

Policing the wilderness: A descriptive study of wildlife conservation officers in South Africa

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Of the various aspects of law enforcement, few studies have focused on those responsible for protecting wildlife conservation areas. Even less has been written on this from an international perspective where the protection of natural resources including flora and fauna can be of paramount importance for developing nations. To contribute to the literature about this subject, this research explores the role of wildlife conservation officers commonly referred to as *field rangers* in South Africa. Using field research methods, the authors examined the selection, training, and field operations of rangers comparing public sector officers to their private sector counterparts in a select group of game reserves.

Keywords: field ranger; game ranger; wildlife conservation; anti-poaching and South Africa

Introduction

Natural resources represent an important revenue source for developed and developing nations either as a marketable commodity such as minerals and timber or for the purpose of attracting tourists, i.e., the flora and fauna within the national parks and their private sector counterparts (CIA, 2011; World Bank, 2011). South Africa serves as an example of a nation rich in natural resources that includes large populations of wildlife (Guest, 2004; Meredith, 2005). This specific resource is utilized by numerous and lucrative tourist safari and hunting operations catering to both domestic and foreign visitors (Statistics South Africa, 2011). As a result, the protection of its natural resources from illegal exploitation is important which has in turn resulted in the development of specialized units to enforce conservation laws. These include the government field rangers and private security forces found in the 19 national parks run by South African National Parks; the 303 provincial level game parks, nature reserves, and state forests; and the hundreds of private owned game reserves (South African National Parks [hereinafter “SANParks”], 2011). While they are sometimes perceived as mainly guides for tourists and biodiversity managers, they also have an active role in law enforcement including investigation of crimes, the pursuit and arrest of offenders, preparation of cases for court and testifying at trial.

Yet this general area of law enforcement, the protection of wildlife by conservation officers, receives only limited attention from researchers. Little is known about the exact nature of their job in the USA (Pendleton, 1998; Shelley & Crow, 2009; Tynon, Chavez, &

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Baur, 2010), and even less about such careers in foreign nations. Among specialized conservation officers in foreign nations perhaps no group is more iconic than the African field ranger. This individual serves as the first line of protection for wildlife and the human visitors in the game reserves. The position has been glamorized in popular culture, showing them to often be well-educated, mainly White males who have dedicated their lives to conservation. Yet as we show in this research, that perception is not always the reality. In order to better understand this occupation, our qualitative study examines field rangers in South Africa. Using data gathered from interviews and observation in six public and private game reserves, two training schools, and a university program, we present a description of field ranger selection and training, field operations and threats, career paths, and use of technology. The results were analyzed in the context of law enforcement and private security including the existing literature concerned with their American counterparts to help gain a more comprehensive picture of this occupation. Finally, we compare and contrast the operations in the private and public sector.

The literature

While there is much research on wildlife conservation in Africa, including in the game reserves studied here, there are far fewer comprehensive studies that address the current processes of hiring, training, and managing game rangers and the nature of their day-to-day operations. Of these, even fewer are found in the scholarly research. Fortunately there is adequate existing literature that, when integrated, provides highly useful background for this research. This includes research examining the establishment of the parks during the colonial period in Africa, which incorporates some detail on the role of field rangers and park managers, and analyses of the parks' past and current impact on neighboring communities. Information from a select number of autobiographies of African hunters, field rangers, and administrators including Herne (1999), Leaky and Morrell (2001), and Nyschens (1997) further contribute to the historical background. More contemporary research, including salient work on American "game wardens" or "conservation officers" by Carter (2006) and Eliason (2011) add some detail and permits comparisons to an African field ranger's operational activities. Finally, technical reports from NGO training programs in other countries offer models for comparison to the findings in this study.

Several studies have focused on the sociological aspects of wildlife conservation including the impact of parks on their neighboring communities. While this may be considered on the periphery of this study, it does provide necessary background information considering that field rangers live in these communities and are often viewed with a mix of respect due to their steady employment and subsequent economic contributions, and suspicion because of their duty to enforce the poaching laws. Spenceley (2003) and Wells (1996) examined the impact of the South African game reserves on the local communities and their role in reducing the ever present poverty in many parts of South Africa. Game reserves often employ talented staff that includes wildlife biologists, veterinarians, land management experts, and rangers. Because of their skills, they have much to offer neighboring agrarian communities, but are not always permitted by park management or willing to work outside the parks. Asibey's (1972) research examined this issue in Ghana's parks from a highly interesting approach, asking if a reserve's wildlife should be used for food, and if so at what level it will be sustainable. While this work was done decades ago, it is still relevant today as human population growth pressures on game reserves including outright demands for hunting and fishing rights in the parks are ever present in South Africa.

Warchol and Johnsons' (2009) qualitative research on bush-meat poaching found evidence of this in select game reserves in KwaZulu Natal Province.

Additional research on the development of the African game parks adds historical background. Toit, Rogers, and Biggs' (2003) study of Kruger National Park in South Africa focused on a wide variety of management issues, offering an interesting history of the early development of the reserve with some attention paid to the role of the field rangers and their basic duties during the early years of the park. Caruthers (2007) added to this history in her study of the development of wildlife management in South Africa from 1930 to 1960, noting the evolution of a more scientific and professional approach in the parks. She notes the early dichotomy of park staff, where Whites were designated as game rangers and Blacks to the lesser position of native police. Carruthers' (2008) subsequent research revealed the past discriminatory nature of game protection positions in Kruger Park decades ago, noting that Black rangers were paid less and treated poorly compared to their White counterparts. She further noted that poor pay and lack of an incentive or reward system for quality work were non-existent among all rangers, but had a more detrimental effect on Black rangers.

