

Eastern Karoo Precinct

The Karoo Large Terrestrial Bird Survey (KLTBS) began in July 1995 and takes place in six districts in the eastern Karoo, viz., De Aar, Philipstown, Noupoot, Hanover, Richmond and Colesberg. The precinct is bounded by the Orange River (Northern Cape/Free State provincial boundary) in the north and east, the Northern Cape/Eastern Cape provincial boundary in the south, and the N12 national road in the west. The precinct consists of extensive, flat to gently undulating plains that are broken by dolerite koppies (mesas and buttes) and small mountain ranges, such as the Renosterberg, Tierberg and Tafelkop.

Natural habitats

The precinct is in the Nama Karoo Biome, an area of grassy, dwarf shrubland. The Nama Karoo is regarded as a semi-desert and precipitation, which occurs predominantly in the summer months, is unpredictable and sporadic (Desmet & Cowling 1999). The average annual rainfall measured from 1974-1993 at several towns in the area was: De Aar: 305 mm; Colesberg: 390 mm; Richmond: 325 mm; Hanover: 328 mm; Noupoot: 362 mm and Philipstown: 334 mm) (De Aar weather station unpubl. data).

Just north of De Aar, the ephemeral Brak River flows in an arc from south-east to north-west, eventually feeding into the Orange River basin. Other ephemeral rivers in the area include the Hondeblaf, Seekoei and Elandsfontein. The perennial Orange River and large Vanderkloof Dam are dominant features in the north and east. Other impoundments consist of small- to medium-sized earthen farm dams on ephemeral rivers and drainage lines.

The main geological layers are sediments of the Dwyka formation, which is overlain by the Ecca and Beaufort groups (Lloyd 1999). The dolerite intrusions (dykes and sills) are more resistant to weathering than the sandstones and shales, thus causing the formation of the characteristic Karoo koppies.

The vegetation type of the precinct is the Eastern Mixed Nama Karoo that reflects an extensive ecotone (transition) between the Nama Karoo Biome in the west and the Grassland Biome to the east (Low & Rebelo 1996). The Eastern Mixed Nama Karoo has the highest rainfall of all the Nama Karoo vegetation types and is thus ecotonal to grassland, with a complex mix of grass- and shrub-dominated vegetation types (Hoffman 1996). It is relatively sensitive to grazing pressure and, depending on rainfall conditions and stocking density, may resemble either grassland or typical Karoo.

Common shrubs include *Ruschia divaricata*, *Pentzia incana*, *Euclea undulata*, *Eriocephalus spinescens*, *Rhus burchellii*, *Eriocephalus ericoides*, and *Pteronia adenocarpa*. Various species of grass dominate the landscape after good summer rains, especially in the eastern areas of the precinct. These include *Aristida adscensionis*, *A. congesta*, *Eragrostis lehmanniana* and *Themeda triandra*. Some of the ephemeral riverbeds and larger drainage lines are lined by *Acacia karroo* trees.

The avifauna of the area has been described by Kieser & Kieser (1978), Vernon (1986, 1999) and Barnes & Anderson (1998). Threatened mammals, reptiles and amphibians that occur in the area are given in Barnes & Anderson (1998), while Vernon (1999) provided a general description of the animals of the Karoo.

Land use

Europeans colonists first expanded from the southwestern Cape during the early 1700s and by 1830 most of the Cape Colony, including the Nama Karoo, was occupied by colonial farmers. Many of the original Khoikhoi and San inhabitants were exterminated in the conflict which ensued over the control of land and ecological resources.

There has been an interesting evolution of grazing practices in the Karoo during historical times (Hoffman et al. 1999). Earlier colonial pastoralists adopted herding strategies similar to those of Khoikhoi herders, but as land tenure changed and competition for key resources between the Europeans increased, so grazing practices also changed. Livestock had been herded between watering points and kraals, mainly as protection from predators; it was only after the erection of wind-pumps and fencing in the late 19th century that new management systems were implemented. In recent times, rotational grazing systems have replaced more traditional continuous grazing practices.

The agricultural industry in the Karoo has always been based on small stock, particularly sheep, both pure wool and mutton breeds (Vorster & Roux 1983). Stocking rates have generally decreased during the 20th century and this has been influenced by various factors, including water-point provision, droughts, vegetation degradation, macro-economic development, and state subsidies (Dean & Macdonald 1994; Hoffman et al. 1999). Unfortunately not all Karoo farmers apply judicious grazing management; this has resulted in a general degradation of the Karoo landscape and declining agricultural productivity over the past 100 years (Acocks 1953; Dean & Macdonald 1994; Hoffman 1999).

