# Black-backed Jackal *Canis mesomelas*



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|---|---|
| Namibian conservation status | Least Concern |
| Global IUCN status | Least Concern since 1996 |
| Namibian range | ~809,700 km² |
| Global range | ~6,453,500 km² in two distinct sub-species:<br>▸ ~3,150,400 km² in southern Africa<br>▸ ~3,303,100 km² in northeastern Africa |
| Population estimate | Common to fairly abundant across its range |
| Population trend | Stable. Possible increase on farmlands due to compensatory breeding where natural enemies have been removed |
| Habitat | Open country including grassland, scattered thickets and lightly wooded areas particularly in the Karoo, Kalahari and even in the Namib Desert. Makes extensive use of agricultural lands |
| Threats | ▸ No major threats, even though they are heavily persecuted on game and small-stock farms as livestock killers. Depending on the situation, such activities might or might not have significant impact on jackal populations. However, the use of non-selective predator control methods against jackals, such as poisons and gin traps, have a significant impact on other species, including scavenging birds and many mammals that are highly beneficial to farmers and healthy ecosystems<br>▸ Rabies and canine distemper can cause local, short-lived population declines<br>▸ Persecuted for their role as rabies vectors |

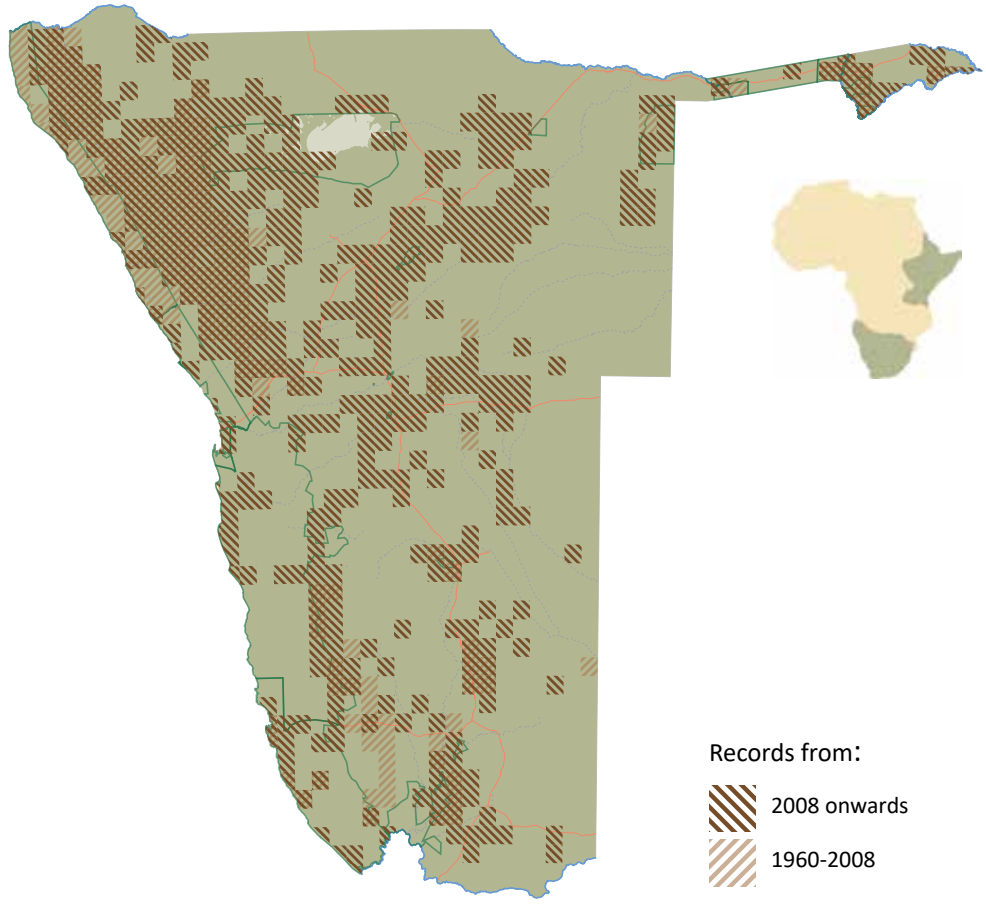
## IDENTIFYING FEATURES

The black-backed jackal is a small- to medium-sized canine of 6–13 kg (Kingdon & Hoffmann 2013) with a distinctive dark saddle running from the nape of its neck to the tail. The coat is reddish brown to tan, with a black-tipped bushy tail, and the black of the saddle is intermixed with silvery hair. A black side stripe slopes up from behind the shoulders to the rump. The side and shoulder stripe, and tail markings, can be used for individual identification (Loveridge & Nel 2009, Murray & Merrifield pers. comm.).

