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Degree of Doctor of Philosophy

Tigers in global wildlife crime:

Addressing the issue in the Amur-Heilong region

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ABSTRACT OF DISSERTATION

The scale of illegal wildlife trade problem has become so massive and devastating that it has been proclaimed the second largest hazard to biodiversity, along with deforestation and habitat degradation. Increasing demand for alternative medicine, including traditional Chinese medicine, among the growing middle class in China, other Southeast and East Asian countries have resulted in increased pressure on wildlife species, bringing endangered species to the brink of extinction.

Illegal trade in tigers and their parts remains one of the main challenges to securing a global wild tiger population despite many years of effort in tiger conservation. Various practices and approaches have been employed on global and national levels, however it is still not clear which measures have had the most significant impact. For the last twenty years Amur-Heilong has remained a transborder region with one of the most viable and stable tiger populations despite the unabated level of Amur tiger poaching and smuggling across the Sino-Russian border.

This dissertation analyses global and regional practices to address wildlife crime in cases of tiger related crime. From the global perspective the author uses various methods to analyse the implementation of a tiger related agenda within the context of CITES as the most pertinent global policy tool, as well as takes stock of the best practices and challenges of the tiger range countries to address the problem on the ground.

With regards to regional analysis, the author focuses on the Amur-Heilong transborder region. The dissertation covers Amur tiger conservation efforts taken in Russia and China, focusing on the problem of tiger poaching and illegal trade, its drivers and measures taken by both countries to address the problem. The author uses a mixed methods approach, including such research techniques as spatial analysis, tiger seizures analysis, field wildlife market surveys and application of the holistic indicator framework to answer the formulated research questions. The findings indicate that successful collaboration of law enforcement and nature conservation agencies coupled with stronger penalties and adequate legislation are the main components in addressing the problem of tiger related crime, despite existing challenges and ongoing illegal wildlife trade along the Sino-Russian border.

Keywords: wildlife crime, illegal trade and trafficking of tigers, Amur tiger, Amur-Heilong region, CITES, wildlife market surveys, wildlife crime indicator framework

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Abbreviations

ASEAN	Association of Southeast Asian Nations
ADB	Asian Development Bank
BaCH	Biodiversity and Community Health Initiative
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CITEP COP	CITES Conference of the Parties
CITES MA	CITES Management Authority
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CNP	Chitwan National Park (in Nepal)
CPPCC	Chinese People's Political Consultative Conference
DA indicator	Data-based indicator
DNPWC	Department of National Parks and Wildlife Conservation in Chitwan National Park (in Nepal)
IFAW	International Fund for Animal Welfare
EA indicator	Expert-based indicator
EAEU	Eurasian Economic Union
EIA	Environmental Investigation Agency
ENV	Education for Nature Vietnam
ESPO	Eastern-Siberia – Pacific Ocean
ETIS	Elephant trade information system
EU-TWIX	Trade in Wildlife information Exchange
FFI	Fauna & Flora International
GDP	Gross domestic product
GEF	Global Environmental Facility
GIS	Geographic information system
GSPC	Global Strategy on Plant Conservation
GT SEZ	Golden Triangle Special Economic Zone
GTF	Global Tiger Fund
GTI	Global Tiger Initiative
GTRP	Global Tiger Recovery Program
ICCWC	International Consortium on Combating Wildlife Crime
IUCN	International Union for Conservation of Nature
IUCN SSC	IUCN Species Survival Committee Cat Specialist Group
Lao PDR	Lao Peoples' Democratic Republic
MNR	Russian Ministry of Natural Resources
NGO	Non-governmental organization
NICE-CG	National Inter-agency CITES Enforcement Coordination Group (in China)
NTCA	National Tiger Conservation Authority (in India)
PA	Protected area(s)
PA indicator	Process or document based indicator
PICE-CG	Provincial Inter-agency CITES Enforcement Coordination Group (in China)
RMB	Renminbi
RUB	Ruble
SABZ	Sikhote-Alin Biosphere Zapovednik (in Russia)
SAWEN	South Asia Wildlife Enforcement Network
SARS	Severe Acute Respiratory Syndrome

SCO	Shanghai Cooperation Organization
SDG	Sustainable Development Goal
SEPA	China's State Environmental Protection Agency
SFA	State Forestry Administration
SMART	Special Monitoring and Reporting Tool
SREB	Silk Road Economic Belt
TASS	Russian News Agency, "Telegrafnoe agentstvo Sovetskogo Soyuza"
TETF	Tiger Enforcement Task Force
TRAFFIC	Wildlife Trade Monitoring Network
TCM	Traditional Chinese medicine
TCL	Tiger conservation landscape
TRACE	Tools and Resources for Applied Conservation and Enforcement
TRC	Tiger range country
UNEP	United Nations Environment Program (or UN Environment)
UNGA	United Nations General Assembly
UNODC	United Nations Office on Drugs and Crime
USD	US Dollar
WCCB	Wildlife Crime Control Bureau
WCO	World Customs Organization
WCS	Wildlife Conservation Society
WEN	Wildlife Enforcement Network
WHO	World Health Organization
WildCRU	Wildlife Conservation Research Unit
WJS	Wildlife Justice Commission
WWF	World Wildlife Fund
WWF TAI	WWF Tigers Alive Initiative
ZSL	Zoological Society of London
DVTU (ДВТУ)	Customs (Far Eastern Customs Directorate)
УФСБ (UFSB)	Federal Security Service
ДВОТ (DVOT)	Far Eastern Operative Customs
Okhotnadzor (Охотнадзор)	Wildlife and Hunting Department
UMVD (УМВД)	Police (Ministry of Internal Affairs)

Chapter I. Introduction

In 2007 a group of the world's most renowned tiger conservationists published a collaborative article titled "The fate of wild tigers" in the journal *BioScience* where they stated that the global wild tiger population was in a precarious state. Habitat loss and intensive poaching of tigers and their prey were identified as major causes of the tigers' global extirpation (Dinerstein *et al.* 2007). Eleven years have passed since then and it might seem that not much has improved drawing upon the findings of the latest WWF's Living Planet report. It states that 60% of the world's vertebrates have been lost due to human consumption since 1970s (WWF 2018a). Nevertheless, tigers remain one of the most charismatic animals that have been historically admired for their beauty and strength, while large scale efforts and significant funding have been invested by governments and international environmental organizations into their conservation across the world over the last twenty years.

In a rapidly changing world when the leader of one of the world's leading economies publicly calls climate change a "hoax" and the president of Brazil is determined to reverse all biodiversity conservation achievements in the Amazon, is there hope for the wild tigers to strive? Moreover, can wild tigers and rhinos stay safe when the Chinese Government almost managed to lift the 25-year ban on domestic trade in tiger bone and rhino horns from breeding facilities to then postpone their decision a few weeks later (Government of China 2018)? And lastly, would international organizations and national governments pay much attention to the fate of another disappearing endangered species when the latest climate change report gives a devastating prognosis that the greenhouse gas emissions will warm the atmosphere a further 1,5 degrees Celsius leading to intensifying draughts and poverty within the next twenty years (IPCC 2018)?

In this PhD dissertation the author examines tiger conservation practices through the prism of global and regional countermeasures aimed at addressing illegal trade and the trafficking of tigers. The dissertation is devoted to one of the most contentious and politically sensitive issues in wildlife conservation - tiger related crime as the result of poaching and demand for tiger products. The problem, even though particularly relevant to modern wildlife conservation practices, is insufficiently covered in literature which constitutes both challenges and strengths in the present research. Drawing upon the theoretical and methodological achievements of analyzing the contemporary countermeasures for tiger trafficking, the research analyzes the problem from global and regional perspectives, with a further focus on the Amur-Heilong region.

