

South African Conservation Crime and Routine Activities Theory: A Causal Nexus?

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by

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ABSTRACT

The recent wholesale slaughter of rhinos in South Africa has unceremoniously thrust conservation crime into the news. Not only is the wanton massacre of these animals abhorrent in itself, but it becomes even more so when one considers that they are generally being decimated on managed protected areas and nature reserves. During 2010, for example, 333 rhinos were poached across South Africa, 146 of them from within the precincts of the Kruger National Park, South Africa's premier wildlife conservation area. By April 2011 South Africa lost a further 114 rhinos to poaching and current estimates are that we will on average be losing one rhino per day. Conservation law violations encompass many offences against the natural environment, a common one being wildlife poaching. Previous research has often described the extent and impact of poaching as well offender behaviour. While it has indisputably contributed to an understanding of this crime phenomenon and what motivates poachers, more research is needed to examine why protected conservation areas are so easily penetrated and wildlife populations victimised on a regular basis. Theory-based studies focusing on all the elements of a crime should add to the understanding of poaching. This qualitative enquiry examines the efficacy of Routine Activities Theory to explain poaching on protected conservation areas in South Africa. Data collected at conservation areas threatened by poaching were analysed by means of the theory. Wildlife custodianship problems were identified with a view to both developing a framework for understanding the challenges being faced in this arena and empowering policy makers to more resourcefully initiate intervention strategies and control illegal hunting on these conservation areas.

INTRODUCTION

South Africa is a nation with a remarkable recent history. After undergoing a peaceful transition from an apartheid regime to a truly unified and democratic society in 1994 a period of economic growth was concomitantly ushered in by this era of political change. The expansion of the tourism, mining and finance sectors brought considerable wealth to some segments of the country (Meredith, 2005). Yet during this period, the nation was also beset by a staggeringly high crime rate (Glenny, 2008) and high unemployment among large segments of the black majority (Statistics South Africa, 2007). While the soaring violent and property crime rates in the post apartheid era negatively impacted the South African populace, protected wildlife in national parks, game reserves and farms were also increasingly victimised by opportunistic offenders seeking profit from poaching (Warchol, Zupan & Clack, 2003). Unsurprisingly less attention was afforded to conservation crimes due to rampant conventional crime and the need to protect human life. Consequently since the mid 1990s, crimes against wildlife, including illegal hunting, have endured and spread across more conservation areas (Pillinger, 2003; Warchol & Johnson, 2009).

Some may argue that crimes against wildlife have little impact on society. However, this is definitely not the case in South Africa where the crime of poaching goes beyond the threat to the survival of certain species, affecting several aspects of society. Illegal hunting negatively impacts the tourist industry, which relies heavily on revenue generated from public and private game reserves. A prosperous conservation area with diverse and significant wildlife populations attracts tourists whose money supports the reserve and subsequently creates jobs for local residents in and nearby the area. Reductions in the populations of certain high profile species (rhino, elephant, buffalo, etc.), animal carcasses in view of tourists, and the potential for violent encounters between visitors and poachers seriously detract from the tourist value of a conservation area. Furthermore, hunting wild game for victuals, better known as bushmeat, has been linked to zoonosis (the transmission of diseases from animals to human populations) in Central Africa (TRAFFIC, 2002). Moreover, previous research has recognised that certain types of poaching – ivory, rhino horn, birds, abalone and

select plant species (cycads) – is often the domain of organised criminal groups (Irish & Qhobosheane, 2003). This form of crime flourished in post-apartheid South Africa forcing the government to focus on policing street crimes (Glenny, 2008), which in turn provided an opportunity for transnational crime networks that deal in any form of valuable commodity, including wildlife, to move rapidly and exploit the opportunities presenting in South Africa.

In order to identify the causes of poaching and develop solutions, earlier research focused on this problem. Studies attributed poaching to, amongst others, poverty in African communities resulting in individuals hunting for food or profit (Jackson, 2008; Knecht, 2006), or overseas demand for exotic animals as live pets or their constituent parts for use as traditional medicines and decorations (Warchol, Zupan & Clack, 2004). Several researchers applied economic theories to understand the problem, focusing on supply and demand (Wilkie & Carpenter, 1999; Bulte & Horan, 2002). Other studies, though fewer in number, have examined poaching by the application of criminological theory focusing on offenders (Eliason, 2003; Eliason & Dodder, 1999). While this has helped develop an understanding of what motivates individuals to poach, less has been done to examine why protected conservation areas specifically are so easily penetrated and their wildlife populations victimised on a regular basis. Therefore, this empirical enquiry takes an alternative approach by examining the potential of Routine Activities Theory to explain poaching on protected areas in South Africa. Data was collected over a period of three years (2008-2010) via interviews and observations at seven conservation areas threatened by poaching and analysed using said theory. Several causal factors were isolated through the analysis together with their related policy implications for controlling illegal hunting on conservation areas.

THE LITERATURE

Poaching is defined as a game law violation (Beattie, 1976); the unlawful taking of wildlife from a landlord's property (Siegel, 2007); and the taking of a game animal out of season or through illegal means (Clifford, 1998). Poaching was first criminalised in England during the Middle-Ages when wild game became the property of wealthy landowners and the Crown. With the creation of poaching laws, the economic needs,

cultural traditions, and customs of the working classes often clashed with the interests of the wealthy citizens and the state to the point where some people openly disregarded game laws and treated poachers as heroes, even protecting them from the authorities (Jones, 1979).

Similar to England, the documented history of poaching in Africa dates back to its colonial period, where with the advent of new poaching laws, the economic, social and cultural values of the indigenous populations often conflicted with the Europeans who enacted them (Steinhart, 1989). Poaching in Africa is done for a variety of reasons, the most general one being to obtain meat which is commonly known as bushmeat (TRAFFIC, 2002). Bushmeat hunting is widespread and is undertaken on both an individual subsistence and commercial level in South Africa where poachers sell their catch in local villages (Jackson, 2008; Knecht, 2006; McMullan & Perrier, 2002). Poaching is also done to obtain plants, and live animals, generally birds and reptiles (Herbig 2003), for collectors of exotic and rare pets, and to a limited extent, for sport hunters illegally pursuing trophy game in national parks (Davis, 2005). Finally, and perhaps the type that is most well publicised, poaching is done to supply specific animal parts such as ivory tusks, horns or pelts for sale as decorations or traditional medicines (Warchol, et al, 2003). Lately rhino horn is being passed off as a cure for certain cancers in the middle-east resultantly fetching exorbitant prices (Rhino horn myths: then and now, 2011; Swart 2011).

Past research has also classified the motivations of poachers (Muth & Bowe, 1998) and offered explanations for the phenomena via different theoretical approaches. These included explanations of the bushmeat trade based on economic supply/demand models, examined bushmeat consumption and sustainability (Wilkie & Carpenter, 1999; Muchaal & Ngandjui, 1999; Robinson & Bennett, 2004), the relationship between population growth and overexploitation (Bulte & Horan, 2002) and changes in hunting practices (i.e. from snaring to using firearms) based on increased demand for the animals (Damania, Milner-Gulland & Crookes, 2005) or as a means of income (Loibooki, Hofer, Campbell & East, 2002). Other studies even concluded that imperfect labour markets coupled with static agricultural production subject to environmental

shocks led to increased poaching (Barrett & Arcese, 1998). Further research has concentrated on the prevention of poaching rather than identifying the causes (Rowcliffe, deMerode & Cowlshaw, 2004).

