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Ornithology

Non-colonial ground-nesting birds on Robben Island: positive impact of the removal of feral cats on the abundance of Chukar Partridge and Fiery-necked Nightjar

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Abstract

The near complete removal of feral cats *Felis catus* was one of five major drivers of change at Robben Island in the first decades of the 21st century. This note demonstrates that the abundance of Chukar Partridge and of Fiery-necked Nightjar has increased during this period.

Observation

Robben Island (33°48'S, 18°22'E, and 507 ha in area), Table Bay, South Africa, has a history of human impact, including on its biodiversity, stretching back to the early 1600s (de Villiers 1971, Crawford & Dyer 2000). Against this long-term background of change, the first few decades of the 21st century have been particularly turbulent; Quintana et al. (2021) discussed the ebb and flow of biodiversity, particularly from the perspective of the African Oystercatcher *Haematopus moquini*, over this period.

There were five major drivers of ecological change on Robben Island since the beginning of the 21st century (Quintana et al. 2021). (1) An increase of the population of feral cats *Felis catus* to a peak in 2005, their subsequent near-complete removal, and a sustained attempt to eliminate them completely (Quintana et al. 2021). This initiative has radically altered predation pressure. (2) The initiation of a Kelp Gull colony in 2000, which has grown to become the largest in South Africa (Calf et al. 2003, Whittington et al. 2018, Quintana et al. 2021). Kelp Gulls are regarded as predators of the eggs of seabirds (Kemper et al. 2007) and oystercatchers (Underhill 2014). (3) The explosion of the population of European Rabbits *Oryctolagus cuniculus* in 2008 turned the island into a sandy desert; their subsequent complete removal by 2016 has resulted in the scrub vegetation becoming thick and lush (de Villiers et al. 2010, Sherley 2016, Quintana et al. 2021). (4) The population of European Fallow Deer *Dama dama*, increased from three animals introduced in 1963 to c. 300 animals in 2008 (Crawford & Dyer 2000, Sherley 2016); this was followed by a three-year period of attempted live captures, after which the number of deer had again reached c. 300 (CW unpubl. data). Since 2017, numbers were reduced to c. 10 (CW pers. obs). Their removal has also resulted in an increase in vegetation. (5) The colonization of the intertidal zone by the invasive and alien Mediterranean mussel *Mytilus galloprovincialis*. This mussel grows faster than the indigenous mussel and has fuelled the increased abundance of African Oystercatchers (Quintana et al. 2021). These five drivers of change have interacted with each other, often in complex ways. The first four of these drivers of change have been specific to Robben Island, the fifth has occurred

throughout the rocky coastline of the Western Cape. In addition, climate change, is potentially a sixth driver of change on the island, gradually altering weather and ocean conditions (Olivier et al. 2022).

This paper focuses on the first of these drivers of change, the removal of feral cats from Robben Island. The bird species which potentially benefit from this driver are the ground-nesting bird species. This paper confines itself to the 10 species which are not monitored by dedicated projects (the colonial seabirds and the African Oystercatcher) (Table 1). However, seven of the 10 species seem likely to have been influenced by interactions between the drivers of change (Table 1), leaving only three species with the potential to benefit directly from the removal of feral cats, without being influenced, either negatively or positively, by the other drivers of change. These three species are Chukar Partridge, White-fronted Plover and Fiery-necked Nightjar. The impacts on birds in general of the drivers of change on Robben Island will be taken up elsewhere.

The Second Southern African Bird Atlas Project (SABAP2) started in July 2007, and potentially provides useful monitoring for most of the remaining bird species. In addition, surveys of the shoreline have been made, counting the numbers of birds of each species; the series of surveys reported by Underhill et al. (2002) have been continued. A list of bird species observed on Robben Island between 2000 and 2011, and comments about their relative abundance, is provided by Sherley et al. (2011).

The fieldwork protocol for SABAP2 is described by Underhill (2016) and by Brooks et al. (2022). Essentially, it consists of producing comprehensive bird lists over a period of a maximum of five days. Robben Island fits within one recording grid-cell, known as pentad 3345_1820 (see https://sabap2.birdmap.africa/coverage/pentad/3345_1820).