1. Background

Wildlife crime has become one of the major problems in wildlife conservation. In the last decade, the scale of illegal wildlife crime has become so massive and devastating that it has been proclaimed as the second largest hazard to biodiversity along with deforestation and habitat degradation (UNODC 2016; Zimmerman 2003). As a result of massive extirpation of African elephants, rhinos, pangolins and tigers within the last five to six years, the problem has gained significant attention from international academics, environmental NGOs, UN organizations, national governments as well as governmental coalitions. Various global initiatives have been organized to address the problem holistically, such as the London wildlife trade conference (the latest was organized in October 2018), UNGA Resolution on Wildlife Crime adopted in 2017, the US National Strategy on Wildlife Trafficking adopted in 2015, and the EU Action plan on Wildlife Trafficking adopted in 2016. The issue has been significantly scaled up within the context of international agreements, such as the Convention on international trade in endangered species of wild fauna and flora (CITES), Convention on

Biological Diversity (CBD) and the Convention on the Conservation of Migratory Species of Wild Animals (CMS). Many initiatives have been undertaken by the national governments recently to address the issue, for instance the ivory market trade ban was introduced in the UK, China, Hong Kong and Singapore in 2018. Viet Nam has announced that the Government will introduce a complete ivory trade ban in 2020, while Laos decided to close all tiger farming facilities in 2018 (CITES 2014c).

Global wildlife crime crisis has also led to increased attention from the researchers covering various aspects and types of the problem (Aziz *et al.* 2017a; Challender *et al.* 2015; Gholami *et al.* 2017; Lindsey *et al.* 2016; Nijman *et al.* 2017; Rashidi *et al.* 2017; van Uhm 2016a). Given that wildlife crime is complicated and clandestine in nature, it does not neatly fit into one discipline or approach and requires conceptual integration (Kurland *et al.* 2017). Moreover, integration is crucial when identifying the existence for wildlife crime interventions and assessing their effectiveness on a larger scale (Kurland *et al.* 2017).

The problem of poaching for illegal trade has also become one of the major threats to the survival of wild tigers. Tigers used to roam all across Asia, from Turkey to the Far East of Russia (IUCN 2016a). Only over the last century, tigers have disappeared from Central Asia, Bali and Java and large areas of Southeast and East Asia while their current habitat covers only 6% of the historical range (WWF 2018c). The global tiger population was estimated to be between 5,000 to 7,000 animals in 1998, however, their current population is now estimated to be between 2,154 to 3,159 animals (IUCN Red List 2015). Habitat loss and human-tiger conflict represent substantial threats to the tigers' survival, however poaching for illegal trade has led to their disappearance from large suitable habitats and continues to persist at unsustainable rates across Asia (IUCN Red List 2015).

Tigers have been given the spotlight and put on a high-level government agenda during the Saint-Petersburg Tiger Summit organized by President Putin in 2010. Since then, many tiger conservation initiatives have been introduced across the range countries, however the latest report on global tiger seizures indicates that tiger related crime persists globally (Stoner *et al.* 2016). The same has been confirmed by the latest review of the trade in Asian big cats introduced at the 70th CITES Standing Committee meeting in October 2018 (Nowell 2018).

Amur-Heilong remains one of the very few tiger habitats where tigers have been thriving over the last ten years according to the national tiger surveys in Russia and China. The last entire range tiger census in Russia in 2015 showed that the population increased to as many as 540 animals, with around 100 of these known to be cubs within the last ten years (WWF 2015). As for the Chinese side, official statistics shows that the Amur tiger population has about 20 individuals, while IUCN states it to be >7 based on field data (IUCN Red List 2015). The Government of China is determined to restore the wild tiger population and made official announcements about the tiger reintroduction plans to Northeast China by 2026 (Yusu 2016).

Despite a stable population of Amur tigers, the animal is still facing significant threats for its survival. These include direct threats such as poaching for illegal trade and indirect threats associated with the deterioration of habitats, including forest fires, logging, roads infrastructure and human population density (Ministry of Natural Resources and Environment of the Russian Federation 2010).

Law enforcement reports in Russia and China indicate that illegal trade and trafficking in tigers has historically been persistent in the region, while the population census numbers indicate slow but stable population growth (IUCN Red List 2015). Given that the problem of tiger trafficking is present in all tiger range countries, the Amur-Heilong region stands out as

one of the most successful regions for significantly reducing the threats to tigers and addressing the trafficking problem while maintaining stably rising numbers of animals in the wild. Present research is based on the thorough assessment of the regional practices and counter-measures for tiger related crime in the Amur-Heilong region, coupled with the inter-disciplinary assessment of global practices and the nature of the tiger related crime.

2. Problem statement

Wildlife crime is one of the biggest threats to global biodiversity, especially for the wild populations of tigers *Panthera tigris*, rhinos and elephants. Illegal trade in tigers and their parts remains one of the main challenges to securing a global wild tiger population despite many years of effort in tiger conservation. Various practices and approaches have been employed on global and national levels, however it is still not clear which measures have had the most significant impact or if any at all. For the last twenty years Amur-Heilong has remained a transborder region with one of the most viable and stable tiger populations despite the unabated level of Amur tiger poaching and smuggling across the Sino-Russian border.

3. Research aim, research questions and objectives

<u>**Research aim:**</u> to evaluate the efficiency of countermeasures for the illegal trade and trafficking of tigers through analyzing policies and practices globally and locally in the Amur-Heilong region

To fulfill the aim the following research questions have been formulated:

1. What are the extent, causes and characteristics of tiger related crime?
2. How is tiger related crime addressed at the global level?

3. How successful are the countermeasures for illegal trade and trafficking of tigers in the Amur-Heilong region?

To answer the research questions the following research objectives have been set:

<u>Objective 1</u>: to identify how wildlife crime is framed in academic literature and what global policy measures exist

<u>Objective 2</u>: to give an overview of the global tiger population and specify major threats

<u>Objective 3</u>: to identify reasons driving illegal trade and the trafficking of tigers

<u>Objective 4</u>: to identify and analyze global trends in tiger related crime

<u>Objective 5</u>: to evaluate how illegal trade and the trafficking of tigers have been resolved by CITES as the most pertinent wildlife trade policy instrument

<u>Objective 6</u>: to formulate the prospects in addressing tiger related crime by CITES

<u>Objective 7</u>: to identify and assess the main measures taken and policies used to address illegal trade and the trafficking of tigers by the range countries

Using Amur-Heilong as a case study:

<u>Objective 8</u>: to review and assess current regional environmental issues, the state of the Amur tiger population and their major threats

<u>Objective 9</u>: to review and analyze regional legislative and regulative measures to address the problem

<u>Objective 10</u>: to identify the characteristics and analyze the trends in Amur tiger poaching and trafficking

<u>Objective 11</u>: to investigate the level of illegal trade in tigers and other wildlife on the Sino-Russian border

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Objective 12: to evaluate and compare countermeasures of Russia and China for tiger related crime

Objective 13: to develop recommendations and future perspectives for the Amur-Heilong region

4. Justification

Tigers are undoubtedly one of the most majestic and charismatic animals on earth that have attracted attention and interest of people over the centuries. In some cultures, they have become a symbol of wealth and strength to such extent that consuming their parts have been attributed to becoming more powerful, rich and healthy. Moreover, based on informal conversations with the tiger biologists from India, in some rural communities it is still regarded as a great honor to be killed by a tiger in Indian jungles, while the soul of a killed person goes directly to heaven. This might also explain little evidence of retaliatory killings in these communities.

Personal interest and admiration of these animals have become one of the key motivators for choosing the topic of the current research, while gained professional experience in tiger conservation and a collection of profound data have provided solid knowledge and excelled skills for the completion of present analysis.

