

Pigeons and people: mortal enemies or lifelong companions? A case study on staff perceptions of the pigeons on the University of South Africa, Muckleneuk campus

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Pigeons have been a part of our lives for as long as we can remember. Some people view them with joy, others disdain. Regardless of the perception, control measures are often implemented against the birds in a bid to reduce their presence in urban environments without considering the views of members of the public in the process. Complaints about pigeon activity are, typically, given more attention than praise for these birds. However, people who are pro-pigeons are often not provided with the forum to express their views of the birds. This study explored the perceptions of staff with regard to the pigeons inhabiting the University of South Africa's Muckleneuk campus. Two hundred and forty-six participants provided their opinions on the pigeons, their related activities and the perceived impact on staff on the campus. Recognising that both people and urban wildlife play a role of cause-and-effect in human-wildlife conflicts can contribute to understanding peoples' relationships and perceptions of animals which transgress the boundaries between urbanisation and nature. By considering peoples' perceptions, attitudes and behaviours towards urban wildlife, management strategies can be significantly informed in the process of mitigating conflict. The study has shown that the negative perception of pigeons, which was assumed to be the position of all the people affected by the pigeons at the University of South Africa's Muckleneuk campus, is in fact incorrect. Participants would rather encourage the nesting and breeding activities of the pigeons on campus, as they felt that the human-pigeon interactions and the viewing of squabs in nests contributed positively to their work environment. Pigeon control strategies should therefore not solely be on the biological aspect of a perceived pigeon problem, but should also include the human association.

INTRODUCTION

Urban environments house more than half of the world's population (United Nations, 2014). While only constituting a relatively small percentage of the world's surface, its effects are far reaching and disproportionate to its size. Despite the negative

and often detrimental impacts on the natural environment, urban environments have the potential to contribute to biodiversity (Pickett, Cadenasso, Grove, Boone, Irwin, Groffman, Kaushal, Marshall, Mcgrath, Nilon, Pouyat, Szlavecz, Troy, & Warren, 2011). Modified habitats, shelter, abundant food resources, permanent water availability and reduced predator presence are synonymous with city environments. These factors enable certain species to undergo synurbanisation, whereby animal populations adapt successfully to urban environments by

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overcoming certain ecological barriers (Luniak, 2004). Theriologists–ecologists have defined synurbanisation as the ability of animal populations to adjust to specific conditions of urban environments, thereby enabling their continued existence (Andrzejewski et al., 1978; Babinska-Werka et al., 1979). Synurbanisation enables species to adapt and transgress the societal boundaries of human habitation, to live successfully, side by side with people. The feral pigeon (*Columba livia*) and speckled pigeon (*Columba guinea*) (hereafter referred to collectively as pigeons) have adapted well, globally, to the urban environment (Haag-Wackernagel et al., 2006).

Pigeons have for centuries been among the most abundant bird species in built-up environments, having adapted their nesting requirements and foraging habits to be conducive with urban lifestyles. According to Luniak (2004), species such as the pigeon, tend to be ecological generalists, with high reproductive capacities and prolonged breeding seasons. Abundant resources, shortened breeding cycles and the scarcity of predators contribute to urban pigeon populations' ability to increase within short time periods. Society has ambivalent feelings about these pigeon populations. Negative perceptions of pigeons result in them being viewed as pests and termed as 'flying rats' (Jerolmack, 2008), while their droppings, nesting material, mites and their perceived potentially transmissible diseases are noted with fear and disdain, to which the pest-control industry offers solutions. To others, however, the presence of pigeons is considered complementary to city life and beneficial as their presence in an urban environment provides a connection to nature.