The timing of the start of SABAP2 is fortuitous, because it coincides with the point in time when bird populations impacted by cat predation would have been starting their recovery. To use SABAP2 as monitoring tool, we need to evaluate reporting rates through time. To do this, we used eight two-year periods, starting July 2007. Thus, the first two-year period was July 2007 to June 2009, and the eighth was July 2021 to June 2023. We used two-year periods because the number of checklists per single year was variable. Because the data have essentially the structure of a binomial distribution, we tested for trends in reporting rate using a generalised linear model with logit link function and the binomial distribution, as pioneered by Underhill et al. (1991).

Table 1: Bird species occurring regularly on Robben Island which are non-colonial and ground-nesting. These species ought to have benefitted positively from the removal of feral cats. The column "Likely drivers of change" thus excludes cats. Thickening of vegetation is driven by the removal of the two herbivores (deer and rabbits) and is negative for these species because they preferred the sparse vegetation created by grazing pressure.

Species	Likely drivers of change
Cape Spurfowl *Pternistis capenis*	Thickening of vegetation
Helmeted Guineafowl	Thickening of vegetation
Chukar Partridge *Alectoris chukar*	
African Oystercatcher *Haematopus moquini*	Alien mussel (positive), Kelp Gull (negative)
White-fronted Plover *Charadrius marginatus*	
Kittlitz's Plover *Ch. pecuarius*	Thickening of vegetation
Crowned Lapwing *Vanellus coronatus*	Thickening of vegetation
Blacksmith Lapwing *V. armatus*	Thickening of vegetation
Spotted Thick-knee *Burhinus capensis*	Thickening of vegetation
Fiery-necked Nightjar *Caprimulgus pectoralis*	

Of these three species, the generalized linear models failed to detect a trend for White-fronted Plover and Fiery-necked Nightjar, but did so for Chukar Partridge, for which reporting rates increased steadily through the SABAP2 era (Table 2).

Because it is cryptic in daytime, when most SABAP2 checklists are made, Fiery-necked Nightjars are poorly documented by the atlas

Table 2: Results from SABAP2. 247 checklists had been made for SABAP2 pentad 3345_1820 between July 2007 and June 2023. The table provides the number of checklists for each of the eight two-year periods (midwinter to midwinter two years later), and the reporting rates for the three focal species in each period. The summary results from the generalized linear model testing for trend in reporting rates through the 16-year period are shown.

Years (July of first year to June of second year)	Number of Checklists	Reporting Rate		
		Chukar Partridge	White-fronted Plover	Fiery-necked Nightjar
2007/09	49	53.0	61.2	12.2
2009/11	45	66.7	62.2	8.9
2011/13	74	62.2	51.4	9.4
2013/15	14	71.4	28.6	7.1
2015/17	16	81.3	50.0	6.2
2017/19	23	91.3	60.9	4.3
2019/21	9	100	33.3	11.1
2021/23	17	82.4	52.9	5.9
All years	247	68.4	54.3	8.9
t_6		3.77	–1.15	–0.06
P		0.005	0.30	0.32

project (Sherley et al. 2011). However, its distinct and far-carrying call can be heard at night. We can however report that, during drives on the island covering c. 60 km per night, between 2007 and 2023, there has been a steady increase in the frequency with which the call is heard, from one or two calls per night in 2009 to c. 15 per night in 2023 (CW and BH pers. obs). The visual encounter rate has also increased; both an adult (Figure 1) and a nearly full-grown chick (Figure 2) were photographed in 2023, and the records submitted to the Virtual Museum (Underhill & Navarro 2023).

In surveys made between 1998 and 2001, a period of minimal abundance of feral cats, the number of White-fronted Plovers counted on the shoreline of Robben Island varied between zero and 10, with a median of two birds. In spite of the fact that the SABAP2 reporting rate for the species averages 54%, it is a peripheral species. Nests of White-fronted Plovers have been found during African Oystercatcher monitoring annually since the 2019/20 to 20223/23 breeding seasons, but only one or two per year (LGU, pers. obs).

Figure 1: Adult Fiery-necked Nightjar on Robben Island, 21 May 2023. BirdPix Record 254316. Photo by Barry Hattingh.

Figure 2: Juvenile Fiery-necked Nightjar found on a road in Robben Island on 22 October 2023 demonstrates breeding activity. BirdPix Record 266659. Photo by Barry Hattingh.

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