Occupational stress among law enforcement rangers: insights from Uganda

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Abstract In many countries law enforcement rangers are frontline guardians responsible for the management, monitoring and protection of protected areas and wildlife species. To date, little research has been conducted on law enforcement rangers and their perceptions of stress. This exploratory study contributes to both the criminological and conservation literature by exploring an important human dimension often neglected in conservation science research: law enforcement rangers. Similar to previous research on police occupational stress, it is expected that law enforcement rangers experience stressors unique to their profession. Utilizing an ethnographic case study approach based on interviews and participant observation, this research examines ranger perceptions of occupational stress in a protected area in Uganda. Findings indicate that law enforcement rangers are exposed to various occupational/task-related, external, internal, and occupation-related personal strains. Results from the study have implications in understanding, reducing and preventing occupational stress in rangers, as well as in capacity building for park management.

Keywords Capacity building, ethnography, human dimension, park management, qualitative research, ranger stress, Uganda, wildlife law enforcement

Introduction

Exploring the human dimension of conservation science is vital in the development, implementation and evaluation of sound policy (Gore, 2011). Furthermore, it has been argued that an interdisciplinary approach facilitates a nuanced understanding of social–ecological interactions (Berkes, 2004). Law enforcement rangers are an important human element in conservation science, but little research has been conducted with an explicit focus on rangers' perceptions and experiences.

A clear, concise and universal definition of occupational stress is not yet available (Hart & Cooper, 2001: 91). This is partly attributed to the subjective nature of the concept (Collins & Gibbs, 2003). Because of this, research on occupational stress has predominately been based upon a stressors-and-strain approach. Stressors refer to 'work-related characteristics, events, or situations that give rise to stress', whereas strain indicates 'an employee's physiological or psychological response to stress' (Hart & Cooper, 2001: 94).

The interaction between stressors and strains is also found within the police literature. Stress is distinguished as a form of stimulus that results in 'outcomes [such] as distress or stress reactions' (Liberman et al., 2002: 422), and stress is a 'transactional construct' and 'a process that links features of the human environment (stressors) with reactions to these features by people (stress-related behavior)' (Toch, 2002).

Policing is regarded as a stressful occupation because of its unique characteristics, such as exposure to distressing situations and engagement in dangerous activities (Toch, 2002). Police job stress is also influenced by various external, organizational and routine occupational factors (e.g. community relations, work overload, inadequate equipment; Shane, 2010). Such factors have been shown to be at least as stressful as the intrinsic characteristics of law enforcement (Toch, 2002; Shane, 2010). There are also unique variations related to rank, gender and race, highlighting the complexity of police stress (Morash & Haarr, 1995; Brown et al., 1996).

Significant differences between urban and rural officers have also been identified. Sandy & Devine (1978) outlined four stress factors that specifically affected rural officers: security (e.g. limited manpower), working conditions (e.g. lack of resources), inactivity (e.g. boredom), and social factors such as an 'absence of anonymity'. Officers who work in large metropolitan cities are able to rejoin the public more easily when off duty compared to officers who work and live in small communities, as they are readily identifiable by the community they police. As a result of this rural officers are unable to detach themselves from their occupational identity. More recently, Oliver & Meier (2004) tested and found empirical support for the assumptions of rural stressors proposed by Sandy & Devine (1978).

Few studies have examined stress in wildlife law enforcement. Conservation officers in the USA have identified a number of stressors, including dangers of the job, low salaries, inadequate equipment, and limited support from the court system (Walsh & Donovan, 1984; Oliver & Meier, 2006; Eliason, 2011). There have been similar findings in African settings; two studies in Nigeria found that rangers were generally dissatisfied with their occupation, and were poorly motivated because of insufficient funding and lack of proper equipment, inadequate staffing, poor salary, low

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Received 12 January 2015. Revision requested 6 February 2015.
Accepted 3 March 2015. First published online 26 June 2015.

levels of communication between management and rangers, the hazards of the job, and lack of incentives or promotions (Ogunjinmi et al., 2008; Meduna et al., 2009).