This research is pioneering on several fronts and can be justified on thematical, theoretical, methodological and practical grounds. Firstly, even though wildlife crime has been widely covered in the academic literature, meagre attention has been paid by researchers to the problem of tiger related crime (Bennett 2015; Kurland *et al.* 2017; Lawson and Vines 2014; Spapens *et al.* 2016; van Uhm 2016a; Wyatt 2009; Zimmerman 2003). The phenomenon was mainly covered by the international organizations and environmental NGOs (Nowell 2010; Nowell 2018; Nowell and Ling 2007; Stoner 2014; Stoner *et al.* 2016). The same refers to the

coverage of illegal trade and the trafficking in Amur tigers in the Amur-Heilong region. Plenty of research is available on the conservation of Amur tigers and regional environmental aspects, however limited data is available on the regional assessment of tiger poaching and trafficking and relevant countermeasures (Goodrich *et al.* 2010; Karakin 2011b; Lyapustin 2010; Riley *et al.* 2017; Simonov and Dahmer 2008; Simonov *et al.* 2011). In addition, the problem of tiger related crime remains one of the most contentious and intricate wildlife conservation issues for analysis due to its covert nature and challenges related to the collection and analysis of data. Overall, this constitutes a significant gap in the field of wildlife conservation and environmental policy, as well and an opportunity and a challenge for this present research.

Secondly, this research has significant practical relevance and is pertinent to the current environmental issues. As mentioned above, wildlife crime has become one of the major topics on the wildlife conservation policy agenda, which has gained the highest possible political momentum in recent years given the amount of attention from practitioners and political leaders. In many ways, this has resulted in massive killings of African rhinos, elephants, pangolins and other endangered wildlife. Tigers have mainly been in the shadow of the poaching crisis for the last four to five years with steadily stable poaching rates according to the global seizures analysis (Stoner and Pervushina 2013; Stoner *et al.* 2016). However in late October 2018, tigers were put into the global spotlight after the Chinese Government announced the lifting of the domestic trade ban on tigers and rhinos from breeding facilities (Government of China 2018). Within a few weeks the Government of China decided to delay their decision and investigate the issue in detail. Results and consequences of these potential legislation changes in China have yet to be analyzed and observed, however they signify practical relevance and pertinence to the most current environmental issues.

Thirdly, the research benefits from the instrumental and conceptual interdisciplinarity as argued in Chapter III. The research explores the nature and the drivers of tiger related crime building on the concepts of anthropology, ecology, and social sciences, while it analyzes global and regional crime trends using concepts and methods from criminology, economy and ecology, as well as applying the interdisciplinary indicators framework and the framework of the CITES Resolution with regards to Asian big cats (Chapters V, VI and VIII).

On methodological grounds, wildlife crime and specifically tiger related crime have been mostly studied from a point of market surveys, analysis of spatiotemporal concentrations or policy and law enforcement measures analysis. Current research applies a combination of methods to depict the most accurate picture of the latest countermeasures on several scales: global in the context of CITES and global efforts of range countries (Chapter V and Chapter VI) and regional in context of a thorough investigation of national efforts in Russia and China (Chapter VII and Chapter VIII). Application of a mixed-method approach yields detailed and accurate findings on the assessment of countermeasures, especially on a regional scale, which is meticulously discussed in Chapter IX. This research allows a better understanding of the complex phenomenon of tiger related crime and benefits from the triangulation of data and findings within and between methods.

And lastly, tigers are often referred to as an indicator of a healthy ecosystem and ecological wellness, while tiger abundance indicates the abundance of other wildlife (Breitenmoser *et al.* 2016; Riley *et al.* 2017; WCS Russia 2018; Yadvendradev *et al.* 2010). Tigers as dominant predators of the ecosystem, play a key role in balancing the number of herbivores which is essential for ensuring the availability of forest cover (Global Tiger Initiative 2011). Tigers are often chosen as the key theme for nature conservation initiatives on ecosystems or even national levels (for example, national or regional strategies or action plans for tiger

conservation). Therefore, analyzing tiger conservation practices and countermeasures for their trafficking is an all-inclusive theme engaging analysis at various levels and across several disciplines. The research findings can be beneficial for exploring future avenues of research and contributing to several disciplines and thematic areas.

5. Scope

The dissertation has been framed within the following boundaries that define the scope of the research:

1. Tiger: the research focuses on policies, practices and countermeasures for illegal trade and the trafficking of tigers only. In some parts the global countermeasures for tiger related crime are analyzed within the context of illegal trade and the trafficking of Asian big cats, however specifically focusing on tigers. With regards to the regional case study, the research is analyzing the practices and countermeasures for trafficking of Amur tigers only. Similarly, in some sections of the analysis the research analyzes the government measures and legislation of Russia and China pertinent to endangered species that have been listed in Russian or Chinese Redbooks, however with a special relevance to Amur tigers.

2. Tiger related crime: the research analyzes the nature of tiger related crime as a smaller segment of wildlife crime. Same refers to the analysis of the countermeasures for tiger related crime. In regional case study analysis, the research is discussing Amur tiger conservation practices and threats to Amur tigers in Russia and China, however only those that might be relevant for the problem of illegal trade and trafficking of Amur tigers. Present research is not focused on the assessment of regional Amur tiger conservation measures and practices.

3. Geographical: the research findings are presented within the geographical scope of tiger range states when related to global analysis and to regional context of the Amur-Heilong region when related to the case study analysis.

4. Methodological: the research applies mixed-method approach by employing qualitative and quantitative methods from several disciplines. The scope of this approach is framed by the pertinence to the problem of tiger related crime, which has been established individually by the author. Mixing of research techniques enabled full assessment of the countermeasures for illegal trade and the trafficking of tigers globally and regionally.

5. Timeframe: tiger seizures analysis covers the period from 2000 till 2016 for the global analysis and from 2000 till July 2018 for the regional analysis. The findings of the policy efforts with regards to addressing tiger related crime are analyzed since the adoption of tiger relevant CITES Resolutions till the present day.

6. Data: data scope and limitations of data are covered in Chapter III, Section 7 on Data sources.

7. Language: for the case study analysis of the countermeasures in the Amur-Heilong region, some data had to be translated from Russian or Chinese. In such cases the author had to translate the documents from Chinese and Russian. When analysis the global practices in range countries are concerned, the research analyzed data available in English only.

8. The covert nature of the main topic: given the covert and criminal nature of tiger related crime, it is quite challenging to get a full and accurate picture of the phenomenon and assess the success of the countermeasures. The author used the breadth of available relevant methods borrowed from different disciplines to

analyze the phenomenon of tiger related crime and assess the success of the applied countermeasures globally and regionally.

6. Research design

Present research employs a mixed method approach with predominantly qualitative research. Chapter III on Methodology, section 2 on "Mixed method approach and justification" describes the approach, its value and justification. Current research design has been adopted from the research design types that have been developed by Johnson and Onwuegbuzie for mixed research (Johnson and Onwuegbuzie 2004). Johnson and Onwuegbuzie argue that while constructing the research, the researcher has to make two major decisions: firstly, whether one wants to operate mostly within one dominant paradigm or not and, secondly, whether one wants to conduct phases concurrently or sequentially (Johnson and Onwuegbuzie 2004).

Figure 1 explains the logic of the present research design, where capital letters refer to high priority or weight and lower letters refer to lower priority or weight and "+" stands for concurrent order of research stages. Current research is based on predominantly qualitative research with a mixture of quantitative research techniques. However, the findings of the qualitative and quantitative stages are mixed and integrated concurrently in the research, thus ensuring the criteria for the mixed methods research.

