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Global Risks, Conservation, and Criminology

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1.1 Conservation Crimes Are a Global Problem

In recent years, levels of unsustainable and illegal natural resource exploitation have escalated in scope, scale, and severity such that the issue is now firmly in the crosshairs of high-level policymakers. Exploitation is now the dominant cause of global wildlife decline, surpassing habitat degradation, climate change, and habitat loss (McLellan, 2014). The World Wildlife Fund’s 2014 Living Planet Index, which measures trends in thousands of vertebrate species, showed a 52% decline in size of populations between 1970 and 2010. Populations of freshwater species fell by a staggering 76% during this time period; marine populations dropped 39% (McLellan, 2014). Today, a wide array of government, civil society, nongovernmental, and private sector partners are collaborating and coordinating to address this problem at multiple scales.

Wildlife-related problems were once considered boutique issues fitting squarely within the purview of the conservation community. Due to their widening range of impacts, these issues are now considered a global scourge in a swath of sectors. The problem is no longer viewed as solely limited to the ecological impacts or moral implications of species extinction, although these consequences are profound (e.g., Valiente-Banuet et al., 2015; Vucetich, Bruskotter, & Nelson, 2015). Wildlife trafficking threatens the security and prosperity of people, poor inspection processes of at border crossings allow the spread of zoonotic diseases, park rangers are being killed, and rebel militias are players in global ivory markets (Clinton, 2012). Reductions in biodiversity or the population sizes of species can have other substantial negative human health impacts unrelated to these risks, including loss of potential sources of pharmaceuticals, experimental models for studying disease, crop pollination, and both micro- and macronutrients for humans lacking alternative sources of protein (Meyers et al., 2013). Recent recognition of these risks by policymakers has led to calls for inclusive approaches to create a comprehensive picture of the problem to inform on-the-ground programs and high-level policies. Diverse sectors with equities in wildlife policy generation commonly
acknowledge proactive solutions require holistic, integrative, and innovative perspectives. For example:

- Secretary of State Hillary Clinton, in her 2012 remarks to the Partnership Meeting on Wildlife Trafficking stated there is a need to look at the problem of wildlife trafficking in a comprehensive, holistic way (Clinton, 2012).
- In July 2013, U.S. President Barack Obama signed Executive Order (EO) 13648 on Combatting Wildlife Trafficking. The EO established a Presidential Task Force on Wildlife Trafficking and Interagency Advisory Council on Wildlife Trafficking, both of which were charged with incorporating knowledge from multiple sectors and diverse agencies (Obama, 2013).
- The United Nations Environment Programme published an Environmental Crime Crisis report, discussing far reaching societal consequences of the illegal wildlife trade; the report called for a global and holistic response to be implemented at all levels and with all means possible (Nellemann, Henreiksen, Raxter, Ash, & Mrema, 2014).
- HRH The Prince of Wales and HRH The Duke of Cambridge hosted the End Wildlife Crime Conference; during his speech the Prince acknowledged finding a solution to illegal wildlife trade will require people from many different sectors to work together (Prince of Wales, 2013).
- In 2015, 41 governments signed the Kasane Statement at the Kasane Conference on Wildlife Trafficking, committing to engaging with the transport sector to raise awareness of the role they can play and support development of industry-wide practices that eliminate the illegal wildlife trade (Kasane Statement, 2015).

These policy statements and new funding lines indicate conservation crimes are a high political priority at this time; they also underlay new interdisciplinary collaborations, multi-sectoral partnerships, and renewed scientific attention to the global problem. Across these initiatives, programs, and speeches there is widespread agreement that the convergence of threats—to ecosystems, geopolitical stability, national security, human health and well-being, and future generations—requires multidisciplinary and multidimensional approaches to resolve negative effects. However, policymakers are often uncertain about what data are needed, available, and attainable to inform the most effective solution architecture.

This book is intended to complement the work being done by government actors, private sector partners, civil society and nongovernmental organizations, development institutions, and others to reduce the negative effects of conservation crimes on people and the environment. The academic community has much to contribute, particularly in terms of evidence for evaluating the efficacy, efficiency, and feasibility of policy alternatives. Academic inquiry can help document the voice of local people and other publics who are necessary players for meaningful outcomes. The science of conservation crime, also referred to as conservation criminology, is particularly relevant (Gore, 2011). This paradigm offers an integrative means for addressing the natural and societal domains inherent in wildlife trafficking. Comprised of three primary disciplines—natural resources management, risk and decision science, and criminology—conservation criminology seeks to overcome limitations
inherent to single-discipline science and provide practical guidance about on-the-ground practice (Figure 1.1). It is not a rigid, prescriptive dogma and it is not confined to the walls of the ivory tower. Rather, it is a lens that different stakeholders can use to view the risks associated with human-environment relationships. As an interdisciplinary paradigm, the fundamental goal of conservation criminology is to provide a platform for conversations and connections that lead to new knowledge. The paradigm incorporates the principle of holism—the whole is not only greater than the sum of the parts but the parts are related in such a way that their functioning is conditioned by their relationship to each other.

This chapter profiles conservation criminology in its current form, as well as its key strengths and limitations. Additional chapters in this volume elaborate and build upon many of the concepts described in this chapter. Ideally, current and future practitioners will adapt principles discussed in this and other chapters,
allowing for the evolution of applied conservation criminology. This chapter first discusses the three foundational disciplines of conservation criminology, paying particular attention to key theories and principles. Reviewing the attributes of the three different disciplines enables readers to have a common foundation upon which they can consider the solution architecture of conservation criminology as a concept. The chapter details strengths and weaknesses with the approach and identifies gaps in the knowledge base. It concludes with a roadmap for the book, highlighting important landmarks and a vision for the future of conservation criminology.