The University of South Africa's (UNISA) Muckleneuk campus in Pretoria is host to a large number of pigeons. The birds have access into the ceilings of the buildings through open access points and loose exterior ceiling boards, as well as into open electrical and air conditioning ducts, which are positioned on the exterior of the buildings. This easy access for the pigeons has created an increase in the number of protected and sheltered breeding and roosting sites, which, in turn, provoked health concerns because of the build-up of their faeces and associated fungi and nest mites and bird lice—which have been reported to infest the offices and inhabitants of certain buildings on campus (Westington, 2013). The faeces build up on the various balconies on the campus buildings and the accumulating nesting material are of particular concern and require attention. According to Ntshoe (2013), large financial inputs have been put towards trying to manage the birds and their associated problems on an ad hoc and reactive basis.

University Estates Management, responsible for the upkeep of the campus, identified the need for a long-term, successful and sustainable pigeon control strategy. The campus' pigeon problem is interdisciplinary in nature, as both the people affected by the birds, as well as various environmental factors, will all play significant roles in the successful management of the problem. This paper will explore the human and social disciplines of the study by reflecting on staff perceptions and views of the pigeons and the pigeon-associated perceived impacts on the people and the campus.

METHODS

This cross-sectional mixed methodology study comprised two parts, namely, an online questionnaire and follow-up interviews.

A quantitative design (Jennings, 2001) was adopted for the online questionnaire, which was electronically accessible to all staff members between September 2013 and September 2014 on SurveyMonkey. This is an online survey development cloud-based company (Survey Monkey, 2015). Data were gathered from willing staff members, in both administrative and academic positions, on the UNISA Muckleneuk campus. Primary data were collected from the direct input of participants into the online survey. Participants provided their personal opinions and perceptions relating to pigeons and their activities as well as the potential impact the pigeons have on the staff on the UNISA Muckleneuk campus. Content analysis (Braun, & Clarke, 2006) was used to analyse the data.

In addition to the online survey, semi-structured qualitative interviews were conducted with willing participants to corroborate, clarify and qualitatively supplement the questionnaire data. Participants provided their personal opinions and perceptions relating to pigeons, their related activities and the impact thereof on the UNISA Muckleneuk campus. Saturation was determined by participants' responses. Data were recorded and transcribed, and thematic content analysis (Braun, & Clarke, 2006) was used to analyse the data.

Institutional ethical permission was received for the research. Ethical issues were considered in order to ensure that the rights of participants were observed, namely, anonymity, respect for the dignity of persons, nonmaleficence and confidentiality (Terre Blanche, Durrheim, & Painter, 2006). Participation was voluntary, and participants required informed, voluntary consent to participate in the research.

RESULTS AND DISCUSSION

A total of 246 participants contributed to this study, of which 226 (92%) were online surveys and 20 (8%) face-to-face interviews, after which saturation was obtained. Figure 1 depicts the summary of these findings.

The results are discussed as per the following main themes gleaned from the questionnaires and interviews:

- pigeons as flying rats or a connection to nature;
- people's perceptions of pigeons;
- pigeon activities;
- feeding;
- roosting;
- nesting and breeding;
- pigeon activities that impact people;
- nesting material;
- ectoparasites;
- viewing of squabs in nests;
- interacting with pigeons;
- direct feeding of pigeons; and
- humans and their responsibility towards the environment.

Are pigeons 'flying rats' or a connection to nature?

An age old societal perception of pigeons in urban environments is that of them being 'flying rats'. 'Rats with wings' is a metaphor that captures the felt potential of this bird to wreak havoc on civilisation by unleashing disease (Jerolmack, 2008).

However, according to the staff who participated in the study, 77% of them disagreed with this statement, as the pigeons are not seen as vermin and their behaviour towards people is not considered to be as destructive as that of rats. Such labels attempt to reinforce the perception that the appearance of pigeons in human spaces should be experienced with disgust or anxiety (Jerolmack, 2008). Only 12% of the participants agreed with the statement, as they believed that pigeons host fleas and lice and, as one participant stated, '(they) fly from different locations to come and bring disease'. Eleven percent of the participants were undecided as to their opinion regarding pigeons being considered to be flying rats.