Time order decision: **Concurrent**

Paradigm emphasis decision:
Dominant status

QUALITATIVE + quantitative
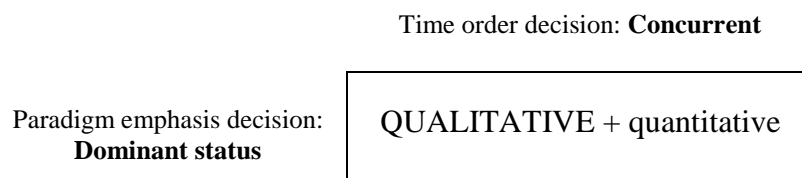
Figure 1: Research design type (adapted from Johnson and Onwuegbuzie, 2004)

Figure 2 represents the flow of the thematic development in the dissertation. The figure highlights three major themes: wildlife crime, tiger related crime and Amur-Heilong region as

the case study. The figure also shows a major outcome of the case study analysis, which is final

indicators framework assessment.
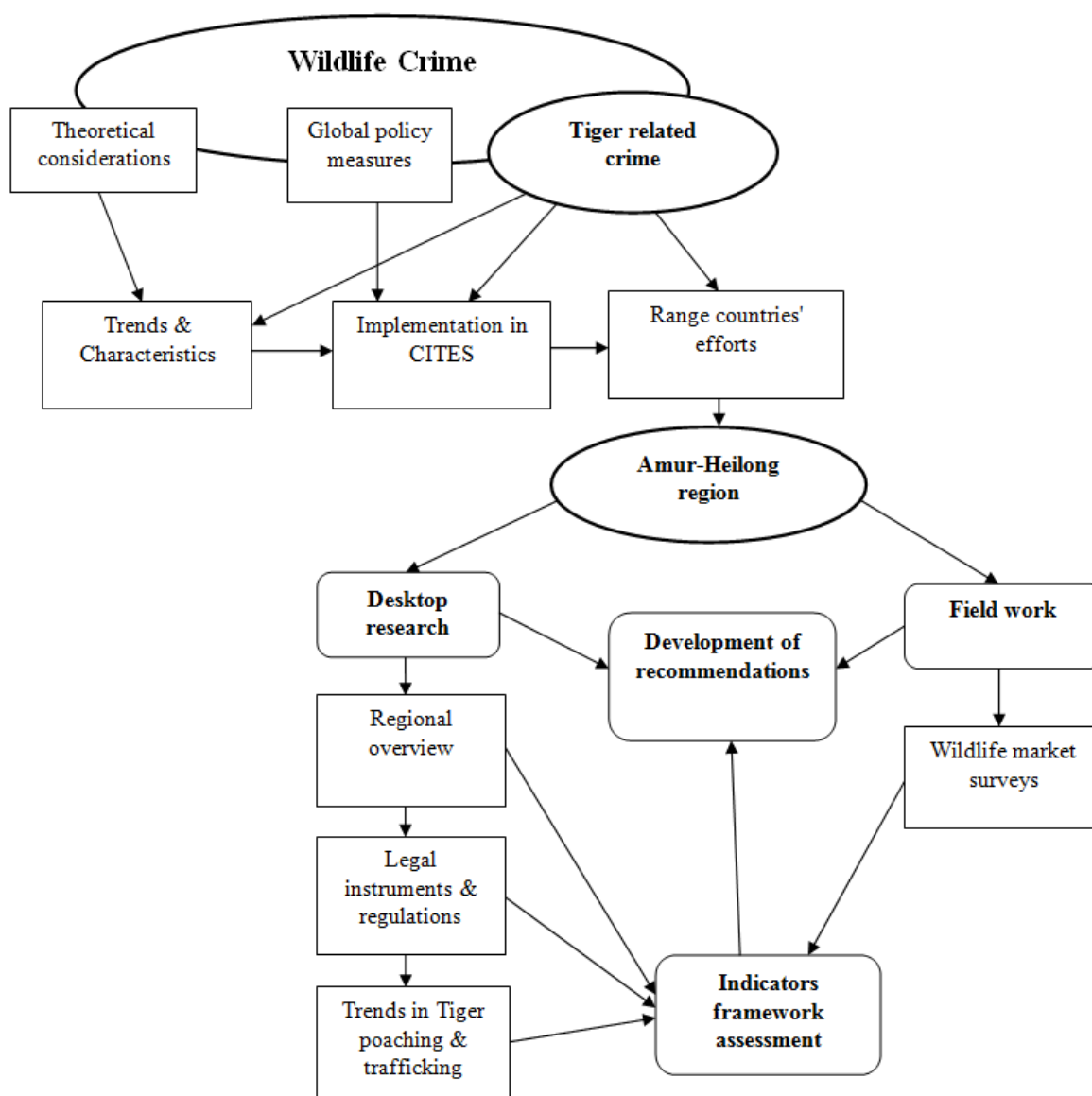
Figure 2: Workflow of thematic development and research stages of the dissertation

Wildlife crime is the starting point of a research query with smaller explored topics: theoretical

considerations of wildlife crime and employed global policy measures to address it. Tiger

related crime evolves as a smaller part of wildlife crime theme but becomes the key topic of the

dissertation and subsequent analysis. The author analyses the main topic of the dissertation

from different perspectives: first, trying to define the scope and main trends, secondly, to

evaluate how it was addressed in CITES as the most pertinent policy instrument and, thirdly,

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how it was addressed by other tiger range countries. Then the author moves to the examination of tiger related crime in the Amur-Heilong region as the main case study. The analysis is broken into four main stages: desktop research, field work, application of indicators framework and development of recommendations. Multiple data type results from the desktop research and field work are integrated and contribute to the assessment by the indicators framework for wildlife and forest crime. The final stage, which is the development of recommendations for the tiger related crime in the Amur-Heilong region, is based on the results of the indicators framework assessment and findings from the field work and desktop research.

7. Time dimension

All data was collected over a three year period during the author's employement as tiger trade programme leader in the World Willife Fund and TRAFFIC based in Malaysia, Kuala Lumpur from July 2012 till March 2016. During this period the author attended various international governmental and non-governmental tiger meetings and workshops, CITES meetings and conferences related to Asian big cats and tiger related trade and trafficking, including various thematic wildlife crime meetings, workshops and conferences organized by NGOs, government agencies and other strategic partners involved in the topic of wildlife crime and tiger conservation. This gave the opportunity to collect materials that might not be openly available to a regular scholar as well as enrich collected materials with a lot of participant observations data and process it with academic literature. Additionally, a nine day research field trip was implemented to investigate wildlife trade markets in China on the Sino-Russian border as part of the case study research.

8. Structure of this dissertation

This dissertation is organised in ten chapters. The first chapter introduces the background and research topic, justifies the research, identifies its scope, as well as introduces the schematic

flow of thematic development. Chapter II introduces the global problem of wildlife crime, outlines major theoretical approaches from disparate disciplines, and identifies major global policy measures for addressing the problem. The chapter also gives description of tiger species and outlines its major threats. Chapter III presents the theoretical and methodological approaches to research with a detailed description and justification of applied research techniques and employed data sources.

Chapter IV through IX are all result-based: i) Chapter IV aims to define the notion of tiger related crime, identify its causes and characteristics: ii) Chapter V analyses global policy efforts for addressing tiger related crime within the context of CITES; iii) Chapter VI analyses the counter-measures for illegal trade and the trafficking of tigers undertaken by range states; iv) Chapter VII introduces the case study of the Amur-Heilong region, including analysis of the current threats to Amur tigers; v) Chapter VIII focuses on a thorough assessment of the countermeasures for Amur tiger related crime in Russia and China by employing different research techniques, including application of the indicator framework for wildlife and forest crime, and, finally, vi) Chapter IX reports on assumptions and major findings centered around formulated research questions, including practical, theoretical and methodological contributions.

Finally, Chapter X summarizes key results and major conclusions of the dissertation, proposes recommendations for future avenues of research as well as for practitioners on global scale and, specifically, on the regional scale separately for Russia and China.

9. Conclusion

The introductory chapter aimed to lay the foundation of the dissertation. It introduced the research problem and research questions, on justified theoretical, methodological, practical,

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and other pertinent grounds. Additionally, the scope and the outline of thematic development were presented, including the time dimension of the research period. Based on these foundations, the research can proceed with a literature review in the following chapter

Chapter II. Literature review

1. Introduction

The literature review aims to provide a theoretical and conceptual foundation of the research. It is designed in a thematic manner to formulate the body of knowledge relevant for the topic, identify main issues related to the research problem and as well as to discover the gaps that have not been addressed in academic literature. The chapter also aims to outline the latest trends in addressing the problem, as well as identify the most pertinent direction for further analysis that evolves in the body of the dissertation. In addition, literature review provides the background and starting point for the formulation of three research questions that shape the basis of inquiry of the dissertation.