Distribution records of black-backed jackal, and present estimated area of distribution in Namibia.

Inset: African distribution of black-backed jackal according to IUCN (Hoffmann 2014c).

The Namibian distribution in the main map is more up to date and does not necessarily agree with the distribution shown in the inset.




This jackal is similar in size to the side-striped jackal but the dark saddle should prevent any confusion. Individual black-backed jackals with a less distinct, paler saddle are found, which might be confused with side-striped, but in that species the stripe on the flank is white and there is little contrast in the pale-brown coat. The black tail tip of the black-backed jackal in contrast to the white tail tip of the side-striped jackal is another way to distinguish the species.

## DISTRIBUTION

The black-backed jackal occurs in two discrete areas, separated by a distance of approximately 900 km. *Canis mesomelas schmidti* occurs in East Africa and *Canis mesomelas mesomelas* in southern Africa. The southern African subspecies is found in parts of South Africa, Botswana, Angola, Zimbabwe and Mozambique and throughout Namibia (Estes 1991, Hoffmann 2014c, Wilson & Reeder 1993). In Namibia, black-backed jackals occur both within and outside protected areas, and the species' overall current distribution is similar to that which occurred historically (Shortridge 1934). Hoffmann (2014c), in the most recent global assessment, regarded them as absent in the Zambezi Region, but occurrence has since been confirmed (L Hanssen pers. comm.).

## POPULATION ESTIMATE AND TREND

Black-backed jackals are common in Namibia. Historically they were regarded as abundant except from Grootfontein to the northeast through Kavango and Zambezi Regions, where they were sympatric with side-striped jackal (Shortridge 1934). Prior to the 1970s, black-backed jackals were not considered an agricultural pest in Namibia, despite being widespread, because most small livestock were kraaled at night (Shortridge 1934). However, starting in the 1970s their numbers were severely decreased in southern sheep-farming districts due to (subsidised) jackal-proof fencing and hunting (Joubert & Mostert 1975). Numbers at that time were estimated at 51,325 black-backed jackals on Namibian freehold farmlands, mostly in the central to northern districts. Jackal numbers in the south seem to be recovering though, despite large numbers still being killed through organised hunting (C Luyt pers. obs.), poisoning and gin traps.

Black-backed jackal densities vary greatly and depend on prey diversity and abundance (Klare *et al.* 2010). In South Africa, for instance, densities of 34–40 individuals/100 km$^2$ have been recorded in the Drakensberg Mountains (Rowe-Rowe 1982), 33–43 individuals/100 km$^2$ on nature reserves in central South Africa (Klare *et al.* 2010), but

only 2 individuals/100 km² on small-livestock farms that actively managed black-backed jackals (Kamler *et al.* 2013). Along the Namib Desert coast, Nel *et al.* (2013) recorded jackal densities between 0.1 to 13.1 individuals per km of coastline, dependent on resource availability. Similarly, hourly counts carried out at a Cape fur seal colony, situated on a 1 km long beach in southern Namibia, revealed a maximum number of 33 and 76 jackals foraging at the same time during and after the seal pupping season respectively (I Wiesel pers. comm.). These extreme variations in abundance make it difficult to assess population densities for Namibia without further study. However, the population is regarded as stable.

## ECOLOGY

Black-backed jackals occur in a wide range of habitats and occupy virtually all habitats within their distribution, including arid coastal desert, karoo, woodland, savanna and farmland (Ray *et al.* 2005b). They prefer open habitats and show a tendency to avoid denser vegetation (Loveridge & Nel 2009). Where they are sympatric with side-striped jackal, habitat is partitioned and black-backed jackals are found in more open areas, aggressively displacing side-striped jackals to woodland habitat (Loveridge & Macdonald 2002).