The social, psychological and physical impacts of stress on police officers have received much scholarly attention. Research has identified links with anxiety, depression, staff turnover, poor health and illness, alcoholism and drug abuse (Brown & Campbell, 1994; Toch, 2002). Stress has also been found to be related to poor performance (Shane, 2010), psychological distress (Liberman et al., 2002), and suicide (McCafferty et al., 1992), and to have a negative impact on the personal lives of officers, including causing marital problems (Toch, 2002).

Research has shown the importance of examining police personnel to gain knowledge of elements distinct to the profession, including discretion (Bittner, 1970), occupational culture (Paoline & Terrill, 2014), and the focus of the present study: occupational stress. Analogous to the research on stress amongst police personnel, investigating stress amongst law enforcement rangers is crucial in identifying stressors and related outcomes, as well as for informing the development of specific strategies to alleviate or prevent stress-related effects. This exploratory study contributes to both the criminological and conservation literature by using an ethnographic case study approach to examine law enforcement rangers' perceptions of occupational stressors in a protected area in Uganda.

Study area

Uganda has a population of c. 30 million people. Approximately 90% of the population live in rural areas and rely on agriculture as a main means of employment and sustenance (Emerton & Muramira, 1999; UBOS, 2013). Queen Elizabeth National Park (1,978 km^2; Fig. 1), one of 10 National Parks in Uganda, lies in the south-west.

The Uganda Wildlife Authority is the governing body responsible for monitoring and management of Uganda's protected areas and wildlife. It also promotes the socio-economic benefits of wildlife management for local communities, responds to problem wildlife, and implements international treaties and conventions. Within Queen Elizabeth National Park the Authority has seven departments: law enforcement, community conservation, monitoring and research, tourism, civil engineering, mechanical engineering, and finance. This study focuses solely on the law enforcement department.

Law enforcement rangers are required to monitor and protect the Park and its resources, implement information-gathering operations, perform security and guarding duties, respond to problem species, escort visitors to the Park, and compile reports. In conjunction with the community conservation department, they also engage in meetings to sensitize local communities to park benefits and to deter or dissuade local people from committing illegal activities. The rangers are provided with housing, and required to live on-site at headquarters or at one of the 25 ranger outposts, gates and sub-headquarters throughout the Park.

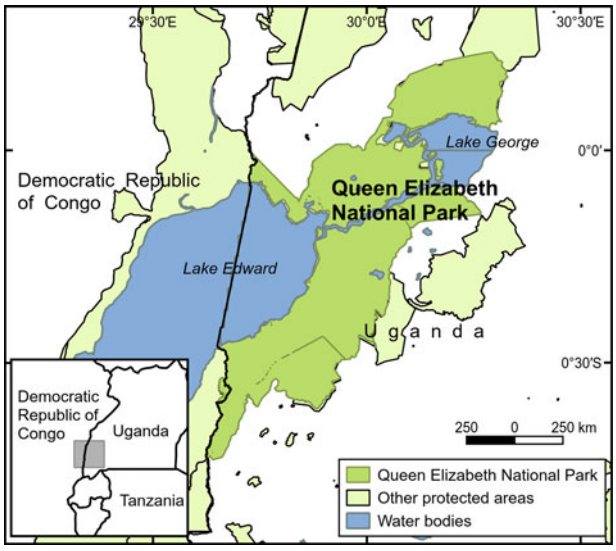

FIG. 1 Location of Queen Elizabeth National Park in Uganda.

Methods

This research was part of a larger study on the culture and operations of law enforcement rangers, and the objective was to explore ranger perceptions of occupational stressors. As feedback loops between occupational, personal and social pressures may occur, the influence of job-related strain on the personal experiences of rangers was also examined.

An ethnographic case study approach was employed and data were collected during September–October 2012. Ethnographic research is premised on understanding the culture, including the shared and learned beliefs, behaviours, language and values, of a particular group and often requires the researcher be 'immersed in the day-to-day lives of the people' they wish to study (Creswell, 2013: 90). Data were based on open-ended, semi-structured interviews and participant observations.

