UNIVERSITY OF CAPE TOWN

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Contested natures: Caracals, cats and the boundaries of nature in the Atlantic Beach Estate, South Africa

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CSSR Working Paper No. 428
January 2019

Centre for Social Science Research
S · S · U

iCWild
Institute for Communities and Wildlife in Africa

Published by the Centre for Social Science Research
University of Cape Town
2019

http://www.cssr.uct.ac.za

This Working Paper can be downloaded from:
http://cssr.uct.ac.za/pub/wp/428

ISBN: 978-1-77011-415-9

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Acknowledgments:

This working paper was developed at the request of the management of Atlantic Beach Estate to help understand the ecological and social dimensions of the conflict over how to cope with predation of domestic cats by caracals. The analysis does not necessarily reflect the views of management or residents.

Contested natures: Caracals, cats and the boundaries of nature in the Atlantic Beach Estate, South Africa

Abstract

*In the mid-2010s, residents of the Atlantic Beach Estate (ABE) – a relatively high-income residential and golf estate about 20 kilometres north of Cape Town on the South African west coast – became embroiled in a dispute over how to respond to a caracal (*Caracal caracal*), or perhaps caracals, killing domestic cats (*Felis catus*). Caracals are increasingly noticed in urban Cape Town. The ABE, with capacity and interest in monitoring wildlife, offers the first clear example of what caracal presence in residential areas might mean for domestic animals, people and other wildlife. The paper draws on a survey of ABE residents to show that the attitudes of residents tended to cluster into three 'world-views' about how to live with pets and nature in the ABE. Just over half (53.4%) had a 'pro-nature without cats' world view, that is, they were opposed to removing the caracal and in favour of restricting cats to their owner's property. Almost a fifth (19.2%) had a 'pro-nature with free cats' world view (were opposed to removing the caracal and were opposed to restricting domestic cats to their owner's properties). Just over a fifth (20.7%) of the sample had a 'protect free cats from caracals' world view (wanted the caracal removed and to allow cats to roam freely). At stake was not whether to live in or with nature, but what kind of nature was suitable for an eco-friendly estate. Some residents worried that the caracal posed a threat not only to their pets/companion animals, but also to children (though this view was not supported by conservation officials). Most residents, however, valued the presence of the caracal and as the debate evolved, more critical attention was placed on the impact of domestic cats on small wildlife within the ABE. Some residents built walled gardens and 'catios' (enclosed areas attached to the house) for their cats to keep them safe as the debate simmered on over how to live with nature in a family- and pet-friendly eco-conscious housing estate.*

1. Introduction

In the mid-2010s, residents of the Atlantic Beach Estate (ABE) – a relatively high-income[1] residential and golf estate about 20 kilometres north of Cape Town on the South African west coast – became embroiled in a dispute over how to respond to a caracal (*Caracal caracal*), or perhaps caracals, killing domestic cats (*Felis catus*). Caracals are increasingly noticed in urban Cape Town[2] and the ABE, marketing itself as an 'exclusive lifestyle estate' in a 'visually pleasing and ecologically conscious environment'[3] and with capacity and interest in monitoring wildlife, offers the first clear example of what caracal presence might mean for domestic animals, people and other wildlife.

Between early 2013 and mid-2018, 66 domestic cats reportedly went missing on the ABE (Van Huyssteen, 2018: 3). During this time, the remains of 31 domestic cats were found, of which 21 could be linked to an owner on the estate. There was some dispute between cat owners, who suspected a caracal, and ABE managers who wanted more proof, but after several autopsies found that the cause of death was mostly likely a caracal (*ibid.*), the debate turned into what, if anything, should be done. ABE management found themselves caught in a fraught (and at times public) debate between residents – and between residents and conservation officials over whether the caracal should be captured and relocated. At stake were concerns about pet safety (with some residents worrying also about potential danger to children), what it means to live with nature on the ABE – and linked to this – what the original vision for the housing estate as facilitating wildlife movement meant in practice.

The 'caracal-cat' issue for ABE provides a vivid illustration of the different social understandings of what kind of nature is appropriate for an enclosed residential estate bordering a nature reserve. The website describes the various residential villages within the estate as 'carefully designed to blend unobtrusively with the pristine fynbos and rolling dunes' (Figures 1, 7, 8 and 11). There are strict architectural guidelines and, to ensure a 'Cape farmhouse

[1] Houses in Atlantic Beach Estate retail from R4 million to R20 million (see e.g. https://www.pamgolding.co.za/property-search/residential-properties-for-sale-atlantic-beach-estate/6616).

[2] There is no evidence on caracal numbers in Cape Town or whether the population is expanding. Caracals are increasingly noticed, but this could also be the impact of social media and the growing use of camera traps (or trail cameras). Caracals have moved into spaces like the nature reserve next to the University of the Western Cape, but this could either indicate a growing population in Cape Town or them being pushed out of other urban green spaces because of housing development.

[3] See http://atlanticbeachestate.co/

environment', street boundary walls are not permitted (ABE, 2015: 50). Boundary walls and fences not on the street are allowed but limited to 1.8 meters and for buildings facing the golf course, the maximum height for a fence is 1.2 meters (*ibid.*: 54). In many places, the natural vegetation comes right up to the patios and windows of houses on the estate, allowing animals (including caracals) an easy approach to many homes – and their pets (Figure 8). Two key questions arose: should a medium-sized predator (the caracal) be tolerated or excluded in this environment; and how should domestic cats be managed, if at all, given that they are both valued pets and potentially serious predators of small wildlife (birds and rodents)?

This paper analyses data from a survey commissioned by ABE management amongst residents in 2017 to show that different 'world views' were evident. The paper records how ABE's management strategy sought to reflect dominant attitudes within the estate whilst being guided by expert ecological opinion (which turned out to be contested) and legal advice. Concern that the caracal might pose risks to children resulted in an application to *CapeNature* (the body responsible for conservation in the Western Cape) to capture and relocate the caracal, but this was turned down and ABE management was advised not to pursue the matter legally. As more information emerged about the number of domestic cats in the wild spaces within the ABE, the estate rules were changed to require that residents keep their cats on their properties and only let them outside if under their control. Some residents made their garden walls cat proof to keep cats in and some built 'catios' (enclosures attached to the house) for their cats (Figure 12). However, not all residents agreed that cats should be contained in this manner, or that it was appropriate to harden the boundary between their properties and the wild vegetation within the estate.

2. The Atlantic Beach Estate: Rules and Regulations regarding the management of Wildlife and Pets

The ABE development was approved in 1997 and consists of two spatially integrated components: a 136-hectare privately owned residential estate managed by the Atlantic Beach Home Owners Association (ABHOA) and a 28-hectare golf estate owned by the City of Cape Town but managed under lease by a third party. The golf course includes 'conservation areas' (mostly linear strips of natural vegetation between the golf course and residential villages) amounting to between 15 and 20 hectares of endangered Cape Flats Dune Strandveld.

Environmental approval for developing on this endangered habitat was based on envisaged connectivity with the Blaauberg Nature Reserve into which the ABE extends at the Southern end like the bow of a ship (top left photo of Figure 1). A link was also envisaged via Melkbos Conservation Area to Koeberg Nature Reserve and the Dassenberg Coastal Catchment Partnership to the North. By 2017, the estate was almost completely developed, with 855 free standing homes and almost 2,300 residents (Duval, 2017).

The 'biodiversity agreement' between the ABE and the City of Cape Town envisaged the ABE as providing a 'critical faunal link' to the nature reserves (Biodiversity agreement, 2018: 2). It prevents the golf course from encroaching into the conservation areas, requires the ABE to remove alien vegetation and to promote and improve environmental sustainability. This includes a prohibition on the destruction or removal of any indigenous species in the conservation areas, or the introduction of any non-indigenous fauna into the conservation areas, including cats and dogs (*ibid.*: 6). The ABE has, however, introduced springbok (*Antidorcas marsupialis*) which do not naturally occur in this area (and which are managed by capturing, removing and introducing individuals to ensure adequate genetic diversity[4]). It has also put up an electric security fence that acts as a barrier to people and to medium-sized mammals.

The fence includes (on much of its west boundary with the Blouberg Nature Reserve) an overhang and wire mesh (Figure 1), making large stretches impermeable to animals larger than rodents. The North border (with the town of Melkbosstrand) has a bar fence without wire mesh, making it more permeable for small to medium mammals such as mongoose and domestic cats and even young or Cape grysbok (*Raphicerus melanotis*) and caracal. The fence clearly restricts 'faunal movement' of larger species such as the springbok and even full-grown grysbok (Van Wyk, 2017: 12).

The security fence is monitored by cameras and security personnel. Human security is essential to the ABE which markets itself as being primarily a safe space for families within beautiful natural surroundings. This is consistent with the strong focus on security in all high-income estates, including those marketing themselves as 'eco estates' in South Africa (Govender, 2018). Whether the ABE should be classified as an 'eco estate' is a matter of contestation given that it is relatively densely populated. For some residents, its natural environment and fauna are essential to the identity of the ABE. For

[4] Information from Harry White, 4/12/18. This strategy was adopted after residents became concerned that springbok numbers had increased beyond the carrying capacity of the ABE.

others, the wild animals like tortoises and grysbok are simply ‘nice-to-haves’ in a space primarily dedicated to keeping families and pets safe.

