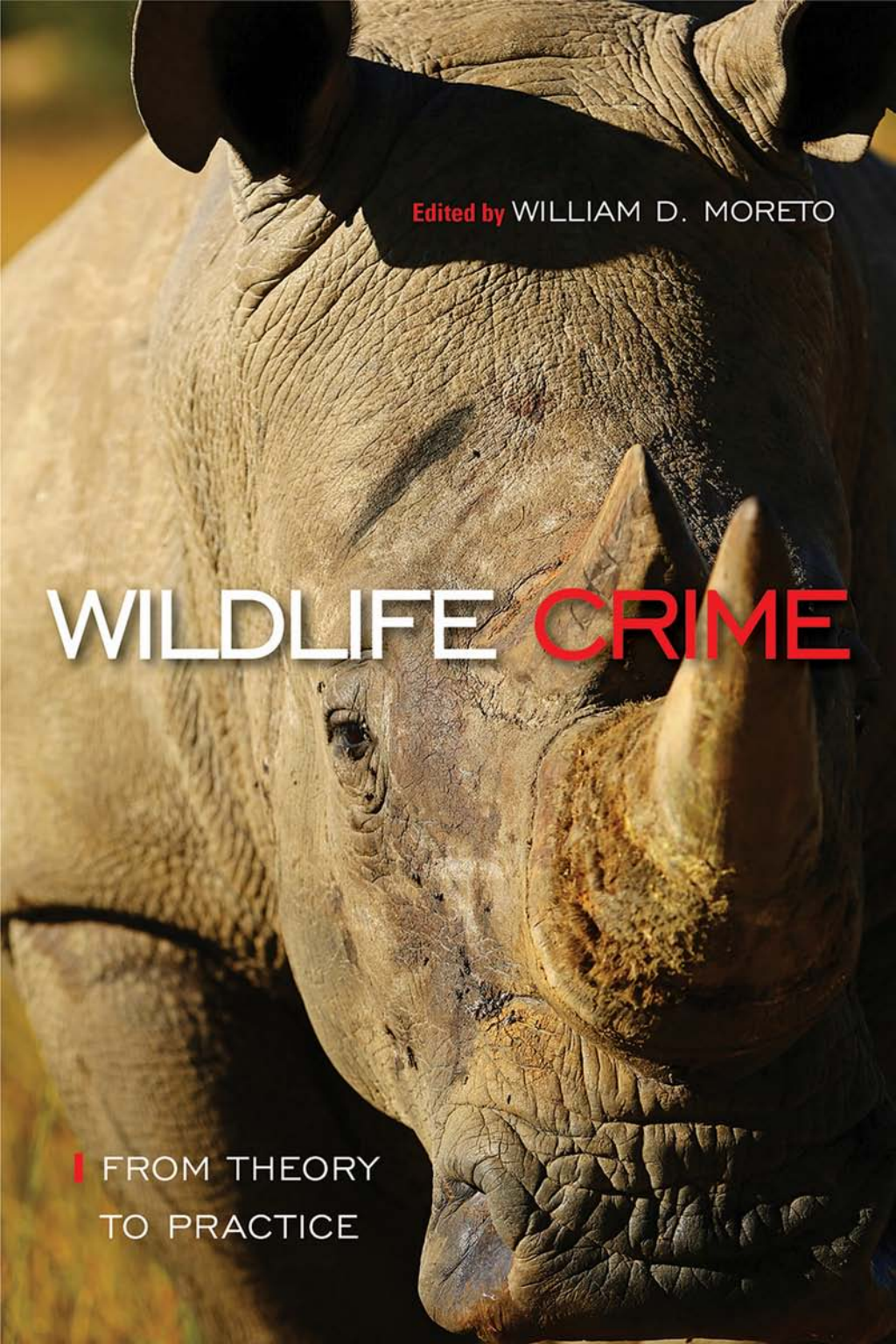

Edited by WILLIAM D. MORETO

# WILDLIFE CRIME

## FROM THEORY TO PRACTICE

# WILDLIFE CRIME

Photo credit: Daan P. van Uhm

*Edited by* WILLIAM D. MORETO

# WILDLIFE CRIME

*From Theory to Practice*

TEMPLE UNIVERSITY PRESS
*Philadelphia • Rome • Tokyo*

TEMPLE UNIVERSITY PRESS
*Philadelphia, Pennsylvania 19122*
*www.temple.edu/tempress*



Published 2018

Library of Congress Cataloging-in-Publication Data

Names: Moreto, William D., editor.
Title: Wildlife crime : from theory to practice / edited by William D. Moreto, Ph.D.
Description: Philadelphia : Temple University Press, 2018. | Includes bibliographical references and index. |
Identifiers: LCCN 2017055042 (print) | LCCN 2018011706 (ebook) | ISBN 9781439914731 (E-book) | ISBN 9781439914717 (cloth : alk. paper) | ISBN 9781439914724 (pbk. : alk. paper)
Subjects: LCSH: Wildlife crimes.
Classification: LCC HV6410 (ebook) | LCC HV6410 .W55 2018 (print) | DDC 364.16/2859—dc23
LC record available at https://lccn.loc.gov/2017055042

♾ The paper used in this publication meets the requirements of the American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1992

Printed in the United States of America

9 8 7 6 5 4 3 2 1

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# WILDLIFE CRIME

# INTRODUCTION

*From Theory to Practice*

William D. Moreto

## Situating This Volume

I recall that first time I proposed this volume to Aaron Javsicas, now editor-in-chief of Temple University Press. He had contacted me via email prior to the American Society of Criminology (ASC) annual meeting in 2014 to set up a time to discuss my recent work and my future plans. Unfortunately, due to our schedules, we were only able to meet very briefly to discuss the growing interest of wildlife crime within the field of criminology. Fast-forward to a couple of weeks before the 2015 ASC meeting, and I received another email from Aaron. We were able to finally to have an actual conversation during this conference, and I laid out my vision for the volume. After I finished describing my proposal, I was surprised (and still am) that Aaron was on board with my ambitious goal. Before I provide a more "traditional" introduction to the contributions of this volume and to the authors, I feel that it would be appropriate to provide a glimpse into the impetus for this edition—similar to what I told Aaron. Note the following are primarily my own reflections and do not necessarily represent those who have contributed to this volume.

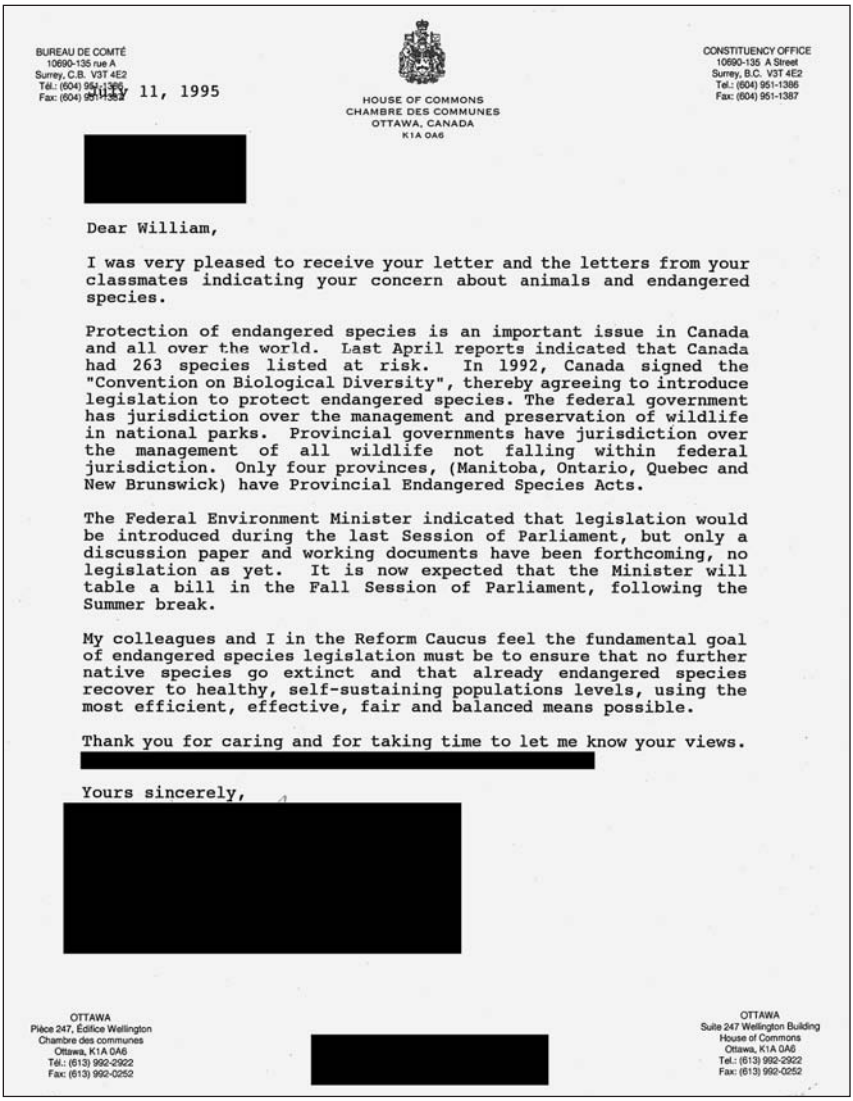
### *Criminology within Conservation Science*

The following volume is intended to be a modest contribution to the growing literature on wildlife crime. Although this volume also includes scholars from other disciplines, the majority of contributors are criminologists, crime scientists, and criminal justice scholars (for ease, I'll simply refer to the collective as

"criminologists"). I admittedly reached out to authors with a background in criminology, crime science, and criminal justice to help solidify the explicit role of these fields in the study of wildlife crime and environment-related crime, in general. Indeed, while empirical criminal justice research on wildlife law enforcement can be found in the early 1980s (Charles 1982), the overwhelming majority of research on wildlife crime and wildlife law enforcement from criminologists has occurred within the past two decades. This is not to say that earlier research in other disciplines, including work done by sociologists (e.g., Palmer 1975; Bryant 1979), does not contribute to the foundation that current criminological scholarship is built upon (e.g., such work has been instrumental in the criminological assessment of animal abuse; Beirne 1995), but, rather, I focus attention on the more recent contributions by criminologists.

As I explain momentarily, this is because I believe that criminologists have a place within the conservation sciences. In other words, I dedicate a volume to the criminological study of wildlife crime situated within the broader scope of conservation. As such, this volume defines wildlife crime as "the illegal exploitation of the world's flora and fauna" (Interpol n.d.), including the poaching and trafficking of wildlife species. This definition is used in order to narrow the focus of the book and does not include other important issues, including animal abuse (see Maher, Pierpoint, and Beirne 2017, for a comprehensive collection on the topic). Increasingly, social scientists have become more involved within the conservation sciences, however, compared to geographers, political scientists, and economists, criminologists have not yet been able to establish a strong foothold.

In my assessment, this is in part because of the general lack of interest in the topic or perhaps even the perceived lack of legitimacy as a research area within criminology. For example, when I was a doctoral student, I discussed my research interests with an established scholar and I remember them asking me: "Where do you intend to publish *that*?" Admittedly, I was also guilty of this perspective when I first started my doctoral studies. I myself did not enter my Ph.D. program with the intention of pursuing wildlife crime research. I became *professionally* interested in the topic because my mentor, Professor Ron Clarke, was interested in applying environmental criminology and crime science approaches to the study and prevention of wildlife crime. Although Professor Clarke's interest in wildlife crime was sufficient enough for me as I (a) was interested in environmental criminology and crime science and (b) went to Rutgers School of Criminal Justice to work with Professor Clarke, additional factors solidified my decision to dedicate my research agenda to this area. First, the complexity of the issue piqued my interest as a developing researcher. Second, the lack of criminological attention provided an opportunity to contribute to the development of an under-researched topic.



BUREAU DE COMTÉ
10690-135 rue A
Surrey, C.B. V3T 4E2
Tél.: (604) 951-1386
Fax: (604) 951-1387

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OTTAWA, CANADA
K1A 0A6

CONSTITUENCY OFFICE
10690-135 A Street
Surrey, B.C. V3T 4E2
Tel.: (604) 951-1386
Fax: (604) 951-1387

[redacted]

Dear William,

I was very pleased to receive your letter and the letters from your classmates indicating your concern about animals and endangered species.

Protection of endangered species is an important issue in Canada and all over the world. Last April reports indicated that Canada had 263 species listed at risk. In 1992, Canada signed the "Convention on Biological Diversity", thereby agreeing to introduce legislation to protect endangered species. The federal government has jurisdiction over the management and preservation of wildlife in national parks. Provincial governments have jurisdiction over the management of all wildlife not falling within federal jurisdiction. Only four provinces, (Manitoba, Ontario, Quebec and New Brunswick) have Provincial Endangered Species Acts.

The Federal Environment Minister indicated that legislation would be introduced during the last Session of Parliament, but only a discussion paper and working documents have been forthcoming, no legislation as yet. It is now expected that the Minister will table a bill in the Fall Session of Parliament, following the Summer break.

My colleagues and I in the Reform Caucus feel the fundamental goal of endangered species legislation must be to ensure that no further native species go extinct and that already endangered species recover to healthy, self-sustaining populations levels, using the most efficient, effective, fair and balanced means possible.

Thank you for caring and for taking time to let me know your views.

[redacted]

Yours sincerely,

[redacted]

OTTAWA
Pièce 247, Édifice Wellington
Chambre des communes
Ottawa, K1A 0A6
Tél.: (613) 992-2922
Fax: (613) 992-0252

[redacted]

OTTAWA
Suite 247 Wellington Building
House of Commons
Ottawa, K1A 0A6
Tel.: (613) 992-2922
Fax: (613) 992-0252

**Figure I.1** A letter I received from my local Member of Parliament after expressing my concerns regarding animals and endangered species.

The final factor was *personal*. I have always been concerned with environment-related issues, particularly the extinction of endangered species. In fact, I even wrote a letter, along with some of my fellow classmates, to my local member of Parliament when I was in elementary school to voice my concerns about endangered species—my 11-year-old self even received a response (see Figure I.1). As an adult, I was familiar with criminological research ranging

from serial sex offender decision making to restorative justice programs in aboriginal communities to graffiti artists' motives and motivations—in other words, fairly broad. But I knew nothing about wildlife crime.

As I soon learned (and am still learning), much can be gained in the study of wildlife crime from a criminological perspective, including the adaptation, extension, and testing of criminological concepts and theory. Simply put: criminologists are well suited in the investigation of wildlife crime since it *is* a crime. Discussions on the development and definition of specific activities as criminal, the sociopolitical and cultural context by which some activities are criminalized while others are not, the situational characteristics that result in crime opportunities, and the resulting strategies for prevention, punishment, and rehabilitation (to name a few) are all within the purview of criminologists.

Additionally, criminologists who study environment-related topics have tended to publish primarily in criminological channels rather than conservation-based outlets. In my opinion, however, criminologists need to publish in avenues beyond those in criminology, whether they be peer-reviewed journals or practitioner-focused magazines. This will help ensure that criminological research is viewed as an integral and legitimate aspect within conservation science. Fortunately, criminological research has increased in appearance in recent years within conservation outlets (e.g., Gore, Ratsimbazafy, and Lute 2013; Petrossian 2015; Moreto 2016; Moreto, Lemieux, and Nobles 2016; Moreto et al., in press; White 2016).

That was the first "hook" for the present volume: a volume that would be dedicated to examining wildlife crime, primarily from a criminological perspective. But there are other volumes that are similar in focus and scope. To differentiate the current volume from others, I wanted to develop a collection that crossed theoretical perspectives, incorporated explicit discussions on methodology, and provided an outlet for practitioners to contribute to. In sum, I wanted to develop a volume that addressed three "silos" I believe exist within the criminological study of wildlife crime.

### *Theoretical Silos*

Most volumes covering environment crime have originated from specific "camps." Therefore, collected volumes often have similar underlying or overarching themes and often are developed to push forward a conceptual or ideological perspective. Moreover, editors are more likely to be familiar with scholars who share similar views and are therefore more likely to incorporate such work within their collections. This is evidenced by recent volumes operating from conservation criminology (Gore 2017), environmental criminology and crime science (Lemieux 2014), and green criminology perspectives (Beirne and South 2007; Brisman, South, and White 2016; Hall et al.

2017). I do not consider this to be inherently problematic. Indeed, an effective edited volume should display consistency in tone and demonstrate an appropriate flow among and between the chapters—I can only hope that this volume lives up to such expectations!

Unfortunately, this results in theoretical silos. Essentially, scholars become sufficiently familiar with work that adheres to their own theoretical and ideological perspectives, while ignoring, neglecting, or simply being completely unaware of the work of others. I admit that I myself am guilty of being intimately more familiar with work within my own silos (e.g., environmental criminology and crime science, and policing). This does not mean that I am not familiar with work from other perspectives, but, rather, I am focused on developing and utilizing a specific orientation in the study of wildlife crime.

Acknowledging my own bias while also being cognizant of the current academic landscape, I proposed this volume with the intent to bring together the main theoretical perspectives—green, conservation, and environmental—that have driven the study of wildlife crime within criminology into one collection. My hope is that the following collection will be useful not only for established scholars in the field but as an inclusive companion for students new to the study of wildlife crime. It is my opinion that each of the aforementioned perspectives provides a unique contribution to the study of wildlife crime. Moreover, each helps cover aspects of the topic that the other frameworks may not necessarily be tailored for or interested in. For example, environmental criminologists are known for focusing their attention on the spatiotemporal and situational (i.e., proximal) factors that influence crime events, while green criminologists are well versed in understanding the underlying sociopolitical, economic, and cultural factors (i.e., distal) that result in crimes and harms. Environmental criminology is associated with the applied, multidisciplinary field of crime science, while green criminology is often associated with critical, cultural, and radical criminology. In the end, each has a place in the study of wildlife crime and it would behoove those of us who study wildlife crime to be familiar with perspectives that do not necessarily align with our own (see also White, Chapter 3).

### *Methodological Silos*

To date, the majority of edited books covering environment crimes have focused on the presentation of theoretical and empirical works as opposed to an explicit discussion on methodology. Essentially, most edited volumes attempt to deliver a comprehensive overview of a topic rather than discuss methodological techniques. Again, this is not unexpected since detailed discussions on methods are reserved for research method textbooks. With that in mind, I believe there is considerable value in explicitly drawing attention

to methods used to study wildlife crime. There are three main reasons I believe methods should be given more consideration: first, they provide researchers with an opportunity to "take stock" of quantitative and qualitative strategies that have been used, as well as nuances associated with conducting such research, including gaining access to agencies, organizations, or individual study participants, ethical considerations (e.g., institutional review board), and using novel analytical techniques.

Second, transparency in methodology may help bridge the gap between different perspectives, including more broadly the natural and the social sciences, thereby facilitating an environment that is interdisciplinary and multimethod (cf. Moreto 2017). In recent years conversation regarding the need to better understand the human dimensions of conservation science has highlighted the need for interdisciplinary scholarship, particularly the increased inclusion of the social sciences (Agrawal and Ostrom 2006; Adams 2007). Unfortunately, this is easier said than done. For instance, challenges associated with inherent differences in (and at times ignorance to) philosophical orientation and methodological approaches foster an environment in which it is difficult to assess and evaluate sound interdisciplinary research. One way to help counteract this reality is for "researchers [to] share their experiences with interdisciplinary research in practice," which will result in "a wider body of knowledge for potential interdisciplinary researchers to draw on" (Campbell 2005, 576).

Finally, I believe detailed discussions on methodology within the scope of actual wildlife crime research provide an opportunity for students interested in the topic to see "the how and why" of the process. On a completely selfish level, I unabashedly must confess that I enjoy reading about the creative methods used by researchers to study a myriad of wildlife crime topics and I want this volume to include such reflections. On a more utilitarian level, I hope that by including explicit discussions on research methods the future generation of wildlife crime scholars will learn from the experiences of current researchers and will be able to develop their own innovative techniques.

### *Academic and Practitioner Silos*

The idea of a collected volume on wildlife crime initially came to me after I had conducted fieldwork in Uganda in 2014. I recall speaking with a number of commanders in the Uganda Wildlife Authority (UWA) and discussing their needs and the challenges they faced. Not surprisingly, they mentioned a number of practical, on-the-ground issues (e.g., lack of equipment) but rarely discussed the potential role of academia in helping with their daily operations. Notably, this fieldwork occurred after I had attended three sep-

arate events dedicated to wildlife crime: the Wildlife Crime Symposium (hosted by the Rutgers School of Criminal Justice), the Wildlife Criminology Symposium (hosted by the World Bank), and Wildlife Crime Workshop (hosted by the University of Southern California). Academics, practitioners, government officials, and representatives from the private sector were in attendance. One question arose in all three events: "How do we bridge the gap between academics and practitioners?"

The following year, in 2015, I held a visiting fellow scholar appointment at the Netherlands Institute of Crime and Law Enforcement (NSCR). During a weeklong symposium with practitioners, academics, and the private sector, it became apparent that some of the most considerable problems in the study and prevention of wildlife crime were the varying (and at times incongruent) goals and objectives of stakeholders, challenges in establishing metrics for assessment and evaluation of interventions, and translating theory into practice. Since then I have presented at other events that brought together academics, practitioners, and public and government representatives, including former President Barack Obama's Presidential Taskforce on Wildlife Trafficking and other proceedings hosted by the U.S. Department of Defense, U.S. Department of State, U.S. Special Operations Command, and Cornell University. Again, questions arose as to how to translate academia into practice.

These cumulative experiences (among a number of others that I will not further bore the reader with) solidified my belief that the bridge between academics and practitioners needed to be explicitly explored. In particular, practitioners' viewpoints needed to be included and represented within academic circles. By doing so, scholars will be able to develop well-rounded "realistic evaluations" (see Pawson and Tilley 1997) by incorporating practitioner perspectives that would help draw attention to the context in which interventions are developed and implemented, understand the mechanisms that drive or hinder an intervention, and better interpret the subsequent outcome. In essence, incorporating the experiences and perspectives of practitioners will help contribute to the development of translational criminology (see Laub 2012; Sampson, Winship, and Knight 2013) and further provide a platform on which academics, especially those in the social sciences, can collaborate with practitioners within the conservation sciences.

It is important to note that it is not common to have practitioner perspectives in academic editions in criminology. This reality is not unexpected given that scholarly publications are not seen as pivotal for professional development for those "on the ground." This lack of involvement may also be due to a lack of knowledge on how to contribute. Request-for-proposals may only be sent to academic mailing lists, organizations, or networks, which may not include practitioners. With respect to my academic colleagues who contributed to this

book, I admit that I was especially excited to have a part in this volume dedicated to practitioner experiences and practitioner-driven research.

## A Brief Introduction to Wildlife Crime

Before I introduce the different parts and chapters in this volume, I first provide a (very) brief overview of wildlife crime, specifically focusing on the drivers and resulting impacts. It is important to note that both the drivers and the impacts of wildlife crime are consistently addressed throughout the different parts of this book and what I present here is simply a teaser of what is to come. In general, there have been a number of different drivers identified within the literature, including the political economic perspective (Stretesky, Long, and Lynch 2014; White, Chapter 3), political motivation and rebellion (Naylor 2004), culture and tradition (Ellis 2013; Moreto and Lemieux 2015; Forsyth and Forsyth, Chapter 6; Leberatto, Chapter 7), supply and demand markets (Courchamp et al. 2006; Lemieux and Clarke 2009), and human-wildlife conflict (Treves and Karanth 2003), to name a few.

Like the factors that drive wildlife crime, the implications of such crimes are also wide ranging and can have considerable impact at the local, national, regional, and international level. Not surprisingly, much attention has focused on the ecological costs associated with wildlife crime, particularly as it relates to keystone species (Payton, Fenner, and Lee 2002). Moreover the potential introduction of invasive species (e.g., unwanted exotic pets like pythons) to environments that are ill-equipped to accommodate such species can also have devastating impacts on local wildlife populations and their habitats (Wyler and Sheikh 2008). Additionally, the financial losses associated with the poaching and illicit trading of wildlife can be particularly disadvantageous to local populations that could have economically benefited from such wildlife (Duffy 2010). Threats to public health and national security have been identified as well (Wyler and Sheikh 2008).

## Introducing This Volume

The present volume is divided into three parts: the first focuses on the theoretical foundations for the study of wildlife crime. The second centers on empirical and methodological developments in the study of wildlife crime. The third and final part offers practitioner perspectives from individuals with extensive ground-level experience. This volume is comprehensive in breadth and scope and includes firsthand experiences and research from a number of nations including China, Indonesia, Kenya, Madagascar, Morocco, Peru, Russia, South Africa, Tanzania, and the United States, to name a few. Additionally, the use of both qualitative and quantitative analytical strategies is demonstrated in this collection.

### *Part I: Theoretical Foundations*

The first part begins with a chapter by Avi Brisman and Nigel South and provides an in-depth discussion on wildlife crime from both green and conservation criminology viewpoints. In particular, Brisman and South maneuver through the various nuances associated with different, yet interrelated, outlooks on wildlife crime, while highlighting the various characteristics associated with the dynamics of wildlife crime activities. Throughout the chapter the authors refer to a number of drivers that contribute to and perpetuate wildlife crime, including structural sociopolitical changes, traditional and cultural practices, poverty, and greed, among others. Notably, the authors provide a unique discussion on the role of emotions and passions as they relate to assessing wildlife crime from biocentric and anthropocentric approaches.

The following chapter is written by Gohar A. Petrossian and Nerea Marteache, and the authors utilize an environmental criminology perspective to examine illegal, unreported, and unregulated (IUU) fishing. Specifically, Petrossian and Marteache draw from concepts found in the crime concentration and rational choice perspective literature to provide a detailed overview and assessment of IUU fishing. In addition, the authors provide suggestions from a situational crime prevention approach for reducing or preventing IUU fishing.

Rob White follows with a chapter that explicitly addresses the theoretical silo mentioned earlier. In his chapter, White provides an overview of the strengths and limitations of three primary approaches in the study of wildlife crime: situational, contextual, and political economy. He then calls into question the perceived disjointed and even conflicting nature of these perspectives with one another. He concludes by describing avenues for compromise, as well as suggestions on how to approach wildlife crime from a collaborative and holistic approach.

The final chapter in Part I is written by Greg Warchol. Unlike the previous chapters, which provide an overview of established and well-known theoretical frameworks, Warchol introduces a new approach in the study of wildlife crime: theory of enterprise. Operating from this perspective, Warchol discusses the illicit ivory and rhinoceros horn trade and the potential involvement of organized crime as well as the facilitating role of corruption and globalization.

### *Part II: Empirical and Methodological Developments*

The first chapter in the second part continues with an exploration of the illegal trade in rhinoceros horn and elephant ivory. Drawing from fieldwork conducted in South Africa and Tanzania, and supplemented by information obtained from several national- and international-level conferences, Louise

Shelley and Kasey Kinnard provide an in-depth investigation on the convergence or intersection of wildlife trafficking and other types of criminal activity. The authors offer insight on trade dynamics and routes and the actors involved, as well as factors that facilitate the rhinoceros horn and elephant ivory trade, such as corruption.

The next three chapters are unique as they draw from ground-level interviews with individuals who are actually involved in wildlife crime. York A. Forsyth and Craig J. Forsyth draw our attention to the cultural historical context of poaching in Louisiana, in the United States. Reflecting on interviews conducted on poachers over a 26-year period, the authors apply two theories—Miller's Lower Class Culture and Gusfield's Culture Conflict—to demonstrate how offenders' justify and support their actions through personal and cultural expectations.

In his chapter, Antony C. Leberatto also provides us with insight on the perceptions of individuals actively engaged in wildlife crime. Based on formal interviews, informal conversations, and participant observations, Leberatto provides a detailed overview of the overlap between ecotourism, nature-based entertainment, and the illegal wildlife trade in Peru. Although the chapter is more empirical than methodological in its objective, Leberatto provides the reader with an engrossing discussion on the strategies he used to conduct research on multiple actors throughout the illicit market chain.

Next, Daan van Uhm outlines methodological considerations when conducting multisite research on the illegal wildlife trade. In this chapter, van Uhm provides the reader with thorough descriptions of his fieldwork in China, Morocco, and Russia. Having examined a number of different illegal trades, including caviar, Barbary macaques, and traditional Chinese medicine, van Uhm presents his experiences of gaining access to informants and study participants, encountering dangerous situations, and facing ethical dilemmas.

Meredith L. Gore, Gary J. Roloff, Alexander Killion, Jonah H. Ratsimbazafy, and Georg Jaster then deliver a unique methodological chapter guided from a conservation criminology framework. In their chapter, the authors advocate for the use of intelligence mapping in order to reduce conservation crime risk, specifically illegal rosewood logging in Madagascar. The authors detail their experiences using field-based participatory risk mapping as a means to gain a better understanding of the geospatial characteristics of illegal logging and present a methodology that other scholars can use to generate a nuanced exploration of space, vulnerability, and risk within the scope of wildlife crime.

In line with the prior methodological-focused chapters, Nicole Sintov, Viviane Seyranian, and Milind Tambe present their experience conducting ground-level wildlife security research in Indonesia. Accurately noting the

challenges associated with the application of wildlife law enforcement patrol technology and issues that arise from technology adoption, resistance, and diffusion, the authors summarize their experiences on applying computational game theory and security games through a green security software referred to as PAWS (Protection Assistant for Wildlife Security). In particular, the authors detail how educational intervention may be useful in alleviating limitations associated with lab-to-field technological transitions.

### *Part III: Practitioner Perspectives*

The third and final part focuses primarily on practitioner-based experiences and practitioner-driven research initiatives. Keeping with the theme of technology from the previous chapter, Johan Bergenas offers his experiences attempting to develop and implement the use of technology for wildlife law enforcement initiatives in Kenya. Highly personal and engaging, Bergenas provides a distinct opportunity for readers to obtain some insight on the challenges, joys, politics, and realities associated with ground-level conservation initiatives.

Next, Madelon Willemsen and Rodger Watson present a discussion on utilizing a transdisciplinary approach to wildlife crime prevention. As I noted previously, there has been much discussion on the need to develop an interdisciplinary approach within the conservation sciences. In this chapter, Willemsen and Watson extend this discussion by differentiating between and arguing instead for a transdisciplinary approach in the study of wildlife crime. The authors contend that a transdisciplinary perspective is better situated to incorporate the needed divergent forms of thinking in order to reduce "wicked problems" like wildlife crime.

In the final chapter of this volume, Rohit Singh, Barney Long, and I present the preliminary findings from a practitioner-based study examining ranger perceptions of their occupational well-being and workplace conditions throughout Africa and Asia. Comprehensive in scale and scope, this study is the first of its kind and highlights the importance of research dedicated to examining front line protected area personnel. We also discuss the benefits of and the challenges associated with practitioner-academic collaborations and partnerships.

## Concluding Remarks

Let me end this introduction by first sending my sincere appreciation and gratitude to all the authors of this volume. As I wrote this Introduction, I kept referring back to the Contents of this book and I caught myself on numerous occasions surprised—nay, starstruck—at who actually agreed to provide a chapter to this edition. I am extremely humbled that you all not only

contributed to this unique collection but took the time to develop and provide original manuscripts. I truly do hope you enjoy reading this collection as much as I have. To Ron Clarke, thank you for your continued guidance and mentorship. I also thank Aaron Javsicas, Ryan Mulligan, Jamie Armstrong, Nikki Miller, Kate Nichols, Ann-Marie Anderson, and the entire team at Temple University Press for working with me throughout this entire process and for trusting my vision for this volume. I appreciated the feedback I received and the support you all provided. I would also like to thank the anonymous reviewers for their constructive and helpful feedback that led to a demonstrably improved product. Last, thank you to Jacinta and Ares for your love, patience, and understanding throughout this process. I appreciate you sharing me with this project.

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# I

# THEORETICAL FOUNDATIONS

# 1

# PERSPECTIVES ON WILDLIFE CRIME

## *The Convergence of "Green" and "Conservation" Criminologies*

Avi Brisman and
Nigel South

> The land is one organism. Its parts, like our own parts, compete with each other and cooperate with each other. . . . If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent thinking.
>
> —**Aldo Leopold,** *A Sand County Almanac* **(1966)**

**EDITOR INTRODUCTION:** *Brisman and South begin this volume by highlighting the increased attention that criminologists have paid to wildlife crimes (and environment-related issues more broadly) in recent years. This has led to the development of specific orientations, particularly green and conservation criminology. While the authors acknowledge that differences do exist between these perspectives, they contend that these approaches are complementary to one another as well as to other approaches that have been used to explore and reduce wildlife crimes. They exhibit this by providing an overview of the literature that covers wildlife harms and crimes as well as the responses that have been developed to address these issues. The authors end by drawing from their green criminological background to further emphasize and solidify the importance of distinguishing between human/nonhuman species, and the role that emotions and passions play in conservation.*

Traditionally, criminology has tended to be *anthropocentric* in its approach to harms, cruelty, exploitation, or crimes affecting nonhuman subjects. In this respect it has, as Halsey and White (1998, 349) note, emphasized "the biological, mental and moral superiority of *humans* over all other living and non-living entities" and viewed nonhuman nature "*instrumentally*—as something to be appropriated, processed, consumed and disposed of in a manner which best suits the immediate interests of human

beings" (emphases in original). As such—and as Moreto Brunson, and Braga (2015, 360) have observed—law enforcement and criminal justice systems have "generally considered" wildlife offenses to be a "low priority when compared to other crimes (Cook, Roberts, and Lowther 2002)." Until recently, this was also the case with the criminological study of such offenses and of official or informal responses. As South, Brisman, and Beirne (2013, 32) suggest, "Whether due to indifference or ignorance or denial, criminologists have seldom given attention to animal abuse [and related harms to nonhuman animals]." This is not to imply that animals have never appeared in criminological discourse, but, when they have, it has generally been in a limited sense, portrayed "as the passive objects of human agency that can be damaged, violated, stolen or otherwise misappropriated." This view has been dominant, from the criminal anthropology of the nineteenth century to the biocriminology of the twenty-first.

In recent decades, this picture has begun to change in quite significant ways and it is now the case that wildlife or nonhuman species "crimes" can be discussed in terms of various theoretical and philosophical orientations concerned with speciesism, biodiversity, and environmental and species justice (Ellefsen, Sollund, and Larsen 2012; Halsey and White 1998). Criminologists interested in these topics might take a "green," "conservation," "eco-global," or "environmental" perspective (South and Brisman 2013; Gibbs et al. 2010; White 2011; Situ and Emmons 2000; see also White, Gore et al., and Petrossian and Marteache in Chapters 2, 3, and 9), and criminological perspectives and positions have been developed and articulated with the explicit aim of engaging with issues related to wildlife/animal/nonhuman species. For example, a green criminology has adopted a broad approach, frequently (though not always) addressing damaging impacts on the environment and on all species, as framed within political economy and cultural contexts (Brisman and South 2014; Stretesky, Long, and Lynch 2013; White 2002). One of the central themes in green criminology has been the call for greater awareness of harms and criminal acts committed against nonhuman species (see, e.g., Agnew 1998; Beirne 1995, 1997, 1999, 2009, 2014; Benton 1998; Cazaux 1999, 2007; Nurse 2013; Sollund 2011, 2012, 2013, 2017a,b). This echoes work on crimes and harms against the powerless (South 2014; see also Brisman et al. 2015), gender and feminist politics that have informed important analyses of social movements concerned with animal rights (Gaarder 2011, 2013), and crimes of trafficking in women, children, and animals (Sollund 2013). A developing green criminological perspective on wildlife and animal abuse issues also reflects insights from animal rights theory and from critical criminology. South, Brisman, and Beirne (2013, 33), for example, suggest this could embrace the challenging of legalistic definitions of crime and the exploration of conceptualizations and consequences of human actions that lead to harm, suffering, and pain—but without unin-

tentionally making the case for a widening of measures of social control, policing, and incarceration that will most likely unequally affect human populations who are themselves disempowered and marginalized.

A second major perspective, the idea of a conservation criminology, has been defined and pursued in differing ways by several scholars (Gibbs et al. 2010; Herbig and Joubert 2006; McGarrell and Gibbs 2014; see also Gore et al., Chapter 9) but can be seen as an interdisciplinary approach, providing a foundation for research on wildlife crimes, poaching,[1] and trafficking that has aimed to integrate "principles from opportunity theories of crime, animal behavior, satellite data, risk perception, and machine learning" in order to generate "new insights for policy and practice" about "why and how wildlife crimes occur and where they are likely to transpire in the future" (Gibbs et al. 2017, 240). Although conservation criminology has been mostly associated with a focus on wildlife and animal issues, it has also extended the application of its methods to investigation of topics such as "pollution-related risks/crimes, including the international trade in electronic waste and multiple dimensions of climate change" (Gibbs et al. 2017, 240).

Although these various works in the broad field of criminology might reflect a number of differences in assumptions, they also share core concerns about sustainability and the threat of extinction (see also Moreto, Introduction) as well as opposition to animal cruelty, animal exploitation, and wildlife crimes. This correspondence of priorities and aims is appropriate and to be expected because the primary goal is the placing of the study of nonhuman and related environmental topics and challenges firmly on the criminological agenda. As a result, whatever the criminological nomenclature, some convergence of theory and method is both inevitable and desirable (see also White, Chapter 3).

We do not aim here to make distinctions that set out divisions or competition between what are, in fact, complementary trends in criminology. Instead, in this chapter, we provide an overview of some wildlife-related crimes, harms, and responses, of relevance to both green criminological and conservation criminological perspectives—and other related approaches—paying attention to the internationalization and profitability of wildlife trades and markets, and noting some developments in prevention and responses. Although our focus is on aspects of *wildlife crimes* rather than *animal abuse* (as it might pertain to companion animals or slaughterhouses), we make references to the latter where appropriate. Following a brief discussion of criminological attention to wildlife crimes and harms, we will engage with the complexity of the human/nonhuman relationship by considering some of the passions and fascinations aroused by "other" species when objectified by human social practices, such as keeping pets and maintaining zoos. This reminds us of the often neglected but powerful dimension of "emotion" that contributes to the construction of meaning and morality in

human relationships with nonhuman species. This emotional attachment to—or dislike of—other species has complex origins (see generally Herbig 2010; Skibins, Dunstain, and Pahlow 2017) but, in part, the messages conveyed about emotional responses to nonhuman species have to be understood in terms of culture (Brisman and South 2014; Flynn and Hall 2016; see also Brisman 2014a). This is not an entirely new area for investigation and consideration in the literature on conservation, animal welfare, or speciesism, but reminding ourselves of the *emotional* rather than simply *utilitarian* or *financial* connections between humans and other species is probably always worthwhile. We will conclude with a note on the contemporary confusions that beset us as we declare our care and concern for animals and environments while at the same time, exploit and degrade them (Maher, Beirne, and Pierpoint 2017).

## Criminological Attention to Wildlife Crimes and Harms

For quite some time, the international trade in wildlife as "live bodies" or as harvested "parts and products" was largely overlooked in criminology. As the scope, extent, and geographic range of the illegal trade in wildlife has grown and expanded, however, alongside other global, cross border, and domestic criminal markets, so too has criminological attention to trafficking and related animal abuse. For example, McMullan and Perrier (2002) have explored lobster poaching from a *legal* perspective; Tailby and Gant (2002) have examined illegal abalone markets in Australia using *case studies and market analysis*; Petrossian and Clarke (2014) have used an *empirically based model* of theft (CRAVED: Concealable, Removable, Available, Valuable, Enjoyable, and Disposable) to investigate which fish are preferred by illegal commercial fishers; and Lemieux (2014) has investigated *opportunity structures* that favor poaching in a variety of contexts.

To some extent, the expansion of the illegal wildlife trade has occurred as a result of forces similar to those underpinning other markets. In other respects, there are distinctive features related to individual- and family/small trader–types of enterprise (Reuter and O'Regan 2016; Robis Francisco Nassaro 2017; Sollund 2017b). An Interpol report on environmental crime (Nellemann et al. 2016, 41) suggests that "organized environmental criminal networks increasingly operate like global multinational businesses, connecting local resources to global markets through complex and interlinked networks often embedded in the business community and in government, sometimes including those tasked with protecting wildlife." The examples provided in the following section focus on some of the elements of these markets in order to illustrate the complexity of the means of procurement, trades, and trafficking related to wildlife crimes.

## Poaching, Hunting, Trading, and Trafficking as Criminological Concerns

In a report on "the Living Planet," the World Wide Fund for Nature (WWF) (2014, 16; see also WWF 2016) draws attention to what is actually a *decline* in life on the planet—at least for some species and largely as a result of the activities of one particular species: humans. Since the 1970s, human-created stressors have increasingly affected biodiversity and ecological systems in negative ways. As the director of science and policy at WWF-U.K. puts it, "For the first time since the demise of dinosaurs 65 million years ago, we face a global mass extinction of wildlife. We ignore the decline of other species at our peril—for they are the barometer that reveals our impact on the world that sustains us" (Barratt, quoted in Bawden 2016). The WWF (2014, 20) has pointed to three main threats to populations (rather than entire species): climate change; "habitat loss and degradation"; and "exploitation through hunting and fishing (intentionally for food or sport, or accidentally, for example as bycatch)." Of course, hunting and exploitation of various other species by humans are not new activities and are part of an evolutionary relationship across centuries. Indeed, as the Stanford Environmental Law Society (2001, 6) points out, "Because of our ability to design and manufacture powerful tools, *Homo sapiens* have become the most effective and efficient predators the world has ever seen. It is not difficult for humans to hunt a species to extinction, and it is becoming easier."

Over the years—and particularly in the absence of restrictions on methods, numbers or seasons related to hunting—the sustainability of species populations was easily put at risk. With the twentieth-century introduction of legal controls and protections to restrain trading in various species, it was hoped and expected that threats of overexploitation and extinction would be reduced. Instead, the scope, extent, and geographic range of *illegal* trade in wildlife has grown to the point where it is now recognized as a serious "threat." The implications of this illegal wildlife economy run beyond concerns for biodiversity. As Gore and colleagues (2016, 1) assert, "wildlife crime is politically destabilizing, subverts the rule of law, undermines sustainable development investments and generates monetary proceeds that fuel other organized crime and conflict." This analysis is supported by Nellemann and colleagues (2016, 41) in a report prepared for Interpol:

> Crime groups coordinate through harvesting, trading, and transporting networks to subvert national and international laws and move wildlife products to market. [. . .] In the long term organized wildlife crime, enabled by corruption, contributes to the erosion of the state [. . .] challenging countries to control their own borders,

> resources, and government policies. As illicit economies grow and political power is looted by transnational criminal organizations, states will weaken further in a vicious cycle of state degradation accompanied by increased foreign illicit trade.

Of course, as in any other relatively new field of research, the evidence base for certain claims, expectations, or possible correlations may not yet be firmly established. In this case, other investigators have found a lack of evidence linking wildlife crime and organized crime groups (see Leberatto 2016; Pires et al. 2016). In other studies and analysis, where links have been identified between wildlife trafficking and terrorism, this has raised national and international security concerns (see, e.g., Dawson 2016, 11, 88–89; Wong and Gettleman 2016, A1; Wyatt 2013, 55–58), although other researchers (see, e.g., Duffy 2016; Duffy et al. 2015a, 2015b) have offered a critique of the evidence that poaching funds terrorism. Inevitably, much of the evidence is disputed, and the links and questions being raised mean that criminological attention to poaching, trafficking, and related animal abuse has increased.

### *Dynamics of Hunting, Poaching, Smuggling, Trafficking, and Trading*

Although animal abuse and wildlife crime may be new areas of criminological study, poaching has long been a subject of research interest in criminology and the sociology of deviance. The emphasis, however, has usually been on it as a form of rule-breaking in the context of hunting and other leisure activities, rather than in terms of conservation or environmental concerns (see, e.g., Abotsi, Galizzi, and Herklotz 2016; Rytterstedt 2016). As von Essen and Nurse (2017) summarize, "The deliberate illegal killing of wildlife poses a profound challenge to the legitimacy of regulatory regimes and to a global agenda for bio-conservation, such as the EU Habitats Directive, the US Endangered Species List, and the IUCN listings of threatened wildlife species." This challenge—or better yet, *these challenges*—stem(s) in part from the fact that across various social and cultural contexts, there are a number of motives and incentives leading to and shaping the method and purpose of poaching. These range from ignorance of, or denial about, regulations and restrictions, to thrill seeking and excitement, to a desire to collect trophies, to claims of "rights" on the basis of tradition (see generally Brisman 2014a). Wider and more structurally rooted sociopolitical changes can also encourage poaching activity as a matter of subsistence or resistance or both. In some cases, as von Essen and Nurse (2017) put it, "Illegal hunting is the denunciation of newly enacted wildlife policy that is seen to criminalize customary livelihood or lifestyles practices." This is discussed further in the analysis offered by Peterson and colleagues (2017), who argue that neoliberalism has

exhibited a "tendency to convert nature into alienable property" with the effect of excluding those who "do not accept subjugation as eco-rational subjects," resulting in a new form of wildlife crime that has constructed or labeled "those participating in previously acceptable subsistence and recreational activities as criminal deviants."

There are, however, "fashions" that seem to influence both the species that are hunted and poached and researchers' priorities. As the Stanford Environmental Law Society (2001, 6–7) points out, much species decline is related to consumer demand. Some commonly sought—and illegally obtained and marketed—wildlife "products" include elephant tusks, rhinoceros horn, the thick fur and skin of sea otters, tiger bones, feathers of exotic birds, and the hard shells of sea turtles and other reptiles. As Wong and Gettleman (2016, A1) report, "Some Chinese investors call ivory [from elephants] 'white gold,' while carvers and collectors call it the 'organic gemstone.'"[2] Rhino horn has been used in traditional Chinese medicine for centuries (see Duffy et al. 2015a for a discussion); adult tigers are valued for their claws, pelts, and teeth; tiger cubs can be sold for their meat and for their bones, which are used in traditional Chinese medicine, as well as in large jars of wine—either on their own or with bear paws, scorpions, and snakes—so-called wildlife wine for which there is a market due to claimed health benefits (Paddock 2016b; see also Domonoske 2016; Sullivan 2016; see generally Paddock 2016a).

To some extent, research interests reflect such consumer tastes. As Warchol and Harrington (2016) point out, a considerable amount of research is concerned with the impact of poaching on rhinoceros and elephant populations but poaching of reptiles, birds, and marine life, which actually takes place on a significantly greater scale, receives rather less attention. Indeed, as Herbig (2010, 110) explains, "intervention programmes have, due to public outcry and censure, been implemented to check and control environmental perturbation," but most of these have reflected popular feelings about beauty or what is "cute" (Flynn and Hall 2016) or assumptions about "intrinsic value or profile in the public arena, as in rhino and elephant poaching, cycad smuggling and even abalone and rock lobster plundering along certain of South Africa's seaboards."

We return later to the question of why some species rather than others tend to be more desirable in terms of *consumption* and regarded as more worthy of *protection*. Our immediate purpose here is to underscore that just as the taking, theft, and killing of different flora and fauna elicit different *sympathies*, the *markets* for illegal trade of plant and animal species cannot be essentialized. Duffy and colleagues (2015a, 346) argue that "we need to be cognizant of the fact that the illegal wildlife trade is not a singular phenomenon that requires a one-size-fits-all strategy to tackle it." Importantly, the argument for specifically tailored strategies for prevention is now quite widely made (see, e.g., Lemieux 2014; Pires and Moreto 2011). While Duffy and colleagues

(2015a, 345) note that poor people may "poach to raise their income in situations where they have limited alternatives," it is also crucial to understand poaching in terms of matters such as "prestige, identity and custom (MacDonald 2004)" (2015a, 345). As such, Duffy and colleagues (2015a, 345) contend that while poverty may be a driver with regard to poaching activity, its origins and effects are multidimensional and encompass, for example, "lack of power, prestige, voice, and an inability to shape one's future (Sen 1999; Hulme 2010)."

Elsewhere, in an exploration of the dynamics and complexity of the wildlife trade, Duffy (2016) shows that while there are primary levels of trade in ivory, rhino horn, and tiger parts in exchange for money, a wider perspective would also need to take account of the mechanisms by which these species and their commodified "products" are exchanged in other ways, for basic and luxury goods, from food to jewelry. This observation fits well with the strategy for a "product-based" framework for analysis of illegal wildlife markets and understanding of who becomes involved, and what stages are needed for a successful trade to occur, as developed by Moreto and Lemieux (2015a).

While poaching may still, at times, be a "local" or "traditional" activity, it has also become networked and professionalized. Forms of illegal hunting and wildlife trading that are conducted as a subsistence strategy must therefore be distinguished from—and addressed in different ways to—the commercial-scale poaching of animals with high-value parts.[3] Nellemann and colleagues (2016, 41) describe these contemporary developments in the following way:

> A financier who can supply weapons and material to poaching parties often directs harvesting networks. Harvesting networks can include poor villagers, park rangers, professional hunters, conservation authorities as well as large poaching gangs such as rebel groups or insurgents working under the direction of a financier. Involvement by the political elite in poaching syndicates greatly increases the number of illegal kills and can directly contribute to high rates of poaching.

Thus, there is a blurring of activity from poaching and obtaining wildlife to the next stages of sale or use. As noted above, poaching for sale or trade is ages old but the commodity chains involved and indeed incentives for involvement have been evolving (Reuter and O'Regan 2016) and patterns of poaching may be changing. Duffy and colleagues (2015a, 345) argue that this is happening because of the interactions between "changing patterns of wealth in demand countries" and the "dynamics of poverty in supply countries," meaning that "recent increases in poaching are more closely related to increases in wealth in demand countries, rather than poverty in supply countries."

Wyatt's (2012, 2013) work on wildlife trafficking and markets in Russia and elsewhere—and on law enforcement responses to try to curb illegal trafficking and trade in animals—provides insights into traditions that are surviving

alongside new practices, which, interestingly, can overlap with other trades in prohibited or controlled commodities (see also South and Wyatt 2011). van Uhm and Siegel (2016) illustrate these trends particularly well in their analysis of the illegal trade in black caviar. As a desirable and luxury food item, caviar has been in demand for centuries in various societies and cultures but, as in the case of other luxury foods (such as abalone; see Tailby and Gant 2002), when the problem of scarcity emerged, the trade became attractive to organized crime groups, which have since engaged in illegal fishing and smuggling of the catch and caviar. A high price is attached to what van Uhm and Siegel refer to as "edible gold," partly because this act of consumption is closely related to status, and demand is not based on utility but on the emotional power attached to the enjoyment of exclusivity. Again this is not a unique observation and has been made by other scholars with an interest in wildlife "commodity" markets from across conservation science and criminology. The point, however, is to underscore the range of motives, and the breadth of scale, of poaching activities (see, e.g., Duffy 2016; Duffy et al. 2015a, 2015b; Hill 2015; Pires and Clarke 2011; Yee 2016), which can complicate responses.

### *Responses*

A spectrum of responses can be identified from global to local, public to professional (see, e.g., Ayling 2016; Brack 2002; Elliott 2007; Moreto and Lemieux 2015a, 2015b; Moreto, Brunson, and Braga 2015, 2017; Tomkins 2005). Goyes and Sollund (2016, 88–89) note that "most trade in 'wild' nonhuman animals does not involve breaching laws or regulations. Trade and hunting are usually *regulated* rather than *banned*. The *Convention on International Trade in Endangered Species* of Wild Fauna and Flora (CITES), now with 181 parties, regulates the trade in endangered species, including 5600 animal species, many of which are threatened" directly by the activities of wildlife hunters and traders or as a result of this combined with loss of habitat. As these authors argue, however, there are weaknesses in both the underpinning philosophy and the operationalization of CITES. We might also point out that in a world now characterized by information economies and rapid scientific advance, electronic publication, and instant knowledge exchange around global networks, the understanding of genetics and the basis for the taxonomic statements that underpin such international regulatory classifications and systems can all change quickly—and in ways that may leave international laws and protections lagging behind (Newman and Zhou 2016).

Various approaches to the reduction of offending are now well developed and part of the usual set of responses. For example, the principles of situational (and other) crime prevention strategies as applicable to environmental and wildlife crime issues have been outlined by Brisman and South (2015) and, in particular, widely applied in relation to poaching, which can be regarded as a

sign of criminology's increasing role in addressing wildlife crime and also of the changing dynamics of poaching (see, e.g., Haas and Ferreira 2016; Lemieux 2014; Lemieux and Clarke 2009; Pires and Moreto 2011; Schneider 2008; Wellsmith 2010).

In some contexts, initiatives include those in use against other "predators," such as animal-abuse registries that require persons convicted of felonies involving animal cruelty to register with the police and provide certain personal information. Proponents argue this is a technique that keeps the public informed and provides authorities with an early warning system with respect to animal-related offenses as well as other crimes, on the grounds that animal abuse is often an indicator of future antisocial or violent behavior (McKinley 2010; Urbina 2010). Such registries can serve a shaming function—and there is some support, more generally, for approaching environmental harm through shaming (Mares 2010; Roug 2014; Wong and Gettleman 2016)—but as with all shaming, there are disintegrative and reintegrative forms and there are sensitive judgments to be made about the use of such measures (see Edelman and Harris, 2017).

Turning back to the poaching and the illegal trading of wildlife, the declaration that emerged from the London Conference on the Illegal Wildlife Trade (signed by 42 countries in February 2014) called for the following actions: (a) eradicating the market for illegal wildlife products; (b) ensuring effective legal frameworks and deterrents; (c) strengthening law enforcement; and (d) promoting sustainable livelihoods and improving economic development.[4] These actions should be understood as interrelated: market reduction regulatory schemes have included measures to curb illicit trading in wildlife by disrupting criminal networks and banning ivory trading arising from elephant poaching in Africa, but the success of a ban is dependent on the degree of enforcement. For example, in late December 2016, China announced that it was banning all commerce in ivory by the end of 2017—"a move that would shut down the world's largest ivory market and could deal a critical blow to the practice of elephant poaching in Africa" (Wong and Gettleman 2016, A1). The announcement was hailed by representatives of major environmental nonprofit organizations, such as the Natural Resources Defense Council and the WWF, who estimate that more than 100,000 elephants have been killed in Africa in the past decade in an effort to meet the Chinese demand for ivory, and who claim that 50–70 percent of all smuggled elephant ivory—and perhaps more—winds up in China (Wong and Gettleman 2016). Whether the ban serves to put poachers out of business and shut down the ivory industry remains to be seen. As Wong and Gettleman (2016, A1) report, "The question of enforcement is one that will apply to China . . . as it enacts the ban, and government actions will be closely watched by conservationists and advocates. Chinese officials often announce ambitious pol-

icies but sometimes fall short on carrying them out. This is true of many environmental protection and conservation policies."

Before concluding this section, it is imperative that we call attention to the increasing militarization of conservation and conservation areas. This, too, is not a new phenomenon, and Duffy (2016) argues that conservation concerns about biodiversity losses have now been combined with global security anxieties to generate a new form of "war by conservation." This, Duffy (2016, 238) claims, is "an 'offensive position' in certain locations whereby conservation is the intervening *aggressor*, not simply the *defender* of wildlife" (emphasis added). This form of response is spatially extensive in contrast to a tactic that might be described as "fortress conservation," which—as implied—would rely on fortification and fencing of marked-out territories. According to Duffy (2016, 239), "war by conservation" reflects the "integration of conservation objectives with global security concerns, specifically the US-led War on Terror and [counter-insurgency techniques], such that conservation is relegated to a position of secondary importance" (see also Wall and McClanahan 2015; McClanahan and Wall 2016). In many respects, this is a new development but also old fashioned in being a war on the ground.

## Emotions and Passions Aroused by "Other" Species

While some commentators conceptualize nonhuman animals as morally and ethically *equal* to humans (a *biocentric* approach), other humans regard nonhuman animals solely in terms of ways in which the latter can serve the interests of the former (an *anthropocentric* approach, defined earlier, see Halsey and White 1998; see generally Brisman 2014a). Even so, although some humans may consider some nonhuman animals to be of *no use whatsoever* or *actually harmful*—"pests" or "invasive species" (see, e.g., Angelici 2016; Kekkonen 2016; Lie 2017; von Essen and Allen 2017; see generally Skibins, Dunstain, and Pahlow 2017), other nonhuman animals may be valued or revered for their utilitarian value to humans in a number of ways (e.g., recreational, spiritual, religious, as food, as companions). Some become anthropomorphically transformed into lovable "objects"—toys or "subjects" in various media—while others attract cruel or lethal attention because they arouse emotions of fear and distress (see, e.g., Angelici 2016; Bond 2015; Herbig 2010; Skibins, Dunstain, and Pahlow 2017; Sollund 2017). Herbig (2010, 112–123; see also 2003) provides an illustrative case of reptiles, which are, he says, "for the most part, albeit stereotypically, abhorred by the majority of society" and perceived as "cold, emotionless and malicious organisms that one would rather, according to Bruwer (1997), avoid." This kind of emotional reaction may be regarded by some as irrelevant to understanding wildlife trades, but it is actually pivotal with regard to deviance in this sphere,

with miscreant individuals (originating from both the national and the international arena) making full use of this sentiment, and the opportunities created thereby, to promote and pursue their trade (see Slater 2014).

Questions about which nonhuman animals fall into which categories—and why—strike emotional chords, and spark considerable argument and debate (see generally Friedman 2016; Mazurek, 2017; Rott 2016). Consider, for example, the controversy in the United States regarding the "exotic pet" business—a lucrative industry such that "more exotic animals live in American homes than are cared for in American zoos" (Slater 2014, 98).[5] In the absence of a federal law, as Slater (2014, 106) explains, "Privately owning exotic animals is currently permitted in a handful of states with essentially no restrictions: You must have a license to own a dog, but you are free to purchase a lion or baboon and keep it as a pet."[6]

Wildlife conservationists, as well as animal welfare advocates, argue that bringing wildlife (captive bred or freeborn) into the suburbs is dangerous and cruel—and should be criminalized.[7] Although infant animals may be docile, "docile is different from *domesticated*" and "of all the large land mammals that populate the planet, just over a dozen have been successfully domesticated. No matter how tamed or accustomed to humans an undomesticated animal becomes, its wild nature is still intact" (Slater 2014, 119, emphasis added). Thus, when an animal reaches sexual maturity and begins to express its predator instinct, it can pose a threat to its caretakers as well as to itself. In response, exotic pet owners, such as supporters of the nonprofit organization REXANO (Responsible Exotic Animal Ownership), retort that the number of incidents involving injuries from exotic pets is significantly less than those involving dog bites and that bans will simply increase the population of illegal exotic animals. They also stress "the inherent rights of humans to own exotics" (Slater 2014, 119).

Much as there are multiple motivations for poaching, the reasons for exotic pet ownership vary. Some people regard their animals—especially primates—as "surrogate children, dressing them up in baby clothes, diapering them, and training them to use the toilet" (Slater 2014, 107). Others consider owning an exotic pet as a symbol of *status* or *power*. As Slater (2014, 107) describes, "They believe their exotics set them apart, the relationship made all the more intense by the unintended social isolation that is often the result of having an unpredictable beast as a companion. . . . Though anyone can own a cat or dog, exotic-pet owners take pleasure in possessing an animal that has, for hundreds of thousands of years, refused the saddle of domestication: They take the uncivilized into society and in doing so, assert their power." Such approaches are clearly anthropocentric (and, in the first case, *anthropomorphic*). So, too, is the approach of "collectors" (who could just as easily acquire antiques, art, baseball cards, coins, guns, or stamps) and "impulse buyers"—those who simply cannot refuse to purchase "adorable tiger cubs with scrumptious soft scruffs" or "tiny

chimps in baseball hats and T-shirts that say, 'I (heart) you'" (Slater 2014, 118). Such owners differ from wild animal lovers, who may begin as volunteers at a wildlife sanctuary and subsequently adopt a rescued exotic animal in need of a home. These individuals frequently see their pets as a way to reconnect with the natural world and view ownership of endangered species as an act of "conservation" and an important way of keeping such animals alive on Earth.

But what exactly is being *conserved*? The market place of the internet makes the sale of numerous species easily available in ways previously inconceivable (Goyes and Sollund 2016; Sollund, 2017b). Furthermore, it is able to spread and also manipulate images and expressions such as "adorable" faces, "intelligent" gestures, and "attractive" markings, although as Slater (2014, 107) reminds us while these animals are "no longer completely wild, neither are they domesticated—they exist in a netherworld that prompts intriguing questions and dilemmas." Taking the "wild out of wild animals"—by inter alia taming, domesticating, and making them dependent—has removed them from their original relationship with nature and placed them within the realms of human fantasy (Slater 2014, 119). In other words, humans—the "ultimate invasive species," to use Dawson's term (2016, 24)—do not really *protect* or *conserve* wild animal species through exotic pet ownership, nor do they help stem the tide of the "epoch of epic defaunation" (Dawson 2016, 8, citing Dirzo 2014). Rather, in another case of hubris and myopia (see generally Brisman 2014b), such owners have succeeded only in preserving *their image* of what they think (wild) animals are and what the relationship between humans and nature, more generally, should be like. They are contributing to a culture of consumption (Brisman and South 2013, 2014) with regard to nature rather than extending empathy or engaging in conservation.

## Conclusion

This discussion draws our attention to the international and interdisciplinary nature of a number of challenges, contradictions, and dilemmas that are of concern to biologists, ecologists, geographers, political ecologists, political scientists—and criminologists. This includes the fantasies and myths, as well as vested interests and unrealistic beliefs that underpin wildlife abduction, trade, abuse, and slaughter. Examining environmental education aimed at young people, Dickinson (2014, 1) uses the term "ecocultural schizophrenia" to describe the process whereby "adults frame environmental issues within a core 'stay-away-get close' double bind, sending conflicting messages to protect and appreciate trees, yet ultimately cut them down for hyperconsumption." A similar process applies, of course, in relation to animals in zoos and farmyard petting attractions, sending messages about conservation and the importance of protecting wildlife and wilderness, while also commercializing and "Disneyfying" the experience of "getting close to nature" (see also Leberatto, Chapter 7).

In opposition to such objectification, claims of the rights of animals as "subjects" have led to criticisms of wildlife trades and entertainments. So, for example, "In Argentina, in December 2014, a court . . . declared an orangutan a 'person' in response to a petition from animal rights groups who filed for the freedom of twenty-nine-year-old Sandra, saying that her 'detention and imprisonment' in a Buenos Aries Zoo violated her rights as a nonhuman person" (Grant and Jungkunz 2016, 6). Whether acknowledging or granting rights to nonhuman animals would lead to protection and preservation is a matter of some debate (see generally Brisman 2014a) and, as Slater (2014, 119) reminds us, "what can get lost is what's best for *the animals*" (emphasis added). One thing that remains clear is that "as the planet's remaining wilderness is degraded, each generation grows up with an increasingly impoverished view of natural biodiversity, so that human experience itself is undergoing a form of extinction" (Dawson 2016, 66, citing MacKinnon 2013). If this continues, then future generations may inherit an Earth bereft of biodiversity—one without animals in the wild or in the realm of human fantasy.

## NOTES

1. In this chapter, we use the terms "illegal wildlife hunting" and "poaching" interchangeably, although we recognize that others have found distinguishing the two useful (see, e.g., Duffy et al., 2015b).

2. For criticisms of the idea of ivory as the "white gold of jihad," see Duffy (2016).

3. Duffy and colleagues (2015b) note, however, that "the distinction between subsistence and commercial hunting can be blurred because meat may be hunted to supplement both diets and income (Mackenzie, Chapman, and Sengupta 2011; Vega et al. 2013)" and that illegal wildlife hunting for subsistence can, under some conditions, transform into commercial hunting. Notwithstanding this important point, our argument is simply that illegal wildlife hunting is not a singular, discrete phenomenon; there are multiple motivations for engaging in illegal wildlife hunting and, as we endeavor to explain in our discussion of "responses," multiple ways in which the phenomena may be approached.

4. See https://cites.org/sites/default/files/eng/news/sundry/2014/london-wildlife-conference-declaration-140213.pdf.

5. Slater (2014, 106) notes that "the term exotic pet has no firm definition; it can refer to any wildlife kept in human households—or simply to a pet that's more unusual than the standard dog or cat."

6. Some states require a license or permit; others have enacted a partial ban or a complete ban.

7. The commercial import of endangered species into the United States has been restricted since the early 1970s. Thus, many, although not all, of the large exotic animals that end up in backyard menageries (e.g., bears, lions, monkeys, tigers) are bred in captivity (Slater 2014, 106–107).