Purposeful operational construct sampling was used to select study participants (i.e. only law enforcement rangers and supervisors were approached to participate). The sampling frame for interviews was derived from an administrative list of the total population of 79 law enforcement rangers within the Park. Twenty rangers were selected randomly to give all personnel an equal chance of selection, and to reduce selectivity bias (Patton, 2002). Given the limited number of supervisors and scheduling conflicts, four supervisors were opportunistically asked to participate. All

respondents were read and provided with an informed consent form, promised confidentiality and compensated for their involvement.

Interviews were conducted in private in three settings: the respondent's home, the home of the assistant warden of law enforcement, and in a conference room at Park headquarters. The decision to conduct interviews in the home of the assistant warden of law enforcement was based on the difficulty of accessing a private room at headquarters, and I was given permission to do so. Interviews lasted 1–3 hours and were audio-recorded unless the respondent declined to be recorded. All voice recordings were uploaded to a laptop, kept in a locked bag (along with interview notes), and stored in my room.

I also engaged in participant observations to supplement interviews. Such observations have resulted in substantial and meaningful findings in the policing literature (e.g. Manning & Van Maanen, 1978) by generating direct and naturalistic observations (Patton, 2002). The use of participant observations helped 'provide clues to understanding the more subtle, implicit underlying assumptions that are often not readily accessible through observation or interview methods alone' (Emerson et al., 2011: 4). I engaged in both 'informal and formal interviews' and was able to 'observe a variety of different activities', while also becoming 'known to many people in the study population' (Pelto, 2013: 129).

Approximately 500 hours of participant observation of rangers was completed. Although I lived with and amongst the rangers at Katunguru headquarters in the Park, I also had the opportunity to interact with rangers at several outposts, gates and sub-headquarters. I also engaged in routine day foot patrols. By observing rangers during operations, important patrol group behaviours and dynamics were recorded, leading to a better understanding of field operation logistics and difficulties. This approach also helped generate rapport and trust among the study population. Field notes were taken to record observation data, and a complete narrative reflection of daily events was also completed (Emerson et al., 2011).

Data collected from interviews and participant observations were transcribed, coded and analysed in *NVivo 10* (QSR International, Doncaster, Australia) using a two-stage process. Firstly, initial or open coding was conducted, disaggregating data into sections and analysing each section for commonalities or differences (Saldaña, 2009). Pattern coding was then performed to identify overreaching themes (Miles & Huberman, 1994). The quotations reported in the Results are indicative of respondents' perceptions and experiences. Codes are used to anonymize responses, to protect the identity of respondents. My personal field notes and narratives were also included to supplement responses. Rutgers University International Review Board for the Protection of Human Subjects (IRB #12-737) reviewed and approved the methods used, as did the Uganda National Council for Science and Technology (Ref: SS 2758).

Results

Twenty-four interviews were conducted; all respondents were male, 23–54 years old. The majority of respondents were married (87.5%) with children (83.3%). The mean duration of respondents' employment with the Uganda Wildlife Authority and within Queen Elizabeth National Park was 9.3 and 7.6 years, respectively. In general, most rangers did not consider their job to be stressful but were able to identify several stressors. Similar to previous policing research, particular themes were identified among stressors: occupational/task-related, external, internal and occupation-related personal.

Occupational/task-related stressors

Respondents referred to various occupational/task-related stressors (Table 1). They highlighted the arduous nature of foot patrols as a main stressor because of the size of the Park, the challenging terrain, the harsh conditions, and the logistics of particular operations (e.g. difficulty in accessing water during extended patrols); for example, R016 described how the limited access to water during patrols often caused strain because 'you may travel from morning up to evening without getting water'.

Respondents were also concerned with encountering dangerous wildlife, armed suspects, and rebels during patrols. R006 explained how 'armed poachers stress us out' and that 'if the poacher gets the chance of killing you, he will kill you'. Similarly, R014 mentioned his anxiety of coming across rebel groups during patrol and how 'you may encounter them and you exchange fire and you are killed'.