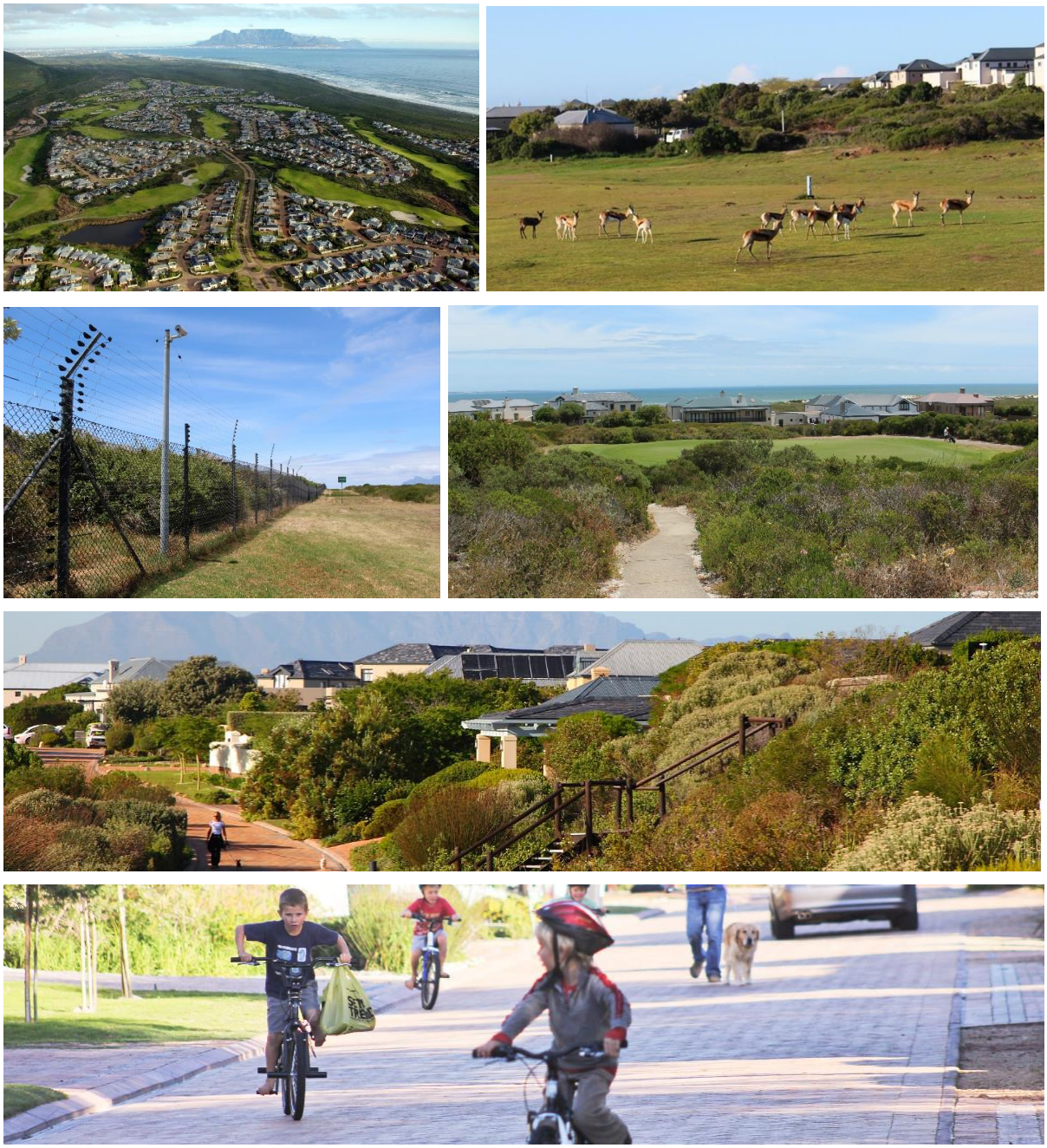

Figure 1: Photos of Atlantic Beach Estate (bottom two from the ABE website)

For many residents, pets are an important part of family life. In November 2016, a group of concerned residents set up a *Facebook* page called *Pets lost & found*

in Atlantic Beach Estate[5] to collect information about pets lost to predators and to help people protect their cats from caracals. Earlier that year, in the 13 May 2016 Newsletter, Harry White, the Chief Executive Office of the ABHOA, had reported that 'We know that in the Western Cape, Caracals, who can grow up to a maximum height of 90cm and can weigh up to 18kgs, are attacking and eating domesticated cats', noting that some of the reported missing cats on the ABE may have 'encountered a snake' or been 'adopted elsewhere' but that 'we believe that some may have been taken by the caracal' (White, 2016). The *Pets lost and found in Atlantic Beach Estate* website's About page is revealing of the atmosphere of social conflict that emerged over the cat caracal issue – and their clear position against having a caracal inside the ABE:

> This page is dedicated to the safety and wellbeing of our pets at Atlantic Beach Estate, Melkbosstrand. We are particularly concerned about the caracal threat and encourage members to share any information which may promote our pets safety. This is not a page for animal activists to troll and spread false information to enhance their agenda. This is not a page for those who believe that caracal were here first and must therefore be tolerated. Please refrain from blaming us for living here.

The group collected information on lost cats, helped look for lost pets, worked with ABE management regarding autopsies and photographed suspected caracal kills (Figure 10).

The ABE's Operational Environmental Management Programme (OEMP) from 2012 makes it clear that pets should not be a threat to wildlife. Households are limited to two cats and two dogs, dogs may not leave their owner's property unless on a leash, and cats, if they roam freely, are required to be fitted with a collar and bell (OEMP, 2012: 29-30). As of 2014, the ABE rules required cats and dogs to have identification on their collars and preferably to be micro-chipped. Outside of properties, dogs are required to be leashed and cats to wear a bell and an identification disk (par. 43). In May 2017, the rules were amended to read that cats could only be allowed off properties if under strict control of the owner (par. 42).[6]

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[5] https://www.facebook.com/groups/1292270590815580/post_tags/?post_tag_-id=2303243316384964 I am grateful to the mangers of this *Facebook* group for allowing me access for research purposes.

[6] The change in rules initially required that cats also be on a leash, but this was amended quickly after complaints from residents that this was impractical.

The official rules of the ABE do not mention protecting residents or their pets from wildlife other than snakes. The OEMP lists poisonous snakes (the Cape cobra and the puff-adder) as being part of the fauna, noting that in the unusual event of a dangerous snake entering a building, trained staff can be called to catch the snake and relocate it into the Blaawberg conservation area (OEMP, 2012: 8, 29, 53-4). The word 'caracal' does not appear in the 2012 OEMP and the only allusion to mammalian predators is that they are 'rare' (*ibid.*: 8). When the caracal-cat controversy erupted in 2017, ABE management thus had to formulate policy on the fly.

3. The caracal

Caracals are medium-sized feline predators with long legs, a reddish coat (hence its common Afrikaans name 'Rooi-kat') and distinctive large pointed black ears with tufted tips (Figures 2, 8 and 9). Although often referred to as a 'lynx' by South African farmers, DNA analysis supports a monophyletic genus (meaning that it has a distinct evolutionary line).[7] The caracal is critically endangered in North Africa and parts of Asia but is common, and their numbers assumed to be stable, in central and southern Africa, which comprise most of its global range, and hence the caracal is classified by the IUCN Red List of Threatened Species as 'Of least concern' (Avgan et al., 2016).

Caracals have a broad habitat tolerance and are present in all African habitat types except for equatorial forest and the Sahara interior (Ray et al., 2005: 87). They weigh up to 18 kilograms and are the 'largest of Africa's smaller cats and occupy a broad unspecialized niche which bridges the small-large felid gap' (*loc. cit.*). Caracals appear to favour drier woodland and savanna regions and mountainous desert (Avgan et al., 2016) but can be found also in semi-desert, scrubland, moist woodland and thickets (as in the Western Cape). Caracals became the dominant predator on South Africa Karoo sheep farms in the mid-twentieth century – probably benefiting from efforts to control the black-backed jackal (*Canis mesomelas*) as this reduced competitive pressure and caracals could easily cross jackal-proof fences (Nattrass et al., 2017). It remains common in the Karoo and is increasingly noticed on the urban fringe, including Cape Town (although whether this is due to enhanced surveillance and the expansion

[7] The caracal is thought to have diverged from the Asian ancestor of all modern felids between 8.5 and 5.6 million years ago when the progenitor of the caracal lineage arrived in Africa (Johnson et al., 2006). The caracal's closest 'cousins' are the serval (*Leptailurus serval*) and the African golden cat (*Caracal aurata*).

of human settlements into natural vegetation or to any expansion of the caracal population is unclear).

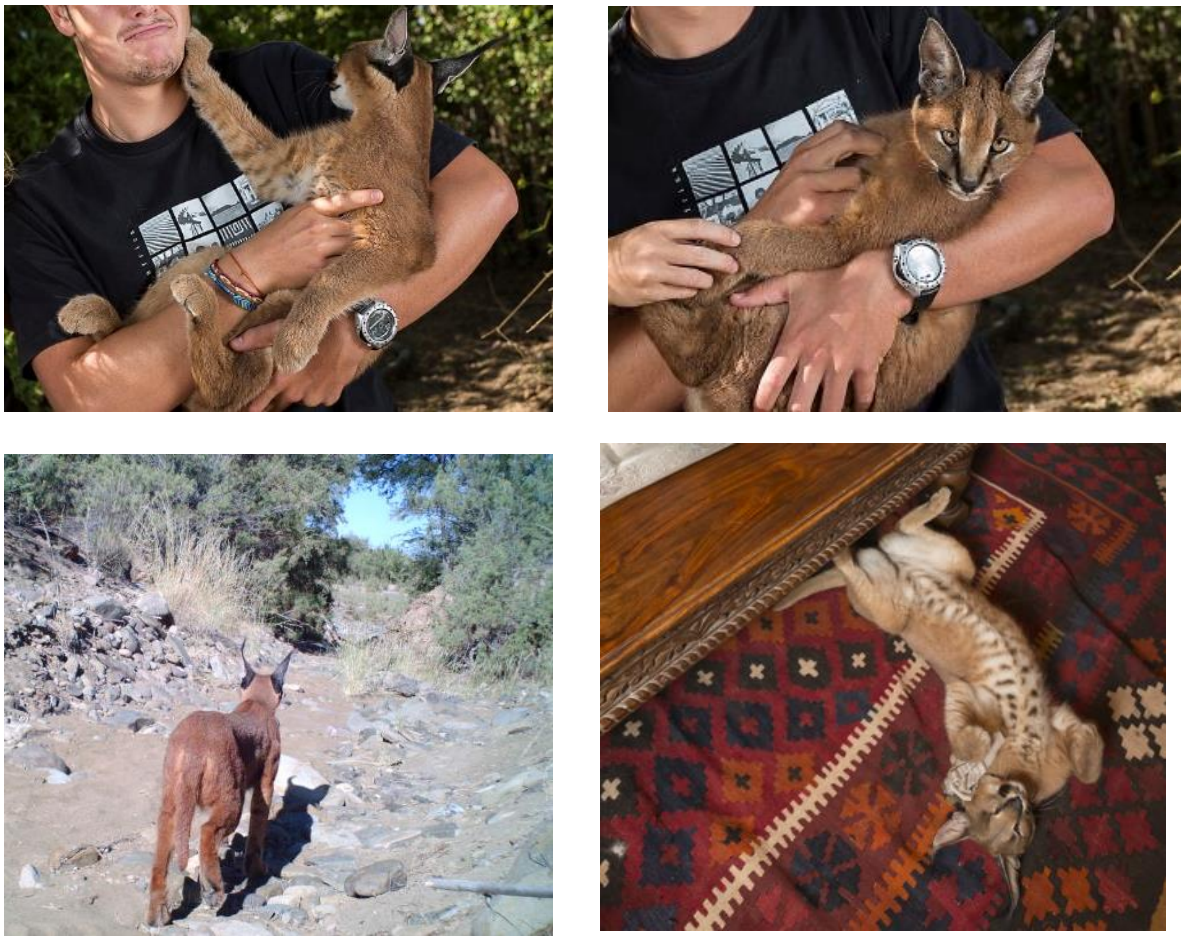

Figure 2: Carcals in the Karoo. Bottom left: wild caracal in a dry river bed (photo Lukas Botes). Other photos are of young pet caracals © Houdini & Palanque, for the Karoo Predator Project.

Caracals are diurnal and are known to hunt during the day and night depending on prey availability and to avoid human activities, especially when persecuted (Avenant and Nel, 2002; Avgan et al., 2016; Ramesh et al., 2017). They can survive (even prosper) in human-dominated landscapes such as rangelands and the urban fringe, and they are tameable when captured young (Figure 2). Caracals were once used for sport in India where people reportedly placed bets on how many pigeons a tame caracal could kill when unleased on an unsuspecting flock feeding on the ground (Rosevear et al., 1974: 407-8). Rosevear et al. comment 'This deliberate act of "Sport" with its resultant fluttering confusion must with little doubt be the true origin of the expression to "put a cat amongst the pigeons"' *(ibid.*: 408). Sharma and Sankhala, were informed by retired cheetah and caracal trainers in India that professional

hunters used caracals to catch kites and that there was even a training school for this (1984: 130). This suggests that caracals, like the domestic dog and cat, are capable of reading human cues and adapting to life alongside or even with humans. However, they are not common pets (especially when full grown) given their robust size and ferocity.