The majority of the participants (77%) felt that pigeons were a part of nature; they indicated affection towards the birds and considered them to be 'God's creatures'. The pigeons are considered as an opportunity to get closer to wildlife, while in a working environment, as their presence provides a living connection to nature in a usually 'dead' urban environment. This relates to the insistent desire that modern humans have to reconnect with the natural world, despite the continued domination and suppression of nature that goes hand in hand with development (Player, 2007). While 13% of the participants were undecided in their opinion, 11% of the participants disagreed with the concept that pigeons are a connection with nature. This they based their opinions on the perceived irrelevance of the pigeons' contribution to the ecosystem and the view that pigeons, which have habituated to thrive in urban environments, are domesticated and do not fit the

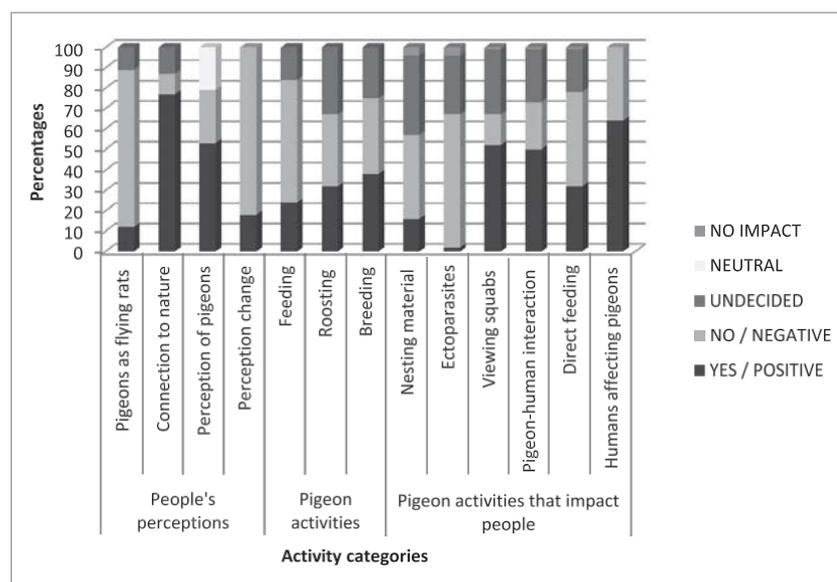


Figure 1 Summary of categories and results of staff perceptions of the pigeons on the University of South Africa's Muckleneuk campus

description of 'wildlife'. Wolch and Emel (1998) describe the moral panic that accompanies the idea of 'wild' animals defying the boundary between 'proper' spaces for humans and animals. People's view of nature will influence the way in which wildlife is controlled or managed in urban environments. Thus, the way in which people construct their idea of animals reflects their conception, not only of nature, but also of society (Sabloff, 2001). Botkin (2012) explains that environmental issues can only be effectively confronted once people change their perception of nature.

People's perceptions of pigeons

People's perceptions of pigeons strongly influence their reaction towards the birds as well as their behaviour, opinions and interpretation of how pigeon-related activities affect them. Stern, Kalof, Dietz and Guagnano (1995) describe how individual's attitudes about an issue influence their behavioural intentions towards that issue. When participants were requested to state what their perceptions or views of pigeons were, just over half (53%) indicated that they have positive experiences with pigeons and encouraged their presence on campus. The following is an example of a participant's response: 'They are part of nature. They are calming to look at and hear, especially in a stressful working place. It is nice to have nature close by.' Because participants were positive towards the birds sharing their work environment, they demonstrated higher levels of tolerance of the noise associated with the pigeons and the potential health risks associated with their breeding activities. Participants were therefore less likely to formally complain. The following quotes are examples of what they stated: '(I) encourage the pigeons, very positive perception' and 'I think they are great creatures, they are beautiful.'

Only 26% of the participants indicated negative perceptions toward the birds, based on the belief that the pigeons and their activities have a direct impact on them. These participants were sensitive towards pigeon-related health risks and found the birds to be 'irritating, especially in the work context'. Priego, Breuste and Rojas (2008) suggest that there is a wide range of ways in which contact with nature, in this case pigeons, contributes to a generalised improved quality of life. Twenty-one percent of the participants were neutral as to their perceptions of the pigeons on campus.