Overwork and the lack of manpower was another stressor mentioned. Manpower was especially problematic for rangers living at outposts and gates because only a few rangers live and work in such areas. R004 reported that living in the outposts was 'more tiresome due to only few [rangers]'.

Some respondents also described the compounding pressure they felt at the outposts because of the requirements of the job and the limited support available. R021 expressed how 'even you get pressurized, eh? And think that if they (management) come and find illegal activity near my area, then they might think that I am not doing [. . .] work'.

Notably, although information obtained from community informers was believed to be useful in guiding operations as well as establishing covert presence within the communities, respondents also communicated their concerns about using informers. They justified their apprehension by referring to situations in which informers would gain the trust of rangers and then deliberately mislead them:

TABLE 1 Occupational/task-related stressors identified by Uganda Wildlife Authority personnel (n = 24) working in Queen Elizabeth National Park (Fig. 1), in interviews conducted during September–October 2012.

Occupational/task-related stressor	Quotes from interviews
Law enforcement operations comprising laborious foot patrols in difficult conditions & dangerous settings. Respondents also expressed their concern over other duties, including night guarding.	'Difficult to penetrate' [R001] 'If you don't know the terrain & you running after somebody, you could get broken (injured)' [R003] 'Killed by terrain' [R004] 'You can be patrolling then it rains heavily. You aren't able to continue. That means that it (rain) has killed your patrol' [R011] 'The work we do is tiresome' [R021] 'Sleeping in the bush can be quite difficult for me' [R015] 'Night guarding, I don't like that one' [R011]
Encountering poachers, wildlife or rebels during bush operations could result in physical harm.	'Those people who are poaching are armed. As you are looking for them, they are also looking for you' [R006] 'You can be shot by those poachers or they can spear you'[R011] 'Exchange of fire is risky for me' [R010] 'You go on patrol [in] four & in case you get rebels, they don't move in a group of four. They in hundreds.' [R022] 'The buffaloes are killing our fellow staffs' [R001] 'Hostile animals' [R021] 'Sometimes if you are not lucky, it can injure you' [R003]
Limited manpower led to rangers being overworked, especially at the outposts.	'You work tirelessly because of many commands' [R018] 'You work 24 hours, so it is a real stress' [R019] 'Don't have time for sleeping' [R014] 'You find you don't have peace. There's not resting in law enforcement' [R023] 'Lack of manpower! You find at the outpost, you are only two people.' [R002]
Difficulties working with informers resulted in distrust of key contacts within the communities & increased suspicion of working with community members.	'They are double dealers' [R011] 'Not really trustworthy' [R001] 'Should not trust the informer a hundred percent' [R016] 'After directing you somewhere, he moves & makes another direction' [R012]

> You find an informer, he has given you the information for the first time [and] you succeeded. Now because he has entered into deep [trust with you], he's knowing all of your corners (operations). Again, he changes [sides]. He starts giving out information [to the poachers]. (R001)

External stressors

Respondents also discussed a number of external pressures, including the difficult relationship with local communities (Table 2). Although some respondents viewed the relationship with communities positively, others considered community–ranger relations to be tense and taxing. According to R003, 'law enforcement are hated' by the nearby communities. Furthermore, many of the rangers discussed their apprehension of being attacked, poisoned, bewitched or falsely accused by community members.

Respondents surmised that the rift between the rangers and the communities stemmed from their occupational responsibilities (e.g. arresting intruders to the Park) and their inability to respond adequately to problem species. R008 reported that community members 'feel we have failed to control animals [that] go and destroy their crops'. R017 explained how when animals 'invade the communities' tension between rangers and local people increases because communities 'associate the animals with Uganda Wildlife Authority'.