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# 2

# ENVIRONMENTAL CRIMINOLOGICAL PERSPECTIVES ON ILLEGAL, UNREPORTED, AND UNREGULATED FISHING

Gohar A. Petrossian and
Nerea Marteache

**EDITOR'S INTRODUCTION:** *Like green and conservation criminology, environmental criminology theories are useful in examining wildlife crimes. Unlike the other perspectives covered in this part, environmental criminology focuses on understanding the spatiotemporal and situational factors that result in crime events. Emphasis is on exploring the proximal correlates of crime, rather than distal influences, and identifying strategies to prevent or reduce such activities. In this chapter, Petrossian and Marteache provide an in-depth overview of illegal, unreported, and unregulated (IUU) fishing prior to discussing relevant environmental criminology concepts. The authors then outline prevention recommendations based on the techniques of situational crime prevention and provide real-world examples of situational crime prevention–like approaches in action.*

IUU fishing is a serious global problem. The impact of IUU fishing goes beyond the harm it causes to targeted commercial species: IUU fishing affects nontarget species collectively known as bycatch, disturbs the marine ecosystem, and significantly affects the livelihoods of coastal communities in developing countries that depend on fishing for survival. One approach for studying IUU fishing is through environmental criminology, which can be used to empirically test hypotheses and propose evidence-based policies to address the problem.

This chapter begins with a short definition of IUU fishing and a description of the problem and its scope. It then provides a brief introduction to

environmental criminology theories, followed by a review of recent criminological literature that specifically uses concepts from these theories to analyze, understand, and explain IUU fishing. The main policy recommendations that directly derive from the findings of these studies are summarized. Last, examples of real-life interventions are used to illustrate the practical utility of situational crime prevention techniques. The goal of this chapter is not only to show that these prevention strategies are theoretically and empirically driven but also to demonstrate their relevance and practicality. Equipped with this knowledge, fisheries management organizations and regulatory authorities can adopt the strategies proposed or illustrated in this chapter to more effectively combat IUU fishing at the local, regional, and national levels.

## The Problem of IUU Fishing

### *Defining IUU Fishing*

The term "illegal, unreported, and unregulated (IUU) fishing" is used to describe fishing activities that are carried out in violation of national laws or internationally agreed conservation and management regulations. The official definition of IUU fishing is provided in the United Nations International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported, Unregulated Fishing (IPOA-IUU fishing) and includes the following activities:

> (1) those conducted by national or foreign vessels in waters under the jurisdiction of a State, without the permission of that State, or in contravention with its laws and regulations; (2) those conducted by vessels flying the flag of States that are parties to a relevant regional fisheries management organization, but operate in contravention of the conservation and management measures adopted by that organization; or (3) those conducted in violation of national laws or international obligations, including those undertaken by cooperating States to a relevant regional fisheries management organization (RFMOs). (FAO 2001)

IUU fishing activities range from underreporting catches to operating within countries' territorial waters or in the high seas without authorization. Having authorization to operate within a country's managed exclusive economic zone (EEZ) does not necessarily mean the vessel operates legally. A vessel may still operate illegally if it (a) either uses prohibited gear or methods, (b) either operates in closed/protected areas or during closed fishing seasons, (c) operates without internationally mandated vessel monitoring equipment, (d) either fails to report catches or makes false reports, and (e) either keeps undersized or protected fish. Operating illegally in the high seas

generally means the vessel failed to show a flag or other markings specifying its origin (Palma 2010). IUU fishing also refers to the unauthorized transshipment of fish to cargo vessels. In sum, IUU fishing refers to activities that are carried out before (e.g., obtaining fake licenses to fish), during (e.g., using prohibited gear or catching protected fish), or after the fish have been caught (e.g., making false reports or engaging in illegal transshipment).

### *The Impact of IUU Fishing*

Fishing has played a significant role in the livelihoods of humans since ancient times. Archeological evidence suggests that fishers harvested commercial marine resources in the Mediterranean, northern Black Sea, and Atlantic coast (e.g., Spain, Morocco, and Portugal) as far back as the fifth and third centuries B.C.E. At that time, they could already process fish for export (i.e., dry, salt, and smoke), and the fisheries played a significant role in the economies of the nations in the region (Bekker-Nielsen 2005).

It was not, however, until the beginning of the second industrialization period (1950–1980) that fishers began exploiting fishing grounds in large scale (Gelchu and Pauly 2007). During that period, significant improvements in fishing gear and technology, as well as the motorization of fishing vessels that could travel farther distances from the coast led to the heavy exploitation of fishing grounds globally. This period coincided with some important historical shifts that also had an impact on fisheries worldwide. For example, after World War II, Japan expanded its fishing capacity and invested in the growth of its fishing industry to fill the food deficit that resulted from the country's role in the war (Asada, Hirasawa, and Nagasaki 1983; APO 1988). During the same period, newly decolonized African countries became world players primarily due to the initiatives undertaken by European owners of small fishing fleets in coastal African countries (Njifonjou and Njock 2000).

While the global expansions in technology, gear, and vessels made fish harvesting easy, it also led to the collapse of some very important fish stocks within a short period of time. Overfishing became a significant problem as early as the 1970s, but fishers continued exploiting important commercial fisheries beyond their sustainable yield capacity (i.e., fish were harvested at a higher rate than they could reproduce), threatening some fish stocks and collapsing others. According to the United Nations Food and Agriculture Organization (UN FAO), by 2005, about 80 percent of global fish stocks have been fully exploited, overexploited, or depleted (FAO 2005).

Some estimates suggest that the global scale of IUU fishing is between 11 million and 26 million tons annually, which translates into US$10–23.5 billion (MRAG 2008). Coastal states bear the direct impact of this activity, as over 90 percent of fish are taken from their territorial waters (HSTF 2006). This is especially true for coastal states whose territorial waters fall within

the eastern central Atlantic, southwest Atlantic, eastern Indian, northwest Pacific, and western central Pacific regions (Agnew et al. 2009).

The negative consequences of IUU fishing are significant and include not only environmental but also economic and social harm. Illegal fishing vessels often use destructive fishing practices, such as bottom trawling and blast fishing, and these activities lead to the obliteration, devastation, and often permanent damage of the key components of the marine ecosystem (FAO 2007). Bottom trawls and dredgers are among the most destructive gear in use (Watson, Revenga, and Kura 2006). Blast fishing, which is practiced in over 30 countries, involves the use of a bomb set to explode under water. This method of fishing severely damages the coral reef system, and its impact is sometimes permanent (Caldwell and Fox 2006).

IUU fishing practices often lead to the incidental capture of unintended species, collectively known as bycatch. An estimated 300,000 whales, dolphins, and tortoises, 100 million sharks, as well as 480,000 metric tons of shrimp are discarded every year (Kuper n.d.). Shrimp trawlers account for the highest rate of bycatch within the seas (Alverson et al. 1994), while illegal longline fishing has a detrimental effect on albatrosses (Petrossian, de By, and Clarke, in press), some of which are critically endangered (IUCN 2011). Among the most significant economic impacts of IUU fishing is the loss of the value of the catch, such as loss of gross national product, additional loss associated with the revenue in levies, landing fees, and taxes that are not collected from legitimate operations (Liddick 2014). IUU fishing also contributes to hunger and poverty in developing African countries, such as Senegal, Sierra Leone, Kenya, and Angola. Local artisanal and subsistence fishers in these countries often find themselves in conflict with foreign commercial fishing vessels that use violence and intimidation to draw these small fishing vessels away from fishing grounds (Liddick 2014).

Yet another devastating impact of IUU fishing is the disturbance of the balance of the food chain and the disruption of the local ecosystems. IUU fishing has indirectly impacted large sea predators, such as dolphins, seals, and whales. For example, the overfishing of sardines and anchovies brought about the significant drop in the bottlenose dolphin populations in the Mediterranean Sea. IUU fishing has also had a detrimental effect on seabirds, such as puffins, whose populations have dramatically decreased due to the overfishing of the species they depend on for survival. Norwegian puffins and the thick-billed murre suffered a 60 percent population drop because they are unable to provide enough food for their chicks (Ocean Sentry 2009).

IUU fishing presents a significant threat to the biodiversity of the oceans, undermines the stability of developing countries, directly impacts coastal countries with rich marine biodiversity, threatens the food supply and job stability of millions of people worldwide, and is likely to have a continuous negative impact for years to come. Despite these serious implications, criminological

research on the topic remains scarce. This is unfortunate since criminology is equipped with tools that can be used to combat IUU fishing and devise policies to achieve effective prevention.

### *Challenges*

Despite the many efforts proposed and implemented at the international, regional, and national levels, the international community still faces many challenges that need to be overcome to efficiently address the problem of IUU fishing. First, IUU fishing is a global phenomenon. As such, it requires the commitment of the global community. Strides have been made toward that direction, and examples of these include the UN FAO Code of Conduct for Responsible Fisheries proposed in 1995 and the UN FAO Port States Agreement proposed in 2009. These international instruments, although binding for its signatories, have no enforcement power and rely heavily on individual countries to convert these into law and apply them. And, unfortunately, the countries that lag behind or are not willing to participate in such international efforts are also those that suffer from the IUU fishing problem the most. Moreover, most of these carefully crafted international instruments are voluntary in nature. Leaving it up to the countries to address the problem, by utilizing the provisions of these instruments or converting these provisions into local laws or regulatory instruments, presents many opportunities for IUU fishers to manipulate the loopholes or simply avoid responsibility for their illegal actions.

Recently, the UN FAO Port States Measures Agreement (PSMA) became a legally binding treaty that now requires that its 29 countries and the EU that have ratified it abide by its provisions (FAO 2016). This agreement, therefore, requires that these countries designate special ports to accept foreign fishing vessels and that each arriving vessel provide information about its catch, the location where it fished, and its fishing license, prior to their arrival at the port. These countries have a vested interest in participating in this type of instrument, because IUU fishing directly or indirectly affects them. However, many ports of convenience that have been used to offload illegally caught fish are not in major fishing countries, nor are these in countries that have ratified or signed the PSMA or are party to the regional fisheries management organizations (RFMO) within their regions that attempt to regulate fisheries operations. A typical example of this is Singapore. According to a study published by Pew Environmental Group (2010), between 2004 and 2009, IUU fishing vessels visited Port Singapore 33 times to offload their catch. Singapore is not a major fishing country, nor did it ratify the PSMA, nor is it a party to any RFMO.

This gives IUU fishing operators plenty of loopholes to exploit. Refrigerated cargo vessels, or "reefers," present yet another significant obstacle to

effectively addressing the problem of IUU fishing. Many commercial distant-water fishing vessels stay on high seas for long periods of time, without having to worry about costly runs into ports to offload their catch (Gianni and Simpson 2008). Refrigerated cargo vessels make this possible, as the fishing vessels not only use these reefers to transship their illegal catch but these reefers are also used for essential services, such as refueling, rotating crews, and resupplying bait, food, and water (Gianni and Simpson 2008). In fact, more recent trends indicate that illegal fishers are increasingly using refrigerated containers, which are not subject to any fisheries inspection regulations, to transport fish across continents (Daniels et al. 2016).

Last, and importantly, many countries operate "open registries," allowing foreign-owned vessels to fly their flag once registered. These states lack either the resources or the will to monitor and control vessels flying their flag, or they have not ratified any pertinent international instruments that would hold them responsible for monitoring the activities of their fishing vessels (Environmental Justice Foundation 2009). This is an incredible challenge to combating IUU fishing and one that has not been sufficiently addressed to date. The practice of registering with countries that have lax regulatory mechanisms, if any, to monitor vessels' activities, allows these vessels to bypass international and national fisheries regulations and controls. Even more significant is the problem of "flag-hopping," which is the practice of reflagging the vessel in cases when the flag states do actually take the initiative to penalize the IUU fishing vessel. In the next section, we review recent criminological literature that examines IUU fishing from the lens of environmental criminology.

## IUU Fishing from an Environmental Criminology Perspective

Environmental criminology refers to a family of criminological theories that focuses on the study of the criminal event. These theories suggest that opportunity plays a significant role in crime commission and that the characteristics of the immediate environment influence the decisions made by offenders. Criminogenic environments facilitate crime, and crime clusters around those environments, thereby, creating patterns. The three main theoretical approaches of environmental criminology are: (1) the routine activity theory (Cohen and Felson 1979), which deals with the ways that opportunities arise (and decline) as a result of society's daily rhythms and habitual activities; (2) the geometric theory of crime (Brantingham and Brantingham 1991), which explains the way that offenders seek and find opportunities for crime in the course of their everyday lives; and (3) the rational choice perspective (Cornish and Clarke 1986), which deals with how offenders make decisions. In this section, we will review recent studies that have examined the problem of IUU fishing from an environmental criminology perspective. The first three

studies analyzed the patterns of concentration of IUU fishing and the other two studied this issue from the rational choice perspective.

### *Crime Concentration*

Research has shown that crime is highly concentrated (Weisburd et al. 2016; Park and Eck 2013; Eck, Clarke, and Guerette 2007). When analyzing crime patterns, a few locations experience the most crime (e.g., hot spots) (Eck 2005), a few items are disproportionately stolen (e.g., hot products) (Clarke 1999), a few victims are repeatedly targeted (e.g., repeat victimization; Pease 1998), and a handful of offenders are responsible for the majority of crime being committed (Clarke and Eck 2005). Studying crime concentration is essential to determining the most vulnerable locations, products, and victims, and knowing these concentrations will lead to the better understanding of the possible causes of crime. This, in turn, will lead to more targeted and efficient prevention and crime reduction interventions. Two types of crime concentration have been used to study IUU fishing: hot products and risky facilities.

#### Hot Products: CRAVED, CRAAVED, AND CAPTURED

Not all products are at the same risk of being stolen: some types of cell phones are more desirable to thieves than others, some items in grocery stores are stolen at a higher rate, and some models are disproportionately targeted by car thieves. When faced with a theft problem, it is important to study what products are at a higher risk, and why. Clarke (1999) proposed the CRAVED target selection model to explain this, suggesting that products are more likely to be stolen if they are easy to *conceal* and *remove*, widely *available*, high in *value*, easily *enjoyable* and *disposable*. This model has been used to analyze the theft of a variety of products, such as timber (Baker 2003), bicycles (Johnson, Sidebottom, and Thorpe 2008), parrots (Pires and Clarke 2012), and livestock (Sidebottom 2013). In each of these studies, the CRAVED elements were operationalized to describe the specific characteristics of the product targeted. For example, Pires and Clarke (2012) operationalized *removable* in terms of the parrots' nesting type, assuming that parrots nesting in cliff nests were not easily removable, while those nesting in termite mounds (that are relatively easy to access) are. Pires and Clarke (2012) also modified the acronym by splitting the construct *availability* into two separate measures: *abundance* and *accessibility* (thereby creating the new acronym CRAAVED). More recently, Moreto and Lemieux (2015) introduced the CAPTURED product-focused model (*concealable, available, processable, transferrable, usable, removable, enjoyable, desirable*) to examine how wildlife products are moved through illegal markets.

To date, two studies have used CRAAVED to examine what species of fish (Petrossian and Clarke 2014) and crustaceans (Petrossian, Weis, and

**TABLE 2.1. APPLICATION OF THE CRAAVED TARGET SELECTION MODEL TO ILLEGALLY CAUGHT FISH AND CRUSTACEANS**

| Concept measured | Fish* | Crustaceans† |
|---|---|---|
| ***Concealable*** | Overlap between the species native range and the top 10 ports visited by IUU fishing vessels in the study by Pew Environmental Group (2010) | Overlap between the species native range and the 120 ports visited by IUU fishing vessels in the study by Pew Environmental Group (2010) |
| ***Removable*** | Caught with long-liners | Difficulty of getting to the species (depth) |
| ***Abundant*** | Catch volume | Catch volume |
| ***Accessible*** | Number of illegal fishing countries that caught the species in the past 10 years | Size of species native range |
| ***Valuable*** | Length | Species price category |
| ***Enjoyable*** | More often found in recipes | More often found in recipes |
| ***Disposable*** | Highly commercial (yes=1, no=0) | Commercial status |

* Petrossian and Clarke 2014.
† Petrossian, Weis, and Pires 2015.

Pires 2015) are more vulnerable to IUU fishing. In both cases, a matched case-control design was used to compare illegally and legally caught species. Table 2.1 shows how each of the elements of CRAAVED was operationalized in these two studies. While the first study (Petrossian and Clarke 2014) found that every CRAAVED characteristic was related to the variation in risk of capture among the species of fish, in the second study (Petrossian, Weis, and Pires 2015) only crustaceans that were *abundant*, *valuable,* and *enjoyable* were more likely to be caught illegally.

**Risky Facilities**

Crime is also likely to concentrate among places such as bars, libraries, hospitals, and bus stops. The concept of risky facilities is used to study this phenomenon, and it states that in any group of homogeneous facilities, a few of these facilities will account for most of the crime (Eck, Clarke, and Guerette 2007). There are several factors that can explain this variation in risk, such as the location of the facility, its design, layout, and size, and management practices (Clarke and Eck 2007).

The concept of risky facilities was used by Petrossian, Marteache, and Viollaz (2014) to study why IUU fishing vessels favor some ports instead of others when choosing a location to offload the illegally caught fish. Their analysis of the 120 maritime ports that received IUU landings during 2004–

| TABLE 2.2. FACTORS INCLUDED IN THE ANALYSIS OF RISKY PORTS* | |
|---|---|
| **Concept measured** | **Variables used** |
| ***Easy concealability of the illicit vessel*** | Average daily vessel traffic |
| | Average daily fishing vessel traffic |
| | Harbor size |
| ***Easy disposal of cargo*** | Distance of port to highway |
| | Distance of port to railway |
| | Access to transportation |
| | Consumption of fish and fishery products (country level) |
| ***Lax regulation and/or enforcement*** | Rate of vessels inspected per 1,000 arrivals |
| | Free port |
| | Corruption index score (country level) |
| | Level of illegal fishing (country level) |
| | Catch inspection schemes (country level) |

* Petrossian, Marteache, and Viollaz 2014.

2009 years (Pew Environmental Group 2010) revealed that about 22 percent of the ports ($N = 26$) had been visited four or more times, and those visits accounted for 64 percent of the total. The rest of the ports were only visited three times or less during that time period. Both groups of ports were compared on the characteristics that facilitated concealability, easy disposability of illegal cargo, and reduced risk of detection. Table 2.2 shows the constructs and variables studied in this research. The study found that ports facilitating the concealability of IUU landings were visited at a significantly higher rate, which is also the case for ports with lax regulation or enforcement.

## *The Rational Choice Perspective*

The rational choice perspective (Cornish and Clarke 1986) argues that offenders make rational decisions about crime before, during, and after its execution. Offenders make calculated decisions that would maximize their gains and minimize both the effort needed to commit the crime and the risks of being caught. Offenders do not always make perfect decisions, however, as their knowledge and ability to opt for the best alternative is *limited* by the information and the time available to make the decisions needed to carry out the crime. In other words, their decision making process regarding where, how, when, or even whether to commit a crime may be *bounded* due to the constraints of time and resources needed to objectively assess all their options.

In a recent study, Petrossian (2015) applied this theoretical perspective to study illegal fishing in the EEZs of 53 countries. The research focused on

**TABLE 2.3. RATIONAL CHOICE CONCEPTS AND VARIABLES USED TO MEASURE IUU FISHING***

| Concept measured | Variables used |
|---|---|
| ***Effort*** | Access to ports of convenience |
| ***Reward*** | Number of internationally attractive species |
| ***Risk*** | Fisheries' monitoring, control, and surveillance capacity |
| | Patrol boats per 100,000 sq. km. |
| | Detectable fishing vessels within the country's EEZs |

*Adapted from Petrossian 2015.

explaining the decision to engage in illegal fishing through such variables as the effort needed to successfully get the illegally caught fish to the markets, the likely reward linked to the availability of the desired species, and the potential risk of being caught. Table 2.3 shows the variables that were used to measure each of these concepts. The study found that all the variables, except for the risk factor associated with the presence of detectable fishing vessels, significantly predicted the degree of illegal fishing in these countries' EEZs. Fisheries monitoring, control, and surveillance efforts (as the risk factors) and the number of internationally attractive species present in the country's waters (as the reward factors) were the two strongest predictors of the degree of illegal fishing in the EEZs of these 53 countries.

### *Choice Structuring Properties*

The concept of choice structuring properties (Cornish and Clarke 1987) stems from the rational choice perspective and refers to the specific characteristics of a particular type of crime that make it attractive to the offender. Offenders consider, among other things, the effort needed to commit the crime, the anticipated rewards, whether the use of weapons or violence is needed, the risk of detection, and the availability of targets. The concept of choice structuring properties was created to help examine the likelihood of displacement to other types of crimes if the opportunities to commit the original crime were successfully blocked.

More recently, Pires (2011) divided choice structuring properties into static and variance properties. *Static* properties are those that are inherent to the type of crime, and they have been used to assess whether displacement from one type of crime to another is likely in the event that the first becomes more risky (that is, if crime prevention efforts are successful). For example, a pickpocket may be attracted to the idea of stealing from unsuspecting victims while camouflaged in a crowd and would never commit a robbery because it requires engaging in threats and/or violence, which does not make the crime attractive for that specific offender. *Variance* properties are specific to the

**TABLE 2.4. VARIANCE CHOICE STRUCTURING PROPERTIES OF IUU FISHING VESSELS IN THE SELECTION OF COUNTRY TO OFFLOAD THEIR CATCH USED***

| Construct measured | Variables used |
|---|---|
| ***Concealability of vessels and illegally caught fish*** | Number of vessels in port |
| | Percentage of a country's ports within the 125 top ports in the world in total cargo volume |
| | Value of fish imports |
| | Value of fish exports |
| ***Convenience of offloading the fish in that country*** | Number of marine species within the country's waters that are highly commercial internationally |
| | Quality of port infrastructure |
| ***Strength of fisheries monitoring, control, and surveillance efforts*** | Illegal fishing score |
| | Catch inspection schemes score |
| | Observer schemes score |
| | Vessel monitoring schemes score |
| | Scores on control of access to stop illegal fishing |
| ***Effectiveness of country governance*** | Political stability and absence of violence/ terrorism |
| | Government effectiveness |
| | Control of corruption |
| ***Country's commitment to wildlife protection regulations*** | Number of environmental protection and conservation treaties and conventions a country belongs to |
| | Percentage of territorial waters that are marine protected areas |
| | Environmental sustainability coefficient |
| ***Level of country's development*** | Country Development Classification by the UN World Economic Development Prospects |

* Marteache, Viollaz, and Petrossian 2015.

crime event: each time an offender decides to commit a crime, he must make decisions about the location, the target, the modus operandi, and the tools necessary to carry it out. Following the example of the pickpocket, variance properties refer to how the crime is to be committed: area of the city where he will operate, specific pedestrian to be targeted, in what moment he will approach him, what pocket he will try first, or whether he will use some sort of distraction. These choice structuring properties can, thus, be used to analyze why offenders prefer some modus operandi or certain types of targets, and, as such, are used to analyze crime concentrations.

Marteache, Viollaz, and Petrossian (2015) focused on the variance properties to explain why IUU fishing vessels favored some countries over others

when offloading their illegally obtained catch. All countries that were visited by IUU fishing vessels during the 2004–2009 period ($N = 72$) identified by the Pew Environmental Group (2010) were included in the analysis. The constructs measured were concealability, convenience, fisheries MCS, governance, wildlife regulations, and level of development of the country. The specific country characteristics that were analyzed are listed in Table 2.4. At the country level, three variance choice-structuring properties had a significant impact on the number of visits received by IUU fishing vessels. Countries with higher quality of port infrastructure and where vessels and catch could be easily concealed were visited more often. At the same time, countries with poor governance also attracted a higher number of visits by IUU fishing vessels.

## What Have We Learned about the Factors That Influence IUU Fishing?

To date, only five studies have analyzed the problem of IUU fishing through the lens of environmental criminology. These studies adopted different theoretical approaches to examine the problem at the country, port, and target levels. The results of these studies consistently indicate that situational factors play a significant role in deterring illegal fishing. These include:

- ***Risk of detection***: strong monitoring and surveillance capacity, disapproval of illegal fishing, reduced opportunities for IUU fishing vessels to operate undetected, control of corruption, and political stability deter IUU fishing by increasing the risk of detection and likelihood of punishment.
- ***Effort needed***: easily removable targets, easy port/country access to offload the catch, better port infrastructure, and higher demand of fish are factors that facilitate IUU fishing by reducing the effort needed to commit the crime.
- ***Rewards obtained***: abundance of fish, presence of commercially attractive species near ports/countries, and high value of the catch make IUU fishing more attractive and profitable.

## Research-Based Policy Recommendations: Situational Crime Prevention

Each of the five studies discussed in this section concludes with a list of recommendations directed, in line with their findings, to prevent IUU fishing. We have organized these recommendations according to the 25 situational crime prevention techniques (Cornish and Clarke 2003). Situational crime prevention aims to make crime less likely to happen by modifying the char-

acteristics of the immediate environment that facilitate it. To do so, it is very important to focus on very specific crime categories, as the situational factors of each crime category vary significantly. For example, different types of car theft such as "theft of cars for export overseas," "theft of cars for disassembling and selling them as parts," and "theft of cars for joyriding" differ significantly on the make and model being targeted, the methods used to steal them, and how the cars are disposed of. Understanding in detail all the elements involved in the commission of the crime is also key to identifying and addressing the criminogenic factors of the environment (Clarke 2008). The 25 situational crime prevention techniques were created to organize and systematize prevention options for any given crime as well as to assist practitioners in the design and conceptualization of new prevention efforts (Clarke 2014).

These techniques are classified under five strategies that aim to deter offenders from committing crime by (a) increasing the perceived risk; (b) increasing the perceived effort; (c) reducing the reward; (d) reducing the provocations; and (e) removing the excuses. Previous scholars have highlighted the value of situational crime prevention for wildlife and environment crimes (e.g., Lemieux 2014; Pires and Moreto 2011; Wellsmith 2010). As seen from the studies discussed in this section, the level of risk, effort, and rewards are paramount in facilitating IUU fishing, and it stands to reason that they should be key to preventing it. This is why most policy recommendations included in these studies have focused on these three strategies. However, there are also some examples of how removing excuses can help prevent this crime.

***To make IUU fishing more risky***, the studies above focused mostly on *strengthening formal surveillance*, by:

- Improving countries' monitoring, control, and surveillance strategies as well as their formal surveillance and patrol capacity.
- Enhancing monitoring and inspection of vessels at the biggest and busiest ports.
- Extending Memoranda of Understandings' (MOU)[1] enforcement responsibilities, including the creation of centralized law enforcement bodies.

In countries where corruption and political instability make formal surveillance challenging or ineffective (Moreto, Brunson, and Braga 2015; Le Manach et al. 2012; Sundström 2012; Agnew et al. 2009; Hauck and Kroese 2006), establishing external monitoring mechanisms by the international community would help *extend guardianship*. Suspicious activity in/near the ports can be reported by the fishing community of the area (acting as *place managers*) that has a vested interest in the prevention of IUU fishing.

*Reducing the possibilities of operating anonymously* would also increase the risks of detection. This could be accomplished, for example, through the strict implementation of the 2005 FAO Port States Measures Agreement, which requires that vessels that intend to access a port provide information about the vessel, its catch, the trip, and its fishing license, among other things.

Most of the policy recommendations aimed at ***making IUU fishing more difficult*** addressed the challenge of *controlling access* of IUU fishing vessels to ports, by:

- Making inconspicuous entry of IUU fishing vessels into known ports of convenience more challenging by increasing and improving the ports' monitoring and inspection efforts, as these ports facilitate the easy offload and disposal of illegally caught fish.
- Increasing inspections of fishing vessels offloading their catch at free ports.

Another way to increase the effort needed to commit this crime is by *controlling the tools* used to commit it by closely monitoring long-liners, which are one of the primary IUU fishing methods.

***Making IUU fishing less rewarding*** can be achieved by *disrupting the markets*, by using strategies such as:

- Establishing and strengthening regulations and trade controls on species highly commercial internationally, because this can act as an obstacle for the disposal of the illegally caught fish.
- Exerting international pressure on the 22 countries extensively engaged in illegal fishing and demanding that they take steps to curb this practice or otherwise face trade restrictions and penalties.

Finally, some of the recommendations were directed at ***removing excuses***, which can be achieved by educating consumers about what fish tend to be illegally caught and should be avoided (*alert conscience*), and incentivizing restaurants to display this information in their menus *(assist compliance*), in order to reduce the demand for those species. In particular, in countries with high levels of IUU fishing, it was recommended that nongovernmental and governmental organizations educate the fishing community and the general population about the consequences and losses derived from this activity.

## Situational Crime Prevention in Practice

This section discusses examples of programs and interventions that demonstrate how the techniques outlined above can be used to reduce and prevent

**TABLE 2.5. SITUATIONAL CRIME PREVENTION TECHNIQUES PROPOSED BY THE LITERATURE TO PREVENT IUU FISHING, WITH EXAMPLES OF EXISTING INITIATIVES**

| Increase the effort | Increase the risk | Reduce the rewards | Reduce provocations | Remove excuses |
|---|---|---|---|---|
| #1: Harden targets | #6: Extend guardianship ***The Coalition of Legal Toothfish Operators*** | #11: Conceal targets | #16: Reduce frustration and stress | #21: Set rules ***Catch Share programs (British Columbia, U.S., Mexico, Samoa)*** |
| #2: Control access to facilities ***Smart licensing of artisanal fisheries (Tanzania)*** | #7: Assist natural surveillance | #12: Remove targets | #17: Avoid disputes | #22: Post instructions ***Eastern Tropical Pacific Seascape*** |
| #3: Screen exits | #8: Reduce anonymity ***International blacklisting of IUU fishing vessels*** | #13: Identify property ***IMSC's Fisheries Certification Program*** | #18: Reduce emotional arousal | #23: Alert conscience ***Sustainable seafood advisory lists (U.K., U.S., Canada)*** |
| #4: Deflect offenders | #9: Utilize place managers | #14: Disrupt markets ***The EU IUU Regulation*** | #19: Neutralize peer pressure | #24: Assist compliance ***The International Marine Mammal Project*** |
| #5: Control tools/ weapons ***The Illegal Driftnet Campaign (Italy, Albania, and Tunisia)*** | #10: Strengthen formal surveillance ***The Fish-I Africa Task Force*** | #15: Deny benefits | #20: Discourage imitation | #25: Control drugs and alcohol |

IUU fishing in practice. Table 2.5 outlines the 25 situational crime prevention techniques and lists examples of existing initiatives that use situational crime prevention techniques to address IUU fishing. Each of these listed interventions is briefly described below.

## *Increase the Effort*

### Control Access to Facilities: Smart Licensing of Artisanal Fisheries (Tanzania)

In order to secure the sustainable harvesting of small and medium pelagic fish species and effectively combat illegal and unreported fishing in Tanza-

nian waters, the Department of Fisheries and the UN FAO partnered to establish a licensing system for artisanal fishermen in the country. With the aim of facilitating the licensing process and making it easier for these fishermen to license their vessels, the program made new technologies available to them. Licensing fees could be paid through the so-called "mobile money or smart money" application. Once the fishermen registered their vessel, they were provided with a badge and license plates that attested to their compliance with regulations. A benefit of using this technology is providing fishermen with the opportunity to receive timely updates on weather conditions, pirates, oil spills, and other hazardous conditions at sea, as well as help law enforcement efficiently coordinate search and rescue operations if the vessel is in distress. This is also an example of *assist compliance (Remove Excuses)*, as the application is also used to remind the fishermen in a timely manner when it is time to renew the payment of the licensing fees. Meanwhile, the department of fisheries is able to monitor the activities of these vessels via a tracking system (IOC 2014).

**Control Tools: The Illegal Driftnet Campaign (Italy, Albania, and Tunisia)**

Black Fish and the ShadowView Foundation partnered to launch the Illegal Driftnet Campaign in Italy, Albania, and Tunisia, with the aim to expose the illegal use of driftnets (banned by the UN in 1991) in the fisheries of these countries. The partnership carried out port inspections on land, as well as boat inspections at sea via the use of drones, with the aim to specifically identify whether these vessels used illegal driftnets. After two months of inspections at 56 different ports, they were able to identify seven ports that were used to offload catches that were carried out using illegal driftnets (deGroot 2013). The evidence collected through their investigations was used to prosecute owners of illegal fishing vessels involved in using illegal driftnets in the Mediterranean. The publicity surrounding these prosecution cases raised awareness about the consequences of using illegal driftnets in the prohibited areas with an aim to discourage future activities by other motivated offenders.

### *Increase the Risks*

**Extend Guardianship: The Coalition of Legal Toothfish Operations (COLTO) (Australia)**

COLTO, based in Australia, is an international initiative run by legal fishers who formed an alliance to combat the illegal fishing of toothfish. The organization works closely with the government, nongovernmental organizations, and the public to raise awareness about the problem of the illegal harvesting of toothfish and the need to take urgent action to address the problem in the

region. The coalition launched the "Wanted" reward scheme in 2003, which offers a reward of up to $100,000 for information leading to the successful prosecution and conviction of illegal fishers and companies engaged in such activities (OECD 2005).

**Reduce Anonymity: International Blacklisting of IUU Fishing Vessels**
RFMO, which are organizations that are responsible for the management of marine resources in countries' EEZs and the high seas, have created publicly available lists of blacklisted fishing vessels, which are vessels that have engaged in illegal fishing activities within their convention areas. The information about the vessel is made public only after the RFMO has reviewed the evidence of violation provided by the inspecting authority and after its member states reviewed and agreed to the RFMO's recommendation to blacklist the vessel. The vessel in question is also given the opportunity to prove otherwise. After the member states and the flag state have had the opportunity to review the evidence, the RFMO blacklists the vessel and makes that information publicly available (Palma 2010).

**Strengthen Formal Surveillance: The Fish-I Africa Task Force (Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, and Tanzania)**
The Fish-I Africa Task Force is an intergovernmental fisheries enforcement collaboration that involves using satellite tracking of fishing vessel movements, as well as the creation of operational, investigative, and legal support for the law enforcement in Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, and Tanzania. One example highlighting the success of this collaboration was the capture of the PREMIER and SOLEVANT illegal fishing vessels that were tracked by satellite for 15 months and were eventually arrested operating within the Liberian waters (Stop Illegal Fishing 2016).

### *Reduce the Rewards*

**Identify Property: The International Marine Stewardship Council's Fisheries Certification Program**
The Marine Stewardship Council (MSC) certification program ensures that fish sold bearing the MSC's Chain of Custody certificate can be traced back from the point of sale to the point of landing. To receive MSC certification, the fishery must obey all local, national, and international laws, as well as undergo a rigorous evaluation by the scientific community to assess their environmental impact. The MSC considers the following factors when determining eligibility for the certificate: the status of the target fish, the impact of the fishery on the ecosystem, and the overall performance of the fishery management system (Marine Stewardship Council 2017), all of which are

measures adopted to ensure that the fish have not been caught illegally or unsustainably (Palma 2010).

**Disrupt Markets: The EU IUU Regulation**

This regulation was established as a tool to fight against IUU fishing, and, more specifically, the import of IUU fish into the EU, the world's largest importer of seafood products. As per this regulation, only fishery products that carry catch certificates, which attest to their compliance with fisheries laws and conservation measures, will be allowed into the EU market, and it imposes heavy sanctions on EU operators who engage in illegal trade. Additionally, the regulation is composed of two other core components: third-country carding process and penalties for EU nationals. The third-country carding process involves assessing non-EU countries that export fisheries' products into the EU on their efforts to combat IUU fishing. The countries receive yellow, red, or green cards, and, based on this carding process, the EU authorities determine the degree of sanctions (i.e., trade bans) that they are willing to impose on these countries. Last, if EU nationals are found to have engaged in or supported IUU fishing anywhere in the world, under any flag, they face penalties that are proportionate to the economic value of their catch, depriving them of any profit for the illegally caught fish (WWF 2016a). This is also an example of technique #15, *Deny Benefits (Reduce the Rewards).*

### *Remove Excuses*

**Set Rules: Catch Share Programs (Canada, United States, Mexico, and Samoa)**

Catch Share programs are also known as rights-, area-, or quota-based management schemes. Area-based programs allocate exclusive privileges to a fishing area or a fishery to a group of fishermen, who are then required to comply with the fisheries regulations. The quota-based program is based on assigning portions of the allowed catch as shares to participants, who are then incentivized to catch less to ensure healthy growth of the fish populations so that they can benefit from this in the long run. Many such programs have been implemented in both developing and developed countries around the world with notable success (e.g., British Columbia's Integrated Groundfish Program, the United States' Gulf of Alaska Rockfish Cooperative Program, Mexico's Baja California FEDECOOP Fishing Rights system, and Samoan Safata District Customary User Rights Program) (EDF 2016).

**Post Instructions: The Eastern Tropical Pacific Seascape Initiative (Costa Rica)**

The Eastern Tropical Pacific Seascape is located in the tropical Pacific Ocean, in front of the western coasts of Costa Rica, Panama, Colombia, and Ecuador.

The region experiences illegal fishing and overexploitation of coastal marine resources. In Costa Rica, one of the facilitators of these activities is the dispersion of environmental regulations among a variety of environmental laws and decrees and a complicated structure and distribution of responsibilities among administrative entities, which make it difficult to understand and abide by such regulations. Nongovernmental organizations and local authorities work together to design flyers and booklets detailing and explaining existing regulations on such topics as the FAO Code of Conduct for Responsible Fishing and the commercialization of fish. These flyers are then handed out to fishermen during information sessions and workshops (Wild Aid Inc. 2010).

**Alert Conscience: Sustainable Seafood Advisory Lists (United Kingdom, United States, and Canada)**

The Sustainable Seafood Advisory Lists involve different programs that aim at raising awareness about the impact the consumers' seafood choices have on the environment. Different countries, such as the United Kingdom (Marine Conservation Society), the United States (Seafood Watch), and Canada (OceanWise), as well as environmental organizations, such as Greenpeace, have created seafood guides where most commonly consumed fish are listed under the "fish to eat" and "fish to avoid" categories. Some of these guides are available not only online, but also via smartphone applications and in pocket paper versions (WWF 2016b).

**Assist Compliance: The International Marine Mammal Project**

The international marine mammal (IMM) project has led the international effort to protect dolphins, which are a common bycatch, especially in yellowfin tuna fisheries. In these fisheries, dolphins are either deliberately targeted, such as in the case of yellowfin tuna fisheries in the tropical Pacific Ocean, or become entangled in purse seines that are used to capture the tuna. Dolphin Safe Tuna labeling originated in the United States and requires that the companies that operate fishing vessels and would like to have the Dolphin Safe label on their products comply with the laws and policies that are designed to minimize dolphin fatalities. To receive the Dolphin Safe label, a company must agree to surprise inspections and international observers onboard their fishing vessels and audits of their logs at ports, as well as random inspections of their canning and storage facilities (Phillips 2015).

## Ways Forward

Despite the many challenges that must be overcome to effectively address the problem of IUU fishing, there have been some noteworthy responses that show promise. Perhaps, the best way to address the problem would be to adopt a piecemeal approach and tackle the problem one step at a time. The

complex nature of IUU fishing, with its many types, will be better addressed when the specific problem is identified, as this will allow for devising more targeted intervention strategies. If a community faces a significant IUU fishing problem, for example, what is the nature of that problem? Is the problem primarily that of major commercial vessel operators intruding into the areas where they are not supposed to, or is it a problem of using illegal fishing gear? Clearly identifying the problem will provide an evident path to solving it (i.e., controlling access to certain areas vs. controlling the illegal fishing gear), and this should be the first step. As seen in this chapter, situational crime prevention can be used to devise strategies to effectively deal with the specific issues at hand.

The role of the community in the effort to combat IUU fishing should not be underestimated. Some of the most successful response strategies found in our research involved engaging and empowering community members and capitalizing on their collective strength. Community members' involvement in combating IUU fishing should be encouraged, as they are among the most capable actors who are also most motivated to eradicate IUU fishing. After all, these communities are directly affected by it. Alternatively, providing the community with the opportunity to self-regulate, and shifting the responsibility and ownership of the problem from law enforcement to the community, holds much promise, as these self-regulatory mechanisms rely on rational actions that must be taken to ensure long-term benefits. In a way, this is a solution to the problem in which people consent to "a system of coercion" (Hardin 1968), where they are compelled to do what needs to be done regardless of whether they fully agree to the methods of doing it or not.

Community empowerment should also rely on continuously educating the public and raising awareness about the significant long-term consequences of IUU fishing if the public continues to ignore the problem and not take responsible actions to curb it (see also White, Chapter 3). These educational campaigns should rely on solid empirical research that should be conducted to keep the problem afloat. The problem of IUU fishing, therefore, should not be treated as a distant issue suffered by few but as one that will affect directly every one of us if timely and efficient ways to curb it are not found.

Situational crime prevention is among the most successful crime prevention strategies employed by criminologists to study a wide range of crime problems, both conventional and unconventional. The 25 techniques are based on the solid foundations of environmental criminological theories, and their practical relevance has been repeatedly proven empirically. Studying IUU fishing through the lens of environmental criminology will lead to the advancement of empirically driven intervention strategies. It is with this conviction that we hope to stimulate more criminological interest in the topic.

**NOTE**

1. MoUs are international agreements that establish inspection procedures of vessels entering ports of the signatories of the agreement.

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# 3

# PARADOXES OF PREVENTION

## *Situational, Contextual, and Political Economy Responses to Wildlife Crime*

Rob White

**EDITOR'S INTRODUCTION:** *The following chapter by White addresses the theoretical silo mentioned in the introduction of this volume. White has been a central figure in the green criminological study of environment-related crimes and harms for two decades and is well-situated to provide an overview of the development of wildlife crime as a viable area of study within criminology. Focusing on three distinct orientations used to examine wildlife crime within the criminological literature—situational, contextual, and political economy—he provides an overview of the strengths and limitations of all three perspectives. In the penultimate section, White discusses the potential benefit of incorporating these perspectives in developing holistic responses to address wildlife crime and outlines future avenues for collaborative research.*

Different theoretical and analytical approaches to wildlife crime give rise to different practical understandings and responses to the problem. This chapter considers three distinct approaches to the issue of illegal wildlife trade, which for convenience are referred to herein as the "situational prevention," the "contextual," and the "political economy" approaches. The discussions begin with an exemplar and description of how each constructs the problem of wildlife crime and then describes the solutions to the problem proposed by each.

The situational prevention approach focuses primarily on the applied theories, techniques, and technologies of crime prevention (e.g., specific methods of intervention designed to stop or prevent wildlife poaching—the

"how to"). The contextual approach is mainly concerned with historical settings and postcolonial relations (that is, a critical interpretation of the militarization of antipoaching in the context of European settlement in places such as Africa—the "who and why"). The political economy approach argues that main attention needs to be placed on destruction of habitat rather than wildlife trafficking per se (that is, species decline is most threatened by overarching economic imperatives and consumerist practices—the "what"). Each approach has its limitations and strengths.

As part of the discussion the chapter explores the paradoxes of prevention in relation to wildlife crime. This refers to the apparent contradictions and/or oppositions between these approaches; it also incorporates the ideas that each tends to ignore or dismiss the contributions and insights of the other—thereby contributing to tensions at both the theoretical and the practical levels. The chapter responds to these paradoxes by arguing for a middle ground, a conceptual space in which it is argued that certain key questions and practical compromises ought to shape concrete responses to wildlife crime in any given situation.

## Situational Prevention

In regard to environmental crime more generally, great purchase in recent years has been derived from the application of "situational crime prevention" approaches and techniques (Pires and Moreto 2011). Situational crime prevention is based upon the idea that, for someone who is capable of offending, the decision whether to commit a specific crime will be a function of both an opportunity presenting itself and the likely rewards from exploiting that opportunity being sufficient to offset the perceived efforts and risks (Sutton, Cherney, and White 2013). Situational prevention revolves around identifying modifiable conditions that are susceptible to intervention and can reduce or preempt perceived opportunities for crime (Clarke 2008). The broad approaches and specific techniques of situational crime prevention are directed at increasing the effort of crime, increasing the risks, reducing the rewards, reducing provocations and disputes, and removing excuses (Clarke and Eck 2005; see also Sutton, Cherney, and White 2013).

An exemplar of this approach is a recent volume on poaching that has been directed almost exclusively to the question of crime prevention (rather than causes of crime) and in particular situational crime prevention (Lemieux 2014). The primary question highlighted in this collection was how to stop the poaching of rhinos, elephants, and other species and the ostensible answer is found in crime science solutions that emphasize particular technologies, techniques, market measures, and data modeling (Lemieux 2014). Some of this work involved complex computer simulations that attempt to map out a wide range of intersecting variables (e.g., animal,

poacher, ranger, site specific information) so as to enhance the targeting of law enforcement efforts. Essentially, the emphasis was on data collection and, in particular, sophisticated data processing and analysis.

Situational crime prevention is multifaceted and incorporates diverse focuses. The main orientation is toward removing the opportunity to commit crime and increasing the likelihood of apprehension. This approach is particularly useful and effective in that different kinds of harm tend to call forth different kinds of responses. It entails identification of specific actors, circumstances, and exchanges in relation to particular kinds of environmental crime. Once these have been adequately identified, then appropriate crime prevention measures can be put into place. Importantly, particularly in regard to the other approaches discussed further on, a focus on "what works" in the here and now does not necessarily preclude adoption of wider social prevention measures—those meant to enhance community well-being over time and that are designed to bring about systemic changes at social, economic, cultural, and political levels.

Recent criminological work on illegal poaching of elephants and rhinoceroses, and on illegal trade in parrots, have likewise exposed the conjunction of many different factors that go into why and how such activity takes place. Again, a key lesson from this research is that tailoring responses to the specific context and the specific crime is essential. For example, responses to elephant poaching have included suggestions such as closure of logging roads, DNA coding of ivory, use of pilotless drones, and the banning of international trade in ivory (Lemieux and Clarke 2009). The illegal trade in parrots involves many different players and situations (Pires 2012). Here it is suggested that intervention focus on protecting the nests of target species during breeding season, using CCTV surveillance, actively focusing on geographic areas where most species are concentrated (hot spots), and identifying and shutting down key city markets and road blocks on widely used trafficking roads (Pires and Clarke 2012; Pires 2013). In regard to rhinoceros poaching, it is suggested that measures ought to include more rangers and military patrols on the ground, dehorning animals, and other science-based interventions such as microchipping, investing in community-based ecotourism projects, and making bilateral government agreements to cooperatively curb the illegal trade (Pires and Moreto 2011; Ayling 2013a). Similar types of proposals have been put forward in relation to illegal fishing and other types of environmental crimes (Smith and Anderson 2004; Wellsmith 2010, 2011; White 2008).

One of the key areas of interest throughout this extensive and growing literature is that of disrupting markets. In specific terms, such considerations are closely associated with the development of a "market reduction approach" (MRA). The MRA, as applied to the illicit endangered species trade, seeks to identify the routine patterns of those involved: poachers, handlers, and consumers—those who hunt, transform, transport, and buy the wildlife

(the likely offenders); the precise wildlife being hunted, transformed, transported, and purchased (the suitable targets); and those whose remit is to actually conserve and protect those species (conservators, police, customs, and wildlife officers) (Schneider 2008, 2012).

The systematic and rigorous analysis of crimes such as poaching is demonstrating the importance of studying harvesting networks and the resilience of these networks to environmental law enforcement efforts (Ayling 2013a, 2013b). These studies also highlight that the notion of "organized criminal networks" has to be interpreted widely, since the scale and number of actors involved ranges from small to large, local to international, loose associations to more formalized networks, and temporary and transient to the more enduring (Gibbs, McGarrell, and Sullivan 2015). Moreover, distinctions need to be made between localized activity based upon subsistence and/or tradition and activity involving organized criminal gangs seeking large profits from international sales (Ayling 2013a; Von Essen et al. 2014).

Such an approach does not preclude consideration of why certain actors engage in the wildlife crimes in the way they do. Indeed, recent work is increasingly conscious of the limitations of narrowly conceived situational prevention measures that do not take into account the social and cultural context of phenomena such as poaching (Pires and Moreto 2011; Kahler and Gore 2012). As Nurse (2013, 211) comments, "Citizens who feel marginalized within society and who lack appropriate life chances or are under economic or social pressure to harm animals, will do so unless they are provided with alternatives." This observation extends to different communities in different parts of the world. Those adopting situational crime prevention approaches have demonstrated an awareness of the importance of the sociopolitical and economic situation of local communities (Reuter and Bisschop 2016).

Yet, the social context of illegal wildlife crime and the social consequences of situational crime prevention nonetheless require greater attention than perhaps has hitherto been the case. The relative dearth of discussions of power, interests, and social justice among those concerned with the "how" of environmental crime prevention has, however, in recent years been met by critical analyses that focus precisely on these issues. This is notwithstanding the general defenses of situational crime prevention that argue that it "works" within its own terms of reference and that, ultimately, it benefits society by achieving immediate reductions in crime (Clarke 2005). As seen below, clearly there are ongoing issues and tensions here. As well, there has been a notable silence in some of the environmental situational crime prevention research in regard to green criminology literature that has directly and for a long period of time focused specifically on wildlife trafficking issues (see, e.g., Wyatt 2013; Sollund 2011). This is unfortunate given the overlap of interests between these analytical camps as there is much to be gained by closer dialogue and cooperation.

## Contextual Approach

The contextual approach is mainly concerned with the historical settings and postcolonial relations within which much contemporary environmental crime and crime prevention takes place. This is especially prominent to recent work that provides a critical interpretation of the militarization of antipoaching in the context of European settlement in Africa, although the framework is relevant to other continents as well. In this research and commentary, the key questions are directed at the "who and why" of poaching.

An exemplar of this kind of critical thinking about antipoaching intervention is work that has concentrated on the at times extreme violence used to protect endangered megafauna in Africa such as elephants and rhinoceroses (Smith and Humphreys 2015; Wall and McClanahan 2015). Importantly, the justification for the use of such violence is framed as protection of natural resource assets and/or preservation of species. This has been described and critiqued as "fortress conservation," a politics of exclusion that involves the eviction of local people from protected areas (Brockington 2002; Brockington and Igoe 2006). The aggressiveness and militarization of such antipoaching strategies have led them to being dubbed examples of "warrior conservation" (McClanahan and Wall 2016).

Critics point out that the protagonists generally involve the state in some way, and powerful social interests such as businesses and conservation groups. The victims of this top-down coercion may include local people who are thereby prohibited from undertaking traditional activities or those who through circumstance are forced into poaching for survival. Commentators are raising a number of interrelated issues relating to the militarization of antipoaching campaigns, for instance in countries such as South Africa, not the least of which is the escalation of violence involving new technologies (such as drones) and employment of counterinsurgency techniques (including "manhunts") (Smith and Humphreys 2015; Humphreys and Smith 2014; Duffy 2014; Wall and McClanahan 2015).

The concern is at least twofold: First, counterpoaching is fast becoming militarized at every level—involving not only greater use and variety of weapons but reliance upon military and paramilitary personnel (and ex-personnel). Conservation is increasingly taking on the substantive form of war, and in any war there are inevitably casualties and collateral damage. Whether this is happening everywhere (within and outside of Africa, for instance), and for the same reasons, is an important consideration, as is fully understanding the immediate social context.

Second, the focus of this new "war" is protection of vested interested of a particular kind. Thus, for example, it has been observed that "the intense focus on rhinos in South Africa stems from the ever-expanding 'commodification' of the animals, which lie at the heart not only of the illegal horn selling networks, but also the tourist industry—whether for sport hunting or

wildlife viewing—on which more and more parts of South Africa are becoming heavily reliant economically" (Smith and Humphreys 2015, 209).

Those who own and control the lands that have been transformed into national parks and reserves, and who have the political and financial resources to protect their interests, are those who benefit the most from this form of commodification of nature. In this case it is mainly the minority elite, composed mostly of whites who run the wildlife ranches and allied tourism industry, who are yet again privileged by arrangements that, in turn, reflect the interests of wealthy American and European hunters who come to Africa to engage in legal "trophy hunting" (Wall and McClanahan 2015).

If protection of species is designed to make money, for some, it is done so in the context of significant transformations in preexisting relationships. For example, there is a broad tendency for processes of criminalization to turn traditional users of particular natural environments into offenders. Thus, highly regulated and securitized lands are emerging within several African countries today, often under a conservation or wildlife preservation banner (Smith and Humphreys 2015). This can have devastating consequences for local populations:

> When wildlife reserves are established, local communities can suddenly find that their everyday subsistence activities have been outlawed and they have been re-defined as criminals. Some of the world's best-known pristine wilderness areas are, in fact, engineered environments. Creating a national park means drawing up new conservation rules which outlaw the everyday subsistence activities of local communities, such as hunting for food and collecting wood. (Duffy 2010, 11)

Expansion and protection of wildlife reserves, often in the interests of white owners rather than traditional land holders, and frequently under the rubric of "conservation," thus serve to legitimize the foreclosing of lands from traditional users.

Interestingly, another critical strand of the contextual approach to poaching is that concerned with political protest, forms of rural defiance, and folk crime (Holmes 2016; Pohja-Mykra 2016). The notion of "folk crime" refers to offenses that are generally perceived by perpetrators and other members of their community as not being particularly criminal, offensive, harmful, or dangerous (Ross 1983). Such crimes are frequently committed repeatedly by the same offenders, are well known in the offenders' community, and do not impair the offenders' public identity as respectable and law-abiding citizens (Ross 1983).

In regard to poaching and illegal hunting, certain types of traditional rural activities (such as hunting or gathering of firewood) have been reconceptualized over time as "wrong" or "illegal" or "criminal." One response to

this criminalization of what were formerly legal activities is political resistance and defiance by members of the local community. As indicated above, conservationism has had a major impact on the ways in which traditional users of natural resources engage with forests and lands. This is not unique to colonial settings such as Africa. Historically, for example, this involved significant changes in land use in places such as the Adirondack Mountains in the United States in the 1880s:

> For many rural communities, the most notable feature of conservation was the transformation of previously acceptable practices into illegal acts: hunting or fishing redefined as poaching, foraging as trespassing, the setting of fires as arson, and the cutting of trees as timber theft. In many cases, country people reacted to this criminalization of their customary activities with hostility. Indeed, in numerous regions affected by conservation, there arose a phenomenon that might best be termed "environmental banditry," in which violations of environmental regulations were tolerated, and sometimes even supported, by members of the local rural society. (Jacoby 2003, 2)

Nonetheless, in many places where colonial rule and/or settler populations were imposed upon indigenous people, it was not only land use that was put into question (including the commodification of law itself). For instance, colonial rule also involved reconceptualizing and relabeling traditional practices associated with living on the land. For example, in many British colonies hunting traps and snares (used by local African communities) were outlawed although use of guns (used by white Europeans) was not (Duffy 2010).

Contemporary examples of similar processes of criminalization, and resistance, are evident in the Scandinavian countries, where the European Union and environmentalist nongovernment organizations have joined forces to introduce new illegal hunting offenses (von Essen et al. 2015; Rytterstedt 2016). In effect, what was once part of the majority culture—namely, killing of wildlife for subsistence and protection—has been relegated to the status of subculture and deemed to be "deviant." Local rural dwellers have in some instances fought against these trends, in part through partaking in traditional hunting activities, and in part by repositioning hunting as a cultural practice fundamental to rural life. Rhetorically and symbolically, this response repositions the ban on hunting as an attack on rural identity, while serving to legitimate hunting as a valued social practice (von Essen et al. 2015). Those who resist the imposition of the hunting ban may, in effect, take on the mantle of "folk hero"—at least in their eyes and those of their supporters (see Forsyth and Forsyth, Chapter 6).

Such "crime" therefore may well be defined proactively as a social and cultural good among those who participate in illegal hunting, regardless of

formal legislation and/or majority opinion. The legitimacy of rules and regulations is thus questioned by participants, and some engage in illegal hunting as much as anything as a form of political dissent (Pohja-Mykra 2016). This sometimes occurs with the tacit approval of the guardians of national park reserves or local authorities in charge of law enforcement in that community (Pendleton 1997; Holmes 2016).

In a study that explores why people harm and kill animals, Nurse (2013) developed a typology of offender motivations that includes what he calls "masculinities criminals." Of particular interest here is the notion that certain forms of hegemonic masculinity—especially those that have a clear basis in aggressive masculinity—are linked to perpetrators who harm animals (in the case of Nurse's study, illegally). Such characteristics are present as well among those who are involved in counterpoaching (see Smith and Humpheys 2015). Research on hunting communities confirms the highly masculinized nature of hunting in countries such as Norway and other Scandinavian states (Sollund 2015). The implication is that violent people engage in violent acts, such as harming animals, and this is often supported by a culture of violence that legitimates the behavior (whether legal or illegal).

There appears to be differences in "moral ecology" (Jacoby 2003) among residents, visitors, and users of traditional lands. Those living and working in the Adirondack Mountains in the late 1880s held to a common rights ideology that maintained that undeveloped lands, whether private or public, were open to hunting and foraging (Jacoby 2003). Thus, informal rules guide what is allowable and what is not when it comes to the natural surrounds. This could be in the order of "Never kill anything that you do not need" through to not disturbing fish, fowl, or forest creatures when in the midst of breeding season (see Jacoby 2003, 24). This point will be returned to later when discussing indigenous notions of sustainability.

Motivations to engage in poaching vary greatly and are best understood in terms of local conditions and historical relationships (see Forsyth, Gramling, and Wooddell 1998; Kahler and Gore 2012; White 2013; Zhang, Hua, and Sun 2008; Bell, Hampshire, and Topalidou 2007; McMullan and Perrier 2002; Pires and Clarke 2011; Moreto and Lemieux 2015). In some locales and under some conditions poaching exists with considerable community support. For example, in Costa Rica turtles have been a target for hunting for many years due to a wide range of intersecting factors: the tradition and the history of the practice, which has been occurring for many hundreds of years; the value to local people, as food and because the shells and skins have traditionally been used for household objects and jewelry; the qualities of the object, in that turtle eggs are believed to have aphrodisiac qualities; income sources for local people based upon demand in external consumer markets; tourism and the appeal of local souvenirs based upon turtle products; lack of government regulation insofar as there is no apparent profit for the gov-

ernment in prosecuting cases; and the pressures of the black market, which generates high illegal demand for turtle-based goods (see Campbell 2003; Toreng and Rankin 2005). The demise of the turtle population is thus due to complex reasons and multiple push and pull factors. Addressing their future simultaneously means addressing the past, present, and future of the humans living and working in that region.

One limitation of the contextual approach is that *understanding* why local people use wildlife the way they do should not be conflated with *approval* for the behavior. Traditional methods and rationales for using wildlife, whether legal or illegal, need to be assessed in terms of ecological criteria (such as notions of sustainability) as well as ecophilosophy (which relates to considerations of the status and rights of animals more generally). As the world changes and species become threatened, and the methods of harvest become more efficient and/or devastating, so too individuals and communities must reassess their relationship with nature.

## Political Economy

A political economy approach argues that more attention needs to be placed on destruction of habitat rather than on wildlife trafficking as such. Here it is argued that species decline is most threatened by overarching economic imperatives and consumerist practices. The main concern is with the "what" of environmental degradation (and only tangentially with crime prevention as a set of techniques and practices).

An exemplar of this approach is work that focuses on system-level destruction of habitat stemming from the capitalist treadmill of production (Lynch, Long, and Stretesky 2015). It is argued that environmental crime prevention, as such, is inherently limited regardless of intent, motivation, or technique. This is because it is not poaching, hunting, or animal trade that is most prominent in destroying species or putting them on the endangered list. Rather:

> The vast majority of species that are recognized as threatened or endangered legally are those that are impacted by various forms of human development rather than through poaching, hunting or animal trade. Human development has widespread impacts on species by destroying ecosystems in ways that sometimes eliminates these ecosystems and non-human species locally, and on a larger scale impeding ecosystem functionality and habitat structures through processes such as ecosystem segmentation that have negative impacts on non-human species viability. (Lynch, Long, and Stretesky 2015, 120)

The root cause of the problem is thus structural, and the main impetus behind the destruction is deemed to be a specific type of political economy—that of capitalism.

This argument can be illustrated by brief examination of specific industries and the destruction of different types of habitat. For instance, factors affecting deforestation, and reduction in forest biodiversity, include among other things unsustainable harvesting of forest products for industrial use and livelihood needs. However, deforestation is not only solely the outcome of logging. Land clearance is also due to agricultural exploitation, cattle farming, mining, oil and gas installations, and hydroelectric dams (see Boekhout van Solinge 2008a, 2008b, 2010a, 2010b; Boekhout van Solinge and Kuijpers 2013). There is also the phenomenon of "conflict timber," associated with west Africa, for example, in which deforestation is linked to the funding of civil wars and armed conflicts (Boekhout van Solinge 2008a; Brisman and South 2013; Milburn 2015). Another reason for deforestation and biodiversity reduction is the increasing reliance on energy from organic sources, especially in the global North (see Burrell, Gay, and Kavallari 2012; Charles et al. 2013). For example, global vegetable oil supplies used for biodiesel production are on the increase because of European and North American demand, with Indonesia and Malaysia major producers in the Asian region. This translates into massive shifts in land use (Mol 2013).

The conversion of land for commercial purposes has direct bearing on the well-being and survival of nonhuman animals. For example, the native woodlands demolished for cash crops such as GMO soybeans in Argentina have a major impact on the habitats of animals such as pumas, jaguars, Andean cats, and tapirs, which cannot survive outside this particular ecosystem (Robin 2010, 271). Similar events are happening in places such as Indonesia, where deforestation is putting pressure on the Sumatran tiger and the orangutan (Boekhout van Solinge 2008b).

Yet the destruction of wildlife habitat is not all the same, everywhere. Nor is it interpreted the same by different stakeholders and participants. There is a significant difference, for example, between fire burning carried out by indigenous people in northern Australia (part of traditional methods of landscape management and reverence for country) and burning of fires in Borneo and Sumatra (which are largely for commercial purposes even if performed by local villagers). The rejuvenation of the land sometimes requires actions that superficially appear destructive and damaging to wildlife habitat and the creatures living therein. This is very different from the sorts of exploitative efforts generally driving wildlife habitat destruction in most parts of the world today.

Responding to the types of issues identified in a political economy approach basically requires political intervention. If capitalism writ large is the problem, then the "solution" is to reform it or replace it with something else, although this is seldom discussed in any detail by proponents of critical political economy (Lynch, Long, and Stretesky 2015). Specific responses might perhaps include introduction and better enforcement of environmental laws

that prevent land clearing, stricter controls on or abolition of polluting industries (especially those most contributing to carbon emissions), and banning of the planting of GM crops. But these strategies depend entirely upon the balance of political forces at the local through to the international levels.

More generally, the fact is that species are at risk in the here and now. Categories such as "threatened" and "endangered" are reflections of real patterns and present trends. While acknowledging habitat loss is a major driver behind species endangerment and extinction, there is nonetheless a place for specific environmental crime prevention measures insofar as these can and do offer a modicum of protection for particular species.

## Paradoxes of Prevention

As outlined, each approach discussed in this chapter has its limitations and strengths. I refer to the "paradoxes of prevention" as the apparent contradictions between these approaches, which also means that each tends to ignore or dismiss the contributions and insights of the other—thereby contributing to tensions at both the theoretical and the practical levels. In this concluding section it will be argued that it is important that a middle ground between these approaches be constructed. That is, a conceptual space is needed in which concrete and suitable responses to wildlife crime in any given situation can be devised.

It is useful to briefly reiterate some of the key elements of the problem. Megafauna such as rhinos and elephants are linked to extensive national parks as well as to efforts by international conservation groups to protect these species. A primary question for those interventions that appear to be in line with situational crime prevention has been "how" to stop the poaching of rhinos, elephants, and other species through employment of particular technologies and techniques (Lemieux 2014). The social and historical dynamics and dimensions of poaching tend to be marginalized in such accounts, however, although situational crime prevention more generally is cognizant of their importance.

Thus, more discussion is needed about the root causes of crime, such as economic deprivation or social disengagement, and about long-term motivations, such as tradition or culture (von Essen et al. 2014). Attention also needs to be paid to the notion that illegal hunting is a form of resistance to conservation policy that is seen to be unfair and lacking in legitimacy (von Essen et al. 2014; Holmes 2016; Pohja-Mykra 2016), something which is particularly evident in Scandinavia (von Essen et al. 2015) and historically in the Adirondacks in the United States (Jacoby 2003). Social context is especially meaningful in the African context, as conservation has tended to favor and privilege the white power elite over and above the interests of indigenous Africans (Brisman, South, and White 2015). Criminalization, in this in-

stance, is heavily overlayed with militarization of antipoaching measures and a continuation of elite economic and political domination. Yet, poaching frequently does demand a robust response precisely because local communities do benefit from conservation. For example, tourism and related industries rely upon the presence of the very animals targeted for poaching. It is not only the elites who may benefit or lose out depending upon what happens in the poaching wars.