There are autobiographical accounts offering more detail about the recruitment and operational duties of field rangers in the later decades of the twentieth century. Leaky and Morrell's (2001) account of Leaky's tenure administering the Kenyan Wildlife Service (KWS) during the period of rampant elephant poaching in the 1980s noted his willingness to recruit and hire former poachers due to their specialized skills. Leaky stated "I thought they'd make excellent members of our anti-poaching teams since they knew the terrain and techniques. Several of them readily signed on, glad to be earning a steady wage. Some of the worst poachers are today among our best rangers" (p. 84). This practice was also mentioned by Nyschens (1997), a former professional elephant hunter and admitted prolific poacher who later became a field ranger in southern Africa. Furthermore, there is evidence that this employment practice is not necessarily restricted to Africa, as some American game rangers were self-admitted former poachers (Carter, 2006; Eliason, 2003).

Root's (2005) account of his service with the Natal Parks Board provided more detail about both the duties and the distinctions made between White and Black rangers in South Africa during the Apartheid period. Game guards, a lower designation in South Africa were commonly Black South Africans, while Whites were designated as game rangers – a higher rank whose responsibilities included anti-poaching, investigations, game management, game capture and relocation, problem animal control, maintaining bore holes and fences, and erosion control. While game rangers were paid more and afforded better accommodation within the park that included family quarters, game guards were often stationed in pickets or primitive camps throughout the park and served strictly as the title implies, to protect game. Root described all rangers as, "nearly all strongly built with very little excess weight and were incredibly fit as due to the covered distances daily on foot or on horseback. Nearly all were dedicated to conservation or to the man in charge of them" (2005, p. 11).

Leaky and Morrell (2001) also mentioned the low morale and pay for rangers, inadequate equipment and difficult working conditions in the KWS including long foot patrols and the danger posed by armed poachers and predatory animals. Leaky stated that "rangers earned barely enough to feed and clothe their families . . . and you couldn't expect a man with a .303 Enfield to take on someone wielding a modern assault rifle" (p. 63). His solutions included the imposition of strict military discipline on the KWS to improve effectiveness and morale, and the addition of hundreds of modern automatic firearms and dozens of vehicles for patrolling and more aggressive tactics.

The findings from these autobiographical accounts were supported by scholarly research such as Gibson's (1999) study of poaching in Zambia, which provided a thorough overview of the game rangers' duties and the hardships they faced. Described as a quasi-military branch of the civil service in Zambia with the protection of government employment, field ranger work was at best harsh, offering difficult and dangerous working conditions both on the job and off. He found that Zambian rangers frequently lacked essential equipment including boots, properly functioning firearms, and even ammunition due to inefficiencies in the central administration of their department. Furthermore they faced social isolation in the local communities. Rangers provided economic benefits to the local economy as a result of their jobs and often live in and marry residents from the local town or village. Rangers may also protect rural residents from crop raiding wild animals that leave the reserve. Yet the law enforcement responsibilities of a ranger "often overcame the positive features of the scout-villager interactions producing a frequently tense – sometimes overly hostile – relationship" (p. 125). This was a function of the ranger's responsibility to enforce poaching laws in rural areas where game meat often represented a large proportion of the local villager's diet and income. Given that much illegal hunting was committed by locals living adjacent to the reserve, it was highly likely that the ranger would arrest one of his neighbors for illegal hunting. Gibson also found that some Zambian game scouts had abused their powers conducting frequent searches of local homes for illegal game meat, using physical force against suspect poachers, and occasionally keeping the carcass for their own consumption. Pendleton's (1998) research on American parks noted another source of conflict between visitors and rangers due to the latter including more traditional or "hard law enforcement" duties in addition to traditional "soft enforcement" role.

Jachmann and Billiouw's (1997) study of elephant poaching in Zambia offered a good description of the structure of ranger operations and the development of cash rewards for game rangers whose arrests result in confiscated trophies such as ivory and offenders. They noted that investigations, being proactive by following leads and developing informants, were more effective than the standard routine patrols. Coupled with a reward system for rangers, it resulted in more effective control over poaching.

One of the more unique studies was done to identify the various factors affecting the job satisfaction level of rangers in Yankari Game Reserve, in Bauchi, Nigeria. The authors found that the often difficult conditions of working in remote areas with dangerous game, physical hazards of rivers and difficult terrain, limited opportunities for promotion and advanced training, and low salary all contributed to the high levels of dissatisfaction and low motivation among rangers. Furthermore, the study found that these conditions fostered corruption and complicity with poachers including allowing them into the park, accepting bribes from poachers and grazers, and informing them of the location of game animals (Ogunjinmi, Umunna, & Ogunjinmi, 2008).

Technical reports from conservation NGO's offer information about different training programs for field rangers. WildAid (2004) offered an array of course for rangers and park managers in the government parks of South East Asia. These included a ranger basic training course of 147 hours of instruction in a wide range of modules including patrolling, intelligence gathering, crime scene processing, surveillance, and law and legal processes. Other courses offered were the enforcement manager's course and the wildlife-monitoring course. The latter is oriented toward training rangers to record observation about the wildlife they encounter while on patrol. This is for selective game rangers who will also be trained in using camera traps, GPS, data analysis, and plaster casts of animal tracks. The former is for rangers who have the potential to become team leaders and

instructors. Their instruction includes training in the principles of management to preparing cases for court (WildAid, 2003).

Methodology

The methodology we employed was descriptive field research utilizing interviews, observation, and secondary data analysis. This methodology allowed the researchers to both experience and interpret social expressions and processes between individuals and groups in order to “examine various phenomena as perceived by participants and represent those observations as accounts” (Fitzgerald & Cox, 1994, p. 87). Our objective was to describe the phenomenon of interest, i.e., the South African field rangers in as much detail as possible.

The research sites

The data were collected at nine sites located in four of the nine provinces in South Africa. At the time of this study, South Africa had 19 national parks, 303 parks at the provincial or state level, and hundreds of privately owned game parks. Our sample included three national parks, one provincial park, one private commercial game farm, a private game reserve, two private field ranger schools, and a university. The sites were specifically selected to allow for comparison within and between two distinct provinces in South Africa – the Limpopo and the Western Cape. Furthermore, the sites were also chosen for the following additional reasons: (1) The study sites represented both privately owned and public game reserves; (2) the reserve sites varied in size, location, and nature and threat of poaching; (3) the diversity of wildlife populations differed by site; and (4) the educational institutions included privately owned operations offering short and long term training programs for field rangers and a four year university academic program designed for field rangers who sought eventual management positions within the reserves.