Interestingly, although poaching is a crime, explanations of it through criminological theory are more limited in number. Eliason (1999), pointing this fact out discussed different methodological and theoretical approaches to further contribute to the literature. Neutralisation Theory was employed to explain how poachers in the United States rationalised their actions (Forsyth, 1993; Eliason & Dodder, 1999) and as “a cognitive dissonance reduction strategy, whereby individuals who use it are able to successfully alleviate guilt that would normally be associated with law violating behavior by neutralising any definition of themselves as criminals” (Eliason, 2003, p. 225). Neutralisation Theory was also used to explain poaching in Canada, finding that violators avoided and manipulated existing laws and that poaching became a part of the social structure (McMullan & Perrier, 1997; 2002). General Deterrence Theory was used by Milner-Gulland & Williams (1992) to model poacher behavior who found that organised hunters were only deterred at very high levels of enforcement and concluded that penalties should be related to the “quantity of output of a poacher” (p. 397). Hilborn, et al's. (2006) longitudinal study found that since 1977, expanded law enforcement budgets and anti-poaching patrols in the Serengeti National Park in Tanzania allowed populations of certain animals to rebuild. While these studies have contributed to understanding various types of illegal hunting, the existing literature has been somewhat fragmented in providing the academic community and policy makers with a comprehensive understanding of the juxtaposition of all the contributing elements to poaching. Another approach may help facilitate a better understanding of the phenomena.

Routine Activities Theory

Routine Activities Theory (Cohen & Felson, 1979) contends that crime is opportunistic and dynamic in nature. It suggests that crime is more likely to occur, though not inevitable, when three conditions are satisfied: (1) the presence of a motivated offender,

(2) the presence of a suitable target, and (3) the absence of capable guardians (Felson in Shane, 2010). The presence of a motivated offender is a given; the theory presumes an offender is predisposed to acting on his or her criminal inclinations, for without an overt act, there would not be a crime. In other words people are regarded as inherently self-centered and hedonistic – prepared to steal. Once an offender is sufficiently motivated, they must find/encounter a suitable target. Suitable targets typically exhibit four qualities that structure an offender's choice in selecting it: (1) value, (2) inertia, (3) visibility, and (4) access (Felson, 1998). Different types of offenders see value (or desirability) from different perspectives, which can be elucidated upon by using an archetypical crime example contrasted in each case with its conservation crime equivalent. Joy riders and carjackers, for instance, target cars that have a high symbolic value (e.g. fast/powerful, sporty, popular), whereas professional thieves go after vehicles or vehicle parts that are easily converted to cash. By the same token bushmeat poachers will target species that provide suitable sustenance while the more professional/organised poacher will target animals with a high value parts and a ready market such as rhino horn, elephant tusk or abalone flesh. Value is, therefore, dependent upon the person assessing the object and does not depend on the actual economic worth of that object. Inertia refers to the target's weight or size and how easily it can be carried away or disposed of. In the case of a whole car, it is inherently mobile and can be easily moved around. As for vehicle parts, most of them can be quickly removed and transported or disposed of, which partly accounts for why auto stripping is such an attractive crime. Similarly an animal poached for bushmeat is easily and quickly dissected and disseminated while horns and tusks are also easily moved and rapidly disposed of. Visibility is the degree to which the target can be seen and clearly identified and/or whether or not the offender knows that the target is there. Quite obviously, a car is easily spotted while parked at the curb or at a parking facility by someone on foot, on a bicycle, or while slowly cruising through the area. Wildlife is also easily spotted or located, particularly when suitable habitat, home ranges and/or feeding areas are taken into consideration. Accessibility relates to an offender having access to the target, and if they can retreat or escape. Because the overwhelming majority of vehicles are stolen from an outdoor location, they can be easily accessed. Thieves can

also gain interior access rather easily by defeating the often primitive locking systems with very rudimentary tools. Wildlife can also be accessed with relative ease in their natural habitat, which simultaneously provides good cover for poaching and escape. The last segment of Routine Activities Theory is the absence of capable guardians. The motivation to commit a car theft follows Hirschi's (1969) line of thought that crime occurs when controls are weak or absent. When temptations are high and controls are low, a motivated car thief can strike more easily with the reduced probability of being caught. A capable guardian is not necessarily a formal agent (e.g. police officer or security guard), but anyone who can serve as a reminder that someone is watching who may be able to identify the offender (e.g. peering citizens, building superintendent, parking lot attendant, store owner) or other physical deterrent such as a fence or security system. Since most vehicles are stolen while unattended, it is understandable how thieves can strike quickly and leave without a trace. This applies *mutatis mutandis* to wildlife.

Routine activities themselves are defined as "the day to day activities that characterise a particular community. In disorganised communities, the routine activities are such that they practically invite crime" (Walsh & Ellis, 2007, p.66.).

The theory is, at least in part, conterminous with the Rational Choice perspective (Cornish & Clark, 1987; Burke 2009), since one of its core assumptions is that individuals make rational decisions to commit crimes (Walsh & Ellis, 2007), weighing up both the benefits and risks associated with crime before deciding to engage in the criminal event. Unlike other theories that may concentrate on the offender, Routine Activities treats the motivated offender as only one element of the criminal event, looking at other factors that contribute to the crime equation. To start with, the premise is that crime occurs in a social system (Winslow & Zhang, 2008), where criminals feed on and depend upon the patterns of everyday life. It also looks at the structural conditions that may explain the distribution of crime in society. Furthermore, it is not concerned with the personal histories of offenders. Instead it considers the crime's situational characteristics and the involvement of particular persons or objects as well as the target's degree of attractiveness in the context of levels of guardianship (Cohen & Felson, 1979). Its focus on the three key elements of the criminal event has led to it

being applied to explain a variety of offences. For example, Wright and Decker (1994) examined residential burglary via Routine Activities Theory. Mannon (1998) applied the theory in his study of domestic violence while Messner and Tardiff (2006) analysed how socio-demographic characteristics in conjunction with time of day, week and month related to urban homicide via Routine Activities Theory. Akers and Sellers (2004) are, furthermore, of the opinion that the theory has played an important role in illuminating internet crimes and natural disasters. Finally, studies have expanded the theory to focus on offenders, not just the nature of victimisation (Gilbertson, 2006; Meith & Meier, 1994). The Routine Activity Theory is obviously not without criticism. Eck (2003), for example, submits that Routine Activity Theory cannot explain problems, but neither can theories that address fewer elements. Nevertheless, it can help develop a framework for understanding problems.

The Routine Activities Theory, it is submitted, may well provide a suitable and unique theoretical framework for examining poaching on conservation areas. As a rule South Africa's game reserves are located in close proximity to human populations, often with high unemployment and crime rates providing a pool of motivated offenders. Capable guardians refer to the compliance management staff and the natural and man-made barriers in the conservation areas. Finally, suitable targets are the wildlife. As with humans, wildlife follow, or are at least predestined to follow, very predictable patterns of behaviour during their day to day activities.

METHODOLOGY

The Research Sites

Although unfeasible to portray in any great detail, the data for this study were collected at seven sites (see Figure 1) located in the Limpopo, Mpumalanga, KwaZulu-Natal, and Western Cape Provinces of South Africa.

