



## A review of the population status and threats to Peregrine Falcons throughout Namibia

Robert E. Simmons<sup>1\*</sup>, Andrew R. Jenkins<sup>1</sup> and Christopher J. Brown<sup>2</sup>

<sup>1</sup> DST/NRF Centre of Excellence, FitzPatrick Institute,  
University of Cape Town, Rondebosch 7701, South Africa.

\* Present address: Dept of Nature Conservation, Tshwane University of Technology,  
Pretoria 0001, South Africa  
Rob.Simmons@uct.ac.za

<sup>2</sup> Namibia Nature Foundation, P.O. Box 245, Windhoek, Namibia  
cb@nnf.org.na

### Abstract

By reviewing all available data from atlas projects, road counts, nest records and specialized studies we estimate that Namibia's Peregrine Falcon *Falco peregrinus minor* population does not exceed *ca.* 100 pairs. Most are concentrated in the arid western escarpments areas, with a well-studied population in the Orange River valley in the south and other populations in the Waterberg Plateau in acacia savanna in central-north Namibia. Most birds occur in areas experiencing mean annual rainfall below 450 mm. Breeding occurs between August-October with 1.7 young per pair fledged from 8 pairs over 47 pair-years in the Orange River. Little is known of their ecology but birds frequent waterholes to hunt nomadic species such as sandgrouse and larks, as well as coastal mudflats where they hunt migrant shorebirds.

High temperatures and UV levels probably protect breeding birds from threats such as DDT pesticides used for malaria. However, increasing temperature and decreased rainfall with global climate change is likely to decrease Peregrine populations by 2050 in Namibia.

**Key Words:** Namibia, Peregrine Falcon, *Falco peregrinus minor* escarpment rivers, Near-Threatened, desert regions, threats, climate change

### Introduction

This study reviews all available data on the resident Peregrine Falcon *Falco*

*peregrinus minor* population in Namibia. Data were collated from four main sources (i) compilations gathered for Namibia's Red data book (Simmons & Brown 2009); (ii) the Southern African bird atlas data (Harrison et al. 1997); (iii) Namibian raptor road counts and nest records and (iv) personal studies and unpublished observations of individual researchers (e.g. Jenkins 2000, Braby et al. 1987) throughout Namibia.