Rangers also voiced their frustration over the ambiguity of the Uganda Wildlife Act and the leniency of the criminal justice system. Specifically, respondents explained how the Wildlife Act failed to differentiate between various types of offences, and inadequately recognized the variability in severity of offenders and crimes. Respondents were particularly disappointed with the lax treatment of poachers (e.g. small fines) as some assumed that offenders would not be deterred and would reoffend (e.g. poach) to recoup lost earnings. Others maintained that such weak laws and leniency actually incentivized offenders.

Political interference was another external stressor identified by respondents. Local politicians were reported to side with local people during conflicts or disagreements between communities and the Wildlife Authority, often misleading community members by providing false information or promising unrealistic solutions in exchange for political support. This in turn undermines the authority, legitimacy and effectiveness of the rangers and the Wildlife Authority.

TABLE 2 External stressors related to their occupation identified by Uganda Wildlife Authority personnel (n = 24) working in Queen Elizabeth National Park (Fig. 1), in interviews conducted during September–October 2012.

External stressor	Quotes from interviews
Relations with the local communities were believed to be contentious & led to rangers becoming suspicious of community members.	'They can hate you because you are arresting them & you are stopping them from doing what they want. Even living with them is not good' [R021] 'You find there is a big gap' [R020] 'The relationship is not one hundred percent okay. It is forced I would say' [R008] 'They think that [the wildlife] are our animals [. . .] They say, "Animals belong to the rangers. The park belongs to the rangers."' [R022]
Disappointment over the lax criminal justice system resulted in cynicism & low morale among rangers as perpetrators received little punishment.	'Laws against illegal activities are a bit soft' [R006] 'When you get a suspect, you're disappointed by these light punishments' [R019] 'So take into court, you find the courts, they are releasing them' [R014] 'Somebody will come & pay & will go away. You are demoralized & he's going back to work (poach) for more money. To compensate for the money he used in where? In the court' [R001]
Interference from local politicians who are looking for political support contributed to the divide between community members & rangers.	'With the local leaders & politicians, they come down & deceive the people' [R012] 'You know politicians, they want to be voted' [R013]

Internal stressors

Participants identified several internal stressors and referred unequivocally to the lack of suitable equipment and resources (e.g. boots, rain jackets, mosquito nets, tents) to conduct field operations effectively (Table 3). R005 referred to a patrol that I had participated in: 'You saw that time [on patrol], the thorns passed through the boots because the boots are old.' The rangers that I patrolled with were especially vocal in their criticism of the equipment ('You send me to a garden without a hoe, I will produce less.' Patrol 3: field note). Beyond the impact on operations, respondents also explained how inadequate equipment could potentially lead to physical injuries and sickness.

Respondents perceived the overall communication capabilities (e.g. limited cell phone reception and radio equipment) within the Park to be meagre and, given the risks associated with patrols and the limited communication, described how the lack of first aid kits available for patrol operations was problematic. This was exacerbated by the limited transportation available for medical emergencies, as well as for general field operations. Furthermore, the food ration provided for extended patrols, typically comprising maize flour and beans, was considered insufficient and inappropriate for patrols as it required access to water and fire, took a long time to prepare, and could draw unwanted attention (i.e. poachers would be able to see smoke as rangers cooked).

The relationship amongst the rangers was also described to be contentious at times, particularly when individuals were promoted, resulting in jealousy and anger amongst colleagues. Junior rangers felt that supervisors often spurned their ideas or requests and would become overly suspicious of rangers not performing their duties, or becoming involved in illegal activities. This division was perceived to be less significant by supervisors, although they did acknowledge its existence and attributed it to the characteristics and requirements of the various ranks:

> I'm saying whatever I do, I cannot be in good terms with all the rangers. Because I keep stepping on their heads (putting pressure on them). Because I want them to implement my activities. . .Because they're the one on the ground. So, I have to be on their neck to ensure that they are not here [doing nothing]. They're in the field [working]. (R019)

Participants also expressed their concerns regarding job security, given the contractual nature of the job. Rangers work on 4-year contracts, which can be extended based on performance and evaluation. There was discontent with how promotions were given, and respondents believed that some rangers advanced as a result of favouritism, tribalism and nepotism within the organization.