Meanwhile, the political economy approach argues that habitat destruction is systemic and therefore it is system change that is required first and foremost (Lynch, Long, and Stretesky 2015). Little is said, however, as to how this is to be achieved. Nor is anything said about the importance of existing interventions beyond their limitations or apparently skewed priorities. The sense is that it is the analysis itself that counts most. However, there is no prescription as to how best to respond to the analysis so provided. Interventionist action tends to be the subject of critique, rather than considered as part of a constructive dialogue as to where we might go from here. It is notable, as well, that the political economy approach is not the only one that acknowledges the damaging aspects of habitat loss. For example, it is likewise of concern and relevance to writers adopting the situational crime prevention approach (see, for example, Clarke and De By 2013).

Rather than attempting to impose a one-size-fits-all intervention and/or one that ignores the historical legacy of colonialism, Duffy (2014) helpfully suggests that there are three central questions that must be asked:

- Who are we protecting wildlife from?
- What are we protecting wildlife for?
- What methods should we deem as acceptable?

In other words, it is essential to approach the issues holistically.

Other researchers and scholars are and have mirrored these concerns (Moreto, Introduction). For example, acknowledging and accounting for local community interests when devising specific situational crime prevention interventions has been mentioned in regard to wildlife trafficking (see, e.g., Schneider 2012). These include measures such as fostering community and village patrols in their own right (rather than solely relying upon external agencies and outside armed forces), through to building fences around villages to avoid encroachment from animals such as elephants that do damage to residents' homes and fields.

At a framework (rather than technique) level, there is also support for community-based conservation strategies to complement the more traditional law enforcement approaches (Moreto, Brunson, and Braga 2017; see also Wyatt 2013). These refer to initiatives that encourage local community engagement and participation in protected area management. In essence, the idea is

that members of the local community work together alongside park rangers and other authorities to prevent crime and protect species. In this scenario, the manifestation of military perspectives and approaches may hinder community relations and create distance between relevant parties (Wall and McClanahan 2015; Smith and Humpheys 2015). Moreover, there are specific contextual variables—such as revenue sharing programs, appropriate responses to problem animals, legally obtaining needed resources, employment of ex-poachers, legitimacy of park laws and regulations, and mistrust of outsiders (even if employed as a park ranger)—that affect community-governance arrangements, implying that significant attention has to be given to building relationships of trust if community-based conservation strategies are to be successful (Moreto, Brunson, and Braga 2017).

The dynamics of local political economy, as well as long-standing cultural traditions, also must be addressed. For Duffy (2014), this translates into land reform, housing, and social aid, with biodiversity conservation at its centerpiece. Changing community circumstance and community understandings is the socially just way to address issues of biodiversity and conservation. Such an approach also acknowledges the multiple uses of natural resources that have sustained populations over the millennia precisely because traditional uses have been ecologically sustainable.

Consider for example, different notions of "sustainability" used in the Australian context, the consequences of which have completely different implications for the conservation agenda:

> The concept of sustainability may be viewed slightly differently by non-Aboriginal people than by Aboriginal peoples and Torres Strait Islanders. To many non-Aboriginal people, the concept broadly implies the maintenance of maximum economic *productivity* of lands and seas. For Aboriginal peoples and Torres Strait Islanders, it often means the continuance of *use* of wildlife resources for subsistence. This small but important difference can lead to confusion over the "sustainability" or otherwise of wildlife use. There is also an important distinction to be drawn between concerns over declines in the local abundance of a species, which may reduce its short-term availability as a resource for harvest, and declines in abundance which are sufficiently widespread and diverse to be a cause of concern for species' survival. Local declines in abundance associated with harvesting will not threaten a species with extinction unless the rate of offtake is unsustainable in the longer term. (Caughley, Bomford, and McNee 1996, 8, emphasis in original)

This means that effective community-based conservation strategies much involve active listening to what may well be quite different voices. What

is legitimate and what is not is to some extent in the eye of the beholder. Conservation through environmental protection can include measures such as protected areas, closed seasons, catch quotas and size restrictions. These will work best when there is sufficient buy-in from local and traditional users of lands (and waters). This, in turn, rests upon adequate communication about the nature of the problem and flexibility in how best to respond to it. One practical response is to construct conservation areas that incorporate multiple uses (Bustamante et al. 2014). This can be achieved either through zoning schemes that distinguish sensitive or fragile areas from those where sustainable yield might be possible and/or the granting of "special rights" for traditional and indigenous people (albeit perhaps with ecologically based restrictions).

The instrumental appropriation of land by powerful external forces such as transnational corporations and agribusinesses has also disempowered those who have simultaneously been most negatively affected by broad conservation strategies reliant upon locking up lands and protecting them via coercive force (Borras, Franco, and Wang 2013). As Gedicks (2005, 168) reminds us, "Multinational mining, oil and logging corporations are now using advanced exploration technology, including remote sensing and satellite photography, to identify resources in the most isolated and previously inaccessible parts of the world's tropical rain forests, mountains, deserts and frozen tundras. What the satellites don't reveal is the fact that native peoples occupy much of the land containing these resources."

The commercial imperative to seek new regions (and species) to exploit has particularly impacted upon indigenous peoples worldwide (Klare 2012). This is because the commodification of nature (and its various biotic and abiotic elements) has frequently been accompanied by the pushing aside of traditional owners in favor of state and corporate interests. The colonial legacy not only endures but new forms of power are presently being wielded. In such circumstances, without political pressures in favor of social and ecological justice, a community-based conservation strategy will necessarily have limited effect.

As this chapter has demonstrated, the use of wildlife as resources for traditional and indigenous people makes social and historical analyses essential in consideration of environmental crime prevention. Imposing a tough conservation policy "from above," such as fencing nature reserves and coercively keeping people out, can end up criminalizing activities that are historically imbued and built in to the fabric of long-standing cultures and ways of being, such as foraging for food and collecting wood for cooking fires (Duffy 2010). Creative responses are needed to foster substantial and positive changes in the lives of these communities. For example, in Canada, the Income Security Program (ISP) established for Cree hunters in north Quebec provided guaranteed income to allow the Cree to hunt: "With the

ISP, production is linked to people's need and there is no incentive to overexploit wildlife resources. Indeed there is a voluntary decrease in hunting in overused areas, and other wildlife conservation practices such as monitoring the numbers of certain game are recognized as hunting-related work under the ISP" (Altman, Bek, and Roach 1996, 89). Other crime prevention initiatives are likewise receptive to working with, rather than against, community interests in order to enable a win-win environmental solution (see Pires and Moreto 2011; Wyatt 2013). Multiple interests thus need to be accommodated as part of the crime prevention problem-solving process.

## Conclusion

This chapter has provided discussion of three different, overlapping, and at times competing approaches to environmental crime prevention. Rather than choosing one approach over another, the basic argument has been that we need to learn from each, appreciate their strengths and limitations, and develop contextually relevant approaches to wildlife crimes suited to particular locales, peoples, and circumstances.

Social action around poaching thus has to take into account several key issues. These obviously relate to power, interests, and social justice. However, they also pertain to important temporal and spatial considerations. There is urgency around protecting certain species that simply cannot be ignored or delayed through being mired in technical and political debates over who is responsible, who should be accountable, who benefits, and what is to be done about it. In the end, it is the animal or plant that is bound to lose, as well as humanity at large. Likewise, there is a pressing need to map out the vulnerabilities associated with place, as this is a prime consideration in which species are at threat and why.

All of this implies increasing international efforts to both prevent wildlife trafficking *and* stop habitat destruction. Each task is inherently political and each is incredibly challenging and difficult. Powerful interests will resist such efforts at every step. Yet, the possibility of successful environmental crime prevention demands nothing less. For the paradoxes of poaching can only be overcome by direct action and collaborative interventions.

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# 4

# WILDLIFE CRIME AND CRIMINAL ORGANIZATIONS

## *Can the Theory of Enterprise Help Explain the Ivory and Rhino Horn Trade?*

Greg Warchol

**EDITOR'S INTRODUCTION:** *Up to this point, the chapters in this volume have focused on theoretical frameworks that have been widely considered to be useful in the study of wildlife crime. In the final chapter of this first part, Warchol discusses the potential utility of a theoretical approach that has not yet been used to investigate wildlife crime: a spectrum-based theory of enterprise. Using the illegal ivory and rhino horn trade as examples, and highlighting the transnational and organized nature of these trades, Warchol provides a compelling argument for the relevance and utility of spectrum-based theory of enterprise to examine wildlife crime. Moreover, Warchol suggests that the adaptive nature of groups involved in the illegal ivory and rhino trade fosters a challenging problem as those involved can also exploit legal channels to facilitate illicit trade, while also taking advantage of opportunities promoted by corruption and globalization. Warchol's contribution to this volume is an appropriate way to end the first part as it shows that the exploration of wildlife crime is still conceptually evolving and developing.*

The global trade in wildlife includes both a legal and illegal component. There is an extensive legal trade in a wide variety of species to provide sustenance, clothing, building materials, and even pets. However, there also exists an illegal trade in both common and endangered wildlife. Marine species and land mammals are poached for food, elephant ivory for decorative carvings, timber for flooring and furniture, rhinoceros horns and wild plants for medicines, and birds for the pet trade. This en-

vironmental or green crime includes both a domestic and transnational component. While some illegally harvested wildlife are consumed locally in their countries of origin, a portion of high demand products are transshipped from their source nations to consumer markets abroad. The latter process may involve the rather uncomplicated smuggling of wildlife products across frontiers to a neighboring country for sale or follow a more complex land, sea, and air route to a different continent (Orenstein 2013; Warchol, Zupan, and Clack 2003; see also Shelley and Kinnard, Chapter 5). What drives this illegal trade is consumer demand for wildlife products that either cannot be purchased legally or are very expensive on the legitimate market (Albanese 2011). The impact on some species including but not limited to tigers, African and Asian rhinoceros, and African elephants is dramatic population reductions that potentially could lead to extinction in the wild (Schneider 2012).

While challenging to place a precise dollar figure on an illicit market, some estimates of the annual value of the illegal wildlife trade range as high as US$50 to $150 billion with the latter figure including the extensive commercial harvesting of fish and timber species (United National Environmental Program [UNEP] 2014). However, these are crimes taking place in remote areas often with weak or nonexistent monitoring of wildlife populations and their exploitation. The true volume and economic value of the illegal trade in wildlife may be even greater. The high estimated value of this global market generally ranks it among the top three or four types of transnational crimes that also include the trade in narcotics, human trafficking, and military weapons (TRAFFIC 2016b). The incentives for both individuals and criminal enterprises to exploit wildlife for profit are apparent. As demand for consumer goods increases with population growth and global wealth, and wildlife are viewed as a commodity, the market for these products will continue to expand putting additional pressure on the species and their habitats.

Beyond the threat to the survival of the species exploited in the illegal trade, the crime also hinders the economic progress and political stability of some developing nations where wildlife is sourced and trafficked. This situation occurs in countries that depend heavily on these natural resources for both their domestic markets and international trade (Donovan 2013; Vira and Ewing 2014). Wildlife is a valuable commodity for domestic use, ecotourism, and international sale as shown by the US$323 billion annual value of the *legal* global trade in wildlife (TRAFFIC 2016b). The loss of this revenue to poaching and trafficking impairs economic development and often fosters the corruption of the government institutions responsible for protecting the resources and managing the economy. This ultimately weakens these institutions making them more susceptible to the corrosive influence of criminal enterprises profiting off the wildlife trade.

Previous analyses have found evidence that a segment of the illicit trade in wildlife is the domain of transnational criminal enterprises (Albanese 2011; TRAFFIC 2012; United National Office on Drugs and Crime [UNODC] 2016). The term "transnational crime" was coined in the early 1970s to help define cross-border crimes. In 2000, the United Nations developed eighteen categories of transnational offenses, one of which was environmental crime, which would include wildlife crimes (Roth 2017). Transnational crimes involve groups of actors motivated by financial gain participating in an illegal business that violates the laws of more than one nation or affects another country (Winslow and Zhang 2008). In the context of wildlife crimes, what makes the involvement of contemporary transnational criminal groups or syndicates a serious threat is their ability to move large volumes of endangered species products out of source nations to consumer countries, respond to changes in market preferences and enforcement practices, and corrupt the institutions of government via bribery, extortion, and infiltration. Gastrow (2003) concluded that the emergence of these criminal enterprises in Africa was a more recent historical development and a function of the political and economic changes on the continent. It has become almost institutionalized in parts of Africa where it undermines the rule of law, ethical governance, economic development, and public trust. The inability to control the problem has left some nations such as South Africa and Swaziland with a low-risk environment for criminal syndicates and made them vulnerable to additional exploitation of their natural resources (Irish and Qhobosheane 2003; Pillinger 2003). The increased involvement of transnational crime syndicates in wildlife offenses is also an unintended consequence of globalization. The opening of once closed or restricted markets and national borders facilitated the movement of both legal and illegal goods. Furthermore, new trade agreements, the rapid growth of the internet, electronic banking systems, express mail operations, and the ubiquitous sea cargo shipping container were quickly exploited by criminal organizations to move large amounts of contraband more easily across national borders and continents. It has profoundly affected Africa in both positive and negative ways (Albanese and Reichel 2014). Globalization fostered increased economic investment by first-world nations in developing countries with foreign-owned and -staffed business centered on the extraction of natural resources. However, with their legitimate business interests came an organized criminal element that exploited wildlife populations.

One way toward a better understanding of the illegal wildlife trade and the involvement of criminal enterprises starts with a formal analysis of the offense. The social scientific literature on wildlife crimes includes the application of various theoretical approaches to explain different aspects of the problem (Eliason and Dodder 1999; Eloff and Lemieux 2014; Forsyth and Marckese 1993; Herbig and Warchol 2011; Petrossian and Clarke 2013).

However, few have attempted to analyze the involvement of organized crime in the exploitation of wildlife. Furthermore, past research on organized crime, often based on the theory of ethnic succession, focused on the traditional Mafia as the typical model of organized crime defined by its hierarchical structure and the shared ethnicity of its members. However, contemporary transnational groups vary greatly in structure and membership that goes beyond kinship, involve legitimate businesses, and often network with other distinctly different syndicates and gangs. Albanese, Das, and Verma (2003) contend that this older model of organized crime fails to clarify a group's activities with regard to those of a similar ethnic group that avoids criminality. An alternative that focuses more on the social, political, and economic conditions via a business model may be more helpful in examining the problem.

This chapter first examines the developments that contributed to the contemporary illegal global trade in African elephant ivory and rhinoceros horn. Next addressed is the role of transnational criminal enterprises in wildlife trafficking. The chapter then focuses on the viability of one theory to help explain how these groups became involved in wildlife crimes. Rather than earlier alien conspiracy and ethnic succession theories, a business model of organized crime is examined relying on Smith's spectrum-based theory of enterprise. This posits that similar to a legal business in structure and function, organized crime exists to fill a market need for a good or service that cannot be legally obtained. High demand combined with the relative low risk of apprehension by the authorities along with the potential for large profits creates the perfect conditions for organized crime to flourish. Following this is a description and analysis of the contributing factors that fostered the emergence and expansion of these groups, which includes globalization and corruption in the context of enterprise theory. The implications of the theory with regard to enforcement tactics are discussed in the final section.

## Wildlife Crime: Its Dimensions and Consequences

The illicit wildlife trade is a global business that includes the unsanctioned harvesting, trafficking, and consumption of flora and fauna. While sometimes thought of as limited to mostly rare mammals including the *charismatic megafauna*—tigers, elephants, rhinoceroses, and the great bears—the trade more commonly involves massive amounts of marine life, plants, trees, reptiles, birds, and insects, both common and rare (TRAFFIC 2016b). Seemingly, any flora or fauna that has a value as a food, medicine, decoration, building material, fuel, collector's specimen, or pet is subject to being harvested from the wild and trafficked in the illegal trade. The global nature of the trade is illustrated by the fact that it includes countries that serve as

sources of wildlife, transshipment points, and consumer destinations. As examples, rhino horns and elephant ivory are primarily poached in African range states such as Kenya, South Africa, and Zambia; transshipped through other nations both on and off the continent; and consumed primarily in the markets of China and Vietnam. Timber products illegally harvested in Malaysia are processed into furniture and flooring with a portion destined for sale in the United States. Exotic birds poached from the wild in South America are smuggled across the Atlantic to collectors in the European Union (EU) (TRAFFIC 2008). The trade has distinct commercial aspects with poached wildlife sometimes obtained through the complicity of legitimate businesses, shipped via licit and illicit methods, and sold in both legal and illegal markets. For instance, illegally harvested timber is sold by lumber mills to legitimate businesses after the true illicit origins of the species are disguised or it is commingled with legal species (UNODC 2016). Specific regions of the world have been identified as global hotspots for the wildlife trade including the international border regions with China, East and southern Africa, Southeast Asia, the eastern borders of the EU, and parts of Mexico, the Caribbean, Indonesia, New Guinea, and the Solomon Islands (TRAFFIC 2016b).

While the trade is diverse and global, briefly examining some aspects of it including the targeted species provides a better understanding of the threat. An extremely common type of wildlife use in Africa involving both rural subsistence and commercial hunters is the trade in wild game meat commonly referred to as "bushmeat" (Pillinger 2003; TRAFFIC 2002). African game species hunted for food range from the large mammals such as hippo, buffalo, and the great apes to smaller ones including duikers and impalas (Warchol and Johnson 2009). Past analyses found that the legal and illegal trade in bushmeat totals millions of tons of wildlife annually (Bushmeat Crisis Task Force 2008). A more well-publicized part of the wildlife trade involves the illegal hunting and trafficking in various large cat species, namely tigers, leopards, lions, and cheetahs. Primarily occurring in Asia and Africa, the trade in these mammals is a product of consumer demand for their skins as decorative items and their body parts as ingredients in traditional medicines. A smaller part involves the live capture of cat species for the exotic pet trade with cheetahs being one popular sought-after animal (Warchol, Zupan, and Clack 2003). The long decline in tiger numbers to currently about 3 percent of their estimated population in 1900 was initially due to overhunting, but more recently is a function of rampant poaching for their body parts (Guynup 2014). As tigers have become more difficult to obtain, a quasilegal trade in lion body parts has developed in Africa as a substitute (TRAFFIC 2015). By volume, one of the largest parts of the illegal wildlife trade involves bird and reptile species harvested in Asia, South America, and Africa. These animals are generally taken alive to be sold into

the exotic pet trade both in their source nations and abroad. However, there is a market for reptiles as a food product with the pangolin as an example of a delicacy sought after in Asia (TRAFFIC 2016a). Excluding the massive industrial-scale illegal harvesting of timber and fish species for commercial sale and use, a dynamic, albeit smaller illegal trade exists in plants and marine life. Flora are commonly poached from the wild for use as traditional medicine ingredients, garden decorations, food, and collectors' specimens (Warchol, Zupan, and Clack 2003). Marine species are poached for individual consumption and commercial sale in domestic and international markets (Steinberg 2005; Warchol and Harrington 2016; Petrossian and Marteache, Chapter 2). Finally, and discussed in more detail later, is perhaps the most well-publicized type of wildlife crime—the poaching and trafficking of elephant ivory and rhinoceros horn.

The illegal wildlife trade is an increasing, extensive, and complex transnational crime involving a diverse group of participants. Its expansion is driven in part by human population growth and economic conditions both in impoverished and wealthy countries. As human populations increase in economically deprived nations, wildlife is in demand as a necessity for survival. In rural areas, this includes both individual subsistence poaching of wildlife for food, firewood, medicinal plants, and clothing, and small-scale commercial operations to sell the same for income. Participants in the illegal wildlife trade include criminal syndicates (Albanese 2011; Knecht 2006; Warchol and Johnson 2009; van Uhm, Chapter 8) motivated by profit from a relatively low risk crime, military and insurgency forces exploiting destabilized conflict zones, and some terrorist groups in search of revenue sources to fund their activities (Orenstein 2013; Venter 2003). At the consumer end of the spectrum, in wealthier nations, wildlife is desired as a luxury good or for cultural use among immigrant populations. The expansion of the middle classes in China and Vietnam had the unintended consequence of fostering more elephant and rhinoceros poaching in Africa to meet consumer demand for ivory and horn, both prized luxury goods. Increased urbanization in Africa has led to more demand for wildlife game meat in restaurants. In the United Kingdom and France, shipments of bushmeat from Africa are regularly confiscated by airport authorities ordered by immigrants for cultural ceremonies and holidays (Chaber et al. 2010; Davis 2005).

The illegal trade affects the targeted species and the economic and political stability of the source and transshipment nations. Hunting pressure on some species beyond sustainable levels results in population declines that can eventually lead to the risk of extinction in the wild. For example, rampant poaching of Asia's wild tigers drove their population numbers down to around thirty-two hundred animals (International Union for Conservation of Nature [IUCN] 2015). This is also illustrated by concerns about the resurgent trade in rhinoceros horns and elephant ivory after successful efforts at

species recovery from previous waves of commercial poaching in the 1980s. The illegal trade further represents an economic loss to countries that depend upon wildlife as a natural resource whether for ecotourism, domestic trade, or export products (Chamely 2005; Frost and Bond 2007; World Bank 2013). Legal commercial safari hunting operations in South Africa generate an estimated US$120 million annually (Statistics South Africa 2015) and constitute about 10 percent of the GDP of Tanzania and Namibia (Donovan 2013).

## The Ivory and Rhinoceros Horn Trade in Africa

There are two distinct species of African elephant—the small forest elephant (*Loxodonta cyclotis*) and the considerably larger savannah animal (*Loxodonta africana*). Humans have used both species of African elephants for military purposes, popular entertainment, and as a food source for millennia. But it was mainly the interest in their ivory tusks dating back to about 1000 B.C.E. that would contribute to the extensive hunting of the animals and eventually represent a threat to their survival in the wild (Meredith 2001). As the African continent was first explored resulting in several periods of colonization, the practice of hunting elephant strictly for ivory increased to meet the demand primarily in Asia. Beginning as far back as the 1400s, elephant populations were slowly but steadily exploited as European explorers mapped more of the continent in search of natural resources and wealth. While indigenous Africans mainly used elephants as one type of food, by the late 1800s, the beginning of the most recent period of Western colonialization, Europeans wanted ivory for numerous commercial uses.

The nature of their ivory and subsequently its commercial uses varies by species in terms of color, hardness, and appearance (Jackson 2003). Ivory, once used to produce consumer items such as billiard balls and piano keys, and is now carved into bracelets, religious icons, and animal and human figures. Ivory was continuously exported from Africa since the early twentieth century to Europe and the United States at varying levels due to political and economic events. In 1914, one thousand metric tons of ivory possibly representing the killing of as many as fifty thousand elephants left the continent for consumer markets in the West. Though the two world wars and Great Depression temporarily reduced exports, overall demand trended upward with a corresponding decline in elephant populations. The decades that followed World War II would also signal the end of the European colonial period in Africa. In nations experiencing decolonialization transitions marked by liberation wars, political instability, and economic deterioration, natural resources would be subject to exploitation by the different warring factions and opportunistic organized criminals whose activities were often facilitated by corrupt government officials. Similar to precious metals, ivory would even be viewed as preferable to some currencies for a time in the 1970s

during periods of inflation and unstable economic conditions (Jackson 2003).

Expanding markets for ivory in Asia would steadily increase pressure on African elephant populations. The Japanese consumer demand for ivory *hankos*, a small rectangular block with a personal seal carved into the base, fueled much of the elephant killings in Africa during the late twentieth century. Bale (2015) noted that between 1979 and 1989 an estimated five thousand tons of ivory representing about two hundred fifty thousand elephants was shipped to Japan. However, the post–Cold War growth of China's economy with its developing middle and upper classes combined with long cultural and commercial use of ivory led to it surpassing Japan to become the world's largest market for African elephant ivory (Orenstein 2013). These factors would foster massive increases in poaching well into the late 1980s. In some nations with full-scale civil wars or low intensity insurgencies, military units with the capacity to kill elephants and transport large volumes of ivory collaborating with criminal networks helped create the industrial-scale poaching of this era (Vira and Ewing 2014). The stage was now set for an environmental disaster.

The African elephant population estimated at around 1.3 million animals in 1979 had declined to about 700,000 by 1989 (Poaching Facts 2016). The losses were not evenly distributed in the range states. Certain countries were hit exceptionally hard while others like South Africa, Botswana, and Zimbabwe avoided the extensive poaching. Uganda's elephant population declined from sixty thousand to six thousand animals while Tsavo National Park in southern Kenya lost half of its population of thirty thousand elephants to poaching in just two years (Meredith 2001). Between 1981 and 1987, Zambia's elephant herd of about 160,000 was reduced by poachers to 43,000 while Mozambique's elephant population declined from about 54,800 to about 18,600 by poaching (Jackson 2003). Forest elephants of central Africa fared better since they were harder to locate compared with savannah elephants found further south. However, this would change during the new poaching wave of the 2000s with militarized poaching units specifically targeting those populations. The dire situation would be partly mitigated with the 1989 decision to place all African elephants in Appendix I of the 1975 Convention on International Trade in Endangered Species (CITES), which prohibited the global trade in ivory and elephant products (Thornton 1997). Signatory nations to the convention were obligated to act to enforce its provisions that protected the species from illegal exploitation.

While the 1990s ushered in a period of recovery for Africa's elephants, two developments would contribute to a resurgence in poaching. At the 1997 Harare, Zimbabwe, CITES conference, Zimbabwe, Namibia, and Botswana, not affected by the large-scale poaching of the 1970s and 1980s, proposed to down-list elephants to a CITES II category. This would allow for the trade in

ivory including a one-time sale of ivory stocks to Japan. The possible effects were that the CITES down-listing of elephants and the ivory sale would stimulate demand for additional ivory in China and Japan. This development also corresponded with the steady growth of China's economy and its middle and upper classes due to increasing foreign investment and trade deals. The ability to purchase luxury items of cultural significance including ivory would encourage more for-profit poaching. The Environmental Investigation Agency (EIA) analysis that contended that these changes would reinvigorate the market leading to renewed elephant poaching and trafficking was found to be correct. Increases in elephant poaching and ivory seizures by customs officials in both elephant range states and consumer nations was documented. Wildlife syndicates had found a new business opportunity (see also van Uhm, Chapter 8).

While increased conservation efforts throughout late 1980s and 1990s reduced poaching, another wave began in the early 2000s resulting in a renewed threat in some regions of the continent. Kenya was seriously impacted as poaching steadily increased from 2008 to 2013 resulting in the killing of 1,545 animals. The Kenyan Wildlife Service concluded that its severe loss of elephants due to poaching was a by-product of lifting the ban on ivory (EIA 2000). Poaching increased in Zimbabwe, Zambia, and Tanzania and would later be documented in other African range states. The surge in elephant poaching was not just limited to East and southern Africa or just a product of liberation wars and small gangs as in the past. Major improvements in transportation, electronic communication, and banking systems due to globalization were exploited by expanding transnational criminal enterprises (Vira and Ewing 2014). Most severely affected by large-scale commercial poaching were the elephant populations of West and Central Africa where losses reached unsustainable levels in some years. Wildlife syndicates intent on exploiting ivory, along with the mix of terrorist and military groups based in Uganda, Somalia, and Sudan poaching to fund their operations, were at the forefront of this new wave. Media reports indicated these more sophisticated poaching operations using modern weapons and methods of transport could kill herds of elephants and quickly move large volumes of ivory to export centers. Chad, Cameron, Congo, Kenya, Tanzania, and Uganda were suffering the brunt of the problem. The Congo's elephant population once estimated at more than eleven thousand elephants in the 1980s but declined to about eighteen hundred surviving animals by the early 2000s. Research in Central Africa in 2012 concluded that as many as one hundred elephants were killed each day totaling an estimated thirty-five thousand animals for the year (Fay 2011; Vira and Ewing 2014). A decline was also identified in South Africa's Kruger National Park from 2014 to 2016 where previously no elephant losses to poaching were reported between 2000 and 2013 (Poaching Facts 2016). A 2013 estimate put the elephant population

at roughly five hundred thousand animals in thirty-seven range states with about 60 percent of the total in three nations—Botswana, Zimbabwe, and Tanzania (UNODC 2016).

The African rhinoceros suffered a similar fate to the elephant experiencing three periods of population decline. During the European colonialization of Africa in the late 1800s, as many as one million rhinos may have inhabited the continent (World Wildlife Fund 2016). Unfortunately, they were often considered pests by farmers or abundant game animals for hunters resulting in little concern for their protection. Their numbers would be dramatically reduced first by unregulated hunting into the 1970s and next by increasing Asian demand for the horn in the later decades of the twentieth century. Long viewed as having curative powers for a range of physical ailments, the horn was sought after for use as an ingredient in Asian traditional medicines (Orenstein 2013). Processed into a powder form and mixed with other natural products and modern pharmaceuticals, it was dispensed by traditional healers for everything from headaches to sexual dysfunctions (EIA 1993; Leakey and Morell 2001). The physically smaller black rhino population declined to an estimated sixty-five thousand while the southern white rhino fared much worse with only fifty to two hundred surviving by the first half of the 1970s (USFWS 2000, 2004). In subsequent decades, the black rhino population would decline rapidly due to a combination of legal hunting and later by poaching for its horn. By the mid-1990s, it experienced a 96 percent population decline to an estimated twenty-three hundred animals. Perhaps the most dramatic example was in Zambia whose population of about fifty thousand rhinos in the Luangwa Valley dropped to a dozen by 1992 due to rampant poaching (Gibson 1999). The U.S. Fish and Wildlife Service (2004) noted that it lost a larger percentage of individuals than any other species in the past hundred years.

In response to the dire situation of Africa's rhinos, a massive and successful conservation effort based in South Africa combined with enhanced law enforcement against poaching and trafficking commenced in the early 1990s (USFWS 2004) that was unfortunately followed by a new threat to the species. Rhino poaching did not disappear altogether in South Africa but remained at levels that did not threaten the species survival. Yet by the early 2000s, the third wave of large-scale rhino killing would strike the region ushering in a renewed threat to their survival. The emergence of a market economy and increased foreign trade in Vietnam would result in more prosperity for segments of its population. As its new middle and upper classes became wealthier, interest in acquiring exotic and luxury goods including rhino horn also increased. A segment of the Vietnamese population adhered to traditional medicines that included faith in the medicinal powers of rhino horn including its ability to cure cancer (Rademeyer 2012). The other component of the demand was interest in acquiring complete rhino horns as a status symbol to display one's wealth. An-

other opportunity was now available for syndicates with the logistical ability and resources to operate in a transnational illegal market.

Demand for the horn was first met through legal rhino hunting by Vietnamese in South Africa where the private ownership of wildlife is allowed, and later by poaching. Private game farms began to see a very profitable trend where Vietnamese, Thai, and Laotian nationals, frequently young women with no hunting experience, would arrive for legal rhino hunting safaris. It is legal to hunt privately owned rhino in South Africa. Under its CITES protection the horn can be exported but cannot be sold as a commodity. It must remain intact as a hunting trophy and not commercialized. Deemed "pseudohunting," young impoverished Southeast Asian women were recruited and paid by Vietnamese and Laotian wildlife trafficking syndicates to go to South Africa for a sanctioned rhino-hunting safari to obtain the horn as a legal and exportable trophy (Orenstein 2013). However, upon return to Vietnam, the horn would quickly disappear into the marketplace selling at high prices. Between 2003 and 2010 nearly four hundred of the pseudohunts were done predominantly by Vietnamese nationals in South Africa (Rademeyer 2012). The main drawbacks, however, for the syndicates was the high cost of the legal rhino hunts at up to US$50,000 per animal and, later, increased government scrutiny of hunters. The alternative and less expensive method for obtaining the horn was to network with Africa wildlife syndicates and poachers. In 2016, the southern white rhino population was an estimated 20,700 animals and black rhinos numbered 4,900 animals (Poaching Facts 2016). South Africa, which has the largest populations of rhinoceroses, was heavily targeted by poaching syndicates. World Wildlife Fund (2016) determined that poaching increased 9,000 percent in South Africa from a loss of 13 animals in 2007 to 1,215 animals by 2014. More recently between 2013 and 2014 rhino poaching in all of South Africa increased 21 percent with 1,004 killed in 2014 and another 1,215 in 2015. In Kruger Park 826 rhinos were killed in 2015 (Poaching Facts 2016).

## Smith's Theory of Enterprise

Organized crime syndicates have long been viewed as criminal conspiracies defined by ethnicity or shared background of their members and deemed a product of their social and economic surroundings. This approach had led to law enforcement focus on the familial or ethnic relationships between members. Even in some of the recent literature about trafficking syndicates involved in the African wildlife trade a common method to describe them has centered on kinship, tribal affiliation, nationality, or ethnicity (Gastrow 2003). Smith's spectrum-based theory of enterprise (1980), however, offered an alternative way for understanding contemporary organized crime and its structure and functions, and presupposes alternative approaches to controlling it.

Smith critiqued the older paradigms used to describe organized crime as no longer primary. These models, dating back to the 1920s, relied on the alien conspiracy concept holding that organized crime was solely the product of foreign gangs such as the Italian Mafia. It is based in part on the concept of *ethnic succession* that examined criminality among new immigrants to the United States. The marginalization of newly arrived ethnic groups contributed to their involvement in illegal enterprises to obtain wealth and social standing. The shared ethnic and social backgrounds would help maintain solidarity in the criminal groups. They would eventually end their involvement in illegal activities as they became prosperous. The void in the illegal market would be filled with members of the next immigrant group arriving in the country (Roth 2017). Furthermore, and quite critical, these groups were not viewed as operating as a business. Rather, crime syndicates were considered distinctly different from businesses, the latter of which were viewed as inherently legitimate with the actors participating in different behaviors involving only legal goods and services. Contemporary thought at the time was that crime within businesses was more likely to be considered the action of one or a few corrupt employees—the white collar criminal. While the concept of a criminal enterprise eventually emerged, it was classified as a type of crime rather than a business (Clinard and Quinney 1967). Yet for many decades the common view was that organized crime and legitimate businesses were still separate entities with separate origins.

Smith (1980) notes that by the early 1960s a fresh perception of criminal enterprises began to emerge. Contrary to the view that they are best viewed as conspiracies and/or ethnically connected gangs, syndicates were also found to have defined, stable structures with rational actors managing opportunities and activities that was more similar to large businesses than previously considered. Yet it would still take many years before criminologists would consider organized crime from the perspective of an enterprise with illegal activities that have direct parallels to legitimate businesses. Smith's three assumptions for a new approach are "that enterprise takes place across a spectrum that includes both business and certain kinds of crime; that behavioral theory regarding organizations in general and business in particular can be applied to the entire spectrum; and that while theories about conspiracy and ethnicity have some pertinence to organized crime, they are clearly subordinate to a theory of enterprise" (370). Regarding the first point, the activities of criminal enterprises operate within the same market as legal businesses. For example, the stolen goods fence and the loan shark compare to their legal counterparts of retailer and credit lender. Second, drawing from the sociology of organizations, Smith found that both legal and illicit businesses adapt their behavior and structure to their operating environment to succeed. Finally, Smith stated that while conspiracy and ethnicity can help us understand aspects of organized crime, explaining it as an en-

terprise is primary. The conspiracy helps expand their activities while their ethnic similarities foster a bond between members, but these are secondary to enterprise. He notes, "Market dynamics operating past the point of legitimacy establish the primary context for an illicit entrepreneur, regardless of his organizational style or ethnic roots" (375).

Smith's theory provides a new framework for analyzing the nature of transnational crime syndicates in the ivory and rhinoceros horn trade. These groups, though ethnically centered in terms of core membership, have structures, operations, motivations, and actors that parallel a legal business to provide desired products to consumers. This in turn should influence the enforcement approach to controlling or ending their involvement in wildlife crime. By considering what is necessary for a legal business to exist, function, and expand, the same can be targeted by enforcement efforts to hinder the business of organized crime. This starts by identifying the contributors to the formation of the syndicates and how they are structured and operate. The following section examines transnational crime groups, what contributed to their development, and what is known about their operations.

## Transnational Criminal Enterprises: The New Business of Organized Crime

Part of the illegal trade in wildlife—mainly the more rare and/or higher value species and their products including but not limited to elephant ivory, rhino horn, tiger parts, and sturgeon caviar—involves criminal syndicates (UNODC 2016). These groups capitalize on their members' skills and connections with other criminal networks to gain financially by dealing in protected species. Their involvement in the trade includes recruiting poachers, providing bribes, smuggling, and selling illegally obtained wildlife (Shelley 2005; TRAFFIC 2012; Van Uhm and Siegel 2016; Wyatt 2009). An analysis of these groups' structure and operations offers support to Smith's assertions that organized crime falls within the spectrum of enterprise. This in turn has implications for enforcement efforts used to control the problem. Albanese (2011) contends that this is the defining form of organized crime in the twenty-first century. The United Nations Convention against Transnational Organized Crime defines the phenomena as a specifically structured group of three or more actors existing for a period with the goal of committing one or more serious crimes for either financial or material gain (Gastrow 2003). They are further defined by the fact that their offenses violate the laws of more than one nation or affect another country (Winslow and Zhang 2008). Global organized crime is not a recent development. While these groups have existed for many decades, they have expanded and become more sophisticated to the point where their activities can pose a threat to the stability of fragile states by undermining their political and economic institutions (Shelley 1995).

The general concept of organized crime has been defined in several manners. As previously noted it was once viewed as mainly criminal gangs with a shared ethnic identity and loose structure operating in a defined and sometimes limited geographic region similar to the Mafia. The reliance on ethnic identity as a key feature in defining organized crime was central to its understanding. It can seem appropriate when examining the problem in southern Africa if one just focuses on this characteristic. In the region, Chinese criminal enterprises have long been involved in ivory and marine species trafficking (Warchol and Harrington 2016) and Vietnamese groups networked with the Boer mafia and Zimbabwean and Mozambican poaching gangs have recently become implicated in the rhino horn trade (Rademeyer 2012). However, as Smith and others have concluded, a sole reliance of the ethnicity of a group's membership was misleading. Labeled the "ethnicity trap," Albanese, Das, and Verma (2003) contend that this only helps describe the actors rather than their activities. Furthermore, modern transnational syndicates are not exclusive to one ethnicity. As shown in the rhino horn trade, cooperation among many diverse groups in the illegal marketplace with the same end goal is now commonplace. Rather, other characteristics should be taken into account when examining the modern criminal enterprises, namely their structure and operations.

Subsequent analyses of transnational criminal enterprises resulted in an expanded definition to include their activities and organizational models. Winslow and Zhang (2008) classified the groups as involved in the buying, selling, and distribution of illicit goods and services and the infiltration of legitimate businesses and government institutions. These activities include wildlife crimes, money laundering, narcotics, stolen vehicles, human and precious gem trafficking, investment fraud, and cybercrime (Albanese 2008). Additional research found that transnational criminal enterprises, similar to a legal business, rely on various models of organization including traditional and alternative structures sometimes with loosely affiliated or temporary networks of members or smaller groups (Albanese 2011). The UNODC (2002) identified five types:

1. Criminal networks organized by the skills and activities of the members.
2. Standard, rigid hierarchies with a single leader, defined activities and often a common social or ethnic identity.
3. Regional hierarchy similar to above but with activities limited to a specific geographic area.
4. Clustered hierarchy involving numerous groups of actors but governed as a whole.
5. Core groups of individuals working with a broader, loose network. This model is defined by a flat organizational structure and generally lacks a common social or ethnic identify among its member.

Shelley (1995) examined the threat from modern transnational organized crime concluding that it is a function of their structure and operations and further noting they are often complex, adaptable groups with a global reach. Criminal enterprises target nations where market conditions are favorable for their success and the risk of apprehension is low. Economically and politically fragile states are especially vulnerable as their systems of justice are either overwhelmed with other priority issues, are only marginally effective, or are simply outmatched by criminal enterprises. She notes that the threat from transnational criminal enterprises "undermines the political structures, the world economy and the social order of the countries in which the . . . groups are based and operating . . . the resulting instability invites more crime and may preclude the institutionalization of democratic institutions, the rule of law and legitimate markets" (4). Zimbabwe under Robert Mugabe offers a supporting example of the problem in southern Africa. Goredema (2003) concluded the nation was a transitional state that became especially vulnerable to exploitation by organized crime. Zimbabwe was characterized by a law enforcement power vacuum, corruption fueled by falling wages, and a collapsing economy combined with numerous opportunities to profit off crime with a low risk of apprehension by the authorities.

Transnational organized crime is a business, albeit an illegal one and it operates as such across national borders. It identifies and satisfies consumer demand for products that are either too expensive to obtain via legitimate means or are illegal. Albanese and Reichel (2014) contended that transnational criminal enterprises complete parts of the criminal business process in different countries. Relying on a network of participants including legitimate businesses, goods and services are procured by the criminal enterprises in one nation and shipped to consumers in another while the profits are laundered in a third. For example, rhino horns poached in South Africa's Kruger Park by Mozambican hunters hired by an Afrikaner syndicate were smuggled to Ho Chi Minh City by Vietnamese nationals for its consumer market with the profits deposited into a bank in Swaziland or laundered through a legal business in Pretoria.

## Organized Crime and the African Wildlife Trade

Shaw (2014) found that organized crime blossomed on the African continent almost like a major corporation with subsidiaries and franchises relying on the talents of workers from many different backgrounds. Their sophistication of operations, ability to respond to changes in consumer demand and law enforcement tactics, and diversity of members has replaced the old model of the ethnic gang. The syndicates integrated into nearly all aspects of society in some nations to the point where so-called mafia states have developed. Government officials, their friends and family members worked with organized crime groups to enrich themselves and expand their power

to the point where government institutions and criminal enterprises became almost indistinguishable. This initially was due in part to the post–World War II era in Africa where the colonial period gave way to liberation movements, civil wars, and major political changes (Gastrow 2003). One development was the emergence of smuggling networks moving valuable contraband and consumer goods across national borders. Over time, these small groups expanded to meet demand for more products facilitated by the impact of globalization.

The involvement of modern transnational criminal syndicates in different aspects of illegal trade in southern African wildlife has been well documented in the literature (Cook, Roberts, and Lowther 2002; Schneider 2012). Their participation in wildlife crime is a product of the value of the species. Orenstein (2013) found that well organized, outfitted, and funded syndicates working with poaching gangs and intermediaries, using established trafficking routes and able to bribe or bypass border security were dealing in the high value wildlife products, namely ivory and rhino horn. Once obtained the horns rapidly move through a "tightly organized network of 'runners' who coordinate with poachers by cell phone. The runners transfer their goods . . . to South African businessmen who sell them to criminal syndicates that transfer the horns to end markets in Asia" (87). South Africa, which became the center of organized crime, did not experience a destabilizing civil war or liberation movement but instead a peaceful political shift. However, the implementation of international trade sanctions during Apartheid provided an incentive to enterprising criminals to expand their networks into new markets. These networks would move wildlife products out of the country in the decades that followed the end of Apartheid. Venter (2003) concluded that the South African syndicates generally use the same routes and traffickers to move different products and often cooperate with one another. Paralleling legal enterprises, a sophisticated distribution chain developed with one group suppling other groups with the in-demand products. Revenue from the sale is laundered via legitimate businesses to conceal its origins. He notes "there is a direct link between the profitability of crime and existing markets for goods obtained through crime" (383).

The contemporary rhino horn trade mainly out of South Africa was primarily the domain of Vietnamese syndicates recruiting hunters from Laos, Thailand, and Vietnam and working with the Boer mafia to meet consumer demand for a high-value wildlife product. The growth of the Vietnamese syndicates was enabled by the economic changes occurring in Vietnam as the nation adopted a market economy in place of the state-run communist model. Rademeyer's (2012) investigation concluded that Vietnamese organized crime took advantage of the domestic demand for rhino horn by exploiting legal hunting regulations in South Africa. Exhibiting the flexibility of a well-run legitimate business, when new prohibitions were enacted to end

the Vietnamese pseudohunts the syndicates quickly adapted by recruiting hunters from the Czech Republic and Poland to legally obtain the horns. Neighboring Zimbabwe's economic catastrophe and resulting breakdown in the rule of law corresponded with dramatic increases in poverty. The situation would lead to a rapid increase in rhino poaching by gangs recruited both by Zimbabwean and by South African syndicates with connections to overseas groups supplying consumers in their domestic markets.

The resurgent ivory trade that is primarily though not exclusively affecting Central and East Africa is also dominated mainly by criminal syndicates relying on poaching gangs and some paramilitary forces to exploit a profitable business opportunity. One of the earliest indicators of the renewed large-scale ivory trade was in 2002. A six metric ton shipment of illegally harvested ivory organized by a Hong Kong syndicate was seized by authorities in Singapore where it was expanding its operations. The subsequent investigation revealed that this was the latest in a chain of shipments from East Africa to Asia. A highly sophisticated criminal enterprise with a global network of poachers, traffickers, carvers, and retailers and the logistical ability to move ivory in multiton quantities using legal shipping companies was responsible (EIA 2002). As an example, in July 2017 a 7.2 metric ton shipment of elephant ivory hidden in a frozen fish container was intercepted by customs officials in Hong Kong (Leung and Carvalho 2017). An analysis of the African trade by the UNODC (2016) noted that the interception of mixed shipments of different species of wildlife including ivory by customs authorities indicated a confluence of trafficking networks. Furthermore, they concluded that the prevalence of large volume ivory shipments along with the geographic concentration of poaching hinted toward the involvement of a few large-scale operators in this market. Orenstein (2013) concluded that contemporary ivory syndicates have responded to pressure from customs enforcement by varying their routes and destinations.

## Contributors: Corruption and Globalization

One element that transnational criminal enterprises help foster and exploit to facilitate their business is corruption. This phenomenon, which occurs within public and private institutions, is defined as the "unlawful, intentional giving or offering to give any benefit not legally due in circumstances where there is a prohibition, or an offer or acceptance of such benefit in return for the commission or omission of an act in relation to certain powers or duties" (Irish and Qhobosheane 2003). It includes a diverse set of activities and actors such as bribes, fraud, nepotism, extortion, and influence peddling done by low-level bureaucrats to top government officials (Albanese 2011; Moreto, Brunson, and Braga 2015; Van Uhm and Moreto, in press). While seemingly always present, it can increase during periods of political or eco-

nomic instability and quickly be exploited by criminal groups to their advantage. Corruption has a corrosive effect undermining the institutions in which it occurs. If present in a government ministry, it diminishes democracy and the rule of law. Corrupted officials willingly disregard the legal practices and act only in their self-interests or that of their friends and associates. As it becomes institutionalized, it reduces the public faith in government.

Numerous examples from southern Africa help identify the correlates of corruption and illustrate how organized crime cultivates and exploits corrupt officials to traffic in endangered species. Pillinger (2003) described how low pay among customs officers in Swaziland helped contribute to their willingness to facilitate wildlife smuggling from South Africa. The collapse of Zimbabwe's economy in the early 2000s that resulted in hyperinflation was linked to increasing corruption at all levels of the government bureaucracy. Goredema's (2003) analysis identified corruption committed by individual government employees in a single instance; repeat offenders committing additional criminal acts as a continuation of their relationship with organized crime; infiltration of government agencies at the lower levels by criminal networks; influence or infiltration of organized crime into the high levels of the bureaucracy; and the funding of politicians running for elected office. Research also attributed political and economic instability as one contributor to corruption. Nkala (2003), using Botswana as an example, noted how politicians and government bureaucrats at times viewed the situation as an opportunity for profit. Botswana's crime syndicates used periods of instability to their advantage to traffic in a wide variety of contraband including natural resources relying on the assistance of customs officers and government ministers to facilitate their crimes. In Namibia a range of informal criminal networks were trafficking different commodities. These included Chinese organized crime groups with links to neighboring South Africa moving illegally harvested abalone to Hong Kong (Grobler 2003; TRAFFIC 2014). Perhaps the most notorious cases are from South Africa where long established criminal networks have exploited its weak justice system to their advantage to prosper in the trade in endangered and protected species. These groups depended on the entrenched corruption already present in the country for their success. The payments to officials at different levels of government were a cost of doing business for the syndicates to facilitate the movement of goods and provision of illegal services (Irish and Qhobosheane 2003).

While international organized crime has existed for decades, the phenomenon of globalization fostered their growth and business expansion into new markets. Globalization refers to the lessening or removal of restrictions on the movement of people, goods, and services across international borders. It began with the collapse of the USSR and subsequent emergence of market economies in the Eastern Block and several Asian nations. Globalization is

also defined by free trade agreements, access to low cost labor by developed nations in the developing world along with less expensive transportation, and greatly increased world travel. The period from the early 1990s to present witnessed the rapid expansion of the internet, mobile communications, express mail services, containerized shipping, and electronic banking.

Globalization would offer considerable benefits to legitimate businesses in search of new markets, natural resources, and faster shipping of products. The same benefits would be exploited by criminal enterprises including wildlife traffickers to efficiently move goods and services and access new markets (Lavorgna 2014). Albanese (2011) concludes "globalized businesses are used to provide illicit goods and services which cannot be provided legally to customers around the world" (2). Similar to their legal counterparts, globalization resulted in transnational criminal enterprises becoming more diverse and modern, able to easily operate across international borders, network with other groups, and use corruption to their advantage (Mittelman and Johnston 1999; Van Dijk and Spapens 2013). In some instances, the legal and illegal were linked together. Legitimate foreign investment in new markets could include a criminal element intent on exploiting the opportunity. Chinese businesses looked to Africa as an untapped source for establishing new operations. However, their domestic consumer demand for ivory and other wildlife products would contribute to a small criminal element exploiting the opportunity. Individuals affiliated with legitimate Chinese companies would solicit poachers to obtain wildlife products that would be commingled with legal cargo and shipped back to the mainland. In the context of wildlife crime, modest amounts of contraband would now be shipped from the source nation to consumers in first world nations via express mail (Warchol, Zupan, and Clack 2003) while larger volumes such as shipments of tons of ivory tusks could be commingled with legal cargo in seaborne shipping containers. The open borders of the EU, designed to foster legal trade, also allowed for illicit wildlife products to move unimpeded from country to country with little chance of discovery once in the Union. Wildlife traffickers would also use the internet to buy and sell endangered species. An order from a collector in the Czech Republic for an endangered South African reptile could be fulfilled with the purchaser and seller never meeting. Electronic banking allows for money transfers that do not involve the physical movement of currencies, such as Kenya's system that uses mobile phones.

The implications for law enforcement were serious. Police agencies found themselves now dealing with sophisticated criminals, and contraband that could easily move across national borders. International laws, jurisdiction restrictions, and even political disagreements between nations would hinder their ability to investigate the offenses and pursue the offenders. The effects of globalization on crime and enforcement became more apparent over time.

Criminals could rely on nations with weak policing and judiciaries such as Zimbabwe and South Africa as safe havens (Chihuri 2003). Wildlife traffickers would target fragile states as a base of operations and an export center to move products to consumer nations. South Africa, which has long been home to organized crime groups, was estimated to have nearly five hundred different syndicates in operation by the early 2000s. About a fourth of these groups were involved in cross-border activities including wildlife trafficking. Also contributing to South Africa's notoriety as a center for criminal enterprises was its distinction as a major sea and air route between Asia, Europe, and the West (Irish and Qhobosheane 2003). The country's modern transportation infrastructure, relatively unsecure land borders with its neighbors, ineffective policing combined with high demand for illegal goods and services, and existing organized crime groups made it a center for African syndicates. Over time, these transnational criminal enterprises established diverse networks of participants and smuggling routes for moving contraband. As a matter of business efficiency and worker skills, the same transit routes used to ship narcotics or gemstones are also used to move wildlife products and stolen cars (Venter 2003).

## Summary and Implications

While a segment of wildlife poaching includes subsistence hunters seeking game for food, clothing, medicines, or income (Pillinger 2003; Warchol and Johnson 2009) other types are driven by avarice rather than necessity (Schneider 2012; TRAFFIC 2016b). The contemporary illegal trade in African rhino horn and elephant ivory, the crown jewels of the wildlife trade, are mainly controlled by sophisticated transnational criminal syndicates with the organizational and logistical resources to obtain and move these items in volume to consumer markets on other continents. The emergence of globalization, which ushered in the era of the internet communications and banking, express shipping, and the removal of some or all restrictions on cross-border trade, has been quickly exploited by modern criminal syndicates run by illicit entrepreneurs including wildlife traffickers to move their products from source nation to market. This in turn has contributed to increased government corruption that serves to ease the operations of criminal businesses. The new waves of large-scale elephant and rhinoceros poaching beginning in the early 2000s were defined by the involvement of contemporary transnational organized crime syndicates.

Criminologists once viewed organized crime syndicates as groups or gangs defined by the shared ethnicity of their members and involvement in a criminal conspiracy. This perspective, which was common in descriptions of wildlife trafficking syndicates, would also influence the enforcement approach to dealing with the problem that focused on targeting the top members of the

group. However, more recent analysis indicates that these are sophisticated syndicates with an extensive network of diverse and replaceable participants, defined organizational structures, and the ability to adapt to changes in political, economic, and enforcement conditions to ensure both their profits and survival. A different approach to examining the transnational crime syndicates is found in Smith's theory of enterprise. Smith's analysis revealed that while conspiracy and ethnicity contribute to our understanding of modern organized crime they are not central. Rather, the key characteristic is the business or enterprise model. Smith concluded that they operate in the same market as legal businesses with corresponding activities and are highly adaptable to changing market conditions. What is known about modern ivory and rhino horn syndicates does offer support for Smith's theory. These highly capable and adaptable groups, often utilizing legitimate shipping and retailing operations, provide high demand, expensive products to consumers. They alter trafficking routes and destinations in response to enforcement activity and exploit new consumer markets (see Shelley and Kinnard, Chapter 5).

An application of this perspective to wildlife syndicates can foster a better understanding of their structure and operations and reveal enforcement tactics to control or eliminate these enterprises—the same general approach one would use to impair a legal business's operations. For example, applying racketeering statutes including money laundering investigations and civil forfeiture to target the economic foundation and main motivation of an illegal business organization can cripple it without the need to target its participants. Scrutiny of pseudolegal hunting operations that may be ignoring criminal activity is required. Gaining the cooperation of commercial shipping companies used by traffickers to provide intelligence and report suspicious shipments is a necessary requirement that will impair their ability to deliver product. International agreements among wildlife source, transshipment, and destination countries to share intelligence and conduct joint police investigations is another critical component to control the illegal trade that is often lacking. The establishment of specialized organized crime and anticorruption units in the justice systems of involved countries can also contribute to preventing wildlife crimes. Finally, market reduction approaches to change consumer preferences are also part of the solution. Together these changes can move wildlife crime from low- to high-risk crime. If the syndicates can be eliminated or at least greatly restricted in their ability to conduct business and move product, and consumers desire less, rhinoceros and elephant poaching will certainly diminish. Interestingly, a very positive remarkable development has been the announcement by the government of China of a ban on the commercial processing and sale of ivory and related products taking effect in December 2017 (Office of the State Council 2016). The decision should have a marked effect on reducing the ivory market in China and demand for the product that in turn will affect suppliers.

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# II

# EMPIRICAL AND METHODOLOGICAL DEVELOPMENTS

# 5

# THE CONVERGENCE OF TRADE IN ILLICIT RHINO HORN AND ELEPHANT IVORY WITH OTHER FORMS OF CRIMINALITY

Louise Shelley and
Kasey Kinnard

**EDITOR'S INTRODUCTION:** *Shelley is considered to be one of the foremost experts in the study of transnational crime. In this chapter, along with Kinnard, she examines and dissects the convergence of the illegal rhino horn and elephant ivory trade with other criminal activities, including other illicit wildlife markets and organized crime. Drawing from extensive fieldwork and interviews with those intimately familiar with the illegal wildlife trade, the authors provide a compelling and detailed discussion on the scale and scope of both the illegal rhino horn and elephant ivory markets by outlining the factors that promote and hinder trade logistics, including trafficking routes, networks, and corrupt practices.*

Much of the transnational illicit wildlife trade is not a stand-alone phenomenon. It is conducted by transnational networks that combine criminal actors, corrupt officials, and diverse types of facilitators. It is a new high profit activity in which traditional organized crime groups, such as the Chinese triads, are only one of diverse participants. These networks facilitate and participate in diverse kinds of illicit activity to take advantage of global routes and marketplaces. The routes wildlife parts travel to their destination markets often converge with both licit and illicit products.

This chapter will analyze two of the most prominent forms of illicit wildlife trade—trade in elephant and rhino parts. The convergence of this illicit trade with others allows law enforcers more opportunities to discover this illegal activity and the possibility to initiate cases that may have more traction with foreign officials—such as the trafficking in drugs, weapons, and

humans. Understanding the mechanisms of this trade is key to attacking it and dismantling the networks responsible for this trade (Pires and Moreto 2011; Wyatt 2013; Moreto and Lemieux 2015).

According to the research of the United Nations Environment Programme, environmental crime is growing at the rate of 5–7 percent annually, exceeding the rate of growth for legitimate trade (Nellemann et al. 2016). The illegal trade and poaching of wildlife is only one of five categories of transnational organized environmental crime, according to the United Nations Environment Programme, but it is especially complex to understand and combat (Nellemann et al. 2014). In addition to these crime categories are other acts that result in environmental degradation that are not illegal, like deforestation for agriculture (Pires and Moreto 2011). The particularly high value of wildlife products, and the facilitating factors of the trade, to be discussed further, make it hardly surprising that crime groups with developed expertise in transnational crime have turned to the highly profitable trade in ivory, rhino horn, and other animal parts.

This chapter will examine the role of illicit networks and organized crime in the trade of elephant ivory and rhino horn. We will explore the local conditions that facilitate this trade, the corruption that is an important facilitator, the routes that these animal products travel, and the key actors involved in the trade. We will use our on-the-ground field research and interviews on ivory and rhino horn poaching and trafficking conducted in South Africa and Tanzania and during attendance at multiple national and international level conferences on the issue, many of which require anonymity for speakers and experts who shared their knowledge with us. This research supplements the diverse research studies of academia, NGOs, and of multilateral organizations that we have reviewed. The chapter will focus on the intersection of ivory and rhino trade with other forms of illicit wildlife trafficking and with other serious forms of criminality.

The ability of wildlife traffickers to increase supply and to maintain price levels simultaneously means that the wildlife trade is one of the most successful examples of *illicit entrepreneurship* in the world. Entrepreneurship has been defined as "the capacity and willingness to develop, organize and manage a business venture along with any of its risks in order to make a profit." Illicit entrepreneurs do the same to make a profit, yet the key difference is that they traffic in or produce illicit and/or deliberately harmful products.

Illicit entrepreneurship exists in both the illicit drug and wildlife trades but their trajectories are different. While revenues from the drug trade far exceed profits of the wildlife trade, it is an established business that grows but does not expand exponentially like the trade in parts of the elephant and rhino horn. (United Nations Office on Drugs and Crime 2014). Growth rates for the wildlife trade, particularly the products discussed in this chapter, exceed those for legitimate raw commodities. Rhino horn trade, especially in

the past nine years, has scaled at a pace resembling that of the supercharged growth of a cyberbusiness. In 2007, 13 rhinos were killed in South Africa and in 2014, 1,215, representing a growth rate of 15,476 percent over 8 years, or average annual growth rate of 76.3 percent (Save the Rhino 2016). Officially the number of rhino killed in South Africa declined to 1,175 in 2015 in South Africa, but rates in other range states increased (Van Noorden 2016), which may indicate a spreading of this criminal activity. Yet, this growth has occurred largely without the web as most rhino horn available online is counterfeit (Sellar 2014); however, ivory is available on the web (Phelan 2016).

Unfortunately for the traffickers this growth is not sustainable. The supply of rhino horn, ivory, pangolin scales, lion bone, abalone, and other wildlife products is finite, therefore, there are limits to growth. In the meantime a diverse group of networks prosper selling these species despite protections put in place by CITES, the international body that regulates the trade in plants, wildlife, and their products.[1]

Importantly, the wildlife trade has grown so quickly because it has built upon existing cross-national networks that trade in other illicit and licit commodities on a global scale. Often counterfeit and consumer goods produced in Asia travel to Africa and Europe and in return animal parts flow to Asia. Organizations that traffic wildlife may be part of sophisticated criminal groups or interact with them. Wildlife traffickers, therefore, have their facilitators, shippers and front companies in place, helping them to mislabel and transport goods. They have located and work with corrupt officials, both local and international, who often do more than turn a blind eye, instead sometimes serving as key personnel in the conspiracies to find animals and move wildlife products. There has been limited research on the intersection of illicit wildlife trade and corruption.[2] Yet this problem is widely known. For example, a chief ranger at Kruger National Park, home to the largest wild rhino population in the world, has said, "We're surrounded by police stations we don't even recognize as police stations because they're working with the poachers" (Christy 2016).

Illicit wildlife goods are hidden, not only with other illicit commodities but also with less valuable licit goods that pass unnoticed through customs and across numerous borders. Parts of endangered wildlife species may travel with shipments of tea leaves, timber, and marble, but may also be deliberately mislabeled as "spare parts" and "scrap plastic" (AP 2011; Inocencio 2013; Afp 2015; Save the Rhino 2015; OECD 2016). Research in Vietnam reveals similar efforts to disguise illicit wildlife products (Cao Ngoc and Wyatt 2013). The profits of this trade often move as cash and through trade-based money laundering, a complex system that allows trade in other goods to pay for the purchase of wildlife products. By over- or undervaluing goods, profits move without entering the international banking system (Cassara 2015).

The growth trajectory of trade in rhino horn, elephant ivory, pangolin, and other products merely reflects the capacity of the traffickers to adapt, and

to obtain, move, and market their product to affluent populations. Unlike the illicit drug trade, with which the wildlife trade often converges, the purchasers are often not part of a criminal community but rather affluent and high-status individuals from Asia's legitimate economy.

## Reasons for Growth

### *Facilitating Conditions*

Illicit entrepreneurship in rhino horn and ivory tusks could grow so rapidly because there was high demand and money in the markets of Asia, wildlife in Africa, and developed criminal networks and high levels of corruption along the entire supply chain. These market conditions of supply and demand made this trade work but many more forces explain how this business scaled so rapidly. Unfortunately some of the facilitating conditions characterize vast swaths of Africa that is now the source of much endangered wildlife.

The presence of fake wildlife products, the public service campaigns in Asia to prevent consumption, and the exorbitant costs of wildlife products like ivory and rhino horn have unfortunately not dented consumption. In some cases, the high price may actually serve as a stimulus and make the item a desired status symbol or investment. The prestige has also stimulated a market for fakes that highlights the value of rhino horns (Montesh, 2012).

Law enforcement in Africa, Asia, and at points in between has failed to disrupt the crime syndicates and transnational networks that are key to the success of this trade. As a prime South African government advocate for the rhino said to us in a private meeting, "There is not only our corruption but everyone else along the route" (South African National Parks official, personal communication, January 2015). Corruption is a key facilitator (Sellar 2014; Nelleman et al. 2014; Hübschle 2015; Moreto, Brunson, and Braga 2015; Hübschle 2016; van Uhm and Moreto, in press), as will be discussed subsequently, but it is not the only component explaining the absence of success in combating illicit wildlife trade.

## Attitudes toward Legal Regulation of Wildlife Trade

Another key element is that most who trade in wildlife products along the entire supply chain from Africa to Asia do not accept the ban or restrictions on trade. Interviews with hundreds of smugglers, buyers, and combatants by a South African researcher reveal that traders do not recognize what they are doing as illegal. "It starts with the poachers who are individuals that have lost their ancestral lands and the associated hunting rights as a result either of colonial expropriation or of the establishment of protected areas and transfrontier conservation parks"[3] (Hübschle 2015). The mainly white Afrikaner

farmers who breed rhinoceroses believe it is their right to have the option to extract maximum profit from the rhino they raise, particularly as costs of protecting the animals have increased (private rhino owner, personal communication, July 2015). While some of these farmers claim they can assist in conservation efforts of the animal by filling markets with farmed horn, research conducted by the wildlife trade monitoring network, TRAFFIC, concludes that existing farming programs in Vietnam do not fulfill the demand for horn or many other wildlife products (TRAFFIC Southeast Asia 2008). Many buying the wildlife products in Asia are unconcerned or unaware that it is illegal, or that products are procured only by killing the animal (World Wildlife Fund 2013). Another portion of those buying the products, particularly rhino horn and ivory in Asia are doing so as an investment, banking on the extinction or increased rarity of the animals (Hübschle 2015), or as a means of displaying wealth for the growing middle class, particularly in Vietnam (Cao Ngoc and Wyatt 2013).