1.2 Three Foundational Fields of Conservation Criminology

1.3 Foundation 1: Natural Resource Management and Policy

Science surrounding Earth’s natural biophysical systems—climate, stratospheric ozone, terrestrial and marine ecosystems, and the cycles of water, nitrogen, and carbon—is the purview of the natural sciences. Of specific interest to conservation criminology are the sister sciences of natural resource management and conservation biology. Both disciplines include a focus on exploring and understanding direct and indirect threats to biodiversity and natural resources including trees, water, animals, and minerals. They consider natural systems as well as the different anthropogenic processes, including deforestation, desertification, pollution, agricultural expansion, or urban sprawl that can drive species extinction, habitat loss, introduced species, or overexploitation of species (Mulder & Coppolillo, 2005). The natural biophysical systems disciplines that are most relevant to conservation crimes diverge by context. Problem definition dictates the extent to which geography, ecology, zoology, or other natural sciences are applied in pursuit of attaining the answers that achieve desirable end goals. In many ways and in contrast to criminology, the natural sciences have historically prioritized thinking about harm as something humans have caused instead of suffer from (e.g., driving the Mauritius dodo or passenger pigeon to extinction was harmful to non-human species and did not functionally cause humans harm). Select themes recurrent in natural resource management and conservation biology that clearly connect to conservation criminology are profiled below.

1.3.1 Different Values Underlie Natural Resource Management and Conservation

Fundamentally, natural resource management and conservation biology exist because society values natural systems, although our values can, and do, differ. Here, a value is a stable, superordinate cognitive structure. Values form the root of attitudes and behaviors associated with conservation, are important elements of
cultural transmission, and are linked to prevailing human needs. One example in conservation biology is the “no use” value of preservation, which aims to protect species, ecosystems, or landscapes without reference to natural changes in living systems or human requirements. Alternatively, “wise use” values of natural resource management involve the maintenance of environmental quality and resources, or a particular balance among species, including people, of a particular area (Callicott & Nelson, 1998). Value typologies from psychology compliment social norm theories and attitude frameworks describing different stakeholders’ motivations, satisfaction, and participation in conservation action (e.g., Decker, Brown, & Seimer, 2001).

Values underlie a number of tensions that are often found within natural resource management and conservation biology. A well-known example is the tension between conservation (i.e., wise use) and preservation (i.e., no use). Both terms define human relationships with the environment, but invoke fundamentally different approaches for governance and reform (see Callicott & Nelson, 1998). Friction between integrated conservation and development projects (ICDPs) and sustainable development is another example (see Tisdell, 1999). On the one hand, ICDPs aim to promote voluntary compliance with conservation rules, ideally providing livelihood alternatives so as to simultaneously conserve biodiversity and preserve livelihoods. ICDP-based strategies have met mixed results in the field (see Barrett & Arcese, 1995; Gandiwa, Heitkönig, Lokhorst, Prins, & Leeuwis, 2013). On the other hand, sustainable development activities may be implemented in a top-down manner that promotes exclusion of people from geographic spaces, generally locals, in order to achieve compliance with conservation rules. This fences and fines approach ideally results in high deterrence rates and thus compliance with conservation rules but the conditional technique and lack of local involvement in decision-making commonly backfires (Kubo & Supriyanto, 2010).

There is an inherent set of assumptions about the value of social sciences in natural resource management and conservation or more specifically how, when, and in what contexts social science can contribute to conservation science policy (Mascia, 2006). Here, value, the verb, is applied as an assignment of importance in terms of whose science is privileged and whose is marginalized within the conservation domain (e.g., setting research agendas, the weight of results in decision-making and authoritativeness of the science). These assumptions remind us there are many different stakeholders with equity in conservation (e.g., states, corporations, donors, organized crime cartels). Stakeholders operate within the context of institutional settings such as family, friends, tribes, communities, health systems, policy, and schools. At a micro level, individuals can play different roles within the natural resource management process being investigated; people hold diverse social roles and are not in fact homogenous, although sometimes during stakeholder engagement processes, we assume they only hold one identity! These factors add to the complexity of the networks engaged in the problem. Because of values, human-human relationships are often as important to consider as human-natural resource relationships (Lute & Gore, 2014).
1.3.2 The Precautionary Principle and Prevention

The precautionary principle is a regulatory instrument developed in response to situations of environmental risk, such as those associated with biodiversity conservation (Myers, 1993). Applied in different forms around the world, it is relevant to issues such as hazardous substances and toxic chemicals. It is considered a multidisciplinary concept embedded in legal, economic, and scientific policies. The precautionary principle reflects the idea that uncertainty about environmental risks should not preclude preventative action (Cooney & Dickson, 2005). Further, preventative actions can be taken in the face of uncertainty about outcomes and the burden of proof is reversed (e.g., guilty until proven innocent). The precautionary principle is widely applied, for example, in guiding decisions about which species should be included in the Convention on International Trade of Endangered Species of Wild Fauna and Flora Appendices, and thus subject to international trade controls. Precautionary approaches also appear in many multilateral fisheries agreements on management and conservation such as the North Atlantic Salmon Conservation Organization. Perhaps the most well-known global application of the precautionary principle relates to protected area sites for biodiversity conservation. These mechanisms link indicators of biological risk such as species status to management responses such as prohibition on use (Cooney & Dickson, 2005). In reality, some conservation decisions simultaneously pose threats and benefits to humans and the environment. Many biodiversity conservation contexts do not adhere to a decision-making model where there is only one clearly risky strategy and a precautionary one. Often, decisions are between risk to and from different sources and over different timescales. A widely known example of this phenomenon would be wildlife harvest (i.e., hunting) bans. The tradeoffs of this approach involve, in a highly simplified form, the risk of overexploitation of a species on the one hand and the risk of illegal trade on the other. Decision-making regarding wildlife harvest bans involves a complex array of dimensions, including ethics associated with the method of take, sustainable livelihoods, allocation of benefits associated with wildlife trophies, and economics of wildlife trade (see Challender & Cooney, 2016).