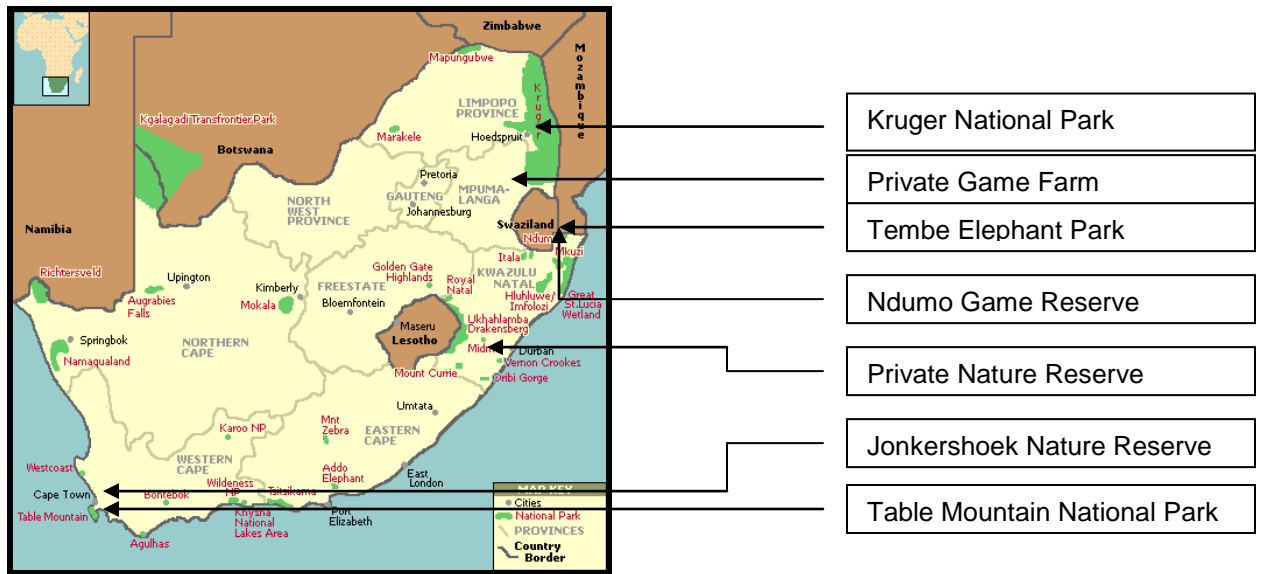


Figure 1 – pictorial orientation of the relevant study sites

The study sites included two national parks, three provincial parks, and two private game/nature reserves. These sites were selected for the following three reasons: 1) the sites were all located in close proximity to human settlements with their populations of potential motivated offenders (a situation commonly encountered in South Africa); 2) the sites varied in size, ownership and type of wildlife allowing for interesting comparisons; and 3) the sites provided excellent cooperation with the researcher allowing access to relevant compliance management personnel and criminal investigators.

The national parks comprised Kruger National Park (KNP) and Table Mountain National Park. KNP is essentially located in the Limpopo Province bordering Mozambique to the east and Zimbabwe to the north. Being a sizeable park of approximately 19,000 square kilometers, KNP has extensive wildlife populations, for example, 147 mammal species, 2000 plant species and over 500 bird species. The populations of the so-called high profile or status species includes roughly 14,000 Elephants, 150,000 Impala, 3,800 Warthog, 17,000 Wildebeest; 5,000 White Rhino; and 32,000 Zebra (South African National Parks, 2008a). Needless to say other somewhat less common species also present in significant numbers. Table Mountain National Park, located in the Western Cape Province, is approximately 221 square kilometers in

size and includes an extensive ocean shoreline. Its wildlife populations include large and small mammals such as Eland, Red Hartebeest, Cape Mountain Zebra, and Cape Fox, numerous reptile, amphibian, insect and bird species, and marine life in the Table Mountain National Park Marine Protected Area. This region is home to some high profile marine species such as Abalone (Perlemoen), Rock Lobster (Crayfish), Hake, Cape Salmon, Snoek and of course the Great White Shark

The smaller provincial parks included Jonkershoek Nature Reserve, Ndumo Game Reserve and Tembe Elephant Park. Jonkershoek, which is about 9,800 hectares in size, is also located in the Western Cape Province. The reserve's mammal population includes Leopard, Honey Badger, Baboon, Klipspringer and an assortment of smaller animals such as mice and shrews. It is also home to a variety of lizards and more than 1,100 plant species, many of which are either indigenous or endemic and exceptionally rare (Cape Nature, 2009). Tembe Elephant Park is located in northern KwaZulu-Natal and is approximately 20,000 hectares in size. It forms part of the border with southern Mozambique with its primary attraction being the resident population of approximately 220 Elephants. It is, however, also home to numerous other species including common grazers and browsers along with the *big five* – Lion, Leopard, Buffalo, White Rhino and of course Elephant (Tembe Elephant Park, 2004). Adjacent to Tembe is the 10,000-hectare Ndumo Reserve also bordering Mozambique on the Usuthu River. Although Ndumo lacks Lions or Elephants, its wildlife population includes more than 420 bird species, as well as dynamic populations of Hippo, Giraffe, Black and White Rhino, Leopard, Red Duiker, and numerous other small mammals (Kohler, 2004).

The final two sites were a private nature reserve located in southern KwaZulu-Natal and a private game farm, which is approximately 80 kilometers south-west of the KNP (the names of both concerns are withheld at the request of their management). Both of these are privately owned operations with the 6,000 hectare nature reserve catering to tourists, while the game farm is a small commercial operation that breeds common and endangered wildlife for sale to other game reserves. The reserve supports the *big five* along with a variety of smaller mammals, though in fewer numbers than at the other public reserves and parks. The private game farm was the smallest of the

sites at just a few hundred acres. Its wildlife population, which includes Rhino, Giraffe, Kudu and Impala, is considerably smaller due to its reduced size.

Sampling and Interviewing

The research sample (n = 34) consisted of those individuals identified as being directly involved, and specialising in, monitoring and preventing illegal hunting, and apprehending poachers – approximately 75% of the entire enforcement/compliance management corps available at the research sites, but excluding those whose function was not predominantly enforcement/guardianship focused (e.g. extension officers, administration and maintenance staff, and so forth). The sample included the managers of field ranger units, supervisory section rangers, anti-poaching rangers and criminal investigators. While all the sites maintained a ranger staff, their organisation fluctuated depending on the park and the nature of the poaching threat. For the sake of perspicuity, larger game parks (such as KNP and Table Mountain National Park) are often divided into sections headed by a supervisory ranger, i.e., a section ranger. This individual commands a staff of field rangers of varying number depending on the size of the park, who patrol a designated section. Section rangers are responsible for ensuring that their area is patrolled; illegal incursions are prevented or detected; and intruders are apprehended (South African National Parks, 2008b). Section rangers often assimilate a very detailed overall picture of the state of poaching in their region. Resultantly, they are excellent sources of information on poaching and park security. Anti-Poaching Units or APUs are highly specialised units consisting of well-armed and trained field rangers particularly proficient in detecting, tracking, confronting and apprehending poachers. They are distinctly paramilitary oriented whose mission includes the use of deadly force. Such or similar anti-poaching units are operating in the national and provincial parks as well as in the private game reserves affected by illegal hunting, however, not all conservation areas have dedicated APUs. In the KNP for example, all their field rangers act in this capacity due to the heavy poaching pressure on the park. Only the private game reserve employed an APU at the time of this research. Criminal investigators also play a role in wildlife conservation. In this study, only KNP maintained an intelligence unit called the corporate investigation

service or CIS. This highly specialised and talented unit supports the section rangers by intelligence gathering inside and outside the park, threat analysis, poaching data collection, crime scene (poaching) investigation, and counter-poaching operations.

Purposive sampling was used in this research endeavour, which by its very nature requires the use of individual judgment, knowledge, and needs to identify those individuals for inclusion into the sample. While this strategy is a non-probability method, it has been used successfully with a very small margin of error in, amongst others, predicting elections and for marketing studies. Though this method cannot guarantee a perfectly representative sample, the use of in-depth semi-structured interviews and observations, combined with secondary data analysis and triangulation nevertheless culminated in a detailed analysis of the poaching phenomenon via Routine Activities Theory.

Interview questions were formulated based on the premises of Routine Activities Theory, a review of the available literature on poaching, the researcher's past experience scrutinising wildlife crime, and consultation with known experts regarding the nature and extent of the poaching at the various sites. Professor Greg Warchol's (Northern Michigan University) invaluable contribution in this regard is graciously acknowledged and appreciated. Interviews were conducted on-site¹. Each interview was in-depth and focused on the following: 1) the wildlife targeted by poachers; 2) the level of poaching at the particular site; 3) the causes of poaching and motivation of offenders at the site; 4) the nature, organisation and tactics of the poachers at the site; 5) the size and structure of investigative, ranger and APU units and physical security in the conservation area; and 6) the capacity of the rangers and APU units to detect, apprehend and deter poachers. To protect the identities of the subjects, the field notes were constructed without reference to names, and, as previously stated, the names of the private concerns omitted on request. A system of numeric codes was employed to identify the subjects and their responses. In addition to the field interviews, on-site

¹ The interviews lasted between 45 and 90 minutes in duration. All subjects were informed of the purpose of the study, the voluntary nature of their participation, and the protection of their identities. None of the subjects declined participation in the study. Responses were handwritten and reviewed each evening.

observational and secondary data were also collected to verify the interview data as far as possible. Observation was used to record data about the physical features of the conservation areas². Besides the time spent at the actual research sites, information was also sourced autonomously from the surrounding areas near each site, including from the small communities and towns.

