



WHAT DO RANGERS FEEL? PERCEPTIONS FROM ASIA, AFRICA AND LATIN AMERICA

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ABSTRACT

Rangers play an important role in the management and protection of biodiversity upon which human well-being depends for ecosystem services. While performing their duties in harsh field conditions, often with insufficient and inadequate equipment, rangers in many countries are under constant threat from encounters with wildlife and poachers. To better understand the rangers' perceptions of their working conditions, 1,742 rangers from 293 conservation sites representing 40 countries across the regions of Asia, Africa and Latin America were surveyed. Although results differed between regions, overall results showed that four out of five rangers have faced a life-threatening situation, more than a quarter saw their family for less than 5 days in a month and a large proportion do not feel adequately equipped or trained to fulfil their job requirements. Being close to nature was indicated as the key motivation for rangers, while low and/or irregular salary and dangerous working conditions were identified as the worst aspects of being a ranger. This survey is the first large-scale snapshot of ranger perceptions and will be followed by further detailed surveys and analysis.

Key words: Rangers, working conditions, job motivation, wildlife conservation, job satisfaction, poaching

INTRODUCTION

The world is facing a biodiversity crisis. The actions of humans have resulted in an overall decline of 60 per cent in wildlife population sizes since the 1970s (WWF, 2018). Current rates of species extinction are now 100 times higher than the standard rate of extinction in Earth's history (Lamkin & Miller, 2016). Biodiversity loss does not just impact Earth's wild ecosystems, but directly impacts human well-being which is dependent on the environment for goods and services (Diaz et al., 2006; Hooper et al., 2012).

Rangers are on the frontline of people working to manage and protect the world's biodiversity. The International Ranger Federation (IRF) defines a ranger as a "person involved in the practical protection and preservation of all aspects of wild areas, historical and

cultural sites" (IRF, 2019a). Protected areas are constantly under threat from unsustainable resource use and hunting, recreation disturbance and fires, among others (Schulze et al., 2017). In addition to being responsible for the law enforcement of the areas in which they work, modern rangers are involved in a myriad of tasks that include monitoring and surveying wildlife, managing interactions with local communities and visitors and fire suppression. Rangers therefore play an instrumental and indispensable role in conserving biodiversity.

Despite the critical role that rangers play, their importance has long been overlooked as they often operate in rural areas with limited contact with society (Digun-Aweto et al., 2019). As a result of the lack of recognition for their work, low prioritisation of the issue

of illegal wildlife trade and limited governmental budgets, the level of support provided to rangers from governments and non-governmental organisations has been low. In 2017, the US government alone spent \$30 billion on drug control efforts, whereas to tackle the issue of illegal wildlife trade, only \$260 million was spent in 67 African and Asian countries (World Bank, 2019).

In addition to the inherently stressful nature of policing work (Moreto et al., 2016), most rangers carry out their roles in harsh field conditions while being inadequately trained and equipped, poorly paid and, under threat from wildlife encounters, poachers and communities (Leaky & Morrell, 2001; Ogunjinmi et al., 2008; Eliason, 2011a; Warchol & Kapla, 2012). The poor and hazardous working conditions of rangers, while well known to anyone working in the field, have only recently been brought to public attention. This is in part due to growing awareness of the high fatality rates of this occupation as a result of the data and publicity provided by the International Ranger Federation. Between 2009 and 2019, 1,020 rangers have lost their lives in the line of duty and this figure is likely to be an underestimate (IRF, 2018; IRF, 2019b).

Several studies in Africa and the USA have found that dangerous and difficult working conditions affect rangers' motivation, morale and satisfaction with their job (Leaky & Morrell, 2001; Ogunjinmi et al., 2008; Meduna et al., 2009; Eliason, 2011b). For wildlife management to be effective, rangers have to perform well in their job (Jachmann, 2008). Seeing that job satisfaction and motivation have been found to be positively correlated with job performance (Judge et al., 2001), it is imperative that we better understand what motivates rangers to choose and remain in their occupation and what affects their job satisfaction to improve wildlife management.

While there has been a growing body of research on rangers in recent years, a disproportionate number of studies have been carried out on rangers from the USA and or Africa (Eliason, 2006, 2011a, 2011b, 2017; Ogunjinmi et al., 2008; Digun-Aweto et al., 2019; Spira et al., 2019). To the best of our knowledge, other than Moreto et al. (2017) which looked at a subset of the Asia dataset from this study, there has been no prior study of ranger perceptions in Asia and/or Latin America. Considering that the two regions contain over 7.5 million square kilometres of protected land area and 1.8 million square kilometres of protected marine area (UNEP-WCMC, 2020a; 2020b), we believe such a study is long overdue.

The intent of this paper is to provide a snapshot of rangers' personal views of their working conditions, and to gain a deeper insight into the factors that affect the motivation of rangers. As part of an initial pilot study of rangers, the data was previously published in a series of reports (WWF & RFA, 2016; WWF & TRAFFIC, 2016; WWF & GWC, 2019 – Supplementary Online Materials 1, 2 and 3) that were largely descriptive in nature with little discussion of results which this paper will delve into more deeply. It is hoped that this large data set, along with more detailed follow-up ranger surveys (Belecky et al., 2019), will serve to influence and improve government policy towards rangers, their working conditions and ultimately, wildlife law enforcement and protected area management.