Caracals reach sexual maturity at about a year and have been recorded as breeding all year in South Africa, but with a seasonal low in Winter, presumably due to reduced prey availability (Stuart 1982; Bernard and Stuart, 1987; Avenant and Nel, 1998). Like other cats, caracals are solitary, and females raise their kittens without assistance from males. (In fact, males can pose a danger to kittens, as kittens have been found in the stomachs of killed male caracals in the Karoo (Stuart, 1982: 41)). Studies of captive caracals reveal that kittens can run and chase prey after three to four weeks, eat solid food from one month and are fully weaned anytime between 10th and 25th week (Stuart, 1982: 111). Kittens were well developed by 10 weeks and could defend themselves aggressively (would fall on their backs, snarling and hissing, claws fully extended when threatened) (*ibid.*: 112).

3.1. Territoriality

Caracals are territorial animals, with territory size positively related to body size and negatively related to prey availability (Nowell and Jackson, 1996).[8] Caracals are known to range widely and to disperse over large distances, enabling them 'to effectively recolonize vacant areas following removal' (Marker and Dickman, 2005: 75). In the Cape Province, a young adult male travelled 138km before settling in a 48km^2 area (Stuart, 1982). Hunters and farmers maintain that caracals move long distances on regular routes known as 'kattepaaie' (cat roads), and they target these when setting traps (Stuart, 1982: 138).

Dispersal and wide-ranging activity, together with their opportunistic breeding strategy, preference for rodents (a widely occurring taxon) and ability to prey on a variety of other mammals and birds as well as being able to include carrion in

[8] The limited available studies reveal a wide variation in the home range size of caracals (Marker and Dickman, 2005) with males generally having larger territories than females (Avgan et al., 2016). In Southern Africa, reported sizes of the adult male home range varies from 15.2 km^2 in the Mountain Zebra National Park, to 19.1 km^2 in the farmlands adjacent to the park (Moolman 1986 cited in Bothma, 1994: 107), to 27 km^2 in the West Coast National Park (Avenant, 1993; Avenant and Nel 1998); 308 km^2 in the Kalahari Gemsbok National Park (Bothma and Le Riche, 1994) and 312.6 km^2 in North-central Namibian farmlands (Marker and Dickman, 2005). Territories appear to be linked to food availability and competitive pressures from other predators.

their diet where necessary, underpins their successful colonisation of farmlands in much of southern Africa (Nattrass et al., 2017). Human-modified landscapes such as rangelands, plantations and cultivated lands[9] are potentially attractive for caracals primarily as a source of rodents, but also domestic livestock.

3.2. Diet

Studies on captive caracals estimated that an adult requires an average of 586 grams of meat a day (Stuart, 1982) and for wild caracals it is probably a kilogram of meat a day (Grobler, 1981: 261). They are opportunistic feeders, known to eat birds, snakes, spiders, lizards, tortoises (Nowell and Jackson 1996, 30, 51; Avenant and Nel, 1997), but mostly mammals, the bulk being rodents (Avenant and Nel, 2002; Drouilly et al., 2018). A study of home range use in the Postberg National Park (West Coast, Western Cape Province, South Africa) found that the caracal favoured areas with vegetation associated with high densities of rodents (Avenant and Nel, 1998).

Diet varies regionally depending on prey availability (Stuart, 1982; Avenant, 1993; Avenant and Nel, 1997, 2002; Drouilly et al., 2018). Studies from South Africa reveal that rodents are typically the most common prey item[10] and that consumption of larger mammals, especially fawns and small livestock, increases when rodent densities decrease (Avenant 1993: 109; Avenant and Nel, 2002). A comparative study of caracal habitat and prey in the West Coast National Park and on eight adjacent farms found that sheep and goats were only preyed upon from March to June (during and just after the small stock lambing season in the area). This was also the time when rodent (the main prey) densities decreased and when caracals in the reserve preyed most heavily on springbok (Avenant and Nel, 2002).[11]

[9] A study of caracal land use in the Natal Drakensburg midlands found that caracals preferred modified landscapes to wilderness (Ramesh et al., 2017).

[10] In the Karoo National Park, rodents comprised 86% of prey items followed by grey rhebuck (*Pelea capreolus*) (23%) and hyrax (*Procavia capensis*) (22%) (Palmer and Fairall, 1988). In the Kgalagadi Transfrontier Park, the primary prey resource was small mammals, mostly rodents, including springhare (*Pedentes capensis*) and larger prey animals included steenbok (*Raphicerus campestris*) and smaller carnivores up to the size of a black-backed jackal (Melville et al., 2004). The remains of birds, insects and domestic livestock were identified in eight of the 116 scat samples collected (*ibid.*). On the South African East Coast (near George and Vleesbaai) rodents accounted for more than 70% of the caracal's diet, the bulk comprising the Vlei rat (*Otomys irroratus*) (Braczkowski et al., 2012).

[11] During the hot season, caracals in the Kgalagadi Transfrontier Park focus their foraging in areas where they are likely to encounter Brant's whistling rats, but in winter, when these rodents are less prevalent, their foraging paths are more random (Melville and Bothma,

In the Postberg Nature Reserve (West Coast, Cape Province South Africa) a study found that each adult caracal ate approximately 5,427 *Cricetidae* and *Muridae* and 148 rodent moles a year, and that this, coupled with its preying on hyrax, hares, small antelope and small predators, implied that the caracal played an important role in the ecosystem and that eliminating the caracal could cause disorder and other problems for farmers such as rodent and mole plagues (Avenant, 1993: 182). Similar ecological arguments were made for the Southern Free State, where a study of caracal diet on small stock farms revealed that caracals fed predominantly on mammals (93% of the volume), the most important being Lagomorpha (28%), rock hyrax (*Procavia capensis*) (17.3%), springhare (*Pedetes capensis*) (15.2%) and domestic sheep (*Ovis aries*) (13.6%) (Pohl, 2015). The study emphasised that caracals did prey on sheep, primarily during the two lambing seasons (March to April and September to October), but that its prey also included potential damage-causing animals such as rodents destroying crops and carrying disease, hyrax competing for forage with sheep and mole rats whose tunnels cause damage to tractors (*ibid*.).

Caracals also eat small carnivores. In the Karoo National Park, an analysis of 100 scat found the remains of two carnivores: suricate (*Suricata suricatta*) in one scat and polecat (*Ictonyx striatus*) in the other (Palmer and Fairall, 1988). Male caracals are also known to kill and eat caracal kittens in the Robertson Karoo (Stuart, 1982: 41) and to hunt and kill black-backed jackals and African wild cat (*Felis Silvestris*) in the Mountain Zebra National Park (Grobler, 1981: 260) and black-backed jackals, African wild cat, bat-eared foxes (*Otocyon meglotis*) and Cape foxes (*Vulpes chama*) in the Kgalagadi Transfrontier National Park (Melville et al., 2004). On the South African East Coast (near George and Vleesbaai) they have been recorded eating domestic cats and the Cape grey mongoose (*Galerella pulverulenta*) (Braczkowski, et al., 2012). In the Robertson Karoo they were recorded as having consumed polecat, grey mongoose (*Herpestes pulverulentus*), yellow mongoose (*Cynictis penicillate*), gennet (*Gennetta sp*.) and water mongoose (*Atilax paludinosus*) (Stuart, 1982: 40).

Caracals are well designed for stalking and killing mammals and birds. Their characteristically large ears are attuned to small sounds, and their powerful back legs (longer than the front legs) can propel them two meters into the air to catch birds. Caracals have also been observed to hunt larger mammals such as the Dorcus gazelle in Algeria, the Urial in Pakistan and have even been recorded

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2006a). They are also more likely to cross over into Namibian farmlands more often during the cold season (Melville and Bothma, 2006b).

attacking an Oryx (in southern Arabia) (Nowell and Jackson, 1996). They have been known to scavenge (Avgan et al., 2016) though this appears rare in Southern Africa.[12]

Caracal diet thus depends on context and may also depend on individual proclivities. This can pose challenges for conservation. For example, in the winter of 2016, a female caracal killed and fed on at least 20 endangered African penguins (*Spheniscus demersus)* near Boulder's Beach, outside Simonstown on the Cape Pensinsula (Dickenson, 2016). She was successfully captured and relocated to Hout Bay. However, early in 2017, a second caracal, a large male, was caught on camera in Simon's Town raiding the penguin colony again. Whether these caracals had an individual preference for penguins or were simply opportunistically taking advantage of a nutritious food source, is unclear. There is suggestive evidence from cougars (*Puma concolor*) that prey preference varies across individuals in the same ecosystem and that 'prey-class vulnerability to cougar predation, at least for bighorn sheep, is largely a function of the behaviour of individual cougars' (*ibid.*: 774). Similarly, an Australian study of predation by feral domestic cats on small marsupials and flightless birds found that particular individual cats (most often the larger, male cats) were disproportionately responsible for predation on threatened species, and hence they call for:

> the application of crime-fighting forensic and aggregate profiling techniques in wildlife protection programs to determine the profile of predators likely to prey on focal wildlife species and to guide the development of control methods that specifically target these individuals (Moseby et al., 2015: 331).

One of the key areas of contention within the ABE caracal debate was whether caracal predation on domestic cats was the work of an individual (rogue) caracal or just part of the broader balance of nature. Given that caracals can adapt to human dominated landscapes and that a generalist opportunistic predator is pre-adapted to the consumption of locally-available food items, the consumption of domestic cats, even if only by an individual, is consistent with the natural history of the caracal and in this sense is 'natural'. Opportunistic predators such as caracals are likely to develop a search image and prey preferentially on locally abundant prey – in this case domestic cats. Yet for many cat-owners in

[12] The general presumption in the literature is that caracals prefer freshly killed meat (Skinner, 1979: 523; Pringle and Pringle, 1979) but they are known to scavenge carcases dumped by humans (Nowel and Jackson, 1996: 51; Skinner, 1979: 523; Avenant, 1993: 111) and to cache kills and return to them later to feed on them, and to feed on kills made by other predators (Stuart 1982: 62; Bothma, 2012: 56).

the ABE, this was not the kind of nature they had knowingly bought into – and if there were a particular individual caracal with a proclivity for targeting domestic cats in the ABE, then it should be captured and relocated. As discussed below, those favouring the removal of the caracal favoured a version of 'nature' that was more managed and safer for humans and their companion animals than that articulated by others.

4. Opposing world-views about living with nature in the ABE

The cat-caracal debate emerged into the open in late 2016. Marina Redpath lost her cat 'Mr Bear' in October, and then the following month lost a second cat, 'Sushi'. Their mutilated and partially eaten bodies were found in a fynbos area off Sea Hare Circle, where she lives. The experience was traumatic for her and her family. It was through Marina Redpath's subsequent activism, together with her friend Anne Jennens, that the *Pets lost and found in Atlantic Beach Estate* grouping was formed to assist other pet owners and to engage with the ABE management over the caracal-cat issue. They investigated and found that at least 35 cats had gone missing in ABE during 2016 and that 10 of those had been in Sea Hare Circle. The bodies of several cats and the remains of grysbok were found in the fynbos within Sea Hare Circle, an area subsequently named 'pet cemetery' by Marina Redpath (Figures 10 and 11).