The precautionary principle can be considered a source of friction in an increasingly connected world; frictions provide barriers and obstacles to risks. When effective, friction counteracts the flows (e.g., how we distribute natural resources and energy) that create risks (Khanna, 2016). Ultimately, conservationists are propelled by a sense of urgency to increase friction (e.g., retard extinction) and so the precautionary principle accommodates, and is used to justify, the need for preventative action (Cooney, 2004). Such actions, designed to control flow, can be the result of conservation for the purpose of moral duty for future generations or utilitarian values and ecosystem services (Hance, 2016).

1.3.3 Community-Based Conservation

Community-based conservation (CBC) involves the devolution of authority to local communities to manage natural resources (Bergh, 2004). The approach stands in contrast to top-down approaches in which decision-makers make and
take actions unilaterally based on their professional knowledge, training, and expertise. CBC accounts for the fact that local people cannot undertake conservation (i.e., a long-term strategy) when their short-term needs are not met. One broad appeal of CBC is that it theoretically ensures benefits for local people and recognizes indigenous people’s rights to land and resources. Ideally, this model attends to the increase in public expectations for conservation solutions tailored to the local context and decrease in agency funds and personnel to effectively conserve all natural resources across time (Raik & Decker, 2007). CBC is intended to bridge the conservation-development divide and can take different forms. ICPD projects are a subset of CBC; all are implemented at the community level but not all CBC projects involve the scale of economic development entailed in ICDP. Community-based natural resource management tends to refer to rural programs concerned more with utilization of natural resources than protected area management (Mulder & Coppolillo, 2004). One reason CBC is widely applied is that it can enable citizen participation in natural resource and conservation decisions. Citizens can be involved in making, understanding, implementing, or evaluating decisions for improved outcomes (Decker et al., 2001). The overall conservation climate is enhanced through improved relationships among relevant stakeholders and increased capacity of different stakeholders to contribute to conservation in practice. Challenges to citizen participation abound and can include lack of time and money, resistance among decision-makers, complexity of weighting the input of different opinions, and poor relationships with certain stakeholders (Decker et al., 2001). Precaution may be aligned with the long-term interest of those people whose actions threaten biodiversity (Cooney, 2004).

1.3.4 Protected Areas

Protected areas (PAs) are one of the most widely used and flexible policy instruments in biodiversity conservation, even more so than market mechanisms such as direct land acquisitions, supply chain mechanisms such as green certification, or ICDP projects such as community forestry. In 2011, there were an estimated 160,000 terrestrial and marine PA established globally and the 193 Parties to the Convention on Biological Diversity committed to increasing the global extent of PAs to 17% of national lands (up from 12.7%) and 10% of marine areas under national jurisdiction (up from 4.0%) (Mascia et al., 2014). They are geographically defined areas designated or regulated to achieve specific conservation objectives; they are a common mechanism for implementing a precautionary approach for conservation threats. PA management categories include strict nature reserve, species management area, national park, or managed resource PA. And, they can have different management objectives including science, sustainable use of natural ecosystems, or conservation through intervention. These categories acknowledge PAs are socially defined and involve socially constructed governance regimes. These human dimensions of PA management have long been recognized, and given PAs’ regulatory dependence, the enforcement community has been and will likely continue to be a key player in their use as a
conservation tool. The fences and fines approach to PA management necessi-
tates engagement of the enforcement community. Police or rangers are key play-
ers in resolving deviant human behavior within the geographic boundaries of
PAs through both enforcement and relationship building with local peoples,
however, there are other relevant authorities that can be involved in rule setting
(see Ratsimbazafy, Gore, & Rakotoniaina, 2013).

Debate exists about the requirements for successful PAs; they are often restric-
tive and top-down in their regulatory composition and local communities rely-
ing on natural resources for their livelihoods often experience significant adverse
impacts. PAs are generally considered to be permanent fixtures on the landscape
but that is not always the case. PAs are regularly downgraded, downsized, and
degazetted (i.e., PADDD); indeed there is evidence of PADDD from as long ago
as 1902. PADDD decreases the legal restrictions imposed on human activities
within a protected area by a relevant authority. PAs may also experience a total
functional loss of legal protection (Mascia & Pailler, 2011). PADDD demon-
strates one way that PAs are responsive to social pressures involving tradeoffs
between conservation goals and other objectives such as industrial scale activi-
ties, local land pressures, or land claims (Mascia et al., 2014). At a broader level,
devolution is a manifestation of local control over geography and autonomy to
pursue one's own interests; some argue greater autonomy will bring greater
stability (Khanna, 2016).