METHODS

The sampling method consisted of a survey with close-ended questions (Supplementary Online Material 4) to gain insight into ranger working conditions and factors influencing ranger motivation. Questions were drafted by the World Wide Fund for Nature (WWF) in consultation with subject experts that included ranger associations, conservationists who work with rangers, and rangers themselves. The survey questions covered a range of topics related to working conditions, such as threats faced, how often respondents saw their family,



Ranger of Manuripi-Heath Amazonian Wildlife National Reserve, Bolivia © Adriano Gambarini / WWF Living Amazon Initiative

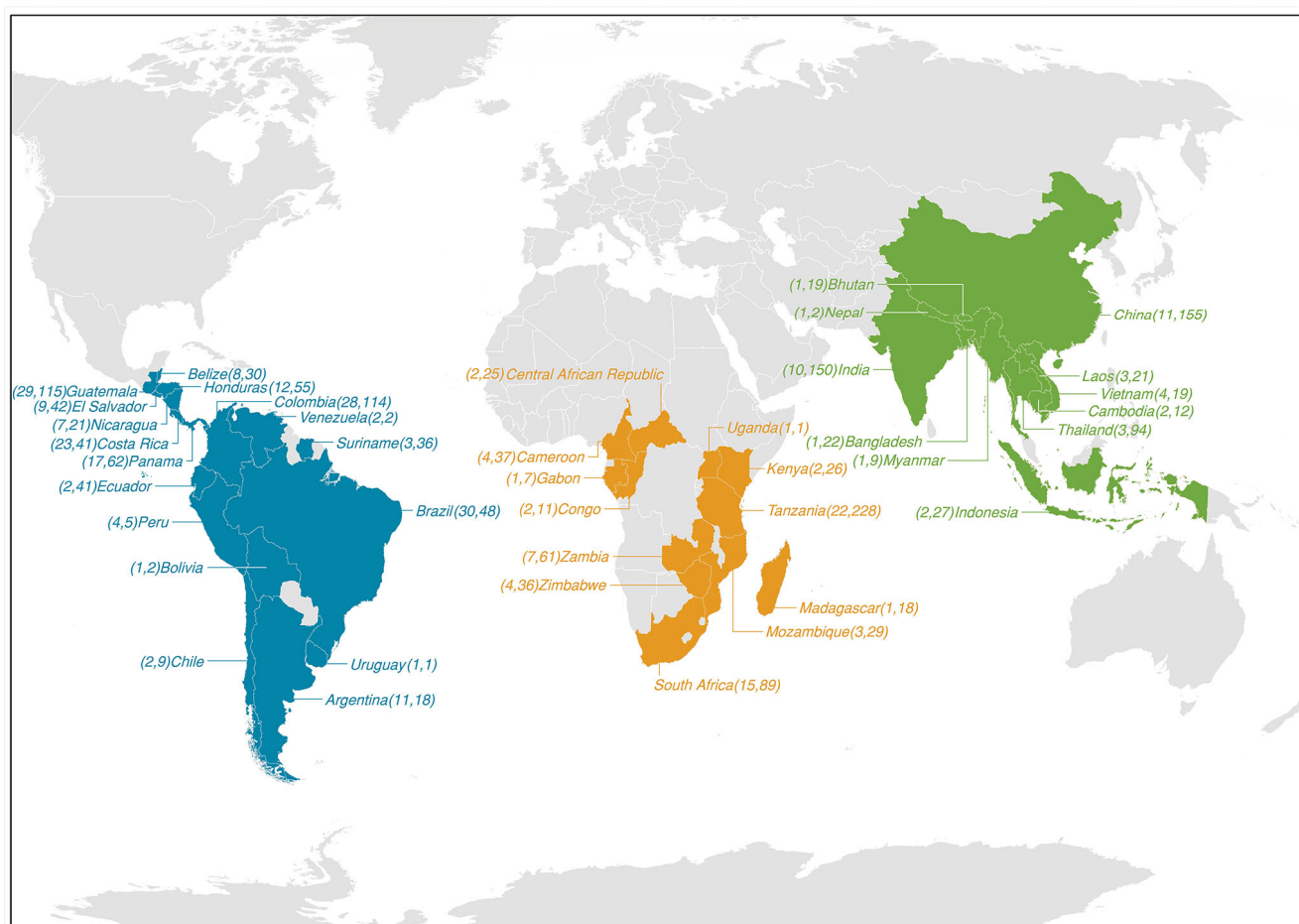


Figure 1 The countries where surveys were conducted with the number of sites and respondents for each country in parentheses, respectively¹

and if they felt adequately trained and equipped for their job. To better understand ranger motivations, the survey also asked respondents to rank aspects they disliked about their job, what motivated them to stay on and, why they would or would not want their children to work in the same field.

Data were collected between 2015 and 2018 through surveys conducted in 293 conservation sites representing 40 countries across Asia, Africa and Latin America (Figure 1). In total, 1,742 ranger responses were received.

Site selection was based on accessibility and contacts in the field. For countries and sites where the WWF survey team did not have direct access to frontline staff, they partnered with other conservation organisations and ranger associations to increase the number and coverage of responses. This study did not include armed forces posted on deputation in national parks and wildlife sanctuaries and focused only on rangers hired either on permanent or short-term contracts by relevant

forest and environment ministries. We therefore recognise that many other types of ranger are not represented in this study and recommend further studies focus on privately hired rangers, community game scouts, and indigenous rangers working in their ancestral domain.

The vast majority of surveys were conducted through personal interviews carried out by focal points in WWF offices, ranger association and other conservation organisations within each country in the local language. Each surveyor was briefed on the survey guidelines prior to conducting interviews to ensure that data were collected in a uniform and error-free manner. Instructions on how to complete and submit the survey were also included in the questionnaire. For countries in Asia, additional responses (about 10 per cent) were obtained from paper surveys submitted by mail and e-mail. Prior to completing the survey, all respondents were briefed on the survey's purpose, data use and confidentiality and their voluntary agreement to participate was obtained.

RESULTS AND DISCUSSION

A total of 1,742 rangers were surveyed from 39 sites in 11 countries in Asia (n=530), 65 sites in 12 countries in Africa (n=570) and 189 sites in 17 countries in Latin America (n=642). Characteristics of the respondents are given in Table 1.