Black-backed jackals form monogamous territorial pairs, often with life-long pair bonds (Estes 1991). The pair forms the basis of the social structure that may also comprise their offspring and the previous year's offspring acting as helpers (Moehlman 1978, Loveridge & Macdonald 2001, Kamler *et al.* 2019). The breeding season is often synchronised with the main lambing season of their prey in spring (varying from August to December across southern Africa), enabling the jackals to provide high-quality food for the new pups (Estes 1991, Klare *et al.* 2010, Kamler *et al.* 2012a). An average of 4.6 pups (range 1–8) are born in dens after a gestation period of about 60 days. Food is regurgitated by the parents and alloparents, and also carried back to the den (Moehlman 1978, Estes 1991). Alloparents also guard the pups and their presence increases overall pup survival (Moehlman 1979). Pups are fully weaned by 8–9 weeks of age, when they start foraging together with their parents (Moehlman 1978, Ferguson *et al.* 1983). Subadults reach sexual maturity at 11 months, but typically start breeding at two years of age at the earliest (Ferguson *et al.* 1983). They usually disperse at one year of age when not staying as helpers (Moehlman 1987, Kamler *et al.* 2019) and dispersal distances of up to 135 km have been recorded (Ferguson *et al.* 1983). However, some dispersed offspring that have already set up a territory of their own, may occasionally return to their natal range to help their parents raise the next litter (Loveridge & Macdonald 2001). Black-backed jackals often go on extraterritorial forays, sometimes up to 8 km from their home-range boundaries, often to hunt or look for mating opportunities (Kamler *et al.* 2019).

The breeding pair is territorial and they aggressively defend their territory together with their helpers (Moehlman 1987). In South Africa they have been found to occupy territories of 1.3 to 27.7 km² (Ferguson *et al.* 1983), with home ranges being 14.7 km² per territorial pair in the Kalahari (Ferguson *et al.* 1983), 9.7 km² in Nama Karoo near Kimberley (Kamler *et al.* 2019), and up to 27.7 km² in Gauteng and Northwest Province (including farmland) (Ferguson *et al.* 1983). In south-eastern Botswana the average territory size was 15.9 km² (Kaunda 2001). In Namibia, territoriality has only been studied in coastal areas. For example, territory sizes

around Cape Cross, a mainland seal colony, vary from 0.2–11.1 km² during the breeding season and are positively correlated with the distance to the food source (Jenner *et al*. 2011). Along the coast away from mainland seal colonies, where food patches are mostly small and widely separated, jackal group sizes are small, and territories are narrow and extremely elongated. Where food patches are rich, fairly clumped and also heterogeneous, group sizes are large and territory sizes small (Nel *et al.* 2013). Larger group sizes can improve the black-backed jackals' efficiency as hunters (cf. Estes 1991, Jenner *et al*. 2011, Merrifield 2012, Murray *et al*. 2012) by allowing them to take larger prey such as adult springbok (Krofel 2007) or defensive prey such as seal pups (I Wiesel pers. obs.). Nevertheless, single black-backed jackals have been reported to kill impala and other medium sized ungulates (Kamler *et al*. 2010).

Black-backed jackals are predominately nocturnal, particularly on farmland where they are persecuted, but they may be active both during the day and night in undisturbed areas (Stuart 1981). At mainland seal colonies along the Namib Desert coast, activity is seen throughout the day, with weak individuals suffering from sarcoptic mange making use of the warmer daylight hours (I Wiesel pers. obs.).

Black-backed jackals are opportunistic and eat whatever is seasonally available from plants, invertebrates and reptiles to birds and mammals (Estes 1991, Stuart 1976, Stuart & Shaughnessy 1984, Kamler *et al.* 2012a). They readily scavenge, but when hunting they show a preference for "hider" ungulate species, rather than "followers" during ungulate birthing periods (Klare *et al.* 2010). Due to their opportunistic feeding behaviour, they may feed extensively on insects in years of good rainfall, which has for instance reduced predation on livestock in Namaqualand (C Luyt pers. obs., cf. Bothma 1966). When foraging, black-backed jackals respond to prey distress calls and are alert to large carnivore activities (Loveridge & Nel 2009). They will also often follow larger carnivores in order to scavenge (Bothma & Le Riche 1984, Estes 1991). They forage in pairs and family groups and can form large aggregations at large carcasses and at seal colonies (Kaunda 1998, Merrifield 2012, Murray *et al.* 2012). On small-livestock farms in South Africa, sheep were an important part of the black-backed jackal diet, although wild prey were preferred over sheep in most seasons (Kamler *et al*. 2012a).