1.4 Foundation 2: Criminology, Crime Science,
and Criminal Justice

Criminology is a well-established social science; for hundreds of years its aim has
been to study, understand, and prevent crime. As criminologists work to under-
stand the various causes of crime, its distribution and control, explanations for
how crimes occur are produced alongside insight about why some people commit
crime. Many models have emerged to explain crime, including learning, biologi-
cal, and psychological theories of crime. The explanation of crime is theoretically
competitive. In some cases the explanations involve references to rule or law, law
making, or role of law enforcement agencies. Other views refer to culture or the
postmodern conditions of life that result in crime. Generally, criminological theo-
ries share a focus on criminal behavior, study crime defined by law, and consider
victimization of non-humans peripheral. Harm emerges from crime and is com-
monly viewed as something that affects humans. In this regard much of what
natural scientists know has had little impact on criminology. The field implies
human control in the legalistic or normative sense is possible, effectual, warranted,
and justified. It is known for being highly theoretical and sometimes critiqued as
being peripheral from policy and practice.

Only recently has criminology thought about crimes against nature as a
distinguishable type of crime, versus, for example, street crime or white-collar
crime. These experts are often called green criminologists. For example, theories
of green behaviorism tell us that crime, if the result of an individual’s biological
response to environmental toxins such as high levels of lead in drinking water,
cannot be eradicated or controlled. By exploring effects of lead exposure on criminal behavior, green criminologists explain the negative public and environmental health outcomes related to lead exposure as a functional response to environmental conditions; the causes of an individual’s behavior are thus external rather than internal. Green criminologists offer a provocative perspective, within their discipline, by proposing green harms are more widespread than criminal harms. They are the most important concerns in society because they cause the most injury, violence, damage, or loss to both people and ecosystems as a single green harm may result in widespread exposure to a toxin. Some behaviors not legally defined as criminal also cause harm. The legality of a behavior is not predictive of the harm’s magnitude or whether that harm is adequately defined in law. They argue harmful outcomes, not the behavior as defined by the rule of law, should be examined and become the subject matter of criminology. Environmental problems—pollution, global warming, resource depletion—cannot be fully understood or analyzed when the frame of reference emphasizes the importance of problems only for humans. Often, nature is viewed as a benign actor who is victimized itself at times. Although academically interesting, this book does not offer a substantial critique of green criminology or invest heavily in theoretically comparing conservation, green, and environmental crime. Lynch and Stretesky (2014), White (2008), and to some extent Gibbs, Gore, McGarrell, and Rivers (2010) and Gibbs et al. (2016), offer such insight. Next, select theories, patterns, and typologies from criminology, crime science, and criminal justice that relate to real world problems of conservation are discussed.

1.4.1 Opportunity Structures of Crime

Many theories of crime come from a dispositional point of view; certain discrete tendencies exist among those who commit crime compared to those that do not. Deviant behavior is explained as the product of differential socialization processes that result in individual proclivities to commit crime. Alternatively, the opportunity perspective extended by Cohen and Felson (1979) recognized the broader role that a situational landscape plays in producing crime. Context matters and is central to the axiom that opportunity has a causal role in crime. This approach considers wildlife poaching to be like other crime in that it is the result of motivated offenders seizing criminal opportunities they encounter. The existence of criminal opportunity is a requirement for a crime to occur. This perspective facilitates thinking about how criminal opportunity structure(s) for poaching develop and are exploited by poachers.

Drawing on the routine activity theory of crime (Clarke & Felson, 1993), poaching can be viewed as a criminal opportunity involving three groups: offenders, victims, and guardians. Crime opportunities are highest when victims and offenders meet in the absence of capable guardians. Opportunity structure theories of crime offer exciting tools for conservationists because policies and programs can work to reduce crime by focusing on how to dismantle opportunity structures for poaching as well as address who is committing the crime. Guardians stand out as a direct way to protect victims, which is one
reason why we focus so much on improved enforcement in conservation in policies such as the U.S. Strategy Against Wildlife Trafficking. Strategies aim to improve the capacity of guardians to deter offenders with their presence or intervene during commission of a crime. Understandably, conservation resources are regularly focused on increased enforcement efforts. For example, patrols can be directed into areas preferred by poachers to increase apprehension or guardians can decrease response times to poaching reports. Criminology prods the conservation movement to think about poaching prevention as well as enforcement.

1.4.2 Crime Prevention

Criminologists excel at building knowledge about who commits crime and why, and crime scientists explore the opportunity structures that make crime possible. Crime scientists know effective crime prevention strategies are ideally tailored to the criminal opportunity structure as well as the motivations of the offender. They think about ways to engage in preventative interventions for a specific poaching problem. They do this by designing interventions that work to increase the effort, increase the risk, decrease the reward, remove excuses, and remove provocations for committing crime. These five intervention targets comprise the increasingly popular and prescriptive situational crime prevention techniques (SCP) (see Lemieux, 2014). Thinking about these basic elements of a poaching problem identifies entry points for intervention using SCP. Along these lines, crime scientists ask:

- What is the specific problem? Is the problem triggered by prompting, provocation, pressure, or permission?
- Who are the offenders? Are they repeat offenders? What are their motives? What do they need to be effective? Are they provoked, mundane, or anti-social?
- What tools do offenders use? Can tool procurement be disallowed? How do the tools get to the target?
- Who are the victims/what are the targets? Are some repeatedly involved? Why are targets at locations where problems take place? Can they relocate? Can targets be made less attractive?