## Legal Barriers

This absence of perception of illegality sets apart many forms of illicit wildlife trade from other kinds of criminality. For example, wildlife trafficking was not a crime in Mozambique until recently and the main wildlife law did not come into effect until 2014 (USAID 2014). Another example is wildlife laws in Tanzania, which are not uniform across the country. Zanzibar's wildlife regulations only pertain to species native to the island (Goitam 2013; Tanzanian police official, personal communication, November 2015). Research in Uganda finds that wildlife laws may be written off as illegitimate by neighboring communities who may have lost land or livestock to national parks, leaving parks at risk (Moreto, Brunson, and Braga 2015).

## Established Trafficking Routes

As previously mentioned, the growth of the wildlife trade has been aided by the presence of long established trade routes for licit and illicit goods. East Africa provides a good example of this. Traffickers using the East Africa route to move drugs from Asia to Europe have long used Zanzibar as a place to offload their drugs, breaking them into smaller shipments before transporting them to end markets in Europe ("The smack track" 2015, January 15). With the growth of ivory trafficking, these enterprising groups have exploited Zanzibar's lack of regulation as there are no elephants native to the island. The island's law enforcement can only counter the ivory trade when it interacts with drugs (Tanzania police official, personal communication, November 2015). Law enforcement on the island tell us they are also acutely aware of their limited capacity to control the extensive coastline that facilitates traf-

ficking on small boats and dhows (traditional sailing boats originally used in the Indian ocean) that are used to move all manner of goods to and from the island, and also transfer loads to larger shipping vessels further out at sea. A similarly difficult enforcement situation also exists in in Mozambique (Bureau of International Narcotics and Law Enforcement Affairs 2014).

Our fieldwork suggests that most poachers are so poor that they have to be provided everything to go out and kill the animals—transport, guns, and cell and satellite phones (South African wildlife official, personal communication, December 2014). These results resemble those of Pires and Moreto (2011, 105) on the illicit caviar and abalone trade. Those who kill rhinos rarely do this on their own initiative, and until recently there was little speculative rhino killing whereby hunters killed the animal with the hope of selling its horn. Typically rhinos have only been killed when the hunters have orders and the funds have been provided from Asia to poach these massive animals. But this is changing as local poachers amass working capital permitting them to kill with the hope of future sale (South African wildlife official, personal communication, May 2016). Reports of renting and lending of firearms to poachers in South Africa reinforce the understanding that poachers lack the basic weapons to undertake this crime (Al Jazeera 2016; "Big game poachers" 2014, November 8; Lwangili 2016).

Therefore, the increased killing of rhinos is not a sign of entrepreneurship in difficult market conditions. Most hired killers are recruited among those who frequent local taverns (*shebeens*) within the community; other poachers travel to Kruger Park from major cities to slaughter the rhinos as these collaborators had once worked together in the mines or served together in prison (South African crime researcher, personal communication, June 2014). Indeed, it is believed that a few years ago as many as 80 percent of rhino poachers in South Africa ventured from Mozambique across the Olifants River, but more recently the killers are local South Africans inhabiting the poverty-stricken communities around the parks where unemployment may exceed 50 percent (Grill 2015; South African crime researcher, personal communication, May 2016).

## Local Capacity

The situation in South Africa is typical of the wildlife poachers in many parts of sub-Saharan Africa. They inhabit rural areas with poor education, absence of job opportunities, and limited opportunities to engage with the licit economy. Criminal activity provides the only possibility for significant access to cash and the possibility to escape poverty.[4] As one Tanzanian wildlife official explained, those who live in the areas adjoining the parks feel blessed that they have animals available in the park to hunt. These valuable natural resources are not creatures to be treasured by the local populations

but are seen just as sources of revenue and food by the local inhabitants (Tanzanian wildlife official, personal communication, September 2016). Academic research supports the role that poverty and absence of opportunity play in the perception of value and legitimacy of bans and limits on hunting of wildlife by communities (Pires and Moreto 2011).

Another potential driver of growth of the wildlife trade comes from illicit entrepreneurs seeking diversified means to fund conflict. According to the United Nations Environment Programme, "In the last twenty years at least eighteen civil wars have been fueled by natural resources" (Matthew, Brown, and Jensen 2009). Ivory and rhino horn have been traded and revered for centuries, therefore they could be turned into valuable commodities for combatants. The boom in demand in Asia presented unprecedented space for profit making, so like blood diamonds of Sierra Leone and tin, tungsten, and tantalum of the Democratic Republic of Congo (DRC), ivory particularly has become a means for nonstate actors to extend their campaigns to challenge governments, extract power and riches from resources and people, or to destabilize regions across East and Central Africa (Lezhnev 2016; United Nations Security Council 2016).

Many researchers and groups, like the Global Initiative against Transnational Organized Crime, C4ADS, the Satao Project, Freeland, and local and national governments, are undertaking the work of identifying the networks and individuals involved in the wildlife trade. Existing analyses suggest that there are a relatively small number of groups or networks operating along the wildlife trade supply chain. The makeup of these varies by location, product, their deployment of corruption, and extent of integration with the licit economy, but they share several common attributes including flexibility, proficient use of corruption, and an ability to integrate their contacts in the local community with larger supply chains. Governments in Africa have been ineffective protectors of their valuable wildlife because, apart from corruption, investigators and members of the judiciary do not understand the complexity and severity of the issue. Combating wildlife crime and following the associated money flows is not a standard part of legal training in many countries, including Tanzania where lawyers are often unable to build and present cases in a compelling way (Tanzanian professor of law, personal communication, November 2015, September 2016). Effective deployment of law enforcement could have more success as our research and that of associates in the field reveals that there are a limited number of networks in Africa, Europe, and Asia that are responsible for the lucrative trade.

## Illicit Networks and Groups

African groups often work across several countries to ship the rhino horn out of East Africa. The Vietnamese diaspora in Eastern Europe, as revealed

by the Osseus case, have helped ship horn through the Czech Republic to Vietnam and are associated with the pseudohunts that will be discussed subsequently ("Trade in Rhino Horns," n.d.). South African gangs from the Cape Flats area of Cape Town that specialize in the illegal abalone trade work with Chinese groups. Chinese Triad groups control much of the abalone trade but have roots in the rhino horn trade, beginning from the 1970s (Warchol and Harrington 2016; Warchol, Chapter 4). The convergence of the abalone and rhino horn trades is well established (Kines 2000; Wildlife and crime experts at University of Cape Town conference, personal communication, May 2016).

There are several more range states for elephant than there are for rhinoceros. Consequently, there is a greater variety of criminal actors involved in the elephant ivory trade than the rhino trade, at least at a local level, but there are still fewer networks than might be expected according to law enforcement and NGO analysts. The participants in this trade have evolved over time to include diverse nonstate actors and rebel groups that entered and adapted the ivory trade to fund operations. In the Great Lakes Region of DRC, Burundi, Rwanda, and Uganda, wildlife trafficking is just one form of criminality used to fund the entrenched instability in the area (United Nations Security Council 2016). At higher levels on the supply chain, the number of players likely decreases to accommodate the few people and groups that have means and capacity to ship cargo containers of illicit goods. Tips from a single anonymous source to Asian based NGOs led to large-scale seizures of ivory from both East and West Africa. This indicates that the higher levels of the supply chain may narrow significantly in number of actors (U.S. based wildlife crime investigator, personal communication, June 2016).

The Lord's Resistance Army is currently viewed as the only armed group in the area still using ivory as a major revenue source (United Nations Security Council 2016, para. 169), but many current and former insurgent groups in the area, like the M23, Allied Democratic Forces (ADF), and Mai Mai Morgan, used ivory or other poaching and wildlife trafficking to fund their activities in and around DRC (Vira and Ewing 2014; United Nations Security Council 2016). Some of these groups have shifted to mineral trade as a result of declining elephant stocks and high profit margins for tungsten, tantalum, and gold. Regulations such as the U.S. Dodd-Frank act to reduce these groups' role in mineral extraction, smuggling, taxation, and "permitting" but have not been very successful (United Nations Security Council 2016) and were immediately targeted for elimination by the Trump administration (Ryan 2016). Rebel groups have survived because they have been protected by or recruited by the defense forces of DRC. As recently as early 2016, DRC tried to recruit from the ADF, which has also been tied to M23 and the Somali based Al-Shabaab (United Nations Security Council 2012, 2016; Yang 2013).

The leader of the ADF, Jamil Mukulu, was arrested in Tanzania in 2015 and found to be in possession of fake identity papers from multiple countries and operating several businesses, including a taxi company and an auto importing and selling business (Nakabugo 2015). This exemplifies the intermingling of illicit and licit business used by the loose network of actors involved in ivory trafficking and criminality in the region. The Forces Démocratiques de Libération du Rwanda (FDLR), operates in the DRC and has gone so far as to split its combat structure and its business activities (Dranginis 2016). Their business activities include ivory poaching, kidnapping, mineral smuggling, and their lucrative charcoal poaching and trafficking operations (Dranginis 2016). This represents their diversification as well as the convergence of different forms of illicit activity (see also Gore et al., Chapter 9).

In Tanzania the networks driving the scourge of elephant poaching and ivory trafficking function according to the previously delineated methods of corruption—the centrality of front, shell, and fake companies facilitated by high-level officials (Environmental Investigation Agency 2014). For example, a one-time secretary general of Tanzania's ruling party has come under fire for his alleged role in trafficking, stemming from seizures of containers of ivory shipped by a company he was part owner of and that he had personally signed-off on (Anderson and Jooste 2014; "Big game poachers" 2014, November 8; Environmental Investigation Agency 2014).

While fewer networks than one might expect are operating the ivory trade within Africa, new research is revealing that the ivory sourced by many of these groups may ultimately converge as part of a trade run by the so-called Shuidong syndicate in Southern China, which claims that up to 80 percent of all poached ivory moves through its territory (Environmental Investigation Agency 2017). This group exemplifies *illicit entrepreneurship*—by way of their own confessions of their past and current wildlife trafficking preferences—and our understanding that criminality will adjust as risk and profit possibilities change (Environmental Investigation Agency 2017).

## The Main Rhino Networks

Based on our fieldwork, it appears that there are three primary networks responsible for the illicit rhino horn trade—all of them linked to different Asian countries. The first network is a triad based network and is linked to the Chinese diaspora community that settled in South Africa in the 1990s. Leading members of the network are prominent businessmen, operating in the mining, retail, and tourism industries, revealing the intersection of the licit and illicit (South Africa–based wildlife crime investigators, personal communication, January, June, August 2015). According to our research in Southern Africa and Asia, Chinese triads operating in Africa operate more

loosely than their counterparts back home in Hong Kong and Macau, and also collaborate with other Eastern European, Latin American, and South Asian crime networks operating in the region. This network appears to use techniques developed to smuggle abalone and shark's fin to move rhino horn (Gastrow 2001; South Africa based crime expert, June 2014 and June 2015).

The second network involves the interconnected Vixay Keosavang and Vannasang groups that operate out of Laos and have close ties to Thailand, Cambodia, and Vietnam, through which much rhino horn transits (Hübschle 2016; Vietnam based wildlife crime investigator, personal communication, January 2015). Both of these are known to trade with the Bach brothers who operate the smuggling route between Thailand and Vietnam via Laos (Davies and Holmes 2016). Keosavang, Vannasang, the Bachs, and others in their network all operate registered businesses around wildlife farming, hospitality, or trading.

The connected networks of Keosavang, Vannasang, and the Bach family exemplify the convergence of illicit wildlife trade with other forms of criminality. Bach Mai is reported by Thai police to import narcotics from Laos into Thailand, while his brother Bach Van Limh allegedly smuggles cars transnationally and runs prostitution rings. Van Limh is also said to have several "legitimate" businesses including a hotel and café, a gold trading business, and a job placement company for migrant workers (Davies and Holmes 2016). These are types of businesses used to launder money and the gold trade is often used as a vehicle for trade-based money laundering (Miller, Rosen, and Jackson 2016). Businesses recruiting migrants also can facilitate recruitment of individuals to be trafficked (Shelley 2010). Recent reports claim that Vixay Keosavang may be less involved in wildlife trafficking since 2014 and may now be focusing on businesses that facilitate illicit transport, such as car smuggling and trade-based money laundering (Davies and Holmes 2016; Miller et al. 2016).

The third network is a Mozambique-based narcotics syndicate that smuggles guns and ivory, and has links to other narcotics and wildlife traffickers in Tanzania, Zanzibar, and Kenya. This network is thought to move and launder money through its extensive web of companies from restaurants to import-export firms, and our research suggests that this group includes Mohamed Bachir Suleman, a Mozambican drug kingpin sanctioned by the U.S. Treasury for narcotics and money laundering activity (U.S. Department of the Treasury 2010). While three of his businesses have been sanctioned, our network analysis indicates that there are several more companies that he or family members own that are outside the sanctions. Although this is a multiethnic network, its leaders are of South Asian ethnicity, and our work in the region suggests ties to designated Pakistani narcotics trafficking networks.

The Mozambique-based group may be one of the premier smuggling networks in Africa. It consists of a matrix of subnetworks that operate all along

the Swahili-speaking coast. In addition to money laundering and narcotics trafficking, the group in Mozambique, per our fieldwork, is also a premier weapons supplier with air and sea assets to support moving illicit cargo, and often smuggles goods from the coast on small boats or dhows, which then offload the consignments onto larger boats waiting in international waters. This method for moving narcotics is long established (Blum 2016) and mirrors the modus operandi for moving wildlife off shore in the same region. This network also supplies heroin from Pakistan to this region (Blum 2016; Bruwer 2016), a commerce that our on-the-ground contacts suggest is likely facilitated by the Pakistani diaspora in the region. Closed door conversations with wildlife investigators tell us that this group is connected to the Kenyan "Akasha" drug trafficking network, also with Pakistani connections, from which there have been recent extraditions to the United States (U.S. based wildlife crime investigator, personal communication, January 2017; United States Attorney's Office Southern District of New York 2017). These comments have been reinforced with the Drug Enforcement Agency having just revealed that the Akasha network also traffics large quantities of ivory and has claimed in recorded conversations to have rhino horn stocks, and product from points south, including Mozambique ("Do dope-smugglers also peddle ivory?" 2017, February 11).

This network has never been publicly linked to a rhino horn seizure, but multiple credible reports identify this network as a key facilitator of rhino horn and, increasingly, ivory trafficking, and significant operational work by the U.S. Drug Enforcement Agency and others is exploring the links, even if they are not well documented in the literature at this time. ("Do dope-smugglers also peddle ivory?" 2017, February 11; South African based wildlife crime expert, personal communication, January, July, and August 2015). Members of this network are believed to also facilitate the drug trade to China. The Assistant Public Security Minister of China announced in June 2015 that African drug suspects have acted as agents for Pakistani drug lords (Yan 2015). This is concerning as many diaspora Pakistani narcotics networks have links to crime-terror groups in their country. This is the same pattern observed in the rhino trade, hardly surprising as the two trades at times intersect by way of Chinese and Eastern European criminal groups, as discussed later.

## Pseudohunts

Rhino horn has been secured for years by means of pseudohunts. These are run more by criminal networks than criminal organizations. These groups are deeply linked with the legitimate economy including farmers who raise rhinos, safari organizers, and taxidermists who prepare the horn for the hunters to take home. While the trophy hunting industry of countries like

South Africa, Tanzania, and Zimbabwe are extremely lucrative (Warchol and Harrington 2016), our research reveals the facilitators of the legal industry may be well aware of the illicit activity they are engaged in.

The "pseudohunt" subverts the historical tradition of the hunt. Run by corrupt game farmers and their associates, they used these hunts to mask a large illegal trade in rhino horn and ivory to Asia (Czech Environmental Inspectorate 2013).[5] In these staged hunts, a trophy is legally prepared but the horn, ivory, etc., is exported to Asia for consumption (Professional Hunters' Association of South Africa, n.d.; Rademeyer 2016b). The documentation accompanying the horn may be falsified (Moreto and Lemieux 2015). Pseudo-hunts of rhino and elephant across Africa, and canned and captive-bred hunts of lions in South Africa, have served as just one piece of the supply of illicit wildlife products making their way from Africa to consumer markets in Asia.

Examples of the significance of pseudo-hunts of rhino in South Africa, include those facilitated by Dawie Groenewald, which culminated with an indictment in the United States for violations of the Lacy Act ("Owners," 2014), and those involving trafficked women as "hunters" in a scheme orchestrated by Chumlong Lemtongthai (Osborne 2012), a major Southeast Asian wildlife smuggler sentenced in South Africa. Lemtongthai is a member of the Keosavang group previously discussed (Connett 2014). Furthermore, an investigation of ivory flows to China by the Elephant Action League found that sellers willingly described how they use a safari hunting outfit and taxidermists in South Africa and Zimbabwe to prepare and legally ship "trophies" that would later be disassembled to put the ivory and rhino horn into the market (Crosta, Sutherland, and Beckner 2015).

Another transshipment point developed through the Czech Republic whose large Vietnamese diaspora community has key links with Asian markets, often for the import of counterfeit goods and illegal cigarettes. Two criminal cases, also linked to pseudohunts, have been investigated by Czech authorities, both revealing the links of illicit rhino trade with other illegal commodities. Operation Rhino was initiated in 2013 when the Czech Customs Investigation Unit team (Czech Environmental Inspectorate 2013), specializing in illegal wildlife trade, received information from its colleagues investigating Vietnamese illegal cigarette trading that an illegal tiger shipment would transit the Prague airport on the way to Vietnam. A Czech government search revealed hidden rhino horn rather than tiger parts. The ongoing Osseus case, investigating Vietnamese crime groups in the Czech Republic, combines activities in the synthetic drug market with a diversified trade in animal parts, including rhino horn from Africa. The first convictions were obtained in 2015 but the complex investigations are still ongoing ("Trade in Rhino Horns," n.d.)". Both of these cases show the importance of convergence as will be discussed more subsequently.

## Corruption as a Facilitator

Facilitating the wildlife trade are all levels of government officials, from park employees to law enforcement and judiciary officers, to customs and documents inspectors, to individuals at the ministerial level. Corrupt park rangers, park guards, and other employees of national and private reserves provide information to poaching syndicates about the location of wildlife and also, on occasion, provide cover for poaching teams moving inside protected areas (Moreto et al. 2015; South African wildlife official, personal communication, April 2014 and January 2015). Cases of corrupt park employees actually poaching or running their own poaching rings are documented in several countries, including South Africa, Zimbabwe, Democratic Republic of Congo, Tanzania, and more. Social media, including use of coded signals and photos, are employed by government officials to pass information (Rademeyer 2016a; South African wildlife official, personal communication, January 2015; Tanzanian wildlife official, personal communication, November 2015). Local police may also provide protection to poachers en route to parks and private reserves, and also within the community (Grill 2015; South African wildlife official, personal communication, January 2015; Tanzanian wildlife official, personal communication, November 2015). Officials have been known to issue fraudulent CITES permits authorizing exports of wildlife products that should not be permitted to leave the country, or to leak relocation records for live animals revealing secret locations to poachers, as has occurred in Limpopo, South Africa, with devastating effects for those private owners attempting to provide safe haven to rhinos (Hübschle 2015; South Africa based private rhino owner, personal communication, July 2015). These private owners and private reserves currently hold nearly one quarter of South Africa's white rhino (Knight et al. 2015), making attacks on them particularly dangerous for the overall stability of the population. Interviews conducted in Tanzania indicate that retired Tanzanian law enforcement and conservation officials are targeted by ivory poaching syndicates as it is known that they have limited pensions and their past work experience is not appreciated nor utilized by law enforcement and the government (Tanzanian wildlife and military officials, personal communication, September 2016).

The corruption is not just of government officials of source countries but includes corruption of diplomats. Dozens of cases across Africa have implicated diplomatic staff from Vietnam, China, and North Korea in the trafficking of ivory or horn (Al Jazeera 2016). Senior Vietnamese diplomatic staff stationed in South Africa have been directly implicated in illegal rhino horn trade including the First Secretary, the Economic Attaché, and the Political Counselor of the embassy (Rademeyer 2012; Environmental Investigation Agency 2013a, 2013b). In late 2015, a North Korean diplomat was found to

be trafficking in rhino horn from South Africa (Rademeyer 2015). North Korean diplomats are believed to use their positions in the commission of many criminal activities, whether to smuggle wildlife products via embassies in Pretoria and Addis Ababa, or smuggle tobacco and gold via the embassy in Dhaka, Bangladesh ("Bangladesh expels North Korean diplomat for smuggling," 2016; Rademeyer 2016a, 22). This is hardly surprising as North Korea has been funding much of its overseas operations through illicit trade in wildlife and other illegal commodities and counterfeit currency since at least the early 2000s (North Korea: Illicit Activity Funding the Regime, S. Hrg. 109–887, 2006, sec. Federal Financial Management, Government Information, and International Security Subcommittee of the Committee On Homeland Security and Governmental Affairs). Chinese state visits to multiple African countries have prompted allegations of smuggling of valuable animal parts on government aircraft (Environmental Investigation Agency 2014; Al Jazeera 2016).

## Wildlife Trade Intersects with Other Crimes

Transnational organized crime groups operate like businesses and often have diversified financial streams to insure continued profits over time. Seeking economies of scale and exploiting already existing corrupt relationships makes traffickers choose to send illicit commodities together along the same routes. For example, Vietnamese crime groups have a diverse criminal profile with wildlife trade being just part of their illicit activity. They are also engaged in "drug and diamond smuggling, vehicle theft, armed robberies and ATM bombings" (De Greef and Raemaekers 2014).

Chinese triads have a well-established base in South Africa, with law enforcement recognizing their contribution to rising crime rates by about 1990 (Gastrow 2001) when the country, nearing the official end of Apartheid in 1994, began to reengage with the global economy (Institute for Security Studies 2010), and corresponding with reduced economic strength and weakened enforcement capabilities brought on by systemic government shift (Warchol and Harrington 2016). At the Johannesburg airport, a large sign will greet you inviting you to visit a Chinese-owned casino, a traditional domain for Chinese triads to launder and access money (Kvinta 2014). Members of the Chinese diaspora community in South Africa have allegedly threatened local ivory traders who sought to reveal their participation in the trade after it was banned (South Africa based former employer of ivory carvers, personal communication, July 2015). Triad groups are also involved in human and drug smuggling in South Africa (Gastrow 2001). They traffic the protected abalone, exchanging methamphetamines for the valued seafood product (De Greef and Raemaekers 2014). There is evidence to suggest that there are interactions between abalone and rhino horn traders not only at the procurement level but

at the higher levels of the trafficking organizations in South Africa (Milliken and Shaw 2012). According to antipoaching specialists in South Africa, there may be as much as 90 percent convergence between the illegal abalone and rhino horn trade at the procurement levels (Wildlife and crime experts at University of Cape Town conference, personal communication, May 2016).

It is possible that the rhino trade interacts with more than the drug trade. For example, as Fundisile Mketeni, the director of South Africa's National Parks, stated, "Rhino horn travels with cigarettes, arms, and people." Long hollowed trucks help transport smuggled cigarettes. Rhino horns are moved along with the masses of cigarettes, the cigarettes passing unimpeded because this trade is under the patronage of one of the most politically powerful families in South Africa (Tobacco industry representative, personal communication, February and July 2015).

Similar convergence was observed in West Africa when in December 2013 known ivory trafficker Jean-Philippe Nkaga was arrested in Minkébé National Park in Northeast Gabon. Elephant tusks from there were moved to Cameroon with the assistance of forest people in the area ("Arrest of a notorious poacher and ivory dealer in Minvoul—Gabonews English," 2013), also known as pygmies, who have a long history of being marginalized and exploited in Gabon (Knight 2003). This remote region is also known as a meeting place of many transnational crime groups seeking to appropriate the region's natural resources (U.S. Fish and Wildlife official, personal communication, February 2014). A 2011 exposé revealed the illegal gold mining, ivory poaching, child slavery, and prostitution going on in a town near the park, this illegality facilitated by falsified mining and residency paperwork from corrupt officials (Fletcher 2014; U.S. Fish and Wildlife official, personal communication, February 2014).

Additional challenges for combatting ivory poaching in and around Gabon come from legal logging concessions, which often abut protected area where forest elephants reside. Many Chinese companies, including Chinese government-owned parastatals, possess leases to log in Gabon. Several of these companies have been implicated in ivory seizures, whether small amounts in workers' camps, or large amounts in modified shipping containers to obscure ivory among a shipment of timber (Pavia 2013; Vira, Ewing, and Miller 2014).

The convergence of wildlife trade with other forms of illicit activity is particularly relevant in regard to armed conflict. The Lord's Resistance Army (LRA) is known to function within DRC's Garamba National Park, where it poaches forest elephants and transports the ivory through Central African Republic (CAR) into South Sudan and Sudan to sell for cash, weapons, ammunitions, etc., which are used to fund its continued conflicts in the region (Moses 2013). The LRA is also known to abduct adults and children for use as porters, child soldiers, and sex slaves (Agger and Hutson 2013).

Victims of abduction by the LRA report transporting elephant meat, ivory, and other ill-gotten goods to LRA camps or on to locations where those goods are traded for the supplies and money that make their continued efforts to destabilize the area possible (Agger and Hutson 2013). Work by the organization Invisible Children support the correlation between poaching incidents and abductions (Invisible Children 2016). The UN Security Council Committee concerning the DRC reports that Mbororo herders in the area are forced, through threats of abduction to work as intermediaries for the LRA (United Nations Security Council 2016).

According to the UN Security Council, the linkages of wildlife, natural resources, and arms trade exacerbates conflict in the Great Lakes Region ("United Nations Security Council Resolution 2136," 2014). In 2015, several arrests were made near the border of Tanzania and Burundi in what was apparently an ivory for arms deal facilitated through a church with ex-rebel fighters from Burundi (The Citizen Reporter 2015; U.S. Department of Justice official, personal communication, April 2015).

The Mai Mai Morgan group in Eastern DRC is widely known to receive protection and participation from government forces in the area. One general is even noted as tracking ivory prices to know when to order that stocks be exported (United Nations Security Council 2012). Mai Mai Morgan asserts its control of its territory by giving "access rights" to locals for mining and taxation, and operating a monopoly over the illicit cigarette trade in the area. Therefore, with this group, ivory trade converges with other illicit activities.

An important arms trade exists in Africa apart from that directly linked to armed conflict. Arms are unfortunately all too available in many parts of Africa. Illicit wildlife trade helps pay for some of the arms imported into the region from Europe and other parts of Africa (Carlson, Wright, and Dönges 2015; U.S. based arms trade researcher, personal communication, 2015). As highlighted by Carlson and colleagues (2015),

> The widespread availability of firearms complicates the fight against elephant and rhino poaching. The illicit trade in weapons and ammunition, including diversion from state stockpiles, is giving poachers relatively easy access to military-style weapons and hunting rifles. Further, conviction rates in many countries are relatively low and weapons confiscated from poachers occasionally find their way back to the black market (and back into the hands of poachers). (29)

## Ivory and Rhino Horn Routes

We now focus our attention on discussing the trading and transportation routes for the illegal ivory and rhino trade. Once ivory and rhino horn are obtained by organized crime groups, they must get these products to market.

Markets like the one in Khartoum, Sudan are desirable because ivory can be mixed with stocks said to have been obtained prior to the CITES ban on international trade of ivory procured after 1989. Another hot spot is the market in Lagos, Nigeria, which was the only African market whose supply of ivory grew after the ban went into place (UNEP, CITES, IUCN, TRAFFIC 2013). The presence of multiple conflict regions in Africa makes it difficult to analyze the effectiveness of the CITES ban but underscore the complexity of controlling and combating wildlife poaching and trafficking in regions outside of central state control (Lemieux and Clarke 2009).

Another challenge for the traffickers is getting these heavy tusks from these markets to Asian or Western buyers. Most of the ivory from Khartoum is bound for Asia, via the Middle East, while Mombasa, Kenya, and Dar es Salaam, Tanzania, are major seaports for shipping directly to Asia. Emerging evidence indicates that, while shipping is still predominantly from Dar es Salaam and Mombasa, ivory is more and more being containerized in dry ports of Uganda in order to exploit trade agreements between countries that allow already containerized freight to move through and out of port without inspection (U.S. based wildlife crime investigator, personal communication, November 2015; Uganda based wildlife crime investigator, personal communication, November 2016).

According to research and analysis by C4ADS, an NGO that does supply chain analysis, based upon large-scale ivory seizures, the bulk of the illicit ivory trade is concentrated and is shipped through fewer than twenty-five ports. It is not dispersed and shipments are contained in no more than two hundred fifty containers (Miller, Vira, and Utermohlen 2015). Transnational criminals seem to have concentrated their activities on just two source "hot spots"—the Tridom and Dzanga Sangha Reserve in Central Africa (northeastern Gabon, northwestern Republic of Congo, and southeastern Cameroon, and southwestern Central African Republic) and the cross-border locale of the Selous and Niassa Game Reserves (southeastern Tanzania and northern Mozambique) (Wasser et al. 2015).

According to the Environmental Investigation Agency, the ivory obtained from Selous Game Reserve in Southern Tanzania is transported to Dar es Salaam, either by the lone northbound road or by sea on traditional dhows. Raw ivory arriving in Dar es Salaam is then subdivided in safe houses until it is consolidated for shipment from Dar es Salaam or Mombasa or to be transported by container from Zanzibar. Combined with low-level consumer products, the contraband ivory usually leaves Tanzania unhindered as

> a network of unscrupulous freight forwarders and shipping agents ensure all the paperwork is completed and customs officials are paid off. The containers are loaded on board vessels operated by one of the handful of shipping lines plying the route from East Africa to East

> Asia, such as CMA-CGM or Pacific International Lines. The shipping route can then involve a series of transit countries, usually the United Arab Emirates and Malaysia, before reaching important intermediary destinations, including Haiphong in Vietnam, Manila in the Philippines and Hong Kong. From there the illicit ivory is transhipped, either by sea or land, to the end market of China. (Environmental Investigation Agency 2014, 16–17)

The LRA is largely believed to move ivory from Garamba Park in DRC to the Kafia Kingi region, on the border of Sudan and South Sudan, by way of permanently stationed porters that carry ivory across CAR. From Kafia Kingi the ivory, along with diamonds and gold looted from CAR, are traded with a few traders, notably Arabic speaking, possibly soldiers on camelback, for guns, ammunition, food, and uniforms, and a separate trader said to pay in U.S. dollars for the ivory (Christy 2015; United Nations Security Council 2016). Alternately, some ivory is transported via Arua in Uganda, to Sudan, then on to Mombasa, Kenya, likely for shipment by sea (United Nations Security Council 2016).

The path of rhino horn is often different from that of ivory; the movement of the horn also tends to overlap the legal systems for moving people and goods. Those that acquire horn by corrupting the legal permit system in South Africa to hunt rhino must also go through the process required to have that "trophy" treated or prepared and shipped out of South Africa (Professional Hunters' Association of South Africa, n.d.), which typically takes months after the "hunt" has occurred. Horns are shipped either to Asia or detoured through Europe as the Vietnamese community in the Czech Republic facilitates the trade.

Rhino horn shipped through the Czech Republic converges with many other forms of crime including illicit trade in consumer goods, methamphetamines, and marijuana (Nožina, research for TraCCC grant, February 2015). And the criminal groups within the Vietnamese community of the Czech Republic are involved with many other types of illegal activities including trade in counterfeit clothing, electronics, and smuggled or illegally produced cigarettes: illegal production and distribution of cigarettes and alcohol products with fake brand names. The components used for producing cigarettes are smuggled into the Czech Republic from Vietnam or China whereas the raw materials for alcohol production are obtained in the Czech Republic or Balkan countries (Nožina 2010).

The shipment of rhino horn to Southeast Asia, converges with many other forms of criminality as well: human trafficking, the drug trade, car smuggling, and money laundering. In Laos, a transshipment point for rhino horn, much of the trade is directed by individuals linked to the local casino where large amounts of money are staked and visitors can consume meat of

endangered tigers (Environmental Investigation Agency 2015). Lack of state capacity, exacerbated by extremely high levels of corruption, make this zone a paradise for all things illicit, particularly wildlife (Environmental Investigation Agency 2015, 16).

## Conclusion

Wildlife trade could grow so rapidly because traffickers tapped into existing trade routes for licit and illicit goods and the smuggling of people. Fortunately for the traffickers, the largest demand for wildlife products was in Asia, the prime export arena for many African natural resources. Our research has revealed that the rapid growth of the illicit wildlife trade has been possible because it has gone into existing criminal and trade networks. Convergence of illicit wildlife trade with other illegal commodities is central to its phenomenal growth and the strength of the networks that engage in this activity. Corruption on the ground and along the supply chains has been important in facilitating this trade. These corrupt facilitators range from individuals in the parks to customs officials in transit countries and Asian criminals protected by high-placed individuals.

Apart from the traditional crime groups that engage in this activity, our research reveals that the pseudo-hunt business that links some rhino farmers, safari outfitters and even corrupt taxidermists is not a stand-alone crime. Illustrative of this is the criminal indictment of Groenewald, charged by American authorities, who has a previous conviction for smuggling and U.S. Lacy Act violations (U.S. Attorney's Office Middle District of Alabama 2010). Also our research suggests corrupt activity of professional hunters and veterinarians who facilitate the trade. Customs and tax fraud must also take place to ship so-called trophies out of the country.

Asian and African crime groups on both continents have enabled this trade to develop. Moreover, our research reveals that Vietnamese diaspora communities have been key facilitators in trade routes through Europe. Fortunately, well-run investigations in Europe have provided insights that help us understand better the illicit networks, the problems of convergence, and the points of connection between the poaching of wildlife and diverse forms of illicit trade.

Unfortunately, the efforts to stem the trade of rhino horn in South Africa have spread the killing to neighboring countries; and killers of elephants, once they deplete stock in one region, move to the next where elephants still roam. This phenomenon corresponds to criminological insights on the geography and displacement of crime. Therefore, it reveals that we must have regional and not just country-based strategies to protect animals at the source. We must pay more attention to the phenomenon of convergence; this will help us follow crime patterns better.

Understanding and acting on the knowledge that wildlife trade converges with other crimes is an important tactic to help address this illicit trade. While inhabitants and officials of many countries may not readily turn into environmentalists nor understand the threat posed to their own survival from wiping out species, they do comprehend the costs of other kinds of crime with which this trade intersects—drugs, human smuggling, and corruption. Showing these intersections may be crucial in engaging many consumer countries in Asia in countering wildlife trade.

This work affirms that illicit wildlife trade undermines security in Africa. This problem has broader global repercussions as countries such as China are major investors on the African continent. Understanding the costs of this trade to economic development and political stability are key in developing strategies to effectively address it. Linking the illicit wildlife trade with threats to national security may be a more effective motivator for action by Asian consumer countries than appeals for the preservation of biodiversity.

## NOTES

1. Information on the convention and enforcement is available at https://www.cites.org/.

2. The work of Stephen Pires, William Moreto, Julian Rademeyer, Tom Milliken, and others provides extensive discussion of this topic.

3. For further analysis of this idea, see Rosaleen Duffy, *Nature Crime: How We're Getting Conservation Wrong*, New Haven: Yale University Press, 2010, 55.

4. This recalls the famous novel of Alan Paton *Cry the Beloved Country* of a murder committed when a burglary to acquire a grub stake goes terribly wrong. Although this was 65 years ago, unfortunately little has changed for many black South Africans.

5. Further understanding of pseudo-hunts can be gained by reading research of Julian Rademeyer both independently and through the Global Initiative against Transnational Organized Crime.

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# 6

# ORDINARY FOLK TRANSFORMED

## *Poachers' Accounts of Cultural Contests and History*

York A. Forsyth and
Craig J. Forsyth

EDITOR'S INTRODUCTION: *Shifting from transnational forms of wildlife crime to local-level poaching activities, this chapter by Forsyth and Forsyth represents over two decades of interviews with poachers in Louisiana, in the United States. Applying Miller's lower-class culture and Gusfield's culture conflict frameworks, the authors investigate the unique poaching subculture that exists due to culture clash and conflict within the region. Similar to the topics covered in the first part of this volume—namely, the chapters by Brisman and South, and White—Forsyth and Forsyth reinforce the importance of understanding local subcultures when examining wildlife crime.*

In this chapter, we argue that culture conflict can be applied to understanding poaching behavior in Louisiana, in the United States. In particular, the game laws represent middle-class morals inflicted upon a rural society. As a result, traditional hunting practices became illegal. Hunters rejected the legitimacy of the norm and refused to obey game laws and therefore became known as poachers. Although we use the specific case of southwest Louisiana, this conflict occurred and continues in numerous places, where middle-class values intrude upon traditional views of life. Drawn from interviews with eighty-two poachers over a twenty-six-year period, we apply two sociological theories to investigating poaching in Louisiana. Specifically, Miller's (1958) focal concerns of urban lower-class culture. In particular, we find that excitement and smartness parallel the value system of the poachers we interviewed. We also incorporate Joseph Gusfield's (1963) concept of the enemy

deviant to highlight the cultural conflict that surrounds poaching and poachers. Notably, accounts of their deviance contribute to poachers' unique history and rough image as outsiders/outlaws. Both these theories are discussed to demonstrate the utility of the cultural conflict and its social class foundations in social change.

## Theoretical Framework

### *Miller's Lower-Class Culture*

Mainstream theories about deviance and crime have given relatively scant attention to the role of pleasure as possible motivational foundations for certain forms of deviance and criminality. Many offenders seem to be motivated by the excitement, challenge, and relief from boredom that crime offers. The sociological connection between pleasure and deviance is culture. Socialization determines what gives someone pleasure. Successful participation in various subcultures would therefore produce a degree of pleasure for them. Some researchers suggest that unconventionality underlies all their behaviors (Donovan and Jessor 1985). High-risk behavior and deviance are manifestations of criminality that Hirschi (1984) defines as: the tendency or propensity of the individual to seek short-term immediate pleasure.

Miller (1958) identified six values of lower-class culture: ***trouble*** (involves run-ins with authority), ***toughness*** (the exhibition of physical prowess, masculinity, and fearlessness), ***smartness*** (the display of the ability to outsmart), ***excitement*** (thrill seeking and taking a chance), ***fate*** (a tendency to trust in luck), ***autonomy*** (the need to feel independent and free from external authority). Cultural focal concerns or values become a device for understanding the motivations for a particular behavior. High-risk behavior is a central component of this subculture as it is difficult to extinguish because it underlies all their behaviors (Donovan and Jessor 1985).

### *Gusfield's Culture Conflict*

In 1963, Joseph Gusfield's utilized culture conflict as an explanation for the Prohibition movement. Specifically, he focused on the culture conflict between the Irish and German Catholic immigrants and the old middle-class Protestants who had dominated the politics of America in the nineteenth and early twentieth centuries. In order to force people to obey norms of which they do not approve, it is often necessary to dominate them. This can be accomplished by assimilative reform (i.e., by using prestige). In the first few decades of the twentieth century, assimilative reform failed because immigrants did not accept the status of the temperance supporters' culture. This culture is middle class, rural, orthodox Protestant, born in the United States,

and supported nondrinking norms. Drinking in public was the counternorm of the immigrants and was a central value of their culture (which was poor, urban, and Catholic-Irish and German). If assimilative reform fails, then one can dominate by force and authority or coercive reform. Coercive reform emerges when the object of reform is seen as an intractable defender of another culture—someone who rejects the reformers' values and in reality does not want to change. Coercive force means forcing morals or legislating morality, that is, coercing the public definition of what is moral and respectable through the use of laws. Laws against drinking were passed in every state with the apex of these laws becoming the Eighteenth Amendment.

Immigrants were considered enemy deviants because they refused to abide by, first, the cultural norms and, second, the laws enforcing these norms. The enemy deviant accepts his or her own behavior as proper and considers the public norm as illegitimate. The enemy deviant becomes an upholder of an opposite norm. The behavior of the enemy deviant is publicly defined as deviant, with the reason for such definition dependent on the notion of political power: culture clashing against culture to determine whose morals are superior. This is dominance without a corresponding legitimacy.

Issues of moral reform are one way through which a cultural group acts to preserve, defend, or enhance the dominance and prestige of its own style of living within the total society. But legal norms cannot be established in an area that does not support the norms. Indeed, in the case of alcohol and Prohibition, urban immigrants had counternorms. The drinking behavior that the temperance movement sought to end occurred in communities in which the temperance advocates were unlikely to live and the laws were unlikely to be enforced. You cannot enforce a norm in a place where the majority of people have counternorms and the norms are seen as illegitimate. The enemy deviant contradicts the cultural and institutional expectations of the other opposing group. The state's chief task is to keep itself in existence. To do this it must appear legitimate. If a sizable portion of the population refuses to comply with laws, then the legitimacy of the state is threatened. If the state sees parity between elements the state can act on its own behalf. In this case no money was allocated for enforcement (Forsyth 1988).

## Situating This Research

Socialization refers to the process through which individuals assume cultural traits. They obtain a knowledge of the ways and things that are appropriate in their segment of society. Research on woods-burning reveals the cultural supports for this particular crime (Bertrand and Baird 1975; Bankston and Jenkins 1982). In the same way, the communities where poachers live are resistant to conservation laws. They have a traditional orientation and remain isolated pockets of the past (Doolittle and Lightsey 1979).

The cultural history of a group must be addressed in order to understand any group behavior. Indeed, there is no way to understand the problem of poaching in southwestern Louisiana without some understanding of the cultural history of this region. The cultural history of the French Acadian people who settled in southwest Louisiana is one of exclusion from the mainstream. Indeed, it is only within the past eighty years that social integration began to occur (Clarke 1985; Gilmore 1933, 1936; Parenton 1938; Smith and Parenton 1938). The French who settled in this area remained separate due to several factors, including solitary occupations, a working-class heritage, language, and Catholicism (Gramling, Forsyth, and Mooney 1987). This formed the basis of a cultural conflict between the French-Acadian culture and the American culture that was a relative newcomer to the area.

Sellin (1938) offered three situations in which conflict between cultures is likely to emerge: when the norms of cultural groups are significantly different and the groups occupy adjacent territories; when the norms of one cultural group are extended to cover the territory of another; and when members of one cultural group migrate to another area occupied by another cultural group. This latter circumstance represents the cause of the cultural conflict in the group here studied. "Folk outlaws" is a colloquial term that refers to game poachers in southwestern Louisiana. They are considered by the state and federal game wardens to be criminals; nevertheless, outlaws are not necessarily considered as such within their home communities in Louisiana. In fact, game outlaws are a sort of cultural hero among the traditional Acadians.

The drilling for oil offshore in Louisiana began to change the southwestern area of the state from a rural agricultural based-society to a more urbane one dominated by oil (Forsyth and Gauthier 1991). In the 1950s oil brought a middle class with a need for recreation. These pastimes included hunting and fishing, which eventually necessitated more conservation laws to ensure that there would be wild game and fish for which to spend their leisure upon. The result was a gradual intrusion on a way of life. Hunting behaviors that were previously acceptable became unacceptable. Poaching is only one example of this clash of cultural codes. The intruding culture's values and norms became dominant and part of the legal code.

The first full-time Louisiana Wildlife Enforcement Officers (game wardens) were hired in 1953. Previously, this type of position was a part-time or seasonal job. Traditionally rural communities in Louisiana used what are now considered game animals to supplement their diet. Urbanization created a different view of game, bringing recreational hunters and conservationists, hence, creating a conflict over game use. An example is the open season with a twenty-five bird per day limit on grosbecs, which was in effect during the 1920s.[1] Grosbec hunting is now illegal. A mandatory jail sentence is now imposed upon conviction of possession of a single grosbec at any time. Traditional game animals became illegal to hunt due to the ever widening scope of

conservation laws. Those who did not desist but persisted in the old ways were called "outlaws," although the term is somewhere exaggerated.

There exists a deep-seated resentment among these Acadians, who settled the area, held against the Americans who destroyed their way of life by destroying the environment and making many game animals illegal to hunt. Old traditions persisted well into the twentieth century in southwest Louisiana (Gilmore 1933, 1936; Parenton 1938; Smith and Parenton 1938). The diet that consisted mainly of fruits and vegetables grown in gardens was supplemented seasonally by various wild fruits, nuts, and game. Fish also supplemented the diet seasonally and were an important source of protein. Wild game was not exploited till the advent of refrigeration. If a deer or other large animal, such as a calf, was killed, the whole community shared the meat. Game was only killed in sufficient quantity to "make a plate." Refrigeration had an adverse effect on game animal populations because now meat could be stored. This led to overkill and populations decreased substantially within the twentieth century. Red meat became increasing incorporated into the daily diet because of the availability presented by refrigeration. The advent of refrigeration and improvements in transportation systems also made it economically feasible to supplement income with game animals. The ability to store meat creates the overkill of game. This technology creates more mindful game wardens, who now rely on personal knowledge of traditional hunters for selective enforcement (Forsyth 1993a, 1994; Forsyth and Forsyth 2009, 2010, 2012).[2]

The poachers we studied belonged to a group that had been both physically and socially isolated long before game laws became important. Miller's theory supports the idea that distinct values develop because certain groups have been segregated and divided from each other socially, economically, and spatially. The internalization of these values combined with the requisite skills and the opportunity to perform them results in actions consistent with cultural prescriptions (Forsyth and Marckese 1993a, 1993b; Mooney, Gramling, and Forsyth 1991). The Cajun or Acadian culture has been unevenly affected by the intrusion of other cultures into the area. The more isolated the families have been, the more they have retained earlier cultural traits. They still retain many of the ideas from the isolated past of the area. They are constantly in contact with others who support an "us" and "them" orientation toward the larger society. By most standards these individuals could be considered failures as they were all poor and school dropouts. They attempted to demonstrate their adequacy through poaching. Most of them were acting within roles that were justified by local standards.

Poachers are members of a cultural group conforming to norms displaced by the urban search for weekend recreation (Forsyth 1993a, 1993b, 1994, 2008a, 2008b; Forsyth and Marckese 1993a, 1993b). In 1989, shrimpers rebelled against the use of Turtle Excluder Devices (TEDs), and staged the

country's largest marine blockade in protest. The TED seemed straightforward enough. Endangered turtles get caught in the shrimpers' nets and drown, so the TEDs were designed to protect the turtles. But shrimpers are not individuals with a total disregard for an endangered species but persons who belong to families and communities that perceive they are being trampled on by outsiders (Margavio and Forsyth 1996; Margavio et al. 1993). Cultural conflict occurred in these two cases as the drilling for oil off the Louisiana coast brought outsiders into French Louisiana starting in the 1920s (Smith and Parenton 1938) and as hunters and fisheries became subject to game laws following World War II. As populations have become increasingly urban and contact with rural areas declines, even more cultural intrusions of once inaccessible areas will occur. The protection of species appears to be an urban phenomenon, having taken little input from rural areas who may have economies tied to these species. Many deviants endeavor to rationalize their behavior as reasonable, if not conventional, but we are beginning to see the emergence of a vigorous, antisocial backlash from rural America. Some people are beginning to sense that they are being condemned for simply pursuing traditional forms of behavior trapping: hunting, digging for Indian relics, owning and using firearms, cockfighting, killing predators that are often listed as endangered that pose a danger to livestock, and filling in wetlands that they view as unusable marshes.

## Methods

The subjects of this study were French Acadian (Cajun) poachers in south Louisiana. A total of eighty-two poachers have been interviewed. The first set of interviews occurred in 1991, and they continue to this day. All of the poachers were white males and ranged in age from nineteen to seventy-eight. Poachers were identified through the personal contacts of one of the authors. Additional poachers were identified through a snowball method. Respondents were interviewed in their homes, in the field, or in the home of one of the authors. Interviews ranged from one to four-and-a-half hours. Each respondent was questioned as to the reasons they engaged in poaching, what type of game they hunted, and how they started poaching. Additional questions were intended to elicit responses about their illegal activities and confrontations with game wardens, residents, and other hunters. Data were put into several categories for easy retrieval/analysis. Voice recorders are used, if permitted by the respondent(s), and note-taking took place in all cases.

## Findings

Our findings support the notion that poaching activities represent some level of culture conflict and contribute to the criminal motivation literature that

interprets offenders' accounts as narrative sense-making, where offenders attempt to align their actions with personal and cultural expectations. In particular, respondents expressed a unique entitlement to territory and wildlife, while also showcasing pride in being recognized as an outlaw. Additionally, as mentioned earlier, Miller (1958) identified six values of lower-class culture. Two of these values, excitement and smartness, explain much of the motivation for poacher behavior in our study. For ease, we provide quotations that are indicative of respondents' general perceptions that support these themes. All quotations are presented verbatim, no identification of data on any level exists nor is it allowed by each of the authors.

## Entitlement and Outlaw Status

Respondents explained in detail how they felt they were rightful owners of the territory and the wildlife that inhabited the land. Study participants primarily attributed this sense of ownership to their heritage:

> When our people came over from France they mingled with the Indians in Nova Scotia; sometimes they even got married. The Acadians picked up a lot of stuff, well they learned a lot from the Indians. There are records of that. The same thing happened when they moved to Louisiana. It was survival, so Acadians have an inherent right to hunt just like the Indians. My grandfather was pure Indian, so were a lot of other Acadians, but they hid their heritage.
>
> My first job away from home . . . We had grits for breakfast, lunch, and dinner. We would shoot grosbecs for meat. Sometimes we ran out of everything rafting down to Patterson so we were forced to eat anything we could kill if we wanted to eat. I hate grits or grosbecs now. I would never kill one to save my life, but I tell you this much if I went hunting I would not pay attention to all that shit that says you kill one of this or two of that, bullshit, I'll shoot what I can and be done with it.

Despite their perceptions of rightful ownership of the game, respondents acknowledged the label of outlaw bestowed upon them and readily embraced such status. This was primarily due to pride in their history, their forefathers, and their role of "badass" in preserving their heritage:

> One year when I was a little kid during WWII there was a snow on the ground for a few days; only a few trees had any food, the robins would pile up in them, and I killed 700 robins. My brothers and I would hunt deer, robins, and ducks.
>
> When I was young and growing up there was a lot of times when the only meat we got was something that we scrounged up ourselves.

> We would hunt grosbecs and bec croshes during the summer. In winter we would hunt grives [robins] and chalks during the winter in the roosts, especially the roost by Millers Lake. We would use sarbacanes [blowguns] and place them right on their breasts, we would kill a good mess and then clean them by the fireplace, and cook a gumbo. We would salt and dry game also, making jerky and such for the summer . . . I don't feel a bit bad about what I did then I'm proud of it. We had to work hard to make it I hope that my children and their children don't have to go through what I went through. Every now and then if someone gives me a mess of birds I will cook them up and have an old time supper reminiscing *les vieux temps* (the good times). If I get a chance I will get me a mess of birds if I think the coast is clear.
>
> When I was a young boy and we moved to the country to live with my grandparents. My grandfather had been a woodsman all his life . . . I learned a lot from the old man even though he could hardly speak two words of English . . . My grandfather's favorite dishes were woodducks and squirrels, so I would take his old crack-barrel Iver Johnston .410 and I would go kill a pair of squirrels and woodducks every now and then. I learned how to walk in the swamp without making waves in front of me, how when woodducks were coming in to remain still and look at their reflections in the water. I would only take five shells because I was outlawing and you had to make every shot count. I never attracted much attention or really disturbed the patterns of the wildlife I was taking.

Notably, respondents appeared to acknowledge the legitimacy of others also utilizing the land in accordance with state law. Essentially, while respondents did believe that they had rightful access and use to the territory, they recognized that others also engaged in state-approved activities as well. This concurrent existence was emphasized by the following respondent: "I hunt ducks but branshoo's mostly, squirrels, rabbits, grosbec's, beccrosh but only the breast, flamon's . . . I never hunt deer because people pay too much to hunt on leases and I don't want to interfere with what they do. I destroy owls and hawks because they eat little rabbits."

Ours findings lend credence to the idea that accounts are drawn from one's sociocultural milieu. By using accounts when discussing perceived wrongdoings offenders can either align their actions with social expectations (Geertz, 1973) or maintain their desired social identities (Jenkins 2004). The accounts given are manifestations of a person's social identity. When confronted about their wrongdoings they explain their actions in the context of a sense of self: as rough, fearless, hardworking, smart, badass men (Copes, Hochstetler, and Williams 2008; Katz 1988; Sandburg 2009). Much like the one-percenter biker; they do not escape the stigma. In fact, they shove it into

the face of a world they care little about (Quinn and Forsyth 2009, 2011a, 2011b, 2012; Watson 1980). Carried to its extreme the idea of evoking selected aspects of a stereotype results in an attempt to assume a celebrity stigma—a deviant mark that individuals perceived to be revered by their audience. Like outlaw one-percenter, they wish to convince the audience that the term "outlaw" is correct. The stereotypic image becomes a master status around which all other traits are organized (Gramling and Forsyth 1987).

## Excitement

Many poachers commented on the pure excitement of illegal hunting. Specifically, excitement is generated by the challenge of being possibly caught by game wardens. In fact, it appeared that poachers reveled in the gamesmanship of outlaw poaching. For example, one respondent simply stated, "I outlaw [poach] for the challenge of getting caught." One respondent admitted how "if it were not for the game wardens I would not outlaw [poach]," he added, "they make it fun." Another respondent described, "it's a real rush knowing that the game wardens are out there trying to hunt you. They never have caught me yet." The excitement felt by another respondent was clearly demonstrated when he revealed, "I like to do it [poach] because it gets to be exciting sometimes when the game wardens chase you."

## Smartness

In addition to the excitement felt by respondents, some poachers explained how they also enjoyed outsmarting game wardens. In other words, they appeared to get pleasure from out-finessing the game wardens. As mentioned previously, questions related to the familiarity with territory result in perceptions of legitimacy and ownership. Additionally, poachers enjoyed matching themselves against game wardens in a contest to see who had greater knowledge of the terrain, particularly since a game warden represented a field expert. Beyond terrain, poachers also enjoyed exhibiting knowledge of guns, hunting tactics, and the use of special equipment. One respondent explained:

> I had them going all over the place one time. I spotted them before they spotted me. I knew the spot real good and my brother was with me. We divided up and made them chase us both but in two different directions keeping them about 1/2 mile away. I would head off in one direction shining my light intentionally in their direction and then cut it off backtracking in another direction. When they got to where I was at last . . . my brother shined towards them from where they just left. In a little while they would head towards where my brother shined from but he was heading along a little shant [a pathway] back

> towards me. When they got to where he was we shined towards them walking in opposite directions and they took off pissed off. We went and killed about six rabbits and they never bothered us. It's relaxing to go hunting and it reminds me of days when life was . . . simpler.

Of note was the simplicity of techniques used by the poachers during this perceived "game of wits" with game wardens. This simplicity is important because it underscores the perceived differences between the poacher and the game warden. The game warden represents the modern, more complicated techniques of policing and many poachers commented on how they outsmarted the more complex skills of the game wardens. Furthermore, since all the poachers interviewed were high school dropouts, part of the gratification these men received from poaching was they were able to outsmart the expert, college-educated warden:

> We killed about fifteen grosbecs, five flamons, twenty beccrosh, three herons bleus. We stashed the icebox where we can get to it with a boat. We played like we were boat riding and then we picked up the ice chest later on, drove up to the landing and rode back to the house. I had a lot of close calls but I'm not going to give up. I'll run, I'll hide, but I'm cautious about coming out. That's when they catch you. They might know you are in the woods but they are going to wait for you to come out or get you going to your car.
>
> About twenty years ago I was headlighting [a portable light powered by batteries] . . . by my Uncle's place. He used to raise goats and cattle out there. He would keep the goats locked up at night in a little yard. Somebody must have called the game wardens because they were on my ass. I kept running, turning my light off and on. I needed to get to the house, but if I would go too straight I know they would catch me. So I kept tracking off this way and that until I passed by the goat cage. I used to feed the goats sometimes grass and feed so they liked me. I opened the gate and I grabbed a little ram. I put the headlight on the horns of the goat and made a noose with the wire to the batteries, turned the light on, gave a slap and let him go. I closed the gate and hid in the woods by the side of the pasture. The goat was hauling ass to the other side of the pasture when the game wardens passed by me. Every now and then the goat would look back, those game wardens were on foot and they would take after that goat. I saw my chance and I got back home. No telling how long the game wardens chased that goat.

Importantly, in situations where poachers were apprehended, respondents focused on the advanced equipment and technology available to game wardens, rather than their skill set. In other words, respondents believed

that the playing field was partly uneven due to the resources available to law enforcement officials. As one respondent elaborated: "One poacher had been caught spotting deer [same as headlighting] on the river at night twice this season. It seems that he fails to recognize the Bell Jet Helicopter. This puts the poachers at a terrible advantage. All they [game wardens] have to do is position themselves hovering over at a great height . . . turn off the running lights . . . radio positions to ground or water based units."

In summary, these comments are better understood in the context that some poachers are skilled criminals and most poachers tell stories that enhance their reputation. These poachers are similar to other highly skilled criminals. Some crimes can be committed without any prior experience or skill. Crimes of passion such as murder are one such example. In contrast, a professional criminal has had training and is a member of a highly skilled occupation whose crimes are planned with unusual care. He is differentiated from the amateur, occasional, and opportunistic criminal (Forsyth and Forsyth 2010). Clinard and Quinney (1973) states that professional criminals specialize in offenses that require skill. Staats (1977) argues professional criminals have a high degree of skill to manipulate their victims and law enforcement. For example, the safecracker was once considered the most skilled criminal, hence at the top of his profession. The professional criminal is generally characterized by *skill* (a complex of techniques that exist for committing crimes) and *status* (a position of high prestige in the criminal world, hence high recognition).

According to Staats (1977), crime is always changing and becoming less specialized. He sees the decline as being attributed to the advance in police technology so that detection and recognition of criminals is easier. The major trend is crime becoming less specialized, as well as forgoing preferential criminal activity for crime that is more opportunistic. Specialization makes the apprehension of criminals easier because law enforcement agencies specialize in specific criminal activities. The poacher in his own jargon is saying the same thing. Like the safecracker, he is a dying breed of criminal.

## Discussion

Criminology has long recognized the central role that culture plays in participation in crime (Donovan and Jessor 1985; Hirschi 1984). Wildlife crimes are no different. Wildlife crimes must be understood through subcultural webs of meaning that involve tradition, ethnic heritage, individual and social identities, and other subcultural factors (Muth and Bowe 1998; Pires and Moreto, 2011). Subjective beliefs about the credibility of a law, rather than the objective probabilities of apprehension and prosecution, will determine citizen response to the law (Gusfield 1963; Shover, Bankston, and Gurley 1977). The rural communities where these poachers live are resistant to change.

They are oriented toward the past, remain isolated pockets of traditionalism, and are in conflict with the codes of the larger culture (Doolittle and Lightsey 1979). In our study, poachers acted within historical roles justified by local standards. Meanings that are acquired early in the personal histories of these poachers gave rise to a more general orientation that favorably disposed them toward certain violations of game laws. Significant others, particularly fathers and grandfathers served as models for skills and sources of justifications.

In the past twenty-five years poaching has gained the attention of scholars; most using multilayered qualitative techniques (Moreto, Lemieux, and Nobles 2016; Warchol, Zupan, and Clack 2003; Moreto 2015a, 2015b; Warchol and Kapla 2012; Forsyth 1993a, 1993b; Reisner 1991; Eliason 1999, 2003a, 2003b, 2004, 2008, 2012). The complex realities behind these acts call for studies using historical searching, interviewing, and letting the informants speak for themselves (Wong 2015) to investigate poachers' motivations (Moreto and Lemieux 2015; Forsyth and Marckese 1993a, 1993b; Muth and Bowe 1998) and their techniques to neutralize wrongdoing (Eliason and Dodder 1999).

In addition, this attention and the methods have a worldwide focus: Warchol's (2004) interviews with poachers in South Africa and Namibia; Alacs and Georges' (2008) in Australia; Forsyth and Marckese (1993a, 1993b) and Forsyth and Forsyth's (2009, 2010, 2012) interviews in Louisiana; Eliason and Dodder's (1999) interviews with deer poachers in the western United States; Jachmann's (1997, 2008) in Zambia and Ghana; and Moreto and Lemieux's (2015) in Uganda. All reveal that poaching is done by ordinary people, informally and opportunistically, hunting illegally for subsistence, economic gains, and as a cultural tradition; not members of criminal organizations. The assertion that culture affects human behavior is as close to a truism as exists in social science. Theoretical links between culture and behavior are assumed to be internalized by actors resulting for the most part in actions consistent with cultural prescriptions.

According to Sykes and Matza (1957) when offenders contemplate committing criminal acts they use linguistic devices (i.e., neutralization techniques) to neutralize the guilt of committing crime (Maruna and Copes 2005). But this is a middle-class assumption of guilt. These poachers manifest no guilt; indeed this is a stable value of rejection of the mainstream or an explanatory mechanism for persistent criminality. Wildlife crime researchers must recognize levels of meaning. Many theories, including neutralization theory, suggest that those who engage in deviant acts always seek ways of making sense of their actions and reconciling them with a middle-class dominated self-concept. Such ideas should be long dead, since Miller (1958) and Cohen (1955) exposed these biases in their explanation that conformity is to the specific subculture and not the dominant middle-class view. One must understand a subculture before assigning a conclusion of neutralization.

## NOTES

1. Most of these species of water fowl mentioned in this paper are found in the Atchafalaya Basin area of Louisiana. Grosbecs, branshoos, flamons, beccroshes, and chalks are all water fowl.

2. Much of the history of game use and other dietary facts presented here were obtained from discussions with retired game wardens.

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# 7

# "I DISLIKE IT BUT THIS IS WHERE THE MONEY IS"

## *Ecotourism, Nature-Based Entertainment, and Peru's Illegal Wildlife Trade*

Antony C. Leberatto

**EDITOR'S INTRODUCTION:** *Ecotourism and nature-based entertainment have generated both support and criticism in their ability to reduce wildlife crime by incentivizing local communities. Such approaches are often focused on providing economic alternatives to citizens and establishing a sense of ownership. In this chapter, Leberatto examines the intersection between ecotourism, nature-based entertainment, and the illegal wildlife trade in Peru. Focusing primarily on the domestic illegal wildlife market, the author interviewed several individuals involved throughout the various stages of the illegal trade, and engaged in participant observation of market dynamics at popular tourist destinations. Similar to the previous chapter by Forsyth and Forsyth, it is clear that framing wildlife crime within the local culture is necessary in order to fully comprehend how such activities are sustained and perceived in Peru as well.*

There is much debate about the difficulties of defining "ecotourism" (Donohoe and Needham 2006); how to reach ecotourism's central goals of conservation, sustainability, and the improvement of residents' lives (Blamey 2001); and its negative results (Doan 2013). While many scholars describe the harmful effects of ecotourism projects to ecosystems and local communities (Das and Chatterjee 2015), these harms may go well beyond failures to achieve conservation goals. This study utilizes the example of ecotourism and tourist activities across Peru in order to describe the connections between nature-based tourism, harms to biodiversity and conservation, and the illegal wildlife trade. The data for this study come from an

ongoing field exploration into Peru's illegal wildlife trade (Leberatto 2016, 2017) that includes interviews (*n*=85) with actors involved in the illegal trade processes and participant observations.

First, a review of the relevant literature describes the expected goals of ecotourism (including Peru as an ecotourism destination) and information about the illegal wildlife trade. This is followed by the central research aims and methodology of the study. The findings are divided into two general sections: the first section highlights several instances in which ecotourism activities harm protected and endangered wildlife. The second section describes the direct connections between the requests for services and enjoyment of ecotourists, and the illegal wildlife trade in Peru. The chapter ends with a discussion of the links between wildlife black market economies and ecotourism and possible solutions.

## Defining Ecotourism, its Successes, and Failures

Defining ecotourism can be a daunting task as practitioners, scholars, conservationists, governments, and tourists define and practice ecotourism in very different ways (Blamey 2001; Donohoe and Needham 2006). One of the most widely cited definitions comes from Ceballos-Lascuráin (1987) who described ecotourism as: "Travelling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestation (both past and present) found in these areas" (14). Ceballos-Lascuráin's (1987) definition is a starting point for what has become a lengthy, ongoing debate on how to define the principles of ecotourism and its expected results (Donohoe and Needham 2006).

Contemporary definitions of ecotourism recognize the importance of including concepts and principles that acknowledge the need to improve the quality of life of local residents in the areas marked for conservation. For example, Fennell's (2001) content analysis of eighty-five ecotourism definitions found that these projects are largely defined as (1) taking place in natural areas, (2) involving conservation components, (3) exploring the local culture, (4) bringing benefits to local residents, and (5) facilitating educational opportunities. Likewise, Donohoe and Needham (2006) created an ecotourism conceptual framework based on their own content analysis of academic and government definitions. This framework serves as a representation of the main principles of ecotourism. Specifically, these projects must be (1) nature-based, (2) involve preservation and/or conservation, (3) include educational components, (4) be sustainable, (5) have a distribution of benefits to locals, and (6) include ethical, responsible and/or awareness components (Donohoe and Needham 2008).