The majority of respondents were male (88.4 per cent). The most common age bracket surveyed overall was 31-40 years of age (32.3 per cent). For Asian rangers surveyed, however, a large proportion were middle aged at 41-50 years old (31.6 per cent). Conversely, the largest category of the African rangers surveyed were younger at 21-30 years old (46 per cent). Overall, very few of the respondents had served more than 20 years (12.2 per cent), with almost one-third having just 2-5 years of ranger working experience (29.5 per cent). Almost one-third of African respondents, however, had served 6-10 years (29.1 per cent). Rangers employed on permanent contracts are salaried and are usually provided government benefits as compared to Rangers on short-term contracts rangers who may be paid hourly or daily and are not usually eligible for government benefits. Overall, almost three-quarters of respondents were hired on a permanent contract (74.7

per cent). This figure was much higher for respondents in Africa (93.6 per cent) and lower in Asia (63.6 per cent).

Threat

Have you faced a life-threatening situation?

When provided with four life-threatening scenarios, an overwhelming 79.9 per cent of respondents indicated they had faced at least one in the course of their work (Table 2). Of those who responded affirmatively, “dangerous encounter with wildlife” was the most common situation experienced (64 per cent), followed by “threatened by poachers” (56.1 per cent), “threatened by communities” (51.8 per cent) and lastly, “attacked by poachers” (40.3 per cent). This order of scenarios was the same for rangers surveyed in each of the three regions.

The job of a ranger, like all law enforcement jobs, is an inherently dangerous one. That almost 80 per cent of all rangers surveyed have faced at least one life-threatening situation is testament to that fact. Due to the nature of ranger work, it is inevitable that rangers might come across dangerous wildlife encounters. In 2019 alone, 23

Table 1. Characteristics of ranger respondents

Characteristics		Overall (%)	Asia (%)	Africa (%)	Latin America (%)
Gender	Male	88.4	97.4	81.2	87.0
	Female	11.1	2.6	18.8	13.0
Age	<20 years	0.2	0.2	0	0.5
	21-30 years	26.8	21.8	36.0	21.9
	31-40 years	32.3	27.7	33.8	33.1
	41-50 years	24.9	31.6	17.6	23.5
	51-60 years	13.9	11.6	10.9	17.7
	>61 years	1.8	0.2	1.7	3.3
Years served	0-1 years	12.2	14.2	10.7	11.9
	2-5 years	29.5	37.9	19.5	31.0
	6-10 years	22.0	13.4	29.1	23.2
	11-20 years	24.0	23.8	23.9	24.3
	21-30 years	9.9	9.1	13.8	7.2
	31-40 years	2.2	1.5	2.8	2.3
	>41 years	0.1	0.2	0.2	0
Employment type	Permanent	74.7	63.6	93.6	74.5
	Short-term	25.3	36.4	6.4	25.5

Table 2 Exposure to life-threatening situations

Note: Percentages do not sum to 100 per cent as choices are not mutually exclusive

Region	Faced at least one life threatening situation	Attacked by poachers	Threatened by poachers	Threatened by communities	Dangerous encounter with wildlife
Overall	79.9%	40.3%	56.1%	51.8%	64.0%
Asia	63.4%	26.8%	52.4%	38.4%	62.2%
Africa	88.6%	66.7%	72.6%	70.5%	82.7%
Latin America	86.3%	25.2%	43.8%	43.6%	48.4%

of the 149 reported rangers who died in the line of duty were killed by wildlife (IRF, 2019b).

According to Schulze et al. (2017), hunting and resource use was found to be the most common threat in protected areas in the “Afrotropical, Indo-Malaya, and Neotropical realms” which correspond to our Africa, Asia and Latin America regions. Many local communities that live in or around protected areas usually depend on resources within for their livelihood or subsistence. This and the growing demand for wildlife products for the illegal wildlife trade is likely why more than half of respondents have been threatened by communities and/or poachers.

African respondents had the highest proportion of rangers who have faced at least one life threatening situation (88.6 per cent) and Asian rangers the lowest (63.4 per cent). Poaching, largely driven by the multibillion-dollar transnational illegal business that is illegal wildlife trade, unsurprisingly results in rangers coming into contact with poachers in remote locations armed with guns, knives and other weapons. This is especially so in Africa where demand for elephant ivory and rhino horn has led to the involvement of organised crime syndicates and armed militia that use highly advanced technology and heavy firearms (Austin, 2019), resulting in the high proportion of African respondents who have been “attacked by poachers” (66.7 per cent). Comparatively in Asia, snaring is the main form of hunting (Gray et al., 2018). Poaching and illegal wildlife trade in Latin America, while growing in recent years, is largely opportunistic and unlike in Africa and Asia, disorganised (Reuter & O’Reagan, 2017). Additionally, other than jaguars, Latin America does not hold megafauna with any great global demand. These reasons, coupled with the fact that the scenarios provided referred to poachers specifically and not illegal loggers who are more active in Asia and Latin America, could explain the comparatively lower proportions of Asian and Latin American respondents who have been “attacked by poachers” (26.8 per cent and 25.2 per cent respectively). Further studies looking at the relationship

between threat types, types of protected area and ranger perceptions are required to gain a deeper understanding of the situation in Asia and Latin America.

Family

How many days a month do you get to see your family?

Overall, more than a quarter of rangers surveyed saw their family for less than five days in a month (26.5 per cent) and only one-fifth saw their family for more than 15 days (20.6 per cent) (Table 3). The remoteness and isolation of the locations that rangers work in often means postings to stations far away where they are unable to return home daily. Too few rangers may also result in longer average postings that see them away from their family for extended periods of time. Facilities in and around protected areas might be inadequate, resulting in rangers choosing to have their families in towns away from protected areas to give their children a better education and standard of living.