Literature review develops a multidisciplinary framework for theoretical approaches to wildlife crime that have been covered in the academic literature, as well as outlines major developments in global responses and policy tools to wildlife crime, including their relevance to tiger related crime. Finally, literature review describes the tigers' taxa and outlines its major threats, with a specific examination of poaching for illegal trade which serves as a background for further analysis.

2. Wildlife crime

Academic literature does not suggest a clear distinction among the terms poaching, wildlife trade, and wildlife crime, not to mention that the terms have contested meanings depending on the context (Carter *et al.* 2017). Other definitions have been found in academic and experts' literature, such as illegal killing, illegal taking, wildlife trafficking, illicit wildlife trade and informal nature management, the term which is mostly used in social science literature (Acheson 2006; CITES 2007a; CMS 2017; European Union 2016; Fajardo del Castillo 2016;

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Humphrey 2012; INTERPOL 2014; Ryzhova 2012; Sharma *et al.* 2014; UK Government 2014; US Government 2015; WCCB 2016).

Carter, Lopez-Bao et al. (2017) suggest that most of wildlife conservation agreements and national species protection laws do not define poaching, instead enumerate illegal activities related to wildlife. However, there is a commonly used term that poaching is illegal killing or taking of wildlife (Carter *et al.* 2017; Spapens *et al.* 2016).

2.1 Historic perspective

As transpires from academic literature, the wildlife trade is not a new phenomenon (Alexander *et al.* 1979; Broad *et al.* 1988; Oldfield 2012; van Uhm 2016b). Historically, there has always been a market for wildlife objects, used as food, clothes, pets, or some curio objects (Alexander *et al.* 1979). The earliest use of wildlife objects for various reasons dates back to the Egyptian pharaohs, Roman, Greek rulers and elites, all the way through the human race history (Alexander *et al.* 1979; van Uhm 2016b). As a result, for example, elephants, lions, and hippos disappeared from Europe due to overexploitation by Romans and Greeks.

Van Uhm gives a detailed historical perspective of wildlife trade that came along with the development of human civilization (van Uhm 2016b). He argues that use of wildlife historically can be divided into three interrelated pillars: functional use, such as fur and leather for clothing to protect from cold, such as animals used for work and warfare (e.g., war elephants of Hannibal), and animal products used for medicine (e.g., traditional Chinese medicine). Secondly, animals used for entertainment and educational purposes, such as in circuses, zoos, and pets (e.g., large global reptile fairs). And thirdly, for symbolic use of wildlife to represent status (e.g., sturgeon caviar for elites), religion (e.g., leopard and tiger skins (shubas) used by priests and religious leaders in Tibet), and fashion trends (e.g., feathers

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of exotic birds of prey) (van Uhm 2016b). However, it should be mentioned that the use of wildlife for food and shelter (such as timber) survival has been omitted in this description.

2.2 The current situation of wildlife crime

In the last decade, the scale of the illegal wildlife trade problem has become so massive and devastating that it has been proclaimed as the second largest hazard to biodiversity along with deforestation and habitat degradation (Zimmerman 2003). Moreover, for certain species, it has become the primary threat, followed by degradation and habitat loss (Oldfield 2003, 2012; Smith *et al.* 2011b; World Bank 2017).

Demand for ivory in the twentieth century led to the extinction of elephant populations across many parts of Africa (Blanc 2007). Since 2007, the scale of illegal ivory trade has more than doubled, which is more than three times higher than last highest peak in 1998 (Lawson and Vines 2014). The rate of global elephant poaching has been the highest for the last twenty years (Lawson and Vines 2014). The rate of African elephant poaching in 2012 was estimated to be 7,4 percent, which was higher than the natural population growth rate of 5 percent (Lawson and Vines 2014).

Increasing demand among the middle class in China for alternative medicine, including traditional Chinese medicine, has resulted in a high pressure of demand on many species, bringing tiger and rhino populations to the brink of extinction (Patrick 1995; Schneider 2012). Two sub-species of African rhinos have gone extinct only in the past decade (the western black rhinoceros *(Dicornis bicornis longipes)* and northern white rhinoceros (*Ceratotherium simumcottoni)* as the result of uncontrolled illegal hunting activities (Bennett 2015). South Africa, which holds 73 percent of the global wild rhino populations and 83 percent of all of Africa's rhinos, suffered from extremely high poaching rates: over 1,000 rhinos were poached

in 2013, compared to 448 in 2011 (Lawson and Vines 2014). The situation has not significantly improved, according to the reports of South African Government when 508 rhinos have been poached from January till August in 2018, compared to 688 animals for the same period in 2017 (South African Government 2018). Lawson and Vines suggest that increased rates in elephants and rhino poaching in recent years may result not only from high demand for wildlife goods globally but also political instability and insurgency of militant groups or armed non-state actors in source African countries, what provides an ideal setting for wide-scale poaching (Lawson and Vines 2014).

At the end of the twentieth-century caviar from sturgeon eggs became a luxury product for the upper classes across Europe. Only between the years of 1998 and 2006 the amount of sturgeon caviar trade amounted to more than 1,300 tons while sturgeon populations faced a sharp decline (Schneider 2012).

The saiga antelope (*Saiga tatarica*) populations suffered more than 95% decline in their populations since 2005 as the result of illegal hunting for their horns (powder made of shredded and sliced saiga horns are used in traditional Chinese medicine) (Bennett 2015).

Another species that have been massively exploited in local and international wildlife trade for a range of consumptive usage is pangolins (Challender *et al.* 2015). "The Guardian" regarded the species as the world's most illegally trafficked mammal with more than a million of these animals killed only in the last decade (Carrington 2016). The population became commercially extinct in China in the mid-1990s, which was later dependent on the imports from Southeast Asia. Even though the species is hard to census, the evidence suggests that populations are currently rapidly declining as the result of illegal trade and the species is becoming increasingly rare (Challender *et al.* 2015). Pangolins were given the highest protection possible

under the CITES convention by unanimous countries' agreement to impose a complete ban on trade in these species and enlisting it into CITES Appendix I during the last CITES Conference of the Parties (CoP17) in September 2016 (Carrington 2016).

Not only endangered species are involved in illegal wildlife trade. Latest UNODC report states that millions of species that are not listed in CITES are being harvested and traded illegally (UNODC 2016).

Poaching for endangered species to feed the demand for illegal wildlife products has been estimated to be worth between eight to ten billion dollars per year, excluding timber and fisheries (Lawson and Vines 2014). The value of global legal wildlife trade has been estimated to be over 105 billion dollars per year back into 2010 (van Uhm 2016a). Several publications inferred that overall financial value of illicit wildlife is hard to assess due to multiple reasons, the covert nature of it being one of them (Haken 2011; Spapens *et al.* 2016; UNODC 2016; van Uhm 2016a).

Illegal wildlife trade has been studied and scrutinized by many international governmental and non-governmental organizations, national governments and their coalitions, especially in the course of the past decade (CITES Secretariat 2013b; European Union 2016; INTERPOL 2014; Oldfield 2003; TRAFFIC 2008; UNODC 2016; US Government 2015; van Uhm 2016a; World Bank 2017; WWF 2017).

2.3 Theoretical approaches to wildlife crime

There is currently a research gap in academic literature with regards to the holistic overview of theoretical approaches to wildlife crime. The author categorized reviewed major concepts and approaches in Table 1.