The three national parks were Kruger National Park (KNP) located mainly in the Limpopo Province of South Africa bordering Mozambique to the east and Zimbabwe to the north, and Table Mountain National Park (TMNP) and Agulhas National Park (ANP) both located in the Western Cape. KNP is a public park of about 19,000 square miles and has very large populations of wildlife – 147 mammal species, 2000 plant species, and over 500 bird species. The populations of just the well known species included approximately 14,000 elephant, 150,000 impala, 3800 warthog, 17,000 wildebeest, 5000 white rhino, and 32,000 zebra (SANParks, 2008). TMNP’s wildlife includes an array of smaller mammals but it is primarily known for its marine protected coastal areas with the highly endangered abalone shellfish. Similarly, ANP has few terrestrial mammals, but is home to large populations of bird species and marine life, and 2000 species of indigenous plants. The provincial park was the 10,000 hectare Jonkershoek Nature Reserve also located in the Western Cape whose wildlife populations include leopard, a wide variety of small mammals, and rare insects and reptiles. The private game farm referred to as Site A was a small commercial operation located about 50 miles southwest of Kruger National Park. It bred endangered species for profit including white rhinoceros and a variety of large antelope. Since it is a private operation, it employed its own security staff to protect the game. Also included was a private game reserve referred to as Site B, operated for tourism, which also employed a private game protection unit. This site had the traditional “big five” mammals of Africa – lion, rhinoceros, buffalo, leopard, and elephant – as a tourist draw, in addition to a wide variety of smaller indigenous species. The two field ranger training schools included

ProTrack located in the Limpopo Province and the Nature College located in the Western Cape. The final site was Cape Peninsula University, which offered a degree program in wildlife conservation.

Duration, sampling, and interviewing

The data were collected over a six week period. The lengthy time frame was necessitated by the long distances between sites often covered by driving, the need to arrange for interviews (lasting 60–90 minutes each) to fit respondents' schedules, allow for follow-up visits as needed, and time to review and transcribe field notes. The research sample ($N = 42$) was drawn from the population of section rangers ($n = 6$) and field rangers ($n = 21$), university educators ($n = 3$) and trainers of field rangers ($n = 4$), park administrators ($n = 3$), and criminal investigators ($n = 5$) in the nine selected research sites. Demographically, the sample ranged in age from early 20s to late 50s, with experience in the position ranging from two years at Site A to more than 30 years at KNP. The most experienced respondents were the administrators, section rangers, and criminal investigators, and the least experienced were the field rangers, both private and public sector. The sample included two White females, four Black males, and 36 White males. The purposive sampling method was employed in this study. While this strategy cannot ensure a representative sample, the use of in-depth semi-structured interviews and observations, combined with secondary data analysis, nevertheless resulted in a detailed description of the nature of field ranger training, education, and operations at the sites.

Interview questions were formulated based on a review of the literature, the authors' past experience studying wildlife crime, and consultation with known experts regarding the role of field rangers in South Africa in the nine sites. The interview questions focused on the general themes of ranger selection characteristics, the structure of the education and training programs, career advancement and motivational reward opportunities, daily operations in the field, supervision, and the application of technology to enhance job performance. Interviews were all conducted on site. To protect the identities of the subjects, field notes were constructed with no reference to their names. Instead, a numeric codebook was used to identify the subjects and their responses. After the interviews were collected and reviewed for content and accuracy, the codebook was discarded, thereby ensuring the confidentiality of the study participants. In addition to the field interviews, observational and secondary data were also collected. Observations were made of rangers on patrol, picket camps, ranger housing, equipment used by rangers, physical security structures in the reserves, locations where poaching occurred, and evidence of poaching including confiscated wildlife parts. Field notes and photographs were recorded from observations. Secondary data including training academy course syllabi, law enforcement intelligence reports, and policy manuals were also collected from interviewees if available.

The reliability and validity of the data was checked through triangulation. Information from the interviews and field observations were linked to and compared with other data and sources of information. For example, the interview data was verified by: (1) reviewing existing official data; (2) comparing the observations of phenomenon from other site visits; (3) validating the content of one interview with other interviews conducted; and (4) comparing interviewee comments to photographic evidence collected during the study period. Each interview also used check-retest questions to ensure the validity of responses by asking the same question in a different format to verify the consistency of responses. This process was done during the six week course of the study after data collection each day,

and again reviewed over the three month period that the data were analyzed upon return from South Africa.

Terminology

In South Africa, various terms are used to describe conservation officers including game ranger, game scout, anti-poaching officer, game guard, and field ranger. After consultation with interviewees, the researchers settled on *field ranger* as the most commonly used term. Also, within South Africa there are a wide variety of terms used to describe conservation areas. These are national parks, provincial parks, game reserves, game farms, safari parks, and nature reserves. The researchers use the term *reserve* as a generic term when referring to a wildlife conservation area unless identifying a specific location. Additionally, the findings incorporate varied scholarly literature on US game wardens and conservation officers as points of comparison to provide a more comprehensive overview of resource protection worldwide.

Findings

Qualifying for the position

Our first step in the data collection was to identify how individuals qualify for the position of field rangers. We discovered that several routes exist for those pursuing careers as field rangers in South Africa. These included the completion of rigorous academic programs offered at universities; obtaining diplomas from private training institutions offering short term programs; and past experience in the military or in agriculture tending animals combined with excellent physical fitness and outdoor skills. A background with one or a combination of these qualifications made one eligible for a position depending on the reserve.