It is beyond the scope of this chapter to debate all the previously listed components of ecotourism. Further, it is likely that the definition of ecotourism

and its principles will continue to evolve (Donohoe and Needham 2006). This investigation utilizes a broad view of ecotourism that combines concepts from both Fennell (2001) and Donohoe and Needham (2006). As such, ecotourism is *tourism projects and nature-based activities that are sustainable (do not bring additional harms to biodiversity, communities, or ecosystems); are focused on conservation/preservation (this may include species, ecosystems, or cultures); are educative (help in understanding and spreading knowledge about ecosystems, local cultures, their history, and social problems); and help to improve the quality of lives of local residents (through access to education, health services, and livable wages among other quality of life markers).*

Although some ecotourism projects may bring financial benefits to local residents, many of these ventures fall short of accomplishing goals related to the conservation of wildlife, ecosystems, or the improvement of citizens' lives (Das and Chatterjee 2015). Within the context of Peru, some scholars note that ecotourism projects may aid conservation efforts (Gockel and Gray 2009). However, others highlight the detrimental effects of ecotourism to wildlife conservation (Coria and Calfucura 2012). For example, the creation of ecolodges, paths to view natural attractions, unregulated growth of visitors, noise, and pollution may harm wildlife in these areas (Doan 2013; Coria and Calfucura 2012). Researchers also highlight ecotourism's shortcomings in the lack of economic and social benefits to local, poverty-stricken residents (Doan 2013). As such, many owners of ecolodges across Peru are national and foreign business entrepreneurs, and many of the workers in these lodges come from major metropolitan cities across the nation (Doan 2013). This means that very few of the financial benefits of these ecolodges funnel down to local rural residents (Doan 2013).

Although previous ecotourism evaluations focused on describing the successes, failures, and limitations of these projects (Gockel and Gray 2009; Coria and Calfucura 2012; Doan 2013), they largely neglected to explore the possible connections between ecotourism and the illegal wildlife trade. If we are to see ecotourism, nature-based entertainment, and/or cultural attractions as valuable commodities that result in financial gains, we must also consider the possibility of informal and black market economies arising in order to capture some of its monetary benefits.

## Tourism in Peru

This field investigation takes places across Peru, a nation widely recognized for its abundance of biological and cultural diversity (CBD 2016) and a notable tourism destination (Doan 2013). In addition to housing thousands of plant and animal species (CBD 2016), Peru is also home to thousands of pre-Columbian archeological sites, and a very diverse culture that stems from complex civilizations dating back more than fifteen thousand years.

Tourists have a wide array of natural and/or cultural options for entertainment across the nation.

Tourism is very important to the Peruvian economy. According to the *Ministerio de Comercio Exterior y Turismo* (MINCETUR) or Ministry of Exterior Commerce and Tourism, 6.9 percent of the nation's total Gross Domestic Production (GDP) (more than US$7.6 billion) comes from tourism (MINCETUR 2016). In 2015, more than 3.5 million foreigners and 10.8 million nationals toured across the nation (MINCETUR 2016).

Many tourism-related services across Peru are informal or illegal. Peru's *Instituto Nacional de Estadística e Informática* (INEI) or National Institute for Statistics and Computing estimates that about half a million of the nation's hotels and restaurants operate informally (INEI 2014). Further, it is estimated that 47 percent of the nation's total GDP comes from the informal, illegal, or unregulated sector (INEI 2014). It is likely that many tourists utilize a variety of illegal, untaxed, or informal services. Therefore, it is logical to assume that some ecotourism and nature-based entertainment operators may be informal and/or illegal and that some of their services can be detrimental to conservation, or related to the illegal wildlife trade.

## The Illegal Wildlife Trade

The illegal wildlife trade is of special importance to multidisciplinary researchers across the globe. Although this trade is widely cited as a multibillion dollar global industry (Elliott 2012), estimating its financial and logistical scope is difficult, if not impossible (TRAFFIC 2008). Likewise, a great deal of studies that utilize anecdotal information link the illegal wildlife trade to organized criminal enterprises (Schneider 2012); however, investigations that analyze data collected from the field dispel belief in the involvement of organized criminal groups (TRAFFIC 2008; Leberatto 2016, 2017). Several field investigations into the illegal wildlife trade describe the actors involved in its processes as common, law-abiding citizens that include farmers, zoo owners, pet shop keepers, market sellers, laborers, fishers, private collectors, tourists, and law enforcement (TRAFFIC 2008; Maldonado Rodriguez 2011; Moreto and Lemieux 2015b; Leberatto 2016, 2017). Likewise, investigations into the illegal wildlife trade in Latin America find this trade to be largely composed of ordinary residents (Reuter and O'Regan 2017), who at times engage in this trade opportunistically (Pires and Clarke 2012), and to supplement their low wages (Maldonado Rodriguez 2011; Leberatto 2016, 2017).

Investigations across Peru describe the illegal commerce in birds, mammals, and reptiles (González 2003; Williams et al. 2011; Quevans, Falcón, and Elias 2014); however, only a few investigations examine the mechanisms of the wildlife trade processes through the words and experiences of the actors involved (Maldonado Rodriguez 2011; Leberatto 2016, 2017). For example,

Maldonado Rodriguez (2011) investigated the trade of night monkeys for malaria research in the triborder region of Peru, Brazil, and Colombia and found this trade to be carried out by ordinary citizens looking to afford basic life necessities (Maldonado Rodriquez 2011). Likewise, Leberatto's investigations into the illegal wildlife trade across Peru (2016) and in the nation's open-air markets (2017) found this commerce to be carried out by ordinary residents who engage in this trade opportunistically and informally. Notably, many traders dislike their involvement in this commerce, yet feel pressured to take any opportunities at their disposals in order to supplement their low wages and afford basic life necessities (Leberatto 2016).

Given what we know about the informality of services and goods across Peru, ecotourism, and the illegal wildlife trade, this investigation answers two general questions: (1) How can ecotourism related activities harm protected and endangered wildlife in Peru? (2) What are the connections between the requests for services and entertainment of ecotourists to the trade of protected and endangered wildlife across the nation?

## Methodology

The data for this study comes from an ongoing exploration into Peru's illegal wildlife trade that began in 2012 and continued through 2018 (Leberatto 2016, 2017). This article describes findings across the three main regions of Peru (coast, highlands, and rainforest). Formal interviews ($n$=85), informal conversations with persons who participate in the illegal wildlife trade, and participant observations (Spradley 1980) comprise the main narratives in the study. In order to limit biases throughout the field investigation, I conducted no preparatory research (Glaser and Strauss 1967), nor did I read academic studies or NGO reports on the illegal wildlife trade. I approached this investigation as an exploratory study of the processes and the people involved in the trade of protected and endangered wildlife across Peru without knowledge of theories or concepts on this topic. At the start of the investigation, I was largely unfamiliar with most of Peru outside of its capital, Lima. I started at zero at each of forty-seven cities included in this study by asking cab drivers, produce sellers, and residents where to find wild animals for sale. I located illegal wildlife markets by visiting all the locations suggested by residents and also scouted every major shopping area across each of the cities (or about four to eight sites per city). I visited most research sites during the daytime and closely monitored my location through my smartphone's GPS to measure its distance relative to the center of the city and as a measure against getting lost in unfamiliar places. Importantly, the welcoming nature of Peru's residents shielded me from feeling unsafe; in fact, several citizens went out of their way to help me reach research sites and were excited to help once they understood the purpose of my visit. I helped citizens feel at ease

with my questions or requests by having a genuine, friendly, and professional disposition.

Whenever I encountered a person selling protected or endangered wildlife, I invited him or her to participate in the study. The majority of sellers declined participation (on average one out of every ten wildlife sellers agreed to participate). However, with the help of some market sellers, I employed a snowball sampling technique (Goodman 1961), which is useful for the recruitment of hidden populations. This technique helped me to recruit wildlife hunters, middlepersons, and intermediaries who do not sell fauna in markets or in plain view of residents, and also led to the inclusion of actors who rescue protected and endangered wildlife into the study.

Interviews were informal and conversational; they took place in a variety of settings including markets, ports, private residences, boats, and natural areas and were conducted in Spanish. Some of the interviews were audio recorded; this varied based on the participant's involvement in the illegal wildlife trade. For example, I read an oral consent form that described the study and subject's rights as interviewees to persons who were hunters, middlepersons, intermediaries, and sellers of protected and endangered wildlife. Their answers were annotated in a small paper pad and later transcribed. Persons who worked as wildlife rescue workers, conservationists, ecological police, and those who purchased or had wildlife as pets were given an informed consent form. These subjects initialed the form in order to participate, and for the interviews to be audio recorded. Transcriptions were created from the audio files, and audio files were deleted. Deception was not employed in any part of this study. All subjects were aware that this was an investigation of the illegal wildlife trade of Peru. In order to safeguard the participants' privacy, the names of the cities are redacted and pseudonyms are used for research subjects.

At the suggestion of informants, the study was amended to pay subjects ten soles to participants (in 2012 rates $3.66). Payment indicated to subjects that this study was not a law enforcement initiative, and that their time and input was valuable. However, payment was also voluntary; many participants enjoyed the interviews and felt payment was unnecessary.[1]

In addition to interviews, detailed observations (Spradley 1980) took place across markets, ports, natural areas, locations with the temporary custody of wildlife, and cities across Peru. I employed the role of a "passive" observer (Spradley 1980): a "bystander or spectator" who does not engage in the trade. A few subjects also made suggestions (Spradley 1980) about places I should visit and observe in order to understand this commerce. Notes on the observations were recorded on a small paper pad or smartphone after each observation ended (usually while on a car, bus, or boat to the next research site). I also took hundreds of photographs of wildlife being traded and rescued throughout the nation. At the end of each day I reviewed the notes

from the observations, formal and informal interviews, and photographs in order to compile them into a report of the day's investigative efforts.

Several aspects of the grounded theory approach (Glaser and Strauss 1967; Strauss and Corbin 1990) guided this exploratory investigation. Grounded theory allows researchers to create theories and expand the scope of their research based on the ongoing analysis of data (as opposed to methodologies that test previously created theories). As such, the general focus of this investigation in 2012 was the illegal trade of wildlife in Peruvian markets. However, after the initial interviews and observations were transcribed into documents and coded manually (Glaser and Strauss 1967; Strauss and Corbin 1990), it became apparent that some of the illegal wildlife traders were closely linked to the ecotourism industry (Leberatto 2017). This link became clear when some traders made the assumption that I was a tourist interested in purchasing protected and endangered species (Leberatto 2017). From there on I included a focus on ecotourism and tourism-related activities throughout the investigation's interviews (by inquiring specifically about who drives the demand for illegal wildlife) and participant observations (by visiting popular tourism destinations to observe visitors' interactions with wildlife). The data analysis revealed several connections between ecotourism and illegal wildlife trade as described by persons involved in the trade processes (including wholesale traders, buyers/owners of wildlife, sellers of wildlife parts, and Shamans who utilize wildlife parts in rituals), and in the rescue of protected and endangered wildlife (owners/workers of wildlife rehabilitation centers, conservationists, and Peru's Ecological Police).

The focuses in this chapter are the numerous themes related to ecotourism and tourist-related activities from the interviews, photographs, and participant observations. Conclusions are also triangulated with the help of literature on the subject. The findings are divided into two parts. The first section explores the connections between ecotourism and nature-based tourist activities to the harm of protected and endangered wildlife. The second section describes direct links between requests made by national and international tourists for services or entertainment, and the illegal wildlife trade across Peru.

## Findings

### *Ecotourism, Nature-Based Activities, and Harms to Biodiversity in Peru*

The growth of ecotourism in Peru is linked to formal and informal services and attractions that offer visitors various nature-based entertainment options. The following section describes how nature-based tourism activities

harm Peru's biodiversity. These activities include (1) excursions where visitors view animals in their natural habitats; and (2) interacting with animals in temporary custody locations.

### *Viewing and Interacting with Animals in Their Natural Habitats*

Observing animals in the wild is one of the founding principles of ecotourism (Blamey 2001). However, there are a number of problems associated with viewing wildlife in their natural habitats. For example, creating roads/paths, constant travel, noise, and pollution involved in this activity may harm wildlife populations (Doan 2013).

At times, ecotourists break the law and/or overlook regulations put in place to protect ecosystems in order to view wild species. This is explained by Daniel, a conservationist who works in a privately owned ecolodge located inside a protected natural reserve. Daniel explains instances in which international bird-watchers illegally break into the ecolodge's property and cause damage to bird populations:

> Many international bird watchers (who are not staying in the hotel as guests) want to come into the hotel's grounds. We limit and prohibit their entry in order to safeguard the forest's visitor capacity, however they find a way to sneak in . . . Oftentimes these bird watchers use systems to call the birds, the "callbacks" (bird call playbacks) . . . There are some bird watchers that are specialists and are very careful in their observations, but there are others who just want to check off (the bird species) from a list, they do not care if they cause a problem, they make a repeated use of the callbacks (outside of the recommend three) and sometimes we find them with some very sophisticated, loud equipment and making lots of noise that perturbs other bird species.

Daniel notes that some of the bird-watchers who illegally sneak into the hotel grounds are careful in their bird watching practices. However, others do not care if they cause damage to bird populations so long as they get to check off the species from their lists. Regardless of the illegal bird-watchers' methods, their entry into this private and nationally protected zone oversteps the forest's visitor capacity and jeopardizes all of the species inside this ecosystem.

There are other harms related to nature viewing trips. Although Daniel is happy to work for an ecotourism company focused on conservation, this was not the case with his numerous previous employers: "With the other (ecolodge) owners we would open trails and were not really interested in rehabilitating

the area. We simply used them (trails) until those trails stopped showing signs of life, for example, if at first instance we would see macaws, parrots . . . and then with time of us introducing people (into the area) they disappeared, we would use those trails less frequently. Therefore, there was an impact that was really caused (by the use of trails)." Daniel's previous employers "did not care" about conservation or rehabilitation of ecosystems and their policies negatively affected wildlife in these protected natural areas. Additionally, some ecotourism guides capture wild animals for the enjoyment of tourists while on nature viewing trips (Groom et al. 1991), and ecotourism operators may offer visitors the chance to swim in lakes and rivers where protected and endangered wild species live. These close interactions with wildlife can result in injuries and/or the spread of diseases between fauna and humans (Baker 2015).

Daniel feels it is necessary for ecolodges to hire experts that analyze the impact of their lodges and tourist activities, or for the SERNANP (Servicio Nacional de Areas Naturales Protegidas) to take on this work before more damage is caused in nature viewing excursions. Nevertheless, there are many other options for travelers to interact closely with wildlife outside of protected areas or parks; visitors may interact with animals in private establishments that possess the temporary custody of confiscated wildlife (Leberatto 2016).

### *Tourists' Interactions with Wildlife in Temporary Custody Locations*

There are many facilities across Peru that house protected and/or endangered species that were confiscated from the illegal wildlife trade (Leberatto 2016) (the permanent custody of these animals lies with the Peruvian government). While some of these locations label themselves wildlife *rescue centers* or *centers of temporary custody*, some also function as hotels, recreation centers, restaurants, or private zoos. Oftentimes, ecotourism operators offer and facilitate excursions to these facilities within their activity packages. These locations may be located in or around protected zones, rural towns, or urban cities; they are much more accessible in comparison to protected zones or natural parks. It is important to mention some general connections among these locations, ecotourism, the illegal wildlife trade, and possible harms to humans and biodiversity.

In order to attract visitors and raise funds, some of these locations offer visitors the option to take photographs while they hold or feed wild animals. The privilege to hold these animals may be included in the visitor's entrance fee or purchased for an additional cost. Close interactions with wildlife are the selling points for many of these establishments. In fact, many ecotourism operators incentivize visitors to purchase their tourism packages by including

images of tourists holding and feeding wild animals in their pamphlets and billboards. Nevertheless, this is a trend that appears to be slowly shifting.

Rodrigo is in his late twenties and works in a center that focuses on the rehabilitation and reintroduction of critically endangered wildlife. This center allowed visitors to feed critically endangered species in the past but this changed recently. He explains, "The trend among wildlife rehabilitation centers internationally is that species should not be fed or held by visitors." Although this center no longer allows visitors to feed or hold wildlife, some visitors break the center's restrictions. This pushed the center to build double fenced, reinforced animal cages. Rodrigo explains why they had to take such drastic measures to prohibit visitors from feeding and disturbing wildlife: "The tourists forced us to have to do this (double fencing the cages), they would not listen, they would go stick their hands in and give the animals their (human) food . . . give the monkeys candy and potato chips . . . we had no choice but to do it." As a result of the double fencing, it is very difficult to see some of the animals housed inside the cages. Although there are signs throughout this center explaining to visitors to not feed or get too close to animals, Rodrigo explains that it is a constant struggle to get visitors to follow the center's rules.

Continued close interactions with wildlife can make species easier to catch once they are returned into the wild, and also result in injuries to both animals and visitors. Ernesto (a sporadic wildlife trade middleman in his forties) notes an anecdote related to these dangers. He explains that a tourist was once seriously injured by an interaction with a wild animal in a temporary custody center and that center's owner (a foreign resident) "refused to help them . . . just left them to their own devices." Although some wildlife custody centers are against the practice of close human/animal interactions, workers also understand the financial necessity of many locations that hold the temporary custody of wild animals. These locations are responsible for providing the food, habitats, and medical care of animals; they do not receive any aid from the Peruvian government (Leberatto 2016). Additionally, some species are far too accustomed to human interactions and would not survive on their own in the wild; they become permanent residents of these centers and interact with visitors daily. (See Figure 7.1.)

According to several wildlife traders, some locations that possess the temporary custody of confiscated wildlife also engage in the illegal wildlife trade by buying and/or requesting protected and endangered species in order to lure and entertain visitors (Leberatto 2017). Some wildlife traders note that a few of these locations have sold protected and endangered species to visitors who "fell in love with the animals" that they encountered in their visits in the past.

It is not surprising that some of these locations may request a particular species from wildlife traders in order to stand out from other competing

**Figure 7.1** Spectacled bear housed in temporary custody center. Photo credit: Antony C. Leberatto.

nature-based tourism activities, and gain visitors' patronage in an effort to stay afloat. This does not mean that all the locations that have temporary custody of wildlife engage in the illegal wildlife trade; several of them are very strict with their regulations and policies. In fact, many workers in these locations note that they refuse to commercialize wildlife offered to them by visitors and locals. As noted by Benny, the owner of a private zoo in his sixties, residents at times stop by to offer him wild animals to purchase. He explains, "They (the illegal wildlife sellers) know that this is a zoo and we cannot buy them (animal)," instead Benny tells the sellers to go to SERFOR (Servicio Nacional Forestal y de Fauna Silvestre) so that the animal may be placed legally in a zoo or rescue center.

As opposed to some of the wildlife rehabilitation/rescue centers, most ecolodges, hotels, restaurants, recreation centers, and even some zoos were founded by persons who do not have any formal training in biology or conservation. Untrained individuals may not understand the negative consequences of human/wildlife interactions, or the appropriate welfare needs of wild species. The lack of funds, proper infrastructure, and training on wildlife welfare negatively affect the wildlife housed in these locations. These overlapping complexities create a scenario in which some of these locations may only stay afloat by luring tourists if they offer close (and possibly dangerous) interactions with wildlife, acquire charismatic fauna illegally, and/or, perhaps, "replace" species that may succumb to living under subpar conditions.

### *Requests of National and International Tourists for Protected and Endangered Wildlife in Peru*

The previous section explains some of the possible harms to wildlife that may come from activities related to ecotourism. In some of those instances, visitors may not be fully aware of the harms they cause to wildlife and ecosystems. However, there are several instances in which ecotourists are fully aware of the damage that their actions and requests cause to the biodiversity of Peru and that their actions are illegal. These include (1) tourists who purchase and request illegal souvenirs made with wildlife parts, (2) tourists who engage in traditional medicine rituals that utilize wildlife parts, (3) tourists who purchase wildlife illegally in order to "reintroduce" them into the wild, (4) tourists who engage in illegal hunting for entertainment, and (5) "cultural" entertainment for tourists through the *Yawar Fiesta*, *Fiesta de Sangre*, or Blood Party.

### *Supplying the Demand of Souvenirs Made from Protected and Endangered Wildlife Parts*

Across Peru, artisans utilize the skins, body parts, leathers, teeth, bones, and feathers of protected and endangered animals to make jewelry, keepsakes, and art (Groom et al. 1991; Shanee 2012). In contradiction to ecotourism principles of preserving ecosystems, these items are largely marketed and sold to ecotourists (Groom et al. 1991). As noted by sellers of jewelry and handcrafts, tourists come to Peru specifically to request items and keepsakes with wild animal parts. Gabriel is in his early thirties and works making bracelets, earrings, and necklaces with animal parts (of monkeys, birds, and reptiles) since he came to a large urban rainforest city from the rural rainforest.[2] Gabriel primarily sells his handcrafts to tourists who stop by the city's main plazas. He greatly dislikes this informal trade: "I dislike it but this is where the money is . . . sometimes I really dislike it because you have to kill them (the animals), the animals want to live too, I do not like it but I do it out of necessity." At times, Gabriel must find and kill wild species in order to make the handcrafts for tourists. In addition to making handcrafts, he also sporadically hunts, purchases, or sells wild animals. On a good day, Gabriel may earn about 50 soles or less than $15. Likewise, Lalo, who is in his late twenties, and also peddles handcrafts with animal parts to tourists. He mostly utilizes jaguar teeth to make necklaces and notes that this commerce is mostly fueled by tourist demand: "They (tourists) request jaguar, people come to see the teeth, you earn more money (by selling them)." The main driver behind Gabriel and Lalo's involvement in the illegal wildlife trade is the demand from tourists who come to visit Peru's natural parks and wish to take a piece of the jungle back home. Both Gabriel and Lalo want to find formal work. Gabriel explains that he would like to "stop doing handcrafts"; however, catering to tourists' demands is, "where the money is."

### *Traditional or "New Age" Medicine, Ecotourism, and the Use of Condor Feathers*

Some tourists travel to Peru in order to seek out and experience the legacy of mysticism and rituals created by ancient South American civilizations. Although the use of protected and endangered animal parts in medicines and rituals to cure ailments is customary among various cultures in Peru (Williams et al. 2011), it is also marketed to tourists as spiritual tourism (Prayag et al. 2016). On several ecotourism activity packages, guides bring visitors to local open-air markets in rainforest and highland cities in order to visit "traditional" medicine shops where visitors can purchase tonics and amulets that contain wild animal parts.

Emilia is in her twenties and works selling traditional medicine items (farm and wild animal parts, plants, seeds, shells, artifacts, and tonics). Throughout the week, hunters stop by to offer Emilia wild animals they have caught opportunistically around their homes (Leberatto 2016, 2017). Some hunters come from the mountains of the highlands to bring her local species such as Andean foxes (*Lycalopex culpaeus*). Emilia notes, "A fox's meat is good for your lungs, its tail is good luck." Likewise, hunters from the rainforest also offer her wild species. "They (hunters) also come from the rainforest to offer us snakes (skins); they are for injuries, when you have hurt your bones." Some of Emilia's customers are *Chamanes*, otherwise known as shamans, witch doctors, or natural medicine doctors, who utilize plant and animal parts to cure ailments and conduct rituals. National and international visitors also purchase animal parts or tonics in order to cure their own ailments. However, some customers require the help of Chamanes to cure a disease, rid themselves of bad energies, and/or welcome prosperity. In order for the Chamanes to carry out their ceremonies, Emilia's customers must first gather all of the necessary components. Ecotourists who decide to undergo a ritual on a whim, or spiritual tourists who travel to Peru with the intent to experience rituals carried out by Chamanes, incentivize the illegal wildlife trade by requesting and purchasing animal parts of protected and/or endangered species.

In a ceremonial room filled with puma pelts, anaconda skins, and condor feathers at the top of Andes Mountains, a shaman named Abel explained the use of condor feathers in rituals and ceremonies:[3]

> Abel: The feathers of condors are mostly guide (feathers). They are guides that are exclusively used by condors so that they may fly and cut (make turns) at 360 degrees. Therefore, that guide (feather) is very important because it cleans the part of the coronary chakra. However, the guides, in reality, are hard to find, what they (hunters and natural medicine suppliers) sell you are other

feathers at the market, secondary feathers from the posterior parts, those are wide. But, in reality, feathers like that, guides, are difficult to get.

Interviewer: The guides are the ones that are on . . .

Abel: They have them at the very tip (of the wings) . . . those are the ones that cut (turn) at the time of the flight, the 360 degree circle. Therefore, they are useful for cleaning the coronary chakra, cleaning bad energies.

Abel explains that he does not utilize any wild animal parts other than condor feathers in his rituals. He explains that Chamanes who use other animals are not learned or well versed on how to diagnose ailments by analyzing a patient's physical, mental, or spiritual state, much less how to cure them. Instead, these "charlatans" take on jobs for money without properly diagnosing their patients. While Abel may not utilize a wide variety of animal parts, as evident in some open-air markets in the Peruvian Andes and Amazon many citizens, Chamanes, and tourists hold the belief that various wildlife parts are necessary in these rituals.

As noted by Abel, condor guide feathers are very difficult to find. Tourists may also have a difficult time finding these feathers and some illegally solicit wildlife rescue centers in order to acquire them. This is explained by Luz, who is in her thirties and helps to run a wildlife rescue center that houses a variety of species rescued from the illegal wildlife trade including condors. She describes ecotourists' role in this illegal trade:

Luz: We receive a lot of tourism, religious tourism, mystical, as you may say . . . many of them would like to buy the condor feather but obviously the condor is an animal that is in critical danger of extinction. Therefore, we explain to them that one cannot sell the feathers, no? *Why?* Because they kill the animals for that (feathers), because the condor population would decrease.

Interviewer: Is it only people from the surroundings that come to look for the feathers, or is it also from other nations?

Luz: No, they are from other countries. Generally speaking, the Chamanes do not come directly. It is the tourists who look for the condor feather, sadly.

Interviewer: The tourists come to look for it (condor feather) to then take them to the Chamanes?

Luz: Yes, to take them to the *Chamán*, or to their countries, because there is a belief that the feather is protective, that it gives you good vibes, that it gives you good energies.

Interviewer: What countries are these tourists from?

> Luz: The United States, they come from Canada, all of the ones who are related to being mystical; Argentines, they can be Brazilians, Colombians, Mexicans. I mean, it depends on the persons' beliefs. But I am going to tell you it is diverse, they come from all from all the countries (of the world).

As noted by Luz, a great deal of illegal soliciting of condor feathers comes from international visitors who wish to take them to a *Chamán* in order to undergo a ritual, or plan to bring them to their countries. As such, some international tourists incentivize the illegal capture and killing of protected and endangered species through the request for protected and endangered animal parts across the nation.

### *Reintroducing Protected and Endangered Wildlife as an Ecotourism Activity*

In some instances, ecotourists engage in actions that they believe are beneficial to conservation but that in reality can have very harmful effects to entire ecosystems and incentivize the illegal wildlife trade. Some ecotourists purchase wild animals illegally from wildlife market sellers in order to "rescue" and "free" animals from the wildlife trade and "reintroduce" them into the wild. The illegal processes for reintroduction of wild species is a neglected aspect of wildlife crime research (Moreto and Lemieux 2015a). As noted by Ernesto, ecotourists may at times engage in the wildlife trade as "rescuers" of wildlife. He notes, "Tourists have hired me in many occasions to travel with them to the forest and help them return an animal they bought in the markets." (See Figure 7.2.)

The reasoning behind wanting to return trafficked wildlife into their habitats is understandable; however, the manner in which ecotourists engage in this practice is a danger to themselves, the animals, and entire ecosystems. Unfortunately, many of the species traded in the illegal wildlife trade carry ailments acquired in the traffic processes (Godoy and Matushima 2010) and may end up far away from their natural habitats. The Peruvian government requires wildlife rehabilitation centers to meet a lengthy number of criteria before the reintroduction of animals to their habitats in order to secure the health and well-being of the species and ecosystem. Ecotourists may mistakenly introduce species in areas where they do not belong and/or that carry ailments. Additionally, the purchase of trafficked species only exacerbates the illegal wildlife trade, no matter its purpose or sentiment. As explained by Rick, a Western scientist who resides in a rainforest city: "I once made the mistake of buying a monkey that I saw in a market post in order to return him to nature. The next time I walked by the stand the seller approached me and told me they had a lot more this time for me to buy." Rick noted how

**Figure 7.2** Parrot offered at rural market. Photo credit: Antony C. Leberatto.

purchasing wildlife only encouraged a market wildlife trader to purchase more animals from hunters illegally; likewise, the purchase of wild animals by other tourists may also encourage a greater amount of trafficking. Nevertheless, some ecotourists purchase wildlife illegally from market sellers and private vendors with the intent to keep them as pets or transport them to their country of origin (Leberatto 2016, 2017). Regardless of the motivations, the illegal purchase of wildlife by visitors is harmful to biodiversity and conservation.

### *Hunting Wildlife for the Enjoyment of Tourists*

In some instances, wild animals are captured and killed for the enjoyment of tourists (Groom et al. 1991; Doan 2013). Some wildlife trade middlepersons note that tourists would hire them to hunt and kill protected and endangered species. Ernesto explains, "Ten years ago Asian and European tourists would come down all the time and pay large sums of money (1000 soles) to capture jaguars or boars." According to wildlife traders, the decrease of wildlife (Leberatto 2017) and increase of laws against the unlawful uses of animals resulted in far fewer recent requests for illegal hunting by tourists. Although illegal trophy hunting may not be as popular in Peru as it once was, the informality with which other commercial transactions related to the wildlife trade occur indicates that it may easily be arranged in the present.

### *Yawar Fiesta (La Fiesta de Sangre) or The Blood Party*

There is much debate about the historical and contemporary meanings of the colonial celebration of *Yawar Fiesta*, otherwise known as *Toropukllay*, *La*

*Fiesta de Sangre*, or The Blood Party (Vidales 1997; Ho 2014). In the *Yawar Fiesta*, Spanish bullfighting turns into a battle between a bull (a European species introduced by conquistadors) and the Andean condor (the Inca's most venerated animal). In this ceremony, a wild condor is tied to the top of a wild bull, the condor's claws and beak tears pieces of the bull as it extends its wings to gain balance (Vidales 1997). As the torture enrages the bull, young men blow up small explosives to disorient it (Vidales 1997). Once the bull is defeated, the condor is paraded around the town, and, at last, liberated (Vidales 1997). Jose Maria Arguedas's novel *Yawar Fiesta* (1941) describes this celebration as an example of class, culture, and race struggles between the wealthy, white Europeans descendants, the mestizos (of mixed heritage), and the indigenous natives (Vidales 1997).

Today, several Andean communities have adapted this ceremony in an effort to gain earnings by putting on a "performance" for tourists who assume that this is a "traditional" or "authentic" cultural experience (Ho 2014). Jaime, who is in his late seventies and is a Peruvian conservationist and researcher with more than six decades of field experience, explains:

> In earlier times, the famous party of the condor that they used to have (*Yawar Fiesta*) was in one or two places. Nowadays, every town wants to have their own party in order to attract tourists. Usually the condor comes out in bad shape from being tied to top of the bull. They have been doing campaigns to eliminate this, the government authorities as well as international institutions. In some places they have had a certain level of success, in other the citizens have said, "No, this is our cultural party!" What are the authorities to do? They (authorities) go there and they may get lynched.

Jaime explains the growth of the *Yawar Fiesta* due to "traditional" or "cultural" tourism, and some efforts and complications in eradicating it. As noted by Jaime, in some towns residents may only gain earnings from tourism. At the same time, "Tourists are satisfied by viewing a *costumbrist* celebration," or a "traditional" cultural festivity; even if most of these towns only started this "tradition" well after ecotourism became an avenue to generate incomes.

Ecological police agents also describe the trend of catering to ecotourists' demand for manufactured "scenes" of enjoyable, cultural "traditions." Detective Qispi has more than three decades of experience with Peru's National Police, *Policia Nacional del Peru* (PNP). The majority of his experience centers on ecological crimes. Detective Qispi explained an event in which local government authorities illegally paid to capture and house condors destined for the *Yawar Fiesta*: "When we got there we found that this celebration was being promoted by the authorities." The city officials became

enraged as the condors were confiscated, noting that they had a right to continue with their ancestral traditions. Detective Qispi rebutted their claims:

> Detective Qispi: They said, "It is a tradition from our ancestors." In a conversation after the legal processes I asked them, what do you call ancestors? "Our antecedents, our grandparents" (they responded) . . . As an officer and a native of the highlands, I have a strong position, my view of my ancestors are the Incas, they are my ancestors, and their culture I can preserve for all of eternity. But a culture, a custom that was brought from the exterior (Europe), no. Because bullfighting comes from Spain.
> Interviewer: Right, there were no bulls here (Peru).
> Detective Qispi: Right, therefore it is not a custom from my ancestors. . . . In my visits to do sensitivity lectures (for citizens), I let them know of this concept. "What do you call ancestral culture?" Ancestral culture is what we have inherited from the Incas. The rest is folklore, I am not sure, that was gotten from what the Spaniards brought.
> Interviewer: What is the response of the public, the local citizens (to this concept)?
> Detective Qispi: They say it is true, it is true (Detective Qispi is correct), but this is how we were raised . . . I do not know where they got the idea that their forefathers were bullfighting with condors.

Detective Qispi is correct in indicating that the only reason that the *Yawar Fiesta* exists is due to the fact that the Spaniards took over Incan territory by force, and it is not a true representation of *tradiciones Incaicas* or Incan traditions. On the other hand, this celebration is also viewed as a representation of mestizo culture and its struggles to assimilate while upholding traces from its indigenous identity (Vidales 1997). While the debates on the meanings and contexts of the *Yawar Fiesta* will continue, there is no debate on the harms that it brings to the critically endangered Andean Condor, or its clear links to cultural, traditional, or nature-based entertainment for ecotourists.

## Discussion

This investigation utilizes the example of Peru as a notable ecotourism destination in order to explore some nature-based tourism activities that are harmful to biodiversity and conservation. These scenarios progress from simple actions that may not appear to be too harmful (viewing animals in nature and feeding and touching wildlife) to extremely violent events (condors and bulls tearing each other apart in the *Yawar Fiesta*). There are also many instances that are related to the illegal capture of protected and

endangered wildlife (catching species for tourists' enjoyment, to "rescue and reintroduce" them into the wild, and to entertain visitors in temporary custody centers) and the killing of wild animals (using wildlife parts for tourist keepsakes, medicines, rituals, and trophy hunting).

The growth of ecotourism in Peru is related to several requests and services centered at providing enjoyment and entertainment for tourists who may look for a "jungle" experience, a "spiritual" awakening, or "ancestral" traditions. As such, several illegal and black market economies are incentivized, if not created, in order to supply ecotourists with a wide range of tourism experiences. As noted by Gabriel, Lalo, and number of wildlife traders (Leberatto 2016, 2017), citizens do not enjoy fulfilling requests that are harmful to wildlife and biodiversity but feel pressured to take on any avenues available to them to earn a living. Otherwise stated, while some tourists are enjoying their travel experiences, the locals who facilitate these instances experience guilt, shame, or resentment over harming biodiversity and breaking the law in order to earn the patronage of visitors.

The examples noted in this chapter come from Peru, however, many other biodiverse nations may face similar circumstances where ecotourism is linked to various harms to biodiversity conservation and the illegal wildlife trade. However, one cannot assume that the growth of subsidiary black markets and informal services or attractions related to ecotourism may only occur in developing nations. Black market economies related to the illegal wildlife trade also arise in developed and industrialized nations (Eliason 2012). As such, the demand for illegal ecotourism and nature-based entertainment is potentially present in most of the nations of the world.

Although ecotourism is often seen as a solution to conservation problems, we must not assume that biodiversity may only be preserved with the help of foreign visitors or their economic support. Many residents in rural biodiverse areas spend their time and money protecting their local ecosystems instead of depending on NGOs or the government, and without the expectations of any financial benefits (Shanee, Shanee, and Horwich 2015; Leberatto 2016). Therefore, we have to move beyond the ideas that economic gains from ecotourism is a one-size-fits-all measure with which to protect biodiverse areas, incentivize citizens to be proactive in conservation efforts, or to help improve the qualities of lives of local residents.

## *A Possible Solution through Opportunity or Environmental Criminology*

The general concepts of *motivated actors*, *lack of capable guardians*, and *available opportunities* are central to criminologists who utilize opportunity or environmental criminology in efforts to understand crime causes/processes and how to prevent crime (Clarke 2012). Crime is said to be caused by

its available opportunities (Clarke 2012), many of which were highlighted throughout this investigation. Situational crime prevention can help us curtail wildlife crimes related to ecotourism (Pires and Moreto 2011).

Some persons travel to developing nations with the goal of engaging in illegal behaviors that are harmful to conservation due to the fact that these nations afford them a higher class status than native residents, and more criminal opportunities. Developing biodiverse nations do not always have the law enforcement resources or political will to curtail illegal activities. In other words, these actions are easier to get away with in developing nations where there is a *lack of capable guardians* protecting biodiversity. Perhaps some tourists would never have considered breaking the law, but the ease with which they can engage in these illegal acts may incentivize them or help them become *motivated offenders*. Once visitors uncover the relatively easy ways in which to enjoy nature-based activities (or to earn money through actions that harm biodiversity) they decide to take advantage of the great variety of illegal *opportunities*.

Situational Crime Prevention is a tool in the creation of wildlife crime preventive actions (Pires and Moreto 2011). According to situational crime prevention, crime can be reduced by altering the situational factors that lead to a crime opportunity (Clarke 1995). Crime reducing methods must be highly specific at one form of crime, involve the management, design, or manipulation of the environment in a systematic or permanent way, and make crime more difficult or less rewarding (Clarke 1995).

Creating situational crime prevention solutions requires knowledge of the problem and some creativity. One of Clarke's (1995) categories of techniques of situational crime prevention indicates that we can reduce crime by "removing excuses." Ecotourists must be aware of and held accountable for their impact on wildlife crimes in order to decrease the illegal capture and killing of wild animals. Visitors travel in planes, trains, or buses to Peru's ecotourism attractions. We can utilize these travel processes to show compulsory videos at transportation terminals, airports, and in-flight entertainment on proper conservation behaviors and ethics. Videos must highlight legal ramifications for trading wildlife illegally, including examples of ecotourists being prosecuted for wildlife crimes. These videos would "remove excuses" by explicitly describing the negative impacts that ecotourism can have on conservation, and the best ways to avoid these results while visiting the nation, and by creating awareness and, most important, accountability among visitors who travel throughout Peru.

## Conclusion

Many ecotourists travel to developing nations in order to tour their natural areas and to learn about their cultures and traditions. Nevertheless, it is naive, shortsighted, and dangerous to assume that visitors always have the

best interests of the nation they visit, biodiversity conservation, or local residents at heart. Although this study's most notable limitation is the lack of interviews from ecotourists, it is clear that many tourists' demands for services and entertainment cause harmful effects to biodiversity conservation. Future investigations must focus on exploring ecotourists' motivations for requests and services that harm conservation efforts. It is also important for multidisciplinary researchers to look beyond the "meaning" of a term, the status of a singular species, or the laws in place to govern a natural area. Understanding the processes, motivations, opportunities, and possible solutions for conserving/protecting natural and cultural diversity requires extensive fieldwork that not only looks at the problem at hand (such as the illegal wildlife trade) but also deeply reflects on all of its interconnected parts (sociopolitical history, poverty, culture, and globalization) and asks questions of all of the actors who may be involved in these processes (even the ones that society does not normally see as criminal). Only then may we begin to understand the complexities surrounding wildlife protection and arrive at sustainable, fair, and conscientious solutions that help conserve biodiversity and improve the lives of citizens in biodiverse areas across the globe.

## NOTES

1. All study procedures were approved by Rutgers University's Institutional Review Board under the protocols 13-345M Trading for Survival: Analyzing the Domestic Wildlife Market in Peru and 14-337 The Cycle of Peru's Fauna Economy.

2. Urban rainforest cities are large, highly populated, and centrally located cities in Peru's rainforest region. Rural rainforest cities are smaller, less populated, and underdeveloped locations inside the forest.

3. The Andean condor (*Vultur gryphys*) is one of Peru's emblematic species and an important part of pre-Colombian mythology. To the Inca's, the condor is a representation of the heavens, while the puma (*Puma concolor*) and anaconda (*Eunectes deschauenseei*) represent the Earth and underworld. Although condors are gravely threatened across South America, Chamanes utilize condor feathers as a part of spiritual rituals (Williams et al. 2011).

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# 8

# TALKING ABOUT ILLEGAL BUSINESS

## *Approaching and Interviewing Poachers, Smugglers, and Traders*

Daan P. van Uhm

**EDITOR'S INTRODUCTION:** *Similar to Leberatto, van Uhm conducted an in-depth ethnographic fieldwork on individuals involved in the illegal wildlife trade. In this chapter, van Uhm provides us with a glimpse into research he conducted in China, Morocco, and Russia. He focuses his discussion on a number of key issues that he faced, including identifying hidden populations and working within concealed areas, establishing trust and rapport, and encountering and maneuvering through dangerous situations (among other issues). His chapter not only displays the difficulties of researching illegal markets, but provides an important methodological contribution to both the criminological and conservation science literature.*

"Stop right there! Don't move!" From one moment to the next we were surrounded by the police in broad daylight at the entrance of the famous Medina in Fez (Morocco). Immediately, Karim, my informant, was beaten to the ground, handcuffed, and pushed into one of the police cars before I realized what was happening. Apparently, he was wanted by the police and, of course, they wanted to know who I was and why I was there. "A researcher from the university? How do you know him [my informant]?" While Karim was taken to the police station, we were extensively interrogated. After a while the police decided to let us go and we were able to continue our journey.

Carrying out ethnographic research on wildlife trafficking by interviewing people who are directly involved in the trade can lead to unexpected and

difficult situations. In this chapter I will discuss the question of how to approach persons involved in the illegal wildlife trade, why these informants talk about their activities, and which (ethical) limitations and dangerous situations are encountered. This chapter contributes to the increasing criminological literature on wildlife crimes by reflecting on my fieldwork experiences in order to uncover this phenomenon.

## Chasing the Wildlife

The illegal trade in wildlife is a form of crime that manifests itself in various ways, involves a wide variety of actors, and occurs in different parts of the world (Wyatt 2013; Moreto and Lemieux 2015; Sollund and Maher 2015; Petrossian, Pires, and Van Uhm 2016; Van Uhm 2016a). To investigate the actors and network structures of this phenomenon, I decided to conduct three case studies[1] based on descriptive quantitative analyses of European confiscations.[2]

1. The first case study included the illegal trade in caviar (i.e., sturgeon eggs) from the top exporter, Russia. The largest part (>95 percent) of the seizures regarding fish ($N$ = 1,883) consisted of fish products in which caviar from sturgeons dominates the seizures with 85 percent (Van Uhm 2016b). The sturgeon is now one of the most endangered animal groups worldwide (IUCN 2010). After the collapse of the Soviet Union, existing management and control systems disappeared, and criminal networks became involved in the illegal caviar trade from the Caspian Sea. These criminal networks still operate at all levels of the trade: from the poaching areas where they cooperate with law enforcers to major smuggling operations to fuel the demand for this valuable luxury food destined for upper-class society (Van Uhm and Siegel 2016).
2. The second case study included the illegal trade in Barbary macaques from Morocco, the main African exporter of wildlife based on seizures. The Barbary macaque is the most confiscated endangered mammal species in the EU, accounting for almost 25 percent of live mammal-related seizures ($N$ = 178) (Van Uhm 2016b). The estimated illegal trade of two hundred monkeys to the EU each year contributes to a substantial decline in the small wild population of as few as five thousand to six thousand Barbary macaques that remain in fragmented parts of Morocco and Algeria. Although it was formerly believed that the trade was loosely based on the tourist industry, sophisticated criminal groups became involved in the past few decades to meet the demand for exotic pets (Van Uhm 2016c).
3. The third case study included the illegal trade in traditional Chinese medicines (TCM) in relation to the major exporter China.

> Medicine is the largest category among all wildlife classes in terms of quantity—mainly related to the illegal trade in TCM. More than fifty thousand medicines were confiscated during seizures (*N* = 509), including parts of well-known endangered species, such as threatened tiger and rhinoceros (Van Uhm 2016b). TCM has existed for thousands of years and is deeply rooted in Chinese society. Yet, high prices on the black market for illegal animal products that are believed to cure serious diseases (e.g., cancer) ensure the emergence of criminal networks involved in large-scale poaching and smuggling operations all over the world (Van Uhm 2016a).

To reveal the actors and networks inside the world of wildlife trafficking I decided to conduct *multisited ethnographic research*, a method that is designed to obtain in-depth knowledge of a phenomenon that has barely been explored through different field sites geographically and/or socially. Multisited research has become important in a globalized world where ethnography moves from its conventional single-site location to multiple sites of observation and participation in order to connect the local to the global (Marcus 1995). Contrary to traditional ethnography which is based on the premise of full immersion in a culture or setting to understand the "web of meaning" (Geertz 1973), multisited ethnography rather aims to target transnational networks and flows (Marcus 1995). Thus, "multi-sited research might not be able to provide 'thick' description of the individual nodes, but does guarantee 'thick' description of the network, its dynamics and the interplay of relations between people, things, activities and meanings" (Falzon 2016, 126). Marcus (1995) argues that the value of multisited ethnography will increase along the course of a continuously interconnected globalized world:

> Ethnography is predicated upon attention to the everyday, an intimate knowledge of face-to-face communities and groups. The idea that ethnography might expand from its committed localism to represent a system much better apprehended by abstract models and aggregate statistics seems antithetical to its very nature and thus beyond its limits. Although multi-sited ethnography is an exercise in mapping terrain, its goal is not holistic representation, an ethnographic portrayal of the world system as a totality. Rather, it claims that any ethnography of a cultural formation in the world system is also an ethnography of the system, and therefore cannot be understood only in terms of the conventional single-site mise-en-scene of ethnographic research. (99)

By employing a multisited ethnographic study, this enabled me to study the field as a network of localities that are connected through various types

of illegal wildlife flows. In other words, the researcher uses the same qualitative research plan at various local, regional, national, or international sites, many that could potentially be included to obtain an overview of the phenomenon (Hannerz 2003; Siegel 2009). The road along which the wildlife travels is followed by means of observation, semistructured interviews, and informal conversations with people directly involved in the trafficking (e.g., poachers, smugglers, traders). This ensures the representation of naturalistic empirical data on illegal wildlife trafficking in its unique cultural and socioeconomic context.

The primary data were used from a *semigrounded theory* approach whereby the researcher focuses on initial ideas—in this study based on the quantitative analyses of the illegal wildlife trade—instead of going into the fieldwork with a blank slate, but the theory or concepts are constructed through the analysis of data (Glaser and Strauss 1967; Eisenhardt 1989; Glaser 1998). This inductive and iterative strategy results in the construction of theories or concepts from "within the data themselves" (Charmaz 2006, 2). The data collection occurred between March and April 2013 in Morocco, during November and December 2013 in China, and in March, September, and October 2014 in Russia (including visits to Azerbaijan and Kazakhstan). By reviewing the collected data, concepts or elements became apparent and were the basis for a new theory of understanding the actors and network structures in the illegal wildlife trade.

## Hidden Areas and Populations

*Hidden populations* such as drug traffickers, weapons suppliers, human smugglers, and also illegal wildlife traders may be difficult to find because they may reside outside of mainstream society (Watters and Biernacki 1989; see also Forsyth and Forsyth, Chapter 6). Their activities are frequently unrecorded and are concealed due to the illegality of their activities. Therefore, ethnographic research methods are useful for collecting firsthand and insightful information about these hidden populations (Singer 1999). However, in order to get in touch with the right informants it is important to know where they are beforehand as some of the hidden groups are more invisible than others.

During my research, it became clear that wildlife trafficking hot spots included regularly weak regions where the government failed to effectively rule. It is known that in such economically weak and underdeveloped areas organized crime is able to thrive (Bovenkerk 2001). Since state institutions are generally "not very present or cannot be trusted," people take the law into their own hands (Boekhout van Solinge 2014a, 40). To talk to traders of products from endangered species, such as elephant skins, pangolin scales, and rhino horn used in traditional Chinese medicines, I traveled to the Golden

Triangle in Southeast Asia, one of the most underdeveloped areas in the region. To understand the poaching of sturgeons I visited small fishing villages in Dagestan in the Caucasia, which has a high rate of conflict and unemployment (Van Uhm and Siegel 2016). While the Rif Mountains in northern Morocco are traditionally known as a "smugglers' paradise" in the context of poverty, where I was able to meet monkey traders (Van Uhm 2016c).[3]

In order to discern the important fieldwork areas, I regularly followed the directions of my informants. For example, I traveled to Astrakhan, the "caviar capital of Russia," where middlemen directed me to the conflict area of Dagestan where I was able to find poachers and traders. By reading about the regulations regarding the trade in the Barbary macaque monkey species, I discovered that a Moroccan law (No.29-05) provides for measures to regulate the possession of these monkeys for cultural purposes through a certificate of ownership at Djeema El-Fna Square in Marrakech. I went there and found out that street entertainers with their monkeys had connections with illegal traders and poachers. In China, I decided to travel to a selection of famous TCM markets, and from there illegal sellers directed me to the border region with Myanmar and Vietnam in the Golden Triangle that turned out to be an important smuggling port into mainland China. Thus, the areas of research covered both origin areas, such as fishing villages and hunting grounds,[4] as well as the final destinations in the markets and restaurants.

Soon I discovered that while prefieldwork preparations are useful, research can pose some unforeseen challenges. Ethnographic fieldwork needs to respond to circumstances and issues that arise pending the research progress, because the researcher cannot anticipate all eventualities and autonomous decisions about how the investigation will continue (Pollard 2009). Despite prepared plans and schedules, they were often subject to change, as unexpected events occurred. Indeed, during my fieldwork it appeared that certain places were essential to visit more than once while other places were just visited for a brief period of time. Due to limited fixed appointments during my fieldwork, I was quite flexible in my research schedule. For instance, I decided to fly twelve hours in advance from Guangzhou to Kunming in Southern China due to new information that indicated the importance of a specific trade area for endangered species. In other circumstances, I stayed for several weeks, a longer period than expected.

## Observing and Understanding the Context

Having arrived in the proposed area, my first step usually included extensive *participant observation* to gain a close and intimate familiarity with the actors involved (Spradley 1980; DeWalt and DeWalt 2011). Both obtrusive and unobtrusive methods were used depending on the setting. In a covert setting

this could be an advantage as people are usually not aware that they are being observed by a researcher (Zaitch, Mortelmans, and Decorte 2009). I observed several wildlife markets undercover where traders sold their illegal trade such as caviar from wild sturgeons and raw materials for TCM under the counter (*unobtrusive*). On the other hand, my main goal was to find valuable informants who would be able to share useful and reliable information that required me to be more overt (*obtrusive*). This varied from a detached observer to a participant observer with social relationships with informants (Spradley 1980).

According to Spradley (1980, 56–57) the continuum between insider and outsider experiences may vary: "On some occasions you may suddenly realize you have been acting as full participant, without observing as an outsider. At other times you will probably be able to find an observation post and become a more detached observer. Doing ethnographic fieldwork involves alternating between the insider and outsider experience, and having both simultaneously."

Indeed, there were situations where I had to operate as an outsider observer, while in other situations I was more integrated as a participant. For example, during observations of the border region of China and Myanmar (Daluo-Mong La), I observed the smuggling process of rhino horn and elephant skins by young men who also smuggle opium and methamphetamine with motorcycles across the border (Figure 8.1), while in other circumstances I was more integrated as a participant by attending parties and sharing drinks with my informants in Russia. These participant observations regularly led to informal chats but also to spontaneous formal interviews with the informants (DeWalt and DeWalt 2011). This was essential in building up a large network of informants throughout my fieldwork. Furthermore, through these informal chats with participants I was able to cross-reference various sources to verify the validity and reliability of information. This also made it possible to understand and corroborate different perspectives and opinions in their unique contexts while interpreting their arguments (Davies and Francis 2011; Moreto 2013, 2017).

Observing the process of the illegal trade through direct, naturalistic observations provided a more in-depth understanding of the meaning and socioeconomic and cultural context in which actors operate (DeWalt and DeWalt 2011). Understanding a poacher in Sulak (Dagestan) without an impression of his socioeconomic situation or interviewing an illegal traditional Chinese medicine trader without the context of the informal market mechanisms would be difficult. Therefore, participant observations provided rich insights into the lives, choices, and motivations of my informants (Siegel 2016), especially because the informants tend to behave as they normally do, which can be very valuable to understand the meaning of social interactions (DeWalt and DeWalt 2011).

**Figure 8.1** Observing the smuggling process between the China and Myanmar border. Photo credit: Daan P. van Uhm.

## Access and Building Trust

After revealing and observing specific regions where illegal entrepreneurs operate, it is important to gain access to them. *Purposive sampling* was used to select my informants because this is a nonprobability type of sampling in which respondents or groups are selected based on characteristics instead of being representative for the population (Maxwell 2005; Davies and Francis 2011). The informants were collected through snowball sampling; future participants were recruited from among their acquaintances and through the first point of access (Goodman 1961). This purposive sampling method is used to gain access to members of a population that is particularly difficult (Davies and Francis 2011). Moreover, snowballing "ought to filter levels of risk as each point of contact will provide some form of verification for the trustworthiness of the interviewer" (Rawlinson 2008, 14). This made it possible to follow and understand the route of wildlife as it passes through countless hands and places, which directed me to several faraway regions.

After arriving at these places, I contacted, with a great deal of help from my interpreter, potential participants obtained through snowballing. In other situations, I started to ask around to find the right people who were willing to provide me with information. For instance, when I arrived in the small village of Azrou, the main poaching area for monkeys in Morocco, I

made contact with one of the locals in the Berber village. By asking questions about the "monkey business" he referred me to one of his friends, Amir, who appeared to be one of the poachers. This turned out not to be a coincidence as local people regularly know who is involved in these illegal activities (Van Uhm 2016c). As a result, I was having a conversation with a very talkative key player in a small Moroccan teahouse within one hour of my arrival in Azrou. Amir had already been involved in misusing the obligatory certificates for biomedical research to catch additional macaques for the retail trade in the 1990s and he was able to tell me about the professionalization of the trade since then. Moreover, Amir shared his perceptions on the culture and social structure of trafficking monkeys and arranged interviews with other poachers at short notice.

In other situations, visiting wildlife markets turned out to be highly relevant for my research. Live animals or animal products are regularly sold at these local markets (e.g., Leberatto 2016; Leberatto, Chapter 7), such as the *souks* in Morocco or the famous traditional medicine markets in China. In particular, the *Qingping* market and the *Anguo* market in China were very important for observing the social practices in the illegal wildlife trade and for building relationships with my informants. After chatting about their legal businesses, not incidentally they started to talk about illegal businesses and phone numbers were exchanged. In this way, I got to know Wang, an important illegal saiga antelope horn importer in Anguo who had already been involved in the business for many years. Wang helped me to get in touch with his friend, a big player in the illegal trade who had two tons of saiga horn from Russia in stock. This illustrates how such morning strolls frequently brought me into contact with new informants. While I usually had appointments in public places in areas that varied from rich neighborhoods to extremely poor and remote villages, in certain situations I met my informants at their homes or even at parties. In other cases, I visited local teahouses, nightclubs, and karaoke bars to get in touch with illegal entrepreneurs, which allowed me to analyze the participants' perceptions of their worldview in the context of wildlife trafficking. For example, I went along with Igor, a caviar middleman in the heart of Astrakhan in Russia, who introduced me to other illegal entrepreneurs during those social activities.

Contact with these *gatekeepers* was of great importance to gain access to the social world of wildlife crime. Gatekeepers are persons who control access to others and include key persons in the organizations as well as small players in the trade, "people who can open doors to people or places, who are aware of certain risks" (Boekhout van Solinge 2014a, 40). In other words, these gatekeepers were not necessarily occupying important positions in the illegal activities, but rather influenced other players through the "strength of their personality and character" (Reeves 2010, 322). I usually asked them to be with me during the first meeting with newly introduced informants. For

example, in Baku in Azerbaijan, by asking local people for information about illegal caviar trafficking, everyone at the black market for caviar referred me to Ali. Indeed, he turned out to be one of the most important caviar traders in the entire region and became my gatekeeper. After our first appointment, which took place in a local teahouse, Ali helped me with a great deal of highly detailed information and arranged appointments together with other informants. In another setting in China my interpreter, Jia, appeared to be an important gatekeeper as she consumed endangered species herself and could help me with contacts and inside knowledge.

While I tried to avoid any undercover research, not all persons whom I met knew about my research. This can result in several advantages and disadvantages (Boekhout van Solinge 2014a; Scheper Hughes 2004). Sometimes the way in which I was introduced differed from the real situation. One of the examples includes, "He is a researcher from a university in the Netherlands who writes about the trade in caviar," not mentioning that I was primarily interested in the illegal trade. In other situations, they thought I was a buyer or even a seller myself. During my search for a dealer in rhino horn in the Wing Lok Street in Hong Kong, TCM traders thought that I carried a rhino horn for sale in my bag, instead of just a notepad that I usually carried, while on another occasion I was introduced as a patient to arrange time to talk to TCM doctors. This brought me into situations where I was able to experience different social roles to gain access to the illegal entrepreneurs.

Occasionally people were initially suspicious about my background. To remove these suspicions, respondents asked my interpreter several questions about me. Examples include: "Is he a spy from the United States?" (in Russia) or "Is he from the United Nations?" (in Morocco). Although one could argue that it would be more difficult to conduct research if one does not speak the language, I believe that in my research in many situations it was actually an advantage to be a stranger because of the belief that "the wanderer comes today and leaves tomorrow." Generally, people were not afraid that I was an "official." Several informants explained that this worked to my advantage because I did not look like a government official. These informants regularly provided me with a great deal of secret information about their poaching, smuggling, and bribing methods—with the knowledge that I would soon leave.

Even though I was occasionally seen as a stranger or wanderer, in other situations I was considered to be part of the community. Staying in those areas for a period of time may lead to emotional engagement and trust between the researcher and the informants (e.g., Fleetwood 2009; De Wildt 2016). After a while, informants introduced me as a "friend" from the Netherlands and on occasion I was invited to their homes. In this role, I was more integrated into the community. I found myself in Russian karaoke bars sharing a drink with informants, enjoying tea parties in China, and taking forest

walks with poachers in Morocco. These experiences made a stronger social connection with my informants possible, and, accordingly, the relationship with the participants became more truthful and honest (DeWalt and DeWalt 2011).

## Talking about Illegal Activities

Access to illegal entrepreneurs often went fairly smoothly. I found myself, sometimes to my surprise, in a long conversation for hours with key informants or, not incidentally, I was invited to have dinner at their homes. Unexpectedly, most respondents were open in talking about issues related to the illegal trade in wildlife. The reasons for sharing secret information and experiences in the illegal wildlife business were manifold and sometimes puzzling. Generally, they appeared to be comfortable in speaking about the illegal trade in wildlife because it has not yet been completely criminalized. Respondents were often unaware of the damage caused by the offense and did not see it as a serious form of crime; they rather viewed the field in which they operate as a "gray area" between legal and illegal (Van Uhm 2016d). As an example of this, I can point to Wim, one of Europe's largest bird traffickers (in his own words), who was recently found guilty of large-scale illegal animal trading within a criminal organization. He emphasized during an interview that he "stuck" to the rules even though he was aware of the illicit origin of the birds. "At the moment that the original paper or the ring around the leg is there, the bird is legal. This is how the system works" (Wim).[5]

In addition, my informants explained how they were excited about their work and how it is a part of their lives (see also Ferrell and Hamm 1998). These illegal entrepreneurs sometimes even felt honored to talk about their business and to share their life stories while presenting me with (digital) photographs of their lives. They proudly recalled how they collaborated with corrupt officials or explained in detail how they make sure, through the use of the "right connections" with people in the destination countries, that purchasers are forced to pay their debts by "friendly persuasion." Notably, some informants stressed that it would make no sense to go to the police because of their powerful status.

Of course, there were always those who were not keen to speak about their business, others who were scared of their higher-ranking superiors, but in many cases people started talking about illegal business activities quite easily. During the conversations that varied from formal in-depth semi-structured interviews to informal chats on street corners during participant observation, I focused on their modus operandi, network structures, and social world to understand the motivations and context of the illegal wildlife trade. As *semistructured interviews* accommodate flexibility (Davies and Francis 2011), it allowed me to address specific issues in more detail. Usually

they started with stories about others before eventually admitting that they themselves were also involved. For instance, while in conversation with Amit and his son Andrei, caviar traders in Kalmykia (Russia), they talked in particular about the corrupt practices of local government officials and other caviar traders. Amit complained that they bribed so many people. However, after we had talked for an hour or so, they slowly started to explain that in reality their business consisted largely of the illegal trade itself.

Regularly, my informants claimed that they were irresponsible in using many, sometimes justified, neutralization techniques that reflected their socially constructed viewpoints (Sykes and Matza 1957). "The whole system is corrupt; why would I stick to the law?" (Amit). "Besides poaching and fishing, we have no other way of surviving" (Pyotr). "I have been in this business for years, but the law has recently made it punishable. What else should I do?" (Liling). They also spoke about their hopeless situation, their misguided decisions, corrupt politics, or an unequal society. This differed in comparison to those informants who spoke about their business with pride. "Nobody can do something to me" (Vladimir). "I am smart enough to work together with officials" (Yin). "Criminals should be afraid of me" (Boris). They proclaimed that they are fearless, powerful, and intelligent.

Besides wildlife crime, I also spoke about other topics with study participants including friends, family, general interests, and even sensitive subjects such as politics. I have experienced numerous examples of this during my fieldwork in Russia in March 2014, when tempers ran high between the West and Russia regarding the conflict between Russian separatists and political leaders in the Ukraine. Although political discussions can quickly lead to disagreements, they regularly resulted in a more open conversation and even closer contact with the informants.

Some informants were impressed by the fact that I dared to investigate this subject. Other informants even indicated that it was too dangerous to ask specific questions or to go to certain places (e.g., Dagestan, Russia). However, on most occasions they helped me with information and provided me with a link to other people in the business. I was regularly surprised by the extremely detailed information provided by my informants. Yet, I could not just take all the information for granted. According to Albini (1997), the naive acceptance of "truth" from figures from the underworld is regularly influenced by the aura of mystique surrounding the criminal underworld.[6] On the other hand, as astutely noted by Rawlinson (2008, 18): "Why should we doubt the reliability of interview material from offenders more than that from the authorities? As Reiner notes on his reflections of interviewing the police, political restrictions can stymie contentious questions before they are even asked. And, as he reminds us, the police are trained in interrogation techniques and thus have an array of tactics to deflect from unpalatable realities if need be."

However, I had to repeat certain questions to different people and occasionally answers contradicted each other. Small chats during observations were in particular useful to verify information. In addition, activities were mostly cross-referenced among various informants and sources, such as the quantitative data analyses of seizures, NGO reports, and the content analysis of media reports, in order to check validity and reliability (Zaitch 2002; Siegel 2009). Each time one gets a small piece of the puzzle that is eventually put together.

## Sociocultural Dynamics, Reciprocity, and Gossip

Talking with different players in the illegal trade in wildlife in various places over the world, from poachers to middleman and traders, requires an understanding of cultural practices and unique social dynamics (e.g., Nooren and Claridge 2001; von Essen et al. 2014; Leberrato, Chapter 7). For example, in order to interpret the illegal trade in tiger bones from wild tigers next to the illegal trade in tiger bones from captive-bred tigers in China, it is essential to understand the value and meaning of real wild products in the cultural practice of traditional Chinese medicine. Another example is that it is difficult to explain the social dynamics and flows of criminal networks involved in the illegal monkey trade in Morocco without knowing the cultural ties with the Berber communities in the poaching area of Azrou and the Rif Mountains, where many family members live.

Furthermore, in many non-Western cultures, favors gained from social connections play an important role in maintaining social ties in the context of reciprocity (Van Uhm and Moreto, in press). Therefore, on some occasions expectations arose among my informants. Specifically, in China, *guanxi* is the basic dynamic in Chinese personalized networks of influence and refers to those favors gained from social ties (Myers 1995; Zhang et al. 2009). Liling, an illegal entrepreneur in Guangzhou, wanted to set up a TCM business in the Netherlands and had all sorts of related questions. From this perspective, our conversation had sided interests: I provided general information about regulation in the Netherlands and she explained how rhino horns and pangolin scales were trafficked from Hong Kong into mainland China.

