

Sandgrouse-watching at Witsand Nature Reserve

Introduction

Witsand Nature Reserve is most famous for its unusual white sand dunes, famous roaring sands (Brulsand) and spectacular scenery and sunsets. Few realise, however, that Witsand has a spectacular diversity of animals, ranging from desert-adapted insects to the large and rapacious Martial Eagle. Many other birds occur at Witsand, most of which are superbly adapted to live in a semi-desert environment. Sandgrouse are one of the most interesting and uniquely adapted of these desert birds.

One of the spectacles of Africa is the sight and sound of thousands of sandgrouse gathering to drink at a waterhole. This is a common occurrence in the Kalahari and a pan situated close to Witsand has attracted more than 15 000 sandgrouse within 60 minutes. Sandgrouse calls are a characteristic feature of the Kalahari and the sight and sound of several thousand birds arriving at a waterhole is an almost unrivalled spectacle, with potential eco-tourism value. The aim of Witsand's sandgrouse viewing hide and waterhole is to provide viewing opportunities for reserve visitors to observe this spectacle and also to learn about these birds' interesting adaptations to life in the Kalahari.

The different species

Globally there are 16 species of sandgrouse, 12 of which occur in Africa. They all belong to a single family, the Pteroclididae, and although they resemble pigeons they are most closely related to waders (shorebirds) from which they diverged about 70 million years ago.

Three species of sandgrouse occur at Witsand. Burchell's Sandgrouse *Pterocles burchelli* and Namaqua Sandgrouse *Pterocles namaqua* are particularly numerous and they drink in large numbers in the early morning, generally 2-3 hours after sunrise. The Double-banded Sandgrouse *Pterocles bicinctus* is less numerous and this species drinks in the early evening. The fourth southern African species, Yellow-throated Sandgrouse *Pterocles gutturalis*, does not occur in the Northern Cape, with its range being confined to the North West Province of South Africa and Botswana.

Some aspects of sandgrouse biology

Sandgrouse are specialised, obligate seed-eaters (granivores) that feed on the seeds of dicotyledonous annual plants within the arid and semi-arid zones of southern Africa. The chicks are precocial and feed themselves solely on seeds from the day they hatch, which is unique amongst birds. The advantage of a granivorous diet in the more arid ecosystems is that annual plants produce superabundant quantities of seed in a predictable fashion following good rainfall. However, in truly arid environments, rainfall is both highly variable in its quantity and unpredictable in its distribution in space and time. For this

reason, birds that utilise this food source are generally nomadic so that they can exploit the food, when and where it is available. Because of the low water content in their granivorous diet, sandgrouse have to drink regularly from surface-water sources. Such water sources tend to be limited in arid environments, but sandgrouse are capable of flying up to 160 km in a round trip from feeding sites to the closest water source. Thus, it appears that the entire local population will congregate at watering sites each day.

Sandgrouse are marvellously adapted to a life in the semi-arid deserts of Africa, including the following:

- Chicks are precocial, being able to walk within a day of hatching.
- They have cryptic plumage and can therefore evade predation as they forage on the ground.
- They bask in the sun during early morning and to avoid overheating fly to water during the cooler parts of the day.
- At night they huddle together to conserve energy.
- The soles of their feet are very thick and covered with small, callous-like scutes offering protection from the hot ground.
- When the temperature exceeds 31°C they droop their wings (thus exposing the sparsely feathered underwings) to cool down, they huddle (which keeps the air surrounding them at body temperature, thus reducing the amount of heat gained from the environment) and as a last resort they pant (gullar flutter) which results in water loss but is an effective way to lose heat. As a result they are able to keep their body temperature below 42°C, even when the air temperature exceeds 50°C.
- They fly to and from water in large flocks (the only time that they abandon their solitary demeanour), thus reducing the risk of being attacked by falcons and other aerial predators.

For most birds, the physiological demands of reproduction are the most rigorous and critical of any in their annual cycle. In response, most species have evolved the timing of breeding to coincide with the maximum availability of their food, particularly in strongly seasonal environments. Most sandgrouse species follow this pattern and breed through the dry season, when the availability of annual-plant seed is maximal. Namaqua Sandgrouse populations, on the other hand, exhibit an unusually variable breeding season that is not consistently correlated with peak food availability. This variability suggests that factors other than food availability are involved in determining the timing of breeding in different regions. The average clutch size of sandgrouse is three eggs, with the number probably being restricted by the number of chicks that the adult male can provision with water carried over long distances in the feathers of his belly.

Sandgrouse are unique because the sponge-like belly feathers of the males are able to absorb water, like blotting paper, which is then provided to the chicks at the nest. Remarkably these feathers retain the water for the long return flight to the nest. If one observes sandgrouse closely at the water, the belly-wetting behaviour is a sure sign that they are breeding.

Many of the positive and negative affects of man on sandgrouse are a result of their dependence on water.