An example of an academic program was at Cape Town's Cape Peninsula University offering a course of study for those seeking positions as nature conservation officers within the parks of South Africa with an eventual goal of entering park management. The program consisted of three years of academic work followed by a year of field-work, which included the completion of a supervised research project. The curriculum included topics such as game counting, alien species removal, fire control, trapping, off-road driving, firearm usage, and even snake handling. Training in field ranger skills was included, but it was generally oriented for those wishing to be field guides rather than the armed anti-poaching rangers working in the heavily threatened parks. Field guides are those who accompany tourists in the reserves on game drives and walks identifying flora and fauna. Students received training in the function of anti-poaching operations including the law of arrest and court processes. Upon completion of their degrees, students are fully qualified to begin work in the South African parks systems. Once employed in the reserves, the respondent told the researchers that most of these college-trained students may work as field rangers for a short time but typically pursue management or research positions.

A second type of academic program of interest was offered by the Nature College also located in the Western Cape. This privately run institution offered a variety of in-service training programs open to those currently working in game reserves and seeking advancement into different positions including that of field ranger. The programs of study, which ran from several weeks to up to two years in duration, were mainly tailored to the

requirements of Cape Nature, the Province's wildlife conservation agency overseeing the reserves. Courses offered training in what was referred to as soft skills and hard skills. The former referred to specimen collection, species identification, teamwork, communication skills, park maintenance, report writing, conservation law, and occupational health and safety, and the latter focused on tracking, problem animal control, arrest procedures, establishing and maintaining observation points, and counter-poaching. The training consisted of a mix of the theoretical and the practical including both lectures and fieldwork. The students at this institution were already employed by Cape Nature in entry level positions as field guides or entry level field rangers and had their tuition paid by their employer. The field ranger program was nine months in duration and required the completion of additional on the job training with written assignments. Successful completion of the course of study would provide them with opportunities for advancement through the ranks.

A different type of institution was the anti-poaching school. These privately owned training academies offered short term – about 30 days' duration – but intense courses of study for individuals seeking employment as field or anti-poaching rangers for privately owned game reserves. While this may seem brief, it is about the same duration as those offered by WildAid in Southeast Asia (WildAid, 2004, 2008). One such institution was ProTrack located in the Limpopo Province near Kruger Park. ProTrack's students underwent an intense course of study in mainly hard skills such as firearms use, tracking, detecting snares, establishing observation points, and apprehension of poachers. Having completed their course, they contracted to work as field rangers for the numerous private game reserves that ProTrack had existing contracts with. Once on the job, new graduates were teamed with experienced rangers in a system somewhat similar to the use of field training officers by US police departments (Walker & Katz, 2011).

Selecting and training field rangers

The interesting finding about the reserves' selection process for field rangers was that there were no universal national standards. The researchers found this to be a very common sense approach to staffing. The recruitment and selection standards varied by park including whether it was publically or privately owned. Standards were set based on the nature of the poaching threat in the reserve which varied greatly. Parks with persistent threats from armed poachers put a premium on finding individuals with past military experience and/or being physically tough and used to working outdoors. Academic qualifications were helpful, but not required. However, parks facing less serious poaching problems preferred candidates with some academic training in wildlife conservation and biodiversity management.

Kruger Park's method of recruitment into the field ranger corps was illustrative of the nature of the job in a rugged park with a serious poaching problem. Applications are sought for vacancies in the corps from individuals meeting the basic age (18 to 35) and physical fitness qualifications. A diploma from the various short term academic programs offered for prospective field rangers in South Africa is helpful for obtaining employment at KNP, but not necessary. The interviewees explained that KNP strongly prefers physically fit, dedicated young men from agricultural backgrounds with good bush (outdoor) skills including the ability to track wildlife and humans. As one interviewee stated, "someone who can track and spent time looking after his father's cattle". Interestingly, these preferred "agricultural" qualifications are similar in the US, as evidence suggests that conservation officers from urban backgrounds face more situational conflict than those coming from rural areas (Forsyth & Forsyth, 2009).

Following acceptance into the program, a two-week duration paramilitary selection course must be successfully completed. The selection course, which was modeled on the South African Army's Special Forces training, is done outside the park in the town of Barberton and overseen by the African Field Ranger Training Services, a training institution for field rangers. Some applicants can bypass this phase if they are found to be exceptionally qualified due to their past experience in the military or previous work in this field. While the two-week duration of the selection course may seem brief, it resulted in a 60% dropout rate among candidates due to the high level of difficulty and harsh living conditions. The interviewees, all of whom were middle aged, White male senior rangers and investigators, told the researchers that the high drop-out rate was partly due to many new candidates lacking military service due to the end of conscription in South Africa. They believed that newer candidates often lack the mental toughness and self-discipline that comes with military service.

The two week selection course was followed by a six week basic training course. Interestingly, the interviewees told the researchers that the physical standards for this course have been lowered since 1994 when the new government in South Africa eliminated the apartheid system and mandatory conscription into the armed forces. Training officers stated that over the past decade this resulted in an increasing number of candidates lacking experience of living in the bush, tracking, handling firearms, and familiarity with military life. Prior to 1994, the training was conducted by the South African Defense Forces (SADF), which was regularly stationed in KNP to protect the borders. The current training course still used the SADF Special Forces model, though paired down from its past structure. It currently included food deprivation, 15 kilometer forced marches, physical exertion, and psychological stressors. Team exercises were included to identify potential leaders among the candidates.

The candidate corps mainly consists of Black, male South Africans. Some females and a few Whites will apply and be accepted, but most will drop out due either to the difficulty of the course or the limited number of opportunities for advancement once they enter their careers as field rangers. This was also reported by the staff at Table Mountain National Park. The supervisors stated that the more educated candidates only remained on the job for a couple of years before seeking better positions in South African National Parks, commonly in administration. This often resulted in the national parks ending up with a field ranger staff consisting of those with the least education and less motivation for career advancement.