In a study on ranger motivation and job satisfaction, Spira et al. (2019) found that being able to live with their family was an aspect of the job that rangers liked and a positive factor in the rangers’ level of satisfaction. In fact, many rangers considered it punishment when they were transferred to stations far from their home as it meant they would be away from their families for a prolonged period of time (Spira et al., 2019). Considering the fact that more than three-quarters of Asian and African rangers surveyed saw their families

Table 3 Amount of time rangers are able to spend with their families

Region	<5 days	5-10 days	10-15 days	15-20 days
Overall	26.5 %	37.5%	15.3%	20.6%
Asia	45.3 %	30.8%	10.6%	13.4%
Africa	30.2 %	46.9%	15.5%	7.5%
Latin America	7.7%	35.0%	19.2%	38.0%

for less than 10 days in a month (76.1 per cent and 77.1 per cent respectively), this could be having a significant impact on the morale and motivation of these rangers.

In contrast, in Latin America, more than a third of rangers surveyed saw their family at least 15 days in a month (38 per cent) and only a small minority of 7.7 per cent saw their family for five days and less. In general, many rangers in Latin American countries have easier access to their homes as their families either live close to or within protected areas as they are from communities around the area (Elbers, 2011; Jiménez, 2018). The contracts of most rangers in Latin American countries also include a rotating work shifts that results in shorter postings, allowing them to spend more time with their families (F. Avino, personal communication, 9 March 2020).

Enabling conditions

Do you feel you are provided with proper equipment and amenities to ensure safety?

Rangers were asked if they felt they were provided with sufficient basic equipment that includes boots, tents, a compass, GPS and other field gear as well as access to

basic amenities such as clean drinking water, toilets, and bedding facilities. A majority (68.1 per cent) of respondents did not feel they were provided with proper equipment and amenities to ensure safety and fulfil their job requirements. The fact that a large proportion of rangers did not feel adequately equipped and provided with basic amenities while out in the field is not a new finding. Many past studies have found similar results (Gibson, 1999; Leaky & Morrell, 2001; Digun-Aweto et al., 2019). Given the importance of the work that rangers do and the severity of threats faced as a result of that work, rangers should at the very least be provided with basic equipment and amenities required in the field like clean water and mosquito repellent. This would help prevent unnecessary deaths caused not only from injuries, but also diseases such as malaria and other illnesses. In 2019, 27 rangers were reported to have succumbed to diseases encountered at work (IRF, 2019b).

Do you feel you are adequately trained to do your job?

When asked about training, 65.3 per cent of respondents felt that they were adequately trained to do their job to address the threats to biodiversity at their



Ranger with his family in Eastern Cambodia © Ranjan Ramchandani / WWF



Conservancy rangers at the Ololaimutia Ranger post at the border of Mara Siana conservancy, Kenya © Ami Vitale / WWF-UK

site (Table 4). Rangers in general undergo basic job training on how to carry out their daily tasks such as patrolling. However, the responsibilities of modern rangers have expanded beyond basic park management and protection to include tasks like intelligence gathering and community engagement and relations. These tasks require specialised training that many rangers do not receive. In a survey of management in protected areas in tiger range countries, one of the weakest elements observed that many rangers felt insufficiently trained in, were social aspects such as dealing with human-wildlife conflict and community issues (Conservation Assured, 2018).

Out of the three regions, Asian rangers surveyed had the lowest percentage of rangers who felt adequately equipped and trained (25.6 per cent and 52.3 per cent respectively). This could possibly be due to the fact that Asian rangers also had the lowest percentage of rangers on permanent contracts (63.6 per cent). Permanent rangers may be given higher priority for new equipment and training programmes over those on short-term contracts. An overwhelming 83.5 per cent of Latin American rangers surveyed however felt adequately trained. This high percentage might be the result of the

strong and robust training provided to Latin American rangers by local governments and often through partnerships with non-governmental organisations (Paz-Barreto, 2010a). In addition to regional trainings for Latin American rangers, many individual countries have established training schools that offer academic ranger professionalisation courses (Carabias & Cadena, 2003; Paz-Barreto, 2010a, 2010b; Solveria, 2012; Columba, 2013). Interestingly though, in a paper by Coad et al. (2019) that looked at protected areas and their staff and budget adequacy, the region of IndoMalay actually had the highest proportion of protected areas with both

Table 4 Adequacy of equipment and training

Region	Proper equipment and amenities?		Adequately trained?	
	Yes	No	Yes	No
Overall	31.9%	68.1%	65.3%	34.7%
Asia	25.6%	74.4%	52.3%	47.7%
Africa	40.2%	59.8%	57.1%	42.9%
Latin America	29.7%	70.3%	83.5%	16.5%

adequate staff and budgets while the Neotropics had the lowest. These results are surprising as one would assume that sites with more funds would be able to better equip and train their staff and vice versa. While this could be due to differing sites and countries selected in both studies, it is clear more research is needed into the type, depth and frequency of trainings rangers receive in the different regions to better understand the situation and what capacity building improvements are needed.

Motivation

The survey also included three questions designed to better understand ranger motivations.

What is your motivation for continuing as a ranger?

The key reason selected by rangers surveyed from all three regions as the motivation for continuing as a ranger was “I enjoy being close to nature”. The other two highest ranked reasons from Asian respondents were “I enjoy being a ranger” and “I have no other job options”. For Africa, “I am a respected member of the community because of this work” and “I like to implement the law” were the two most highly ranked reasons after enjoyment of nature. Respondents from Latin America ranked “I enjoy being a ranger” and “I believe it is an exciting job” as the reasons for wanting to stay a ranger.