This data was recorded using photographs and field notes describing the features of interest³. Secondary data on poaching, including statistical summaries, law enforcement intelligence reports, and policy manual excerpts were also collected. The data analysis phase involved a physical and relatively protracted content analysis of the interview responses, field notes, photographs and secondary data. This involved first identifying then classifying the patterns in the data. Another necessary requirement was to verify the reliability of the data via triangulation. For example, the interview responses of subjects were verified/authenticated by using secondary data and by personal observations. Field observations recorded by photographs helped verify and add information to the original data collected during the interviews. This was followed by a determination of the significance of the findings, then their subsequent interpretation in the context of Routine Activities Theory.

RESULTS

Motivated Offenders

The concept of motivated offenders was operationalised as the poacher, which included both employees who pilfer from the reserves and interlopers who illegally enter a reserve to hunt. According to Cohen and Felson (1979), motivated offenders, which they are not particularly concerned with (Williams & McShane, 2010) were a product of socially disorganised areas. While Routine Activities Theory does not focus on the

² Observation was done by examining the physical layout of the site including its size, type, condition of the game fences, and the type of terrain. The data were recorded in field notes and photographs. The researcher spent 1 day each at the private nature reserve, Table Mountain and Jonkershoek; 2 days at Tembe and Ndumo; 3 days at the private game farm; and 1 week at Kruger for data collection and observation purposes.

³ Photographs were used to improve the researcher's recall of the physical features of the site observed and recorded in the field notes. No human subjects were included in any photographs.

offender per se (they are assumed present by Cohen and Felson), it was deemed prudent to provide a description of them in this treatise as this study is, as far as could be ascertained, the first to assess the potential of the theory to explain illegal hunting on protected areas in South Africa. Some descriptive information on the nature and motivations of these offenders might thus be beneficial for this and future studies of poaching.

The interview and secondary data revealed that motivated offenders were present at or near all of the research sites. This was partly due to large human populations living in close proximity to the conservation areas with desirable wildlife, very high unemployment rates (Statistics South Africa, 2007), views that wildlife is a resource to be used rather than protected (Warchol, et al, 2003), and the existence of formal claims against some parks contending that it was once tribal land (Herrington, 2008). KNP, for example, has approximately four million people living in villages and towns in close proximity to the park on all four sides, providing an ample amount of motivated offenders and a ready market for illegally hunted bushmeat. KNP's own literature acknowledges the presence of a significant bushmeat-poaching problem (South African National Parks, 2008b). Schneider (2003, p.588) in point of fact states that '[t]heft of more exotic property, such as endangered plants, animals, and their parts, occurs as a result of these same dynamics – thieves, poachers, and handlers trade these items because somewhere there is a handler who has people ready and willing to purchase the ill-gotten goods'. A similar situation was found near Ndumo and Tembe where large human populations were also present, though not to the same extent as KNP. An open-air bushmeat market was discovered and visited in the Mbangweni Corridor, which separates the two parks terminating at the Mozambique border. Bushmeat was also observed at the open-air stalls in the neighboring town of Jozini. Interviews at the conservation sites revealed that some of the game meat sold at these markets came from the nearby reserves. While the existence of offenders was a constant, considerable variation was found regarding their motivations, methods and types of wildlife being poached. Offenders included subsistence and commercial bushmeat poachers; ivory or rhinoceros poachers supplying buyers (middlemen) with

tusks or horns for eventual resale to foreign syndicates; abalone poachers in the Western Cape; and private collectors poaching rare plants, insects and reptiles.

The data from the interviews, supported by reports such as Pillinger (2003) and SANParks (2008b) revealed that subsistence bushmeat hunters were the most common type of poacher at all the sites with the exception of Jonkershoek Nature Reserve and Table Mountain National Park. Jonkershoek was targeted by plant and reptile poachers who were mainly professional collectors from Europe and Asia while Abalone poaching was the main threat to Table Mountain National Park with its contiguous coastline and ideal Abalone habitat. Subsistence bushmeat poachers were typically lower income or unemployed indigenous South Africans or Mozambicans possessing good hunting skills illegally entering the parks and killing game to feed themselves and their family. Most of these poachers were local residents who poached in close proximity to the sites often walking to the conservation area. They hunted mainly by setting small numbers of snares and occasionally utilising small caliber firearms or bow and arrow. Also present were commercial bushmeat poachers who supplied the local market with wild game meat – an item in great demand (TRAFFIC, 2002). Demographically similar to subsistence poachers, they operated alone or in small groups employing larger numbers of snares or firearms (for larger game such as hippos) sometimes combined with dogs to drive game into a killing zone.

Ivory and Rhino hunters were sometimes individual offenders, but more typically groups of poachers using larger caliber military weapons (SANParks, 2008b). These poachers were found mainly in Kruger, Ndumo and Tembe due to the availability of Elephant and Rhino and the large size of these parks. Finally, Abalone poachers, present only at Table Mountain National Park because of its coastal Abalone colonies, comprised a range of offenders. Abalone is in very high demand for both the South African market and for shipment to Asia. A section ranger at Table Mountain National Park described these poachers as a mix of opportunistic local fishermen, white South African certified divers, and more commonly, gangs of untrained divers desperate for income recruited from the large and impoverished informal settlements in and around Cape Town. The purchase of and thriving trade in Abalone was mainly the domain of

several Chinese Triads operating in the area, informally known as the Abalone Coast (Redpath, 2001; Warchol, et al, 2003).

Private collectors were individuals motivated by the desire to increase their own collections of rare species – mainly plants, insects and small reptiles. They were primarily individuals from Eastern Europe and Asia. This was the most common type of poacher at Jonkershoek Nature Reserve, but also present to a lesser extent at Table Mountain National Park. These individuals were described as educated foreigners working in small groups of two or three. Recent arrests of plant poachers at Jonkershoek revealed that several were well-known biologists and academics.

An interesting finding was that motivated offenders also included park employees poaching for bushmeat, ivory and Rhino horn. These individuals were motivated by the opportunity to earn money from selling game meat to local villagers or ivory or horn to traffickers. In KNP, instances of park staff illegally hunting have been previously recorded. In the more serious cases described by several interviewees, one Kruger Park ranger was arrested for shooting twenty (20) white rhinos and another admitted to killing nearly four dozen over a twelve-year period to pay gambling debts. In another instance at KNP, two interpretive guides on a “day walk” with a group of tourists spotted a White Rhino on their tour. They later returned after dropping off their guests and shot the animal for its horn. Evidence of complicity between rangers and poachers in the parks was also reported. A KNP interviewee described the following strategy: “The ranger calls his family and tells them where his unit will deploy for the patrol. They [his family] tell the poachers who target other areas. Others use their mobile to tell them where the animals are. The ranger gets a share of the meat or the profits. Simple.” Corroborating the foregoing sentiments Naude (2002) reports that there have been occasions in Zululand where members of the Game Guard Force have been involved in illegal hunting and that game wardens in the Kruger National Park have been apprehended for slaughtering game and disposing thereof for personal gain.