In acknowledging the cultural forms of reciprocity, I regularly brought along gifts and presents to thank all my informants for all their valuable information. On the one hand, giving gifts may increase the possibility of contamination or bias, but, on the other, one can thank informants, overcome some of the power imbalance between the interviewer and the interviewee, and strengthen social relationships (Zaitch 2002; Head 2009). It also happened that I received presents from my informants. On more than one occasion, after a day of work in the field I came back home with gifts such as Chinese medicinal plants, empty Russian caviar cans, or Moroccan tea.

These gifts reflect the meaningfulness of reciprocity during ethnographic fieldwork in other cultural settings (Wax 1982).

It also occurred that informants were eager to provide information in the hope of exacting revenge on their rivals (see also Siegel 2009). These respondents provided the "truth" about others, who were allegedly connected to criminal organizations or illegal wildlife trade activities. One clear example of this is the case of Svetlana, the director of a caviar farm in the Astrakhan region, who told me about competitors who paid money to officials to fish for sturgeon that were under the permitted scientific quota size. In such cases I had to be especially careful with the reliability of the information and to check once again with other informants or other data. In particular, the content analysis of media reports was extremely useful to verify these statements. Indeed, several Russian media articles confirmed Svetlana's statements. Thus, although gossip could play a role in data collection as valuable information, double-checking with other sources is very important (Siegel 2009). The use of conflicting information was always a very detailed consideration with regard to all possible arguments from different sources.

## Protecting Informants

While gaining access and talking with informants is essential, protecting them plays a very important part in social research. Especially in research on the perpetrators of crimes *anonymity* and *confidentiality* play fundamental roles (Noaks and Wincup 2004). After the respondents consented to the interviews, I underlined that names were not important to me (Davies and Francis 2011). While the limits of anonymity and confidentiality were explained in order for them to be able to make an informed decision about their participation, informants regularly asked me to confirm that no names or companies were going to be revealed. Of course, I respected their wish as the contents of the interviews were not shared with others and the names of informants used in my research were changed into pseudonyms (Siegel 2009).[7] Moreover, providing the names of informants to the police, which is obligatory in certain countries when one has information about their offenses, is extremely harmful and unethical (Noaks and Wincup 2004).

During studies on criminal offenses through interviewing people who are directly involved, the authorities or law enforcers may also exert pressure on researchers to disclose certain information (Sluka 1995; Ferrell and Hamm 1998; De Wildt 2016). To underline confidentiality and anonymity, it is important to defend informants against adverse effects and criminal prosecution. Moreover, without this anonymity fewer informants would more readily provide useful information (e.g., Moreto 2013). Thus, it is of great importance to protect one's informants as long as one is not directly confronted with serious violent crimes or lives being placed at risk (Zaitch

2002). According to Polsky (1967), "The investigator has to decide that when necessary he will 'obstruct justice' or have 'guilty knowledge be an accessory' before or after the fact, in the full legal sense of those terms. [Otherwise] he will not be enabled to discern some vital aspects of criminal lifestyles and subcultures" (139–140).

While this is confirmed by many researchers who have studied perpetrators (e.g., Adler 1993), in extreme situations this can result in serious consequences. Take the case of ethnographer Scarce (1994) who was sentenced to five months' imprisonment for refusing to provide information on environmental activists that he studied.

Finally, my informants regularly asked me not to record the interviews by tape-recording. In such cases, comprehensive note taking ensured the recording of the empirical data. This also resulted in more trustful situations where people were able to speak in more detail about the criminal aspects of their lives (Polsky 1967). In my opinion, a great deal of the detailed information would not have been provided with the dominant presence of a recorder as this can also lead to suspicions during the interviews (see also De Wildt 2016).

## Dangerous Situations

Criminologists and "guilty knowledge" is an extensively discussed topic (e.g., Polsky 1967, 140), especially in a situation where the safety of the researcher is at stake (Siegel 2005, 2009). While, according to Polsky (1967), it is acceptable for criminologists to withhold "guilty knowledge" for the value of science, scientists may find themselves pressured by the legal authorities because they may believe that the researcher is involved in illegal activities (Ferrell and Hamm 1998). To avoid such dangerous situations, as a precaution I recorded spoken messages on my phone and computer with information about the purpose of my research and highlighting the fact that I did not want to be involved in illegal activities; I was just conducting research on the illegal wildlife trade without any intention of becoming involved. Since punitive sentences can amount to many years of imprisonment for trading in rhino horn, caviar, or tiger bones, I had to be careful in order not to become over-involved.

While several criminologists have discussed dangerous situations during their own fieldwork (e.g., Williams et al. 1992; Ferrell and Hamm 1998), I felt relatively safe during my study. Because I traveled to secluded places and built up relationships with people who have no reservations in resorting to violence, of course it was important to clarify that I was there for research activities only and not to stir up "problems" regarding the illegal business. I usually presented myself as an academic researcher and writer of a book (Davies and Francis 2011). Therefore, several informants also provided me with a great deal of tips, advice, and warnings to avoid dangerous situations;

they warned against "dangerous people" or provided tips to visit certain clubs to meet informants.

While, occasionally, I was really "close" to people involved in the illegal trade, it was important to remain peripheral and to avoid any direct contact with operational illegal arrangements (Adler and Adler 1987; Zaitch 2002). On only a few occasions did I feel that I was in a sensitive situation. Examples include the caviar trader Nikolai, who tried to persuade me to start a business line in illegal caviar from Makhachkala (Dagestan) to the Netherlands, and Ali in Baku (Azerbaijan), who decided, after hours of talking about caviar lines from Azerbaijan to the EU, to focus more on the market in the Netherlands. Both Nikolai and Ali pushed me to become involved or to share information about enforcement in the Netherlands. I had to consider their proposals by providing general or rejecting answers.

Nevertheless, there were situations where I was on the edge of safety. For instance, in Anguo in China I was invited to a meeting with a rhino horn dealer to discuss his business in private. In a very small room in a small backstreet alley I was suddenly among four large men who were armed and who were clearly not waiting for people who were snooping around. They wanted to know my exact background, why I asked such questions, and why I was there. Fortunately, they allowed me to leave after answering these questions. After this incident, my Chinese interpreter was firmly convinced that we were being followed by people involved in the same business during a *tuk tuk* ride.

Besides persons involved in the illegal business, officials could also be unhappy with researchers from the West who are searching for information relating to criminal activities. This is in particular the case when officials also play a role in illegal wildlife trafficking (e.g., Smith and Walpole 2005; Moreto, Brunson, and Braga 2015; Van Uhm and Moreto, in press). On a regular basis I was critically questioned during road controls in Dagestan by military personnel in balaclavas who were ready to intervene and who were armed with kalashnikovs. During other occasions Chinese local officials arrived and questioned me as to who I was and what I was doing in those small towns where I tried to check in at hotels. The police also responded to my arrival with suspicion during border crossings (e.g., the borders of Dagestan-Azerbaijan and Astrakhan- Kazakhstan). For instance, I was taken to a special room to answer questions about my background and, last but not least, to pay an amount of money (a bribe) to get out of Russia at the border between Dagestan and Azerbaijan.

Potentially dangerous situations were also created by the intervention of the police. As described in the introduction, after talking for an hour and a half with Karim, one of my key informants in Fez in Morocco, he was arrested in broad daylight at the entrance of the famous Medina (Figure 8.2). Karim was taken to the police station and we were interrogated and asked

**Figure 8.2** Wildlife business at the Medina market. Photo credit: Daan P. van Uhm.

for our passports after which we were allowed to leave. This was not the only time my informant was arrested. Several weeks later it turned out that Hamza, another informant involved in monkey and counterfeit products smuggling, had been arrested in Oujda (Morocco) near the Algerian border; when I called him the police answered his phone. The following day Hamza

was released and I could speak to him again. However, I never ended up in serious trouble, mainly due to carefully considering the interests involved depending on the setting (i.e., going a step further or just retreating), but perhaps the most important reason was common sense. In certain situations, I decided to leave early to avoid risky situations, while in others I stayed for a longer period of time. In other words, I gradually learned to use my gut feelings and intuition that guided me and became an indicator of my (lack of) safety (Boekhout van Solinge 2014a).

## Limitations and Difficulties

While qualitative research on illegal entrepreneurs in the wildlife trade can provide very valuable information required to understand the social world behind these illegal activities, there are several limitations to this research method. First, conflicting information requires a great deal of double-checking, which is sometimes impossible. Usually, it is necessary to make a very detailed consideration of all possible arguments from different sources to understand the underlying story, especially as gossip may play a role in providing information by respondents (e.g., Siegel 2009). Second, sometimes it is not possible or desirable to record the interviews (Polsky 1967). In those cases, a detailed reconstruction of the conversation is necessary. It was a great advantage that my interpreter helped me to clarify the information in the context of the sociocultural backgrounds of the informants. Third, the research results are completely dependent on the availability of the informants (Davies and Francis 2011). While in some situations it was straightforward, in others it was difficult to meet the right people who were willing to talk about their illegal business activities. For example, sometimes people were afraid to talk because of possible threats from higher-placed superiors. Fourth, ethnographic research can result in overinvolvement (Ferrell and Hamm 1998). Because, occasionally, I participated in other activities with my informants and some of them became acquaintances—close to friends—I had to highlight that I had to be peripheral. Fifth, it may have been a limitation for security reasons that some of my informants (e.g., informants involved in caviar trafficking) were linked to acts of excessive violence and even murder. Carefully considering the complex interests involved and the use of common sense were of great importance when making decisions (Zaitch 2002). Sixth, the use of interpreters can be seen as a limitation since I was dependent on a translation by the interpreter (Noaks and Wincup 2004). To overcome this limitation, at the end of each day I summarized and analyzed the interviews together with my interpreter to make sure that I had properly understood the information (Edwards 1998). Finally, the Western perspective of the research should not be underestimated (Arthur 1994). It requires a good understanding of the social and cultural background of the

country or region during ethnographic research abroad. For instance, the political and socioeconomic situation of minority groups in Dagestan was important to understand the catching of sturgeon in those regions or the cultural function of traditional medicines in mainland China so as to be able to interpret the illicit trade.

## Discussion and Conclusion

The illegal wildlife trade moves from the poor poaching areas to the rich business districts as it is smuggled, laundered, stolen, sold, exchanged, manufactured, and transformed from animals or eggs into desirable items in the West (Roe et al. 2002; Duffy 2010). Therefore, the multisited ethnographic nature of my research contributes to the growing literature on wildlife crime by providing insight into different geographic and social areas. Ethnographic research methods are particularly useful to understand social dynamics and complexity of wildlife trafficking, including information about the actors and forces involved, the interconnection between the underworld and the upperworld, the socioeconomic and geopolitical context, and the conflicts and power relations and (dis)functioning of state institutions.

By researching the illegal wildlife trade, a multimethod approach grounded on ethnographic research was used. First, participant observations provided opportunities to obtain essential information by observing several wildlife markets, interpreting people's behavior and everyday practices, and getting in touch with potential informants. This allowed for close and intimate relationships with the actors involved (Spradley 1980). Second, through formal semistructured interviews in-depth information about their illegal wildlife activities was obtained. It was thereby important to gain the trust of respondents, for example, by joining informal activities (Siegel 2009), such as sharing drinks in karaoke bars, enjoying tea parties, going out for dinner, and taking forest walks. These experiences strengthened my relationship with study participants and gradually my informants became more truthful and honest (DeWalt and DeWalt 2011). Moreover, this insider-outsider continuum experience ensured a broad understanding and colorful view of the actors and the social world behind the illegal wildlife trade.

Unexpectedly, many of the actors involved did not worry about divulging their stories about illegal wildlife trafficking. It is an advantage for ethnographic researchers that the trade in wildlife has not yet been completely criminalized (Van Uhm 2017). Many people, not only in the illegal wildlife trade but also in law enforcement, do not take wildlife crimes seriously (e.g., Pires and Moreto 2011; Wellsmith 2011; Wyatt 2013; Moreto, Brunson, and Braga 2017). As a result, they see wildlife trafficking as a mere "gray area" and are quite talkative about their illegal activities. In addition, it appeared that many of the actors involved were willing to talk about their illegal activities

because it is a part of their daily lives (Ferrell and Hamm 1998). Some wildlife traders underlined the "kicks" and "thrills" while others were even very proud of their strong positions and collaborations with corrupt government officials. However, while traditional ethnographers underline that in order to build trust it is necessary to stay in the same place for a long time (e.g., Geertz 1973), during my multisited ethnographic research informants usually started to talk about their illegal activities rather quickly. They introduced me to valuable contacts, described their criminal actions, and shared their worldviews, which made it possible to provide a "thick" description of the social network, its dynamics, and the interplay of relations between people (Falzon 2016).

While there were situations on the edge of safety, I never ended up in serious trouble and I usually felt relatively safe. My interpreters and gatekeepers very much helped me to understand the social and cultural dynamics during conversations and provided useful information about the dangerous nature of the situation. In order to avoid risky situations, it is also important that respondents feel safe to talk about illegal business activities and do not experience harm (De Wildt 2016). Considering the interests depending on the setting contributes to the feeling of safety; however, common sense in combination with indispensable luck and intuition guided the investigation (see also Zaitch 2002). Actually, it is not easy to explain why in some situations I left earlier than expected, while in others I stayed for a long time. This also highlights the reality of conducting ethnographic research where a researcher depends on opportunities to obtain essential data (Pollard 2009).

To conclude, important lessons for future ethnographic researchers, specifically in the field of illegal wildlife trafficking that can be drawn from this reflective chapter of my fieldwork, include the following points. First, *hidden populations* may be difficult to find, yet, local wildlife markets can be an important starting point and may direct to potential gatekeepers due to the interconnection between the underworld and upperworld. Second, even though this *gray area* between legality and illegality in combination with a low level of *criminalization* makes informants talkative, it is essential to schedule multiple appointments and treat informants as people of flesh and blood, rather than criminals. Third, keep in mind that local people may perceive research on illegal wildlife trade as an undesirable *Western interference* in local practices and politics. Fourth, guarantee *confidentiality* and *anonymity* and interpret the social and cultural context to understand *ethical dilemmas*. Fifth, acknowledge the confined *safety* as a researcher in secluded places by avoiding risky situations; to be a stranger or wanderer can be both beneficial and disadvantageous.

Taking this into account, based on my experiences, ethnographic research on illegal wildlife trafficking seems to be well suited to unraveling insights into this understudied phenomenon (see also Leberatto, Chapter 7).

It can play an important part in "confirming or refuting widely held beliefs or paradigms within science, while also providing avenues to generate new forms of knowledge" (Moreto 2017, 443). Moreover, it can uncover the unique social processes that may be neglected through quantitative methods (Drury, Homewood, and Randall 2011). Therefore, it may provide avenues to better understand the activities and the actors involved in the illegal wildlife trade that increasingly threaten endangered species all over the world.

## NOTES

1. A case study is a detailed, intensive study of research defined as a phenomenon, which manifests itself in social reality. The researcher uses multiple observation techniques and information sources to sketch and understand the complexity of the case study (Yin 2008).

2. To get an overview of the illegal trade to the EU, data relating to confiscations in the EU were obtained from the European Union Trade in Wildlife Information eXchange database (EU-TWIX), a database containing information on wildlife seizures in the EU. The data included more than twenty thousand shipments ($N$ = 22,204) of animals and animal products seized in the EU between 2001 and 2010.

3. The Caucasia is an important region for weapons, drugs, and human trafficking (e.g., Arasli 2007), the Rif Mountains are known as the gateway to Europe in relation to the smuggling of hashish and immigrants (e.g., Soddu 2006), and the Golden Triangle is notorious for the booming opium trade (e.g., Zhang and Chin 2011). It is not strange that in such areas criminal groups are active and that overlaps with other forms of crime occur. For instance, more focus on drugs in the Golden Triangle resulted in a shift to the wildlife trade (Van Uhm 2016a).

4. Several studies suggest that the richness of natural resources in such rural areas seems to be a mixed blessing or even a curse in the presence of corruption, weak institutions, and crime (Sachs and Warner 2001; Boekhout van Solinge 2014b).

5. Paradoxically, Wim continued to state that members of criminal organizations who are involved in the ivory trade should be imprisoned but disputed the fact that "just a couple of birds that illegally pass through the border" was of importance. Wim was sentenced to fifteen months' imprisonment, of which five months were suspended, and to pay a fine of €2,000 in addition to a previous conditionally imposed fine of €10,000.

6. For example, a great deal of the criticism of Cressey's book on organized crime in the United States, *Theft of the Nation*, included issues with the validity of the data.

7. It also happened that my informants were already introduced with false names or nicknames.

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# 9

# INTERDISCIPLINARY INTELLIGENCE MAPPING TO REDUCE CONSERVATION CRIME RISKS

Meredith L. Gore, Gary J. Roloff, Alexander K. Killion, Jonah H. Ratsimbazafy, and Georg Jaster

**EDITOR'S INTRODUCTION:** *The following chapter by Gore, Roloff, Killion, Ratsimbazafy, and Jaster could have easily been included within the first part of this volume given its use of a conservation criminology framework and its discussion on the convergence of conservation crimes (similar to that discussed by Shelley and Kinnard earlier in this part). The authors' use of interdisciplinary intelligence mapping to investigate illegal rosewood logging led to its placement within the second part. While the sophisticated analysis performed by the authors is noteworthy, their use of participatory risk mapping to incorporate ground-level human perspectives is (in my humble opinion) to be the strength of this chapter. Notably, this research also highlights the promise and value of interdisciplinary collaborations in understanding a complex problem.*

Exploitation is a dominant cause of global biodiversity declines, rivaling habitat degradation, climate change, and habitat loss (WWF 2016). The World Wildlife Fund's 2016 Living Planet Index, which measures trends in thousands of vertebrate species, estimated an average 58 percent decline in size of populations between 1970 and 2012. Populations of freshwater species fell by a staggering 81 percent during this time period; marine populations dropped by 36 percent (WWF 2016). Exploitation can occur in multiple forms, including the regulated legal use of natural resources to benefit humans (e.g., sustainable harvest of fisheries), unregulated but sustainable use (e.g., sustainable forest management), and unsustainable illegal use (e.g., endangered species poaching), among others. Illegal exploitation is

currently a major foreign policy issue, with policies often focused on reducing risks to people and the environment.

Interactions between humans and the environment have the potential to pose a variety of risks for both, many of which are discussed below. Risk is a function of the probability of occurrence, severity of occurrence, and outreach associated with occurrence (Sandman 2004). Reducing risk to as low as is reasonably possible is a common policy objective in the environmental sphere; reducing risk through management and communication first requires an understanding of both its technical and perceptual components. In many regions of the world, the high profits and low risk of getting caught associated with illegal exploitation of natural resources have attracted the attention of serious criminals and criminal networks. Sometimes, these criminals are "commodity agnostic" and traffic any contraband that does not require extensive skills or resources, including wildlife. Under this opportunistic business model, natural resources crime can converge with other serious crimes, such as drug or gun trafficking.

## Convergence of Conservation Crimes

Risks associated with conservation crimes can be addressed at strategic (i.e., policy), operational (i.e., procedural), and tactical (i.e., in the field) scales. In the context of conservation crimes, convergence refers to the integration of multiple networks that move illegal goods throughout the world. Convergence is rooted in the intersection of crime and deviance, typically with implications for policy making and on-the-ground practice (Shelley and Picarelli 2010; Shelley and Kinnard, Chapter 5). Convergence is one relevant way for thinking about resolving conservation crime risks at multiple scales. The idea has economic implications, given illicit markets often represent connected problems primarily driven by supply and demand (Miklaucic and Brewer 2013). Key to convergence is the overarching phenomenon of globalization, which enables ready access across national borders, anonymity provided by information technology, and secrecy in international finance (Shelley and Picarelli 2010). Deviant globalization incorporates the underside of transnational integration, including cross-border economic networks that produce, move, and consume drugs, wildlife, counterfeit goods, toxic waste, and humans. These activities take place in the shadows of the licit global economy. Bad actors use the technical infrastructure of globalization to exploit gaps and differences in regulations, law enforcement, or markets for illicit goods and services (Gilman, Goldhammer, and Weber 2013). Convergence relies on the organizing principle of these networks, blends legitimate and illegitimate activities (see van Uhm and Moreto, in press), and recognizes that different illegal markets can employ similar methods for achieving different goals (Shelley and Kinnard, Chapter 5). Through conver-

gence, illicit actors have expanded their activities through the global commons in all environments, including cyber (Miklaucic and Brewer 2013). Because convergence is fundamentally economic, it conceptualizes illicit markets as connected problems whose impacts are more important than the criminal actors themselves. Convergence promotes thinking about the extent to which illicit goods pass through the same physical space, same border crossings, and same specialized groups of handlers for specific jobs. The flow of goods and cash for these goods is circular, and flow is not usually limited to a single commodity (Farah 2013).

Convergence is relevant to natural resources, including wildlife, fisheries, minerals, and timber. In some instances, criminal organizations and other serious criminals participate in competition for natural resources even if they are on the margins of the illicit market rather than in the center. Many actors are involved in exploiting natural resources in these contexts. The end of easily accessed resources and the increase in profits that results can encourage even more extensive involvement of organized crime either in legal exploitation or in thefts and diversion of projects after they have been obtained illegally. In Liberia, for example, timber and diamonds have flowed through interrelated networks to different markets while weapons, uniforms, food, and fuel flowed through different groups of brokers and facilitators. Importantly, although convergence of conservation crimes with other crimes can occur, it is not a universal occurrence (Farah 2013).

One implication of illicit goods convergence within the context of deviant globalization is that conservation crimes such as illegal logging and wildlife trafficking can be defined, regulated, and prosecuted as transnational organized crimes (Nellemann et al. 2014). Prior to evidence that conservation crimes converged with other serious crimes, the suite of policy and programmatic responses were limited; broadening the aperture about what constitutes a serious crime and how serious crimes overlap with other crimes enables policy makers and law enforcement authorities to wield new tools (e.g., foreign asset control, financial sanctions, prosecutory mechanisms, laws) to reduce risks from conservation crime. Convergence informs targeting interventions at certain areas of the illicit supply chain (see Table 9.1), but more research is needed that explores the conditions that perpetuate such links. When these links exist, convergence can also inform what the criminal architecture looks like. Understandably then, the knowledge base on convergence is expanding; extant literature explores convergence (and lack thereof) between crimes including drug trafficking and terrorism (Shelley and Picarelli 2010). Investigating convergence of conservation crimes such as wildlife trafficking and illegal logging is a more recent phenomenon (Gore 2017), providing an improved understanding of the illegal activities that can inform efforts to disrupt illicit networks and supply chains. To combat the ground-level threats posed by converging illicit networks, more intelligence

**TABLE 9.1. KEY COMPONENTS OF THE CONSERVATION CRIMINOLOGY APPROACH TO UNDERSTANDING THE ILLEGAL ROSEWOOD SUPPLY CHAIN (GRAY SHADING) BETWEEN MADAGASCAR (SOURCE) AND CHINA (DESTINATION), INCLUDING OPPORTUNITIES FOR CONVERGENCE**

| Component | Source | Supply Chain | | | Destination |
|---|---|---|---|---|---|
| Location | Forests and forest periphery in Madagascar | Local to periurban/ urban | Staging areas | Port | Urban sale |
| Task | Harvest and bundle logs | Move logs to staging area | Prepare paperwork, shipping container, other logistics | Clear customs and security at departure and arrival destinations | Warehouse or point of sale |
| Role | Loggers | Consolidators | Consolidators | Consignors and consignees | Wholesalers |
| Contact requirements | Loggers | Local transporters | Freight logistics | Customs | Wholesalers |
| Select opportunities for convergence | | Financiers with political and social capital who corrupt agents in the judiciary and law enforcement agencies and ensure protection of cargo; and employees and collectors who pay and collect contraband from loggers.<br><br>Nationals with political and social capital to collect, sort, package, and transport logs; freight forwarders.<br><br>Consignors and consignees sign for cargo and are often from import-export shell companies that conduct no business but process paperwork and commingle illicit goods with licit goods. | | | |

**TABLE 9.2. THEORIES, TECHNIQUES, AND METHODS FROM THE FOUNDATIONAL DISCIPLINES USED IN CONSERVATION CRIMINOLOGY FOR THE CASE STUDY OF ILLEGAL ROSEWOOD LOGGING IN MADAGASCAR (INCLUDES GENERAL DESCRIPTION AND APPLICATION OF THE THEORIES)***

| Foundation discipline of conservation criminology | Select theories, techniques, or methods used in case study | General description | Application |
|---|---|---|---|
| Natural resources policy and management/ conservation biology | Forest ecology | The ecology of wooded areas, including the community ecology of trees and other plant and nonplant species and ecosystem processes and conservation. | Spatial composition and distribution of trees in protected areas according to remotely sensed imagery data, which is a form of geospatial intelligence. |
| | Landscape ecology | The study of ecological pattern and process over space and time. | Observed a spatial and temporal pattern of illegal tree harvest, subsequently modeled the processes associated with the crime and moving the illegal product to port. |
| | Hydrology | Focuses on the distribution of water in the subsurface, surface, and atmosphere, the chemistry of water, and the effects of climate on the water cycle. | Remotely sensed imagery data about landscape attributes including elevation, soil type, and forest cover. |
| Criminology/crime science | Routine activity theory and environmental criminology | Focus on circumstances in which offenders carry out criminal acts, including the overlap in space and time of likely offenders, suitable targets, and absence of capable guardians against crime. | Participatory mapping-based spatial identification of precious wood tree stands within protected areas, location of ranger stations, logger campsites, and transit routes. Data is a form of human intelligence. |

(*Continued*)

| TABLE 9.2. (*CONTINUED*) | | | |
|---|---|---|---|
| **Foundation discipline of conservation criminology** | **Select theories, techniques, or methods used in case study** | **General description** | **Application** |
| Criminology/crime science | Situational crime prevention and crime pattern analysis | Primarily preventive strategies that work to reduce the criminal opportunity that arises from the routine activities of life. Assumes geospatial patterns or concentrations of criminal opportunities; crime arises from an underlying spatial framework. | Participatory-based spatial identification of rivers and roads used to transport cut logs to coast as well as stockpile locations. Data is a form of human intelligence. |
| Risk and decision science | Risk analysis | Focuses on determining how large the risks are and what causes them based on observation and inference about the magnitude of risks. | Geospatial analysis of weighted risk surface identification of vulnerable tree stands into a risk-based heat map. |
| | Risk ranking | Technique for prioritizing risk outcomes, usually to inform decision making and risk management or compare risks. | Consensus-based rank of relative risk from illegal logging ranging from 1–3 for each strand of rosewood trees. |
| | Risk communication | Processes for sharing information in order to make risk decisions, including one- and two-way consultations, targeting people with messages, or seeking input. | Participatory risk and intelligence mapping of illegal rosewood logging among experts and villagers. |

*Interdisciplinary intelligence mapping is included in the application column.

is needed about the opportunity structures that underlie the networks (Miklaucic and Brewer 2013).

This chapter focuses on illegal rosewood logging in Madagascar and how the concept of convergence can be used to help identify opportunities to reduce illegal rosewood trafficking. Rosewood is the world's most illegally trafficked product, according to the United Nations Office of Drugs and Crime, accounting for a third of all seizures by value, more than elephant ivory, rhino horn, pangolins, lions, and tigers put together (UNODC 2016). Madagascar is home to multiple endemic species of Malagasy rosewood. The theories, methods, and analysis techniques discussed herein and within the context of illegal rosewood logging help build the knowledge base about the opportunity structures that may underlay convergent natural resources crimes. In this way, insights from this illegal logging case study may be adapted to better understand wildlife crime. First, we detail the context and scale of a conservation crime: illegal rosewood logging in Madagascar. Next, we explain how key principles from: (1) natural resources policy, management, and conservation biology, (2) criminology and crime science, and (3) risk and decision science informed our research (Table 9.2). After presenting and discussing the implications of our results, we broadly review the implications for practice and policy with an eye toward convergence.

## Risks Associated with Illegal Logging in Madagascar

Botanists currently estimate there are forty-seven rosewood species within the genus *Dalbergia*, ten of which are found in Madagascar (Missouri Botanical Garden 2016). The unique and vibrant color, outstanding resonance, and heavy hardwood properties makes it desirable for furniture and musical instruments. In 2014, a metric ton of furniture-grade Malagasy rosewood sold for approximately US$25,000. Less than 1 percent of the profit from the completely illegal trade remains within Madagascar (EIA 2014).

Logging has a long history in Madagascar. Historical records date legal foreign exports as early as 1902 (Patel 2010); logging of hardwoods was banned in protected areas in 2000. Contemporaneously, foreign exports of Malagasy rosewood occurred at relatively low levels between 1998 and 2007 (i.e., one thousand to five thousand tons). Exports jumped to thirteen thousand tons in 2008 and thirty-five thousand tons in 2009. In 2009, when Madagascar experienced its most recent political crisis an estimated one hundred thousand rosewood trees were cut from Masoala, Marojejy, and Manarana National Parks and the Makira Conservation Site (Patel 2010). Illegal logging continues today in spite of a national ban on cutting and export of rosewood and ebony trees (i.e., under Malagasy Decree #2010–141), and international trade restrictions under the Convention on International Trade in Endangered Species (CITES 2016). Stockpiles from seizures in various towns and

seaports in northern Madagascar are valued at approximately US$90 million (EIA 2014).

The supply chain for illegally logged rosewood is not unlike that used for other illegal natural resources such as wildlife in that there are discrete suppliers, stockpiles, transport nodes, and consolidators (Miller, Vira, and Utermohlen 2015). Madagascar lacks a well-maintained paved road network; over 85 percent of roads were unpaved in 2010 (CIA World Factbook 2016). Generally, trees are hand sawed into movable pieces that are rolled or dragged to the nearest waterway. At the edge of the water, buoyant tree species are felled and lashed to the rosewood to aid flotation (Patel 2007). These logs then travel the river network to the coast where they are stockpiled near the beach until smaller boats can transport them to container ships, often destined to China (Patel 2007).

There are multiple risks to people and the environment associated with illegal rosewood logging in Madagascar. Environmentally, selective logging results in removal of rare, mature, endemic trees, culminating in reduced tree species richness and genetic diversity, collateral loss of buoyant tree species to float logs, and increased susceptibility of impacted areas to burning, bushmeat hunting, invasion of persistent and dominant nonnative plant species, impaired habitat for animals, and diminution of endemic mammalian species richness (Brown and Gurevitch 2004). For example, lemurs are often poached around illegal logging camps, and loss of trees degrades habitat quality (Butler 2010).

Risks to humans from forests degraded by rosewood logging likely include loss of some ecosystem services including nontimber forest products, erosion protection, pollination, and watershed protection (Foley et al. 2007). Ecotourism, which is heralded as a primary driver of sustainable development in biodiversity hotspots such as Madagascar, is directly threatened (Ormsby and Mannle 2006). Illegal logging reduces forest aesthetics and ecotourism operators have been subject to increased scrutiny by corrupt local officials who may support the illegal industry. Illegal logging deprives the government of taxable revenue and can result in exploitation of workers (Global Witness 2009). Relative to the value of the logs and potential risks incurred, loggers receive proportionately low profits from the activity, although at approximately US$5 a day the income is comparatively high (e.g., more than 92 percent of the population lives on less than US$2 a day; World Bank 2015). The promise of higher daily wages attracts economic migrants to villages that border protected areas containing rosewood, contributing to population increases in these areas by individuals that are not interested in long-term viability of the local community. Rosewood logging is both a cause and a consequence of corruption within Madagascar (Gore, Ratsimbazafy, and Lute 2013). There is increased evidence of convergence of illegal rosewood logging with other transnational organized crimes including drug

and gemstone smuggling (EIA 2014). In some instances, such as heroin trafficking, Madagascar serves as a transit country (Uranie 2015).

## Reducing Risks to People and the Environment from Illegal Rosewood Logging

Reducing risks to people and the environment from illegal rosewood logging is a global priority; the solution includes the conservation, sustainable development, foreign policy, and law enforcement sectors at a minimum. The Stimson Center, a nonpartisan policy research center working to solve threats to security, labels the problem of illegal logging, combined with illegal fishing, mining, and wildlife trafficking, as "natural security." Diverse strategies and tactics exist for achieving the goal of "natural security" or reduced risks to people and the environment from conservation crimes. Identifying the diversity of entry points available for economic, legal, educational, or other interventions requires knowledge of the threat landscape and operating environment (Gore and Knuth 2009).

Conservation criminology is one interdisciplinary and applied paradigm for understanding programs and policies associated with global conservation risks (Gore 2017). By integrating principles from natural resources management, risk and decision science, and criminology (Table 9.2), conservation criminology–based approaches ideally result in natural security through improved environmental resilience, biodiversity conservation, and secure human livelihoods. Conservation criminology is academically related to green and environmental criminology in that it focuses on environmental problems (e.g., water pollution, illegal logging; see Brisman and South, Chapter 1). The conservation criminology framework is distinct from its academic family in a number of ways. A complete discussion of the similarities and differences is beyond the scope of this chapter, but see Gore (2017) for more information. Some key unique features relevant to this chapter are provided here.

First, conservation criminology often explores or incorporates solutions that lie beyond the scope of the rule of law such as a theory of change-based behavioral intervention (e.g., Gore and Knuth 2009). Second, individual or psychological perspectives on human behavior are sometimes incorporated as a means of understanding why individuals do not act rationally when they break rules (Gore et al. 2007). Third, conservation criminology can involve equities beyond victims and perpetrators, such as ecosystems (e.g., wetland) and ecosystem processes (e.g., carbon cycle). It is also noteworthy that conservation criminology relies heavily on field-based research where the field is often a remote or relatively rural location. Using conservation criminology promotes thinking about preventing *and* responding to illegal logging risks. This thinking is promoted by combining disciplines that compensate for in-

dividual deficiencies (e.g., a focus on ecological processes versus a focus on crime control) and build upon commonalities (e.g., mapping is a tool applied across disciplines). Specifically, and for this case study research, our conservation criminology approach incorporated at least three theories, techniques, and methods from natural resource management, two from criminology and crime science, and three from risk and decision science (Table 9.2). Attributes from this suite were incorporated into the theoretical justification for this research, data collection and analysis methods, and interpretation of results. The underlying assumption of the conservation criminology approach is that consideration of multiple domains of illegal logging (the conservation, criminological, and risk dimensions) makes it possible to uncover sustainable solutions. Further, the multiple foundations of conservation criminology must be consistently integrated with each other throughout the research process versus a stepwise or iterative fashion.

Opportunity perspectives on crime recognize the broader role that a situational landscape plays in producing crime. Context matters and opportunity is one factor influencing crime. In this regard illegal logging, wildlife poaching, and other environmental crimes are like other crimes in that they are the result of motivated offenders seizing criminal opportunities they encounter or seek out (Moreto and Lemieux 2015). The existence of criminal opportunity is a requirement for a crime to occur. This perspective facilitates thinking about how criminal opportunity structure(s) for illegal logging are developed and exploited by crime syndicates (Cohen and Felson 1979). Building on this premise, routine activity theory (RAT) (Clarke and Felson 1993) and environmental criminology, to an extent, proposes illegal logging can be viewed as a criminal opportunity involving three groups: offenders, targets, and guardians. Crime opportunities are highest when suitable targets (i.e., victims) and offenders (i.e., perpetrators) meet in the absence of capable guardians (i.e., authorities). Focusing on the opportunity structures that enable crime events to occur identifies crime patterns. These crime patterns are mirrored in other environmental crimes, such as wildlife poaching and trafficking; in this regard, RAT enables thinking about "convergence" of conservation crimes with other crimes such as drug or human trafficking.

Opportunity structure theories of crime build understanding for intervention by focusing on how to dismantle the architecture enabling illegal logging as well as address the dispositions of offenders. RAT-based strategies aim to improve capacity of guardians across the environmental risk landscape to deter offenders with their presence or intervene during commission of a crime such as illegal rosewood logging. For example, patrols can be directed into areas preferred by illegal loggers to increase apprehension or guardians can decrease response times to illegal logging reports. Community-based conservation promotes thinking about guardianship in a liberal way. For example, faith-based organizations including Catholic Relief Services or the

African Indigenous Church have embarked on innovative partnerships to protect wildlife in Africa (e.g., Invisible Children and Catholic Relief Services' Lord's Resistance Army Crisis Tracker). The religious community is not commonly considered to have equity in environmental crime solutions, perhaps to the detriment of meaningful impacts on crime rates.

Intelligence mapping (IM) is one mechanism for visualizing routine activity data to enhance decision-making processes and communication about risks. In this regard, IM contributes to and draws from both the criminological and risk-based foundations of conservation criminology. IM, among other outcomes, enables risk assessment across a geospatial threat landscape and identifies entry points for research, intervention, planning, or evaluation. IM is currently used to provide strategic, tactical, and operational advantages to policy makers, war fighters, intelligence professionals, and first responders (National Geospatial Intelligence Agency 2016). Key to IM is the notion of all-source intelligence or incorporating multiple sources of information into a decision-aiding tool. One example might be a product that incorporates human resources intelligence, imagery intelligence, measurement intelligence, signals intelligence, and open source data in the production of finished intelligence. Fusing information for the benefit of decision making provides a context-specific and holistic perspective of the problem, and thus the solution set.

The conservation and sustainable development sectors have long used mapping to assess and address wildlife poaching (Kahler, Roloff, and Gore 2013; Herlihy and Knapp 2003). The technique has also been applied within the criminological domain (Liebermann 2004). More novel, however, is integrating all of these approaches to characterize the threat landscape and the operating environment of illegal rosewood logging. Here, we profile our efforts to conduct interdisciplinary IM to reduce illegal logging risks in Madagascar. Our problem set, illegal logging, draws on landscape and forest ecology, so, in this regard, IM also contributes to the natural resources foundation of conservation criminology.

Previous forest risk assessments in Madagascar identified general areas most vulnerable to future illegal logging and lemur extinctions (Barrett et al. 2010; Schwitzer et al. 2014). However with widespread corruption at provincial levels and lack of long-term government stability, focusing enforcement efforts at a local level may prove more effective at proactively reducing negative effects of illegal logging on ecosystems and people (Gore et al. 2016). Fine-scale assessments incorporating data from multiple intelligence sources can contribute to enforcement that directly results in protecting trees before they are felled. The overall lack of holistic and fine-scale IM for conservation crime is problematic because the activity can focus strategies and tactics in specific areas where trees are vulnerable to exploitation. Fine-scale IM can be generated through a combination of high-resolution remote sensing, local

knowledge, and an intricate understanding of the illegal logging process. We integrated remote sensing and modeling capabilities, information from interviews with local Malagasy, and expert knowledge on how illegal logs are moved throughout the landscape into an IM activity for illegal logging to better inform communal enforcement efforts.

## Intelligence-Based Vulnerability Assessment

In August 2014, we engaged in field-based participatory risk mapping (PRM) with two groups in Manopana, Madagascar. The first group was composed of a mix of forest conservation experts, protected area managers, conservation society professionals, forest rangers, federal and local law enforcement officials, and conservation civil society representatives. The second group was composed of local villagers who self-identified as not being members of the first group.

Data collection, entry, and analysis were modeled after Kahler, Roloff, and Gore (2013). Experts traveled to a regional hotel for PRM activities and researchers traveled into village centers for village activities. Two large, color base maps of the region were placed underneath clear plastic overlays for all PRM activities (i.e., once with two groups of experts and once with two groups of villagers). New overlays were used for the village PRM exercise because it occurred after the expert exercise. Participants used colored grease pencils and markers to map the physical location of suitable targets (e.g., trees), motivated offenders (e.g., villages), and guardians (e.g., rangers, park authorities). The general categories (i.e., targets, motivated offenders, guardians) were defined by the researchers, but the exemplars were discussed and agreed upon by mappers before they started mapping. Stockpile locations, transit routes, and other locally meaningful places were also mapped. Next, PRM groups ranked illegal logging risks using a three-point scale (i.e., high to low risk) and recorded the number of group members in agreement with the risk ranking. The four plastic overlays were digitized for analysis and the base maps were left with participants. All stages of research adhered to human subject protection protocol requirements.

Next we georeferenced data recorded on the PRM overlays and evaluated those locations using publicly available remotely sensed imagery data in a geographic information system (GIS). We calculated distances from locations identified as vulnerable to illegal logging in the PRM to a variety of different landscape features. Using a case-control statistical design, which is a type of observational study in which two groups with differing outcomes (in our case, illegal harvest area or not an illegal harvest area) are identified and compared. We produced the data required for a conditional logistic regression model (Hosmer and Lemeshow 2000; Manly et al. 2002). This type of model relies on the bivariate output derived from the case-control statistical design and

can incorporate stratification (e.g., by drainage basins) into the analysis. We found that areas ranked as being the most vulnerable to illegal logging by PRM participants were significantly closer to rivers ($p < 0.001$), the coastline ($p < 0.001$), and protected areas ($p < 0.001$) compared to random locations. This finding was consistent with evidence from other studies that indicated the transportation network for illegally cut logs in Madagascar was exclusively through the river and stream networks, which deliver logs to the coastline (Rasarely et al. 2005; Patel 2007). Given this set of important landscape-level predictor variables, we subsequently modeled a risk surface in GIS. The risk surface represented the potential transportation effort required to move illegally cut logs throughout the study area.

While PRM and our companion modeling process provided a map of where illegal logging was likely to occur based on coarse landscape features, we still lacked spatial information on where unharvested rosewood might occur. To model where rosewood may exist, we again used remotely sensed data on forest cover and combined that information with elevation and soil type to identify areas with favorable rosewood growing conditions (Missouri Botanical Garden 2009). This process resulted in a map of locations that supported forests and had the geophysical conditions suitable for growing rosewood. We subsequently assigned a risk score to each map cell (30m resolution) with the potential to grow rosewood, where the score was based on the amount of effort needed to move a rosewood log to the coastline. We estimated this effort using least-cost path analysis and elevation data. This process treats each potential rosewood map cell as a drop of water and simulates the flow of that drop across the landscape terrain, into a water network, and eventually to the coast. Risk scores were standardized on a one-to-ten scale to describe the relative amount of effort to move each log, where one corresponded to low and ten corresponded to high effort (Figure 9.1).

We subsequently used hydrological models (Merwade 2012) to delineate watersheds and subwatersheds for comparing the risk of illegal rosewood logging across broader areas. This was our attempt to scale the risk results to operational levels. Because rosewood movement through the Malagasy landscape is strongly constrained by topography, we believed that watersheds and subwatersheds were a more realistic portrayal of wood flow compared to administrative or sampling boundaries. We subsequently summed the risk scores for potential rosewood logging within each subwatershed to identify high-risk areas (Figure 9.2). To ensure that subwatersheds of varying sizes were comparable to each other, we standardized our scores by watershed area. Our results revealed several choke points where a high volume of rosewood was likely to move through on the way to the coastline (Figure 9.2). The resultant map also identified areas where increased protection and patrolling could be focused on preventing logs from being felled in the first place.

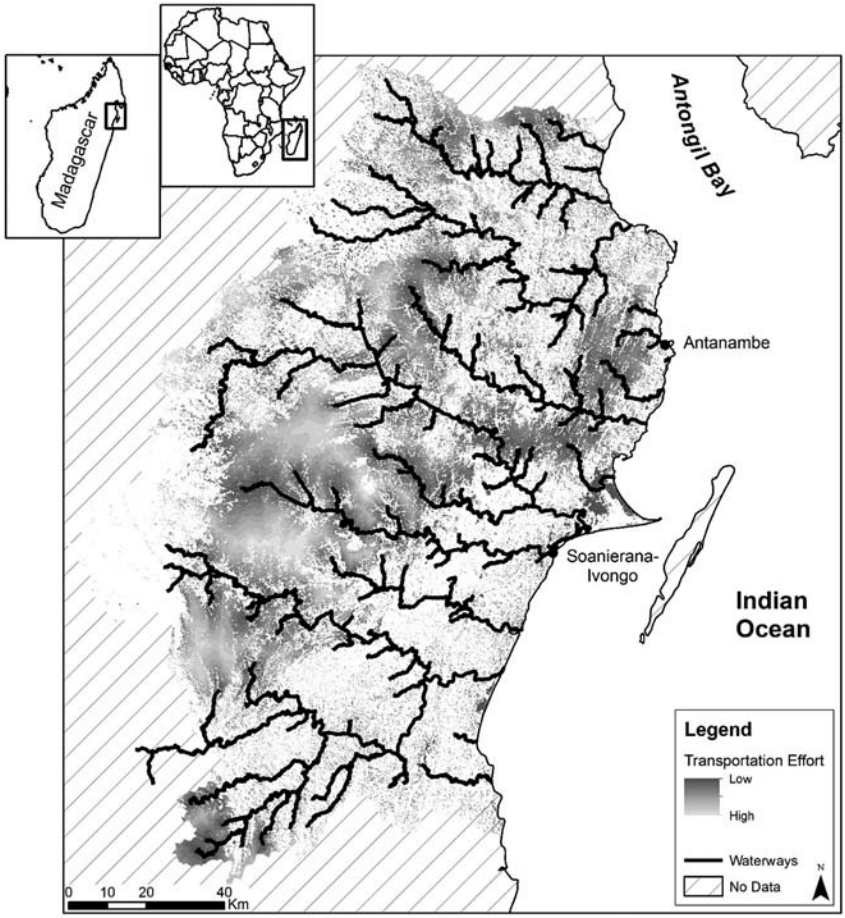


**Figure 9.1** Transportation effort needed to move illegally cut rosewood to the coast in Madagascar. Low transportation effort corresponds to high risk of illegal logging. This risk surface incorporates distribution of predicted rosewood locations based on forest cover, elevation, and soil type and a least-cost path to waterways and distance from coastline.

## Strategies and Tactics Emerging from Interdisciplinary Intelligence Mapping

Interdisciplinary IM can enable precision targeting of the opportunity structure underlying conservation crimes. This means the focus of interventions can be the crime and not the criminal. Identifying geospatial overlap of suitable targets, lack of guardians, and motivated offenders promotes implementing preventive techniques that target the crime situation (e.g., Clarke's (1995) twenty-five techniques of situational crime prevention; see also Pires and Moreto 2011). This is a particularly important point, given the environ-

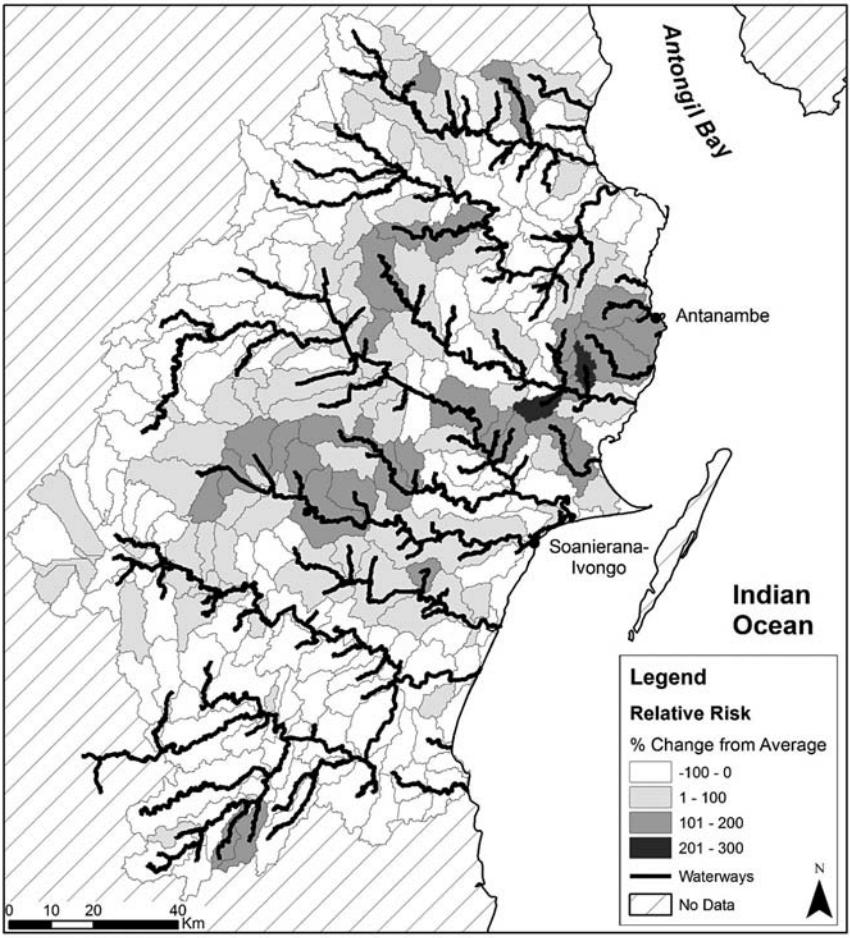


**Figure 9.2** Relative risk of illegal rosewood logging by subwatershed in eastern Madagascar. Subwatershed relative risk scores were derived from the distribution of predicted rosewood locations and based on a least-cost path to waterways and distance from coastline.

mental injustice and moral issues associated with criminalizing the behavior of individuals on the supply side of the supply chain (Duffy 2010). Further, low-level supply side actors are disproportionately trying to survive among the backdrop of poverty, geopolitical instability, or food insecurity (Duffy 2010; Gore 2017). It is also possible some individuals are coerced into illegal exploitation (Lambrechts and Goga 2016; Hodal 2016). This portends implications for "perpetrator displacement," which theoretically suggests that due in large part from poverty, there will always be a steady supply of individuals who will replace anyone arrested for illegal logging (Bowers et al. 2011). Roe

(2008) provides a cogent review on the conservation-poverty debate with implications for policy.

Illegal exploitation of natural resources, including illegal logging and wildlife poaching, may be more susceptible to certain types of crime displacement than others. Protected areas such as national parks are fundamentally designed to be refuges for critically endangered ecological communities and species; they generally are large, remote, have few access points, and have low human population density. The existence of a protected area serves to conspicuously identify the location of endangered species, although measuring and monitoring species as well as enforcement efforts can be notoriously challenging (Balmford et al. 2005). As was the case when large amounts of rosewood were illegally logged from national parks during Madagascar's 2009 political crisis, and based on our PRM, regions in and around protected areas are still at high risk. These design features create low barriers to temporal and spatial crime displacement, where criminal activity is easily perpetrated at different times of day or committed in new locations. Perpetrator displacement, where a new criminal replaces an apprehended one, also seems feasible in the illegal logging context (Bowers et al. 2011). The conservation poverty hypothesis (see Roe 2008 for review and critique) suggests that when few livelihood alternatives to natural resource exploitation exist and exploitation is not a highly skilled activity, conservation crime may be increasingly seen as a low-risk, high-reward activity (Nellemann et al. 2014). In Madagascar, logging, including rosewood, has a long history that is closely tied with political leadership and power (see Raik 2007). The extent to which crime displacement is occurring within the conservation context is an untested empirical question. However, in the case of illegal rosewood logging in Madagascar, engaging in interdisciplinary IM created a holistic and context specific picture of the problem that can inform such inquiry.

IM may not always be useful for thinking about conservation crime (Lélé and Norgaard 2005). In our instance, interdisciplinary IM produced novel and noteworthy information. In using multiple methods to identify the convergent facets of the problem (e.g., PRM with expert and local stakeholders), we built understanding about the preferences and decision making of motivated offenders. IM also served as a mechanism for joining expert and local knowledge about illegal logging. Particularly where conservation-related risks are a concern, differences between expert and local knowledge can be expected (Gore et al. 2006, 2016). The ecologically based rosewood distribution model identified potential targets for future crime, and results from the analytical framework identified geospatial opportunities for crime. Hydrologic modeling approaches produced an understanding of how landscape configuration constrains offenders along the supply chain. Two solution sets emerged. First, we identified vulnerable forest areas where guardians could be deployed to help prevent crime opportunities from ever occurring. Second,

we identified geospatial pinch points along the supply chain that could be broken to make it nearly impossible to move large volumes of wood to the coast. Interdisciplinary IM may be what is ultimately needed to move the needle between strategic and tactical conservation interventions to reduce conservation crime risks that converge with other illicit crimes.

Declines in the distribution and abundance of natural resources such as timber, wildlife, or minerals are a cause and a consequence of social conflict around the world (Brashares et al., 2014). Reducing risks to people and the environment from illegal exploitation is a global policy objective. Conservation criminology is one interdisciplinary approach for thinking about the problem. In this chapter, we applied principles from natural resource management, criminology, ecological modeling, and risk science to the case of illegal rosewood logging in Madagascar. Interdisciplinary IM helped crystalize the problem set by synthesizing multiple sources of information and concomitantly offering a retrospective and prospective visualization of illegal rosewood logging. Exciting opportunities remain to apply our approach to other conservation crimes, including wildlife trafficking or illegal fishing. Perhaps with interdisciplinary approaches such as those discussed herein the negative effects of illegal logging risks may be reduced. Future testing and exploration of interdisciplinary IM in other conservation contexts such as wildlife crime could help expand the knowledge base and intervention tool kit.

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# ADOPTION OF CONSERVATION TECHNOLOGIES

Nicole Sintov,
Viviane Seyranian,
and Milind Tambe

**EDITOR'S INTRODUCTION:** *The role of technology has increasingly become a focal point in conservation. Questions related to the effectiveness, sustainability, and feasibility of specific forms of technology are often at the forefront of discussion. This is especially the case in situations where technology has been suggested as a means of reducing illegal activities within protected areas, while also bolstering law enforcement efforts in such rural settings. In this chapter, Sintov, Seyranian, and Tambe describe their experiences addressing another important issue within the scope of conservation technology: front line adoption. Based on their implementation of a security game software program to aid rangers in Indonesia, the authors discuss the importance of understanding and addressing conservation-focused technology adoption, resistance, and diffusion through education efforts. As shown in the next part, incorporating and understanding conservation personnel perspectives is crucial in implementing front line initiatives.*

New technologies can considerably aid efforts to combat wildlife crime. Although technologies have assisted conservation efforts for decades, in recent years, standardized spatial data captured digitally have enabled new ways of utilizing and maximizing data value. For instance, handheld GPS devices can gather geotagged photos (Lemieux 2015); unmanned aerial vehicles (UAVs, or drones) with infrared technology can quickly scan large swaths of protected areas for illegal activity (Air Shepherd 2016); the

Management Information System (MIST) and Spatial Monitoring and Reporting Tool (SMART) allow wildlife law enforcement rangers (hereafter referred to as rangers) to digitally record data while on patrol, including signs of wildlife, patrol effort, and illegal activities (Smart Partnership 2015). Insights gleaned from these tools can improve detection of as well as reduce illegal activity (Critchlow et al. 2015; Hilborn et al. 2006; Jachmann 2008), underscoring their value to conservation efforts.

As helpful as these emerging conservation technologies can be, they will not curb wildlife crime in isolation. Rather, their success hinges in large part on adoption and proper use by humans. As a case in point, although UAVs are available to assist in aerial patrols, if no agency responsible for patrolling protected areas is willing to use or even try them, their conservation potential will not be realized. Similarly, if a conservation agency decides to adopt SMART but uses it inconsistently, the resulting data and conservation insights will be limited. Consequently, there is an urgent need to understand the ways in which individuals interact with these and other conservation technologies. Toward this end, and in line with prior work, we argue that the social sciences (Bennett et al. 2016; Berkes 2004; Gore 2011; Mascia et al. 2003; Moreto 2016; Moreto, Introduction) are integral to conservation efforts. In particular, psychology can advance our knowledge of the human-technology interface and shape productive partnerships between humans and technologies in the fight against wildlife crime.

In this chapter, we focus on technologies that support the fight against poaching, which we define as the illegal acquisition of wildlife resources in line with previous work (Eliason 2004). Additionally, we center our discussion on a key group of individuals: rangers. Although rangers play an essential role in wildlife security efforts, very little research has focused on their experiences (Eliason 2007; Moreto 2017; Moreto et al. 2017; Singh, Long, and Moreto, Chapter 13). In particular, little is known about factors that may contribute to rangers' acceptance and adoption of new conservation technologies that can help them conduct patrol activities. Without an understanding of this dynamic, the technologies may never reach the hands of the field practitioners who can use them to improve conservation outcomes.

In the remainder of this chapter, we outline fundamental challenges in wildlife security resource allocation. We describe emerging technologies designed to aid in such efforts, and the results of field tests of these tools in various settings. Next, we propose a framework for systematically transitioning conservation technologies from research to field settings, focusing on technology adoption among rangers as a case study. We describe our efforts implementing an educational intervention to aid in this process and end with recommendations for future work on the dissemination of conservation technologies.

## Challenges in Wildlife Security Resource Allocation

Given the challenges inherent to wildlife protection, a ranger's job is not easy. Rangers conduct patrols over vast, inhospitable areas. Second, limited security resources are typically available, often far less than is needed to adequately cover entire protected areas (Eliason 2011). Additionally, rangers' time may also be spent dealing with non-wildlife-related offenses, such as drug activity (Eliason 2007). Hence, rangers must make difficult decisions about which areas to patrol and which to leave unguarded. As a result, it is not possible to achieve 100 percent security by protecting all targets at all times. Instead, ranger patrols must be deployed strategically, taking into account: (1) differences in the importance of subareas of a given protected region; (2) the responses of attackers (i.e., poachers) to different ranger deployment strategies; and (3) potential uncertainty over the types, capabilities, knowledge, and priorities of poachers.

Wildlife law enforcement managers may deploy ranger foot patrol teams using several approaches. They may rely on data from past patrols, use past experience as a guide (e.g., patrolling locations where criminal activities are suspected), leverage informant intelligence, or respond in real time to pressing circumstances (Moreto and Matusiak 2017). These strategies involve varying levels of ad hoc decision making by wildlife law enforcement managers, and can fall short of the methodical, systematic approach that is needed to adapt to changing conditions (Jachmann 2008). As a result, a common strategy for deploying patrols often entails sending rangers to patrol areas that are thought to be wildlife crime "hot spots." This approach not only requires considerable effort and time but also can be predictable and may not get updated frequently, thereby allowing poachers to exploit patrol patterns and limiting conservation success. As a result, rangers can feel overworked and experience high job stress (Moreto 2016).

## Ranger-Based Data Collection and Patrol Technologies

Data can assist with the strategic deployment of ranger foot patrols. Ranger-based data collection systems have been in use for decades to gather basic information on patrol effort (e.g., person-hours), patrol locations, illegal activity encounters, and trends in animal populations (Bell 1985; Jachmann 2008; Jachmann and Bell 1984; Keane, Jones, and Milner-Gulland 2011). Even when gathered in paper-pencil format, such data can aid considerably in conservation efforts. For instance, in Ghana, summaries of basic patrol information were provided to rangers as performance feedback, resulting in enhanced ranger effectiveness and reduced illegal activity compared to control sites (Jachmann 2008). Another study used fifty years of basic patrol data from Tanzania to map trends in poaching effort, patrol efforts, and species

abundance (Hilborn et al. 2006). Supporting the value of wildlife law enforcement, this study found that increased antipoaching enforcement efforts, which were enabled by higher wildlife park budgets, were associated with reduced poaching activity and increased species abundance.

More recently, tools that capture data digitally in standardized formats have substantially facilitated data collection in protected areas. For instance, handheld GPS devices have been used to gather geotagged photos (Lemiuex 2015), which can be used in a wide range of settings and can capture a large amount of situational data that can be used as evidence in prosecution. In addition, MIST and SMART allow rangers to digitally record data while on patrol, including signs of wildlife, the patrol effort, and illegal activities (Smart Partnership 2015). Furthermore, SMART provides a standardized approach to data collection, enabling meta-analysis at all levels from protected area networks to regional species assessments and global evaluations. Globally, SMART is in use at over 140 sites in thirty-one countries of which eight countries have adopted SMART across their entire national protected area network (Smart Partnership 2015). Such data can be used to inform patrol deployment, which can be more effective and efficient than ad hoc scheduling. For instance, Critchlow and colleagues (2015) leveraged fifteen years of SMART and MIST data from Uganda to develop alternative patrol deployment strategies. Field tests of these patrols were associated with higher rates of illegal activity detection in some test sites, suggesting the value of data-based patrol deployments.

Although ranger-based data collection can provide significant support to aid patrol activities, they suffer from a number of limitations (Keane, Jones, and Milner-Gulland 2011; Stokes 2010). First, even the most advanced ranger-based data collection tools look backward in time, providing information about where patrols, illegal activity, and wildlife were observed in the past. Past poaching activity is not always indicative of future poaching activity, and furthermore, these forms of data collection do not account for rapid detection of spatiotemporal changes in protected areas, nor the dynamic interactions between poachers and ranger patrols. Therefore, current ranger-based data collection tools are limited in their ability to predict where illegal activity will occur in the future, as well as provide recommendations for future patrol deployments that account for such predictions.

## Computational Game Theory and Security Games

Ranger patrol efforts could benefit from tools that extend current technical capabilities to systematically anticipate where wildlife crime will occur. In recent years, such predictive tools have been developed and successfully deployed to enhance security in other domains, namely in critical infrastructure settings such as airports (Pita et al. 2008) and seaports (Shieh et al. 2012).

Rooted in computational game theory, these technologies employ security games (Tambe 2011) to model the strategic interaction between two self-interested actors, a defender (e.g., ranger) and an adversary (e.g., poacher). These interactions between rangers and poachers are cast as a game that can be solved computationally, whereby rangers create (dis)incentives to poaching by increasing uncertainty/cost to poachers. The basic idea is that poachers who surveil an area will gather information on when and where rangers (and wildlife) will be present; they will plan their attacks accordingly to avoid ranger presence. In addition to accounting for information on context (e.g., topography) and targets (e.g., wildlife), security games aim to break the attacker's strategy by scheduling rangers' patrols in a randomized fashion that is unpredictable to attackers who may be observing, distributing the probability of patrol coverage both geographically and temporally. Hence, security games address a fundamental security challenge inherent in wildlife security, which is the fact of having limited security resources (e.g., rangers) and vast areas to protect.

As a brief example, a security game in the wildlife domain involves the following: wildlife law enforcement management allocates security resources (i.e., ranger patrol teams) to protect a set of critical targets (i.e., subareas within a protected area) of varying importance. Higher value "targets" may be subareas that have higher biodiversity, larger numbers of animals, protected species, and/or are easier to access (requiring less effort/cost). The ranger deploys a mixed strategy, which optimizes for all possible combinations of covering targets (Kar et al. 2016). Security games also generally assume that the poacher conducts some surveillance on the area, noting both the potential rewards (e.g., the wildlife targets) as well as risks (rangers' strategy; Moreto, Brunson, and Braga 2015) before selecting a target to attack, with the goal of maximizing payoff (rewards for targets successfully attacked minus costs) and avoiding ranger presence.[1] Overall, the players' actions lead to different payoff values. The ranger's performance is evaluated by expected utility, a calculation of the payoff expected when a given ranger strategy is played based on the targets' values, attack likelihood, and ranger resources used. The ranger's goal is always to find the optimal strategy to maximize expected utility, knowing he or she faces an adaptive adversary (poacher) who will respond to any patrol strategy.

### *Security Game Software in Real-World Settings*

Software based on security games has been deployed to protect critical infrastructure in a number of settings, including airports and seaports. It can outperform ad hoc patrol scheduling by addressing the key weakness of such human-designed schedules: predictability. The software accomplishes this by generating randomized patrol strategies that introduce uncertainty and

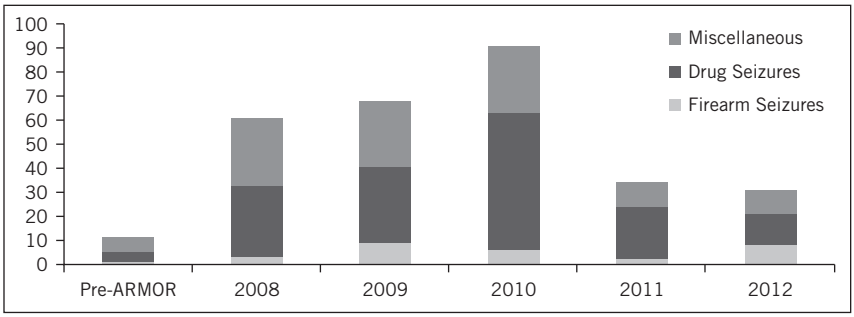


**Figure 10.1** Contraband seized at Los Angeles International Airport checkpoints before vs. after ARMOR software was used to schedule patrols.

unpredictability to attackers. The first deployed security game software, called ARMOR, has been in use at the Los Angeles International Airport (LAX) since 2007 to randomize security checkpoints on the roadways entering the airport as well as canine patrol routes within the airport terminals. Figure 10.1 shows that ARMOR led to a significant increase in seizures of contraband at checkpoints following its introduction. Over time, the number of these seizures decreased, suggesting that ARMOR had the desired effect of deterring people from attempting to bring contraband to LAX (Pita et al. 2008). Although the possibility that contraband was routed elsewhere (e.g., another airport) cannot be ruled out, the fact that illegal activity fell following the deployment of a game-theoretic security approach at LAX suggests the value of such an approach for the locations in which it is used. Other game-theoretic softwares have included IRIS, a scheduler for randomized deployment of U.S. Federal Air Marshals on international flights, in use since 2009, and PROTECT, which has been used to schedule the U.S. Coast Guard's randomized patrolling of ports in Boston since 2011 and has since been expanded to ports in New York, Los Angeles, and Houston.