Current commercial livestock farming in the Karoo revolves mostly around sheep and extensive wool (Merinos) and mutton (Dorpers) production. Approximately 50% of the commercial farming enterprises in the Karoo are found on properties smaller than 3000 ha and less than 25% on properties larger than 6000 ha (Hoffman et al. 1999).

Although game ranching has a relatively short history in the Karoo, there are many properties that stock a few of the plains game indigenous to South Africa, such as Blesbok *Damaliscus dorcas phillipsi* and Black Wildebeest *Connochaetus gnou*. Springbok *Antidorcas marsupialis* are by far the most common game species in the Karoo, and in 1983 were found on 96% of all farms in the region (Jooste 1983). During the 1700s and 1800s, travellers recorded vast herds of migratory springbok (“trekbokken”) in the Nama Karoo. During the early 20th century these numbers declined dramatically through hunting and the restriction of migratory movements by the erection of fencing.

Less than 1% of the Karoo is cultivated under dryland or irrigated conditions, and in the eastern Karoo intensive agriculture is largely restricted to small fields of irrigated lucerne, as well as prickly pear *Opuntia ficus-indica* orchards. *Opuntia* has fortunately not invaded the natural rangelands of this specific area, but the exotic mesquite *Prosopis glandulosa* has become a serious problem in some areas, particularly in drainage lines in the west (Harding & Bate 1991; Henderson 1991). Other invasive exotic plants include *Salsola kali* and *Atriplex lindleyi* ssp *inflata*, *Nicotiana glauca* and the jointed cactus *Opuntia aurantiaca*, while stands of *Populus* and *Eucalyptus* have been largely restricted to the surrounds of homesteads. *Phragmites australis* reeds grow in the beds of several of the ephemeral rivers.

CAR in the precinct

The KLTBS is mainly supported by the eastern Karoo farming community; other participants include De Aar residents, bird-watchers from Kimberley and Northern Cape Department of Agriculture, Land Reform, Environment & Conservation (DALREC) personnel. The support of the farmers is important because they (and their families) are the ultimate custodians of the area's natural heritage.

The precinct is relatively flat and open, which enables large terrestrial birds to be relatively easily observed. Concern has been expressed about the recent inclusion of the very common and vociferous Whitequilled Korhaan *Eupodotis afraoides* in the CAR project, as it may result in an undercounting of other, more important (viz. threatened and endemic) species when emphasis is placed on attempting to record all the korhaans seen and heard.

Local conservation initiatives

The Eastern Mixed Nama Karoo vegetation type is poorly conserved (only 1.08%) and the conservation areas are immediately adjacent to two major dams on the Orange River (Hoffman 1996). DALREC's Doornkloof Nature Reserve (12 000 ha) and Rolfontein Nature Reserve (8000 ha) are situated adjacent to the Vanderkloof Dam in the north and east.

Small isolated reserves cannot fulfill the conservation requirements of large, wide-ranging, non-passerine birds. The only feasible long-term approach to conserving these species is to manage the agricultural landscape in which they occur. The Platberg-Karoo Conservancy is an example of how conservation can be achieved without sacrificing the farming potential of the land. The conservancy was established on 31 July 1990 and it covers the districts of De Aar, Philipstown and Hanover, an area of approximately 1.2 million hectares (although not all landowners are members of the conservancy or subscribe to its ethos). The focus of the conservancy has included seeking selective and environmentally-acceptable methods to control problem mammalian carnivores (such as the Black-backed Jackal *Canis mesomelas*) and the Brown Locust *Locustana pardalina*. Francois Taljaard is the coordinator of the Platberg-Karoo Raptor Project, which is conducted under the auspices of the Endangered Wildlife Trust's Raptor Conservation Group. Besides a conservation awareness campaign, Francois and Ronelle Visagie conduct research on raptors, including the monitoring of nesting sites and the colour-ringing of Southern Pale Chanting Goshawks *Melierax canorus*.

The Platberg-Karoo Conservancy is recognized as an Important Bird Area because of the significant occurrence of two globally threatened species (Lesser Kestrel *Falco naumanni* and Blue Crane *Anthropoides paradiseus*), four nationally threatened species (including Kori Bustard *Ardeotis kori* and Ludwig's Bustard *Neotis ludwigii*) and several globally and nationally near-threatened species (including Blue Korhaan *Eupodotis caerulescens*, Black Stork *Ciconia nigra* and Secretarybird *Sagittarius serpentarius*) (Barnes & Anderson 1998).