The results indicate that rangers from all three regions surveyed display a key motivation for pursuing and continuing a career in wildlife law enforcement. Namely, they enjoyed working and being in nature. Similar findings have been found in the US and Uganda (Moreto, 2016; Eliason, 2017). Two of the highest ranked motivations for African respondents had to do with respect and responsibility. In a study on ranger job satisfaction in Uganda, Moreto (2016) found that the responsibility that came from taking ownership of the Park, its wildlife and being provided a distinct role in Uganda’s Wildlife Authority through conducting frontline work (like identifying illegal activities and apprehending suspects) contributed positively to the job satisfaction of rangers. This was a site-specific study though and may not be applicable to the entire African region. Clearly, there are many factors influencing the motivations of rangers that will require further in-depth study.

What is the worst aspect of being a ranger?

Conversely, when respondents were asked to rank the worst aspects of being a ranger, “Low and/or irregular pay” and “Dangerous working conditions” were overwhelmingly two of the top choices for all three regions. The third other most frequent response in Asia was “frequent transfer”, whereas in Africa, other demotivating factors included “rarely see my family”

Table 5 Reasons why rangers would or would not like their children to follow the same career

Note: Percentages do not sum to 100 per cent as choices are not mutually exclusive

Reasons	Overall (%)	Asia (%)	Africa (%)	Latin America (%)
I would like my children to be rangers	56.7	52.1	42.2	70.9
To protect wildlife and biodiversity	76.1	59.9	79.6	84.2
I want my children to serve nature	75.2	62	90.2	75.7
I am proud to be a ranger	65.7	54.4	66.7	71.9
I want my children to serve their country	54.6	57.7	62.7	48.7
There is good job security	28.9	31.8	37.8	22.8
To have power and authority	22.1	21.5	32.4	17.3
It is easy to get a ranger job	11.5	8.4	20.4	9.0
I would not like my children to become rangers	43.3	47.9	57.8	26.1
It has a low salary	69.4	68.3	69.2	71.4
It is a dangerous job	55.6	52.0	64.6	44.6
There is no reward for hard work	50.0	40.9	57.8	49.4
They would have to stay apart from their family	49.0	44.8	58.4	38.1
There is no potential for promotion	40.9	43.7	39.9	38.7
There is no job security	33.7	32.9	37.7	27.4
The pay is irregular	27.2	25.8	34.1	16.7



Conservancy rangers on early morning patrol at Elangata Enderit village in lower Loita, Kenya © Ami Vitale / WWF-UK

and in Latin America, “little or no reward for hard work”.

Low and/or irregular pay is a common issue identified in multiple studies on rangers (Leaky & Morrell, 2001; Ogunjinmi et al., 2008; Digun-Aweto et al., 2019). Many other studies on law enforcement jobs have found similar associations between low pay and poor job motivation and satisfaction, especially when taking into account the dangerous working conditions (Toch, 2002; Claridge et al., 2005; Kakira, 2010). “Dangerous working conditions” was also ranked by respondents from all three regions as one of the worst aspects of being a ranger. This is not surprising given that close to 80 per cent of all rangers surveyed have experienced at least one life-threatening situation.

Asian and African respondents also highlighted the options “Frequent transfer” and “Rarely see my family”. This is not unexpected as a large proportion were found to only be able to see their families for less than five days in a month. Rangers surveyed in Latin America also disliked that there was “Little or no reward for hard work”. In addition to monetary rewards, successful convictions also impact the morale of rangers. Time and

effort spent catching poachers only to fail at the prosecutor level or lack of judicial support has been found to affect the job satisfaction of rangers (Spira et al., 2019) and is a key issue faced by many in wildlife law enforcement (Eliason, 2011b; Moreto, 2016). The overall effect of this, coupled with “low and/or irregular pay”, results in not just reduced job satisfaction and ineffective output but may present a corrupting element and risk in terms of complicity with poachers in situations where there is little to no motivation to make arrests.

Do you want your children to become rangers?

Overall, 56.7 per cent of respondents wanted their children to become rangers (Table 5). When asked why they wanted their children to become rangers, the top three overall reasons selected were “I want my children to serve nature”, “To protect wildlife and biodiversity” and, “I am proud to be a ranger”. As previously found, a key motivation of respondents for continuing on as a ranger was enjoyment of being close to nature. As the majority of respondents themselves have a love of nature and an intrinsic desire to protect and conserve

natural habitats, it is unsurprising that they would want their children to have similar attitudes and values.

When respondents were asked why they did not want their children to become rangers, the top three overall selected reasons were “It has a low salary”, “It is a dangerous job” and, “There is no reward for hard work”. The reasons respondents gave for why they did not want their children to become rangers echo the worst aspects they ranked about being a ranger (“Low and/or irregular salary”, “Dangerous working conditions”, “Frequent transfer”, “Rarely see my family”, “Little or no reward for hard work”). Therefore, despite most respondents enjoying and having a love of nature, many did not wish for their children to be in the same line of work for practical reasons involving working conditions and benefits. Indeed, the study by Moreto et al. (2017) looking at intergenerational linkages within the ranger profession and using a subset of the same Asia dataset as this paper, found it cannot be assumed that frontline staff will be “intrinsically driven or that such motivation will be unaffected by the challenges and realities of the occupation”. Instead, it is imperative that like any other profession, rangers are provided with adequate pay, equipment and promotional opportunities.

CONCLUDING REMARKS

This study is the first large-scale ranger perception study conducted in Africa, Asia and Latin America and contributes to the long needed growing discussion and literature on rangers on the frontline. However, it is not without its limitations. The uneven distribution of data collected from each country and site may have resulted in the overrepresentation of certain countries and sites. Therefore, the sample size should not be viewed as representative for any individual country, nor should they be extrapolated to all three regions as a whole. In addition, as a rapid assessment, the survey was relatively short and could not go more in-depth into the factors influencing rangers’ perceptions of certain topics. Additional surveys that go into greater detail have the potential to provide a more complete picture of the challenges and conditions that impact rangers and their effectiveness. Future studies should also take note of the choice of wording of questions as it may influence results much like our usage of the word “poachers”.