### *Adapting Security Games to "Green Security"*

Over the past several years, the subfield of Green Security Games was developed to meet the unique needs of protecting forests (Johnson, Fang, and Tambe 2012), fisheries (Haskell et al. 2014), and wildlife (Fang et al. 2016; Nguyen et al. 2016). These domains present a new set of challenges. First, the wildlife domain brings new terrain features, such as changing elevation, vegetative cover, and dynamic target (animal) distribution. Next, diverging from infrastructure security attackers, poachers behave differently: they attack repeatedly, and generally do not conduct extensive surveillance before each attack. The repeated opportunities for interaction between rangers and poachers provide more chances for both sides to adapt to each others' strategies. Green

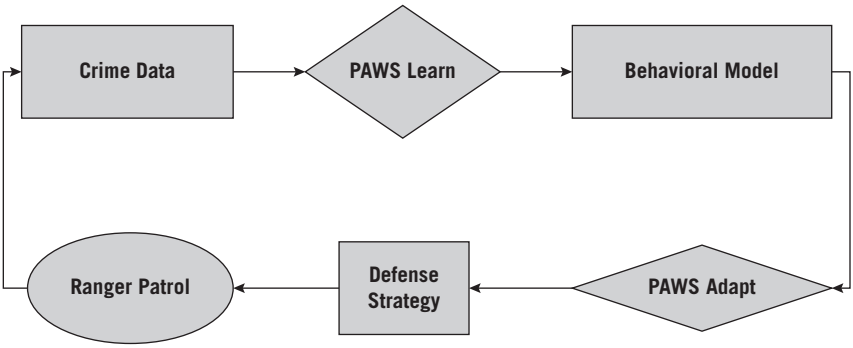


**Figure 10.2** PAWS conceptual model.

Security Games account for these new challenges by: (1) incorporating data on attackers' previous choices to build a predictive learning model of their behavior in order to improve the defender's strategy, and (2) incorporating the complex terrain features of protected areas in order to generate patrols that are practical as well as effective.

## Protection Assistant for Wildlife Security Software and Pilot Results

The Protection Assistant for Wildlife Security (PAWS; Yang et al. 2014) was developed as the first Green Security software system, specifically to optimize the use of wildlife law enforcement in order to protect terrestrial wildlife from poaching (see Figure 10.2 for a conceptual model). PAWS applies machine learning techniques to data from protected areas (e.g., past poaching activity, topography, species distributions). Based on this data, it creates a model of poacher behavior, including predictions of how poachers will respond given different domain features (e.g., animal abundance, water features) and ranger patrol strategies. Based on these predictions, PAWS generates patrols (e.g., route maps, heat maps, GPS waypoints) designed to maximize rangers' expected utility. As more data are gathered, PAWS automatically adapts and improves.

Initial tests of PAWS software were conducted in Uganda in 2013. Subsequently, a second pilot evaluation study was conducted in Malaysia in 2015 and provided valuable insights on how to further refine the underlying models by incorporating topographic information and seasonal changes in animal distribution (Fang et al. 2016). Each PAWS patrol lasted from four to five days, and was executed by a team of three to seven patrollers, who were equipped with printed maps, handheld GPS devices, cameras, and data recording booklets. They recorded signs of animal and human activity. Results from 130 kilometers of PAWS patrols were compared to 624 kilometers of

human-generated patrols (e.g., managers making decisions on foot patrol deployment on an ad hoc basis). PAWS patrols yielded more signs of both human activity (0.86 versus 0.57 average number of signs per kilometer) and animal activity (0.41 versus 0.18 average number of signs per kilometer; Fang et al. 2016). That PAWS patrols yielded more human activity signs is important for (1) identifying high concentrations of poaching activity, and (2) rangers' mere presence may deter poachers.

Although empirical data on deterrence is limited, the results associated with PAWS are consistent with prior work finding that law enforcment, penalties, and fines can deter local poaching gangs (Leader-Williams and Milner-Gulland 1993), including a recent study suggesting that deterrence effects resulted in reduced tiger poaching in Sumatra (Linkie et al. 2015). Furthermore, other work has found that community members near protected areas perceive deterrence as a key factor in law enforcement effectiveness (Fischer et al. 2014), and interviews with poachers indicate that they are likely to be deterred when they perceive interactions with game wardens as fair (Filteau 2012; see also Forsyth and Forsyth, Chapter 6; Moreto and Gau 2017).

The greater number of animal signs identified on PAWS patrols indicates that PAWS prioritized areas with higher animal density. Interestingly, some of the patrol routes suggested by PAWS had never been used by the patrollers before. These explorative routes are important as they can enable an improved understanding of unexplored regions of protected areas. Additionally, they represent a step beyond what is provided by existing ranger-based data collection tools like SMART, which offers data on what has occurred in the past. Leveraging SMART data, PAWS models the complex interactions between animal distributions and different possible patrol scenarios to predict future poaching activity, and deploys ranger patrols accordingly. Overall, results to date show that PAWS can provide valuable suggestions to rangers and strategically guide their patrols.

## Transitioning Conservation Technologies from Research to Field Settings

While these pilot results are promising, a rigorous, full-scale field experiment of PAWS has not yet been conducted. However, in 2016, a more comprehensive field test was launched in Queen Elizabeth National Park in Uganda, with results forthcoming. Given the potential for applying tools like PAWS to wildlife protection, there is a critical need to field test conservation technologies like PAWS to assess their strengths and limitations and improve them before full-on deployment.

As Green Security Games researchers adapt proven infrastructure security approaches to wildlife settings, they are investigating new domains with

which they have relatively limited experience. Moving this field forward requires additional experience in wildlife settings, collaborations with conservation domain experts, and access to datasets from protected areas. Other technology developers may be in a similar situation. This all requires partnering with conservation organizations to move the research (and ultimately, a finished software and/or hardware product) from research to field settings. Whereas technology developers and researchers can offer innovations that hold promise for enhancing wildlife security, conservation organizations can provide domain expertise, access to relevant settings, as well as settings needed to validate the research. Together, the two parties can form fruitful collaborations.

However, no standardized process provides a roadmap for moving technologies PAWS from laboratory to field settings. Although "co-production" models have outlined approaches for conservation program development and implementation (Nel et al. 2016), and other work has explored the "knowing but not doing" gap between conservation research and practice (Knight et al. 2008), the case of disseminating new technologies presents unique challenges. For instance, the objectives of technology developers (e.g., commercial, scientific) often differ from those of intended users (e.g., practical). The crux of this challenge is to understand end users' perceptions around and willingness to adopt emerging technologies. Without this understanding, testing and evaluation may not be possible.

To elucidate the process of technology dissemination, we present the first "Lab-to-Field Technology Transition" framework, which consists of a process model that emphasizes broad stages involved in transitioning conservation technologies from laboratory to field settings. It begins with the formulation of a partnership between a technology developer and organization interested in using the technology in the field. Next, in-depth education helps intended technology users within the organization learn about the technology's inner workings, with the goal of encouraging adoption, and reducing resistance toward change. Following education, if the organization is willing to adopt the technology, field testing is conducted to evaluate it in a given context. This is a critical step as field testing may be necessary to iron out any issues inherent to the technology in that particular setting. At this stage, feedback from the organization's users about the tool's strengths and limitations can substantially improve the technology, increase its usefulness, and further enhance acceptance. If the organization is not willing to engage in field testing, the opportunity to tailor and improve the technology to the particular context is limited, resulting in an end product that may not be optimized for the setting. Once field testing is complete, the technology can be refined, deployed full-scale, and evaluated for effectiveness. It should be noted that the stages of the model may shift around. For instance, following successful field testing, adoption likelihood may increase.

Our lab-to-field technology transition framework emphasizes that testing, refining, and ultimately the success of a new technology rests on user adoption. Hence, understanding end users' perceptions around and willingness to adopt technologies is essential. Moreover, technology education is theorized as a key element of adoption. If the organization's users do not fully understand the technology and its capabilities, it is less likely that the technology will be adopted and employed consistently in the long run. Since the link between education and adoption represents a crucial element of the model, we pay particular attention to illuminating the relationship between these variables. In the following sections, we zero-in on key factors that may link education to adoption.

## Technology Adoption

The technology acceptance model (TAM; Venkatesh and Davis 2000), widely used in the psychology literature to explain individuals' adoption of information technologies, can offer insights on the education-adoption link. Briefly, the model describes perceived usefulness (the extent to which one believes technology will be useful for some purpose) and perceived ease of use (the extent to which one believes technology will be easy to use) as the two key determinants of technology adoption. Although an abundance of literature supports the TAM in explaining technology adoption in traditional office settings (King and He 2006; Turner et al. 2010), we identified only one study that focused on technology adoption among law enforcement officers. Lindsay, Jackson, and Cooke (2011) found that the TAM could be used to explain technology adoption among a sample of police officers in the United Kingdom. Interestingly, they found that low awareness of benefits of technology was a key barrier to adoption and recommended that future work highlight the benefits of a given technology to potential users to increase its perceived usefulness.

## Technology Resistance

Whereas the TAM emphasizes factors that explain technology adoption, a related body of research has identified factors contributing to technology resistance (Ram and Sheth 1989). For instance, when new technologies are introduced in workplace settings, some employees fear that such innovations will interfere with their routines, impact relationships with colleagues, and/or reduce workplace autonomy (Ahuja and Thatcher 2005; Beaudry and Pinsonneault 2005; Lapointe and Rivard 2005; Markus 1983). This latter fear may be particularly relevant to technologies like PAWS that make decisions based on simplified representations of the real world. Additionally, fears that an innovation will be overly complex and add to employee workload have

been identified (Ahuja and Thatcher 2005) and are thought to stem in part from lack of understanding of innovations (Davis and Venkatesh 2004).

Educational interventions have been strongly recommended as a means to minimize resistance, highlight the benefits of new technology, and positively influence other determinants of adoption (Venkatesh and Bala 2008). However, we identified no empirical evidence affirming the utility of educational interventions in reducing resistance to new technologies. Further, little is known about what characterizes resistors, and no work has examined the extent to which they may engage with interventions in the first place. Addressing these gaps is essential to understanding how to transition technologies from research to field settings.

## Technology Diffusion

It is important to note that in addition to individual decision making, social processes also shape technology adoption, particularly technology diffusion, or the process by which an innovation spreads across a given population. The diffusion of innovations theory posits that innovations are adopted in stages throughout a given population (Rogers 1995). Specifically, it describes five categories of adopters differentiated on the basis of features of the innovation itself, communication channels, and time. In sequential order, the five adopter groups are: *innovator*, *early adopter*, *early majority*, *late majority*, and *laggard*. Whereas innovators and early adopters are willing to take more risks as the first to adopt innovations, early and late majority adopters rely heavily on feedback from peers in the earlier adopter groups in making adoption decisions. Individuals in the laggard group tend to be skeptical of innovation and change, and may be more resistant to new technologies in general (Ram and Sheth 1989). In addition, they desire relatively high levels of certainty that a technology works before adopting, and hence may wait to adopt an innovation until they know it has already been successfully adopted by other members of their social group. As their social groups tend to be primarily consistent of other laggards (Rogers 1995), this can lead to limited knowledge about new innovations, and further delay their adoption decisions.

This has implications for our process framework. In particular, diffusion may be facilitated if innovators and early majority group members provide positive feedback about new technologies to later adopter groups, who rely more heavily on such feedback in making their adoption decisions. While late majority adopters may be more accepting of feedback from those in earlier adopter groups, it is unclear whether or not laggards may be influenced by such feedback. Although we found no studies examining efforts to influence this process, we reasoned that educational interventions could play a role in the diffusion process, specifically by fostering positive peer feedback from earlier to later adopters.

## Case Study: Fostering PAWS Adoption through Educational Intervention

To examine whether an educational intervention may foster technology adoption and diffusion, we employed PAWS as a case study. Understanding the underlying framework of PAWS requires knowledge of complex concepts in agent-based modeling, probability, and optimization. The extent to which rangers have this knowledge is unclear, and likely varies by individual. A limited understanding of these concepts could affect the perceived usefulness (and adoption) of PAWS. At the same time, opportunities for learning have been identified as a key contributor to ranger job satisfaction (Moreto, Lemieux, and Nobles 2016). Therefore, we saw an opportunity to investigate the link between the education and adoption components of our lab-to-field technology transition framework in the field. Given the importance of perceived usefulness to technology adoption, and the potential for low awareness of benefits to act as a barrier to adoption (Lindsay, Jackson, and Cooke 2011), we developed and piloted an educational intervention among a sample of rangers that taught them about the complex concepts underlying PAWS. We subsequently evaluated rangers' perceived usefulness and intentions to adopt PAWS technology.

## Educational Program

The program sought to provide rangers with a new lens for understanding poachers' behaviors, build a better understanding of the strengths and weaknesses of manual patrolling strategies, and highlight the advantages of PAWS, which adapts and improves as more data are collected. We theorized that rangers would learn that PAWS can outperform manually generated strategies, thereby enhancing perceived usefulness. Participants in the program were twenty-nine rangers at mixed ranks who were chosen by World Wildlife Fund management and based in Sumatra, Indonesia. The program was hosted by the World Wildlife Fund and delivered over three consecutive days in 2015. It consisted of three parts: lectures, discussion sessions, and a set of interactive games.

On the first day, instructors, which included members of World Wildlife Fund and the university research team, introduced relevant theoretical foundations and basic examples of agent-based modeling, game theory, and security games. They explained how rangers could leverage existing data to optimally conduct patrols over targets and how attackers may respond to various strategies. Next, instructors covered: (1) real-world applications of security games for protecting critical infrastructure; and (2) challenges in wildlife protection and the application of security games to this domain. Finally, they presented PAWS. They described data inputs (e.g., animal density, poaching) and

outputs (e.g., poacher behavior models, suggested patrol routes) and emphasized benefits of PAWS, including how similar approaches had already been successfully used for wildlife protection, and how PAWS could be used on Sumatra to enhance wildlife security.

In addition, participants engaged in several discussion sessions on challenges in wildlife protection, including factors that motivate people to enter protected areas, types of illegal activities in protected areas, and ideas for improving wildlife security. In small groups, they exchanged ideas about these topics; each group presented their conclusions to the other groups. Instructors encouraged groups to develop solutions that could be conceptualized in a game-theoretic manner and potentially incorporated into PAWS software.

Finally, as learner engagement is a key driver of learning outcomes (Carini, Kuh, and Klein 2006), we aimed to maximize engagement with interactive "ranger vs. poacher" games, set in a simulated wildlife park with hippopotamuses scattered throughout (Sintov et al. 2016). Participants took turns playing rangers (who allocated a defense strategy to deter poachers from attacking high-value areas, for instance by allocating more defense resources to such areas) and poachers (who aimed to hunt as many hippos as possible while avoiding detection by rangers). They played both computer and board versions of the games over multiple rounds, receiving real-time feedback on their opponents' response after each round, to learn how opponents adapted to their strategies in either role. Although we aimed to abstract the real-world scenario to the extent possible in these games, not all details could be included, and hence findings should be viewed in light of this limitation.

## Results of Educational Program

Honing in on the education and adoption components of our lab-to-field technology transition framework, we evaluated the impact of our educational program on rangers' perceptions of the usefulness of PAWS and the willingness to adopt it using surveys distributed immediately after the program. Overall, results were promising. Rangers reported high levels of perceived usefulness, positive intentions of adopting PAWS, and rated additional TAM constructs positively. Mean responses were five or higher on Likert scales ranging from one to seven, with higher scores representing more positive perceptions.

In addition, results were consistent with prior TAM research (Venkatesh and Davis 2000), supporting the applicability of this model to the new setting of wildlife law enforcement. Furthermore, building on the TAM, which has described adoption decision making but has not accounted for the influence of interventions, the data produced the more detailed teaching-to-transition technology (T3) model (Figure 10.3), which describes the link

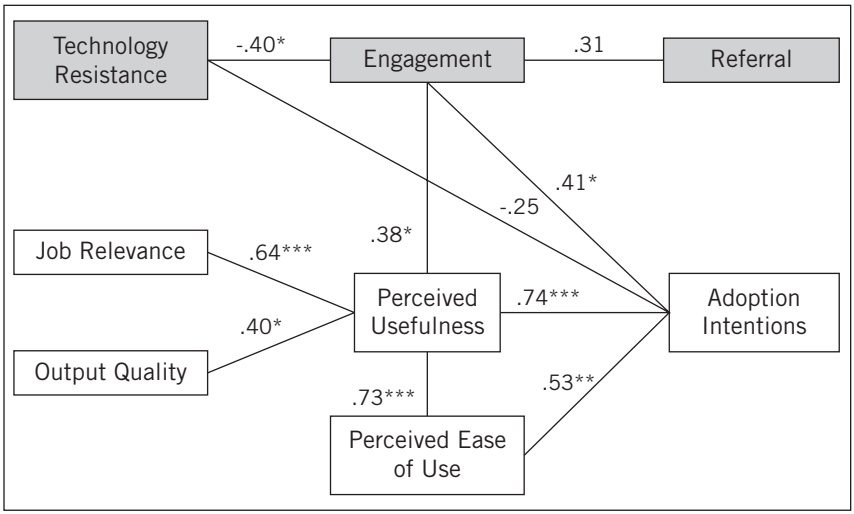


**Figure 10.3** Teaching-to-transition technology (T3) model with bivariate correlations. *p<.05, **p<.01, ***p<.001

between intervention engagement and technology adoption. In particular, based on Spearman correlations, we found significant positive associations between intervention engagement and both perceived usefulness and adoption intentions. In other words, the more engaged rangers were in the program, they more they tended to view PAWS as being useful, and the stronger their intentions to adopt PAWS. It is possible that higher engagement led to greater learning and understanding of PAWS and contributed in part to stronger adoption intentions. Whereas previous TAM studies have simply recommended interventions to foster technology adoption (Venkatesh and Bala 2008), our findings offer preliminary evidence for the utility of this approach. We also examined the link between program engagement and peer referrals but did not find a significant relationship. One possibility for this null finding may be that participants in our program did not have the opportunity to interact directly with PAWS; such hands-on experience may be important for recommending an innovation to peers.

The T3 model accounts for technology resistance. Although no direct relationship between resistance and adoption intentions was observed, program engagement may have acted as an intervening variable. Specifically, resistors were significantly less engaged in the program, suggesting that eliciting interest among resistors and reaching them may be particularly challenging. This is an important point in light of the significant association between program engagement and adoption intentions. If resistors are more difficult to engage, they may learn less about the technology and be even less willing to adopt it or recommend it to peers. These findings underline the

importance of understanding and addressing sources of technology resistance (Venkatesh and Bala 2008).

Finally, this leads to the question of who were the resistors? In our sample, resistors were significantly younger in age, which was the opposite of our prediction. Younger rangers may resist new technologies for several reasons. One possibility is a perception that PAWS reduces their autonomy in making patrol decisions, a theme identified in the qualitative data that also aligns with prior work (Lindsay, Jackson, and Cooke 2011). Another potential reason for resistance was also indicated in qualitative findings not represented in the T3 model. Some rangers questioned the accuracy of PAWS's underlying models and expressed interest in evaluation results. In other words, they wanted evidence of PAWS's efficacy in their settings. Although PAWS aimed to represent the real-world problem as closely as possible, it involved necessary simplification, so not all real-world details were accounted for. These abstractions may reduce rangers' trust in PAWS's ability to make accurate predictions, adversely impacting adoption. One objective of rangers playing games in the ranger role was to demonstrate that even with its abstractions, PAWS could still outperform manually generated strategies. Although we did not collect data from such exercises in this pilot study, future work would be well advised to do so in order to provide the evidence that rangers sought. Alternatively, more complex PAWS models, or field testing results may be necessary as a stronger standard of proof of efficacy.

## Conclusions and Recommendations

Consistent with previous suggestions (Mascia et al. 2003; Berkes 2004; Gore 2011; Bennett et al. 2016), this chapter highlights the importance of including social science in conservation efforts. In particular, our findings suggest that accounting for the human dimensions of conservation technologies is important for their success. Specifically, our lab-to-field technology transition framework describes a systematic process for transitioning new conservation technologies from research to field settings. The framework emphasizes the importance of user adoption at multiple stages of this transition, in particular prior to field testing, which provides a critical opportunity to tailor the technology to a given context, as well as obtain feedback to refine and improve it (see also Bergenas, Chapter 11). Future work should test other parts of the framework. For instance, following pilot testing of a technology, it is suggested that feedback from users about the technology's strengths and limitations be garnered. Research is needed to determine whether and how feedback processes may influence subsequent acceptance of the final product. Additionally, after the technology is refined and fully deployed, a full evaluation, encompassing both the technology's effectiveness and its process evaluation, should be conducted. Evaluation can provide

useful insights that may help to further refine the technology and user education and experience. Overall, we advocate for building a better understanding of and accounting for user adoption of conservation technologies to maximize their success.

Focusing on the link between education and adoption in the lab-to-field technology transition framework, the results of our pilot education program underscore the facilitating role that educational interventions can play in the technology dissemination process. Such interventions can highlight the benefits of a technology, enhance its perceived usefulness, and ultimately encourage adoption (see also Bergenas, Chapter 11). Qualitative data from the present study also speak to the importance of conducting process evaluations in future related work, which can shed light on why interventions may or may not succeed and help streamline subsequent efforts (Pawson and Tilley 1994). Additionally, given hierarchical structures of many wildlife law enforcement organizations, technology adoption may be decided or mandated by mid- and upper-level management. Hence, there may be benefits to focusing on these groups as part of initial intervention efforts. To facilitate smooth conservation technology rollouts, we recommend pairing technology deployments with educational interventions like ours that focus on end users.

Our results also yielded the more detailed teaching-to-transition technology (T3) model, which helps to map out variables that link education to adoption. The T3 model emphasizes the importance of technology resistance, and suggests that reaching resistors in the first place may be particularly challenging. Understanding the sources of resistance is a first step toward addressing them. In our pilot study, rangers' hesitations concerned the potential loss of autonomy, and the accuracy of PAWS modeling. We recommend investigating additional potential sources of resistance, for instance via focus groups or interviews with front line audiences. Although not focused on technology adoption, similar work focusing on front line perspectives has yielded invaluable insights (Eliason 2007; Eliason 2011; Filteau 2012; Jachmann 2008; Moreto 2015; Moreto, Lemieux, and Nobles 2016) to improve conservation efforts.

From a methodological standpoint, although wildlife rangers constitute a relatively small population, future studies should attempt to replicate the results of our educational intervention using a larger, multisite sample. Additionally, an experimental design using a control group and pre- and post-measures are needed to discern causal processes. We also recommend more advanced statistical techniques (e.g., structural equation modeling) to speak to the generalizability of our models. As well, our educational intervention involved several components; future research should isolate and test individual elements to understand the "active ingredients" that can help foster acceptance and reduce resistance.

Finally, as pointed out previously, work on human dimensions of wildlife management tends to focus on local communities (Moreto, Lemieux, and Nobles 2016). This chapter shines a light on an understudied yet critically important group in conservation: the dedicated individuals working at the forefront of wildlife protection. We encourage future work to aid the efforts of this important population who are essential for the success of many conservation technologies. Although our discussion focused on enhancing wildlife security through improved patrol technology, rangers often have basic needs for the job, such as boots and other supplies, which must first be met. Hence, rather than jumping into a site with new technologies, conducting an initial assessment to understand rangers' unique needs is recommended before proposing new technologies or interventions. Again, this underscores the necessity of accounting for the human dimensions of conservation.

## NOTE

1. This example describes the general framework of a security game. See below section, "Adapting Security Games to 'Green Security,'" for an overview of the ways in which the wildlife domain differs from other security domains.

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# III

# PRACTITIONER PERSPECTIVES

# 11

# THE RANGER FOCUS

## *Matching Technological Solutions to on-the-Ground Needs*

Johan Bergenas

**EDITOR'S INTRODUCTION:** *The third and final part focuses on practitioner-based perspectives and research. As I noted in my Introduction, I am particularly excited about this part as it is rare to see practitioners providing input in academic texts. In the first chapter, Bergenas provides his personal reflections on implementing a command, control, and communications system program in Kenya. Honest and personal, Bergenas's chapter complements Sintov and colleagues' chapter from the previous part and highlights the realities and logistics of implementing technological solutions at the ground level.*

The email from the officer in charge of the Ngulia Rhino Sanctuary in Kenya was simple but represented a major breakthrough: "We are now able to see the area of coverage and make informed decisions on where rangers need to improve in their patrol in September." The commander's note was prompted by our team's most recent report on the work of the rangers in the field. It informed him where his rangers had patrolled in the past week, the location of the rhinos, and current security threats to both the animals and the men and women guarding them. His men had used smartphones to record, in real time, their observations from morning and evening patrols. Using a cloud-based database and dashboard, our team had extracted some of the most relevant information and sent it to the commander, the park's senior warden, and researchers. Now the technology had started to produce the intended result: digitalizing the work of a wildlife ranger.

The commander's email was mighty rewarding. When I received it, I had been working on the project for three years. From my front row seat I had seen a consortium of actors come together to support Kenyan wildlife rangers in building a bottom-up technological solution that would make their work more efficient, safer, and impactful. The commander's feedback meant that our ranger-focused technology project was starting to bear fruit. We have a long way to go, but I think we are at a point now where we can tell the story of our initiative, how it came about, and who came on board and why. My primary focus with this firsthand account is to highlight the importance of bottom-up technological solutions vis-à-vis those closest to the wildlife crime fight—the rangers.

You may wonder how a security analyst at a think tank in Washington, DC, found himself in the field among rhinos and elephants coordinating a technology project. In 2012, I participated in a public policy and research project that focused on border security in Kenya. All of my time was spent in Nairobi and in government offices. Through that work I was connected to a Kenya Wildlife Service (KWS) officer that insisted I go with him to Tsavo West National Park and the Ngulia Rhino Sanctuary to see the ground truths about insecurities in Kenya's largest national park bordering Tanzania. That was an adventure I could not say no to and I will now try to show you what we discovered in the bush together with a few dozen wildlife rangers.

In September 2013, the then head of security of Ngulia and surrounding areas—picked me up at an Indian restaurant in Mtito Andei, a small town a stone's throw away from the gates of Tsavo West National Park. The KWS's four-wheel truck provided a bumpy but exciting ride into the Tsavo Conservation Area, the largest park in Kenya. I later looked it up and was in awe, as the park was almost the size of the state of New Jersey in the United States.

I had never been in the wild like this. My world travels had mostly constrained me to conference rooms with government officials and security professionals. Now, airline miles and policy positions felt entirely out of place as the KWS officer gave me ground truths about the everyday fight against poaching and to safeguard some of the last black rhinos and elephants in the world.

Tsavo's iconic creatures had recently come under increased threat from poachers. Since the summer, the park had lost some two dozen elephants and several rhinos. It is hard to find a rhino in the broader Tsavo West area today. That is why poachers penetrate the Ngulia Rhino Sanctuary where the KWS is seeking to protect and grow the country's black rhino population.

An hour into our ride, the commander pointed out his window and announced, "This is Rhino Valley." September is part of dry season in Kenya so the bushy environment did not obscure the vista, but no rhinos could be seen. In the 1970s, approximately six thousand to eight thousand black rhinos roamed these plains. Today, after decades of intense poaching, the park

only hosts one hundred, most of them calling Ngulia home, representing about 10 percent of the total Kenyan population. Sensing my melancholy, the commanders promised we would see a rhino when sitting watch at one of Ngulia's waterholes. It was a small consolation.

## The Ambush

The Ngulia sanctuary was created in the mid-1980s. At its inception, the area was only a few square kilometers and home to a handful of rhinos. After several expansions, it has grown to its current ninety-two square kilometers. There are only a few open spaces in Ngulia, mostly around the five waterholes. Most of the terrain is made up of compact bush vegetation, and it is hard to see much of anything. In my three years back and forth to Ngulia, I have only seen one rhino in daylight. But if you are in the conservation business you must also be in the hope business because currently the odds are stacked against us. This is why tourists' anticipation and big eyes when they enter the main gate in the late afternoon gives me a lot of energy at the end of our working day. *Maybe this is the day when one of the mighty animals will reveal itself to them. I hope I will hear the story back at the lounge later that night.*

The Ngulia perimeter is marked with about fifty-kilometers of five-volt electrical fence. It keeps the rhinos in, but it does nothing to keep the poachers out. Only days before my arrival to Ngulia, park rangers had set up an ambush based on an intelligence tip warning of an imminent attack. The Tsavo West sergeant tasked with organizing the trap had gathered eight rangers and hid in the dirt for fourteen days until the poachers eventually stumbled upon them. He told me this story in great detail, partly because, I think, he wanted me to know about the grim conditions and sophisticated enemies he and the rangers were up against. Water, biscuits, and some dry meat were the only items on the menu throughout the mission, he said, and, to remain undetected, no tents had been pitched or fires started (see also Moreto 2017; Moreto and Matusiak 2017). It must have been miserable out there for those two weeks. Finally, one night at 3:00 A.M., the rangers heard voices in the distance. From experience they knew they were facing heavily armed adversaries. Waiting until the poachers were ten- to twenty-meters away, all nine rangers jumped up and a firefight started. Hundreds of rounds later, three of the poachers were dead, while a fourth got away.

Under the cover of darkness, the poachers had walked the seven kilometers from the Mombasa highway on approach to the northeastern border of Ngulia. The KWS sent two vehicles in pursuit of the fourth perpetrator and the other accomplices that likely waited in cars at the highway, but to no avail. The poachers had been well armed—machine guns and night vision goggles—and one was even a military official on leave.

No rangers were hurt this time, but in the past ten years, some one thousand rangers worldwide have been killed in the line of duty (Global Conservation 2016). Many more have been injured safeguarding the animals. Besides the threat from poachers, ranger forces have to contend with the dangers that lurk in the bush—everything from charging rhinos to poisonous snakes. During one of my patrols in 2016, we came across a beehive. I started fighting them waving my arms up and down as a natural defense mechanism—classic foreign policy analyst behavior, yet one that is very ineffective. The ranger and commander who were with me stood stock still, breathing slowly through their noses. "I have been stung," I cried out as one of the bees left his stinger in my cheek an inch from my eye. It hurt badly, and the part of my face where the stinger sat was pulsating. Hundreds of bees could in a moment's notice be upon us and there was no indoors to run to. No hospital. No medicine. "Stand still," the commander ordered me. "Close your mouth." I complied. We stood there for several minutes as bees were swirling around us but they did not increase in strength so long as we stood still. The commander knew how to fight big and small threats. As the last few bees left us alone, he walked up to me and plucked the stinger from my face. "You allergic?" he said. "No, I don't think so," I said. "Good, let's go," he said and continued through the bush. I was shaken up for the remainder of the patrol. All of this is to say that conditions are tough out there in the bush. The rangers face many threats—big and small—and they have only basic equipment, training, and their bush-made survival skills (see also Moreto 2016; Moreto and Matusiak, 2017; Walsh and Donovan 1984; Warchol and Kapla 2012).

## An Uneven Fight

The commander took me to the Ngulia sanctuary headquarters. He pointed to the living quarters—round sheet and clay houses—where the rangers used to live. "But when the trend in poaching changed," he said, "We had to move them into the sanctuary to be closer to the animals." In Tsavo West and around the world, rangers in need of training and equipment are fighting an uphill battle against increasingly sophisticated poachers with military style communications equipment, heavy weaponry, and sometimes even helicopters. For the most part, the rangers are outgunned. The commander demonstrated just how easy it was to enter Ngulia by ducking under the wire fence. On the other side, he threw up his arms in frustration of how easy it is for poachers to gain unnoticed access to Ngulia. On both sides of the fence, there was a five-meter-wide corridor with roads for patrolling. The roads are raked everyday by tying a tire behind a car and then dragging it around the perimeter to clear footprints (see Figure 11.1). Every morning, rangers inspect the road to look for signs of intrusion. But the terrain around the fence varies—sometimes it is sandy, making footprints easy to detect,

**Figure 11.1** Electrical fence around park perimeter to keep animals in. Photo credit: Elena McGovern.

and sometimes it is very hard. Poachers also adapt and put socks on their shoes to avoid making a mark and sometimes they choose entry points with hard soil.

Unseen and unheard, the poachers approach and kill their prey. Then they have the entire night to make it out of the park using either GPS technology or the light from the radio towers by the distant Mombasa road. Some of poachers are Kenyans and some of them are Somali, the commander explained, supporting the claim that transnational criminals are implicated in poaching and wildlife trafficking (cf. Rademeyer 2016). Ivory, rhino horn, and other wildlife products have become the fourth largest illicitly traded good in the world, representing upward of a $23 billion industry (Lehmacher 2016). The port in Mombasa is a major trafficking hub for the illegal wildlife trade. From there the ivory and rhino horns are sent to markets in Asia selling for up to $1,300 per pound (Levin 2013) and $100,000 per kilogram (Guilford 2013), respectively.

A 2016 investigation by the U.K.-based *Guardian* revealed the identities of some of the transnational criminal ringleaders profiting from illicit wildlife trade, but the traffickers are cunning at evading the law (Holmes and Davies 2016). A 2013 U.S. intelligence analysis pointed to convergence between wildlife trafficking networks and other illicit actors such as drug and

arms smugglers (National Intelligence Council 2013; see also Shelley and Kinnard, Chapter 5). Part of their proceeds go toward buying guns and bombs, paying their members, and even terrorist groups, as the U.S. National Intelligence Council has confirmed that some terrorist organizations are financing their activities through direct or indirect participation in poaching (National Intelligence Council 2013). This is why the UN calls poaching a "grave menace to sustainable peace and security" (UN News Centre 2013).

## The Ranger Life

Connectivity inside the Ngulia rhino sanctuary was spotty as the commander and I went to meet some of the rangers. Depending on where you were, and if you could see the communications towers in the distance, you might get a signal from Safaricom or Airtel (two major mobile network operators). The commander used an open source communications radio to alert his men that their officer in charge was on his way with a visitor. As we approached the ranger station, two camouflaged men in their mid-twenties came out of their sleeping quarters, AK47s over their shoulders, and saluted their ranking officer. I introduced myself as a foreign policy analyst working for a think tank in Washington, DC. Met with blank stares I took another stab at explaining what my job was—policy analysis, keeping an eye on evolving security challenges, writing papers. The confusion grew. To this day, I do not think any of the rangers in Ngulia know what I actually do for a living.

The two rangers, heeding their commander's orders, showed me their base and living quarters. They were the same type of clay and sheet huts I had seen at the Ngulia headquarters. Among clothes and some other personal effects was also a car battery. They used it to charge their phones and radios. I saw an Arsenal T-shirt and facetiously inquired how many Premier League championships the team had won compared to my team, Manchester United. This was the first time the rangers and I connected over something and we bantered over soccer for a good ten minutes. They were up to speed, listening to the games using their phones. Even here, in a rhino sanctuary in southern Kenya, the Premier League is a source of love and contention.

The next hut over was their kitchen, built with stone blocks and covered with a metal sheet. There was a fire in there and one of the pans held some rice. Other supplies in the camp included canned pineapple and biscuits. Their clothes hung on a line between two trees and they had nailed together pieces of wood to create a table and chairs. We sat down. They did not show any indignation about their remote and modest base. They spent a month at a time here before rotating to a different area of Ngulia.

Once every year, they went on leave for four weeks, visiting their wives, children, and families. It was not always easy to get home. First, the rangers

have to find a ride from Ngulia sanctuary to the park headquarters or Mtito Andei, then pay for a bus to head home. Some lived ten or more hours away. I recall a conversation I had with one of the rangers: "Is it hard not to see your family," I had asked. He responded, "This is our duty." I then inquired as to why he had become a ranger. He simply replied, "I love wildlife." Another ranger near us nodded in agreement.

## The Ranger Duty

Over the course of the next few days, I met over a dozen rangers across the sanctuary. In the mornings and evenings, a pair of rangers went on patrol for about three hours. Their mission was to collect data on the whereabouts of the rhinos and identify indicators of security threats like footprints, fence breaches, and suspicious people. They used paper and pen to record their findings. The information was collected by the officer in charge or radioed in over the open communications system to Ngulia headquarters. In turn, this data was sent to the KWS headquarters in Nairobi for archiving. The system does not provide for much, if any, feedback to the rangers on how well they do their job and what trends their data collection amounts to. Moreover, other people can listen in on conversations, which can result in patrol operations being compromised.

The starting salary for a ranger is 14,000 Kenyan Shillings (about US$160) a month. The youngest rangers in Ngulia were eighteen years old and the oldest was in his mid-forties. Some of them had come to the KWS through a national youth program, while others had enlisted. Before their first deployment in the field they go to a basic three-month training, which mainly involves physical training and shooting exercises. After that, they leave Ngulia a few times per year for additional refresher trainings.

In short, conditions are basic in Ngulia, and the rangers make do with what they have. The people I met in the sanctuary during my September 2013 trip seemed motivated and dedicated to their duty. They considered the rhino a treasure and said they were very proud to protect Ngulia's animals (see also Moreto, Lemieux, and Nobles 2016). They were eager to tell their stories about successful counterpoaching incidents and only on a few occasions did they speak of the challenges they face in the bush.

## Going to the Waterhole

The best chance to actually encounter a rhino is sitting watch at a waterhole at night. Rhinos have terrible eyesight and, sitting in the bunker a few feet away from the waterhole one night, our vision was not much better. Without a full moon, you can barely see across the ten-meter spring. The KWS's night vision goggles do not work that well, in addition to Ngulia only having two

pairs for five waterholes and fifty personnel. Rangers are mostly made aware of a poaching attack after the fact, either by finding a dead rhino, often killed by poison or bow and arrow to avoid detection, with its face sawed off or after hearing a gunshot. Indeed, the commander commented on how most of the time rangers are "not able to realize that poachers are in park until we hear gun-shot." From there, rangers have to figure out its origin, before they can pursue an adversary. Often times, they may not see or hear a poacher until it is too late.

That night, I saw my first rhino and her calf. It took an hour before they finally approached the waterhole. The rhinos were constantly on alert and the smallest noise or disturbance—like approaching elephants—made them flinch. Rhinos, the rangers told me, are very sensitive to stress. Pregnant rhinos can miscarry, lose fertility, or delay delivery for months in a stressful environment, which includes being under the threat of poaching. "Pass me the goggles," we encouraged each other. The rangers were as excited as I was (cf. Charles 1982; Eliason 2006; Moreto, Lemieux, and Nobles, 2016, Moreto 2017). Once we were in receipt of the goggles, we became aware of the totality of the darkness and how hard it is to know what—or who—is out there.

The final night before leaving Ngulia, the commander and I sat at the lounge summing up the trip. It seemed to me that Ngulia was not faced with a unique security problem. Ngulia was not so different from other critical infrastructure projects, like those for the security of borders, ports, and power plants. The rhinos were, in this case, the economic infrastructure in need of protection. There were already human assets present—rangers and commanders—and I already had an idea of the security challenges in the sanctuary. So when the commander asked if I could help him secure the sanctuary, I said yes. But I needed help, too.

## The Professor

In the next few months, the commander and I came up with a big picture project plan, the first step of which was to do a more structured and holistic analysis of the Ngulia's security needs. There were already projects ongoing in Tsavo West, but there was no grand strategy for how, in the longer term, Ngulia and the broader park could be comprehensively protected. The technology that was currently deployed had significant flaws, like the camera traps that took pictures at the waterholes too indiscriminately and had to be collected manually by the research team.

To take a bigger picture approach, I intended to draw on my network in the security and technology community. If there were connections between wildlife crime, terrorism financing, and transnational organized crime, surely there would be an interest in piloting a comprehensive approach to

rhino security in Kenya. I was both right and wrong. Some of the prospective partners we approached were willing, but they were too expensive. Others were restricted by congressional restrictions and could not spend resources on what could be perceived as a wildlife issue. I tried to convince them that we could frame this as a program combating transnational organized crime as Tsavo also had drug trafficking, alcohol smuggling, and other types of security challenges, including cross-boundary crime from Tanzania, but to no avail. Then the professor called.

Fredrik Gustafsson is a professor in sensor informatics in the Department of Electrical Engineering at Linköping University, one of Sweden's premier technology universities. For the uninitiated, the professor's expertise revolves around how different technologies talk to one another and how they can extract valuable data from sensors. He wanted me to be a speaker at a conference in Sweden on societal security. I mentioned that I had just been to Kenya and visited a rhino sanctuary, and he suggested that I speak about my experiences. I was surprised, but in retrospect it all made sense.

Over the past thirty years, the professor has been part of the Swedish technology and innovation elite, participating in major national initiatives like the development of Sweden's JAS 39 Gripen jet fighter project. He has also brought his inventions to market, with one of his companies equipping some 20 million cars with software to automatically measure tire pressure. In recent years, he has led national initiatives for societal security technologies with applications for critical infrastructure such as airports, ports, power plants, and national borders. The work had been very Sweden-centric, and he was ready for an adventure. In the lead up to the conference I invited him to write an opinion article with me about how Swedish technology and innovation could help save wildlife. We published it in one of the Swedish morning papers and the response was overwhelming. His inbox that morning was full of praise, and we received offers to expand our thesis in a book where the Swedish prime minister, among other prominent Swedish figures, were contributors. I did my talk in Sweden in November and, before leaving, pitched him on an idea: come to Kenya and conduct a technological feasibility study to safeguard some of the world's last rhinos. The professor agreed.

## The Plan

In January 2014, we flew to Kenya and headed out into the field. We spent a week in Ngulia learning from the commander and the rangers. This was a much deeper dive than when I was there in September. Now we were interested in the specifics: not just that they went on patrols two times a day but what exactly these patrols entailed, how often they transferred the information gathered, and what feedback they received up and down the chain of

command. Before unleashing the professor on Ngulia, I asked him to keep two things in mind when constructing a plan. First, do not come up with a technology plan that requires fundamental changes to how their rangers currently conduct their work as it will take years or decades. Second, make something that is replicable and scalable so that we do not initiate something that could only work in Ngulia. He heeded my advice and off he went to work his magic.

In many ways, the professor and I were like water and oil in the beginning. He was a scientist who had spent his career measuring tangibles. I was coming from the softer sciences where intangibles and political dynamics are very important. He is more of a listener and I am more of a talker, which I found to be frustrating at first because I had no idea what information he needed to do his job. At the same time, the two of us were surrounded by fifty wildlife rangers and we had only a cursory understanding of where they were in their technological evolution. I worked hard to get the professor to talk to the commander and the rangers to identify the security needs at Ngulia. They needed a better fence, as well as a physical watchtower. Not exactly the professor's expertise. Some of them had heard of security systems at embassies using infrared beams for intruder detection. Specific knowledge of drones, infrared cameras, sensors, and radars were largely foreign concepts. I truly had no idea what was going on in the professor's head during these five days. But in the backseat of the car on our way back to Nairobi, the professor conceptually developed the technology plan that still stands today.

I recall at one point he said, "We need to digitalize the rangers' workflow and provide secure communications." It turns out he had internalized every word during our visit, from the senior warden at park headquarters to the rangers on patrol in Ngulia. The old, albeit well-functioning, radio communication system needed to be upgraded since it is completely insecure and anyone, including the poachers, can tune in to the standard shortwave radio band. The professor stated, "What we need is an encrypted command, control, and communications system."

## C3 Comes to Ngulia

A little bit over a year later, with the blessing of the KWS's senior leadership in Nairobi, we deployed the first version of a mobile application and dashboard that enables rangers, commanders, senior wardens, and researchers to see in real time rhino observations and security alerts being made in the field. And by we, I mean a growing team of stakeholders, including design and user-experience programmers at iHub, a Kenyan-based information and communications technology community. We partnered with iHub, who took the lead on working with the rangers to evaluate the best design and user-experience dynamics for the rangers (see also Kujala et al. 2011 and

Sproll, Peissner, and Sturm 2010). My favorite exercise was when twentysome rangers were running around a room at Ngulia headquarters, rearranging yellow and pink Post-it notes on which they had written down the most important security threats they face as rangers—weapons, suspicious people, footprints, and the like.

We went back and forth between Sweden, Nairobi, and Ngulia with updates and improvements to the software based on ranger feedback. The most rewarding part was when a ranger or officer recognized that their input was finding its way into the technology tool. The iHub team was absolutely crucial in making sure that the rangers were involved in every step of the project. The team at Linköping—which had grown to include a handful of designers, programmers, and sensor fusion experts—never could have otherwise achieved this level of local buy-in. At the same time, a fascinating relationship developed between the technology wizards at iHub and their counterparts at Linköping University. My role was to mediate between the two groups as communications and other issues arose. Put simply, project management, deadlines, and preparations are concepts that have very different meanings in straight-laced Sweden and more—much more—relaxed Kenya. Avoiding arguments and working as a cultural translator behind the scenes was my job. Ultimately, we liked each other and believed that we were doing something very valuable.

## Does the Tech Work and Is It Being Used?

The command, control, and communications system developed by the Linköping and iHub teams is in use today in the Ngulia sanctuary. Specifically, the mobile app is an input device, where rangers note their observations regarding security and wildlife matters. Photo documentation is available as well as automatic geotagging. The app is also a navigation tool, where park rangers get their position overlaid on a map. The interface includes local landmarks such as waterholes, roads, trails, bunkers, borders, their patrol routes, and the like. The commander app includes the same functionality as the ranger app but is foremost an administrative tool and platform for officers. The map interface shows the position and trajectories of all rangers, security alerts, and rhino observations. The data can be accessed in real time or analyzed in retrospect. The professor and his team provide briefs to the team in Ngulia about their coverage and other pertinent data.

## Testing before Deploying

The professor, with his background in sensor informatics, was not satisfied with only deploying a mobile app to protect wildlife—however important it

may be. His plan had a longer-term goal. The professor has initiated a research initiative at Linköping University called wildlife security. The next part of the professor's plan was to bring off-the-shelf technology to Ngulia, treating the sanctuary as critical infrastructure. Seaports, airports, power plants, and border security have a lot in common with Ngulia, the professor believed. They all have well-defined perimeters, a few entrance points, and hot spots of particular interest to protect, like the waterholes in Ngulia. To that end, simultaneously with the use of the mobile app in Ngulia, additional sensor systems are being tested in Sweden to evaluate their applicability to the Ngulia project. Too many technology projects have gone to the field too soon and subsequently encountered significant technical and user-experience challenges, the result of which has been a proverbial graveyard of conservation technology projects. In order to avoid this trap, we reached out to Scandinavia's largest zoo, the Kolmården Wildlife Park, with a simple request to use their grounds for testing antipoaching technology. Their answer? Come on over.

Since 2015, we have tested a wide variety of tech there—from drone technology to radar and sound sensors that can, for example, pick up from where shots have been fired (recall the problem the rangers have in that area). Every test and step forward is guided by what we hear from the folks in Ngulia. For example, radar technology will be able to cover large objects moving inside and around the Ngulia border. Smart algorithms will be developed to distinguish humans from animals and to monitor rhino movements. The radar systems will have coverage of five- and ten-km radii. With this technology, the rangers will be able to know from where the poachers are coming and stop them from entering Ngulia in the first place. The commander's frustration with the five-volt fence would be no more.

## Comings and Goings

Our testing in Kolmården, and the larger project, has been made possible by the investment by the United Kingdom government, Linköping University, coupled with Swedish government innovation resources and assistance by some of the most innovative technology players in Sweden. The vast amount of in-kind assistance from all of our partners has also been invaluable. Our partners have helped us solve a lot of problems along the way, but the challenges we have overcome have been significant and I am sure many more lie ahead.

On the human side, the tremendous amount of turnover both in the field—senior wardens, commanders, rangers—and with our local partners, like iHub, has slowed progress significantly. In the second half of 2014, the commander moved on to a different unit in a different park so we had to try to explain to the new security officer in charge of Ngulia what we had all

agreed to do. His major concern was data security, so we worked on explaining how the cloud worked and finally assured him that the system would be many, many, many more times secure than morse code.

These turnover issues continue to plague us. For example, just before I wrote this chapter, the current officer in charge of Ngulia emailed and said he was being transferred to Nairobi. Over the past 18 months, he had been the steward of the project in the field. He provided the leadership necessary for his rangers to incorporate the technology into their daily lives. He had been invaluable. I gave him a present once, a Manchester City jersey—his favorite team—and four soccer balls (footballs to him). I challenged him to put together a team that we would square off with. It never happened. Getting rangers to the same location for a game of soccer was simply too much of a logistical stretch.

## Solving Problems

For every twist and turn, it is hard to say in which direction the project will go, which is very tough for planning purposes and partnerships. We also realized that connectivity in Ngulia was not as great as we once thought (cf. Moreto 2017). This meant that the rangers could not utilize the software to its full extent. In order to address this issue, and via a contact within the Swedish company Ericsson, we were connected to Airtel. One of their staff admired the work we were doing with the project and became our champion. She successfully advocated for Airtel supporting us and the company agreed to provide data and sim cards for the project free of charge. They also donated a significant amount of staff hours to understanding exactly what it would take to improve connectivity in Ngulia. The solution was to bring in Nokia. Their regional director did not flinch when asked if he could redirect the signal from the radio towers east of Ngulia to benefit connectivity to the rangers. He sent out a couple of guys into the field and, just like that, Ngulia had 3G.

## Getting Pissed Off . . .

The conservation community is very competitive. For instance, I have seen competing project managers yell at each other in public meetings over their respective drone initiatives. Both are good people trying to accomplish important conservation objectives, but the resources are very scarce and many want credit. At least that is what one of the billionaire conservation philanthropists—and tech wizard—told me when I brought this dynamic to his attention. Our project has made a very concerted effort to stay out of the fray and instead focus on the rangers and the needs in Ngulia as we understood them. But I do want to share one story that, well, really pissed me off.

Throughout the project in Ngulia we have—on an as-needed basis—improved charging stations, replaced solar panels and car batteries, and provided cords, computers, and screens. We have also connected the Tsavo West handyman to one of our partners in Kenya to provide some basic training on how to maintain power capacity and the like in the sanctuary. We have cobbled together what we can to make things a little easier in the field for the rangers and they can use it as they see fit. Not everyone has the same attitude. In fact, at one point I received an email from someone representing a major conservation organization who was also involved in conservation projects in Tsavo West. Throughout the email the person reinforced and reiterated how rangers should not be charging "Stimson devices" using the solar chargers *he* had provided them for *his* "project."

The good news is that the rangers seem to really care about charging the smartphone devices so that they can use the software on the smartphones. The bad news is that this person seems to have misunderstood his role entirely. Clearly this is not a ranger-focused project but a Steve-centered project (not his real name). Also, there are no "Stimson devices" in Ngulia, they belong to the rangers (and for the record, Stimson never paid for them, one of our partners did, which is true for all hardware and software expenses). It is in my estimation that the role of outside nongovernmental organizations is not to come in and run their own projects in the field but to incorporate relevant skills into plans developed jointly with the people who need the help most. The intraorganizational turf wars are an unhelpful distraction.

## Lessons from the Field

Wildlife crime and efforts to combat it have received a great deal of attention over the past few years as heads of state and celebrities have tried to raise awareness of the perils facing the world's endangered species. Comparatively little consideration, however, is given to the rangers in the field (cf. Moreto, Brunson, and Braga 2017; Moreto 2016). They work long days in harsh conditions, but the ones that I have met have never complained. My experience is that they do what they can with the resources that they have far away from high politics. My sense is that they want to do a good job, report their work to their superiors, and, at the end of the day, return home safe and sound with a sense of accomplishment.

I invite the reader to draw her or his own conclusions from the stories told in this chapter. I have a feeling that this journey has just begun and that a more structured set of lessons learned will be written down the road. Our project is far from done, but we are on our way. Or in the words of the professor: "All technology that is needed exists today. It is mainly a matter of selecting the right combination to give an adequate level of situational awareness, and to deploy the systems gradually in the right order."

For now, I would like to offer the following concluding reflections from my experience in the field, what I have seen more broadly from a capacity-building point of view, and from my work in public policy on this issue. First, technology projects require hybrid teams. As we built our program and team, we consulted with biologists and environmental policy experts. We engaged with the defense industry and academics. We came to realize that environmentalists probably should not be in charge of integrating a complex technological system. In the same way, it makes no sense to put the professor in charge of the reproductive health of rhinos and elephants, though that would be fun to see. Yet, a great deal of the technology projects that we came across over the past few years have been led by people and organizations with comparatively shallow knowledge of technology. The professor cannot be accused of that. He has served as our honest technology broker and his long-term approach to developing a sustainable plan, I believe, has saved us from a lot of mistakes. Having had the long-term commitment from Linköping University and other partners on the ground and around the world has been invaluable. Perhaps most important, we are not beholden to a particular technological solution or tech manufacturer. Our focus is on the end-user and science not artificial deliverables to a funder or producing a flashy YouTube video—although we did produce one in 2014.

Second, the most advanced technology is not necessarily the best to start with. Unmanned aerial vehicles can be part of the solution, but these so-called drones are rarely a first step, or a second, and maybe not even a third. Most park rangers today use basic phones, electrical fences, and manual checks for footprints and the like to fend off intruders. The next step in their technological evolution is not a drone system—that comes later. The point here is that we need to build bottom-up solutions fully focused on the current capabilities of the end user, the rangers. This is why we started with communications.

Third, when partnering with the private technology sector, do not pay them for goods and services. Partner with them. Think for a second about what environmentalists are trying to safeguard: oceans, forests, and wildlife. These are economic engines for countries in the same way that ports, energy infrastructure, and borders are. All of these critical infrastructures need protection, the market for which is vast and growing significantly. Getting involved in building smart technological solutions for our natural world is not just good for our world but good business as well. It offers an unprecedented opportunity to identify new markets, reach new customers, and find new value for products and services that already exist. Find companies that get that and then invite them to work *with* you, not *for* you.

Fourth, more resources will not magically become available through increased competition within the environmental community. During the recent World Conservation Congress, the largest conservation meeting in

the world, secretary-general of CITES, John Scanlon, acknowledged that the conservation community alone could not win against transnational criminals who have made the killing of animals a major component of their illicit enterprises. He is right. Military, security, and technology organizations in governments, multilateral agencies, the nongovernmental sector, private industry, and universities are crucial to safeguarding vulnerable wildlife. These organizations need to stand side by side with the traditional environmental community. While this is an uncomfortable marriage for some, it is a necessary union to stop the slaughter of our most magnificent animals, as well as for the protection of our oceans, forests, and other natural resources.

In closing, I think a lot about the rangers and the commanders and what they do in the field. I worry daily that our project will not produce the results that we jointly set out to achieve. I worry that our ranger friends will remain largely unprotected as transnational criminals continue to ramp up their sophistication with devastating impacts on both animals and people. But I also think it is a good thing to worry about these matters. All good conservation projects should be clear-eyed, big hearted, and ranger focused.

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# 12

# A TRANSDISCIPLINARY APPROACH TO WILDLIFE CRIME PREVENTION

Madelon Willemsen
and Rodger Watson

EDITOR'S INTRODUCTION: *In this chapter, Willemsen and Watson argue that the multifaceted nature of wildlife crime—particularly the illegal wildlife trade—warrants a transdisciplinary approach. Specifically, the authors propose that the three tenets of knowledge as theory (KAT), knowledge as elements (KAE), and knowledge in contexts (KIC) facilitates the opportunity to accurately reflect the intricacy of "wicked problems" like the illegal wildlife trade. Moreover, such an approach fosters an environment where academics, practitioners, and other stakeholders are able to develop constructive and meaningful partnerships.*

## Illegal Wildlife Trade: A Wicked Problem

Environmental crimes, such as illegal wildlife trade, are considered "wicked problems" by conservationists (Roberts 2012; Spapens and Huisman 2016; Moreto 2017). Wicked problems are described as having three characteristics (Rittel and Webber 1973):

- The problem is a result of situation factors that are **unique**.
- The problem is a **symptom of another problem**, and therefore trying to solve the problem as it presents is folly.
- There is **no immediate or obvious solution.**

A wicked problem is inherently complex because it resists clear definition and involves many different stakeholders with different perspectives and, often, with conflicting interests in and understanding of the problem at hand (Balmford and Cowling 2006; Sharman and Mlambo 2012). The wicked problem of illegal wildlife trade and associated crimes such as poaching and consumption of illegal wildlife needs to be addressed (Moreto 2017). It is putting additional pressure on biodiversity, which is already challenged by climate change and habitat loss (Challender and MacMillan 2014; Harrison et al. 2016; Shepherd, Eaton, and Chng 2016). Harrison et al. (2016) argue that iconic species such as tiger, Asian bear, Asian rhino, and pangolin are under more pressure from illegal hunting than they are from habitat loss, and that we risk losing these wild animals in a few years if this criminal activity continues. Even the legal and commercial market trade of wildlife—for example of songbirds like laughing thrush species—is deemed unsustainable and impacts heavily on the wild populations (Shepherd, Eaton, and Chng 2016). Furthermore, recently, illegal wildlife trade has been listed as a serious crime by the United Nations Convention on Transnational Organized Crime (UNODC 2016).

## Efforts to Combat Wildlife Crime

Governments and the conservation communities are working tirelessly to combat the threat of illegal wildlife trade. The Convention on Trade of Endangered Species (CITES) provides a regulatory framework for international trade of a large number of threatened species. Currently, 183 Parties have signed up voluntarily to CITES. Nations also have national laws for environmental protection and illegal wildlife trade in place. Formal cooperation and relationships between countries facilitated through, for example, CITES, Interpol, UNODC, and other organizations also play key roles in preventing wildlife crime.

The prevention of wildlife crime focuses on breaking the supply chain of illegal wildlife trade, through the development of new strategies and interventions to end the poaching (Pires and Moreto 2011; Challender and MacMillan 2014; Haas and Ferreira 2016; Keatinge and Haenlein 2016), and the consumption, of endangered wildlife (Burgess and Compton 2013; Rare 2016). The United Nations General Assembly urges member states to take decisive steps at national levels to prevent, combat, and eradicate the illegal trade in wildlife, by targeting interventions at supply and demand (UN GA 69/314). The G20 Leaders' Declaration on the High Level Principles on Combatting Corruption Related to Illegal Trade in Wildlife and Wildlife Products, provides information and the actions needed to address illegal wildlife trade (TRAFFIC 2017). Supply reduction through policy, regulations, and

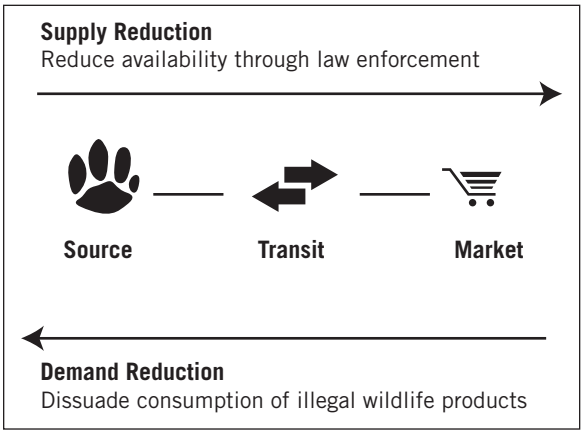


**Figure 12.1** Combating illegal wildlife trade: reducing supply and demand. Adapted from TRAFFIC and WWF 2014.

law enforcement efforts is intended to increase the risk to actors along the illegal trade chain, while demand reduction efforts aim to reduce the pull of consumers for these illegal wildlife products (Figure 12.1).

However, it is becoming clear that these kinds of responses presuppose far too simple a representation of the wicked problem of illegal wildlife trade. Wildlife trafficking takes place across many distinct markets involving many different actors, each with its own drivers and dynamics (TRAFFIC 2008; Ngoc and Wyatt 2013; Challender, Harrop, and MacMillan 2015; Moreto and Lemieux 2015a, 2015b; UNODC 2016; Shelley and Kinnard, Chapter 5). There are indications that wildlife criminals not only meet supply but also create demand by "pushing" illegal wildlife products to consumer markets, for example ivory (Global Eye 2015). Similarly, in Vietnam, a market is created through actively promoting and advertising illegal wildlife products, such as bear bile, "pushing" these to buyers (Wilcox, Nguyen, and Gomez 2016). The lack of effective law enforcement at local and domestic markets (UNODC 2016) and the limited possibility to regulate and enforce the online markets, such as the dark web (Harrison et al. 2016), social media sites (Krishnasamy and Stoner 2016), and e-commerce websites (LaFontaine 2015; Xiao and Wang 2015; Nguyen and Willemsen 2016) provide a host of low-risk platforms for wildlife criminals to supply and access illegal wildlife.

Illegal wildlife trade is driven by financial gain, corruption, and perceived societal benefits (UNODC 2016, 2014; Moreto and Lemieux 2015b; TRAFFIC 2017) and is often nested within licit financial and transport systems (Miller, Vira, and Utermohlen 2015). Corruption is used by all actors in all stages of the trade chain; to generate opportunistic income for hunters and poachers, benefits of social gain for consumers, and monetary gains for organized wildlife criminal groups due to the low risk of repercussions, especially on the Asian and African continents (Miller, Vira, and Utermohlen

2015; Moreto, Brunson, and Braga 2015; Rademeyer 2016; UNODC 2016; TRAFFIC 2017; van Uhm and Moreto, in press). It is not surprising that some argue that wildlife crime needs to be considered as a financial crime to enable the correct response (Keatinge and Haenlein 2016).

The global community engaged in the prevention of wildlife crime is composed of a wide variety of professionals with different expertise and backgrounds that include (but are not limited to) conservation, criminal justice, forensics, criminology, social marketing, policy, journalism, and economics. At a high level, the drivers to take action by these individuals are similar: they work to protect the rule of law and encourage stability, to limit the potential for criminal proceeds to fuel conflict and terrorism, and to protect the environment and prevent species extinction (UNODC 2016). It is these drivers that determine the current approaches to prevention of wildlife crime: reducing the supply and demand of illegal wildlife.

The approaches of the sector to combat wildlife crime are guided and directed by the necessary research and evidence to enable policy improvements, decision making, and action. Furthermore, the majority of the work is restricted by the available amount of funding and although the professionals and their organizations often cooperate, either formally or more loosely, they also compete for funding. Funds need to be raised and donors often expect measurable and direct outcomes for the environment or the prosecution of criminals.

This expectation consequentially restricts the opportunity for innovative and creative approaches (which have not been tried and tested for wildlife crime), as donors want to see a clear "return on investment" in conservation outcomes. Moreover, the deft and adaptive modus operandi of the wildlife criminals trumps the slow moving and reactive approaches of the wildlife crime prevention sector, and despite the multidisciplinary efforts from governments, UN offices, and NGOs, wildlife crime and its threats to biodiversity and security continue to increase (EIA 2016; UNODC 2016).

## A Transdisciplinary Approach

The knowledge production on wildlife crime and the impact on illegal wildlife trade biodiversity is extensive. Interdisciplinary and multidisciplinary research into the issue produces scientific peer-reviewed papers providing knowledge on, for example, the urban demand for wild (and threatened-species) meat in Vietnam (Shairp et al. 2016); levels of trade of art and antique rhino horn pieces in China (Gao et al. 2016); the impacts of hunting and extinction rates in the Southeast Asian forests (Harrison et al. 2016); and the illegal trade of wild ornamental plants in Southeast Asia (Phelps and Webb 2015), to name a few. Research reports, often published by NGOs and/or IUCN specialists' groups, also provide knowledge on the status, conserva-

tion, and trade of Asian and African rhinoceros species for the CITES Conference of Parties and Committee meetings (Emslie et al. 2016). Other reports generate awareness and identify new trends and highlight opportunities for policy and enforcement efforts. For example, reports provide: insights in the extent of physical ivory markets in the United States (Kramer et al. 2016); analysis in market and trade data for tigers (Stoner and Krishnasamy 2016); and evidence of illegal wildlife trade on e-commerce and social media forums (Guan and Xu 2015; LaFontaine 2015; Krishnasamy and Stoner 2016; Nguyen and Willemsen 2016; Xiao and Wang 2015).

These publications provide data on the current situation and progress and often include recommendations for governments and international trade organizations such as CITES. It is critical that this kind of knowledge be published and produced as policy and that decisions for actions be based on this knowledge (Gibbons et al. 2008). However, there is little evidence that the knowledge and recommendations result in changes in practice and policy to effectively combat wildlife crime (Cooney et al. 2016).