ABE management arranged for camera traps to be set in the area. The cameras and analysis of the footage was managed by Lois Van Wyk from the Biodiversity Management Branch of the Environmental Management Department of the City of Cape Town. On 13 January 2017, Harry White reported in the Atlantic Beach Estate Weekly News that no caracals had been seen on the cameras or by the security fence cameras. He went on to note that:

> As communicated to concerned cat owners, if indeed it becomes evident that it is a caracal or some other predator preying on some of the Estate's cats, we will work with Nature Conservation and pet owners to solve the problem, always taking into consideration that the Estate is situated within an environmentally sensitive and protected area.
>
> For instance, a possible solution offered by Dr Liebenberg [a vet at the West Coast Animal Clinic] was the re-introduction to the Estate of indigenous Cape Hare or other small mammals which caracal feed on naturally. The aim of this would be to encourage natural behaviour and provide an abundant natural food supply.

> Another solution suggested by Dr Liebenberg was cat enclosures or cat fences, which one can find examples of on the internet. We happen to know that Elmien Vermeulen, formerly from Peanut Animal Welfare and now involved with The Hope Foundation for Cats, also supports the notion of cat enclosures quite vociferously and if aesthetically pleasing could be supported by the Association and included in its rules….
>
> The fact is that at this stage we simply don't have all the answers, but with so many possible harms that could come to cats that are allowed to roam freely, it could simply be a combination of causes….
> In the Association's opinion it is becoming more evident that the solution that best ensures the safety of cats, the safety of our wildlife and the protection of fellow residents from undue nuisance caused by roaming cats, remains that, like other pets, cats should be contained to the owner's property (White, 2017a).

As it turned out, a caracal *had* been detected on the camera trap on 3 January 2017 (right outside Marina Redpath's house), but it took some time for the photos to be analysed and so ABE management was not aware of this photograph when reporting in the 13 January Weekly News that no caracal had been seen 'to date'. Some cat owners, however, were suspicious of the delay in reporting the presence of the caracal – even suspecting that Louis van Wyk (and perhaps also ABE management) might have been trying to downplay the seriousness of the problem for cat owners.[13] They also rejected the reported suggestion (by Dr Liebenberg) of providing alternative natural food sources for the caracal – seeing this as encouraging the caracal rather than excluding it from the estate, which was their preferred solution. Emotions were clearly running high, with problems of trust emerging on both sides of the divide.

In order to promote a better understanding of the situation, ABE management arranged a talk and discussion session with the *Urban Caracal Project*[14] (a university research project studying the behavioural ecology of caracals in Cape Town). This took place on the 23 February and was attended by members of the ABHOA, City officials, ABE residents and *CapeNature*.[15] At the meeting, residents raised concerns about the safety of their pets and about what they

[13] Harry White denies this allegation, pointing out that ABE management had accepted in May 2016 that caracals were in the area and were killing and eating cats (personal communication, 16 January 2019).
[14] http://www.urbancaracal.org/
[15] Key role players were Laurel Serieys and Joleen Broadfield of the Urban Caracal Project, Leandi Wessels from *CapeNature*, and two officials, Louis van Wyk and Jacques Küyler, from the City of Cape Town (Duval, 2017: 3).

perceived to be a decline in the number of grysbok. City of Cape Town officials said they would be conducting a review of the wildlife in the area, to 'provide the correct data to underpin any decisions made regarding the balance of the numbers of these animals' (Blauwberg Nature Reserve (BBNR), Quarterly Report Jan-March 2017: 3-4). Dr Laurel Serieys from the *Urban Caracal Project* gave a presentation arguing that caracals did not pose a threat to children, that they hunted mainly at night (and hence if residents kept their cats indoors at night they would be safer) and that if a caracal was captured and relocated, it would simply create a vacant territory for other caracals to enter. According to the recollection of some residents, *CapeNature* officials at the meeting conceded that 'the caracal could be removed if they were found to be behaving in an unnatural fashion, such as entering residents' property' (Van Huyssteen, 2018: 5).

The ABHOA commissioned a survey of attitudes of residents of the ABE to find out prevailing views on how to manage the caracal-cat conflict. Invitations were sent out to registered owners to respond to an online survey posing four questions: whether predators such as the caracal should be removed, whether domestic cats should be restricted to their owner's properties, whether the electric fence and gate boundary should be tightened to exclude the passage of any fauna, and whether there should be more research to assess the fauna on the ABE and to ensure an appropriate balance between predators and prey species (Table 1). Reporting in April 2017, the survey (of 479 respondents – that is, over half of households in the ABE) found that most did not want the caracal removed, or to tighten the boundary. Rather, there was a majority in favour of restricting domestic cats to properties and leaving the ABE fence and entry gates as is (Table 1). The next month, the ABE changed its rules from allowing cats to roam freely as long as they were belled, to requiring them to stay on their owners' properties unless under 'the control' of their owners.

Table 1: The ABE survey results (n=479)

	N	% agreeing
The Association should by whatever means available pursue the City (as landowner) and nature conservation authorities for the ongoing removal of predators, such as the caracal, from the Estate.	131	27.4%
Domestic Cats on the Estate should be restricted to residents' properties and not be allowed to roam freely.	288	60.1%
The Association should implement boundary fences and entrance gates designed to prevent caracals and other fauna from entering and exiting the Estate.	95	19.8%
The Association should engage and partner with the City and nature conservation authorities to assess the fauna found on the Estate on an ongoing basis. This assessment should attempt to ensure the best possible balance is maintained between various fauna and predatory species such as caracals.	395	82.5%

Table 2 uses the results of the survey to show how the views of residents tended to cluster into what we might call three main 'world-views' about how to live with pets and nature in the ABE. Just over half (53.4%) had a '*pro-nature without cats*' world view, that is, they were opposed to removing the caracal and in favour of restricting cats to their owner's property. Most of these residents did not want any tightening of the boundary fence and gate. Almost a fifth (19.2%) had what we term a '*pro-nature with free cats*' world view in that they were opposed to removing the caracal and to restricting domestic cats to their owner's properties. Most of these residents wanted no further caracal-proofing of the fence or the gate. Just over a fifth of the sample (20.7%) had a '*protect free cats from caracals*' world view in that they wanted the caracal removed and cats to be free to roam. Most of these residents also wanted the boundary and gate to be made impermeable to caracals. A small minority (6.7%) wanted to remove the caracal and restrict cats.

Survey respondents were also invited to comment further (in an open-ended space) if they wished. Of the total sample, 231 opted to leave comments (and some wrote extensive commentary). Many of the comments from those with a '*pro-nature without cats*' world view complained about neighbouring cats entering their houses, defecating in their gardens and preying on wild-life, especially birds. Some expressed clear resentment towards the cat owners who wanted to remove the caracal, seeing this as a violation of the bargain with nature underpinning the ABE. As one resident commented: 'We invested in Atlantic Beach because it's an eco-estate, not a cat sanctuary!'

Table 2. World views on how to live with pets and nature

	N	%	World view
Leave the caracal and fence alone, restrict cats	250	52.2% *Unrestricted nature without cats*	*Pro-nature without cats* (53.4%)
Leave the caracal, restrict cats and tighten fence	6	1.3% *Restricted nature without cats*	
Leave the caracal and fence alone, let cats roam free	89	18.6% *Unrestricted nature with free cats*	*Pro-nature with free cats* (19.2%)
Leave caracal alone, allow cats to roam, tighten fence	3	0.6% *Restricted nature with free cats*	
Remove the caracal, tighten fence, let cats roam free	64	13.4% *Protect free cats from caracals and further restrict nature*	*Protect free cats from caracals* (20.7%)
Remove the caracal, leave fence alone, let cats roam free	35	7.3% *Protect free cats from caracals and don't further restrict nature*	
Remove the caracal, tighten fence and restrict cats	22	4.6% *Protect a restricted predator-free nature from cats*	*Remove the caracal and restrict cats* (6.7%)
Remove the caracal, restrict cats, leave fence	10	2.1% *Protect a predator-free nature from cats*	
	479		100%

Comments from those with a '*pro-nature with free cats*' world view indicated that they also bought into the idea that living with caracals in the estate was part of living with nature – but that they did not favour an outright ban on free-ranging cats, with many commenting that restricting cats to their owner's properties was not feasible or even natural. As one resident commented: 'Cats are made to roam freely…… its within their DNA, who are we to want to change that??' Another said: 'It doesn't bother me if the cats roam free. It also doesn't bother me if they get eaten. The cat owner should make the decision whether they want to risk the cat getting eaten or not.'

Several of those with the '*protect free cats from caracals*' world view complained about the 'biased' nature of the survey, especially the first question which asked about the removal of predators rather than about the removal of a particular problem caracal. Many thought that the survey was engineered to have a predetermined outcome, especially given comments in preceding Newsletters about how much it would cost to tighten the boundary.[16] Like those with the 'pro-nature with free cats' world view, several people with the 'protect free cats

[16] Interview with Anne and Dave Jennens and Marina Redpath, 10 January 2019.

from caracals' world view argued that restraining cats was unnatural/infeasible and a few argued that domestic cats played a role in controlling the population of small fauna (rodents). Some argued that the caracal had upset the balance of nature in the ABE; had devastated the grysbok population. In addition to expressing pain with regard to the loss of beloved pets, several expressed concern about the caracal potentially posing a threat to small children.

People with this worldview expressed a clear preference that nature within the ABE should be a tamer type of nature than would be found in a nature reserve, and several pointed out that the management already removed poisonous snakes when they came into properties and so the argument against removing the caracal, because it was part of nature, was disingenuous. As one resident commented: 'Snakes are removed and relocated, the same should apply to the caracal'. Another commented: 'We don't believe the Caracal should be removed completely, just that the population should be kept under control, the same way that the buck population is kept under control.' This world view thus rested on the observation that the ABE was already managed as a closed estate, and that the arguments about the natural role of the caracal in ecosystems did not apply. As one resident observed: 'Game farms do not allow wild predators to hunt on their enclosed bok species. From an animal welfare point of view it is inhumane.' Putting it more bluntly, another said: ''This is Pet Friendly, family lifestyle estate & not the Kruger National Park'.

Table 3 summarises the key themes raised by those who opted to leave comments and organises the analysis by world view. Figures 3 to 5 provide key phrase-clouds of themes for each category of comment. Phrase-clouds are visual representations of the data in Table 3: the font size for the summary phrase is proportional to the percentage share of the number of mentions within the three broad world views.