Answering these questions inform the appropriateness of SCP activities. Importantly, evaluating the efficacy of SCP to prevent wildlife poaching problems can be complicated. This complication stems in part from the nature of crime-related data: no matter what the outcome of prevention efforts, not all results will appear in official data sources; rangers are not always there to detect illegal activity and victims cannot file reports. This differs from traditional police data, which typically entails a combination of law enforcement observations and victim reports. Using multiple sources of intelligence (e.g., local sources, expert sources) to improve the size, scope, and level of detail in databases may help overcome this deficiency. The U.S. Office of the Director of National Intelligence recently formed a Counter Wildlife Trafficking Community of Interest in response to this need (Quinn, 2016).
1.4.3 Criminological Typologies

Criminologists excel at producing typologies of crime, for example green criminological typologies of wildlife trade (Wyatt, 2013). These typologies help guide strategies and tactics to reduce negative effects of crime. One typology identifies at least four opportunities for involvement in wildlife crime: pseudo conservation, pseudo hunting, theft, and poaching (Lemieux, 2014). Pseudo conservation involves networks of conservation professionals that cooperatively evade laws and covertly acquire products destined for market. Pseudo hunting entails someone with no hunting experience who applies for permits to hunt legally and supplies parts to market. Markets may be supplied through theft or robberies of wildlife parts from warehouses, museums, game reserves, safari lodges, or taxidermies. Poaching, a fourth opportunity type of wildlife crime, may be considered separately from other sources of wildlife crime because the criminal opportunity structure for the crime is vastly different than pseudo conservation or pseudo hunting. Successful poaching favors individuals with knowledge of animal and ranger movement patterns, access to weapons, and hunting experience. Also, the risk they face while poaching is different than other groups who conceal their actions from enforcement agencies through collusion and legal loopholes.

Another typology for thinking about wildlife crime involves markets for criminally derived goods or products (Lemieux, 2014). This typology proposes at least three types of crime markets; each can be targeted using different strategies and tactics (e.g., policy, regulation). Markets are often in places where other goods such as textiles and produce are being sold. Local markets capture many of the products derived from a local area. For example, the Guangzhou market in southern China is close to Nankunshan National Park; a common activity in the market for tourists is to knowingly purchase wildlife for food consumption (Chow, Cheung, & Yip, 2014). Exclusively local markets have low human population, high locally available species, low amounts of rare species, low sources of distribution and low total product. Regional markets have the ability to acquire products from far off distances because they attract middlemen who traffic species from city to city. The bird markets in Medan, Indonesia are known as being primary hubs for wildlife trade in Asia and have been estimated to sell at any given time up to 200 species of wild birds as pets. Regional markets tend to have relatively high human populations, low species availability, high rare species, low distribution and medium number of product. Feeder markets are local markets that distribute product to other cities and distribute produce for local demand. These markets have variable human populations, high species available, high rare species, high sources of distribution, and high number of product. Until it was recently bulldozed by authorities, the Bellavista local market was known as one of Peru’s main hubs of illegal wildlife trade, selling up to 1,100 animals a week (Brenna, 2016).

1.5 Foundation 3: Risk and Decision Science

The third foundational field of conservation criminology is risk and decision science. The field explores human judgment, the processes and outcomes of decision-making, and risk assessment. In many ways, the field is concerned more...
with the decision itself and decision process than it is concerned with the consequence of decisions. Some sociologists theorize risk is the dominant paradigm through which contemporary society operates—we live in a risk society (Beck, 1992). Risk and its management pose existential concerns on a global level; threats are a function of civilization’s success, and chance and danger evolve from industrialization. These scholars posit that categories of risk reflect a response to uncertainty, which today is unable to be overcome by more knowledge. This view promotes thinking about the multidisciplinary dimensions of risk and its management in that it links the natural, technical and social sciences and can be applied to highly diverse phenomena. Risk remains foundational to technology, economics, natural science, and politics. Crosscutting themes from the idea of the risk society include:

- Threats are contagious and can transform social inequality by dividing, excluding, and stigmatizing risk persons or groups.
- Threats enable a global community.
- Science enhances the acuteness of risk perception and makes risks collectively visible.
- Fear is transforming security into a consumer good such as electricity.

These themes of the risk society carry assumptions. First, because risks address future events that may occur and that threaten us, we are obliged to take preventative action (i.e., precautionary principle). Second, knowledge is hierarchical such that knowing and not knowing can be distinguished and those with knowledge (i.e., experts) are superior over those without knowledge (i.e., laypersons). Environmental risks in particular fall into this category as they are hidden risks that for the most part escape everyday perception and often rest on esoteric scientific models and calculations that can be controversial. Third, old threats pose new risks. Indeed, wildlife poaching and trade has occurred since the time Venetian merchant Marco Polo traversed Europe and Asia but today is considered to be at a crisis level by the United Nations and many others. Fourth, risks cannot be locally circumscribed. The globalization of environmental problems, in particular, such as wildlife poaching, equates threats to the environment with social threats. Wildlife poaching, as one of many global risks, decouples social location and social decision-making responsibility from the places and times at which other people become the object of possible physical and social injury. Finally, global environmental risks such as wildlife poaching have distinctive qualities. They are delocalized such that the causes and consequences are not limited to one geographic location or space. Global risks are, in principle, omnipresent and vary across spatial, temporal, and social scales. The consequences are incalculable. For example, beyond the extinction of a species through wildlife poaching, there is a universe of collateral effects on local and regional economies, ecosystem function, or cultural and religious traditions. The principles of precaution through prevention dominates because global risks are considered to be irreversible and losses irreplaceable. For example, Madagascar’s endemic lemurs are found nowhere else on earth. Thus, if they go extinct as a result of deforestation, hunting, or disease, they are gone forever. Critiques of the risk society provoke thinking about, among other issues, the extent to which its ideas
do or do not apply to the global south, promote discourse among different people who engage with risks, and the extent to which they perceive those encounters as risky (see Gore, Lute, Ratsimbazafy, & Rajaonson, 2016). It is also worthwhile to consider the extent to which the risk society leaves room for non-technical solutions to problems; for example, is there room for environmental ethics or religion in the conversation.