In the 1970s, the transdisciplinary (TD) movement emerged as a response to overcome the mismatch between the production of knowledge and the demands made of knowledge in order to resolve the issues in society (Hoffman-Riem et al. 2008). This mismatch is well-known as the "knowing-doing gap" and occurs in sectors such as biodiversity conservation, natural resources management, and criminology (Gibbons et al. 2008; Barmuta, Linke, and Turak 2011; Hopkins et al. 2015; Dorst et al. 2016; Tulloch et al. 2016). The knowing-doing gap conjoins two challenges, the first being between academia and practice; that is, not providing the right knowledge and/or enabling knowledge transfer to practice and the other way around. The second challenge refers to the ability to implement an action in the real world; that is, not being able to effectively implement a program or project and achieve the objectives and long-term outcomes. The "knowing-doing gap" is considered one of the largest barriers for effective and efficient decision making, policy making, and actions (Gibbons et al. 2008; Wainwright 2010) and consequentially can also be considered one of the barriers to effectively and efficiently preventing wildlife crime.

The TD approach has been applied to resolve a wide variety of complex social-ecological problems (Cockell 2011; Cundill, Roux, and Parker 2015). The TD approach is said to be able to bridge the gap between empirical knowledge and the complex normative world through the acknowledgment that different knowledge requirements are needed to resolve wicked problems (Reyers et al. 2010). As stated by Hoffmann-Riem et al. (2008, 4): "Transdisciplinary research, therefore, aims at identifying, structuring, analysing and handling issues in problem fields with the aspiration: '(a) to grasp the relevant complexity of a problem (b) to take into account the diversity of life-world and scientific perceptions of problems, (c) to link abstract and

**TABLE 12.1. THE THREE TYPES OF KNOWLEDGE AND THEIR EXPLANATIONS***

| Type of knowledge | What kind of knowledge is it? |
|---|---|
| Knowledge as theory (KAT) | The knowledge generated by an empirical research process. Research delivers quantifiable knowledge to alleviate the uncertainties. |
| Knowledge as elements (KAE) | The knowledge generated by clarifying and prioritizing the different perceptions and values of all actors involved. |
| Knowledge in context (KIC) | The knowledge generated and required to adapt technologies, regulations, and practices as well as power relations so that solutions can be implemented in reality. |

*Adapted from Pohl and Hirsch Hadorn 2007 and McGregor 2014.

case-specific knowledge, and (d) develop knowledge and practices that promote what is perceived to be the common good.'"

The TD process can engage the wildlife crime prevention sector, academics, other stakeholders, and the community in mutual learning and problem solving through contextualizing research-based and scientific "known" knowledge and the "know-how" knowledge generated from expertise and experiences of the professionals (Hirsch Hadorn et al. 2008; Ahern, Leavy, and Byrne 2014; Gore et al., Chapter 9; Sintov et al., Chapter 10). As shown in Table 12.1, a TD approach defines a set of three types of knowledge that are required to address wicked problems: knowledge as theory (KAT), knowledge as elements (KAE), and knowledge in contexts (KIC) (Pohl and Hirsch Hadorn 2007; McGregor 2014).

KAT is the knowledge created and required in empirical and scientific research, while KAE is the knowledge created and required by people, their thinking, cultures, and institutions. The KAT and KAE are considered the cognitive aspects (i.e., known knowledge and know-how) for the solution of the problem, and it is possible to quantify, qualify, or describe these two types of knowledge through soft and hard research practices (McGregor 2014). The more tacit KIC includes the sociocultural, motivational, and contextual factors that are important for successfully implementing solutions (McGregor 2014).

Figure 12.2 displays the TD approach for the illegal wildlife trade and depicts the interaction of the three types of knowledge mentioned above, as well as examples of the "knowledge" produced and required in the three types for a holistic and integrated solution to illegal wildlife trade.

Applying a TD approach to prevent wildlife crime is accomplished through three distinct phases. These three phases are specifically designed to bridge the knowing-doing gap by understanding the knowledge requirements for the project and how the three types of knowledge can be produced for a solution (Figure 12.3).

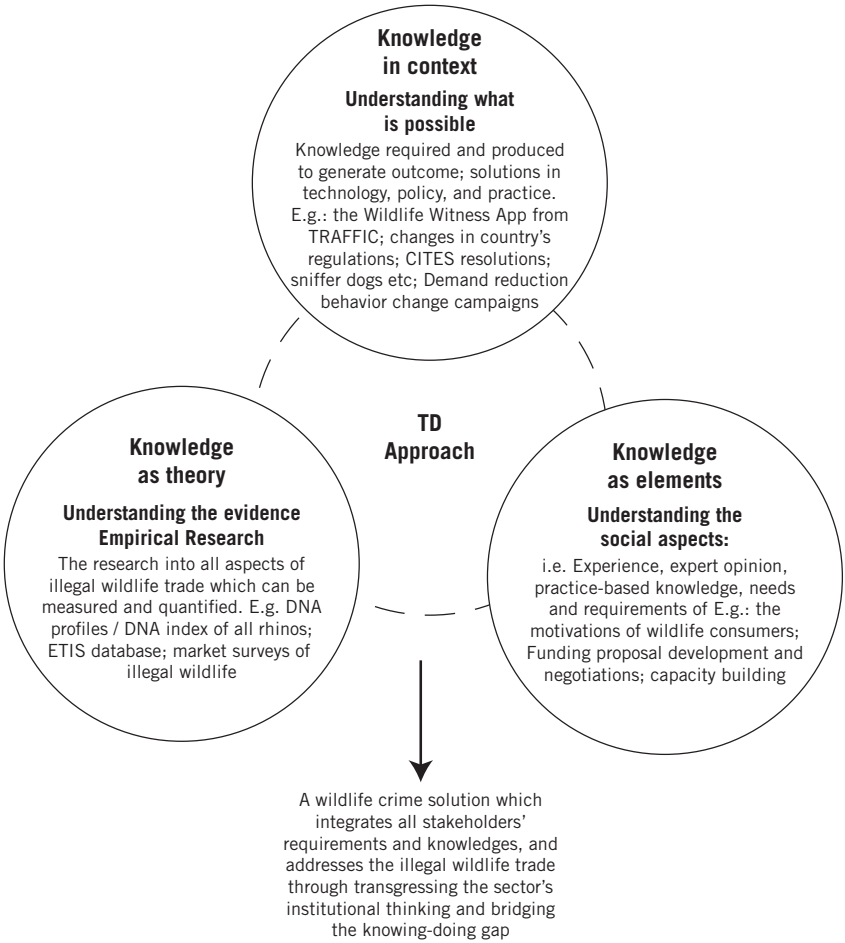


**Figure 12.2** A conceptualization of a TD approach to combat the illegal wildlife trade.

Through the three phases of the "problem identification and structuring," "problem analysis," and "bringing the results to fruition," a TD project aims to build a joint vision, find a common language through close collaboration with all stakeholders, and discuss and prioritize trade-offs while learning at the same time (Jager 2008). Effective project management is considered an important aspect of TD, as well as in the management of complex projects and the achievement of conservation outcomes (Barlow et al. 2016). Project management can establish shared goals among researchers, policy makers, and other stakeholders as well as manage the information flow and learning (Hoffmann-Riem et al. 2008; Geraldi, Maylor, and Williams 2011). Project management in itself is considered a transdisciplinary research enabler (Piko and Kopp 2008; Holleander, Loibl, and Wilts 2008).

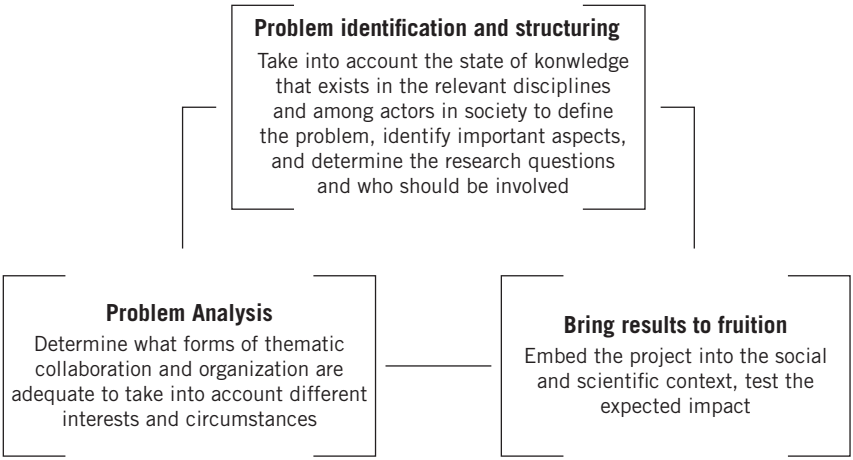


**Figure 12.3** The three phases of a TD project. Adapted from Pohl and Hirsch Hadorn 2007.

## The Difference between a TD and an Interdisciplinary or Multidisciplinary Approach

Currently the sector takes interdisciplinary (ID) and multidisciplinary (MD) approaches to prevent wildlife crime. A MD approach involves different organizations in the sector who are working on the same problem producing knowledge independently in the form of actionable information, reports, or research papers, whereas an ID approach is when organizations coordinate, cooperate with expertise, and consult to produce knowledge to combat illegal wildlife trade, an ID approach (see Table 12.2).

A TD approach stands out from an ID or a MD approach, in that it actively engages the known knowledge and know-how of the sector but also aims to engage a wide range of other relevant stakeholders, professionals, and even the public, from outside the sector, so that through collaborative problem solving and innovation, practical solutions within the problem context can be developed and implemented (Pohl and Hirsch Hadorn 2007; Hirsch Hadorn et al. 2008; Cundill, Roux, and Parker 2015). The TD approach aims to identify, analyze, and resolve wildlife crime in context, rather than taking the threat to biodiversity and/or national security as the starting point for the intervention. The TD approach questions the sector and institution-bounded thinking (Thompson Klein 2004). Furthermore, TD efforts include nontraditional partners in scientific research and expertise (Norris et al. 2016), so that KAE and KIC requirements also can be fulfilled.

MD/ID approaches are logically connected in a horizontal manner (Max-Neef 2005; Norris et al. 2016), addressing problems linearly within the common approach of the sector. TD approaches are articulated not through

**TABLE 12.2. THE DIFFERENCE BETWEEN MULTI- AND INTERDISCIPLINARY APPROACHES**

| Approach to produce knowledge to combat wildlife crime | | Recent examples |
|---|---|---|
| Interdisciplinary approach: | involves organizations that are coordinated by one principal organization that borrows methodologies and expertise from others in pursuit of a (not necessarily) common goal. | Applying social marketing behavior change approaches to reduce consumer demand (Olmedo 2015).<br><br>Engaging the local communities to report wildlife crime through smartphone apps, resulting in enforcement action (e.g., TRAFFIC 2016; ENV 2016). |
| Multidisciplinary approach: | involves different organizations working to address a single problem or theme in parallel without coordination between the organizations. | The financial and economic assessments for speculation in illegal wildlife products (Harvey, Alden, and Wu 2016).<br><br>An assessment of bird flu risks and implications associated with the illegal bird markets (Roberton et al. 2006).<br><br>The adaptation of a current criminology model for developing an improved framework (CAPTURED), which could determine the dynamic impact of wildlife products within illegal markets (Moreto and Lemieux 2015a). |

the disciplinary and institutional thinking, but, through the knowledge requirements to resolve the problem (Thompson Klein 2004). For instance, integrating more qualitative methods into criminology research (Moreto 2017) is one of the first steps toward transgressing the disciplinary boundaries, as it provides the opportunity to fulfill the knowledge requirements from the KAE and KIC perspectives. A TD movement in the sector could develop "super solutions" to combat illegal wildlife crime, through the "transgressing" between the three different types of knowledge, and inclusion of non-traditional partners (Norris et al. 2016). Figure 12.4 depicts these differences.

There are many barriers for adopting a TD approach in any sector, as is the case in the wildlife crime prevention sector. It is argued that the adoption of TD in any conservation intervention is hampered by the requirement for long-term research involvement and commitment of stakeholders to achieve successful outcomes, due to the adaptive management of development and implementation of the solutions (Kiteme and Wiesmann 2008; Bradby, Keesing, and Wardell-Johnson 2016; Norris et al. 2016). The wildlife crime prevention sector has similar requirements. Since the majority of efforts take

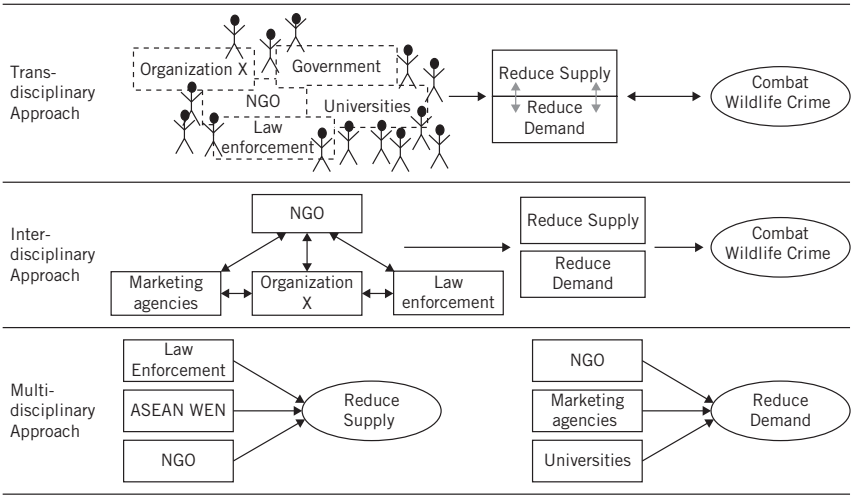


**Figure 12.4** The differences between multi-, inter-, and transdisciplinary approaches to combat wildlife crime. Adapted from Max-Neef 2005 and Norris et al. 2016.

place through project-based funding, the lack of commitment for sufficient and long-term funding could also hamper its adoption in the sector (Campbell et al. 2015). Furthermore, the traditional institutionalized systems to award funding and reward professionals in the sector is another key barrier in conservation (Messerli and Messerli 2008; Griffiths and Dos Santos 2012; Pooley, Mendelsohn, and Milner-Gulland 2014; Campbell et al. 2015; Norris et al. 2016). Indeed, forming a TD team and workforce has been identified as a wicked problem in itself (Norris et al. 2016) creating another barrier for TD adaptation in wildlife crime prevention. Managing a TD project and team requires facilitation and stakeholder management expertise as both are required to integrate all types of knowledge into the specific recovery context between academia, practitioners, and other stakeholders, such as policy makers and the community (Messerli and Messerli 2008; Lynch et al. 2015; Norris et al. 2016; Bergenas, Chapter 11; Sintov et al., Chapter 10).

Despite its challenges, it is clear that a TD approach could be effective in creating solutions for wicked problems. There is a wide range of examples where TD approaches have been successfully applied in conservation (Barmuta, Linke, and Turak 2011; Bradby, Keesing, and Wardell-Johnson 2016), sustainability research (Hirsch Hadorn et al. 2006; Thompson Klein et al. 2012), and climate change (Bhaskar 2010; Thompson Klein et al. 2012). However, there have been but few attempts to utilize a TD approach for wildlife crime prevention, although one paper, by Roberts (2012) describes how a "design" process was able to address wildlife crime and corruption in Borneo and resulted in habitat restoration and protection of the orangutans who

were being poached to be eaten or sold. This suggests that a TD approach may be successful in preventing the illegal wildlife trade.

The theoretical concept of the TD approach to prevent wildlife crime, as explained above, may do nothing but introduce a new "theory of change" for the wildlife crime prevention sector to find solutions for illegal wildlife trade. Theories of change are commonly used in the wildlife crime prevention and conservation sectors to explain and justify assumptions toward the direction taken in the interventions. Theories of change, however, do not often include all the three knowledge types to develop a solution. More importantly, it is critical to develop and implement practical solutions based on these theories to close the knowing-doing gap. We now present an example of how a TD approach could be used within the wildlife crime prevention sector.

## Designing Out Crime Research Center: An Example of a TD Approach

The Designing Out Crime Research Center (DOC), established at the University of Technology Sydney in 2008, has developed and implemented a TD way of working that draws on the discipline of design to resolve wicked problems such as crime. This approach is theoretically underpinned by the work of Kees Dorst, whose frame innovation theory (Dorst 2015) provides the conceptual backbone. At its core, frame innovation provides a practical process through which to rethink wicked problems. It also provides the platform from which a multidisciplinary team can develop transdisciplinary thinking and practice.

## Frame Innovation

For frame innovation to work, the partners involved need to be open to new approaches that are often foreign to problem-solving paradigms, the theory of change, and practices in their respective disciplines. It is this openness to new approaches that enables the development of a transdisciplinary space. Unfortunately, the common MD approaches are much easier to understand for a potential partner or donor. In the case of wildlife crime, a multidisciplinary team would, for example, consist of a conservation expert on the species, a law enforcement officer, and a wildlife forensic expert. It is easy to picture those disciplines working together to take on a wildlife crime problem. The conservationist brings the evidence base on the impact of the illegal trade and trade chains, the law enforcement officer can provide data of seizures and analyze gaps in law enforcement practices around illegal trade, and the wildlife crime forensic expert can analyze the seized commodities. This approach provides a perceived "safe" project where disciplinary experts each observe the situation and give their expert advice—in a manner that is

inherently constrained by their disciplinary thinking and the general approach to problems from within their respective sectors. Bouttellier, a Dutch sociologist, describes this predicament as "complexity without direction":

> In today's world we have difficulty formulating grand comforting ideas. We hear a cacophony of voices and opinions, see rage and frustration, and observe a lot of ad hoc policy and tentative management . . . A great deal of tinkering and muddling goes on within politics, educational institutions, the business community . . . If nobody knows the answer, then we choose what seems "best"; best practices, effective interventions, evidence-based strategies . . . We formulate a politics of risk management and crisis management, of market forces / freedom of choice . . . We let ourselves be guided by effectiveness and efficiency, demonstrated by performance indicators, supervision and control. (Bouttellier 2013, in Dorst et al. 2016, 6)

Through the application of a TD approach, like Frame Innovation, this predicament can be addressed. By applying Frame Innovation, the same individuals bring their expertise but the process generates potential solutions from outside of the disciplinary constraints of the team. The TD approach is not constrained by disciplinary boundaries and is therefore able to generate solution directions that are likely to be radically different from anything previously tried on the problem at hand. These potential solutions can then be assessed through the disciplinary lens of the problem owners for fruitfulness and taken forward, or discarded. As shown in Table 12.3, Frame Innovation is composed of nine steps (Figure 12.5 and Figure 12.6).

**TABLE 12.3. THE NINE STEPS OF FRAME INNOVATION***

| | |
|---|---|
| 1. Archeology: | Analyzing the history of the problem owner and of the initial problem formulation. |
| 2. Paradox: | Analyzing the problem situation: What makes this hard? |
| 3. Context: | Analyzing the inner circle of stakeholders. |
| 4. Field: | Exploring the broader societal field. |
| 5. Themes: | Investigating the themes that emerge in the broader field. |
| 6. Frames: | Creating frames by identifying how these themes can be acted upon. |
| 7. Futures: | Exploring the possible outcomes and value propositions for the various stakeholders. |
| 8. Transformation: | Investigating the change in stakeholder's strategies and practices required for implementation. |
| 9. Integration: | Drawing lessons from the new approach and identifying new opportunities within the network. |

*Adapted from Dorst et al. 2016.

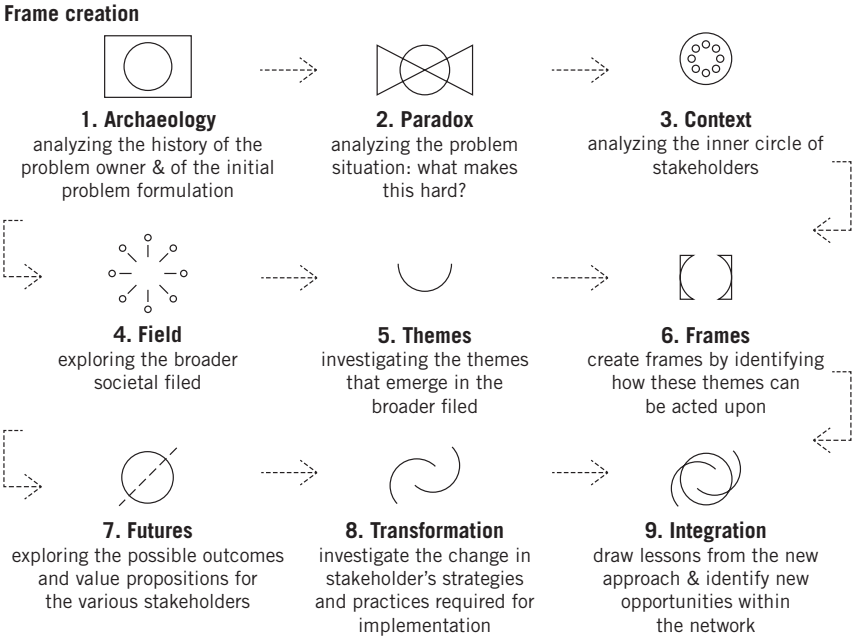


**Figure 12.5** Visualization of the nine steps of frame innovation (Dorst et al. 2016, 5).

The Frame Innovation approach developed at DOC has drawn on academic learning from design and other sectors (business, criminology, psychology, etc.). The Frame Innovation approach has been extensively tested and adapted through its application to real world wicked problems (Dorst et al. 2016), one of which is provided in the last section of this chapter. Reflections learned through the application of Frame Innovation, described below, can assist with the integration of a transdisciplinary approach for the prevention of wildlife crime.

## Lessons Learned from Problem-Solving Literature

There are different types of problems. This statement has been explored through many disciplinary lenses, each proposing different definitions. Three definitions that are particularly relevant to frame innovation are summarized here.

The term "wicked problem," used in this paper, originates from the social planning discipline (Ritell et al. 1973). A more contemporary definition of a wicked problem is presented by Dorst from a design discipline perspective. Dorst (2015) refers to wicked problems as "stuck" or "sticky problems," as

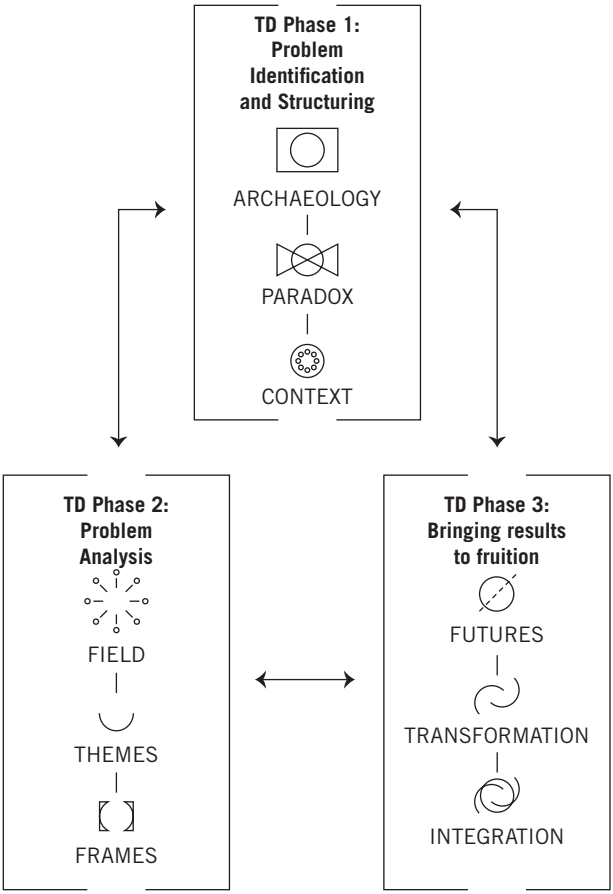


**Figure 12.6** Bringing the TD project phases and the frame innovation steps together. Adapted from Dorst et al. 2016 and Pohl and Hirsch Hadorn 2007.

they are resistant to change and require a TD approach for resolution, because they are:

- Open—the problem is hard to articulately define; it has no boundaries.
- Complex—the problem has many elements and relationships.
- Dynamic—the problem changes over time.
- Networked—there is more than one "problem owner," and it moves across organizations.

Wildlife crime is clearly a wicked problem and fits well within Dorst's definition of this "sticky problem," which prompts reflection on the current problem-solving approaches of the sector.

At a fundamental level there are two ways of solving problems, through convergent or divergent thinking (Guilford 1956). In convergent thinking

one gathers facts about a problem that all add up to the answer to the problem. Convergent problem solving is useful in some circumstances but not when a problem is complex. When a problem is complex (unique, a symptom of another problem, cause and effect is unclear, open, networked, dynamic) a divergent problem-solving approach is required. In divergent thinking multiple possible solutions are developed and then considered.

In the business management discipline, Snowden developed the Cynefin framework (Snowden 2005) to categorize problems and identify what type of problem solving will be effective. In brief, the Cynefin framework operates with the following assumptions:

1. Obvious—Visible order: where cause and effect are easily defined and evidence-based solutions can be implemented with certain results.
2. Complicated—Hidden order: where cause and effect can be ascertained through analysis and good practices identified for implementation.
3. Complex Un-order—where cause and effect can be seen only in retrospect and effective practice emerges from a portfolio of probes.
4. Chaotic Un-order—where cause and effect cannot be established and novel practices are required.

Wildlife crime is commonly approached by trying to establish cause and effect, which is associated with the "hidden order" domain, taking a "sense, analyze and respond" problem-solving approach. The different types of problems, as per the Cynefin framework, require different types of problem-solving approaches. The convergent thinking appears to be the common style of thinking in the wildlife crime prevention sector. This style of thinking sits well in the hidden order domain in the Cynefin framework.

There is a growing body of research into how private sector companies solve problems (referred to as "innovation"). Nagji and Tuff (2012), in a study of top-performing companies, found that these companies invest in an innovation portfolio. Within this portfolio there is a "golden ratio" of innovation investment across three areas: core, adjacent, and transformational. Core innovation is achieved through improving what is currently being done, while adjacent innovation is achieved through adopting new ways of working. Finally, transformational innovation is achieved through creating new value.

The organizations in the wildlife crime prevention sector are often not-for-profit and/or government or international institutions. However, business practices also apply to these institutions. The sector commonly achieves core innovation and adjacent innovation; however, it has not yet transgressed into achieving transformational innovation.

## A Case Study: Changing Paradigms

Divergent thinking through a transdisciplinary approach has contributed to a paradigm shift in how violence is being handled in global cities. This particular approach to transdisciplinary problem solving has been applied to many other problems and in other sectors and is part of a global trend in changing the way governments approach complex problems. To illustrate the application of the Frame Innovation approach and its potential impact, we provide this case study of a project undertaken by the DOC team with their partners. It is not an overstatement to say that this body of work is part of a paradigm shift in how governments are responding to violence in western cities.

## Kings Cross

The DOC team worked with the City of Sydney Council to explore alternative solutions to a grave problem. Kings Cross, an inner-urban suburb of Sydney, had a problem with street violence. The crime statistics showed that it was the number one "hot spot" for violence and antisocial behavior in Australia. The nearby hospital reported that Friday and Saturday nights were unmanageable and that head injuries and injuries from falls and violence were overwhelming their resources. There had been previous attempts to address this issue; for example, in 2008 the State government (Australia has three tiers of government: Council, State, Federal) convened a multidisciplinary team from across government agencies including police and justice, transport, health, alcohol regulators, and the City of Sydney Council to discuss what action could be taken. All of the participating government agencies were provided with crime statistics and asked to propose actions that they could take to reduce violence.

This multidisciplinary approach taken in 2008 resulted in an action list that was being implemented. Actions included tighter restrictions on the sale of alcohol, police conducting high visibility patrols, and transport agencies providing security guards at taxi stands. However, the scale of the problem was not lessening. The City of Sydney Council was interested in understanding the issues from a broader perspective than that of crime and misdemeanor. The council commissioned observation research to count the number of people using Kings Cross (and other suburbs) and to observe their behavior, and for the first time it was possible to quantify the sheer number of people (around thirty thousand) who went to Kings Cross on a Friday and Saturday night.

In 2009 and again in 2012, DOC worked with the City of Sydney Council to explore potential solutions from a transdisciplinary approach. The approach involved using ethnographic research to gain a deeper under-

standing of the problem, and broadening out the voices to include young people, hospitality workers, and local businesses. Through talking with young people in Kings Cross it became clear that people—usually young people, those under thirty years of age—were going to Kings Cross as part of a rite of passage and as part of an identity-forming experience. Typically, young people would go to Kings Cross for special events like birthday parties, "buck" and "hen" nights, or for a certain type of edgy or risky experience at a particular time in their youth, before finding different ways to spend their Friday and Saturday nights. And although some were ending up in trouble, or having committed a crime, none went there with that intention. It became evident, through this research, that if young people were using Kings Cross as a place to have identity-forming experiences, and as a rite of passage of living in Sydney, then it would be fruitful to support this kind of activity, rather than treat it with a risk management framework (i.e., crime prevention).

Taking the concepts of "identity forming" and "rite of passage" the team asked the question: "Who is good at providing safe identity-forming and rite-of-passage experiences?" One answer to this question was "organizers of music festivals." Music festivals are the result of the discipline and practice of event management. Event management professionals aim to create vibrancy, delight, and experience. This new frame gave a new structure and discipline area to explore for solutions to the violence problems in Kings Cross. It also gave food for thought to City of Sydney Council. If the question is no longer, "How do we prevent violence in the nighttime," but rather, "How do we create a vibrant nighttime economy?" then the Safe City Team who had been leading this body of work was probably not the most obvious skill set required. The Nighttime Economy Team was formed and they set to work on the development of the OPEN Sydney strategy. OPEN Sydney has more than three hundred action items all aimed at creating a global, connected, diverse, inviting, responsive, and safe city.

Many interventions were implemented, such as crowd control, portable toilets, and other things that one might expect to see at a music festival, such as a space to go for assistance. This space was branded as a Safe Space and is staffed by "Take Kare Ambassadors" (the name is inspired by the initials of a young man, Tomas Kelly who was violently killed in Kings Cross in 2012). This Safe Space has provided assistance to more than twenty thousand people who were at risk of becoming victims of crime. The evaluation report (City of Sydney 2105) found that the program saves the government more than $350,000 per month, which is attributed to savings from police, ambulance, and other medical treatment.

The Safe Space is one practical example of how rethinking the problem through a TD lens has created impact, the broader impact of this thinking is difficult to attribute, but none-the-less it is important to communicate the

broader paradigm shift that has occurred in this space. Kings Cross is presently undergoing a rebirth. The large premises where alcohol was not only the revenue stream but the business model are largely gone. Broader government interventions have radically disrupted the old paradigm. The OPEN Sydney strategy now encourages businesses whose value proposition is "entertainment" rather than "selling alcohol" to thrive. Violence in Kings Cross has plummeted, and the neighborhood is refashioning itself as a theater and restaurant district.

## Conclusion: Preventing Wildlife Crime through a TD Approach

This chapter outlines the wicked problem of wildlife crime and its challenges in resolving the associated threats to biodiversity and security. The approach of the wildlife crime prevention sector is interdisciplinary and/or multidisciplinary and a "common" approach of convergent thinking and a problem-solving style of "sense, analyze and respond" (Snowden 2005) has been embedded in the sector.

We argue that to resolve the wicked problem of the illegal wildlife trade, the wildlife crime prevention sector should reframe its thinking and practice, and adopt a transdisciplinary approach. The transdisciplinary theoretical framework offers a divergent thinking approach, by fulfilling the knowledge requirements for three different types of knowledge (knowledge as theory, knowledge as elements, and knowledge in context). These three different types allow activities and research to fulfill the knowledge requirements relevant to the aspect of the problem of wildlife crime at hand. This enables the knowing-doing gap to be closed and aligns the development and implementation of practical solutions for all aspects of the trade chain to combat illegal wildlife trade.

Frame innovation, developed and applied by the DOC unit is an example of an evidence-based and effective transdisciplinary approach to "design" solutions for wildlife crime prevention. The exploration of the frame innovation process and the lessons learned pertinent to wildlife crime provide insights of the benefits of a TD application to the wicked problem of illegal wildlife trade. Through the introduction of the theoretical framework of TD, the frame innovation tool and the case study, the wildlife crime sector is encouraged to start to shift their thinking and practice from an interdisciplinary and/or multidisciplinary to a transdisciplinary approach, to allow for divergent problem solving and transformational innovation. Solutions driven from this perspective will be practical, informed by science, and also nimble, proactive, and original. To become more nimble and effective in the prevention of wildlife crime, it is necessary to break down the barriers of the disciplinary and expert-bound approaches to combat wildlife crime and start engaging with this wicked problem from different perspectives.

This could be the key to the development of effective interventions and address the threats of the illegal wildlife trade.

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# 13

# EXAMINING RANGER WELL-BEING AND WORKPLACE CONDITIONS

*A Practitioner-Driven Study*

Rohit Singh,
Barney Long, and
William D. Moreto

**EDITOR'S INTRODUCTION:** *In the last chapter of the volume, Singh, Long, and I provide the descriptive results from the largest study ever conducted on front line rangers. Drawn from surveys collected from 104 conservation areas within 23 countries across Africa and Asia and including data from 1,100 rangers, the chapter provides insight on the perspectives from front line conservation personnel—a viewpoint that has been largely neglected. Additionally, we comment on the value of practitioner-driven research as well as the utility of practitioner-academic collaborations, particularly one that is centered on a social science orientation.*

Current trends indicate that global biodiversity is declining and extinction rates are increasing (Hilton-Taylor et al. 2009). Some have even suggested that the world is currently entering its sixth mass extinction (Ceballos, Garcia, and Ehrlich 2010; Barnosky et al. 2011; Ceballos et al. 2015). This loss of biodiversity has considerable impact on the world's ecosystems and human well-being (Diaz et al. 2006). Unfortunately, much of this has been attributed to human activities and behaviors (Halpern et al. 2008). Historically, conservation efforts have tended to focus on strategies that can sustain or bolster species populations, protect wildlife habitats, and provide support for communities that border conservation areas like national parks. All of these efforts are undeniably important and consistently generate much discussion within the conservation community.

One area of interest that has received little attention, however, is the front line rangers. This is surprising given the central role that rangers play in the

management and monitoring of conservation areas throughout the world. Moreover, despite attention being paid to ranger activities, such as their effectiveness and efficiency in reducing illegal activities (Leader-Williams, Albon, and Berry 1990; Jachmann and Billiouw 1997; Hilborn et al. 2006; Moreto et al. 2014), little is known about the actual experiences and viewpoints of these individuals. The literature that does exist mostly originates from the United States and from countries within the African continent. Knowledge on rangers living and working in Asian conservation areas is sparse.

Our chapter is separated into two sections: first, we introduce and discuss the impetus for conducting a cross-national survey on rangers in African and Asian conservation areas that examined their perceptions on workplace conditions and overall well-being. We also provide an overview of the logistics required in conducting such a study and the challenges we had to overcome. While this is the most expansive study ever conducted on rangers, our objective here is more modest as we simply provide an overview of the preliminary descriptive results. Second, we discuss the importance and value of conducting such research from a practitioner perspective. We also provide a discussion on the significance of developing practitioner-researcher collaborations, particularly with scholars in the social sciences.

## Ranger: A Definition

An important hurdle that needed to be addressed during the course of the study was the appropriate definition of a "ranger." Indeed, the profession itself may include a number of specializations and may involve a variety of disciplines (Appleton 2016). Generally speaking, a ranger is a person who is responsible for the front line protection, preservation, and monitoring of conservation areas and wildlife. The term "ranger," however, can have different designations and administrative ranks throughout the world. Moreover, front line personnel can also be referred to as game wardens, wildlife wardens, forest guards, scouts, watchers, and conservation officers. For our purposes here, we refer to this collective group simply as rangers.

## The Roles and Responsibilities of Rangers

Rangers around the world play a wide range of roles in conservation area management. The IUCN World Commission on Protected Areas' Global Register of Competences for Protected Area Practitioners summarizes the role of a front line ranger as follows (Appleton 2016):

- Protect species, habitat, and ecosystems.
- Maintain ecosystem services, vital for local and national economies.

- Support local sustainable development and use of natural resources.
- Provide opportunities for tourism and recreation.
- Promote equitable forms of governance.

In some cases, rangers are also provided with legal authority to apprehend and arrest suspects and conduct criminal investigations. Prior research suggests that rangers recognize the wide-ranging nature of their occupation. For example, Moreto and Matusiak (2017) found that law enforcement rangers in Uganda identified several responsibilities they considered as being within the scope of law enforcement: ranger-based data collection, guiding, community-related services (e.g., responding to problem wildlife), and traditional law enforcement (e.g., arresting suspects or conducting intelligence operations).

## Current Study Objectives

The current study attempts to contribute to the conservation science literature by examining the perceptions of front line rangers in a number of conservation areas throughout Africa and Asia. This is the first cross-national study on rangers ever conducted and the largest in scale and scope. Importantly, as the primary goal of our chapter is to discuss the value of practitioner-driven research and academic-practitioner collaborations, we decided to only present the descriptive findings from our study to complement our main objective.

## Methods and Data

Data for the present study was collected from close-ended surveys between January 2015 and June 2016 and focused on examining ranger perceptions of their workplace conditions. The study was conducted in 104 conservation areas within 23 countries across Africa and Asia and includes responses from 1,100 rangers ($n$=570 in Africa and $n$=530 in Asia, respectively). Although the World Wide Fund for Nature (WWF) was primarily responsible for orchestrating this large-scale study, data was collected with the help of a number of ranger associations, conservation organizations, and government agencies. This collaborative approach was necessary to not only overcome the logistics associated with the study but also enable us to further contextualize the study (i.e., variation in defining "front line rangers"). The majority of the surveys were conducted face-to-face. Prior to each survey, respondents were informed of the purpose of the study, how the information would be used and disseminated, confidentiality, and that their participation was completely voluntary.

The survey was composed of close-ended questions that tapped into respondent perceptions of their occupation and workplace environment.

In particular, we asked study participants what factors motivated them to continue being a ranger, what aspects of the job were perceived to be problematic, whether they considered their equipment and training to be sufficient, how often they saw their family, and whether they had been threatened by community members or faced a life-threatening situation during the course of their daily operations. What follows next are the preliminary descriptive findings from the survey.

## Descriptive Findings

In regard to motivation to continue as a ranger, the key reason listed by rangers from both continents was the enjoyment of being close to nature. Other reasons identified in Asia included the fact that people enjoyed being a ranger but also that they had no other employment options. In Africa, the reasons for wanting to stay a ranger included being responsible for implementing the law and being a respected member of the community. Conversely, in both Asia and Africa, low and/or irregular salary, frequent transfers, and dangerous working conditions were listed as the worst aspects of being a ranger.

When asked whether they believed that they received adequate amenities and equipment, 74 percent of respondents in Asia and 59 percent of respondents in Africa believed that they were not provided with the required equipment and amenities to fulfill their job requirements. This includes basic equipment such as boots, tents, a compass, GPS, and other field gear. Basic amenities include access to clean drinking water, toilets, and bedding facilities. In terms of training, 48 percent of rangers in Asia and 42 percent of rangers in Africa noted that they are inadequately trained to address the threats to biodiversity in their site.

An important yet neglected component of the ranger profession is the impact it has on the personal lives of the rangers. In particular, the challenges associated living with and at times apart from their families. In our study, 45 percent of study participants in Asia and 30 percent of study participants in Africa see their family less than five days a month. This unfortunate reality is attributed to two main factors: the remoteness of ranger duty stations and the low number of rangers in a site making it difficult for rangers to leave their post.

Finally, respondents were surveyed on their own personal experiences with being threatened as a result of being a ranger. In total, 43 percent of rangers in Asia and 75 percent of rangers in Africa said that community members or other people have threatened them because of their work. Additionally, 63 percent of respondents in Asia and 82 percent of respondents in Africa have faced life-threatening situations. Most situations identified by respondents were attributed to dangerous encounters with wildlife, threats from local communities, and physical attacks from poachers.

## Discussion

Our findings suggest that rangers in both African and Asian settings display similar outlooks on their profession. Namely, respondents in both settings highlighted how they enjoyed the outdoors. Similar findings were found in the United States (Charles 1982; Eliason 2006b) and supported by research in Uganda (Moreto, Lemieux, and Nobles 2016). We also found that most respondents considered the amenities, equipment, and training to be insufficient (see also Walsh and Donovan 1984; Eliason 2006a; Moreto 2016). Study participants also highlighted the personal toll of the occupation by detailing how infrequently they saw their families. This is a considerable issue given the potential impact it may have on staff morale. However, given the logistical and operational challenges associated with limited manpower, particularly at outposts, and the limited resources available for their families (should they be permitted to live together), it is not surprising that respondents spent a considerable amount of time away from their families. Last, it is interesting to note the differences in experiences of rangers living in Asia compared to rangers living in Africa with regard to being threatened by communities and facing life-threatening encounters (see also Warchol and Kapla 2012 and Moreto, Brunson, and Braga 2017). This could be attributed to distinct socio-political and cultural contexts, local dynamics, and perceptions toward conservation initiatives and wildlife. It is clear that more research is needed to further unravel the nuances associated with the ranger profession.

### *A Practitioner-Driven Study*

As noted, the preceding case study was largely practitioner-driven in two ways: first, the initial conception, development, and implementation of the survey started with the WWF. Although outside consultation did occur during the early stages and there is currently an ongoing collaboration within academia (discussed in the next subsection) to further examine the data and move forward with subsequent projects, the start of this project originated with a practitioner-focus in mind. Second, given the scale of the study and the challenges associated with gaining access to several sites, other practitioner-based organizations were also asked to become involved either in data collection or in simply helping to navigate ground-level access and government permission wherever required clearance. Importantly, the familiarity and working relationship that these organizations had with the local government and the conservation areas that were approached were instrumental in legitimizing the present study.

We believe that practitioner-driven studies warrant consideration within the broader scope of conservation science research. Such studies not only provide a unique opportunity to address topics that are under researched

within the scientific conservation community—for example, ranger perceptions of their occupation—but deliver a unique outlook on ground-level conservation initiatives (see also Bergenas, Chapter 11). Further, such research also enables front line conservation staff to be represented in a manner that accurately portrays the complexity and multifaceted nature of the human dimension of conservation policy (cf. Moreto 2017).

### *Practitioner-Researcher Collaborations: The Role of Criminal Justice Scholarship*

Despite the strengths and potential promise of practitioner-driven research, the importance of practitioner-research collaborations also warrant consideration. To date, the collaboration between the authors has led to one scholarly article (Moreto et al., in press) with additional work currently under development. At the time of writing this chapter, we are also currently venturing into the second phase of the ranger perception study. This second phase is more detailed and enables us to conduct more sophisticated analyses of the data. Moreover, we are also attempting to conduct the study in more conservation areas and countries than the first phase discussed in this chapter.

One unique characteristic of the second phase, however, is that it explicitly incorporates and draws from the criminal justice literature. This provides a unique opportunity for the field of conservation to be introduced to areas that criminal justice scholars have long investigated, including community-police relations, police corruption, police job stress, and job satisfaction, while also affording the possibility for criminal justice scholars to assess the applicability of criminal justice theory (see Maguire and Duffee 2015). In other words, this is a mutually beneficial collaboration and highlights the potential for practitioner-researcher partnerships. Importantly, the involvement of criminal justice scholars helps solidify the importance of incorporating the social sciences within the conservation sciences (see Campbell 2005; Agrawal and Ostrom 2006; Adams 2007; Moreto 2017; Moreto, Introduction). Indeed, increasing discussions on criminal justice–related matters (e.g., wildlife law enforcement) and concepts (e.g., deterrence) are explicit invitations for criminal justice scholars to become more involved in such transdisciplinary investigations (Willemsen and Watson, Chapter 12).

## Conclusion

This chapter presented a brief overview of the preliminary descriptive findings of the largest study ever conducted on front line rangers. We also discussed the value of practitioner-driven studies and the role of criminal justice scholars in developing and fostering practitioner-researcher collaborations within the conservation sciences. It is our hope that this

chapter—along with the others in this volume—contributes to important discussions on the study of wildlife crime, its responses, and the species (both human and nonhuman) that are directly impacted by it.

## Acknowledgments

Many conservation organizations, ranger associations, and individual rangers have contributed to these surveys. The authors would like to send our utmost gratitude to all our study participants for their involvement. We would like to thank those involved in facilitating access to each of the study sites, as well as those responsible for data collection and collation including Strategic Good. We would like to thank Assam Ranger Association, German Ranger Association, Tanzania Ranger Association, Protected Areas Workers Association, NSW, Ranger Association Nepal, Swiss Rangers Association, Mongolia Ranger Association, Korea Ranger Association, Department of Conservation, New Zealand, Israel Nature and Park Authority, PAMS Foundation, Wildlife Trust of India, Wildlife 1 Conservancy, and United for Rangers. Additionally, we are grateful to the governments of all participating countries for enabling us to conduct the study. The study team is also grateful to all WWF Offices involved for coordinating the surveys. We also wish to thank Global Wildlife Conservation for their involvement in the second phase of this project. This study was funded by the World Wide Fund for Nature through its Tigers Alive and Wildlife Crime Initiative.

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# CONTRIBUTORS

**Johan Bergenas** is senior director for public policy at Vulcan Inc., the organization led by philanthropist and Microsoft cofounder Paul G. Allen. At Vulcan he covers environmental and global security issues, and is engaged with Vulcan's technology projects. At the time of writing, Bergenas was a senior associate and program director at the Stimson Center, a leading U.S. national security think tank. At Stimson he covered a wide range of transnational security issues, as well as the use of technology to tackle some of the world's hardest challenges. He has also held positions with the Monterey Institute, Oxfam, and Linkoping University. He holds an honors M.A. degree from the School of Foreign Service at Georgetown University and an honors B.A. degree from the University of Iowa. Bergenas has published in the *New York Times*, *Washington Post*, *Politico*, *Foreign Affairs*, and *Foreign Policy*.

**Avi Brisman** is an associate professor in the School of Justice Studies at Eastern Kentucky University (United States), an adjunct associate professor in the School of Justice at Queensland University of Technology (Australia), and a conjoint associate professor in the Newcastle Law School at the University of Newcastle (Australia). His books include *Geometries of Crime: How Young People Perceive Crime and Justice* (Palgrave Macmillan, 2016); *Green Cultural Criminology: Constructions of Environmental Harm, Consumerism, and Resistance to Ecocide* (Routledge, 2014), coauthored with Nigel South; *The Routledge Companion to Criminological Theory and Concepts* (2017), coedited with Eamonn Carrabine and Nigel South; *Environmental Crime and Social Conflict: Contemporary and Emerging Issues* (Ashgate, 2015), coedited with Nigel South and Rob White; and the *Routledge International Handbook of Green Criminology* (2013), coedited with Nigel South. In 2015, he received the Critical Criminologist of the Year award from the American Society of Criminology, Division on Critical Criminology.

**Craig J. Forsyth** is professor of sociology, a Picard Scholar, and holds the Jack and Gladys Theall/BORSF Professorship in Liberal Arts at the University of Louisiana at Lafayette. He is the author of over two hundred fifty journal articles and book chapters. He is the author of *The American Merchant Seaman: Struggle and Stigma* (Taylor and Francis, 1989); coauthor (with Anthony Margavio) of *Caught in the Net: The Conflict between Shrimpers and Conservationists* (Texas A&M Press, 1996); and coauthor (with Heith Copes) of the *Encyclopedia of Social Deviance* (Sage, 2014). His principal research interests are in the areas of deviance, crime, and delinquency. He received his Ph.D. in sociology from Louisiana State University in 1983. He received both his B.A. (1977) and M.A. (1979) at the University of New Orleans.

**York A. Forsyth** has a B.S. in management information systems and a M.A. in political science. He is a data coordinator at the Picard Center, University of Louisiana at Lafayette. He has published articles on piracy, juvenile delinquency, poachers, and game wardens.

**Meredith L. Gore** is a conservation social scientist whose interdisciplinary research explores relationships between human behavior and the environment. Dr. Gore received her Ph.D. in natural resource policy and management from Cornell University, M.A. in environment and resource policy from George Washington University, and B.A. in anthropology and environmental studies from Brandeis University. She is an associate professor in the Department of Fisheries and Wildlife and School of Criminal Justice at Michigan State University (MSU). Dr. Gore is a MSU Global Research fellow and president of the Society for Conservation Biology's Social Science Working Group. Her research interests focus on community-based natural resource management and enhancing understanding of risk concepts and their application to biodiversity conservation. Dr. Gore co-developed the Conservation Criminology research framework and teaching certificate program at MSU; the interdisciplinary approach synthesizes natural resource policy, risk and decision analysis, and crime science. Her leadership in this field has resulted in new scientific insight regarding conservation of species such as white sharks, lemurs, cranes, sea turtles, rhinos, elephants, ploughshare tortoises, double-crested cormorants, black bears, and gray wolves. NSF, USDA, and Michigan Department of Natural Resources have helped fund Dr. Gore's research; her students have received awards from NSF, Fulbright, Jane Goodall Institute, and Great Lakes Leadership Academy.

**Georg Jaster**, is an attorney at law admitted at the bars in Germany (Düsseldorf) and Poland (Płock). He is partner of the Law firm TIGGES Rechtsanwälte and mainly working in the field of international infrastructure and environmental law. From 2013 to 2016 Georg was working in Madagascar as legal counsel for the Malagasy NGO-Platform "Alliance Voahary Gasy." During his years in Madagascar, Georg was training young Malagasy colleagues in international environmental law, he was helping set up structures to fight corruption and the smuggling of endangered species and to develop the Malagasy civil society. He is coauthor of the book *La bonne gouvernance environnementale en 27 études de cas,* (Antananarivo 2016) and author of several articles related to forestry and to the application of the CITES.

**Alexander K. Killion** is a wildlife ecologist who studies human-environment interactions. He was born and raised in rural Illinois and received a master's degree in fisheries and wildlife from Michigan State University. Don't expect him to know anything about

fish, though. He now lives in Boise, Idaho, with two sensitive women (one human, one canine) where he is earning his Ph.D. at the Human-Environment Systems Research Center at Boise State University. Alex is passionate about conducting actionable research and uses quantitative methods to identify both the social and ecological mechanisms capable of supporting coexistence between humans and large carnivores. Additionally, he is a research fellow at the National Socio-Environmental Synthesis Center. In his free time he enjoys running, attempting to woodwork, and kayaking.

**Kasey Kinnard** is the grant administrator and outreach coordinator at the Terrorism, Transnational Crime and Corruption Center (TraCCC) at the Schar School of Policy and Government, George Mason University. She is an illicit trade specialist with particular focus on wildlife trafficking, human trafficking, and the impacts of illicit trade and corruption on development, especially in sub-Saharan Africa. She was coauthor on the paper, "Proper Methodology and Methods of Collecting and Analyzing Slavery Data: An Examination of the Global Slavery Index" and has served as researcher for TraCCC projects on wildlife crime in South Africa and Tanzania. She has previously lived and worked in rural South Africa as a U.S. Peace Corps volunteer in the education and development sectors.

**Antony C. Leberatto** is a native of Peru. He earned his Ph.D. from Rutgers School of Criminal Justice in Newark, New Jersey, and is currently an assistant professor of Criminal Justice at New Jersey City University in Jersey City. In 2012, he began a field investigation into Peru's illegal wildlife trade by interviewing the actors involved in fauna trade (hunters, middlepersons, sellers, buyers) and rescue processes (fauna rescue center workers, environmental police, and conservationists). This ongoing investigation explores the sociopolitical, historical, and cultural meanings of Peru's wildlife trade with the aim of creating sustainable and conscientious solutions that conserve biodiversity and improve the lives of citizens in biodiversity zones. His other research interests include: programs evaluations, international criminology, victimizations, and situational crime prevention. He is especially interested in employing the use of "survivor" and "safety" scripts toward the creation of methods useful for crime prevention. He splits his time between the New Jersey/New York metro area and Lima, Peru.

**Barney Long** works on the conservation of endangered species and the thematic approaches required to achieve the recovery of their populations. He is the director of species conservation at Global Wildlife Conservation and has worked extensively on saola, Sumatran and Javan rhinos, tiger, gibbons, doucs, and a host of other species across the world. Prior to joining Global Wildlife Conservation he led the Species Program at WWF-U.S. and coordinated the global WWF network's program of work on preventing poaching. Barney started his career in Southeast Asia conducting biological surveys and establishing conservation programs for endangered species. Initially using community-based and protected area approaches to conserve species, he expanded to the integration of species conservation within wider landscape and socioeconomic development processes on which he conducted his doctoral research. A key interest of Barney's is how to raise the quality of implementation through improving approaches to protected area management effectiveness, the prevention of poaching, and species conservation and recovery planning. Key to all these are well trained and supported front line staff, which has led to Barney's interest in establishing mechanisms focused on ranger welfare, working conditions, and capacity.

**Nerea Marteache** is an associate professor of criminal justice and the assistant director of the Center for Criminal Justice Research at California State University at San Bernardino. Her research interests and scholarship focus on crime prevention through opportunity reduction and on the analysis and evaluation of criminal justice policy. She is currently working on projects on employee theft, crime in transportation systems, and wildlife crime. She received the Promising Young Scholar award in 2010 from the Sociedad Española de Investigación Criminológica and the Young Criminologist award in 2013 from the European Society of Criminology. Dr. Marteache's recent scholarly work includes coediting the *International Handbook of Juvenile Justice* (2nd ed.), publications in journals such as the *Security Journal, European Journal on Criminal Justice and Research, European Journal of Criminology, Journal of Public Transportation,* and *Crime Science*, and several book chapters.

**William D. Moreto** is an assistant professor in the Department of Criminal Justice at the University of Central Florida, where he is the coordinator for the graduate crime analysis program and is a member of the graduate and doctoral faculty. He received his B.A. from the School of Criminology at Simon Fraser University, and Ph.D. from the Rutgers School of Criminal Justice. In 2015, he was awarded a visiting fellow scholar position at the Netherlands Institute for the Study of Crime and Law Enforcement. His research interests include environmental criminology and crime science, situational crime prevention, policing, wildlife crime, and wildlife law enforcement. His research can be found in leading criminology, criminal justice, and conservation science journals, including *Justice Quarterly, British Journal of Criminology,* and *Oryx: The International Journal of Conservation*. He is the lead author (with Stephen F. Pires) of the forthcoming book *Wildlife Crime: An Environmental Criminology and Crime Science Perspective* (Carolina Academic Press).

**Gohar A. Petrossian** is an assistant professor in the Department of Criminal Justice at City University of New York—John Jay College of Criminal Justice. Her research focuses on applying environmental criminological theories to study crimes against wildlife, with a particular focus on illegal, unreported, and unregulated fishing. Dr Petrossian's research appears in various top criminal justice and conservation journals.

**Jonah H. Ratsimbazafy** is a native of Madagascar. He received his Ph.D. in physical anthropology from the State University of New York at Stony Brook. He is currently the president of the Madagascar Primate Group (GERP) and the director of the Houston Zoo Madagascar Program. He is also an adjunct professor in the Faculty of Sciences and the Department of Veterinary Sciences and Medicine at the University of Antananarivo. With GERP, he has led the World Lemur Festival since 2014. His research interests include primate behavior and ecology. He coauthored the second and third editions of the *Field Guide Series: Lemurs of Madagascar*. He published over 165 scientific publications. From 2006 to 2008, he was the vice president of the International Primatological Society for Conservation. He was the PI of the Project Lemurs and Forests of Madagascar funded by Earthwatch Institute. Currently, he is a co–vice chair of the IUCN/SSC Specialist Group–Madagascar and counselor of the Lemur Conservation Network. He was selected as a 2015 Disney Conservation Hero.

**Gary J. Roloff** is on the faculty in the Department of Fisheries and Wildlife at Michigan State University (MSU). Gary is responsible for the Applied Forest and Wildlife Ecology

Lab (AFWEL) at Michigan State, where he oversees research projects on a variety of topics including feral swine ecology and control, deer herbivory effects on regenerating forests, timber harvest effects on wildlife, and marten and snowshoe hare ecology, among others. Gary's educational background includes a B.S. from the University of Wisconsin–Steven Point, an M.S. from Eastern Kentucky University, and a Ph.D. from Michigan State University.

**Viviane Seyranian** is an assistant professor of psychology at California State Polytechnic University, Pomona. She is a social psychologist who researches how to optimize influence and behavioral change, particularly concerning environmental and conservation issues. In addition to her research in social influence, Dr. Seyranian also develops and tests a wide variety of interventions seeking to empower minority populations. Her research utilizes diverse methodologies ranging from lab and field experiments to qualitative methods such as manual and computerized content analysis. Dr. Seyranian earned her Ph.D. and M.A. in basic and applied social psychology from Claremont Graduate University and her B.A. cum laude in psychology and government from Claremont McKenna College. She completed her postdoctoral training at the University of Southern California.

**Louise Shelley** is the Omer L. and Nancy Hirst endowed chair and a university professor at George Mason University. She is in the Schar School of Policy and Government and directs the Terrorism, Transnational Crime and Corruption Center (TraCCC) that she founded. She is a leading expert on the relationship among terrorism, organized crime, and corruption as well as on human trafficking, transnational crime, and terrorism with a particular focus on the former Soviet Union. She also specializes in illicit financial flows and money laundering. She is presently an inaugural Andrew Carnegie fellow writing a book on illicit trade and sustainability under contract with Princeton University Press. Dr. Shelley received her undergraduate degree cum laude from Cornell University in penology and Russian literature. She holds an M.A. in criminology from the University of Pennsylvania. She studied at the Law Faculty of Moscow State University on IREX and Fulbright Fellowships and holds a Ph.D. in sociology from the University of Pennsylvania. She is the author of *Dirty Entanglements: Corruption, Crime and Terrorism* (Cambridge University Press, 2014), *Human Trafficking: A Global Perspective* (Cambridge University Press, 2010), and *Policing Soviet Society* (Routledge, 1996), among numerous other scholarly publications.

**Rohit Singh** has been with WWF for nine years and brings his considerable experience, enthusiasm, and insights into his position as Wildlife Law Enforcement Specialist–Asia for "Tigers x 2." He is also pillar lead for the Stop the Poaching Pillar of the Wildlife Crime Initiative. Rohit has been instrumental in moving forward uptake and implementation of the Zero Poaching Framework/Toolkit, in driving the agenda to professionalize the ranger force, and in sharing lessons learned in Asia with colleagues in Africa. Rohit is also the chair and main contact for the Ranger Federation of Asia.

**Nicole Sintov** is assistant professor of behavior, decision making, and sustainability at The Ohio State University's School of Environment and Natural Resources. As an environmental psychologist, she views today's most pressing environmental problems as products of human decision making and behavior, and changing human behavior as an essential element in creating a sustainable future for humankind. Blending perspectives

and methodologies from the psychological, environmental, and information sciences, her primary research objectives are to develop and test interventions to encourage pro-environmental behavior change and to understand the psychological processes that underlie change. She pursues these objectives as they pertain to sustainable technology adoption and wildlife security, with a research program that is highly interdisciplinary and field based. Dr. Sintov received her Ph.D. in psychology from the University of Southern California and B.S. in psychology and ecology from the University of California at San Diego.

**Nigel South** is a professor in the Department of Sociology and Director, Centre for Criminology, at the University of Essex, England. With Avi Brisman, he is coeditor of the *Routledge International Handbook of Green Criminology* (2013), coauthor of *Green Cultural Criminology* (2014), and both are coeditors (with Rob White) of *Environmental Crime and Social Conflict: Contemporary and Emerging Issues* (2015). In 2013, he received a Lifetime Achievement award from the Division on Critical Criminology of the American Society of Criminology. He is a fellow of the Academy of Social Sciences and adjunct professor in the School of Justice at Queensland University of Technology, Brisbane.

**Milind Tambe** is Helen N. and Emmett H. Jones professor in engineering at the University of Southern California (USC) and the founding codirector of CAIS, the USC Center for AI in Society, where his research focuses on "AI for Social Good." He is a fellow of AAAI and ACM, as well as recipient of the ACM/SIGART Autonomous Agents research award, Christopher Columbus Fellowship Foundation homeland security award, INFORMS Wagner prize in Operations Research, Rist Prize of the Military Operations Research Society, IBM Faculty award, Okawa foundation award, RoboCup scientific challenge award, and other awards including the Orange County Engineering Council Outstanding Project Achievement award, USC Associates award for creativity in research, and USC Viterbi use-inspired research award. Prof. Tambe has contributed several foundational papers in AI in areas such as security games and multiagent systems; these papers have received over a dozen best paper and influential paper awards at conferences such as AAMAS, IJCAI, IAAI, and IVA. In addition, Prof. Tambe's pioneering real-world deployments of security games has led him to receive meritorious commendations from the U.S. Coast Guard Commandant, LA Airport Police, and the U.S. Federal Air Marshals Service. For his teaching and mentoring, Prof. Tambe has received the USC Steven B. Sample Teaching and Mentoring award; to date he has graduated twenty-five Ph.D. students and mentored ten postdocs. Prof. Tambe has also cofounded a company based on his research, Avata Intelligence. Prof. Tambe received his Ph.D. from the School of Computer Science at Carnegie Mellon University.

**Daan P. van Uhm** is assistant professor in criminology at the Willem Pompe Institute for Criminal Law and Criminology, Faculty of Law, Economics and Governance, Utrecht University. He has conducted research on various forms of environmental crime, such as transnational illegal wildlife trafficking, deforestation and timber trade in Southeast Asia, and the illegal trade in dogs in Europe, and assisted in several lawsuits. Daan van Uhm obtained his Ph.D. in criminology at Utrecht University in 2016. His thesis "The Illegal Wildlife Trade: Inside the World of Poachers, Smugglers and Traders" was published by Springer. Van Uhm primarily focuses on research in the context of green crimes and harms.

**Greg Warchol** is a distinguished professor of criminal justice at Northern Michigan University in Marquette. He holds a doctorate in criminal justice from Michigan State University and a master's and bachelor's from the University of Illinois at Chicago. Prior to his academic career, he was on the staff of the NCVS Unit, Bureau of Justice Statistics; the U.S. Attorney's Office, Northern District of Illinois; and the Cook County State's Attorney's Office, Chicago. He began his field research on the illegal trade in endangered and protected species in 2001 with a focus on poaching and trafficking. His research interests also include work on the impact of the Troubles in Northern Ireland on its legal system.

**Rodger Watson** is deputy director of the Designing Out Crime Research Centre at the University of Technology, Sydney, and has worked in and with the public sector for more than fifteen years. At Designing Out Crime, he leads a team who has developed a transdisciplinary practice that is now being adopted by a range of public sector and not-for-profit organizations. The Designing Out Crime team facilitates multistakeholder programs on complex issues such as identity theft, domestic violence, and prisoner rehabilitation. Together they have completed more than 100 partnership projects and have published their findings in books (most recently, *Designing for the Common Good*, BIS Publishers, 2016), and peer reviewed publications spanning the disciplines of design, innovation, criminology, and conservation. Before joining Designing Out Crime, Rodger undertook a bachelor of arts (psychology), a masters of criminology, and worked with the NSW Department of Justice in crime prevention policy and programs. His passion lies in working with people and organizations to solve the big issues. He is finishing his Ph.D. on public sector problem solving.

**Rob White** is professor of criminology in the School of Social Sciences at the University of Tasmania, Australia. He has published widely in the areas of criminology and youth studies. Among his recent books are *Environmental Harm: An Eco-Justice Perspective* (Policy Press, 2013), *Green Criminology* (coauthored with Diane Heckenberg, Routledge, 2014), *Environmental Crime and Collaborative State Intervention* (coedited with Grant Pink, Palgrave Macmillan, 2016) and *Media and Crime: Content, Context and Consequence* (coauthored with Katrina Clifford, Oxford University Press, 2017).

**Madelon Willemsen** has worked to address threats to biodiversity for over twenty years from a wide range of perspectives. She started as a behavioral biologist in Artis Zoo, Amsterdam, in 1997, and following almost seven years in different senior roles at Taronga Zoo in Sydney, she moved to Werribee Open Range Zoo, Victoria, as general manager, in 2010. In 2013, building on two master degrees in animal behavior and project management, Madelon returned to Sydney for her Ph.D. in conservation project management. Her research found that the traditional conservation research paradigm often confounds innovative and divergent approaches to conservation, and she developed a transdisciplinary framework to better address the threats to biodiversity. From January 2015 to December 2017, Madelon held the position of country director for TRAFFIC in Viet Nam. She was based in Hanoi and with her team adopted a transdisciplinary approach in their day-to-day efforts to combat the illicit wildlife trade, a significant and growing threat to biodiversity. At the time of writing Madelon is looking for her next dream job and publishing papers on her Ph.D. research.

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