Participants indicated that their perceptions of the pigeons originated from friends (20%), the media

(14%), others (personal opinions, observations, experience and religion) (10%), health authorities (8%) and the pest control industry (5%). However, the majority (44%) of the opinions of participants originated from the family in which they grew up. Participants between the ages of 51–60 and 61–70 years were strongly influenced by the family's perceptions about the birds. This may be attributed to the fact that pigeons have been a part of city life for many years (Levi, 1963), and their presence has been encouraged in public spaces and urban landscapes. People actively feed and interact with pigeons, and this is regarded as an enjoyable pastime for old and young alike. While the problematic framing of the pigeons is a recent phenomenon (Jerolmack, 2008), the control of the pigeons is likewise a relatively new concept. Older generations, therefore, base their opinions and perceptions of the pigeons on how they were raised and the way society, at the time, positively viewed and encouraged the presence of pigeons. Personal opinions, observations and experiences of the pigeons and related activities, also shaped the participants' perceptions, as indicated by a participant: 'I am nature lover, I didn't come from a home that loves nature, but I am one.'

Over time, perceptions and attitudes may or may not change, but this depends on a variety of factors. Cordano, Frieze and Ellis (2004) explain how attitudes and perceptions are influenced by socio-demographics, knowledge, experience, values, beliefs and affiliations of an individual. Eighty-two percent of the participants' perceptions of the pigeons had not changed over time. Of these participants, the majority were not willing to change their perception of the birds. Participants continued to hold pigeons in a positive light, because of their affection towards the birds and desire to encourage their activities on campus. Pigeons are described to be an urban dweller's constant companion (Reynolds, 2013), filling city environments with life and character. Participants' willingness to change from a neutral perception of the birds to one that is positive could be achieved through exposure to and acknowledgement of how people interact with the pigeons and view them as companions. As one participant noted: 'Growing up I didn't realise they can be friends, but when I was at Church Square, I saw a white man who had befriended the pigeons. I realised that they are friends instead of just birds who will fly away when you come near.'

Eighteen percent of the participants stated that their perceptions had changed over time. Participants, who felt that their perceptions of the pigeons had changed from positive to negative, based it on

noise disturbance and the health risks associated with pigeons. One participant remarked: 'Before I became asthmatic 4 years ago, I loved them, but becoming aware of the health risks and their impact on me ... it has changed my view of them to negative.' However, participants also felt that their perceptions changed over time, depending on the context in which they experience the pigeons and their related activities. An example of this was stated by a participant as follows: 'It depends on the context, (I am) more negative (towards them) if they mess on my car, but they are also part of nature, so I just live with them.' These findings are consistent with the findings of Krimowa (2012), who suggests that people's perceptions may vary regularly depending on the context or situation in which they experience the birds.

Pigeon activities

Food resources and human buildings are the key ecological factors that bring pigeons into most urban environments (Haag-Wackernagel, 1995). Pigeon feeding is a worldwide phenomenon. It is reported, for example, that 20% of United States of America's households (Deis, 1986) and 36–48% of Australian households (Rollinson, O'Leary, & Jones, 2003; Ishigame & Baxter, 2007) have participated in this activity. It is a pastime that individuals participate in for a number of reasons including enjoyment, having an interest in wildlife, to compensate for loneliness or simply to reconnect with nature. At the Muckleneuk campus, pigeons make use of various buildings as a source of shelter in order to roost, find protection from the elements and safety for rearing of young. Food is provided from direct feeding by staff members and leftover food outside the cafeterias on campus. Participants were asked to respond to the various pigeon activities on campus, namely, the feeding of the birds by people and their roosting, nesting and breeding. The findings are as follows.