Similar to recruitment and selection, ranger training as observed in South Africa was best described as place and threat specific. The training varied considerably both by location and by the nature of the threat posed to the reserve and the wildlife from illegal activities. Whereas KNP emphasize anti-poaching skills as the primary duty, TMNP and Jonkershoek's ranger staff performed an array of duties in addition to preventing marine, reptile, or plant poaching. These duties included trail maintenance, assisting visitors in the park, preventing theft, and some basic biodiversity management (see Table 1). Yet one commonality across the public reserves was that all field rangers had to complete an Environmental Management Inspector (EMI) course required by the national legislation. Five levels of certification were available, ranging from one to five with five being the lowest. The respondents stated that a field ranger candidate could be nearly illiterate and able to complete the exam for a level five certification. All levels, however, included the power of civil arrest. Beyond the EMI certification there were no uniform standards that all the reserves had to adhere to in the training of their field ranger staff.

Table 1. Reserve by characteristics and field ranger duties.

Reserve	Ownership	Nature of poaching problem	Primary responsibilities of rangers	Specialized criminal investigative unit present	Civil arrest authority	EMI certification required or optional
Kruger National Park	Public	Serious	Anti-poaching	Yes	Yes	Yes
Table Mountain National Park	Public	Serious	Anti-poaching and biodiversity monitoring	Yes	Yes	Yes
Agulhas National Park	Public	Minor	Biodiversity monitoring and maintenance	No	Yes	Yes
Jonkershoek Nature Reserve	Public	Moderate	Anti-poaching, biodiversity monitoring and maintenance	Yes	Yes	Yes
Site A – Breeding facility	Private	Moderate	Anti-poaching and biodiversity monitoring	No	Yes	Optional
Site B – Tourist facility	Private	Minor	Anti-poaching and biodiversity monitoring	No	Yes	Optional

EMI = Environmental Management Inspector.

The two privately owned reserves employed private security forces of field rangers though with some distinct differences. Site A employed a full time force of three armed rangers, all of whom were White male South Africans ranging in age from late 20s to early 40s. The rangers carried only side-arms and dressed in ordinary khaki colored work clothes rather than uniforms as in KNP. These rangers were highly motivated and very aggressive in detecting, pursuing, and apprehending poachers in the reserve. This was a function of the nature of Site A's business, a breeding and sale facility of wildlife including quite rare and expensive species such as the black rhino. The owner of Site A told the researchers that many private game farms in the region relied on contract security forces such as trained by ProTrack; however, he choose to employ a permanent force in his reserve. Site B varied somewhat in its approach to game protection. At the time of the study, it relied upon a highly trained, experienced, and well-armed anti-poaching unit consisting of nine men, five of whom were White, ranging in age from mid 20s to mid 40s. These rangers all carried automatic rifles and dressed in military battle dress uniforms complete with web belts and heavy boots projecting a strong paramilitary image. This was a private anti-poaching company hired to protect the wildlife from human threats. The field rangers at both Site A and Site B received their training prior to working at these locations. The rangers at Site A had worked in the public parks before moving to this private operation, while those at Site B all had past military experience and a mix of past public sector game reserve work or training in these skills from private institutions.

Operations and responsibilities

Similar to American game wardens, African game rangers operate within an important, but less structured bureaucratic environment (Carter, 2006). The typical organizational hierarchy at many reserves for the wildlife protection staff consisted of section rangers at the top followed by noncommissioned officers (field rangers at the ranks of corporal and sergeant) and field rangers. Section rangers are the supervisors responsible for a designated area or section of a reserve and have an assigned allotment of field rangers including NCO's in their command. Also included are specialized investigative units as found at Kruger, Table Mountain, and Jonkershoek (see Table 1). These units are charged with investigating crimes, developing informants, gathering intelligence, and working with the courts in the prosecution of offenders. Similar to policing in the US, the field rangers can be thought of as the patrol officers while the investigators are the detectives. Though they are not involved in daily patrols, they do play a very active role in developing the information generated from ranger patrols. Also similar to policing in the US, past research has shown that the investigative function can be very effective in preventing poaching and apprehending poachers and traffickers (Hess & Hess-Orthmann, 2010). The common duty among all field rangers was patrol, which was always done in groups of two to three rather than alone. However, beyond patrol the specifics of this varied by park to meet specific needs. The ranger staff at KNP, which had a more serious problem with illegal hunting, focused mainly on anti-poaching role with less emphasis on biodiversity monitoring.

KNP field rangers were all armed due to the dangers of the job, both from wildlife and human intruders, specifically armed poachers. Their armaments have evolved over time as a necessity to match the firepower of illegal hunters. In the 1950s, it would be common for some field rangers to be armed with a spear. These were replaced later with World War I and II vintage British Enfield .303 bolt action rifles now giving way to modern automatic rifles. Operations in KNP began with a morning parade where rangers were briefed as to any evidence of poaching or intruders in the park. Supervisory rangers (the section rangers)

also plan the patrols based on intelligence from investigators within and outside the park. Corporals also help plan the day's patrol, avoiding routine patterns to hinder poachers who attempt to observe their activities. Patrols, which are commonly done on foot or bicycle were typically conducted in the morning and evening with some being multi-day affairs where rangers will carry or use prepositioned supplies and tents. Ideally, a ranger patrol in KNP consisted of three men whose objective was to look for human spoor (footprints) that always indicate trespassers being either poachers or illegal immigrants, and animal carcasses. If the spoor appeared to be fresh and indicative of a problem, rangers report in and should pursue. One indicator of a carcass and possibly poaching is the presence of vultures. According to the interviewee at KNP, contact with a human is seldom made during their pursuits. Rangers will sometimes use metal detectors on carcasses to confirm that the animal was shot, rather than having died of natural causes or from predation. All carcass finds are required to be reported to the section rangers. Furthermore, if possible the KNP rangers were also required to take blood smears from the carcass for eventual testing for the presence of anthrax, which is not unusual in southern Africa.