Ranger misconduct was identified as a source of stress, and participants were concerned that rangers were becoming involved in inappropriate and illegal activities (Moreto et al., 2015). Supervisors were especially vocal about this type of stressor; for example, R008 described how the indiscretions of subordinates would affect his reputation as a supervisor:

> If a ranger is involved in the poaching, you start worrying, how long has he been doing that? It affects your name as a person. Then, I really feel like I've not done a good job. Yeah, it boomerangs into you also.

TABLE 3 Internal stressors related to their occupation identified by Uganda Wildlife Authority personnel (n = 24) working in Queen Elizabeth National Park (Fig. 1), in interviews conducted during September–October 2012.

Internal stressor	Quotes from interviews
Inadequate equipment, resources & facilitation demoralized rangers as it restricted their ability to effectively & safely perform their duties.	'We are exposed to many hazard. Sometimes you find that somebody has nothing like protective gear' [R022] 'Not just a matter of holding a gun, I need also ration' [R010] 'We don't have these first aid kits' [R003] 'Communication is poor generally' [R013]
Lack of transportation negatively affected law enforcement operations by delaying extraction from field operations & responding to emergency situations.	'To perform my job, I need transport' [R019] 'Don't have transport when sick' [R003] 'At times they don't pick [us up] at the time of your withdrawal from the work' [R010]
Contentious relationships amongst rangers resulted in some rangers feeling alienated, especially those of junior ranks & those who are promoted. Supervisors also expressed their consternation with junior rangers not performing their duties.	'You find that a junior could bring a good decision but your decision will not be heard' [R011] 'You also stress. If I make a mistake, he's (supervisor) going to chase me (dismissal)' [R007] 'There is hatred among us. Hatred. People don't like each other' [R017]
Uncertain job security & unfair promotions led to ranger dissatisfaction as a result of the contractual nature of the job, & personal biases resulting in favouritism, tribalism & nepotism during promotion.	'Contracts are a problem' [R004] 'Others are promoted because they are known by the big people (management), so that is also a big problem' [R003] 'If he (supervisor) doesn't love you, your blood is not marching with him, you remain there (present rank)' [R007]
Ranger wrongdoing negatively affected both personal & group dynamics, particularly from the perceptions of supervisors.	'The most challenging part is seeing your ranger involved in the activity he was supposed to have protected against' [R008]
Low salary & allowance exacerbated other stressors, including difficult working conditions & inadequate equipment & resources.	'We are supposed to get the high money. We are the people in the organization who are facing a lot of risks' [R005] 'Should be paid more' [R012] 'Allowances should be increased' [R004]

Despite their salary having been doubled 2 months prior to data collection, some participants expressed disappointment with the salary and the allowances provided, and referenced other stressors (e.g. working conditions) to support their convictions:

> Depending on my job description and conditions of work, I need higher payments. 'Cause my job, it is a risky job where I interact with other gun people who are poaching. I sleep outside. I don't stay with my family. So at least I should be compensated with higher payments. (R010)

Occupation-related personal stressors

Rangers are required to live on site, resulting in specific occupation-related personal stressors (Table 4). Although they recognized the operational value of living on site (i.e. being able to respond quickly to exigencies), some felt physically secluded and socially isolated. Rangers described how the living conditions (e.g. poor housing facilities) and access to utilities and amenities (e.g. water), especially when stationed away from headquarters, was a source of strain. I visited several outposts and witnessed the variability in the living conditions. Some outposts had fully developed units, similar to the housing at the headquarters, whereas others had mud or uniport (metal roof and sidings) huts.

Although rangers are allowed to live with their families, most choose not to because of their responsibilities, limited accommodation and lack of amenities. Most appeared to be content with this situation but some considered it to be difficult. R010 told how being separated from his family was 'haunting' him and that it would be 'much better for me if I am staying nearby my family.' Those rangers who lived with their families described how limited access to social amenities (e.g. schools) was problematic. Notably, as community–ranger relations can sometimes be strained, rangers living with their families expressed concern about reprisals against them.