Sandgrouse conservation in the Northern Cape

In the Northern Cape man has had both a positive and a negative affect on sandgrouse populations. The provision of artificial water (domestic-stock drinking troughs) has been particularly beneficial to these water-dependent species. In some areas overgrazing by domestic livestock has benefited legume plants; sandgrouse feed on the seeds of these plants.

There have also been several negative affects and it has been suggested that the population of particularly the Namaqua Sandgrouse has declined in numbers during the past 100 years.

- It is highly probable that the harmful chemicals (such as arsenic and BHC) used during the 1900s to control Brown Locusts *Locustana pardalina* had an impact on sandgrouse numbers. As no information was collected, the extent of this impact will never be known.
- In some areas the encroachment of shrubs, such as the three thorn *Rhigozum trichotomum*, would have made the habitat unsuitable for sandgrouse (as well as several other species of birds).
- A more recent mortality factor is the collision of sandgrouse with telephone lines and Dr Penn Lloyd, during his doctoral studies, determined that this was the most significant cause of mortality of adult Namaqua Sandgrouse in the Northern Cape. The sandgrouse are killed or injured when they fly into telephone wires which are situated close to their drinking places (such as gravel pits adjacent to roads). Telkom has recently moved some of the problem lines and fitted others with marking devices in order to make them more visible.
- Penn Lloyd also recorded a very low breeding success of Namaqua Sandgrouse in Bushmanland, the core breeding area for this species. The nesting success of Namaqua Sandgrouse over four consecutive years ranged from 6-14% and averaged 8% (or between 0.07-0.46 young/pair/year), in marked contrast to the breeding success for this species in a protected area, the Kgalagadi Transfrontier Park, where 22% nesting success was recorded and annual recruitment in an exceptional year was estimated at 33-66%, equivalent to 0.76-1.52 young/pair/year. These findings suggest that Namaqua Sandgrouse populations in South Africa may be declining due to excessive nest predation leading to poor breeding success. He attributed this to abnormally high

predation on eggs and nestlings by small mammals and snakes. His theory is that farmers have upset the predator-prey balance through their persecution of so-called problem animals (such as Black-backed Jackals *Canis mesomelas*) and birds of prey (such as the Martial Eagle *Polemaetus bellicosus*). The result is that there are fewer predators of Yellow Mongooses *Cynictis pencilata* and Cape Cobras *Naja nivea* and the latter animals are severely impacting on the sandgrouse populations.

- In the early part of the 1900s farmers used to kill thousands of sandgrouse, often by setting trigger wires at the birds' drinking holes. The breast muscles of the sandgrouse were dried and this meat served as a source of protein during lean periods. The impact on the populations of sandgrouse must have been huge, in one considers the reports of several bags being filled with sandgrouse in a morning.
- Today the hunting of sandgrouse continues, albeit on a much smaller scale. Some farmers in the Kalahari (and elsewhere in the Northern Cape) provide sandgrouse shooting opportunities for wing-shooters, with the shooting taking place at waterholes. Due to their dependence on usually limited watering sites in arid and semi-arid environments, sandgrouse are extremely susceptible to over-exploitation. Such an industry can only be sustainable if the birds are not shot during their breeding season, if bag limits are not exceeded, and if shooting does not take at large water-bodies.

Sandgrouse shooting in the Northern Cape

Sandgrouse wingshooting has been popular for many years, not only because of the birds' fast and erratic flight but because they gather in large numbers at a predictable time at suitable watering sites on a daily basis. Sandgrouse shooting has the potential to provide alternative revenue to rural communities in the arid and semi-arid areas of southern Africa. The value of sandgrouse as a resource is currently considered to be under-estimated and the resource under-utilised. A fledgling sandgrouse shooting industry has started developing in the Northern Cape, based mainly on the utilization of Namaqua Sandgrouse during the winter months. Since the 1980s when sandgrouse shooting took place on an extremely limited scale in the former Cape Province, there has been a significant increase in the number of commercial ventures operating in the Northern Cape. With the development of this commercial shooting industry two main problems have been identified: (1) Sandgrouse breeding seasons are variable and difficult to predict and it is therefore not easy to establish accurate hunting seasons and (2) breeding Burchell's Sandgrouse are inadvertently shot during the Namaqua Sandgrouse hunting season (and probably vice versa).

