spatial distribution and dispersal of released animals, and the presence of juveniles in the groups indicated successful breeding. Secondly, whenever cattle management required cattle in a paddock to be rounded up, the staff - working on foot - searched the entire paddock and recorded the numbers of all wild herbivores that they saw. In addition to providing information on spatial distribution and breeding, these data also provided indices of abundance. Thirdly, usually every two years, all large, wild animals on each ranch were counted during a total-area survey, conducted from a helicopter flying at low level along parallel flight-lines.

The helicopter surveys revealed that eland and zebra populations became established on Shangani Ranch (Figure 1). A giraffe population also became established, even though just six animals (all adult females) were released. The increased number of giraffe clearly resulted at least partly from immigration, either because immigrants were attracted by the released animals, or because of disruption caused on neighbouring properties by Zimbabwe's agrarian reform program or both. Giraffe releases were discontinued because monitoring revealed that the population was increasing as a result of this immigration. Foot patrols revealed that the releases of waterbuck and sable antelope in the

Eland in plastic walled boma © Kevin Dunham

Shangangwe enclosure were initially successful, with numbers peaking during 2005, approximately seven years after the last releases (Figure 2). But during 2006, the number of both species declined to about one-third or less of their former level and then remained generally low. Wildebeest numbers appeared to decline later, during 2007, but then increased.

Fig. 2. The median numbers of wildebeest, waterbuck and sable antelope counted monthly during foot patrols of Shangangwe enclosure on De Beers Ranch, Zimbabwe. Temporal trends shown by lines indicating the 5-month running means (solid line = wildebeest; small dash = sable; large dash = waterbuck).



Major difficulties faced

- The monitoring schemes were good at revealing population trends, but did not reveal the reasons for any population changes. It is still unknown why the sable antelope and waterbuck populations in the Shangangwe enclosure declined so dramatically during 2006: possibly some animals were poached, or chased out of the enclosure. But the absence of an increase in either population during the following three years suggests that both were now being regulated, possibly in some density-dependent fashion, or as a result of a new or additional mortality factor.
- The ranches are large, but home ranges of eland are often also large. The fate of animals that left the ranches was often unknown (one released group of eland reappeared on Shangani Ranch after an absence of two years).
- The groups of the less-common and thus more-costly species that were available were often small, less than the 10 - 20 individuals that was the preferred group size.
- Roan antelope (*Hippotragus equinus*) was a species that would have been re-introduced if groups for release could have been purchased at a reasonable price.

Major lessons learned

- Need to release a sufficient number (suggest 50 - 100) of animals of target species, including males and females of a range of ages.
- Hard releases (freeing the animals immediately they arrived at the release ranch) seemed to be as effective as soft releases (when animals spent up to two weeks in a pre-release boma).

Success of project

Highly Successful	**Successful**	Partially Successful	Failure
	√		

Reason(s) for success/failure:

- Funds were available to obtain and release significant numbers of animals over a period of several years.
- The ranches were large, but nonetheless some released animals dispersed off the ranches. In the early stages, the ranches had a 'soft edge' because at least some of the neighbours were friendly towards wildlife. More recently, Zimbabwe's agricultural reform programme has hardened the edges. This resulted, at least initially, in some species (e.g. giraffe, elephant) finding refuge on the ranches. But in the long-term, the presence of wildlife on the ranches has attracted poachers who kill wildlife for bushmeat or trophies (e.g. elephant tusks, zebra skins). The high demand for meat in neighbouring mining communities has promoted commercial poaching for bushmeat.
- Financial returns from trophy hunting on the ranches were primarily used to fund the anti-poaching activities necessary to maintain the wildlife populations.

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