Despite the limitations, this study does present a snapshot of combined ranger perceptions of their working conditions and motivations for the three regions at the time of survey. The results of which clearly show that in general, rangers are motivated professionals with a true commitment to work and protect nature despite the harsh working conditions and

lack of public recognition. In order to fully support all the work they do, we suggest the following recommendations which are in line with the 2019 Chitwan Declaration (IRF, 2019c; Supplementary Online Material 5) that came out of the 9th World Ranger Congress:

1. With dangerous working conditions, low salary, and poor work-life balance frequently topping the list of the worst aspects of ranger work, one of the greatest challenges is to improve basic working conditions throughout this sector. There is a huge shortfall in the provision of the health supplies, vehicles, weapons, field equipment, shelter, fresh food, and potable water required to keep rangers safe and ensure their effectiveness. Countries must allocate greater budgets for such items in the vast majority of locations where rangers work. Additionally, there is always a need to increase ranger numbers. The effectiveness of a protected area has been found to correlate strongly with the density of rangers (Bruner et al., 2001), and having a low density of rangers can even affect the motivation of rangers working in a protected area (Spira et al., 2019).
2. There is not enough recognition by governments and the public of either the importance or the daily difficulties of ranger work. Considering this, rangers should be treated similarly to other valued public employees who risk their physical well-being to protect the interests of the state – such as police, border officials, firefighters, military, and emergency response specialists. Rangers should be professionalised to the same extent as others performing comparable functions and be paid commensurate salaries and paid on time.
3. Although many NGOs have been trying to fill the capacity gap, there still remains a shortfall of adequate training. The long-term sustainable way to achieve this is through the establishment of specialised colleges and institutions and strengthening of existing institutions, which can develop and deliver a tailor-made curriculum based on best available practices, as well as being able to adapt it to any emerging threats. While government agencies and conservation partners work on the long-term solution, more needs to be done on providing refresher training and specialised short-term courses to frontline staff in line with global standards (Appleton, 2016). Also, there is a need for more holistic training that not only covers technical skills but also concurrently

supports ranger wellness and resilience to help build capacity in 'soft skills' that help enable career advancement, improve self-management and the ability to deal with challenges faced.

The results from this study confirm much of what was previously only anecdotally known about the poor and dangerous working conditions of rangers, especially for the regions of Asia and Latin America where there is a dearth of ranger information. However, it also highlights the urgent need for further studies to improve current knowledge on rangers and the issues they face. Further studies on the threats rangers face and training received will not only allow for deeper understanding of the context behind the results of this study, they also provide the baseline information required for many of the recommendations mentioned. WWF and partners have been conducting a detailed phase II survey and have recently released the Life on the Frontline 2019 report (Belecky et al., 2019). The report covers the results of a global survey of the working conditions of 7,110 public-sector patrol rangers, surveyed at hundreds of sites across 28 countries. Further analysis of this report along with the results of this survey will continue to better inform and galvanise future action to improve the lives of rangers who work so tirelessly to preserve the world's biodiversity.

ENDNOTES

¹The authors of this paper do not endorse the borders of this map shown in this publication, nor any political position related to territorial claims.

SUPPLEMENTARY ONLINE MATERIAL

- 1 - Ranger Perceptions, Asia
- 2 - Ranger Perceptions, Africa
- 3 - Ranger Perceptions, Latin America
- 4 - Survey Questionnaire
- 5 - Chitwan Declaration, 9th World Ranger Congress

ACKNOWLEDGEMENTS

Many institutions and individuals contributed to these surveys. Authors would like to thank all WWF offices in Asia, Africa and Latin America. We would also like to thank the Southern African Wildlife College, Game Ranger Association of Africa, PAMS Foundation, International Ranger Federation, Ranger Federation of Asia and Global Wildlife Conservation. We are also highly indebted to all the frontline staff who participated in the survey. Finally, we thank the anonymous reviewers for their time, effort, and constructive comments