If evidence of poaching is found, rangers will plan and set up observation points. These were formerly called ambushes, but this term was done away with to avoid bias in court proceedings. Rangers in many of the reserves commonly find snares, the most common tool of the poacher. When discovered, rangers were instructed to close the snare, then return later to see if they have been reset, indicating active poachers in the area. Respondents told the interviewers that the policy for field rangers is to pursue, confront, and arrest any poachers or illegal migrants. Deadly force is allowed, but only for self-defense. Rangers were not allowed to use their firearms to protect property. A continuum of force policy was established with regard to the use of firearms. While on patrol, the lowest level rangers would carry their rifles unloaded and without a magazine inserted; the highest level required the ranger to have a magazine inserted in the rifle and a round chambered.

Patrols in Table Mountain and Jonkershoek, however, were typically done during the daylight hours. Rangers at these reserves could be described as jack-of-all-trades tasked with a range of responsibilities including monitoring species, trail maintenance, fence repair, and erosion-control and law enforcement. TMNP is divided into three sections with the ranger staff consisting of section rangers, sergeants, and field rangers in each section. Their operations were described as both reactive and proactive by the interviewees. This reserve has a very serious problem with abalone poaching in the offshore Marine Protected Areas by both sport divers and organized poaching gangs. As a result, rangers needed to both check for fishing permits among sport divers during the day and watch for organized poaching operations at night as poachers would operate after dark just off-shore. With their EMI credentials, rangers all have civil arrest powers similar to private security officers in the US, allowing them to legally apprehend offenders. In addition to the problem of poaching, TMNP also reported a problem of theft from vehicles and some violent crimes. At this reserve, rangers, who are the first line of defense, perform both an environmental law enforcement and traditional law enforcement protecting the visitors and their property.

The operations in Jonkershoek were illustrative of a park that faces a poaching threat of a very different type. This nature reserves lacks the rare mammals, but it has populations of endangered and highly sought after insects, reptiles, and plants. The illegal trade in these species comprises the greatest component of the entire illegal wildlife trade by volume (Warchol, Zupan, & Clack, 2004). These species were poached by offenders fitting a distinctly different profile from those who target bush-meat, ivory, or rhinoceros horn. They were often found to be academics or scientists (sometimes very well known in their

field), reptile dealers, and insect collectors, nearly all of whom are foreigners targeting the park for its diverse wildlife. This unique type of “academic or scientist poacher” seeking specimens for research and collections was not found at the other sites included in this study. The security force at Jonkershoek consisted of a two man Biodiversity Crimes Unit (BCU) and an eight man field ranger force. The two man BCU staff at Jonkershoek, which served a similar function as Kruger Park’s CIS, relied on a combination of casual and tactical observation of visitor activity done in part by themselves, the reserves’ field rangers and workers, and intelligence gathering on the presence of known poachers in the neighboring community. The investigators obtained information both from the police and customs officers and even from local hotel managers who would inform them of the foreign guests who had what they designated as “suspicious items” in their rooms, that is, highly detailed field guides to wildlife, digging instruments, shipping cartons, etc. Similar to the other parks, the BCU investigators employed observation points when supported by intelligence in order to apprehend poachers. The field rangers at this site performed a mix of activities including patrol, guiding visitors, staff transport in the reserve, fire prevention, and reactive anti-poaching. The latter was described as mainly consisting of “preventing people from digging up the flora”. At times, they may receive intelligence about poaching operations. If this is the case, they must report this to the BCU for their review and possible dissemination to the areas other reserves. The field ranger staff receives annual training to update their skills from the BCU. Training has also been provided by the BCU to local prosecutors to familiarize them with the nature of poaching cases. They also cooperate with the Environmental Crimes Unit of the South African Police Service.

In the two privately owned game parks, operations were mainly geared toward anti-poaching and the protection of visitors. The owners and managers explained to the researchers that a premium was placed on protecting the privately owned wildlife. Site A was a small commercial operation that bred and sold wildlife to other game reserves, and Site B was a game reserve catering to tourists on safari. Site A’s field ranger force was charged with protecting the game from the constant threat of poaching in that area of South Africa. Rangers in Site B were responsible for both the protection of their visitors from the wildlife and to prevent poaching, which was mainly for the bush-meat trade.

The field rangers in both sites were highly motivated and aggressive. Both units also appeared to have very strong ties to and support from the reserves’ managers. Rangers in Site A pursued suspect poachers through and out of the reserve, sometimes resulting in vehicle chases. Site B’s unit, which was organized strongly on a military model, was also very heavily armed with automatic rifles. An interesting finding from this unit and only mentioned at this site was a comment by their commander concerning the discretion exercised when apprehending poachers. When asked by the researcher what he does after apprehending a poacher, the commander stated: “The older guys are taken to the police or magistrate. The young guys, the boys, we usually take them back to their farms or towns to be punished by the village elders. You see, they’ll probably get a beating from their fathers since they should have been tending his cattle instead of snaring on a reserve. It’s better to do it this way with them. They’re less likely to come back.” Such discretionary decisions on whether or not to prosecute based on the “status” of an offender or their reasons for poaching also exists in US. In one of the first studies concerning the discretion exercised by game wardens, Forsyth (1993) found that officers are more likely to arrest offenders in lower social classes than those of higher status. Additionally, his study found that apprehended poachers who violated for reasons of survival tend to be overlooked by game wardens and prosecution is often not pursued.

Technology

An interesting finding was the increased adoption and reliance of technology by field rangers. This was done to make rangers both more efficient and accountable, and to compensate for some educational deficiencies among the staff. While radios and even cell phones were commonly used by field rangers, two other innovations identified were of note in this study. One item commonly used was Cyber Tracker, a software program that works on a Palm Pilot or similar PDA. Cyber Tracker allowed rangers to monitor and record their daily activities and encounters in a digital format. The software is icon-driven so rangers, even if illiterate, can simply select from various icons depicting different types of animals, plants, or geographic features. The unit also serves as a GPS providing the supervisory ranger with a complete map of the patrol route taken by the rangers. Supervisory ranger respondents told the researchers than instances of rangers intentionally failing to complete their patrol, i.e., sitting them out at their camps or in foul weather shelters such as those available in TMNP, have occurred. However, Cyber Tracker's GPS feature helps deter shirking among the less motivated. The use of this technology was widespread within the public parks of South Africa.