Interviews at the private game farm revealed that management practices on some private commercial game farms also contributed to the creation of motivated offenders. Private commercial game farms in South Africa are primarily white-owned

operations. While the owner of this particular concern lived on the site and managed daily operations, owners of some neighboring private game farms in the area were absentee landlords. Some of these owned multiple properties and employed managers to run the daily operations of their farms. It was, however, reported that farms with absentee owners and/or inefficient or corrupt managers were far more likely to be targeted by poachers. In fact, the data revealed that there have been cases in which game farm managers have actively participated in illegal hunting by working with a poaching gang for a share of the profits. The owner of the private game farm summed it up by stating: “Ninety-nine percent of game farm poaching is due to bad management. Too many farmers aren’t concerned about security. If the landlord is absentee, the farm manager can tell them anything”.

Finally, how a manager compensates employees was also identified as a motivating factor in employee-based poaching. The interview with the owner of the private game farm revealed that farm employees were often paid in both cash and groceries. However, he noted that few managers provided employees with quality game meat from common species even though it was highly desired. This finding relates to the earlier discussion in the literature about the privatisation of game and the passage of the earliest poaching laws. An interviewee at the private game farm also noted: “Blacks typically get very little from the game farms – low pay and the worst part of any animals, if they get any. If a white wants to kill a Lion, he can afford to do so, legally. If a black wants to hunt Warthog traditionally, common for them, he has to do it illegally”. As a result, employees of some private farms poached game from their owners – a form of employee pilferage. Simply by providing his workers with quality surplus game, the owner of the private game farm alleviated some of the employee poaching on his farm. The private game farm’s owner summed it up by stating: “They want protein, good meat. Slaughter a couple of Impala and give it to them every month and it keeps them from poaching two or three times as many.”

One Kruger Park administrator submitted that: “Where there is wildlife, there will be poaching.” Confirming the view of other interviewees, he argued that the combination of the high demand for protein, population increases, unemployment and severe poverty

among many rural black South Africans near the sites were very significant motivating factors for poachers to hunt for bushmeat. This was also apparent with the Abalone poachers in the Western Cape. Many of the desperate township residents, who lacked any training in diving, literally risked their lives in search of income. Furthermore, the lure of a potentially high payoff for a Rhinoceros horn or Elephant tusk, even among field rangers charged with protecting these species, was identified as another strong motivating factor to take the chance of killing either of these animals and trying to sell its parts. Employee poaching illustrates a unique occurrence, namely capable guardians of wildlife becoming the motivated offenders. Finally, the desire among foreign collectors, some of whom are professors and scientists, to possess those rare plant or insect species motivated them to steal.

Suitable Targets

Cohen and Felson defined suitable targets as things that are, or at least appear, valuable and therefore worth stealing (Williams & McShane, 2010). As previously alluded to, the concept of suitable targets was operationalised in this study as the desired wildlife species sought after by poachers. These include the full range of wildlife from common mammals such as antelope or Hippo for the bushmeat trade, Rhinoceros and Elephant for their horns and ivory, Abalone, and rare and endangered plants and reptiles. All of the wildlife species were considered very valuable commodities for consumption and trade in the local and international market. All seven sites experienced problems with poaching though as noted previously, the nature of it varied by locale due to species (or suitable target) availability. The interview and secondary data collected at KNP revealed the existence of the most serious poaching problem, which included extensive bushmeat and, though less common, rhinoceros poaching. For example, KNP ranger supervisors reported to the researcher that the park lost 15 Rhino to poachers between January 1 and May 1 of 2008. The species targeted for bushmeat, the most common type of poaching in KNP, were more often the smaller grazing species such as Duiker, Warthog and Impala that were abundant throughout the park.

Poaching was also reported to the researcher as a serious problem at Ndumo Game Reserve. The interviews and statistical data revealed that the park was under heavy pressure from organised gangs of poachers striking on a regular basis. The park's wildlife population, which included Hippo, were very attractive targets for bushmeat poachers given the large amount of meat they provide. Data from 2005 revealed that the Hippo population had declined dramatically from an estimated 600 animals to an estimated 227 in just two years. Poaching was also identified as an increasingly serious issue at Tembe Elephant Park. Tembe's size at over 20,000 hectares, difficult sandy terrain, predators and potentially aggressive elephants further hinders the prospective poacher's attempts to locate smaller mammals for game meat. The lower level of poaching at Tembe appeared to be due to the fact that it was simply easier to target nearby Ndumo where the probability of finding suitable prey with less risk was much higher. Furthermore, given that the Elephant population at Tembe represents KwaZulu-Natal's only remaining population indigenous to the province (Tembe Elephant Park, 2004), significant protection was afforded to them by the field rangers.

Interviews at the private game farm revealed that although it had been targeted by poachers over the past few years, they had yet to be successful in killing any game. As discussed later on in the presentation, this was attributed to the effectiveness of the aggressive field ranger staff and proactive management practices emphasising security (minimising external threats) and deterring internal poaching by employees. However, staff and management of this concern reported that the neighboring commercial game farms were often targeted successfully by poachers. This was in a large part due to the perfunctory management practices discussed earlier. Private game farms such as the one in question are commercial operations that breed rare and endangered wildlife, but also have very small populations of more common game such as Impala regularly targeted by poachers. Though these populations may be small, the farms are also very small at just a few hundred acres, which makes locating game quite easy when compared to an enterprise such as Tembe. At the private game farm, the respondents indicated that the primary concern was the poaching of rare animals. The protection of these valuable animals was considered paramount to protecting their common grazing

species, which were nevertheless a target for poachers. Even so, due to the extensive amount of protection afforded to these high value species, the owner and rangers stated that poachers had not been able to kill any type of animal on their property. Finally, both Jonkershoek and Table Mountain National Park reported serious problems with poaching that they attributed to their very small field ranger staff and subsequent inability to thoroughly patrol the parks. These two locations were targeted for their highly desirable species of plants, reptiles, and insects, and at Table Mountain, also its marine organisms.

In sum then, all seven research sites offered a diverse array of suitable targets that held significant monetary and/or personal value to the motivated offender. These included the smaller mammals for bushmeat consumption and sale; Elephant and Rhinoceros for the international trade in ivory and horn; Abalone in demand in both South Africa and Asia; and the small reptiles, insects and plants sought after by collectors. Variation was found in the size of the suitable target populations by site and also by species. For example, while all the sites had mammal populations, both private concerns lacked the plant, reptile and insect species favoured by collectors, and only Table Mountain National Park contained several Abalone colonies.

The Absence of Capable Guardians

The final component of Routine Activities Theory is capable guardianship, which essentially refers to the amount of protection afforded to the target by a person or physical barrier. In this study, the concept of guardianship was operationalised as having three components. These were (1) game fences; (2) natural obstacles including terrain and dangerous wildlife; and (3) the field rangers/compliance management staff including their supervisors.

Even prior to coming across a game fence, the first guardian that may be encountered by poachers approaching from outside a park could well be a natural barrier. Only Ndumo served as an example of a location with an external natural barrier providing a level of guardianship. Its northern border lies on the Usuthu River across from Mozambique, which is the home of many poachers who target the reserve. The

interviews with park staff revealed that during the wet season when the river is high, crossing is more difficult thereby deterring offenders from Mozambique. Conversely, it was repeatedly stated during the interviews that the absence of this capable guardian during the dry season did influence poaching in Ndumo leading to more losses of wildlife. However, the other sites lacked any significant external natural barriers and could be approached by simply walking or driving up to the game fence.

Game Fences

Once any external natural barriers had been overcome, the next guardian encountered by an intruder would be the game fence, which was used at all sites. Although fencing defines ownership and the boundaries of a location, it only provides a limited deterrent in terms of site access as they are mainly designed to prevent animals from leaving. Existing fencing at all the sites typically consisted of heavy gauge wire mesh that stood approximately 3.5 meters in height, supported by mostly wooden posts. Sections of game fence were sometimes electrified to prevent animal egress rather than to prevent intruders from entering. The majority of the fence lines also had standoff zones – an area of approximately three meters on each side of the fence where the brush is cut back allowing for unobstructed perimeter surveillance. In the KNP, one eastern section of the park, employed no fence whatsoever at the border with Mozambique. In its place, the park relies on a heavy growth of the potentially invasive shrub, Sisal (*Agave sisalana*), a very large dense plant with serrated leaves somewhat similar in appearance to a Cactus or Cycad Palm, to define the boundary and present an obstacle to intruders. Describing the Sisal barrier, one ranger mentioned that, “It stops the animals, but not the Mozis [slang for Mozambicans]. They just hack a path through it with a panga and they’re in”.