Table 3: Key themes raised in comments

Key themes	Pro-nature without cats		Pro-nature with free cats		Protect free cats from caracals	
Cats damage natural ecology	29	15.4%	2	4.4%	1	1.7%
Cats can be a nuisance in the house, annoy dogs	16	8.5%	0	0%	1	1.7%
Annoyed by the issue	15	8.0%	2	4.4%	0	0%
Annoyed by cats in the garden	13	6.9%	0	0%	1	1.7%
Cat owners must accept risks and be responsible	1	0.5%	0	0%	3	5%
Cannot confine cats to a property	3	1.6%	10	22.2%	9	15%
Can confine cats to a property	27	14.4%	3	6.7%	1	1.7%
Caracals are a valued part of nature	8	4.3%	4	8.9%	0	0%
Cats should be managed, levied, even banned	12	6.4%	3	6.7%	1	1.7%
Caracal has upset the balance	1	0.5%	1	2.2%	23	38.3%
Management is biased against pet owners	0	0%	0	0%	3	5%
Cats are important for the ecology	0	0%	1	2.2%	1	1.7%
Caracal is innocent	2	1.1%	1	2.2%	0	0%
Prefers caracals to cats	3	1.6%	0	0%	0	0%
Nature trumps pets	55	29.3%	17	37.8%	1	1.7%
Pets trump nature	0	0%	0	0%	3	5%
Conflicted over nature and pets	0	0%	0	0%	1	1.7%
Fear for children	1	0.5%	0	0%	4	6.7%
Caracal eats grysbok/birds	2	1.1%	1	2.2%	7	11.7%
Total comments	188	100%	45	100%	60	100%

Figure 3. Phrase-cloud for the 'pro-nature without cats' group

From Table 3 and Figure 3, it is clear from the comments made by the majority 'pro-nature without cats' position that there is a strong sense that 'nature' should not be meddled with, that it is more important than pets, and that cats cause ecological damage and thus should be removed from the surrounding natural environment by being confined to residential properties. Added to this is often a strongly felt view that cats are a nuisance in other ways too (coming into neighbouring gardens and houses).

Figure 4. Phrase-cloud for the 'pro-nature with free cats' group

Figure 5. Phrase-cloud for the 'protect free cats from caracals' group

Figure 4 shows that the dominant additional sentiments expressed by the 'pro-nature with free cats' group was that cats cannot be contained and that nature trumps pets, implying that pet owners need to accept this. The opposite, of course, was the case for the 'protect free cats from caracals' group (Figure 5). Most thought that cats could not be confined to people's properties. A small minority argued that cats play a role in the ecology too and complained that the caracals were destructive of small game and birds – and could even pose a danger to children.

5. The camera-trap survey and report by the City of Cape Town

As part of the promised information-gathering exercise, Louis van Wyk conducted a camera trap study over a three-month period[17] in 2017 on the ABE and on the bordering sections of the BBNR's coastal area (Van Wyk, 2017). It found that birds accounted for over three-quarters of the 'faunal events' (photos) in the ABE, and that if only mammals are considered, the most active mammal was the domestic cat, followed by small grey mongoose (Figure 6), springbok, domestic dogs under control (*Canus lupus familaris*) and Cape grysbok (Figure 7) (Van Wyk, 2017: 5). For the BBNR section of the survey, birds accounted for just over a third of faunal events (62.5%) and when looking only at mammals,

[17] The report did not specify the dates or even the months of the survey.

the small grey mongoose was the most active, followed by rodents[18] (rats, mice and gerbils), the common duiker (*Sylvicapra grimmia*), Cape grysbok and steenbok (*loc. cit.*). The analysis did not adjust for whether particular individual animals were photographed multiple times.

Source: Van Wyk (2017: 13).

Figure 6: Small grey mongoose (left) and small spotted genet (right) in the ABE

The sampling effort (number of cameras multiplied by the number of days the cameras were active) amounted to 701 in the ABE and 479 in the BBNR.[19] The relative activity index (RAI) for each animal in each area was calculated as the number of photos taken of the animal divided by the sampling effort.[20] Table 4 lists the RAI for mammals in the ABE and the BBNR. It also reports a crude 'city average' from camera trap studies in nature reserves around Cape Town where RAIs have been reported for animals expected to be in that habitat.[21] As can be seen from the table, this average was based on very few data points with a wide range hence it is doubtful whether one can conclude anything about the health of the ABE ecology in comparison to it. Yet, despite acknowledging problems with this methodology (Van Wyk, 2017: 8-9), the report relied quite heavily on this 'City average' in drawing conclusions.

[18] This finding is unreliable as camera traps are not good instruments for sampling rodent presence.

[19] There were 45 cameras used over 93 days in the ABE, and 31 cameras used over 93 days in the BBNR (Van Wyk, 2017: 4-5).

[20] The relative activity index uses all photos, whereas the relative abundance index discards multiple photos of the same individual animal (van Wyk, 2017: 4).

[21] In other words, if an animal is expected to be there and no photos are taken, then an RAI will be recorded of zero. If no photos are taken of animals not expected in the area (for example a Springbok), the RAI is simply missing.

The report noted that grysbok numbers were higher in the ABE than in the surveyed sections outside the fence and that with a RAI of 34.8 compared to the average of 50.8 from camera trap surveys in City of Cape Town nature reserves, 'their population can be considered "normal", especially for the enclosed and fragmented environment they occur in' (Van Wyk, 2017: 10). The report concluded that there was thus 'no cause for concern regarding over-predation of this species' (*loc. cit.*). It is debatable, however, whether it is meaningful to draw conclusions about what a 'normal' population of grysbok would be by comparing the ABE with other nature reserves in Cape Town. Furthermore, these static comparisons cannot speak to the point made by several residents that in their observations, the grysbok population had declined[22] – implying that in the past the ABE had supported a higher population.

Source: Van Wyk (2017: 13).

Figure 7: Cape grysbok in the ABE

The report attributed the 'substantial difference between the grysbok RAI in ABE (34.8) and BBNR (7.5)' to the impermeable fence, noting that the 'lack of porcupines, a species tolerant of human activity, in the estate indicates a barrier that prevents distribution or movement through the natural vegetation on site' (Van Wyk, 2017: 11).

As indicated by Table 4, no caracals were captured on camera traps inside the ABE or in the nearby BBNR areas. The report concluded that this meant that

[22] A letter to Harry White from concerned residents dated 20 January 2017 recalled that Louis van Wyk was reported in an ABE newsletter dated 5 August 2016 to have counted only 8 grysbok during a night count, and that although this was attributed to weather, the concerned residents suspected that 'the herd size has been impacted by increased predator activity' (personal communication).

'above all reasonable doubt, there was not a visiting or resident caracal on site at the time of the survey' and that the site was 'not overpopulated by caracal'. Rather, given an average RAI of 1.5 in other city camera trap nature reserve sites, the report found that it was 'unnatural to have no activity of caracal whatsoever on and around the Estate as they are abundant and their distribution range span [*sic*] across the entire City of Cape Town' (*ibid.*: 10). The report failed to mention, however, that the RAI for caracals across the City sites varied from 0 (for a quarter of the surveyed sites) to 7.1, suggesting that estimated caracal abundance varied, perhaps over time, and that it was not unusual to record a RAI of zero at a particular time in an area with conducive caracal habitat.

Table 4. Relative activity index (RAI)

	Relative activity index			City information sources		
	ABE	BBNR	City average	Number of sites	Max and min	Location for maximum
Small birds	19.5	5.4	2.2	N/A	N/A	N/A
Domestic cats	80.5	0	20.6	7	0.2 – 113.3	Rietvlei
Small grey mongoose	53.9	42.8	1.6	7	0.1 – 6.2	Tygerberg
Springbok	50.5	0	N/A	N/A	N/A	N/A
Dog (controlled)	47.6	0	N/A	N/A	N/A	N/A
Cape grysbok	34.8	7.5	50.8	14	0 – 441.2	Rietvlei
Dog (uncontrolled)	17	0	1.7	5	0 – 4.2	Westlake
Rodents	10	34	13.0	14	0 – 65.3	Tygerberg
Small spotted genet	3.4	1.5	0.5	2	0.6 – 0.3	Rondevlei
Common duiker	0	9.8	62.6	3	1 – 183.3	Bokbaai
Steenbok	0	1.9	33.7	3	0 – 93.3	Rietvlei
Cape porcupine	0	1.5	8.6	8	0.2 – 22.5	Rondevlei
Cape fox	0	0.4	N/A	N/A	N/A	N/A
Caracal	0	0	1.5	12	0 – 7.1	Rietvlei

Source: Van Wyk, 2017: 8.

During the period of the survey (in May 2017), a caracal which had been killed by a car was found near the ABE and domestic cat remains were found in its stomach during an autopsy (Van Huyssteen, 2018: 5). During August 2017, a resident's cat went missing and an autopsy report (considering the cat's injuries and where it had been found hidden) concluded that the cat was probably (but not definitely) killed by a caracal (*ibid.*: 5). It is thus likely that there *was* caracal presence on and near the ABE but that it had not been detected by the camera traps. Where animals occur at low densities it is not uncommon to have false absences for short duration camera trap surveys and hence the survey report was probably too bold in stating that there were no caracals present on the ABE at

the time of the survey and should rather simply have reported that no caracals were detected.

According to the survey report, one of its 'critical findings' as the 'concerning result' that the most active mammal on the ABE site was the domestic cat (*ibid.*: 10): 'Footage from the survey indicated domestic cats predating on rodents on the Estate and they most certainly have a noteworthy ecological impact on the site' (*loc. cit.*). The report speculated that the ABE was approaching full capacity in terms of the development of houses, and that with each household permitted to having two cats, this could have amounted to an 'exponential' increase in cat numbers since the inception of the ABE – and that this may be a factor in the increase in apparent cat mortalities (*loc. cit.*). It suggested that with regard to rodents, the 'lower RAI for ABE compared to BBNR is most likely due to the high cat population' (*loc. cit.*): 'There have been numerous reports to the author by ABE residents of domestic cats returning to their owners and producing predated wildlife including rodents, birds and reptiles' (*loc. cit.*).

The report also highlighted that over a quarter (26%) of the photos of dogs were uncontrolled, noting that 'these dogs could potentially perform a predatory role on the ABE, as well as causing injury and death of domestic cats'. The RAI for uncontrolled dogs of 17 was an order of magnitude higher than that for the City average (1.7) (*ibid.*: 11). Finally, the report commented that the high abundance of small birds in the ABE 'could be the result of bird-feeders which is an inviting and easy alternative for many bird species as opposed to the time and effort it requires to naturally feed in strandveld' (*loc. cit.*).

In its conclusion, the report emphasised that the habitat within the confines of the ABE had been, and continued to be, transformed and managed by humans. In addition to the introduction of springbok, a species not native to the area, the natural environment was profoundly constrained by the non-permeable fence and affected by human actions such as the removal of venomous snakes, the feeding of birds and the presence of uncontrolled domestic cats and dogs (Van Wyk, 2017: 12-13). It recommended further research to monitor changes in faunal activity rates and research on domestic cats.

6. Contested expert opinions and fears about caracals harming cats and children: The 2018 debate and policy shifts

Although there was strong support for policies to restrain cats to residents' properties, such a 'rule' was not enforced in any punitive manner. Rather, the ABE management continued to encourage people to ensure the safety of their pets. Several residents put in applications (that were supported by management) to build 'catios', mostly covered veranda's or covered, protected areas outside windows and running down the length of a wall. However, the conflict re-emerged in March 2018 when the ABHOA started receiving reports of caracal being sighted on the ABE – including looking into people's houses (Figure 8) and missing cats were again blamed on a caracal. In May, two cats were found together and appeared to have been killed by a caracal. An autopsy report by the State Veterinarian concluded that he was 'fairly sure' that a caracal had killed one of the cats and 'most probably' also the other cat, though he said it was possible that a black-backed jackal might also have been responsible (in Van Huyssteen, 2018: 6). The ABHOA reported the matter to the City, but the City remained steadfast in its position that no caracal should be removed and that domestic cats be confined to residents' properties (summary in Van Huyssteen, 2018: 6).