Kruger Park also has begun to employ ultra-light aircraft, giving them a significant advantage for patrols. These aircraft can patrol large sections of the park and linger over an area for long periods of time allowing rangers to track trespassers and/or monitor wildlife populations. Kruger Park can also employ sophisticated forensic investigative techniques if warranted. These include ballistics testing of bullets to link them to specific firearms and the use of DNA analysis to match carcasses with ivory or rhinoceros horns if these are confiscated. These tasks are carried out by KNP's Corporate Investigation Service, a well-organized and highly skilled criminal investigations unit in the park.

Threats

The main threats to field rangers came from three sources: wildlife, poachers, and common criminals in the parks. The threat from dangerous animals – snakes, buffalo, elephant, leopard, and lion – was not found in every park though certainly cannot be understated where present. Kruger of course offered the most opportunities for encounters between field rangers and dangerous game. As reported to the researchers, rangers have been occasionally killed by attacks by wildlife in this park. The threat from dangerous game was less serious in Sites A and B. TMNP, Cape Agulhas, and Jonkershoek lacked the dangerous game, making it a safer place to work in to that extent. There were obvious risks when operating in the offshore in the Marine Protected Areas where the abalone habitat is located due to rough seas or boating accidents.

The second threat, violent confrontations with poachers, was quite serious in several reserves in this study including KNP and TMNP. Poachers were generally armed and very often willing to resort to violence when encountered. The penalty, which includes fines (a predetermined cash fine plus three times the value of the poached wildlife) and incarceration if apprehended and convicted, combined with the value of the wildlife on the illegal market they desire, created a strong incentive to use force to protect it from confiscation by rangers. The most surprising finding was the willingness of abalone poachers to use violence when operating in TMNP's Marine Protected Areas. Numerous instances of shootouts between field rangers and poachers occurred in TMNP. In addition, poachers have also rammed rangers' boats when confronted at sea. The rangers showed the researchers confiscated poacher boats complete with numerous bullet holes in the engines

and cabins that resulted from wildfires. This helped explain why the KNP and private sector rangers were equipped with 7.62 caliber automatic rifles rather than more traditional medium caliber bolt-action express rifles used for shooting African game with their limited capacity internal magazines. Forsyth and Forsyth (2009), in their qualitative study of Louisiana State Game Wardens, were, like the authors of this study, also surprised to discover an unexpected level of danger and violence while patrolling shorelines and waterways.

Similar to the findings from Tynon et al.'s (2010) analysis of crime in US parks, the final threat consisted of common property and violent criminals operating in the park victimizing tourists. This problem was described to the researchers as mostly theft from parked automobiles, quite common problem at TMNP, and the occasional robbery of a visitor. This sometimes resulted in fights where suspects resisted arrest by the field ranger. As a result of these different threats, field rangers needed not only knowledge of anti-poaching techniques, but also basic law enforcement training, to be able to recognize and apprehend violent and property criminals operating in their reserve. To respond to this problem, rangers were schooled in civil arrest procedures, the proper use of physical force to restrain suspects, and the basics of criminal law.

Career advancement

A wide variety of opportunities for career advancement was available in the public reserves. However, no mention of this was found in the private game reserves included in this study. Kruger Park field rangers, for example, could advance through the ranks running from lance corporal, to corporal to sergeant as a result of their superior performance and/or completion of additional in-service training, such as the short courses offered by institutions such as the Nature College. Surprisingly, promotions were based on the recommendations of the ranger's supervisors based on their observations of the subordinate's performance rather than a formal written test. This was a due to the fact that many rangers had poor literacy skills. However, strong literacy skills were not necessary for effective performance in the position. As noted earlier, many of the students enrolled at the Nature College in the Western Cape were already employed in the reserves. Kruger Park also provided certificates of achievement and small financial awards for exceptional performance. This too was dependent upon the ranger's supervisor's recommendations. The respondents mentioned several weaknesses within the training requirements. These included the need for a short course for non-commissioned officers and a train the trainer program.

Aside from opportunities for advancement, several practices were established for the ranger staff at TMNP to encourage quality work. These included an individual career development plan for employees to help them advance in their job and learn more about their field. This was accomplished by offering a variety of short courses for field rangers. The second practice was the use of motivational awards for outstanding performance including the arrests of offenders in the parks. These consisted of engraved plaques, small cash awards, or utilitarian items such as compasses, clothing, or pocket knives. Also available were national level awards. Kruger Park officials reported good longevity with their field ranger staff, noting that many stay on the job for 30 or more years. One problem noted by the respondents was that the candidates who sought out the most in-service training typically only stayed on the job as field rangers for a few years. Their ultimate goal was to move into administrative positions. In a sense, the in-service training, designed to increase the skill level of field rangers, was somewhat counter-productive.

Conclusions

This study's uniqueness stems from its focus on an area of law enforcement not often addressed in the criminal justice literature, i.e., those individuals charged with protecting natural resources. The purpose of this study was not to create the definitive analysis of field rangers in Africa but rather take a first step in describing the nature of the job and the operations by examining a variety of different game reserves and schools that train and educate prospective rangers. We chose to concentrate on South Africa where even less research has been done on this specific topic. Though it was not our purpose to conduct a comparative study, we examined some of these issues in the context of the existing literature on American game rangers.