1.5.1 Risk Assessment and Perception

Definitions of risk generally include a technical component that examines the probability of occurrence and severity of consequences as well as a value-based component that examines the level of dread or outrage associated with an event (Gore et al., 2009). Technical risk assessments typically involve expert-based quantitative approaches that estimate probabilities. Risk assessment informs decision-making under uncertainty and is widely applied across conservation and criminological contexts (Gore et al., 2009). For example, the International Union for Conservation of Nature uses various criteria to assess the extinction risk to various species (e.g., vulnerable, threatened, critically endangered) on their Red List. The 1992 Preamble for the Convention on Biological Diversity notes the high risk of loss of biodiversity as an insufficient reason for postponing action to minimize risk. Hotspot maps illustrate geographic regions at greatest risk from a particular threat (e.g., car theft, commercial wildlife poaching), which can then inform risk management activities.

Risk perception, on the other hand, is a risk judgment; this social psychological concept is complementary to risk assessment in that risk perception is relevant for understanding individuals’ attitudes about risk-related policy as well as behavior toward policy (e.g., support or opposition). It is common for environmental risk perceptions and assessments to not mirror one another (Gore, Knuth, Scherer, & Curtis, 2008). For example, it is perceptually easy to underestimate risks presented by policy advocates and overestimate risks presented by people faced with dealing with the consequences. Additionally, many people anchor their risk perceptions on initial risk estimates. Because of these and other reasons (see Gore, Knuth, Curtis, & Shanahan, 2007 for a discussion of factors influencing risk perception), risk perception affects regulatory design and compliance. Risk and decision science is valuable for understanding local people’s perception of risk, their associated behavior (or lack thereof), as well as the social and physical space within which risks occur.

Environmental risk is commonly described as any source of hazard that resides in the natural or built environment and poses some degree of threat to humans (Keller et al., 2012), versus a risk associated with technology such as nanotechnology. Some chapters in this book illustrate a more inclusive scope of the term. Environmental risk management, then, makes use of the results and insights from risk assessment to reduce negative effects on people and the environment they interact with. Environmental risk perception scholars build understanding about environmentally relevant behaviors and methods to change behavior including decision-making processes, risk and benefit judgments, acceptance, information seeking, risk reducing behavior, pro-environmental behavior,
political actions, and collective action to ameliorate risks. These studies improve how we address emotional, perceptual, and behavioral components of environmental risk perception using tools and techniques from, for example, risk communication.

1.5.2 Risk Communication

Risk communication is the interactive exchange among individuals, groups, and institutions related to the characterization, assessment, and management of risk. Risk communication often contains contextual messages regarding facts or hypotheses about the level of risk and the significance of the risk relative to other issues or actions that are undertaken to manage risk. The format and content of risk communication materials can affect how an individual responds to risk messages. For example, statistical presentations of risk are frequently difficult to interpret and fail to motivate risk-reducing behavior. Risk communication activities can have several design advantages over other interventions (e.g., regulations, incentive programs) because they are flexible; they can target multiple human audiences and management of diverse wildlife species, address numerous issues, involve different stakeholders, achieve multiple objectives, and use assorted evaluation frameworks (Gore et al., 2009).

Risk communication can facilitate decision-making by identifying and incorporating both public risk perceptions and expert assessments into the decision process. Decision-makers might use a persuasive communication approach to induce a change in attitudes, beliefs, or behaviors associated with decision alternatives, achieve acceptance of a preferred management strategy, or motivate action in response to a problem (e.g., use synthetic substitutes rather than real bear bile when practicing Traditional Chinese Medicine). A participatory communication approach might be used to facilitate decision-making processes, resolve stakeholder conflict through participation, or communicate how decisions could be and are made. This latter approach relies on a two-way flow of information and values the importance of knowledge from diverse stakeholders. It also recognizes that messages by themselves are not always effective and acknowledges that poor communication can lead to stakeholder backlash.

1.5.3 Risk Governance

Regardless of how or from whose perspective risk is investigated, its causes and consequences do not usually go ignored: decision-making is an essential task of environmental risk management. Risk governance describes the diversity of structures and processes available for decision-making; it often involves diverse stakeholders, governmental, and non-governmental actors who interact horizontally through multilateral agreements or vertically through community-based management (Renn, 2002). Although decision-makers cannot control all the outcomes of a decision, they may employ high-quality decision-making processes, which can increase the likelihood of good decision outcomes. Quality processes increase the likelihood that decisions are consistent with management objectives, based on the best available information, and responsive to stakeholders’ needs. Developing and maintaining high quality processes is a
significant challenge in conservation. Policy-makers typically must decide among risk-reduction options and usually do not (or cannot) attempt to maximize net benefits. Risk governance reminds us that focusing on effects and likelihood alone can be of limited use for decision-making, particularly for the context of conservation crime.

Procedure and due process are similarly important considerations for making decisions. This is because people are not only concerned about the risks that are imposed on them but also about the processes by which the decision has been made; thus, the relationship between stakeholders is an integral piece of governance. Social science contributes to risk governance by providing different explanations for how results of technical risk assessment are mediated by context or social and mental processes. For example, the rational choice approach for explaining decision-making proposes people have knowledge about potential outcomes, can distinguish between ends and means to achieve ends, and have preferences based on values. Another framework for thinking about risk and decision-making is social amplification of risk, which links psychological, social and cultural risk theories influence decision-making. Systems theory defines risk as a fundamental social construct that is closely linked to the particular rationality of society’s subsystems. In sum, social science perspectives on risk include a range of perspectives about how individuals and cultures think about and respond to risk; networked perspectives offer insight about the structural effects of individuals behaving within a broader societal context.