Even though perimeter fences are generally quite high and occasionally electrified, they have a very limited deterrent effect on humans. Data from interviews and observations revealed that they only presented a minor obstacle to the motivated offender. Respondents indicated that entering a protected area offered little challenge to the poacher. Electric fences, by their very nature, were not always functional and even if they were, intruders simply shorted them out, cut the wires and/or dug a shallow

depression under the fence to gain access to the park. Other techniques included tearing down entire sections of fence which happened twice in Ndumo. In early 2008, local residents tore down about 11 kilometers of the game fence on the eastern border of Ndumo as part of a land claim dispute (Herrington, 2008). Additionally, overgrown brush close to the fence in some sections of Ndumo impaired surveillance of the perimeter and there were usually insufficient guards to engage in proactive patrols. Somewhat ironically, bushmeat poachers, who commonly rely on snaring to capture animals, would often construct their snares out of the very wire that they had cut from the fence.

Natural Barriers

Once inside a park, an intruder may encounter more natural barriers hindering movement. Examples of this were found in both Tembe and Kruger. Tembe's terrain is very sandy making travel slow and arduous and leaving a clear trail that is easily observed and followed by field ranger staff. This feature contributed to the lower levels of poaching in this park. Poachers simply targeted neighboring Ndumo where the terrain was less challenging. A second example was found in the southern part of Kruger where the Lower Sabie River also inhibits access to the region during the wet season. During flood periods this large and fast flowing river presents a significant barrier for the intruder.

Existing wildlife including predatory or aggressive animals – Lion, Leopard, and Buffalo - also provided a limited amount of natural capable guardianship deterring some poachers. Avoiding the thick bush that often exists in the parks such as Kruger, poachers commonly follow game trails. Some predators also regularly use these trails in search of the same species that poachers are seeking. At the same time, large game such as buffalo use these game trails to travel to grazing areas. It was reported that on more than one occasion, intruders, which included suspect poachers and illegal migrants from Mozambique were attacked and sometimes killed by these animals in Kruger. These submissions were in fact confirmed through interviews at other locations. On the flipside of the coin, the lack of these species serves as an incentive to some poachers. For example, private commercial game farms may not have predatory

animals such as lions or leopards. Rangers at these sites reported that the lack of predators was perhaps one factor that made their sites more attractive for bushmeat poachers thereby requiring closer guardianship by field rangers.

Field Rangers

The primary source of capable guardianship, and the one that was most influential with regard to poaching were the field ranger units, which operated at all seven sites, albeit with some interesting differences. One point commonly made by respondents regarding what influenced poaching was that the field ranger force at some of the sites was insufficient in size. At Ndumo Game Reserve there was a staff of 19 field rangers to patrol an area of about 10,000 hectares. The interviews with ranger supervisors revealed there was heavy poaching pressure on the park from all directions and they lacked sufficient personnel to adequately patrol, respond to and investigate offences. Presenting a poaching report, one section ranger stated that: “In 1999, we had only 9 reported snaring incidents – all year. In 2003, there’s 219 incidents. That’s a 3,000 percent change”. In an incident previously noted where 11 kilometers of perimeter fencing was torn down, Ndumo could only deploy 2-3 field rangers to prevent intruders, hardly adequate. This was also the case in 2004 as the section ranger explained: “The eastern border – locals tore down two kilometers of fence. Had to negotiate with them to put up a new fence.” Further expressing his frustration with his small staff of field rangers, he recounted another incident: “A couple of years ago, Hippo and Buff [African Buffalo] were heavily poached in the southeast. It stopped, but not due to enforcement. Due to the fact that the guy left the region. We don’t have enough staff to stop them.”

The same issue was found at KNP, which had a serious problem with poaching. KNP has a staff of about 250 field rangers for a park the size of the Nation of Israel. KNP is divided into 22 sections, each of which is headed by a section ranger with a staff of field rangers under his/her command. One section of the park for example consists of 108,000 hectares with over 40 kilometers of shared border with Mozambique. The section ranger lamented that it was nearly impossible to police such a large area with a staff of 12 field rangers. He reported that he regularly observed individuals he believed

were poachers camped on the hilly terrain outside the fence in Mozambique observing the movements of his field ranger force. Once his cohort were deployed on their daily or weekly patrols, these poachers would enter the park in an area well away from the field ranger activity.

In contrast to the foregoing, interviews at the two privately owned sites revealed that a well trained and proactive ranger force, in combination with a smaller geographical area to patrol, did serve as an effective guardian against motivated offenders. The armed game security staff at the small private game farm, although comprising just three people, was highly motivated and aggressive when dealing with poachers. Here the field rangers were found to be quite capable guardians. They were very enthusiastic about their jobs, eagerly recounting incidents where they had spotted poachers on the farm even pursuing them into the neighboring communities. They were proud of their record of not losing any wildlife to illegal hunting. It was determined that their actions were a function of the nature of the private game farm's core business. Its financial survival depended on the revenue generated from its wildlife. Since these animals were intended for sale to other game reserves that comprise part of South Africa's lucrative tourism industry, any losses would have directly impacted the farm's profit, and perhaps even the guards' employment status. A similar situation was found at the private nature reserve. This site was farmland before being converted into a private game reserve. Its wildlife was purchased at considerable expense and being private property, received substantial protection. Being a small, exclusive reserve catering to wealthy clientele, it was paramount to prevent illegal hunting. At the time of the study, it employed a well trained, motivated and armed, eight man anti-poaching unit. Though this reserve contained a range of species regularly hunted for bushmeat along with Elephants and the endangered White Rhino, the data revealed only a few snaring incidents, some of which were attributed by the manager to (non-enforcement unit related) employee pilferage.

Allied to the field ranger focus of this enquiry the study also found that poachers engaged in a variety of tactics to defeat the effectiveness of the field rangers. Interview data revealed that poachers employed diversionary tactics such as setting snares in

obvious locations meant to be found by rangers. Field rangers would then establish an observation point in one area, only to have the poachers hunt in a different area lacking capable guardians. In another example, the field ranger supervisor at Ndumo reported that several armed poaching gangs were regularly hunting in the reserve. When field ranger units responded to intrusions in one section, the poachers would leave to hunt in another region. This went on continuously with field rangers constantly reacting to the intrusions often after wildlife had been killed. Another more insidious tactic involves poachers threatening field rangers' families thereby rendering them ineffective. The section ranger at Ndumo explained: "The guy [poacher] was threatening the field rangers' families – rape, theft, arson – he would do it unless he [the ranger] cooperated".

Another problem identified was the influence of a poor work ethic among some field rangers with regard to poaching. This was especially prevalent at Table Mountain National Park, an area that is targeted almost daily by poachers seeking mainly Abalone and to a lesser extent Crayfish. Unlike Kruger or Ndumo, their field rangers are responsible for a range of duties in addition to law enforcement. These include fire control, assisting with research projects, and infrastructure maintenance. The supervisor reported some instances of field rangers, who on days with inclement weather (certainly not uncommon in the Cape) would spend their entire shift in warming huts rather than on patrol. It was reported that on these days Abalone poachers often struck knowing that the field rangers would be less likely to be on patrol. Abalone poachers, acting as recreational sport divers were also reported to be poaching during good weather but leaving their catch in bags tied to kelp (seaweed) or underwater rocks adjacent the shoreline. During poor weather, they would return to retrieve their catch, again aware that they were unlikely to be observed.