Table 1: Coverage of wildlife trade and wildlife crime in various fields

Theoretical approach	Key Concepts and terms	Role of wildlife trade (WT) and wildlife crime (WC)
Ecology	Defaunation Trophic cascade Anthropogenic Allee effect Water and diamonds paradox Ecocide	WT and WC contribute to the disappearance of keystone species driven by a strong anthropogenic component, negatively effects perennial species and ecosystems
Sociology and anthropology	Informal nature management Side effects of transition to a market economy	WC happens in countries with transition economies, driven by ineffective legislation or inefficient application of law (however conservationists disagree)
Public health	Severe Acute Respiratory Syndrome (SARS) Avian influenza Ebola	WC and WT have hazardous side effects on public health (outbreaks of zoonotic diseases)
Criminology	Animal crime Green or environmental criminology Wildlife crime Environmental criminal offenses Pipeline model	Criminalization of WT led to WC. Causes environmental harm and leads to development of environmental regulations and their enforcement
Economy	Wildlife trade markets Unequal distribution of natural resources Wildlife trade flows Demand for wildlife Wildlife farming	Development of WT markets that do not fall into biological categories. WT is driven by economic and financial principles (demand, supply, product scarcity, etc.)

2.3.1 Ecological concepts

For the last three to four decades the world has been experiencing a "global wave of anthropogenically driven biodiversity loss," witnessing the extirpation of wildlife species and populations, as well as massive declines in the abundance of local species (Dirzo *et al.* 2014; Ripple *et al.* 2016). Among terrestrial vertebrates, 322 species have become extinct since 1500, remaining species population show an average 25% decline in abundance (Dirzo *et al.* 2014). While invertebrate population decline rates are even more severe, 67% of monitored populations show a 45% average abundance decline (Dirzo *et al.* 2014). **Defaunation,** the term used in the scientific literature equally to deforestation, refers to the loss of species and populations of wildlife as well as declines in locals species abundance (Dirzo *et al.* 2014). Even though remote sensing technology provides rigorous quantifying methods and an immense variety of high-resolution images showing the extent, magnitude and pattern of deforestation,

defaunation remains a "largely cryptic phenomenon" with random global geographic distribution patterns (Dirzo *et al.* 2014).
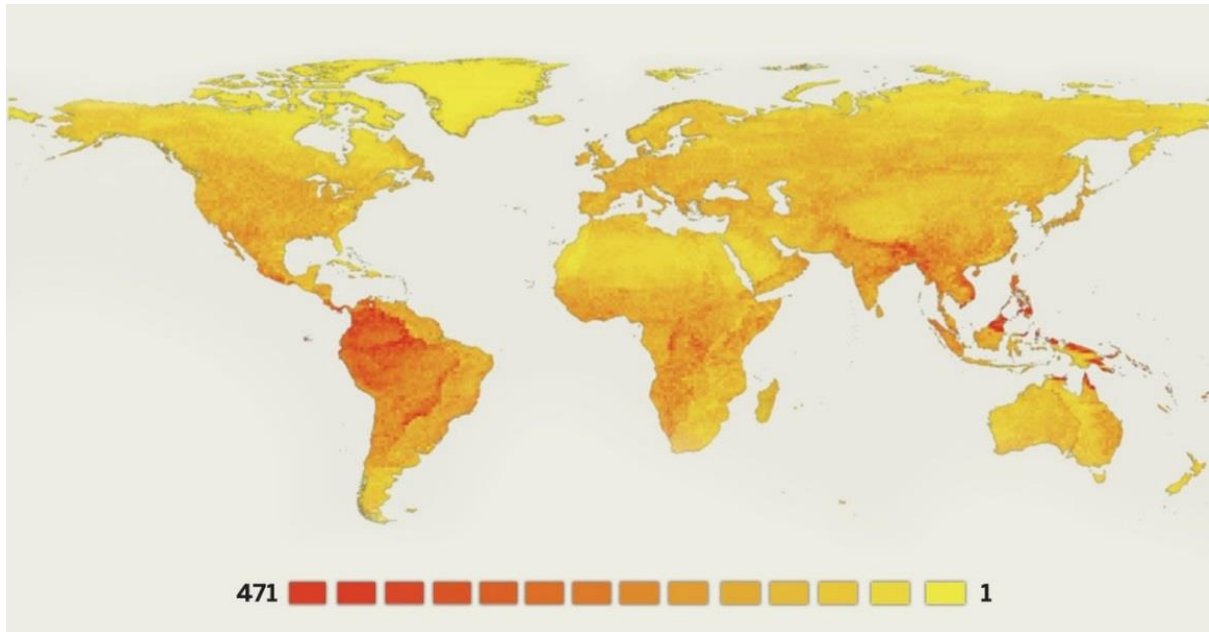
Figure 3: Global population declines in mammals and birds (source: Dirzo et.al. 2014)

It has been estimated that between 17,000 to 100,000 species vanish from our planet each year (Dirzo *et al.* 2014; Leakey and Lewin 1995; Ripple *et al.* 2016; van Uhm 2016a). Dirzo and Young estimated the number of species per 10,000 km^2 in decline according to the IUCN "decreasing" population status, with highest numbers in tropical regions (Dirzo *et al.* 2014) (Figure 3).

Ecologists argue that **disappearance of keystone species** (species with a disproportionally large impact on the environment) would have a disastrous effect on the perennial species and ecosystems (Carter *et al.* 2017; Kaczensky *et al.* 2011; Ripple *et al.* 2016; van Uhm 2016c). For example, the reintroduction of grey wolves *(Canis lupus)* in Yellowstone National Park recovered the entire ecosystems vegetation from beavers *(Castor fiber)* and bison *(Bison bison)* (Ripple *et al.* 2016).

Difficulty in estimating the effects of defaunation is reflected in the process of trophic cascades that have been first observed by the ecologists in marine ecosystems (van Uhm 2016b). **Trophic cascade** is an ecological phenomenon when removal or addition of top predators leads to the reciprocal changes in the predator and prey balance and, hence, dramatic changes in the ecosystem structure (Ripple *et al.* 2016). The current trend in most ecosystems is the removal of the predator by human activities (e.g. poaching of tigers, jaguars *(Pantera onca)*, wolves *(Canis lupus)* and great white sharks *(Carcharodon carcharias)* which leads to the increase of herbivores and the reduction of primary biomass and diversity (Meyer Iii and Terborgh 2011; van Uhm 2016c). A vivid example is a dramatic ecological meltdown in predator-free forests with an imbalanced ecosystem, resulting in an increased number of herbivores, reduction of seedlings and plants and, ultimately, loss of animal biodiversity (Meyer Iii and Terborgh 2011).

Survival and reproduction of small populations of endangered species are limited by the mating shortage and small genetic variety, what is called **Allee effect** (Courchamp *et al.* 2006). This explains why a small population may extirpate at a higher rate than expected. The Allee effect is further affected by anthropogenic pressure, which has been defined by Courchamp as "**water and diamonds paradox**" (Courchamp *et al.* 2006). Water has a lot of use value, but no value in exchange, while the opposite applies to diamonds (Courchamp *et al.* 2006; van Uhm 2016a). The logic of diamonds value has been transferred to endangered species when their rarity would determine higher value on the black market and, thus, accelerate the demand (Courchamp *et al.* 2006).

Courchamp came up with the anthropogenic component of Allee effect which refers to the overexploitation of endangered species due to its high value on the black market (Courchamp *et al.* 2006). For example, a recent rapid increased demand for rhino horn may be explained by

its high price on the black market (van Uhm 2016a). Limited genetic pool, small population, and distribution range and high price fueled up by high demand on a black market gives little hope for endangered species survival (for example, for Javan rhino *(Rhinoceros sondaicus)*, the world's most endangered large mammals with a population of less than 50 animals) (Courchamp *et al.* 2006; van Uhm 2016a).

Higgins brings the term of **"ecocide"** when referring to anthropogenic environmental degradation (Higgins 2012). In her perspective, ecocide is "extensive damage to, destruction of or loss of ecosystem(s) of a given territory, whether by human agency or by other causes, to such an extent that peaceful enjoyment by the inhabitants of that territory has been severely diminished" (Higgins 2012). She argues that wildlife trade is one of the major drivers of ecocide and suggests to regard ecocide as the Fifth International Crime Against Peace (Higgins 2012).