In the Northern Cape it is presently permissible to shoot two species of sandgrouse during stipulated hunting seasons. Burchell's Sandgrouse may be shot from 1 January to 31 March, with a daily bag

limit of five birds. Namaqua Sandgrouse may be shot from 1 April to 15 July, and a bag limit of ten birds per day is stipulated. Double-banded Sandgrouse which occur in the northern areas of the Northern Cape, may not be shot in the Province. The hunting seasons and bag limits are based on the birds' breeding seasons and their current conservation status. The view is that any hunting that takes place during a species' breeding season will be unsustainable and contribute to a decline in its populations. However, breeding seasons are not easy to predict. Due to the unpredictable and dynamic nature of the climate (particularly rainfall) and resultant effects on vegetation, sandgrouse breeding does not take place at the same time each year. It is therefore difficult to predict several months in advance (when the hunting seasons are promulgated) when sandgrouse will reproduce during the following year. Therefore, hunting seasons seem to be ineffective regulatory mechanisms. The Northern Cape Nature Conservation Service has, during recent years, been investigating alternative means of regulating shooting in the Northern Cape to ensure that this resource is sustainably utilized.

Development of a Memorandum of Understanding

The Namaqua Sandgrouse is regarded as being nomadic throughout its range. In South Africa the populations are partially migratory, with apparent autumn (April) and spring (September) movements between the Succulent Karoo and Nama Karoo biomes on the one hand, and the Kalahari on the other. The movements of Burchell's Sandgrouse are poorly known. Some populations appear to be resident, particularly in areas with permanent watering sites. However, this species does undertake at least local nomadic movements in response to patchy food availability following localised rainfall and in response to the availability of suitable watering sites in a region where such sites are particularly scarce. The Double-banded Sandgrouse appears to be largely resident.

Although no detailed information is available, movements of sandgrouse between southern African countries takes place. The management and conservation of sandgrouse is therefore the responsibility of more than one authority and country. To address this matter, the Northern Cape Nature Conservation Service initiated discussions with its counterparts in Namibia and Botswana with the ultimate goal of ensuring the long-term conservation of three sandgrouse species. The three countries decided to develop a Memorandum of Understanding, under the Bonn Convention; also called the Convention of Migratory Species. This document has now been completed, as well as sandgrouse management plans for the three countries and a southern African sandgrouse conservation plan. Unfortunately recent unforeseen hiccups have delayed the finalization of the MoU.

The MoU address matters such as:

- Collaborative scientific research (for example studies of sandgrouse movements, sustainable offtakes,

low reproductive success in certain areas).

- Conservation of key sandgrouse habitats.
- Development of collaborative education and awareness programmes (for wing-shooters, landowners and other relevant persons).
- Promulgating and annually reviewing biologically-acceptable hunting seasons and daily bag-limits.

The Witsand sandgrouse viewing hide

The sandgrouse viewing hide and waterhole was built with funds from the Lomas Wildlife Protection Trust. The development of the hide began at the end of 1999 and was completed by early March 2000. The hide was built with quartzite rocks from the area and its viewing ports are at ground level, a few metres away from the waterhole. The hide is therefore unique as it provides a view of the sandgrouse and other birds (and mammals, such as Springbok *Antidorcas marsupialis* and steenbok *Raphicerus campestris*) from a very different perspective to other bird hides. It is particularly suitable for photography.

As it would have been too costly to hire contractors to build the hide, the Witsand Nature Reserve manager, Reinhart Jessnitz, and his staff were responsible for the hide and waterhole construction. The hide can accommodate 12 or more people.

The hide was officially opened during a University of Cape Town bird-ringing workshop (attended by about 60 people) on 10 March 2000. The event received coverage in several local newspapers (*Diamond Fields Advertiser* and *Volksblad*), the glossy magazine *Africa - Birds & Birding* and several other bird-watching publications.

Other bird species

Many species of birds which are typical of the Kalahari can be observed drinking and bathing at the waterhole. It is particularly the seed-eating birds which are most dependent on a regular drink and Red-headed Finches *Amadina erythrocephala*, Scaly-feathered Finches *Sporopipes squamifrons*, Violet-eared Waxbills *Uraeginthus granatinus*, Black-throated Canaries *Serinus atrogularis* and many more are sure to be observed if one sits quietly and patiently at the viewing hide.

Sandgrouse watching

The best time to view Namaqua and Burchell's Sandgrouse is 2-3 hours after sunrise, although this time varies. Double-banded Sandgrouse are an infrequent visitor to Witsand, but when present they

can be seen at dusk. Check with the reserve officials to obtain the best viewing times for these three sandgrouse species.

Sandgrouse viewing hide rules

In order to prevent unnecessary disturbance to the wildlife that use the waterhole and also to respect the interests of fellow bird-watchers and other occupants of the hide, the following rules apply:

- Please be quiet in the hide and only whisper when necessary.
- Prevent unnecessary movement in the hide, as this will disturb the wildlife using the hide.
- Please walk directly to/from the car-park and under no circumstances is anyone allowed to walk around the hide (i.e. only use the designated path and entrance).
- Please do not litter.

Enjoy your time in the hide and savour the experience of viewing Kalahari birds (and other wildlife) at such close quarters. Please report your observations to the reserve officials. Also please tell your friends about Witsand and its unique hide and do your best to promote an interest in bird-watching in South Africa.

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