1.6 Combining the Three Foundations: Conservation Criminology

Interdisciplinary research is “a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice” [National Academies of Science Committee on Facilitating Interdisciplinary Research Report (2004, p. 2)]. The current conceptualization of conservation criminology fits this definition (Figure 1.1). Synthesizing theories, methods, and analytic approaches from the three foundational disciplines provokes interdisciplinary thinking about many of the conservation-related problems facing contemporary society. Often, synthetic thinking about problems is beneficial in its capacity to compensate for weaknesses of individual perspectives. Interdisciplinary problem definition broadens the suite of possible solutions and pushes the boundary of innovation. Conservation criminology creates a safe space for testing new approaches for resolving environmental risks and discarding ineffective ones. In order to leverage the benefits of the paradigm, it is not sufficient to simply take a conservation biology issue, “add” decision science and criminology to the recipe, and “stir.” As an interdisciplinary science, conservation criminology requires the constant and creative combination of theories, methods, and
techniques from diverse disciplines throughout the entire processes of research, practice, education, and policy. Thinking about the interdisciplinary nature of conservation criminology can be quite exciting but does require patience and understanding of the different languages, epistemologies and ontologies of the core disciplines. The National Science Foundation noted interdisciplinary research is continuously emerging, melding, and transforming. And, what is considered interdisciplinary today might be considered disciplinary tomorrow!

1.6.1 Strengths

In many ways the interdisciplinary thinking facilitated by conservation criminology is its greatest strength. Using reductionist or unidirectional models of a single discipline to study relationships between people and environments can result in critical interactions being overlooked across system components (Milner-Gulland, 2012). Attending to one aspect of the problem will not make much of a difference unless all parts of the continuum are addressed at the same time. No single discipline can accomplish the feat of producing evidence that resolves all negative effects of human-environment relationships. Situating conservation problems inside the broader socio-ecological systems (SES) within which they occur helps transcend reductionist limitations. SES are multi-actor systems whose connectivity is the root cause of complexity (Khanna, 2016). Conservation criminology may be thought of as a skeleton for SES, providing the structural support needed to link individual, social, and landscape factors, as well as feedbacks from within the system that influence conservation crimes. For example, although law enforcement is seen as a critical element in combatting illegal wildlife trade, an exclusive focus on top-down enforcement-led approaches can create new risks to communities, governance, and conservation (Cooney, 2016). Conservation criminology concomitantly engages the knowledge base from multiple disciplines to consider communities as powerful and positive agents of change, the risks that communities bear when living with wildlife, the ecological importance of wildlife in maintaining healthy ecosystems, the contribution of wild meat to food security and human nutrition, and the connection between killing and eating wildlife with increased risk exposure of contracting infectious diseases that animals transmit. Beyond delineating a space for building theoretical understanding about the nature of the problem and characterizing the on-the-ground context, conservation criminology offers a broad and evolving suite of tools for reform such as those discussed in Chapter 9. These tools are not necessarily limited in scope to single disciplines (e.g., technological fixes are a common solution in risk analysis). Conservation criminology helps mainstream traditionally disparate disciplines into current narratives about global environmental risks, including those related to illegal wildlife trade or environmental security (Gore et al., 2016).

1.6.2 Shortcomings

Conservation criminology is not without its weaknesses. To date, the paradigm appears to be applied to problems, harms, and crimes very relevant the global north, meaning discourse is dominated by northern problem definitions, research
themes, and crime priorities. Discourses are typically framed using global north language, both politically and scientifically. The north/south divide debate invites additional consideration about the nature of human-environment interactions. More specifically, do people view themselves as part of or distinct from their environment? What is considered to be natural? The value and potential of a using a conservation crime perspective may be misestimated when one considers the on-the-ground context or scope of policy. For example, illegal exploitation of natural resources is often related to a variety of other illegal acts, varying from corruption to systemic violence. Exploitation is also legal in a wide array of domains and is regulated as such. Not all harms are or should be considered illegal and laws may not be the default form of social control in all regions of the world. It is also unclear what the endgame is; what are we as a society trying to accomplish—a restored ecosystem? A minimum viable population of species? A return to Eden? Risks that are as low as reasonably allowable? Who decides?

Many of conservation criminology’s shortcomings may be underlain by unanswered questions associated with a lack of testing and application. For example, criminological definitions of actors may not hold in a conservation context. Does conservation criminology sufficiently account for the complexity and dynamism of global environmental risks? Is something missing? Does conservation criminology offer sufficient space to consider the multiple factors of social change and examine the extent to which these factors interact? Perhaps most importantly, are we really facing a crisis? Is it really new? What really makes the current environmental situation truly different than what we have previously experienced over time? One of my graduate students recently summed up this reality by sharing an anecdote from his dissertation fieldwork in sub-Saharan Africa. During a focus group, a participant responded to his question about the morality of trafficking children for pastoral labor: “You see danger. I see bread.”