It is important to note that this study is not without limitations including the nonprobability sampling method and the size of the sample, in terms of both the number of sites and individuals interviewed. This was principally due to the logistical challenges, time constraints, and the high cost of conducting field research abroad, which limited the ability of the researchers to obtain a larger sample. Therefore, caution should be exercised before generalizing from the results or viewing these findings as absolute proof positive of trends. One limitation of the research, for example, is found in the racial mix of the sample. While Blacks comprise the majority of all field rangers in the South Africa, they were underrepresented in this sample, i.e., four of the 21 field rangers interviewed were Black. While this may or may not have biased the finding with regard to race affecting one's employment status in the field ranger profession, it certainly warrants additional study especially in light of the past political and racial history of South Africa. Instead, these data present an accurate picture of the role of field rangers at these specific game reserves at a particular point in time. One is able to obtain a better understanding of the selection, training, education, and functions of South African field rangers working in different types of reserves, both public and private. While the goal of this research was to describe rather than assess the merits of how field rangers are trained and function, a natural follow-up project would be to examine whether our findings have enhanced the security of the natural resources.

Given the limitations, the study nevertheless resulted in several interesting findings, some of which do not necessarily support previous research on wildlife conservation law enforcement in Africa and America. Warchol and Johnsons' (2009) study found evidence of conflict in the form of demands for hunting access by local residents at other reserves in South Africa. Similarly, Gibson (1999) described the conflict between Zambian game rangers and local residents living adjacent the reserves. Yet this was not uncovered at our research sites, at least from the perspective of the rangers and their supervisors. They noted a fairly cooperative relationship between field rangers and locals stating that residents of neighboring communities often provided valuable information to park investigators on poaching suspects. Our finding, however, may be a function of the sample including only field rangers, their supervisors, and their trainers rather than local community members, or due to the characteristics of the research sites at this point in time. This issue presents the opportunity for future research focusing on the attitudes of residents living near games reserves. Topics such as access to parks for subsistence small game hunting, fishing, or agriculture could be examined along with issues of *problem-animal* control, that is, when dangerous predators or large grazers leave the park and enter local villages threatening residents and/or destroying crops.

When examining the literature on game rangers in America parks, we found an additional difference. Contrary to Pendleton's (1998) research on the potential for visitor animosity over the American park ranger's move toward including more "hard" law

enforcement duties, this was not the case in our sites. This was partly a function of the fact that visitors to the South African reserves don't encounter field rangers as frequently as one does in American parks where they regularly patrol the main roads in marked vehicles. In the South African reserves field rangers are seldom seen as they patrol out of sight in the bush on foot or by bicycle. Visitors to the reserves are often restricted to game viewing on the road network. This subject of conflict between the reserve's rangers and the public again offers the opportunity for considerable future research that could take into account how long the reserve has existed, if it was created from lands appropriated from Black South Africans, and the economic conditions of the adjacent communities.

One finding that emerged was the general lack of uniform standards for both hiring and training. Yet, given the highly diverse nature of the threats across the various game reserves, one could argue for the utility of this individualized approach. For example, providing paramilitary training and firearms to the rangers in Jonkershoek would be of little value given the nature of their poaching problem. Furthermore, training candidates in biodiversity monitoring or specimen collection would be of less value in Kruger Park where well-armed poachers represented a serious threat to both wildlife and any tourists who may accidentally encounter them. Table Mountain's approach was to combine everything into their training – park maintenance, biodiversity, and anti-poaching. The common requirement was the EMI training, though this was available at a very low skill level for entry-level personnel. Another common feature in the training was to familiarize rangers with conservation law and court procedures. This had previously been a deficiency for many field rangers in South Africa that can easily have resulted in lost cases in court. This development offers the potential for a future study to examine if the improved familiarity in conservation law and the judicial system would lead to more successful prosecutions of poachers.

Another unique finding contradicts popular portrayals of field rangers and their job. Due to new laws such as the Employment Equity Act opening more doors for Black South Africans, fewer Whites appeared to be interested in pursuing careers as field rangers, though they still seek careers in parks management. Now there are not as many South Africans with past military experience to draw from, recruiters have turned to those with the physical and mental skills and toughness to work in the bush with very basic resources. The individuals who work in the field are generally Black South Africans from agricultural backgrounds with limited education, even to the point of lacking basic literacy skills. Yet, even given the difficulties of ranger work at KNP, for example, many remained on the job for 25 to 30 years or longer, becoming highly skilled, and distinguished themselves in the field. A study of ranger job performance pre and post the Equity Act and mandatory conscription as related to rates of poaching would be of interest to determine if it resulted in any consequential differences in ranger effectiveness. Furthermore, an analysis of the effectiveness and fairness of the promotion system at KNP, which is based primarily on a supervisor's recommendations rather than a formal civil service test, would help assess the efficacy of this practice.

The question of how much technology was available and used in the reserves resulted in several interesting findings. These included the use of Cyber Tracker in TMNP and ultra-light aircraft in KNP. This was not mentioned by the other parks visited by the researchers. This raises the question of whether or not these technologies have reduced poaching, thereby protecting the country's natural resources. It would be of interest to examine trends in apprehension rates of poachers prior to and after the application of these new technologies.

Finally, an interesting issue was the willingness of some private and public sector field rangers to use some innovative solutions to apprehend and sanction poachers. The private sector rangers included in this study consisted of a diverse mix of individuals including former soldiers and public sector field rangers, and graduates from private training schools. These rangers felt less inhibited by the restrictions of the civil service, appeared to be very motivated, and willing to use discretion if they apprehended a young, amateur poacher rather than a career offender. This could be a function of their higher salaries or more informal management practices in these smaller private reserves. At the public Jonkershoek Nature Reserve, the small and obviously understaffed ranger unit also appeared very dedicated to their job and employed some creative methods by enlisting local residents of the neighboring communities as informants of suspected poachers. Their innovation may be a function of the need to compensate for the lack of human resources in their reserve, but it also works as a proactive method of preventing poaching. This finding warrants further investigation as we found just a few instances of a willingness to use discretion when dealing with offenders and innovative solutions to identify poachers. The key issue is whether or not these practices lead to a decrease in poaching at the reserves.

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