Pigeon feeding

More than half (60%) of the participants indicated that they disapproved of people feeding the pigeons, especially in a work environment. The following quote from a participant represents the feelings expressed: 'Not on campus...it can result in health risks. Working environment is not your exclusive social environment so you must have respect for other people. You might not even be aware of asthma, etc., because it doesn't impact on you.' These findings were consistent with the

research by Rollinson et al. (2003), who found that human–wildlife conflicts were intensified when bird feeding occurred because of the increased animal population densities and the wildlife's habituation to people, with the concomitant adverse effects of overpopulation. Twenty-four percent of the participants encouraged feeding of the pigeons, they believed that it is 'positive as it makes them (pigeons) feel welcome.' Even though feeding the pigeons is considered to lead to a greater appreciation of wildlife (Ryan, 2011), there are negative implications on the birds themselves and the urban environment. Sixteen percent of the participants were undecided about whether pigeon feeding should be encouraged or discouraged on campus.

Roosting

Jerolmack (2008) describes how pigeons are now a 'homeless' species. The past century has redefined an ever-increasing number of spaces to be off-limits to pigeons (and other animals).

On the Muckleneuk campus, 35% percent of the participants agreed that the roosting activities of pigeons should not be encouraged owing to health concerns relating to potential lice and mite transmission from pigeons roosting on and in the cabling ducts on campus. On the contrary, 32% of the participants feel a sense of responsibility towards the displaced birds. This corresponds with the point of view of Weber, Haag and Durrer (1994), who state that some individuals consider it their duty to be responsible for the pigeons. These participants welcome pigeons roosting on campus, because they consider the birds to provide a pleasant distraction from the daily mundane work-related tasks. Thirty-three percent of the participants were undecided as to whether roosting should be encouraged or discouraged on campus.

Nesting and breeding

The breeding season for pigeons peaks between March and July (Murton, Thearle, & Coombs, 1972); however, owing to the minor fluctuations in resources on campus compared with that of natural areas, they are able to breed throughout the year (Shochat, Lerman, Katti, & Lewis, 2004). Nearly 40% of the participants felt that the birds' nesting and breeding activities on the buildings (in or on the cabling ducts and balcony floors) were positively perceived and should be encouraged, as one participant stated: 'They need a safe place to breed...' It was suggested that there was no reason to restrict their reproductive behaviour, as the pigeon population was perceived to pose no problem on campus. However, not all participants were

activists with regard to the pigeons' nesting and breeding activities. Because of health-related concerns, 37% perceived this to be negative in a working environment, causing the buildings to go into disrepair because of the faecal build-up and messy nesting material, and the pigeons being a distraction from work-related tasks. This participant stated: 'It should be discouraged. I had a nest below my window, but had to wait for the chicks to fly away before the nest could be destroyed...it is noisy and irritating.' On the other hand, the participants who negatively perceived the nesting and breeding activities of the pigeons had nothing against the birds situating their nests and participating in breeding activities in the trees which populate the campus. As long as this behaviour did not take place on the buildings. This suggests that the participants did not negatively perceive the pigeons per se, only their reproductive behaviour associated with the buildings in close proximity to their work space. Twenty-five percent of the participants were undecided regarding the breeding and nesting activities of the pigeons on campus.

Pigeon-related activities impacting staff on campus

The aforementioned pigeon-related activities may directly or indirectly affect people on campus in a positive or negative way, if at all. Participants responded to these impacts as follows.

Nesting material

Litter, in particular nesting material, accumulates under breeding sites or in the cabling ducts. This can be problematic for hygiene, and it contributes to creating an untidy image of the buildings (Giunchi, Albores-Barajas, Baldaccini, Vanni, & Soldatini, 2012). Nevertheless, 43% of the participants stated that they were either undecided (39%) or that the nesting material had no impact (4%) on the people working on campus; they believed that the cleaning thereof would, however, provide an opportunity for job creation. Forty-one percent of the participants supported the unhygienic claims as they felt that nesting material negatively impacts on the staff on campus because of the harboured ectoparasites and feathers, which could affect allergic and asthmatic sufferers. Sixteen percent of the participants considered the nesting material to positively impact staff on campus.