While they do drink fresh water when available, and will even leave their territory in order to find water (Kaunda 2001), the widespread occurrence of black-backed jackals along the Namib Desert coast indicates that they can survive on the water they obtain from their food. The relatively high vegetation content in their diet (7.3–14.3% in the central Namib Desert) probably contributes a significant proportion of their water needs (Stuart 1976).

Black-backed jackals have been shown to have a negative impact on Cape foxes and bat-eared foxes, both by physically killing them and by restricting their available range and denning sites through aggressive behaviour and competition (Kamler *et al.* 2012b, Kamler *et al.* 2013). In turn, black-backed jackals are killed and preyed upon by larger carnivores, including African wild dogs, leopards, lions, cheetahs and brown hyaenas (Estes 1991, Stander 1992, Bothma & Le Riche 1994, Hayward *et al*. 2006b, Kamler *et al*. 2007, Stein *et al*. 2013). Consequently, the presence of large carnivores results in lower densities of black-backed



jackals (Yarnell *et al*. 2013), termed mesopredator release (Prugh *et al*. 2009). This would explain why jackals can attain relatively high densities in areas devoid of large carnivores. The relationship between black-backed jackals and caracals is more complex, because caracals may prey on black-backed jackals (Melville *et al.* 2004), yet jackals kill caracal kittens and therefore the removal of black-backed jackals may result in an increase of caracal numbers (Pringle & Pringle 1979).

There are aspects of the jackal's behaviour, particularly with respect to population control measures that are discussed under Threats below, that have unexpected consequences on their breeding and population. Firstly, a study has shown that anthropogenic mortality, that causes the breakdown of the jackal social structure, may be compensated for by breeding at an earlier age and increased litter size (Minnie *et al.* 2016b), resulting in the population control efforts being ineffective. Similarly, it has been shown that culling of carnivores can increase subsequent livestock losses (Conradie & Piesse 2013). This is best explained by a break-down in the territorial structure of black-backed jackals. Normally, mature breeding jackals allow some of their pups from previous years to stay on in their territory as helpers which help to raise the next generation of pups (Kamler *et al*. 2019). They will not allow any other jackals to breed in their territory, and youngsters need to have reached a certain level of maturity in order to set up a territory of their own. Minnie *et al.* (2016b) has shown that where jackals are persecuted on farms, the mature individuals are removed, allowing the younger individuals to pair and breed in their defunct territories. The net result can be a number of young breeding pairs in the same territory where there used to be only one mature breeding pair. Nevertheless, in some areas where predator-proof fences are used and maintained around small-livestock farms, and jackal hunting is intensive within the predator-proof fences, then jackal numbers can be suppressed and maintained at very low densities (Kamler *et al*. 2013).

Secondly, the use of gin traps and other nonselective traps may also affect the black-backed jackal's natural prey populations, (e.g. Namaqualand: Dreyer 2009) which may lead to increased conflict on farms. Eighty percent of the animals killed by trapping in the Namaqualand study were non-target species, including hares, bat-eared foxes, porcupines and mongooses. These can be a significant proportion of the black-backed jackal diet (Avenant & Du Plessis 2008), and removing these potential wild prey species might leave jackals with little choice but to kill more livestock to survive, leading to further conflict with livestock owners. The use of poisons has a similar effect, but can have the added disadvantage that vultures and scavenging birds of prey can also fall victim.

## THREATS

Black-backed jackals are heavily persecuted in small-stock farming areas, with some farmers using jackal vocalisations and shooting at night (e.g. 30 jackals killed in two nights on one farm, C Luyt pers. obs.). Other indiscriminate predator control measures are also applied, such as the use of gin traps, and there is still widespread and possibly increasing use of poisons, despite the banning of the prescription and import of strychnine in 2003 (C Luyt pers. obs., Simmons *et al.* 2015, Santangeli *et al*. 2016).

Surprisingly, these activities do not currently seem to threaten the overall survival of black-backed jackals (Avenant & Du Plessis 2008). As explained above, jackal persecution measures may kill many jackals, but sometimes they are ineffective in controlling the local jackal population. Additionally, they can result in higher levels of carnivore-livestock conflict. This might be because unselective trapping and poisoning depletes the availability of jackal prey, so raising the likelihood that jackals will kill livestock. And due to the complex dynamics between jackals and caracals, where jackal numbers are reduced, the caracal population can grow, and these cats then inflict more damage on small-stock (Pringle & Pringle 1979). For instance, Conradie & Piesse (2013) showed that in the Ceres Karoo, those farms where most predators were killed in a certain year had the most livestock losses the following year, but they gave no explanation for this observation. The lack of knowledge about the black-backed jackal's ecology and the effect of extirpations needs to be addressed in order to maintain functioning ecosystems.