According to authors examining poaching and wildlife crime from the ecological perspective, strong symbiosis among the species in the ecosystem will be imbalanced as the result of defaunation driven by wildlife trade (Courchamp *et al.* 2006; Lindsey *et al.* 2016). Current anthropogenic impact of defaunation is demonstrated by the high level of species reduction, where even a small decline in certain species as the result of wildlife trade can be fatal for the population as the result of Allee effect and trophic cascade (Courchamp *et al.* 2006; Dirzo *et al.* 2014; Ripple *et al.* 2016; van Uhm 2016a).

2.3.2 Anthropology and sociology concepts

As transpires from social science academic publications, focusing mostly on anthropological and sociological aspects of the problem, informal nature management practices are common in countries with transition economies when radical changes in formal norms become accepted

social norms, formal rules are fluid, whereas former illegal practices shifted into legally acceptable and recognized economic activity (North 2003; Ryzhova 2012). This eventually leads to the precedence of social norms and development of the informal economy in these countries. Such situation was pertinent for Russia and China witnessing "side effects" of the transition to a market economy (Ryzhova 2012). As a result, informal activity was spread in many spheres including trade, service sector, and nature management. Ryzhova brings the example of illegal fishing and poaching. She states that is it expected to witness massive annual poaching of spawning fish in a society where the poaching practice is morally acceptable and based upon traditional economic norms, rather than in a society where usage of poaching nets is socially unacceptable and historically forgotten (Ryzhova 2012).

Acheson states that "informal nature management" is usually caused by ineffective legislation or inefficient application of law (Acheson 2006). Going further informal nature management, social scientists argue that such practice is more common for developing countries rather than developed ones (Acheson 2006; Ryzhova 2012). Haken states that illegal wildlife trade presents significant harm to developing countries, where biodiversity has much higher losses from the damaged structure and economy of developing nations (Haken 2011). However, conservation literature and conservation experts' opinion bring examples when such practices are happening widely in developed countries, driving wild populations to extinction. In contrast, conservation publications argue that poaching is a specifically challenging conservation issue (Carter *et al.* 2017; Kaczensky *et al.* 2011). Given that there are strong incentives to hide, poaching of wildlife remains poorly quantified, thus its social, economic, ecological causes and consequences are not entirely understood (Carter *et al.* 2017; Liberg *et al.* 2011). Numerous examples are covered in conservation publications that describe illegal killings of large carnivores (wolves, bears, big cat species) in countries with developed economies across the globe, such as USA, Canada and Europe (Carter *et al.* 2017; Fajardo del

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Castillo 2016; Kaczensky *et al.* 2011; Liberg *et al.* 2011; Nelson *et al.* 2016; Ripple *et al.* 2016).

The issue of poaching and wildlife crime has also been studied from the point of ethics and social psychology, however mostly viewed through the prism of trophy hunting (Harris *et al.* 2013; Harrison *et al.* 2016; Lindsey *et al.* 2016; Nelson *et al.* 2016).

2.3.3 Public health concept

A different perspective to wildlife trafficking has been studied from the point of hazardous side effects on public health, such as outbreaks of zoonotic diseases. Literature review showed several publications focusing on the impact of wildlife trade on public health (Baize *et al.* 2014; Gómez and Aguirre 2008; Pavlin *et al.* 2009; Rosen and Smith 2010; van Uhm 2016a). Authors refer to a scarcity of academic literature covering this aspect, especially from the point of published health assessments of illegally traded animals (Gómez and Aguirre 2008).

Increased human contact with wild animals and their habitat degradation lead to the risk of pathogen exchange and the emergence of new diseases (van Uhm 2016c). For example, the outbreak of **Severe Acute Respiratory Syndrome (SARS)** coronavirus (atypical pneumonia) in 2003 was traced back to the trade in carnivores and bats (Bell *et al.* 2004). According to the World Health Organization (WHO) reports, the first SARS patients in Guangdong province in China were involved in preparing or packing of wild animals for human consumption (Bell *et al.* 2004). In response to this, Chinese authorities banned all hunting, sale, export, and transport of all wild animals in Southern China at that time. During the period of over three months in 2003, SARS spread to 37 countries globally with over eight thousand potentially infected cases (Bell *et al.* 2004).

Similar links to wildlife trafficking were established during the outbreaks of **avian influenza** (or so-called bird flu) in Asian countries in 2003-2004, and later distribution of **Ebola** virus in West Africa in 2014 (Baize *et al.* 2014).

2.3.4 Criminalization and criminology approach

With the development of environmental and ecological concepts, growing public concern about the environment and nature protection and its impact on humans, wildlife trade has become slowly criminalized within the past few decades (van Uhm 2016a). As a result, wildlife trade has also been analyzed from the perspective of criminology.

All criminological research related to wildlife trade falls under the study area of **"green"** or **environmental criminology**, the term used interchangeably in academic literature (van Uhm 2016a; Walters 2008; White 2008; Wyatt 2009; Zimmerman 2003). Green criminology refers to the studies of environmental harm, environmental regulations by law enforcement and criminologists, as well as environmental laws (White 2008).

Despite defined terminology and scope, there is no green criminology theory as such, but rather a "green" perspective of criminology, which focuses on a certain conceptual approach. This means focusing on a conceptual debate about the environment in the context of social, political and criminological theory (Nurse 2017; Walters 2008). Conceptual perspectives are usually analyzing such phenomena as animals' rights and species justice, environmental rights and environmental justice, ecological citizenship and ecological justice (White 2008). From a conceptual debate perspective, **wildlife crime** is viewed by criminologists as environmental harm (Nurse 2015, 2017).

Another approach in green criminology is to analyze specific environmental issues from the point of criminology, such as decline of biodiversity (for example, in the result of wildlife

trade, poaching or over-exploitation), transportation of toxic waste, illegal logging, chemical pollution, provision of unsafe drinking water and etc. (White 2008).

Van Uhn argues that criminologists pay meagre attention to **environmental criminal offenses** and violations. According to his estimations, out of 1,000 crime publications, only three publications related to environmental criminology have been published (van Uhm 2016a). This suggests that environmental crime has not been taken seriously in criminology field. At the same time, van Uhm points out certain limitations of green criminology due to its focus primarily on crime and law-breaking behavior. Following this logic, if the activity has not been criminalized by law, then it is not criminal (van Uhm 2016a). Thus, if wildlife crime has not been specified by law in any country, then it is not considered a crime. Other general limitations of the criminology approach are paying more attention to the socially-economically poor background, rather than large and rich corporations and less attention to crimes outside the Western world (van Uhm 2016a). No doubt, more research is needed in green criminology, primarily focusing on issues beyond commonly studied areas.

Wildlife crime model

Literature review analysis on wildlife trade showed that wildlife trade usually involves multiple actors: from individuals living in wildlife habitat areas (usually deprived locals or hunters) to profitable companies or corrupted government officials (Bennett 2015; Fajardo del Castillo 2016; Haken 2011; INTERPOL 2014; Lawson and Vines 2014; UNODC 2016; van Uhm 2016a; World Bank 2017; Zimmerman 2003). These actors can be small and large scale, rich and financially deprived, legal or illegal or even criminals.