Ectoparasites

Pigeons are of considerable epidemiological importance, being potential vectors for a host of

ectoparasites such as fleas, mites and ticks (Giunchi et al., 2012). Infestation of these parasites does not depend on direct contact with the birds, as exposure can occur with the pigeons and their nesting or roosting sites being in close proximity to human habitation or working environments. Sixty-five percent of the participants consider these ectoparasites to pose a threat to staff on campus, as noted by one participant: 'It is a big problem; we have to evacuate the offices for fumigation. The fumigation also has health impacts.' This finding validates the complaints received by University Estates from the staff that referred to lice infestations in the offices adjacent to pigeon nesting sites, which were positioned in the cabling ducts. However, it does not appear that pigeons are the exclusive hosts or carriers of disease in comparison with that of other urban birds (Angier, 1991; Helen, 2001). According to Jerolmack (2008), their ability to transfer diseases to humans has seldom been demonstrated. Magnino, Haag-Wackernagel, Geigenfeind, Helmecke, Dovc, Prukner-Radovic, Residbegovic, Ileski, Laroucau, Donati, Martinov and Kaleta (2009) state that pigeons harbour at least 110 human pathogenic organisms, but only seven of these have caused 230 reported infection cases in humans worldwide, 13 of which were fatal (Haag-Wackernagel, 2006). Over 30% of the participants stated that the ectoparasites or the potential threat thereof, had an undecided or no impact on staff. These participants felt that they had not been made aware of any documented cases of infestations of ectoparasites relating to colleagues' offices or experienced infestations on a personal level. A participant responded that 'It doesn't impact people, never heard of anyone being affected.' These findings suggest that the perceived lice and mite infestations associated with the pigeons on campus occur sporadically and are not the norm. Two percent of the participants indicated that potential ectoparasites associated with pigeons positively impact on the staff; no explanations were provided.

Viewing of squabs in nests

Nesting sites are identified and selected based on suitability relating to the protection from the elements and safety from potential predators such as rats, crows and birds of prey, which could raid the nests for eggs and chicks. Pigeons on campus construct their nests on the floor of the highest balconies as well as in or on top of the exterior cabling and air conditioning ducts. Nests positioned within view of offices provide staff the opportunity to observe eggs and squabs in the nest, which result in a potentially positive experience, as confirmed by

just more than half (52%) of the participants, who agreed with this statement. It allows staff to observe pigeon behaviour and the growth progression of the squabs, without intruding or influencing the activities relating to the raising of young. Participants felt that by witnessing this, individuals could experience a connection to nature and also the Christian faith. Pluta (2012) explains that spirituality is often spoken of in terms of a connection to something higher than ourselves, which for many consists of the faith community, connection to God or connection to nature. This finding therefore suggests that observing squabs in nests could be a spiritual experience, as stated by a participant: 'It is a pretty sight, it's a beautiful moment, I realise God is there.' Thirty-three percent of the participants stated that this activity had an undecided or no impact on the staff. This suggests that even though this activity was not actively encouraged, it was also not negatively perceived. A participant noted: 'It will have no impact, only if you want to know more and are interested then it will be a positive impact.' Fifteen percent of the participants felt that the presence and viewing of squabs in their nests had a negative impact on the staff and the working environment. The reason for the negative impacts was, however, not given.

Interacting with pigeons

Botkin (2012) explains that we interact with nature in two ways: rationally and through an inner, personal, non-intellectual response. The latter includes feelings of spirituality, intrinsic value and religious sensitivities. Both ways of interacting with nature are important and perceived in various degrees. In the case of pigeons, perceptions range from harmless domesticated birds to harmful pests, depending on the participants' personal cultural background (Johnston, & Janiga, 1995; Jerolmack, 2008). The impact that the pigeon-human interactions have on staff is considered to be positive. Half of the participants indicated that the interaction with the birds is a calming and peaceful experience. This interaction also provides the opportunity for staff to observe pigeon behaviour and allow a sense of connectedness to nature in a sterile work place environment, which is usually void of natural life. One participant stated: 'It is peaceful and calming. I would rather have pigeons on the windowsill than car noises. Having them brings nature closer.' This sense of connectedness and viewing pigeons as a means to bring nature closer to the offices, reiterates how people who live in the cities subconsciously seek to reconnect with the natural environment, as suggested by Player (2007). Twenty-three percent

of the participants stated that interaction with the pigeons should not take place in a working environment. This interaction reinforces their presence on campus and dependency on human-related resources. Twenty-seven percent of the participants were either undecided and or considered pigeon-human interaction to have no impact on the staff.