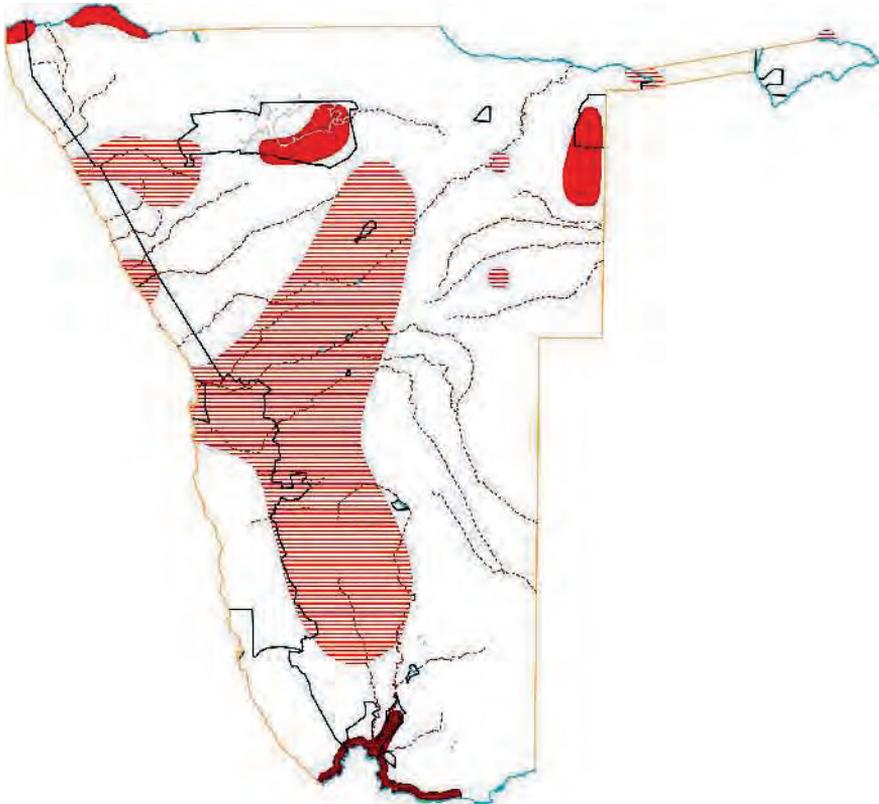


Figure 1. Distribution of Peregrine Falcons in Namibia derived from the Southern African Bird Atlas data (Harrison et al. 1997), Namibian raptor road counts, Namibian nest records and published studies mentioned in the text.

Red areas are regions where Peregrines have been recorded more commonly than light-shaded areas. Darkest regions represent relatively the highest densities in Namibia.

Our main aim is to provide a snap shot of Namibia's Peregrine distribution, population size, conservation threats and conservation status in sub Saharan Africa's most arid country.

## Study area

Namibia covers 845 000 km<sup>2</sup> and lies astride the Tropic of Capricorn in south western Africa. South Africa lies to the south, Botswana to the east, and the northern border is shared with Angola, Zambia and, at the eastern most extremity of the Caprivi Strip, Zimbabwe. The western edge is bounded by the cold Benguela current of the Atlantic Ocean. The coastal plain is dominated by low dunes and gravel plains but the landscape rises rapidly through rugged, peregrine-friendly, escarpment areas at 1600 – 1800 m asl to the central plateau. These central regions are dominated by Nama Karoo low shrubs and thereafter acacia savannas as rainfall rises above 300 mm to the north and east. Major tropical rivers occur in the northern (Cunene, Okavango and Zambezi) and southern border (Orange River) areas and where the first and last river systems cut through rocky gorges provide suitable but arid nesting habitat. The Okavango and Zambezi rivers pass over relatively flat Kalahari sands. Ephemeral rivers that run for days to weeks per year, also cut through escarpment areas and provide suitable nesting habitat for resident Peregrines. Rainfall is highly variable averaging about 600 mm annually in the north-east and decreasing precipitously to *ca.* 20 mm in the western Namib Desert (Mendelsohn et al. 2003).

## Results

### Distribution and population size

In Namibia Peregrines are thinly spread across the entire country but some records were undoubtedly the migratory *calidus* subspecies (Jenkins 1997). There is a tendency for African Peregrines to occur mainly in the western regions where montane breeding habitat is more common, and along the two desert rivers - the Orange and Cunene (Jenkins 1997). The lack of cliffs along the Okavango, Kwando and Zambezi Rivers means that the resident *F.p.minor* is largely absent from these tropical rivers.

The Namibian population has not been assessed, but breeding pairs are known from the Waterberg Plateau Park (3-14 pairs: Brown & Cooper 1987, Simmons 2002), along the cliffs of the Orange River (8-12 pairs: Jenkins & Barnes 2000), the Cunene River (1 pr in 11 km: RE Simmons unpubl. data) and 1 pr in the dry Ugab River (Braby *et al.* 1987). Two nest sites are known from the centrally-placed Erongo Mountains, one on a high cliff with no river below and one on a low granite dome in a particularly avian species-rich river near Omaruru (RE Simmons, PE Barnard pers. Obs.). Other suitable, west-facing, cliffs occur throughout these mountains but occupancy is unknown. One pair is known to inhabit the Swakop River gorges and others probably occur in the Kuiseb River canyon (R Braby pers obs). Birds and presumably

breeding pairs are recorded from the Fish River and the ephemeral rivers of the Skeleton coast (Jenkins 1997) where suitable cliffs exist for breeding pairs (Braby *et al.* 1987, J Paterson pers. comm). From these surveys we estimate that 70 - 100 pairs of Peregrines occur in Namibia.

These falcons occupy an area in Namibia of about 52 466 km<sup>2</sup> (Jarvis *et al.* 2001), the mean reporting rate across the range was 2.6% (Jenkins 1997), and the number of birds seen in Namibian raptor road counts was low at 0.34 birds/1000 km (Jarvis *et al.* 2001).