1.7 How to “Do” Conservation Criminology

Students, conservation practitioners, agency personnel, and other faculty have asked me how to “do” conservation criminology. I do not believe there is any single way to “do” conservation criminology. However, I like to think of conservation criminology as a minimum viable concept (MVC) (Reiss, 2011). Rather than seek perfect information to predict the future, I can ask, “What is the basic information I need to know to get out in the field and start doing?” The idea of the MVC resonates with conservation criminology because it enables action in the face of imperfect and incomplete information so that we can put forward concepts to empirically investigate. The three foundational fields of conservation criminology offer the most basic framework for understanding and generating actionable intelligence that can help resolve the negative aspects of human-environment relationships. Employing the idea of the MVC, conservation criminologists can subscribe to Reiss’s (2011) Principles of Agility. As a group, collaborators can focus on problems before specific solutions, value relationships over processes, and integrate with existing efforts instead of creating isolated programs (Reiss, 2011).
Conservation criminology may be accomplished using design thinking strategies. These tactics put a potential beneficiary (i.e., user of scientific information) at the center of design and calls for interacting with them and all the stakeholders involved in the system throughout the scientific process of framing the problem, working with them to frame the right questions about their collective needs, and creating multiple ideas to test and see what works and learn from what doesn’t. Conservation criminology is an approach that relies on the broad cross-sector coordination permitted by design thinking. This means abandoning individual agendas in favor of a collective approach to engaging in scientific inquiry in response to a real world societal problem. Design thinkers (e.g., Kolko, 2015) call this a form of collective impact, or the commitment of a group of actors from different sectors to a common agenda for solving a specific social problem. Collective impact involves a centralized infrastructure and mutually reinforcing activities among all participants. Collective impact initiatives have defining characteristics. Their actions are supported by a shared measurement system, mutually reinforcing activities, and ongoing communication, and are staffed by an independent backbone organization (Kolko, 2015). The foundational fields of conservation criminology offer a shared measurement system (Gibbs et al., 2010).

Kolko (2015) acknowledged large-scale social change comes from better cross sector coordination rather than from attention from individual disciplines. Cross sector coordination, which is what conservation criminology entails, does not happen often—not because it is impossible but because it is rarely attempted. Stakeholders are used to focusing on independent action as the primary vehicle for social change. The norm is for disciplines to make isolated impacts. There is a traditional orientation toward finding a solution embodied within a single discipline coupled with the hope that others will grow or replicate findings to extend impact more widely. By relying on multiple disciplines, conservation criminology leapfrogs this ideal; it promotes thinking about second- and third-order consequences of risks, not just isolated trends (Khanna, 2016).

1.8 Roadmap

The following chapters include and build upon the foundational fields of conservation criminology to highlight the benefits of thinking about conservation issues from an interdisciplinary perspective. Ideally, these chapters offer insight about how we might effectively navigate the road ahead. There are some considerations that the chapters in this book do not tend to, but are likely relevant for conservation criminology to incorporate in the future. Perspectives from environmental justice, gender, history, journalism, public health, religion and ethics, human geography, or urban studies are mostly missing from the book. Ideally, future scholars and volumes can help build the knowledge base so as to bring these perspectives, and others, into the fold.

In the first section, Chapters 2 and 3 conceptually elaborate on a number of suppositions from the foundational fields. Chapter 2 investigates the application of crime science to conservation. Chapter 3 identifies limitations in current
thinking about deterrence and how those limitations bear acute implications for conservation and around PAs. These chapters challenge assumptions, offer recalibrated ways of thinking, and propose a remapping of ideas so as to improve the ability of the foundational fields to contribute to conservation criminology.

In the second section, Chapters 4 through 8 provide a suite of case studies illustrating breadth and depth of global risks, crime, and conservation as well as how conservation criminology applies to diverse ecosystems. Chapter 4 explores dominant forms of governance within three conservation contexts and compares implications for effective engagement of publics. Chapter 5 uses wildlife harvest as a context with which to consider compliance and cooperation with conservation rules. Chapter 6 unpacks the role of corruption and organized crime, as well as their linkages and potential policy-oriented solutions. Chapter 7 considers how current thinking in policing might be mainstreamed to improve outcomes for conservation, including enforcement and compliance. Chapter 8 describes how sociological work on power relations and authenticity can inform understanding about markets for wildlife tourism. These chapters summarize discrete contexts and integrate different disciplinary principles into conservation criminology to explore practical implications for conservation.

In the final section, Chapters 9 through 11 profile innovations and models within the conservation criminology sphere. Chapter 9 reviews the strengths and weaknesses of mobile applications, forensic science, conservation drones, and open-source software for enhancing detection, deterrence and enforcement. Chapter 10 presents a game theoretic model of human behavior for designing enforcement patrols to protect wildlife and interdict potential poachers. Chapter 11 utilizes social psychology to predict individual’s potential to poach. These chapters illustrate the fantastic potential of innovation and boundary advancement that is possible with interdisciplinary thinking.

Global strategist Parag Khanna (2016) offered a characterization of an increasingly connected world. He argued connectivity is a meta-pattern of our age, and infrastructure is the mechanism by which people connect. In this way, functional geography is becoming more important than political geography. Tensions that arise over illicit movements of wildlife or other natural resources are fundamentally about who gains the most from connectivity. Mapping functional geography (e.g., transportation routes, energy grids, forward operating bases, financial networks, internet servers) concomitantly maps the pathways by which power is projected and leverage exercised. These pathways also distribute risks and benefits across time and space. Infrastructure enables connectivity, which in turn enables supply chains. Supply chains do not acknowledge geopolitical borders and they are increasing in size and global distribution. Khanna (2016) proposed supply chains are how the market exploits the earth and provide a conduit for marauding rainforests, oceans, and other natural resources. Supply chains are the channels for transnational organized crime syndicates (e.g., Russian Bratava, Mexican Sinaloa, Italian Camorra and ‘Ndrangheta, Japanese Yakuza) to bridge supply and demand for rhino horns, illegal timber, drugs, people, counterfeit goods, and synthetic drugs. Connectivity makes exploiting nature easier and connectivity is going to increase. For individuals and groups working to reduce risks to people and biodiversity, the road ahead appears to have deep potholes.
References