Direct feeding of pigeons

Certain staff members have taken it on themselves to actively provide sustenance in the form of seed on a regular basis to the pigeons on campus. This deliberate and direct feeding was considered to have a negative impact on other staff members by 46% of the participants. These participants regarded the university as a working environment, which should therefore be considered as a public space. Individuals' decisions to feed the birds on campus can affect others, who may consider these birds to be pests or who have health sensitivities. Artificial feeding encourages pigeons' dependency on people, which would have negative repercussions on their well-being when the individuals feeding the birds take a leave of absence. This is especially true for the pigeons on campus that breed throughout the year and would therefore have reliant young to feed. A participant insisted that '(it) must not happen, as the pigeons must not be encouraged to be dependent on people for their food.' Interestingly, staff members who discouraged feeding were more concerned about the food type and quality that was being fed to the pigeons, than the actual act of feeding. This concern is also highlighted in a study by Rollinson et al. (2003), who found that direct feeding creates inappropriate diets in birds. Participants suggested that as the pigeons become reliant on the food provision, they become increasingly vulnerable to being poisoned or captured by people.

Thirty-two percent of the participants felt that direct feeding of the pigeons had a positive impact on the staff. It was considered to promote a sense of selflessness—to take care of others—and garner empathy for wildlife (Rollinson et al., 2003), an appreciation for nature and enjoyment in the activity. A participant noted: 'People do it (feed pigeons), because they enjoy it.' Twenty-two percent of the participants were undecided or considered the direct feeding of pigeons to have no impact on the staff. The study also found that the majority of the participants, who felt that feeding had a positive impact on the staff, were women. This finding confirmed the finding by Weber et al. (1994), who suggested that pigeon feeders tend to be women.

Humans and their responsibility towards the natural environment

Shochat, Lerman and Fernández-Juricic (2010) describe how most of the world's land is managed and dominated by humans, resulting in a globally high rate of urbanisation and rapid loss of wild habitat land. Humans are often blamed for the encouragement and growth of 'pests' in urban environments, based on the provision of shelter and food. Sixty-four of the participants agreed with this statement, as they believed that humans are the cause of problem pigeon populations. Of these participants, 60% stated that the reason was the abundant food resources owing to an increase in exotic vegetation, refuse, the use of feeders (Shochat et al., 2010) and direct feeding. Twenty-five percent of these participants indicated that the encroachment of natural habitat is a reason for problem pigeon populations. However, Shochat et al. (2010) explain that urban environments can no longer be viewed as a loss of habitat for wildlife, but rather as new habitat that, with proper management, has the potential to support diverse bird communities. This is supported by further research that found that the provision of shelter to roost and breed on the infrastructure, especially that of cities with tall buildings, provide habitats very similar to the cliff homes of the pigeons' ancestors (Method statement for the control of feral pigeons, 2005). The ample provision of shelter (5%), humans affecting the predator-prey balance (5%), encouragement of the pigeons into urban spaces (3%) and being unsure (2%) were also provided as reasons for problematic pigeon populations in urban environments.

Thirty-six percent of the participants opposed the statement depicting humans to be the cause of problematic pigeon populations in urban environments. They indicated that it is rather due to pigeons' remarkable ability to exploit and adapt over time and space and the lack of natural predators. Lower predation pressures in urban environments enable pigeons to live in higher densities in cities (Sorace, 2002).