In the 25 May 2018 ABE newsletter, Harry White reminded residents that the majority of residents felt that wildlife should 'be left to subsist on and around' the estate, that the caracal was part of this wildlife and that homeowners should 'take responsibility for their pets and keep them safe' (White 2018a) He pointed out that there was no evidence that caracal were 'trapped' inside the estate, and posted photos and a video from the fence security cameras showing a caracal leaving the estate by climbing over the electric fence (Figure 8).

Also in May, a resident reported on *Facebook* that a large and physically threatening caracal had been seen 'fighting' with a domestic cat, that it was apparently unbothered by human presence and was almost on the veranda of the house, with lights on. This encouraged others to comment on how they had lost cats recently to caracal and that a caracal had reportedly even jumped at a glass door, apparently in an attempt to get at a cat inside. The mood on *Pets Lost and Found in Atlantic Beach Estate* became sad and at times angry. Lost and killed cats were mourned as 'fur-children', indicating their important status as companion animals and members of the family, and there was general anger that

caracal predation was not being thought of holistically[23] and would only be taken seriously if it posed direct threats to humans.

Figure 8. Caracal/s in Atlantic Beach Estate

On 6 July 2018, White released another statement through the newsletter, noting the airing of views on social media and complaints about the management of the problem. He reported that after a caracal was seen hunting a rat in a resident's back-yard and chasing a cat in broad daylight, he had consulted with *CapeNature* and other experts to find out if any of this amounted to the kind of 'abnormal behaviour' that would justify capturing and relocating the caracal. White quoted *CapeNature*'s response:

[23] Postings were often rich in ecological narratives. For example, in response to a suggestion that if residents could keep their cats indoors for a month, the caracal would just 'move off the estate', others argued that the caracal would then simply 'decimate' the small buck, rodents and francolins, and come into people's yards after their dogs and children. Photos were posted of a grysbok jaw in a caracal 'lair' where a dead cat had also been found.

> It lives in an environment where it is surrounded by human activity and, like the majority of indigenous wild mammals, over time it becomes habituated to people, their scent, their vehicles, their sounds etc. etc. The "natural behaviour" of wild mammals that exist in a system where there is no constant human activity in their territories or areas of occupancy or where they are persecuted by people is far different to the "natural behaviour" of wild mammals that live in an environment like Atlantic Beach where it occurs in constant close proximity with people. This indifference to people and their activity, even in daytime is commonly observed in similar (bordering onto natural areas where natural vegetation corridors occurs amongst residences etc.) residential areas / housing estates like Grotto Bay, Rooiels, Pringle Bay, Betty's Bay, Gordon's Bay, Simon's Town, Onrus, Hermanus etc. etc. by wild mammals, including caracal etc. This level of habituation to human activity, considering the environment in which the cat lives, is thus not surprising at all – in fact, it is completely expected and fairly common. (*CapeNature*, cited in White, 2018b).

This analysis, in contrast to the camera trap survey report discussed earlier, is notable for its problematization of the concept of a natural environment (note the inverted commas) in human-dominated landscapes. It is notable also for its analysis of caracal adaptability, and hence for its representation of the behaviour of caracals which have become habituated to human presence as natural.

Following this, the Board of the ABHOA (Boyce, 2018a) placed 'on record its final and unambiguous position on the matter', notably that 'other than snakes which pose a significant and substantiated risk to humans, the natural fauna on the estate should not be interfered with unless the behaviour is deemed abnormal by wildlife experts' and that they would 'not challenge the City legally while the City's position is in agreement with the experts' (and *CapeNature*) and would 'continue to act within the mandate received from an overwhelming majority of homeowners through the survey conducted last year'.

The management also put up notices about wildlife on the estate – including caracals, which were described as the largest predator on the peninsula and a 'beautiful animal'. It also referred to 'predatory pets' in a section on the challenges posed to wildlife on the 'urban edge' describing cats as 'instinctive hunters who account for the injury or killing of thousands of birds and small creatures each year', noting that many of these deaths 'can be prevented if we keep a close eye on our pets when they venture outdoors'. A posting on *Facebook* showed that the matter was far from resolved, as it proposed the

following ‘amendment’ to the description beneath the caracal (added in red to an image of the noticeboards) to what he described as the ‘hastily erected “Wild Life” sign boards dotted around the Estate’ (Figure 9). After further representations from concerned residents, the wildlife boards were then adjusted (using an overlay) to describe the caracal simply as the largest predator on the peninsula and the ABE, noting that it is an opportunistic predator that will prey on domestic cats.

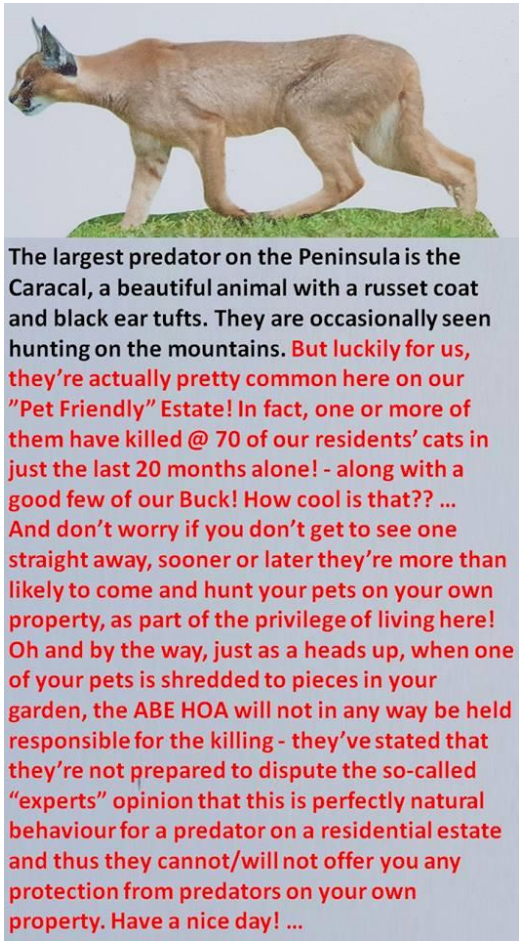

Figure 9. Left an image of the original caracal description on the ABE wildlife notice, with additional commentary added to the photograph and posted on Facebook. Bottom right: the wildlife notice with the adjusted description of the caracal.

Supportive posts on *Facebook* expressed dissatisfaction with the notion of a habituated caracal targeting their pets, even in their homes, as ‘natural’. They were alert to the fact that understanding caracal predation of cats, even on their properties, as ‘natural’ caracal behaviour effectively erased any remaining conceptual boundaries between their homes and the natural environment beyond

their garden walls. As indicated in the red addition to the image of the wildlife sign posted on *Facebook* (Figure 9), residents understood very well the discursive slippage that had just occurred in the ecological analysis: the caracal was no longer being constructed as a predator within an ecosystem surrounding the houses, but as part of an ecosystem including the houses and their pets as prey. Many complained that the so-called experts associated with the *Urban Caracal Project* were caracal advocates and that management was not considering all sides. A group of concerned residents then contracted retired wildlife ecologist Professor J. du P. Bothma to give an opinion on whether caracals posed a potential threat to children as well as pets (discussed further below).

On July 10, 2018, a resident who runs a non-profit kitten rescue centre, posted an emotional statement on the *Pets Lost and Found in Atlantic Beach Estate* page showing graphic photographs of her dismembered cat 'Billy' (Figure 10) who she described as having been 'brutally murdered on my property in Atlantic beach golf estate yesterday afternoon by the caracal'. Billy, who had three legs, was well known in the area (and was the subject of several published children's stories). Her angry and upset owner wrote that Billy was not strong enough to wander and that she was:

> taken on MY PROPERTY …. Then dragged into the bush and brutally attacked and eaten by a CARACAL. We found her head and legs first and hidden away in the bush we found the rest of her body .. under her limp lifeless body I found bones of other victims.. This is NOT on. 70 cats have been taken so far by Caracal on Atlantic beach golf estate .. and NOTHING has been done .. we are told to keep our animals on our property.. well my Billy was on my property!!! Sorry for that one !! The caracal Entered my property and killed my cat .. This caracal is the size of a dog.. If you think I am going to sit here and let my animals be brutally murdered and terrorized, sorry this is not correct.

Her post attracted many supportive comments and calls for action to be taken against the caracal. Co-incidentally, the following day, on 11 July 2018, the ABHOA Board announced that it had changed its mind after reading a report by an independent expert (Boyce, 2018b). This turned out to be the Bothma report.

7. The Bothma report and the issue of caracals posing a potential danger to humans

J. du P. Bothma's report was a 3-page opinion piece rather than a scientific report (it had no references to any literature). His analysis was in line with the dominant understanding of caracal ecology discussed earlier – except when it came to possible risks to humans. On this matter, he observed that given the reported behaviour of the caracal on ABE, there was an 'increasing likelihood that a caracal will eventually enter a home and endanger the lives of its human inhabitants, with young children being especially at risk (2018: 2). Bothma added:

> From personal experience I know that a caracal will focus on any young child which it may encounter and attack it as soon as the child runs or tums [*sic*] its back on it. This may have lethal consequences on Atlantic Beach Estate where the caracal(s) are known to move close to and peer into the homes. lt [*sic*] is also possible that a caracal which has lost its fear of humans may attack a slightly built person. This danger, more so than any other consideration, demands that such possible interaction must be prevented. It may also have grave legal consequences.' (Bothma, 2018: 2).

Boyce then issued a statement on behalf of the ABHOA Board stating that in view of the report, and 'the recent unacceptable and unnatural behaviour displayed by this caracal', the Board 'will take immediate steps to ensure the safe and humane removal of caracals from the Estate and their relocation to a recommended location'. The statement acknowledged that a permit needed to be issued by *CapeNature*, but that should this not be forthcoming, it was the Board's intention to apply to the Courts to compel *CapeNature* to do so (Boyce, 2018b).

The following day, White issued a statement describing Bothma's report as a 'game-changer' because it amounted to expert opinion that caracals could pose a threat to humans. He also noted that another cat had been attacked and killed 'this time within the perimeter of a homeowner's private property' and that management would be seeking permission to capture and relocate the 'abnormally habituated' caracal (White, 2018c). The issue was picked up by the press (Qetsemani, 2018a) which also reported a clear divide within the ABE between those wanting to protect pets and to remove the caracal.

Skye and Ninja – Sterling Way – Mar 2017 - Both cats found within a metre of each other. One cat eaten, the other dismembered.

Jaguar – 13 Sea Hare – Lost 16 May 2018 – Found 17 May in Sea Hare den

Cabana – 15 Sea Hare – Lost 16 May 2018 – Found 17 May next to Jaguar in Sea Hare den.

Topaz – Tradewinds – 7 June 2018 – head and half eaten body in separate locations

Topaz – Tradewinds – 7 June 2018 – half eaten body located away from head.