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REFERENCES

- Appleton, M. R. (2016). *A Global Register of Competences for Protected Area Practitioners*. Gland, Switzerland: IUCN.
- Austin, K. L. (2019). *Follow The Guns: An Overlooked Key to Combat Rhino Poaching and Wildlife Crime*. Conflict Awareness Project. Available at: <https://followtheguns.org/follow-the-guns-report.pdf>
- Belecky, M., Singh, R. and Moreto, W. (2019). *Life on the Frontline 2019: A Global Survey of the Working Conditions of Rangers*. WWF.
- Bruner, A. G., Gullison, R. E., Rice, R. E. and Da Fonseca, G. A. (2001). Effectiveness of parks in protecting tropical biodiversity. *Science*, 291(5501), 125-128.
- Carabias, J. and Cadena, R. (2003). *Capacidades necesarias para el manejo de áreas protegidas: América Latina y el Caribe*. Nature Conservancy.
- Claridge, G., Chea-Leth, V. and Van Chhoan, I. (2005). *The effectiveness of law enforcement against forest and wildlife crime: A study of enforcement disincentives and other relevant factors in Southwestern Cambodia*. East-West Management Institute, Conservation International, and U.S. Agency for International Development, Washington, DC, USA.
- Coad, L., Watson, J. E., Geldmann, J., Burgess, N. D., Leverington, F., Hockings, M., ... and Di Marco, M. (2019). Widespread shortfalls in protected area resourcing undermine efforts to conserve biodiversity. *Frontiers in Ecology and the Environment*, 17(5), 259-264. <https://doi.org/10.1002/fee.2042>
- Columba, K. (2013). *Manual para la gestión operativa de las Áreas Protegidas de Ecuador*. Ministerio del Medio Ambiente, Ecuador.
- Conservation Assured. (2018). *Safe Havens for Wild Tigers: A rapid assessment of management effectiveness against the Conservation Assured Tiger Standards*. Singapore: Conservation Assured.
- Diaz, S., Fargione, J., Stuart Chapin III., F. and Tilman, D. (2006). Biodiversity loss threatens human well-being. *PLoS Biol* 4 (8): e277. <https://doi.org/10.1371/journal.pbio.0040277>
- Digun-Aweto, O., Fawole, O. P. and Saayman, M. (2019). Constraints to conservation at Okomu National Park: A ranger's perspective. *International Journal of Comparative and Applied Criminal Justice*, 43(2), 173-187. <https://doi.org/10.1080/01924036.2018.1509012>
- Elbers, J. (Editor) (2011). *Las áreas protegidas de América Latina: Situación actual y perspectivas para el futuro*. Quito, Ecuador, IUCN, 227 p. ISBN: 978-9978-9932-1-7. <https://portals.iucn.org/library/efiles/documents/2011-019.pdf>.
- Eliason, S. L. (2006). Factors influencing job satisfaction among state conservation officers. *Policing: An International Journal of Police Strategies & Management*.
- Eliason, S. L. (2011a). Death in the line of duty: Game warden mortality in the United States, 1886-2009. *American Journal of Criminal Justice*, 36(4), 319-326. <http://dx.doi.org/10.1007/s12103-010-9087-x>
- Eliason, S. L. (2011b). Policing natural resources: Issues in a conservation law enforcement agency. *Professional Issues in Criminal Justice*, 6(3), 43-58.
- Eliason, S.L. (2017). Becoming a game warden: Motivations for choosing a career in wildlife law enforcement. *Journal of Police and Criminal Psychology*, 32(1): 28-32. <http://dx.doi.org/10.1007/s11896-016-9200-2>
- Gibson, C. (1999). *Politicians and poachers: The political economy of wildlife policy in Africa*. Cambridge, UK: Cambridge University Press.
- Hooper, D. U., Adair, E. C., Cardinale, B. J., Byrnes, J. E. K., Hungate, B. A., Matulich, K. L., Gonzalez, A., Duffy, J. E., Gamfeldt, L. and O'Connor, M. (2012). A global synthesis reveals biodiversity loss as a major driver of ecosystem change. *Nature*, 486(7401), 105-108. <http://dx.doi.org/10.1038/nature11118>
- International Ranger Federation. (2018). *2008-2019 Roll of Honour Map*. Available at: <https://www.internationalrangers.org/meet-our-rangers/>
- International Ranger Federation. (2019a). *Who Is A Ranger?* Available at: <https://www.internationalrangers.org/>
- International Ranger Federation. (2019b). *2019 Roll of Honour* Available at: <https://www.internationalrangers.org/>
- International Ranger Federation. (2019c). *Chitwan Declaration, 2019*. Available at: https://www.internationalrangers.org/wp-content/uploads/Chitwan-Declaration_2019_EN.pdf
- Jachmann, H. (2008). Monitoring law-enforcement performance in nine protected areas in Ghana. *Biological Conservation*, 141 (1), 89-99. <http://dx.doi.org/10.1016/j.biocon.2007.09.012>
- Jiménez, L. N. (2018). Perfil profesional del guardaparque en México. *Áreas Naturales Protegidas Scripta*, 4(1): 49-71. <https://doi.org/10.18242/anpscripta.2018.04.04.01.0003>
- Judge, T. A., Thoresen, C. J., Bono, J. E. and Patton, G. K. (2001). The job satisfaction-job performance relationship: A