## Ecology

Resident African Peregrines prefer sheer cliff-habitat, particularly where it overlooks suitable bird habitat such as woodlands or wetlands. Such sites include the Waterberg Plateau Park region in central north Namibia, and the Orange River in the south. The largest sample of prey in Namibia, of 22 items, is from the Waterberg. All were birds and ranged in size from about 21 g to 350 g. Swifts (*Apus bradfieldi*, *A. caffer* and *A. affinis*) made up 64% of the sample by number but 27% by mass. Rock Pigeons *Columba guinea* comprised 9% by number but 50% by mass. Other species were Rosy-faced Lovebirds *Agapornis roseicollis*, Rock Martin *Hirundo fuligula*, Pale-winged Starling *Onychognathus nabouroup*, White-browed Sparrow-weaver *Plocepasser mahali* and Cape Bunting *Emberiza capensis*. There are few other records of diet in Namibia, but Peregrines hunting sandgrouse and other species visiting desert waterholes are well known (C. Brown pers obs, R. Braby pers. comm.). Migratory falcons regularly frequent coastal wetlands such as Sandwich Harbour where they chase migrant shorebirds such as Curlew Sandpipers *Calidris ferrugina* and Little Stints *C. minuta* (Simmons 2000). Two successful chases were recorded – the first a protracted interaction with a Common Tern *Sterna hirundo* that was eventual captured following 18 stoops along a 1-km long dune ridge, and the second a short “chase” of an adult White-fronted Plover *Charadrius marginatus* that took no evasive action as the falcon approached after a short low flight, and was captured on an open sandy flat.

Breeding records from Namibia are sparse but egg-laying has been recorded in August (1), September (5) and October (1) (Brown & Clinning unpubl. data) with broods of 2, 2 and 3 young (Jarvis *et al.* 2001). Along the Orange River the mean laying date was 10 September, with a range 28 August - 4 October. An average of 1.7 young per pair were fledged from 8 pairs over 47 pair-yrs (Jenkins 2000). Warm spring weather appears to promote greater fledging success in cool Mediterranean environments (Jenkins 2000), but this may not occur in the more arid Namibian environment.



Figure 2. A pair of subadult Peregrine Falcons *Falco peregrinus minor* sharing a meal along a highway in south central Namibia (B1 highway near Mariental). Photo R.E.Simmons

## Threats

There are few threats to this species in Namibia given its relatively remote breeding cliffs. However, pesticides such as DDT are regularly used in Namibia for the control of malaria (Brown & Kock unpublished data), and these may find their way into the environment. This is not likely to affect west-coast Peregrines because there is little pesticide use there. In cases where soil temperatures are high the likelihood that evaporation will reduce levels of DDT or DDE in the food chain is also high (Brown & Kock unpublished data). There are no known cases of death from pesticides or from drowning in farm reservoirs and no reported collisions with cars in Namibia.

Falconry is not practiced in Namibia and it is unlikely, therefore, that young birds are taken from nests or adults are trapped for this purpose.

## Conservation status

This species was recently re-classified as *Near-Threatened* in Namibia because of apparent but difficult to interpret declines in the Waterberg Plateau Park region: 14 pairs were recorded there in helicopter surveys in 1984 (Brown

& Cooper 1987) but only 6 birds (1 definite pr) representing at most 3 pairs were recorded 16 yr later (Simmons 2002). Birds nesting in the Ugab River (Braby *et al.* 1987) were not subsequently reported by the same observers, despite regular patrols in the area. Birds are also scarce in montane regions such as the Erongo Mountains where many more pairs should occur. Further information is required from all these areas.

## Discussion

The resident African Peregrine *Falco peregrinus minor* is widespread but scarce throughout its range from Morocco in the north to the southern Cape coast of South Africa (del Hoyo *et al.* 1994). The known southern African population is ca.850 pairs with about 300 pairs in Zimbabwe (Hartley 2000), ca. 400 pairs in South Africa (Jenkins & Barnes 2000), and ca.150 pairs in Botswana and Namibia (A Jenkins pers. comm.). Namibia's population is estimated at 70-100 pairs, and thus at maximum represents ca.12% of southern Africa's population. This may wax and wane as good annual rainfall allows pairs to invade and breed in arid areas followed by long periods of below average rains. Namibia's Peregrines were concentrated mainly in the western regions where montane breeding habitat is more common, and along the two desert rivers, particularly the Orange River (Jenkins 1997).