Respondents also expressed concern about living within communities when there was no Wildlife Authority outpost nearby. They believed that local people, including poachers, would monitor their activities and operations. R002 observed that 'when you're in the community, they monitor our movements'. As rangers located at outposts do not have access to an armory to store their weapons, they must keep their guns in their homes, which are often locked through rudimentary means, resulting in a stressful situation for rangers. An incident in another park, where an outpost was raided for weapons and a ranger was killed, substantiates the rangers' concerns (Elunya, 2008). Protected areas may be used as rebel zones, and therefore respondents were apprehensive about living in

TABLE 4 Occupation-related personal stressors related to their occupation identified by Uganda Wildlife Authority personnel (n = 24) working in Queen Elizabeth National Park (Fig. 1), in interviews conducted during September–October 2012.

Occupation-related personal stressor	Quotes from interviews
Living conditions, particularly at some of the outposts, led to physical & social isolation. Moreover, some of the housing was considered to be decrepit & rangers would often be monitored by community members. Rangers & their families were at risk of being harmed by wildlife, community members, & rebels while stationed in the park.	'Life is not easy. We are deep in the forest' [R022] 'Isolated from people & things' [R018] 'You are not with your people at home' [R015] 'The disadvantage most of our outposts are, I would say some of them are dilapidated. Their conditions are not good at all. They're not fit, I would say, for human habitation' [R008] 'Accommodation is not good' [R020] 'You just tell them (management) that the house is leaking. They don't mind you' [R001] 'Then, too, sometimes they (local people) monitor our movement' [R013] 'The poachers instead monitor the rangers, instead of the rangers monitoring them' [R008] 'You're with the gun everywhere, you need to look after it, so that they (local people) don't steal it. That is the hardest thing we have been in rangership' [R005] 'To live within the park it is quite difficult, because you are always within the park with the animal' [R015] 'May not retaliate on you, but on your family' [R017] 'All the time be on standby, rebels tend to come in the forest' [R022] 'I'm suspicious of political instabilities' [R023] 'Rebels always hiding in the forest' [R011]
Limited access to utilities, amenities & agriculture made it difficult for rangers to live on site, especially with their families.	'Some outposts where you find water is not there' [R012] 'There's no water' [R014] 'We are in the bush where it is very hard to access water. Water becomes a problem' [R001] 'If we stay with families, you find most children of rangers are not educated' [R003] 'We don't have schools here. You know these rangers have families. Their children need to study, so they need schools around' [R008] 'At the outposts, they have no first aid kits' [R015] 'The first aid should be with us' [R012] 'Here in the parks, we don't cultivate & the cost of living seems to be a little bit higher because we have to keep buying food items; there's no gardens here' [R008]

remote outposts with limited manpower. Finally, respondents expressed their concern at being unable to cultivate their own food while living in the Park, which results in increased day-to-day living costs. Much of the population in Uganda lives in rural areas and traditionally relies on agriculture for employment and sustenance (Emerton & Muramira, 1999), and rangers are at a disadvantage by being situated in areas where they cannot grow crops or rear livestock.

Discussion

The study was intended to contribute to the literature on occupational stress in policing, specifically within the scope of wildlife law enforcement. Participants provided insight on the various difficulties, challenges, and problems they experienced as rangers, and identified similar stressors to those identified in previous studies, including community relations, inadequate equipment and low salary. Stressors were not mutually exclusive, and there was interaction between various pressures. The unique working and living situation of law enforcement rangers resulted in an environment where occupational and personal stressors were interrelated and subject to feedback loops (Cooper & Davidson, 1987), potentially magnifying particular strains and the stress felt by rangers.

The study is not without flaws. Prior research on occupational stress has highlighted the difficulty in examining a subjective concept objectively. I am cognizant that my ability to analyse, comprehend and disseminate the findings are bound by my own perceptions. However, by living with and amongst the ranger population I was able to conduct informal inquiries and confirm findings from formal data collection (e.g. interviews). By using a variety of methods, data

could be triangulated to produce a comprehensive explanation of ranger stress through corroboration (Yin, 2009).