- qualitative and quantitative review. *Psychological Bulletin*, 127(3), 376. <http://dx.doi.org/10.1037/0033-2909.127.3.376>
- Kakira, L. M. (2010) *Monitoring law enforcement effort and illegal activity in selected protected areas: Implications for management and conservation, Democratic Republic of Congo*. MSc thesis. University of Ghent, Ghent, Belgium.
- Lamkin, M. and Miller, A. I. (2016). On the challenge of comparing contemporary and deep-time biological-extinction rates. *BioScience*, 66(9), 785-789. <https://doi.org/10.1093/biosci/biw088>
- Leaky, R. and Morrell, V. (2001). *Wildlife wars: My fight to save Africa's natural resources*. New York, NY: St Martin's Griffin.
- Meduna, A. J., Ogunjinmi, A. A. and Onadeko, S. A. (2009). Biodiversity conservation problems and their implications on ecotourism in Kainji Lake National Park, Nigeria. *Journal of Sustainable Development in Africa*, 10(4), 59-73.
- Moreto, W. D. (2016). Occupational stress among law enforcement rangers: Insights from Uganda. *Oryx*, 50(4), 646-654. <http://dx.doi.org/10.1017/S0030605315000356>
- Moreto, W. D., Lemieux, A. M. and Nobles, M. R. (2016). 'It's in my blood now': The satisfaction of rangers working in Queen Elizabeth National Park, Uganda. *Oryx*, 50(4), 655-663. <http://dx.doi.org/10.1017/S0030605316000387>
- Moreto, W. D., Gau, J. M., Paoline, E. A., Singh, R., Belecky, M. and Long, B. (2017). Occupational motivation and intergenerational linkages of rangers in Asia. *Oryx*, 1-10. <http://dx.doi.org/10.1017/S0030605317001041>
- Ogunjinmi, A. A., Umunna, M. O. and Ogunjinmi, K. O. (2008). Factors affecting job satisfaction of rangers in Yankari Game Reserve, Bauchi, Nigeria. *Journal of Agriculture and Social Research*, 8(2). <http://dx.doi.org/10.4314/jasr.v8i2.43332>
- Paz-Barreto, D. (2010a). *Capacitación de guardaparques en América Latina*. Revista Parques.
- Paz-Barreto, D. (2010b). *Capacitación de guardaparques en Argentina*. Revista Parques.
- Reuter, P. and O'Reagan, D. (2017). Smuggling wildlife in the Americas: Scale, methods, and links to other organised crimes. *Global Crime*, 18(2), 77-99. <http://dx.doi.org/10.1080/17440572.2016.1179633>
- Schulze, K., Knights, K., Coad, L., Geldmann, J., Leverington, F., Eassom, A., Marr, M., Butchart, S.H., Hockings, M. and Burgess, N.D. (2017). An assessment of threats to terrestrial protected areas. *Conservation Letters*, 11(3). <https://doi.org/10.1111/conl.12435>
- Solveira, G. (2012). *Curso Regional para Guardaparques de América Latina: compartir experiencias, crecer sin fronteras (2005-2012)*. Centro de Formación y Capacitación en Áreas Protegidas. Administración de Parques Nacionales.
- Spira, C., Kirkby, A. E. and Plumptre, A. J. (2019). Understanding ranger motivation and job satisfaction to improve wildlife protection in Kahuzi-Biega National Park, eastern Democratic Republic of the Congo. *Oryx*, 53(3): 460-468. <http://dx.doi.org/10.1017/S0030605318000856>
- Toch, H. (2002). Occupational stress. In H. Toch, *Stress in policing* (pp. 73-90). American Psychological Association. <https://doi.org/10.1037/10417-003>
- UNEP-WCMC (2020a). Protected Area Profile for Asia & Pacific from the World Database of Protected Areas, March 2020. Available at: www.protectedplanet.net
- UNEP-WCMC (2020b) Protected Area Profile for Latin America & Caribbean from the World Database of Protected Areas, March 2020. Available at: www.protectedplanet.net
- Warchol, G. and Kapla, D. (2012). Policing the wilderness: A descriptive study of wildlife conservation officers in South Africa. *International Journal of Comparative and Applied Criminal Justice*, 36(2), 83-101. <http://dx.doi.org/10.1080/01924036.2012.669911>
- World Bank. (2019). *Illegal logging, fishing, and wildlife trade: The costs and how to combat it*. Washington, DC: World Bank. © World Bank. Available at: <http://www.appsolutelydigital.com/WildLife/lessons.html>
- WWF. (2018). *Living Planet Report – 2018: Aiming Higher*. Grooten, M. and Almond, R.E.A. (Eds). Gland, Switzerland: WWF.
- WWF & Ranger Federation of Asia. (2016). *Ranger Perceptions: Asia*. Singh. R. Gland, Switzerland: WWF.
- WWF & TRAFFIC. (2016). *Ranger Perceptions: Africa*. Singh. R. Gland, Switzerland: WWF.
- WWF & GWC. (2019). *Ranger Perceptions: Latin America*. Singh. R. Gland, Switzerland: WWF.

RESUMEN

Los guardaparques desempeñan un papel importante en la gestión y protección de la biodiversidad de la que depende el bienestar humano para los servicios de los ecosistemas. En el desempeño de sus funciones en condiciones difíciles, a menudo con equipo insuficiente e inadecuado, los guardaparques de muchos países están bajo la amenaza constante de los encuentros con la vida silvestre y los cazadores furtivos. Para comprender mejor las percepciones de los guardaparques sobre sus condiciones de trabajo, se realizó un estudio de 1742 guardaparques de 293 sitios de conservación en 40 países de Asia, África y América Latina. Aunque los resultados difirieron entre las regiones, los resultados generales mostraron que cuatro de cada cinco guardaparques se han enfrentado a una situación potencialmente mortal, más de una cuarta parte vio a su familia durante menos de cinco días en un mes y una proporción importante considera que no está adecuadamente equipada o capacitada para cumplir con los requisitos de su trabajo. La cercanía a la naturaleza se indicó como la motivación principal para los guardaparques, mientras que el salario bajo y/o irregular y las condiciones de trabajo peligrosas se identificaron como los peores aspectos de un guardaparques. Este estudio es la primera instantánea a gran escala de las percepciones de los guardaparques; le seguirán otros estudios y análisis detallados.

RÉSUMÉ

Les gardes forestiers jouent un rôle important dans la gestion et la protection de la biodiversité dont dépend le bien-être humain pour les services écosystémiques. Tout en accomplissant leurs tâches dans des conditions de terrain difficiles, souvent avec un équipement insuffisant et inadéquat, les gardes forestiers de nombreux pays sont constamment à risque lors de rencontres avec la faune et les braconniers. Pour mieux comprendre leur perception à l'égard de leurs conditions de travail, 1.742 gardes forestiers de 293 aires de conservation à travers 40 pays d'Asie, d'Afrique et d'Amérique latine ont été interrogés. Bien que les résultats diffèrent selon les régions, les résultats globaux ont montré que quatre gardes forestiers sur cinq ont été confrontés à une situation potentiellement mortelle, plus d'un quart voit leur famille pendant moins de 5 jours par mois et une grande proportion ne se sentent pas suffisamment équipés ou formés pour s'acquitter de leurs responsabilités professionnelles. La proximité avec la nature a été indiquée comme la motivation principale des gardes forestiers, tandis qu'un salaire bas et/ou irrégulier et des conditions de travail dangereuses ont été identifiés comme les pires aspects du métier de garde forestier. Cette enquête est le premier aperçu à grande échelle des perceptions des gardes forestiers et sera suivie par d'autres enquêtes et analyses détaillées.