Cities are now viewed as challenging ecosystems for sustaining biotic communities and rich diversity for which humans are responsible for managing. The vast majority of the participants (96%) deem it the responsibility of public and private authorities, namely, municipalities, local councils, conservation organisations, the Department of Water and Environmental Affairs and independent building owners, to control or manage pigeons in urban environments. It was also stated that the responsibility was multi-tiered, suggesting that every person has to be accountable for their actions and realise that

interfering with nature has knock-on effects, even if they are not immediately visible. As evidence suggests, when people are exposed to nature in their daily lives, it heightens their perceptions of environmental problems (Priego et al., 2008). An individual's behaviour and behavioural intentions towards the natural environment are influenced by their environmental attitudes (Fransson & Gärling, 1999). More than half (51%) of the participants indicated that they were interested in or, participated in conservation-related activities. This suggests that they had an awareness of environmental issues, such as problem pigeons, as well as an identity of their roles as humans in the natural world. The majority of the remaining participants, who stated that they weren't actively interested or involved in conservation-related topics, were, however, aware of the pigeons and their related activities on campus. Suggesting that through their regular exposure to the birds on campus, they became aware of the natural world without participating in formal conservation-related activities outside of their working environment. This is in line with a study that has concluded that interactions between humans and urban wildlife influence individuals' attitudes and willingness to contribute to conservation (Krimowa, 2012).

As most of the world's population live in urban environments, the success of conservation projects and human-wildlife conflict resolution depends on the attitudes and perceptions of people in cities relating to urban wildlife as well as their interest and involvement in conservation initiatives.

CONCLUSION

The general view that there is a negative perception of the pigeons on the Muckleneuk campus is inaccurate.

The vast majority of participants indicated through their responses that they are 'pro-pigeon.' They did not perceive, nor experience the pigeons to be a problem on campus, but instead welcomed and encouraged their presence and activities in their work environment. Participants felt that pigeons allow a connection to nature, improved the staff's quality of life by creating a sense of peace and calm in a stressful working environment and are a pleasant distraction from routine work-related tasks. Their positive perceptions largely originated from their family backgrounds and opinion of the birds.

Nesting and breeding were positively perceived and encouraged by most on campus, as they enabled a connection to nature in a usually sterile man-made environment. However, the participants

were concerned about the pigeons' well-being relating to food dependency and the quality of the food that was provided by some staff members on a regular basis. Regardless of the potentially negative implications of having pigeon populations in close proximity to the work space, participants mostly continued to perceive the presence of the birds as positive.

Humans play a significant role in the way in which pigeons impact people and infrastructure. There needs to be a paradigm shift in the way people think and act towards the environment. Jerolmack (2008) pertinently explains that with the loss of everyday animal encounters, there has come a loss of tolerance for them, in essence causing isolation from the natural world. The existence between pigeons and people is interconnected, whether it is formally recognised or not, each plays a role in the others' lives. It is therefore imperative that scientific understanding and people's perceptions relating to human–pigeon interactions are thoroughly investigated in order to successfully manage conflicts in urban spaces.

IMPLICATIONS OF THE STUDY

There is an assumption that pigeons in urban environments are generally viewed in a negative light. However, this study has shown that most staff members welcome and encourage the presence of the pigeons in their working environment. This is contrary to the general assumption that most people, who are affected by the presence pigeons in urban spaces, in particular in the work place, associate the birds with problems and potential irritations. This suggests that a small vocal minority can give the impression that the problem is greater than the actual reality (Ryan, 2011). The concept of pigeon control is often based on the complaints of a perceived problem and public nuisance that these birds could potentially pose. However, people who are 'pro-pigeon' are equally significant in the success of managing human–wildlife conflicts. The opinions and perceptions, both negatively and positively, of all people affected by the pigeons should be considered and investigated prior to the removal or reduction of the species from urban spaces. This study has shown that pigeons play a significant role in society and the rash elimination or control thereof and could potentially not only result in an environmental void but also a societal psychosomatic loss in people positively affected by the birds.

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BIOGRAPHICAL NOTE

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