Although the findings cannot be generalized to other protected areas within or outside Uganda and do not yield statistical generalization, they may be 'generalizable to theoretical propositions' (Yin, 2009: 15). The study thus contributes to establishing a basis for future research, while also corroborating, extending or refuting previous research (Ogunjinmi et al., 2008; Meduna et al., 2009). Although the sample size for the interviews was modest, it was appropriate as it accounted for 30.4% of the total population. Additionally, like most qualitative studies, theoretical saturation was believed to have been reached; thus, it was believed that additional interviews or observations would have resulted in diminishing returns (Ritchie et al., 2003). Moreover, by engaging in more formal interviews I would have had to sacrifice time engaged in participant observation and informal discussions with the study population.

Future research could explore further the differences and similarities between junior rangers and supervisors, and examine how rangers in other departments (e.g. community conservation) perceive job stress, and compare the perspectives of male and female rangers. It would also be useful to study how rangers respond to or cope with the physical, emotional and psychological strains of the job, including both positive reactions (e.g. police resiliency; Paton et al., 2008) and negative behaviour (e.g. perceptions of low salary leading to wrongdoing; Moreto et al., 2015).

The findings could facilitate dialogue on pragmatic approaches to alleviate or prevent ranger stress. Currently, there are limited opportunities to reduce ranger stress within the Uganda Wildlife Authority, as a result of limited resources and lack of knowledge of the subject. However, one of the main priorities outlined by IUCN is developing capacity in protected areas, and therefore further investigation of occupational stress of field personnel is necessary. Unfortunately, competing objectives, limited resources and increasing discussion of the so-called 'green militarization' of conservation (Lunstrum, 2014) may shift dialogue further away from important human elements within conservation science.

Based on the findings presented here, conservation policy should factor in the opinions, perceptions and experiences of law enforcement rangers. As has been found within the policing literature, occupational stress can have a profound impact on officers. As conversation regarding the effectiveness, objectives and challenges of protected areas continues (Dudley et al., 2014), policy makers and park managers must make a concerted effort to understand how stress may affect personnel, organizations and the application of policy.

Drawing from the literature on police stress, two main approaches may be useful for stress management in park rangers. Firstly, confidential counselling by mental health professionals has shown to be useful within policing, including in rural areas (Brown & Campbell, 1994). Such services would help in the development of intervention programmes for effective coping strategies. Moreover, having access to counselling services would be beneficial after critical incidents (e.g. a violent encounter).

The second approach is peer support counselling. Given the costs of professional therapists, the implementation of an in-house peer support network would be a cost-effective alternative (Page & Jacobs, 2011). Moreover, research indicates that officers may prefer or be more willing to speak with a fellow officer rather than a counsellor (Levenson & Dwyer, 2003; Page & Jacobs, 2011). This may be particularly true for rangers given the interrelated nature of their occupational and personal lives, and they may be more willing to seek help from individuals that have an in-depth understanding of 'the hardness of rangership' [R005]. Furthermore, given the social and physical isolation felt by rangers, turning to other rangers for support may be a more realistic option than seeking support outside the organization.

There have been few attempts to conduct qualitative research into wildlife law enforcement (Warchol & Kapla, 2012); this study provides a nuanced approach to examining wildlife law enforcement in Uganda. Such research is crucial in comprehending and appreciating realities that otherwise could be overlooked. It provides a timely contribution to the literature on the human dimension of conservation science, and highlights the importance of understanding the perceptions of ranger personnel for protected area management.

Acknowledgements

I am indebted to the study participants for their involvement, insight and candour. I thank the Uganda Wildlife Authority and Uganda National Council for Science and Technology for reviewing and approving the study; Ronald V. Clarke, Andrew Lemieux, Rod K. Brunson, Anthony A. Braga and Phyllis Schultze for their guidance and assistance; and the three anonymous reviewers and the Editor for their helpful comments and suggestions.

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Biographical sketch

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