African Peregrines take almost exclusively birds, particularly doves and pigeons, especially when they are concentrated below high cliffs (Hustler 1983, Jenkins 1994). Vegetation types are relatively unimportant if suitable cliffs are available (Jenkins 1997), and the linear oasis effect of desert rivers (or waterholes) may be sufficient to concentrate bird prey (Braby *et al.* 1987, Simmons & Allan 2002). Peregrines have also been observed unsuccessfully chasing larger species up to the size of Lesser Flamingos (*Phoenicopterus minor*) and regularly take smaller species than doves (Jenkins & Avery 1999).

African Peregrines breed mainly in the spring (August-December) with a tendency for later breeding at higher latitudes (Jenkins 1997). There were too few Namibian records (from August September and October) to verify whether breeding begins later in the year in Namibia than South Africa. Warm spring weather appears to promote greater fledging success in wet Mediterranean environments of South Africa (Jenkins 2000), but this may be reversed in the more arid Namibian environment where nomadic desert birds are attracted to rain events (Dean 2004) and thus may allow desert-breeding Peregrines an opportunity to breed while prey is abundant.

## Threats

Peregrines in Namibia may fortuitously be buffered by the extremes of environment found there from contaminants such as DDT. However, DDT

and other lethal chemicals are clearly contaminating food chains in southern Africa and entering the raptor community because thinner eggs and dead birds still occur in cooler climates (Curtis & Jenkins 2001). If malaria becomes more prevalent under warmer climate change scenarios (Rogers & Randolph 2000), then pesticide usage is likely to increase and may influence highly sensitive bird-eating raptors such as Peregrines in central regions or along rivers. The use of pesticides along the Orange River and other dead raptors there (Simmons & Allan 2002) suggest Peregrines breeding there may be at risk. Elsewhere collision with transmission lines and fences have caused injuries and fatalities in South Africa (A. Jenkins unpubl data), and this requires monitoring in Namibia.

Increasing temperatures and decreasing rainfall under climate change in western areas of Namibia (Simmons et al. 2004, Midgley et al. 2005), where most of its Peregrines occur, is likely to reduce population and/or breeding success if drier climates results in less prey and fewer breeding opportunities.

## Conservation status

Peregrine Falcons are not listed as globally threatened following their recovery from the DDT era in North America and Europe (Stattersfield & Capper 2000). However, they are categorised as *Near-Threatened* in both Namibia and South Africa because numbers are relatively low and pesticide uptake requires monitoring in all populations where DDT is still applied (Jenkins & Barnes 2000, Simmons & Brown 2009). The Namibian population may be declining given that two monitored populations in the Waterberg and the Ugab River have shown some declines. These may reflect fluctuations arising from wetter and drier years as bird-prey become more or less plentiful, but it may also represent a real decline. If so, then coupled with the small population size this species requires monitoring, preferably in sites such as the Waterberg, the Fish and Orange Rivers and along the Namib escarpment where baseline data is available. These could be undertaken concurrently with surveys of other threatened species such as Cape Vultures *Gyps coprotheres* and Verreaux's Eagles *Aquila verreauxi* (Brown & Cooper 1987, Simmons 2002). Other regions where Peregrines are regular such as the Cunene River should be monitored for breeding population and breeding success, and compared with that from the probably contaminated Orange River population (Jenkins 2000). Investigation of egg shell thickness at nests where egg shells can be collected will be useful to compare with populations where declines are known to have taken place.

We conclude that Namibia has a small and possibly declining population of Peregrine Falcons but breeding or nest occupation in relation to rainfall in Namibia is unstudied. Future climate change, bringing lower annual rainfall

may be the biggest threat to western escarpment-breeding birds.

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