The supervisors

Included in the category of capable guardians were the field rangers' superiors. These supervisors (managers) at the sites were also interviewed to determine how their practices deterred or contributed to poaching. One interesting finding was that some supervisors failed to recognise the extent of poaching. The supervisors at the private

concerns mentioned that poaching in these two regions increases before holiday periods and at the start of the school year. Poachers respond to an increased demand for bushmeat in the local community and their own personal needs, such as ensuring that they have sufficient money to pay for their children's school tuition. As a result, the poaching threat increases at all reserves. The problem is that the level of guardianship does not increase in response to this known trend in every site. While the private game farm management responded to these changes by deploying their forces, management at the other sites sometimes either could not, failed or refused to recognise these issues and did not deploy their guardians in adequate numbers to protect the game.

In the context of Routine Activities Theory, the confluence of the lack of sufficient and capable guardians, with highly motivated offenders in need of money as well as desirable targets contributes to an increase in poaching during these time periods. Moreover, a section ranger at Ndumo indicated that park managers often allowed field/game rangers to take vacation leave during these critical periods leaving the wildlife more unprotected at a time when they are most vulnerable. This is due in part to South Africa's labour laws that unionised field rangers, thereby providing mandatory vacation and requiring the payment of overtime for working on public holidays and Sundays. The inability to pay overtime, however, leaves some parks undefended on certain days. This was also reported at Kruger where rangers as a rule did not patrol on Sundays. As predicted by Routine Activities Theory the poaching fraternity responded by hunting on days when there was a complete lack of capable guardians.

The data on capable guardianship provides several interesting findings that point toward the promise of Routine Activities Theory's application in explain poaching. The quality of guardianship in a conservation area is influenced by the quality of the field rangers and their supervisors and to a lesser degree, by the natural features of the site. The study revealed that when capable guardianship was either not present due to, for example, labour laws or present in insufficient numbers due to staffing and budgetary constraints such as in Kruger Park or Ndumo Reserve, motivated offenders are successful in victimising game populations. However, when capable guardians are present in satisfactory numbers the game victimisation risk is decreased exponentially.

CONCLUSION

While a reasonable amount of research has been done regarding the crime of poaching, comparatively little has focused on or applied criminological theory. Significant opportunities still exist to examine this crime phenomenon via other theoretical approaches. The objective of this research endeavour was, therefore, to build upon the existing criminological literature by completing the first examination of poaching in South Africa from the theoretical perspective of Routine Activities. Specifically, this research has focused on how the interaction of motivated offenders with sought-after wildlife and the corresponding lack of capable guardianship results in poaching in South Africa's protected conservation areas. The findings support the author's view that Routine Activities has significant potential as an appropriate theoretical construct to facilitate a better understanding of the nature of illegal hunting on conservation areas and to develop appropriate solutions to the quandary.

The fact that the private game farm and the private nature reserve were exclusive operations with privately owned wildlife may have played a significant role in their emphasis on guardianship. One wonders if an answer to wildlife conservation is not privatisation of the reserves. Although it is debatable whether opportunistic/subsistence pilfering, as differentiated from poaching proper, will ever be entirely eradicated on these private concerns, it would most definitely appear that an enhanced work and conservation guardianship ethic exists (the reasons for which have been alluded to elsewhere in this treatise) benefiting both wildlife and employees across the board. It is, furthermore, questionable whether Government reserves/parks, with their bureaucratic and regimented flavour, will ever be able to cultivate the same level of work ethic amongst its enforcement personnel.

Findings also point toward some pragmatic policy implications focused on guardianship including target hardening. While capable guardianship consisted of three elements – boundary fences, natural barriers including terrain and dangerous or predatory wildlife, and the field ranger units, all of which had an influence, the latter was found to be the most significant. Fences were an easily overcome obstacle that, at most, temporarily slowed offenders indicating that minimum effort should be placed on

enhancing these as a deterrent against human intruders. However, the natural guardians being difficult terrain, swollen rivers and the presence of predatory animals did deter some poachers from hunting in these parks either completely or seasonally. Given this fact field ranger patrols in such areas can be customised so that fewer rangers are allocated to certain areas depending on the season. This could be critical for conservation concerns that are short staffed.

It is, furthermore, important to recognise that this research is not without limitations. While the study included seven conservation sites, a non-probability sample was employed detracting somewhat from the ability to accurately generalise from the results to the population. Moreover, offender data was obtained from those charged with preventing poaching, not from the poachers themselves. Every attempt was, however, made to verify the validity of the offender data by cross checking the interview responses, observations and the secondary data on poaching incidents with one another. Though this cannot guarantee complete accuracy of the data regarding offender motivations sourced from the field rangers and their supervisors, very little or no variation in responses was found to be present. Nevertheless, this enquiry was not intended to be a definitive application of Routine Activities Theory on poaching. Rather it is designed to offer a preliminary glimpse at the efficacy of using this approach to explain the particular crime phenomenon. All things being equal, results indicate that this theoretical approach offers promise for identifying additional causes beyond the known ones, provoking discourse and developing new conservation policy. Ideally it will lead to future studies employing alternative methodologies or theoretical approaches in different research sites to develop and test new wildlife conservation law policies and contribute to the theoretical explanations of illegal hunting. These may include a comprehensive study via Routine Activities Theory at one location that includes data gathered directly from offenders to thoroughly document their decision-making process, or one that matches several private and public game reserves located in proximity to one another for an interesting comparison. Furthermore, some conservation areas in South Africa are implementing new technologies such as remote sensing, Cyber Tracker for field rangers and the use of ultra-light aircraft for patrols. It would be of value to assess the impact of these guardianship enhancements on poaching. In the

final analysis vigorous and informed conservation management and allied interventions should not be seen as a last option, but indeed as a first choice. It would be prudent to keep in mind that we have not inherited the environment from our ancestors, but that we are merely borrowing it from our children.

REFERENCES

- Akers, R. L. & Sellers, C. S. 2004. *Criminological Theories: Introduction, Evaluation and Application*. 4th Edition. LA, California, Roxbury.
- Barrett, C.B. & Arcese, P. (November, 1998). Wildlife harvest in integrated conservation and development projects: Linking harvest to household demand, agricultural production, and environmental shocks in the Serengeti. *Land Economics*, 74(4), 449-465.
- Beattie, K.H. (Spring, 1976). Evaluative criteria used in anti-poaching campaigns. *Wildlife Society Bulletin* 29-39.
- Bulte, E.H. & Horan, R.D. (July, 2002). Does human population growth increase wildlife harvesting? An economic assessment. *Journal of Wildlife Management* 66(3), 574-580.
- Burke, R.H. (2009). *An Introduction to Criminological Theory*. Third edition. Portland Oregon, Willan.
- Cape Nature (2009). *Jonkershoek and Assegaaibosch Nature Reserves*. [Online]. Available http://www.capenature.org.za/reserves.htm?reserve=Jonkershoek+Nature+Reserve&PHPSESSID=09015a4451cd260663c6c34b63aaef08#reserve_tabs. Accessed March 5, 2009.
- Clifford, M. (1998). *Environmental Crime: Enforcement, Policy, and Social Responsibility*. Gaithersburg, MD: Aspen.
- Cohen, L. & Felson, M. (1979). Social change and crime rate trends: A routine activities approach. *American Sociological Review*, 44, 588-608.
- Cornish, D. & Clark, R. (1987). Understanding crime displacement: An application of rational choice theory. *Criminology*, 25,933-947.
- Damania, R., Milner-Gulland, E.J., & D.J. Crookes. (2005). *A Bioeconomic Analysis of Bushmeat Hunting*. Proceedings of the Royal Society of Biological Sciences, 272(1560), 259-266.
- Davis, B. (2005). *Black Market: Inside the endangered species trade in Asia*. Earth Aware Editions: San Rafael, CA.