Jackals are susceptible to pathogens such as rabies, canine distemper and parvo virus (Loveridge & Macdonald 2001) and also act as vectors for these diseases (Bellan *et al.* 2012). Outbreaks of rabies and canine distemper can cause temporary local population crashes, and these often occur in areas where there are high numbers of dogs (Gowtage-Sequeira *et al.* 2009), or where population and territorial structure are disrupted by human persecution (Ray *et al.* 2005b). However, in Namibia, several outbreaks have been observed in protected areas along the coast, considerably reducing the black-backed jackal population (I Wiesel pers. obs.). Black-backed jackals are also persecuted for their role as vectors, as rabies poses a danger to humans and livestock.

There is very little trade with black-backed jackal skins and body parts (Minnie *et al.* 2016a).

## CONSERVATION STATUS

The black-backed jackal is listed as a species of Least Concern on the IUCN Red List (Hoffmann 2014c) and has been so since its first assessment in 1996 (Lower Risk: Least Concern). It is not included in the CITES Appendices. Its conservation status in Namibia is Least Concern. Griffin (2003) listed the black-backed jackal as secure, and because of its wide habitat tolerance and stable population size, the current classification can be justified.

## ACTIONS

### Management

- Increasing the natural prey of jackals, as well as using livestock management techniques that reduce conflict with jackals, such as livestock guarding dogs, without the use of indiscriminate trapping and poisoning, are necessary for the long-term stability of the species (and a healthy ecosystem).
- Reintroduction of large predators such as leopards might even be important for stabilising jackal numbers. It is known that leopards kill and eat both jackals and caracals, so it is likely that their extirpation on farmlands has contributed to the reported increase in jackal and caracal numbers. Jackal territories in protected areas that they share with larger predators are also more stable than on adjoining farmlands (Minnie *et al*. 2016b). Thus areas where predators are persecuted act like a sink, with continuous immigration of young jackals moving in and never stabilising their territories.
- Adjust Event Book reporting and conservancy reports to distinguish between black-backed and side-striped jackal, to obtain sound distribution data.
- Develop standard methodologies for farmers to identify the correct problem animal species in predation events.

### Awareness

- Farmers need to be made aware of the ecology of carnivore species and the undesirable results that improper carnivore management can have. Specifically, there should be greater effort to explain that the persecution and disruption of the social structure of black-backed jackals usually leads to more problems, as subadults come into the area. The ecological role that jackals play, and their benefits to land owners, needs to be explained and widely distributed.
- Make the public aware that black-backed jackals are no longer referred to as "problem species" in the draft Protected Area and Wildlife Management Bill. There are only problem individuals.
- Guard dogs can virtually eliminate small-stock losses to jackal, and local breeds (or cross-breeds) of dogs suited to rural village life can be trained and used. Similarly, just having livestock sleep in a predator-proof kraal can eliminate most livestock losses.
- Small-stock farmers should be encouraged to keep springbok on their land and to manage healthy ecosystems to reduce predation on small-stock. Farmers should focus on stock management and protection, not predator control.
- The public needs to be made aware that rabies in kudu is most probably not transmitted through black-backed jackals, but directly transmitted from kudu to kudu.
- Promote citizen science participation in online reporting platforms, especially amongst private camera trap owners and farmers (e.g. via NAU). Explain the importance of such data in the national and global context. It is important to record all type of data e.g. sightings, photos, human-carnivore conflict, mortalities, carnivore signs (dens, marking posts).

### Research

- Standardise carnivore monitoring programmes so that information is captured from camera traps, questionnaires, citizen science projects and sign surveys.
- Research should be undertaken on black-backed jackals and their interactions with other carnivores and wild prey on farmlands, to better understand the dynamics of their populations.
- There is a need for applied research aimed to help farmers adopt the best strategy for reducing livestock predation impacts, while allowing coexistence with various other carnivores.

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**Reviewer**: Jan Kamler

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