DALREC and the Platberg-Karoo Conservancy have initiated various research and environmental awareness projects in the area. These include the KLTBS, the Karoo Large Terrestrial Bird Powerline Project (funded by Eskom; see below), the Blue Crane Awareness Project amongst school children, farmers and farm workers (funded by the North Carolina Zoo, logistically supported by the South African Crane Working Group, and coordinated by Maxie Jonk) and the annual colour-ringing of Blue Crane chicks. Two Blue Crane chicks were also fitted with satellite transmitters and their post-fledging movements were monitored (McCann, Shaw, Anderson & Morrison 2001). Other DALREC involvement in the area includes a farmer extension programme.

The major threat of powerline collisions is currently being addressed by Eskom, through the Eskom/Endangered Wildlife Trust Partnership and a DALREC research project. The main aims of this project are to determine the impacts of power lines on large terrestrial bird populations, the characteristics of collisions sites, and to evaluate the effectiveness of earth-wire marking devices (Anderson & Piper in prep; Anderson in prep).

Large terrestrial birds in the precinct, and advice to landowners

The Eastern Karoo Precinct recorded the highest densities of Ludwig's Bustard and White Stork, and amongst the highest densities of Kori Bustard, Karoo, Whitequilled and Blue Korhaan, Secretarybird, and Blue Crane. From these statistics it is apparent that this precinct has great importance for the conservation of large terrestrial birds.

The White Stork mean densities were affected by the particularly high counts of White Stork in January 1997 (1511.9 birds per 100 km), when birds were observed feeding on Brown Locusts, both dead and alive (Anderson 1997). The exceptional insect availability was linked to above average summer rainfall (see species account for further discussion).

It is interesting to note that there is a close correspondence between the Blue Crane and Ludwig's Bustard in terms of the routes on which the highest densities were recorded. The routes that recorded significantly higher densities of both these species were NK043, 044, 051, 061, 062, 101, 141, 311 and 323 (see Appendix). Most of these routes also had elevated densities of one or more of the korhaan species. These routes are all situated south of Philipstown and west of Colesberg in an area which falls largely, but not entirely within the Platberg-Karoo Conservancy (Fig. 29.1). It would be worth investigating the possible reasons for the birds' selection of this area.

It is clear from Fig. 29.4 that natural veld is by far the most important habitat type for large terrestrial birds in this precinct. A major ecological threat is veld deterioration by overgrazing, which results in a depletion of palatable species (such as *Limeum aethiopicum* and *Osteospermum sinuatum*), erosion, and encroachment and bush thickening (by species such as Three thorn *Rhigozum trichotomum* and Bitterbos *Chrysocoma ciliata*). Veld degradation could potentially reduce the populations of large terrestrial birds through loss of suitable habitat and a decreased availability of food.

Despite the important ecological role of the Brown Locust in the Nama Karoo (viz. herbivore of Karoo vegetation, food for predators, recycling of nutrients), it has been controlled by chemical means since the early 20th century. Various harmful chemicals have been used: sodium arsenite, benzene hexachloride (an organochlorine), and diazinon and fenithrothion (organophosphates). It is likely that the chemicals used during locust control operations have had a major impact on the Karoo's large terrestrial bird populations (e.g. Anderson 2000). More recently a synthetic pyrethroid (deltamethrin) and mycoinsecticide (*Metarhizium*), with apparently lower toxicity to other organisms (Bateman 1997), have been used to control Brown Locusts.

Large terrestrial birds (particularly Ludwig's Bustard and Blue Crane) are very susceptible to collisions with overhead power lines (Johnsgard 1991; Allan 1997) and telephone wires (Herholdt 1988; pers. obs). This is almost certainly the single most important threat to these two species in the Nama Karoo and it is likely that the Ludwig's Bustard population may be in long-term decline as a result of this single anthropogenic mortality factor (Anderson & Piper in prep; Anderson in prep). Farmers are encouraged to report collisions to the Eskom/EWT Partnership or to DALREC.

Other conservation problems that affect large terrestrial birds include hunting of bustards for food (Brooke 1984, 1987; Anderson 2000), the capture of Blue Crane chicks as pets, the drowning of chicks in drinking troughs, the entanglement of Blue Cranes in fences (Allan 1993; unpublished information), and possibly unselective problem animal control (birds can be caught in gin traps). The use of poisons for problem animal control also affects scavenging raptors and various non-target mammalian carnivores (e.g. Allan 1989).

Farmers can protect the habitat of large terrestrial birds by good land management practices that are as much to the benefit of the farmer as to the birds. Special problems, such as those mentioned above, can usually be solved with relatively simple measures. When birds are found dead, the circumstances should be carefully recorded and reported to DALREC who will then offer advice on what steps to take to prevent further incidents.

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