- Eck, J. (2003). Police problems: the complexity of problem theory, research and evaluation. *Crime Prevention Studies*, 15, 79-113.
- Eliason, S. L. (1999). The illegal taking of wildlife: Toward a theoretical understanding of poaching, *Human Dimensions of Wildlife*, 4(2), 27-39.
- Eliason, S.L. (2003). Illegal hunting and angling: The neutralization of wildlife law violations. *Society & Animals* 11(3), 225-243.
- Eliason, S.L. & Dodder, R.A. (1999). Techniques of neutralization used by deer poachers in the western United States: A Research Note. *Deviant Behavior* 20, 233-252.
- Felson, M. (1998). *Crime and everyday life* (2nd ed.) Thousand Oaks, CA: Pine Forge Press.
- Forsyth, Craig J. (1993). Chasing and catching 'bad guys': The game warden's prey. *Deviant Behavior* 14, 209–26.
- Gilbertson, T.A. (2006). Alcohol-related incident guardianship and undergraduate college parties: Enhancing the social norms approach. *Journal of Drug Education*, 36(1), 73-90.
- Glenny, M (2008). *McMafia: A journey through the global underworld*. New York: Knopf.
- Herrington, Sandra. (Producer) (2008, November 10). 50/50. (Television broadcast) Zululand Wildlife E- Forum – Second Appeal. Johannesburg, South Africa. South African Broadcasting Service.
- Herbig, F.J.W. (2003). The Illegal Reptile Trade: a criminological perspective. PhD thesis. Pretoria: University of South Africa.
- Hilborn, R., Arcese, P. Borner, M., Hando, J., Hopcraft, G., Loibooki, M., Mduma, S., & A.R. Sinclair. (2006). Effective enforcement in a conservation area. *Science* 314(5803), 1266.
- Irish, J. & K. Qhobosheane (2003). South Africa. In P. Gastrow (Ed.) *Penetrating state and businesses: Organized crime in southern Africa*, Volume Two. Pretoria, South Africa: Institute for Security Studies.
- Jackson, T. (2008). Coming of age. *Africa Geographic* 16(4), 29-33.
- Jones, D.L.V. (1979). The poacher: A study in Victorian crime and protest. *The Historical Journal* 22(4), 825-860.
- Knecht, G.B. (2006). *Hooked: Pirates, Poaching and the Perfect Fish*. Emmaus, PA: Rodale.

- Kohler, L. (2004, April). Ndumo: An African affair. *Wildside*. Prestondale, KwaZulu Natal, South Africa.
- Loibooki, M., Hofer, H., Campbell, Kl., & M.L. East. (November, 2002). Bushmeat hunting communities adjacent to the Serengeti National Park, Tanzania: The importance of livestock ownership and alternative sources of protein and income. *Environmental Conservation* 29, 391-398.
- Mannon, J. (1998). Domestic and intimate violence: An application of routine activities theory. *Aggression and Violent Behavior*, 2(1), 9-24.
- McMullan, J.L. & Perrier, D.C. (2002). Poaching and the ironies of law enforcement. *Law & Society Review*, 36(4), 679-718.
- McMullan, J.L. & Perrier, D.C. (1997). "Poaching vs. the law: The social organization of illegal fishing." In J.L. McMullan, D. Perrier, S. Smith, & P. Swam (Eds.). *Crimes, laws and communities*, Halifax: Fernwood.
- Meith, T.D. & Meier, R. F. (1994). *Crime and its social context: Toward and integrated theory of offenders, victims and situations*. Albany: State University of New York Press.
- Meredith, M. (2005). *The fate of Africa: A history of fifty years of independence*. New York: Public Affairs.
- Messner, S. & Tardiff, K. (2006). The social ecology of urban homicide: An application of the "routine activities approach". *Criminology*, 23(2), 241-267
- Milner-Gulland, E.J. & Williams, N.L. (1992). A model of incentives for the illegal exploitation of black rhinos and elephants: Poaching pays in Luangwa Valley, Zambia. *Journal of Applied Ecology* 29, 388-401.
- Muchaal, P.K. & Ngandjui, G. (1999). Impact of village hunting on wildlife populations in the Western Dja Reserve, Cameroon. *Conservation Biology* 13(2), 385-396.
- Muth, R. & Bowe, J. F., Jr. (1998). Illegal harvest of renewable natural resources in North America: Toward a typology of the motivations for poaching, *Society and Natural Resources*, 11(1), 9-24.
- Naude, B. 2002. Crimes Against the Environment. *Acta Criminologica*, 15(3), 21-38.
- Pillinger, S. (2003). *The illicit bushmeat trade: Northern KwaZulu-Natal*. Strategic Research Consultants, Durban, South Africa.
- Redpath, J. (2001). *The hydra phenomenon, rural sitting ducks and other recent trends around organized crime in the Western Cape*. Institute for Human Rights and Criminal Justice Studies, Technikon, South Africa.

- Rhino horn myths: then and now. Available <http://www.rhinoconservation.org/2011/04/07/rhino-horn-myths-then-and-now>, accessed on 2011/04/18.
- Robinson, J.G. & Bennett, E.L. (November, 2004). Having your wildlife and eating it too: An analysis of hunting sustainability across tropical ecosystems. *Animal Conservation* 7, 397-408.
- Rowcliffe, J.M., deMerode, E., & G. Cowlishaw. (December, 2004). *Do wildlife laws work? Species protection and the applications of prey choice model to poaching decisions*. Proceedings of the Royal Society of London, 271(1557), 2631-2636.
- Schneider, J.L. (2008). Reducing the illicit trade in endangered wildlife: the market reduction approach. *Journal of Contemporary Criminal Justice*, 24(3), 274-295.
- Shane, J.M. 2010. The Limits of Auto Parts-Marking as a Situational Crime Prevention Measure: A Qualitative Analysis. *Law Enforcement executive Forum*, 10(3), 109-140.
- Siegel, L.J. 2007. *Criminology: theories, patterns, and typologies* (9th. ed.). Belmont, CA; Thomson.
- South African National Parks. (2008a). *The Kruger map*. South Africa: Jacana Publishers.
- South African National Parks. (2008b). *Conservation at South African National Parks*. [Online] Available <http://www.sanparks.org/conservation/investigations>. Accessed June 9, 2008.
- Statistics South Africa. 2007, *March labor force survey*. [Online]. Available <http://www.statssa.gov.za/PublicationsHTML/P0210March2007/html/P0210March2007.html>, Accessed March, 1, 2008.
- Steinhart, E.I. (1989). Hunters, poachers and gamekeepers: Toward a social history of hunting in colonial Kenya. *Journal of African History* 30(2), 247-264.
- Swart, G. 2011. By The Horns. *Horizons*, May, 44-47.
- Tembe Elephant Park*. (2004). South Africa: Ezemvelo KZN Wildlife.
- TRAFFIC. (2002). *Food for thought: The utilization of wild meat in eastern and southern Africa*. World Wildlife Fund, TRAFFIC East/Southern Africa – Nairobi, Kenya
- Walsh, A. & Ellis, L. (2007). *Criminology: An interdisciplinary approach*. Thousand Oaks, CA: Sage.
- Warchol, G. and Johnson, B. (2009, forthcoming). Wildlife crime in the game reserves of South Africa: A research note. *International Journal of Comparative and Applied Criminal Justice* 33,

- Warchol, G., Zupan, L. and Clack, W. (2003). Transnational criminality: The illegal wildlife trade in southern Africa, *International Criminal Justice Review* 13, 1-27.
- Wilkie, D.S. & Carpenter, J.F. (July, 1999). Bushmeat hunting in the Congo Basin: An assessment of impacts and options for mitigation. *Biodiversity & Conservation* 8(7), 927-955.
- Williams, F. & McShane, M. (2010). *Criminological Theory* (5th ed.). Prentice Hall: Upper Saddle River, NJ.
- Winslow, R. & Zhang, S. (2008). *Criminology: A global perspective*. Upper Saddle River, NJ: Pearson Publishing.
- Wright, R. & Decker, S. (1994). *Burglars on the Job: Streetlife and residential break-ins*. Boston: Northeastern University Press.