Figure 10a. Photographs of predated cats presented to CapeNature

		
Sushi – 96 Sea Hare – Lost 19 Nov 2016 – Found 12 Dec 2016	Summer - 5 Sea Hare – Lost 4 April 2016 – Remains found 2 March 2017	Berlin – 97 Sea Hare Circle – Lost 7 Feb 2017 – Remains found 8 Feb 2017
		
Berlin – 97 Sea Hare Circle – Lost 7 Feb 2017 – Remains found 8 Feb 2017	Lila – Sterling Way – Feb 2017	Thahan – 1 Mainstay – Lost 16 March 2017 - Partially eaten remains found 23 March.

Figure 10b. Photographs of predated cats presented to CapeNature

Figure 10c. Photographs of predated cats presented to CapeNature

The Board of the ABHOA and the leaders of the *Pets Lost and Found on Atlantic Beach Estate* were now united in seeking permission to capture and relocate any problem caracal. Part of the evidence presented to *CapeNature* included the carefully documented pet kills. A list of all the cats, by name, date of loss, address of owner and details of the owners was presented as part of the evidence – along with notes on the remains of the cats found. This was accompanied by photographic evidence which is poignant in the way that the name of each pet is included. The pictures also provide some indication of how horrifying it must have been to discover a beloved pet in such condition – and how potentially traumatising for family members (Figure 10).

In the 27 July Newsletter, White reported back that their application for a permit had been rejected by *CapeNature*, and that as *CapeNature* had not commented on the potential threat posed by caracals to children, the Board had, by way of their attorneys, 'requested clarification' in this regard (White, 2018d). The issue continued to get traction in the local press, with experts defending *CapeNature*'s decision and concerned residents arguing that 'caracals were hunting in broad daylight and right in between our houses', that attacks were 'getting more brazen' and that they wanted the 'rogue' caracals removed' (Qetsemani, 2018b).

On 24 August, White reported that the estate management had obtained legal advice indicating that they should not pursue the matter through the court (White, 2018e). The legal professionals pointed out that there were no procedural or legal grounds for challenging *CapeNature*'s decision (as they had done their due diligence, had provided reasonable arguments supported by science etc) and that the grounds for concern about the caracal posing dangers to

humans were weak (Meintjes, 2018; Van Huyssteen, 2018). Van Huyssteen commented:

> 'It has since transpired that Professor Bothma's own daughter was injured in 1977 by a caracal which had been captured and kept in an enclosure. *CapeNature* has indicated that it is not aware of any other such incident, and Professor Bothma does not point to any. Professor Bothma also concluded that capturing the caracal will not present a long-term solution' (2017: 8).

The scientific literature on caracal behaviour is very thin and to my knowledge there is no historical research on caracal attacks. The first natural history of South African mammals (FitzSimons, 1919) reports two cases of farmers supposedly being attacked by caracals but it is unclear whether these reports were corroborated or whether the animals might have been diseased. Based on experience in national parks and contemporary experience, experts from the *Urban Caracal Project* and *CapeNature* are comfortable with their advice that caracals pose no appreciable threats to humans. Yet there is always an element of uncertainty with regard to this adaptable animal – and certainly according to J. Du P. Bothma's assessment, the ABE should worry about potential problem animals (as of course they should also worry about attacks on humans by domestic dogs, for which there is a much larger evidential basis).

Source: Qetsemani, 2018b

Figure 11. Fynbos near Sea Hare circle. Atlantic Beach Estate residents call this 'Caracal Alley' or the 'Pet Cemetery'. The outside wall of the

protected garden depicted in the bottom two images in Figure 12 can be seen (closest house).

8.Keeping cats inside

An uneasy stalemate ensued. Some cat owners focussed their attention on building catios (Figure 12) and discussing GPS collars that could potentially alert owners when their cats strayed into dangerous areas, such as an area of Sea Hare circle (Figure 11). In early August 2018, a resident reported that her cat had become terrified of the outdoors and was urinating indoors rather than go into the mesh-enclosed catio. The owner then put 'powder' on the ground outside and found 'huge paws' that were interpreted as being that of a caracal trying to find its way in. By September 2018, *Facebook* postings were reporting that White and Boyce were warning of 'a lot of caracal activity in and around the Estate'. Residents made suggestions about reducing cover in key 'hot spots' but otherwise people were simply warned to keep their cats safe.

Figure 12: Catios on the Atlantic Beach Estate and an enclosed garden to prevent cats leaving.

The *Pets Lost and Found in Atlantic Beach Estate Facebook* page started posting updates on caracal sightings and a *WhatsApp* group was formed, also to relay information about caracal sightings. ABE management focussed additional resources on wildlife monitoring, hiring a conservation officer to manage an ongoing camera trap survey, conduct other field observations, and report to residents including through the Newsletter. Weekly reports started appearing in November 2018. No caracals were captured on the camera traps, but domestic cats (and sometimes dogs) regularly appeared on cameras in the fynbos. As of December 2018, it was unclear how many people were actually keeping their cats confined or putting radio collars on their cats. The newsletter of 2 November 2018 reported that in October, 283 images of animals had been collected from 7 camera traps, of which almost a third (31.8%) were domestic cats (Conradie, 2018). The Newsletter also provided information about catios on the ABE (Figure 12), and offered further assistance (providing residents with examples, presumably including designs and potential suppliers).

9. Conclusion

The ABE controversy revealed distinct world views about the familial and ecological role of domestic cats and over what it means to live in an 'eco-friendly' estate. Yet the dispute should not simply be understood as a clash of values. The rival positions entailed different ecological narratives about the role of the caracal and cats in an enclosed 'natural' environment. ABE management accepted the argument that caracals were part of the natural environment but remained open to the possibility that 'rogue' or problem caracals existed and that if expert opinion indicated that this could pose a threat to children, the caracal concerned should be removed. Prof. Bothma's conclusion, based on his understanding of caracal adaptability and his own experience of a tame caracal injuring his child, that a caracal *might* pose a risk to children thus resulted in ABE management shifting its stance to pursue a capture and removal option. However, when provided with legal advice that the position of the other conservation experts and *CapeNature* was reasonable and that a legal challenge would not succeed, ABE management – in consultation with other wildlife experts – resorted to monitoring the situation and committed to further routine monitoring and planned ecological research.

Expert opinion was not merely contested, the dominant expert narrative changed over time. Initially the narrative from the conservation authorities was to argue that caracals were part of the wildlife ecology within the ABE – and that domestic cats, far from needing protection from the caracal, should be contained on people's properties in order to protect the wildlife outside. However, when

reports emerged of caracals peering into windows, of hunting cats and rats within people's properties in broad daylight, and possibly even attempting to get into catios, the official conservation narrative morphed to emphasise that caracals were adaptable animals which 'naturally' learned to cope with new environments, including becoming habituated to humans, and hence their incursions into people's properties was 'natural'. This, of course, heightened what was already a deep sense of unease amongst concerned residents regarding the threat posed by caracals to domestic cats. For some, this was accompanied by growing scepticism towards expert opinion, seeing it as shifting ground to suit a pro-caracal position irrespective of the costs to pets/family. The notion that a caracal could potentially pose a threat to children, although not supported by contemporary scientific evidence, continued to simmer in the background – the concern being that a problem caracal could (although very unlikely) emerge to threaten small children as well continue to prey on domestic cats.

The caracal-cat debate also highlighted the question of what it means for people to live in a natural environment and keep cats. The ABE's rules require that domestic animals pose no threats to the wildlife and that if a domestic cat roams outside, it should be under the control of its owner. This, however, is difficult to achieve and ABE management has concentrated on urging residents to protect their cats and the local wildlife by building catios.

Figure 13. A caracal outside the ABE West gate, and then inside the ABE having entered through the palisade fence on the pedestrian gate.

As of mid-December 2018, the situation appeared peaceful with no caracal sightings or reports of cat kills. Caracals were being detected by security cameras outside the impermeable fence to the east and west. No activity was detected along the more permeable northern fence (bar fencing) perhaps because that would require them entering the outskirts of Melkbosstrand and negotiating a busy road. During the small hours of 17 December 2018 a caracal was recorded walking up and down the west fence, and then entering the ABE

through the palisade bars around a pedestrian entrance (Figure 13). The caracal was clearly seeking entry to ABE, probably because the fence is only a barrier to movement but not to vision, hence prey within the fence can thus readily be detected from outside, drawing the caracal in. It is also possible that the caracal had previously visited ABE and knows of food sources within the estate. By entering through the pedestrian gate, the caracal revealed that it is already habituated to a human modified environment. ABE management immediately warned residents that there was a caracal within the ABE and hence concerned cat owners were provided with the necessary information to manage the risk to their pets accordingly. A caracal (probably the same caracal) was seen leaving the ABE two days later (close to midnight on 19 December) by squeezing through a small gap in the fence between the wire mesh and the concrete apron.

It remains an open question whether the ABE is an ecologically good place for a caracal or not. When planning permission was granted for the ABE it was, as noted earlier, envisaged as an ecologically friendly estate allowing for faunal movement between the ABE and the surrounding nature reserves. Yet in practice, long stretches of the fence are impermeable and now that the estate is fully built, the environment within the ABE is possibly very different to that imagined by planners two decades ago. The ABE has stretches of natural vegetation, but these are hemmed in by houses, roads and golf courses. Should the fence be made more permeable (more easily allowing in caracals and other wild carnivores, such as black-backed jackal, honey badger and leopard) or less permeable (thereby allowing the estate to become a herbivore, bird and rodent sanctuary)? If the latter, what does this imply for the management of domestic cats on the estate? The issue of what kind of nature is appropriate for the ABE is far from resolved. Further research on both the ecological and social framing of ecologically friendly estates in South Africa would assist both managers and residents of the true costs and benefits of living in one.

Possible research initiatives regarding the caracal include: the capturing and collaring of caracals inside the ABE and the Blouberg Nature Reserve to get a better understanding of the extent and nature of their territories; analysis of caracal scat in the area to better understand dietary preference; camera-trap monitoring to understand faunal densities and caracal prey preference.

There is also a clear need for better understanding of the potential impact of domestic cats on small wildlife in the ABE. Potential research areas could include camera-trap monitoring; surveying residents in the ABE about their cats and recording prey items; and perhaps even radio-collaring some domestic cats in the ABE. Understanding the role of cats as companion animals and family

members in the ABE would also be helpful in understanding the dimensions of this particular wildlife conflict.

Ecological research may assist in an ecological understanding that: takes the human-dominated and managed landscape as a given rather than constructs it as part of some natural environment akin to the neighbouring Blouberg Nature Reserve; understands the ABE as a unique eco-system (rather than with reference to average City of Cape Town RAI metrics) that is subject to dynamic changes over time; takes the ecological observations of residents seriously (perhaps systematising them through citizen-science type data collection), especially with regard to emotionally important species such as the grysbok and birds; and understands caracals as adaptable animals easily habituated to humans and open to the possibility that some individuals might pose more problems in terms of conflict with humans and their pets than others.

This means understanding the role of caracals within the broader ABE ecology (including predation on cats and grysbok, and potentially also as helping control springbok) *and* as potentially 'problem' animals in light of the emotional costs involved in hunting and killing beloved cats on properties, especially those where efforts have been made to protect their cats from predation. Rather than contesting whether caracals are behaving 'naturally' or not, it is probably more constructive to assume that caracals are adaptable animals that may well transgress a socially important boundary between what might be called 'safe' family spaces (home and garden) and outside natural vegetation and public open spaces. Encouraging the construction of safely enclosed gardens and 'catios' is an excellent idea (to protect both cats from caracal and small wildlife from cats) and regarded worldwide as the first step in protecting domestic animals from wild carnivores If a caracal persists in attempting to enter protected properties, then there are legitimate grounds for approaching *CapeNature* to ask for its removal. This would not, however, be a simple process but would require a method for clear identification of the problem caracal and compiling a case history for that individual to prove that the damage-causing behaviour is becoming habitual despite attempts to mitigate the damage. Ultimately these incidents will lead to the development of specific guidelines, formulated with stakeholder involvement for the management of caracal in residential estates throughout Cape Town and South Africa, so that coexistence models for humans and wildlife can be developed through the shared experience of individual estates.

References

Atlantic Beach Estate. 2015. *Architectural design manual, Atlantic Beach Estate.* Available: http://atlanticbeachestate.co/wp-content/uploads/2015/07/Amended-Atlantic-Beach-Estate-Architectural-Design-Manual-1-June-2015-Draft-5.pdf [15 January 2018]

Avgan, B., Henschel, P. & A. Ghoddousi. 2016. "*Caracal caracal*." (errata version published in 2016). *The IUCN Red List of Threatened Species* 2016: e.T3847A102424310. Available: http://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T3847A50650230.en [12 March 2017].

Avenant, N. 1993. The caracal, *Felis caracal caracal* Schreber, 1776, as predator in the West Coast National Park. Master's thesis. Stellenbosch University.

Avenant, N.L. & J.A. Nel. 1997. Prey use by four synoptic carnivores in a strandveld ecosystem. *South African Journal of Wildlife Research-24-month delayed open access*, 27(3), 86-93.

Avenant, N.L. & J.A. Nel. 1998. Home-range use, activity, and density of caracal in relation to prey density. *African Journal of Ecology*, 36(4), 347-359.

Avenant, N.L. & J.A. Nel. 2002. Among habitat variation in prey availability and use by caracal *Felis caracal*. *Mammalian Biology-Zeitschrift für Säugetierkunde*, 67(1), 18-33.

Bernard, R. & C.T. Stuart, 1987. Reproduction of the caracal *Felis caracal* from the Cape Province of South Africa. *African Zoology*, 22(3), 177-182.

Biodiversity Agreement, 29 May 2018, between the Western Cape Nature Conservation Board and the City of Cape Town. Available: http://atlanticbeachestate.co/wp-content/uploads/2018/06/ABE-Biodiversity-Agreement-27062018Scan095206.pdf

Bothma, J. du P. 2012. *Literature review of the ecology and control of the black-backed jackal and caracal in South Africa*. Available: https://www.capenature.co.za/wp-content/uploads/2014/02/Literature-Review-of-the-Ecology-and-Control-of-black-backed-jackal-and-caracal-Bothma-2012.pdf [27 January 2019]

Bothma, J. du P. 2018. *Caracal predation on domestic cats in Atlantic Beach Estate, Melkbos.* Available: http://atlanticbeachestate.co/wp-content/uploads/2018/07/Caracal-Report.pdf [27 January 2019]

Bothma, J. du P. & E. Le Riche. 1994. Range use by an adult male caracal in the southern Kalahari. *Koedoe*, 37(2), 105-108.

Boyce, J. 2018a. *ABHOA Caracal report.* Available: http://atlanticbeachestate.co/wp-content/uploads/2018/07/2018-07-04.ABHOA-Notice-Caracal.pdf [27 January 2019]

Boyce, J. 2018b. *Caracal report – update.* Available: http://atlanticbeachestate.co/wp-content/uploads/2018/07/2018-07-11-ABHOA-Notice-Caracal-Update.pdf [27 January 2019]

Braczkowski, A., Watson, L., Coulson, D., Lucas, J., Peiser, B. & M. Rossi. 2012. The diet of caracal, *Caracal caracal*, in two areas of the southern Cape, South Africa as determined by scat analysis. *South African Journal of Wildlife Research*, 42(2), 111-116.

Conradie, L. 2018. Let's talk conservation. In Atlantic Beach Estate, Weekly News, 2 November.

Dickenson, I. 2016. Caracal kills 20 endangered penguins on South Africa's Cape coast. *EarthTouch NewsNetwork*, 7 July 2016. http://www.earthtouchnews.com/natural-world/predator-vs-prey/caracal-kills-20-endangered-penguins-on-south-africas-cape-coast [27 January 2019]

Drouilly, M., Nattrass, N. & M.J. O'Riain. 2018. Dietary niche relationships among predators on farmland and a protected area. *The Journal of Wildlife Management*, 82(3), 507-518.

Duval, M. 2017. Estate cats vanish. Media release, *BBNR Quarterly Report*, January-March 2017.

FitzSimons, F.W. 1919. *The Natural History of South Africa, Mammals, volume 1*. London and New York: Longmans. Available: https://archive.org/stream/naturalhistoryof01fitziala#page/n7/mode/2up

Govender, S. 2018. Estate living is the in thing. *Daily Dispatch*, 24 November. Available: https://www.pressreader.com/south-africa/daily-dispatch/20181124/281608126483599 [27 December 2018]

Grobler, J.H. 1981. Feeding behaviour of the caracal *Felis caracal* Schreber 1776 in the Mountain Zebra National Park, *South African Journal of Zoology*, 16(4), 259-262

Johnson, W.E., Eizirik, E., Pecon-Slattery, J., Murphy, W.J., Antunes, A., Teeling, E. & S.J. O'brien. 2006. The late Miocene radiation of modern Felidae: a genetic assessment. *Science*, 311(5757), 73-77.

Marker, L. & A. Dickman. 2005. Notes on the spatial ecology of caracals (*Felis caracal*), with particular reference to Namibian farmlands. *African Journal of Ecology*, 43(1), 73-76.

Meintjes, R. 2018. *Capture and Relocation of Caracal at Atlantic Beach Estate.* Available: http://atlanticbeachestate.co/wp-content/uploads/2018/08/Letter-to-ABHOA-dd-21082017.pdf [27 January 2019]

Melville, H.I.A.S. & J. du P. Bothma. 2006a. Possible optimal foraging for Brants's whistling rats by caracals in the Kgalagadi Transfrontier Park. *African Zoology*, 41(1), 134-136.

Melville, H.I.A.S. & J. du P. Bothma. 2006b. Using spoor counts to analyse the effect of small stock farming in Namibia on caracal density in the neighbouring Kgalagadi Transfrontier Park. *Journal of Arid Environments*, 64(3), 436-447.

Melville, H.I.A.S., Bothma, J. du P. & M.G.L. Mills. 2004. Prey selection by caracal in the Kgalagadi Transfrontier Park. *South African Journal of Wildlife Research*, 34(1), 67-75.

Moseby, K.E., Peacock, D.E. & J.L. Read. 2015. Catastrophic cat predation: a call for predator profiling in wildlife protection programs. *Biological Conservation*, 191, 331-340.

Nattrass, N., Conradie, B., Drouilly, M. & M.J. O'Riain. 2017. A brief history of predators, sheep farmers and government in the Western Cape, South Africa. *CSSR Working Paper No. 398*. Available: http://www.cssr.uct.ac.za/pub/wp/398

Nowell, K. & P. Jackson (eds). 1996. *Wild cats: status survey and conservation action plan* (Vol. 382). Gland: IUCN.

Operational Environmental Management Programme. 2012. *Operational Environmental Management Programme, Atlantic Beach Estate*. Compiled by

Ecosense Consulting Environmentalists. Available: http://atlanticbeachestate.co/wp-content/uploads/2015/05/Atlantic-Beach-OEMP-Draft-16-November.pdf [27 January 2019]

Palmer, R. & N. Fairall. 1988. Caracal and African wild cat diet in the Karoo National Park and the implications thereof for hyrax. *South African Journal of Wildlife Research*, 18(1), 30-34.

Pohl, C.F. 2015. The diet of caracal (*Caracal caracal*) in the southern Free State. Master's dissertation, University of the Free State.

Pringle, J. & V.L. Pringle. 1979. Observations on the lynx *Felis caracal* in the Bedford district. *African Zoology*, 14(1), 1-4.

Qetsemani, X. 2018a. Fur flies in Caracal debate. *Tabletalk*, 18 July, 2018.

Qetsemani, X. 2018b. Caracal: residents "living in fear". *Tabletalk*, 8 August, 2018. Available: https://www.tabletalk.co.za/news/caracal-residents-living-in-fear-16457529 [27 January 2019]

Ramesh, T., Kalle, R. & C.T. Downs. 2017. Space use in a South African agriculture landscape by the caracal (*Caracal caracal*). *European Journal of Wildlife Research*, 63(1), 11.

Ray, J.C., Hunter, L. & J. Zigouris. 2005. *Setting conservation and research priorities for larger African carnivores* (Vol. 24). New York: Wildlife Conservation Society.

Rosevear, D.R., Parsons, R. & P.A. Wolseley. 1974. *The carnivores of west Africa*. London, United Kingdom: Trustees of the British Museum (Natural History).

Sharma, V. & K. Sankhala, 1984. Vanishing Cats of Rajasthan. J. In Jackson, P. (Ed.). *Proceedings from the Cat Specialist Group meeting in Kanha National Park*, 116-135. Available: http://www.catsg.org/cheetah/05_library/5_3_publications/S/Sharma_and_Sankhala_1984_Vanishing_Cats_of_Rajasthan.pdf [27 January 2019]

Skinner, J.D. 1979. Feeding behaviour in Caracal *Felis caracal*. *Journal of Zoology*, 189(4), 523-525.

Stuart, C.T. 1982. Aspects of the biology of the *Caracal (Felis caracal*, Schreber, 1776) in the Cape Province, South Africa. M.Sc. dissertation, University of Natal, Pietermaritzburg.

Van Huyssteen, E. 2018. *Opinion.* Available: http://atlanticbeachestate.co/wp-content/uploads/2018/08/Atlantic-Beach-Cape-Nature-opinion-16-August-2018-002.pdf [27 January 2019]

Van Wyk, L. 2017. *Atlantic Beach Estate, Camera Trap Survey: Final Report*, City of Cape Town, Biodiversity Management Branch, Environmental Management Department.

White, H. 2016. From the Desk of Harry White. In *Atlantic Beach Estate Weekly News*, 13 May.

White, H. 2017a. From the Desk of Harry White. In *Atlantic Beach Estate Weekly News*, 13 January.

White, H. 2018a. From the Desk of Harry White. In *Atlantic Beach Estate Weekly News*, 25 May.

White, H. 2018b. From the Desk of Harry White. In *Atlantic Beach Estate Weekly News*, 6 July.

White, H. 2018c. From the Desk of Harry White. In *Atlantic Beach Estate Weekly News*, 13 July.

White, H. 2018d. From the Desk of Harry White. In *Atlantic Beach Estate Weekly News*, 27 July.

White, H. 2018e. From the Desk of Harry White. In *Atlantic Beach Estate Weekly News*, 24 August.