Criminology researchers refer to the **pipeline model** when describing transnational crime (Smith *et al.* 2011a; White 2008). The model allows describing distinct stages, actors, and

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networks involved in a chain of crime where illegal trade persists. The model is based on the movement of illegal products from their origin to destination and functions as a combination of chain and hub networks (van Uhm 2016a). The pipeline model has been used to sketch diamond crime from the mine to the shops. Diamond pipeline model allowed to depict the vulnerability of diamond industry to illicit activities (such as the possibility to steal, hide, illegally transport rough diamonds)(Smith *et al.* 2011a).
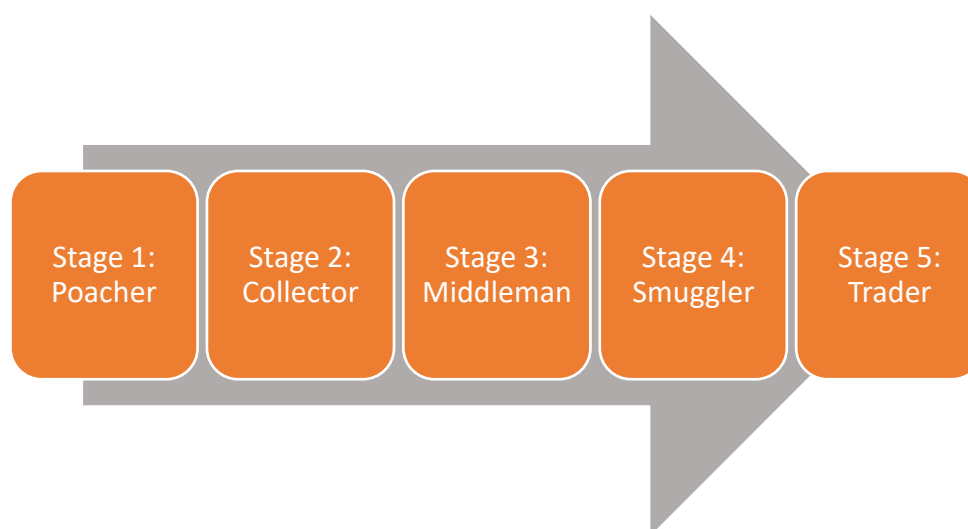
Figure 4: Idealized pipeline model for wildlife crime (source: van Uhm 2016a)

Van Uhm adapts the pipeline model to wildlife crime (van Uhm 2016c). It should be noted that such model has been largely used in other publications by NGOs and international organizations describing wildlife crime, however not referred to as the pipeline model (INTERPOL 2017; TRAFFIC 2008; UNODC 2016). In the first stage of the model, the wildlife is poached or illegally collected at source region. The poachers are usually poor local people (farmers or native hunters) or professional hunters who reside in the area and know where to illegally extract or kill wildlife (e.g. endangered plants, parrots, monkeys, elephants, tigers). The first stage may consist of a highly organized network of poachers or individual local hunters who poach in the areas far from urban areas, in deep forests or even inside protected areas. Depending on the request of the trader, the animal can be killed or kept alive for some time. The second stage consists of wildlife collectors who can be residents or traders

who can sell their goods on a local market in their village or town or sell from their houses or storage places to a visiting middleman or smuggler. The third hub consists of the middlemen who arrange the smuggling of the product to another destination, usually a bigger city. Frequently these people are closely connected with the smugglers who operate in the area. The fourth stage consists of smugglers who are specialized on a specific type of a smuggled product or particular method of smuggling. This stage can also include bribing of an official or law enforcement officer for organizing "problem free" smuggling of a product. However, bribing an official can happen along the entire chain of wildlife crime. At the final stage, the illegal product ends up in the hands of a national or international trader in the point of destination. Or the product can be re-sold to another middleman who will then organize the international smuggling to another country, region or even continent. At the final stage the product is considered laundered to the legal market and being sold together with other legitimate goods in shops, pharmacies, pet shops, clinics for traditional Asian medicine and so on (van Uhm 2016a).

Each stage can consist of one or several individuals or even highly organized criminal networks, depending on the rarity, volume and price of a product. However, van Uhm stresses that this is an ideal model, which can be much less organized and structured in reality (van Uhm 2016a). According to Morselli, criminal networks, like other social networks, can be very fluid and adaptive to changing conditions and situations over time (Morselli 2009). The pipeline model can represent a structured process and help us to understand the nature of wildlife trade, which in reality can be incredibly fluid and flexible.

Another more diffused wildlife crime model has been developed by Phelps, Biggs et.al (2016) (Figure 5). The model describes wildlife crime in fuller complexity and diversity on the case of different taxa where the roles are distributed among the harvesters, intermediates and

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consumers. In contrast to simplified pipeline model, where one actor follows the other, Phelps'

model shows that the wildlife crime involves a significant amount of redundancy (Phelps *et al.*

2016). Redundant channels are created in the result of several barriers in implementing crime,

such as, for example, abundance or wide distribution of the source, or low enforcement (Phelps

et al. 2016).

It should be stressed that economic value of an illegal product significantly increases as it

moves along the stages (TRAFFIC 2008). Sometimes the value can increase up to more than

hundreds of times in comparison with the initial price paid to a poacher by a collector or

middleman at the first stage (TRAFFIC 2008). Obviously, if the trade chain is international or

cross-continental, the economic value significantly increases once the product has been

smuggled across the border due to increased risks and higher criminal penalties (TRAFFIC

2008).
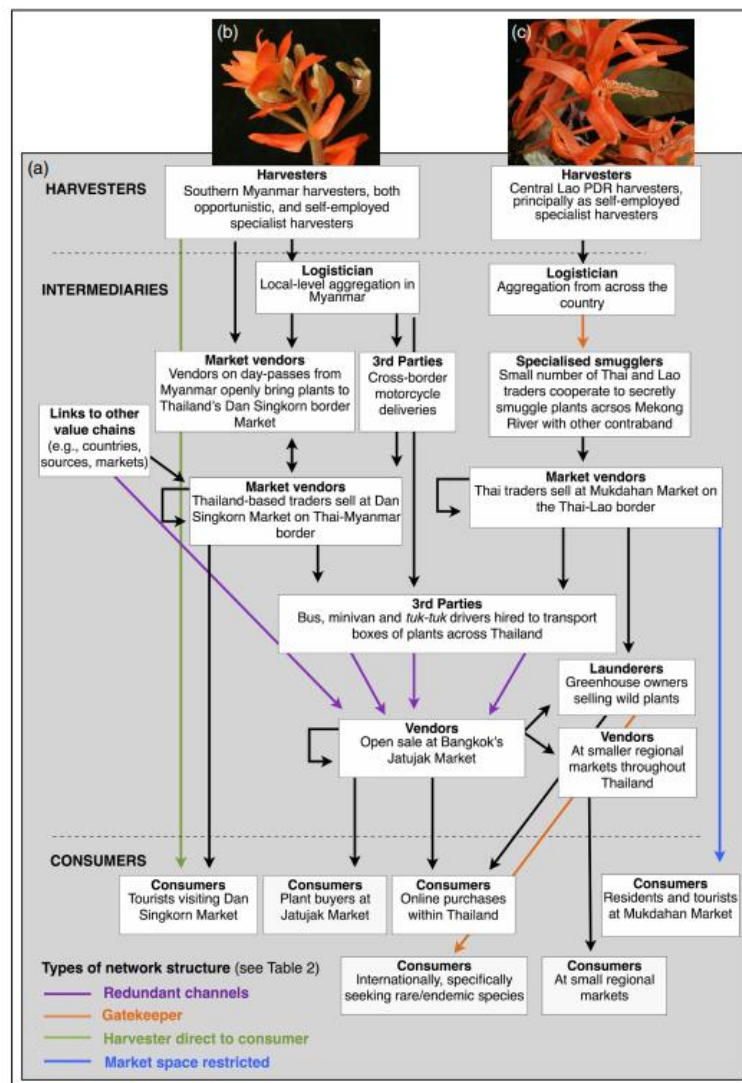
Figure 5: Illegal wildlife trade network structure (source: Phelps et.al. 2016)

2.3.5 Economic and market concepts

Poaching and wildlife crime have been extensively covered in literature from the economic and market perspective, especially when linked to domestication, **wildlife farming** and wildlife breeding (Abbott and van Kooten 2011; Bulte *et al.* 2003; Challender *et al.* 2015; EIA 2015b; Fajardo del Castillo 2016; Kulkarni and Nathan 2016; North 2003; Nowell 2010; Oldfield 2003; TRAFFIC 2008).

According to the latest UNODC global wildlife crime analysis, current illegal **wildlife trade markets** do not correspond neatly to biological categories (UNODC 2016). Some wildlife

markets use multiple species, while some species are traded at numerous types of markets (UNODC 2016). As in the case of trade in illegally harvested reptiles, for example. Skins of various reptiles (python, crocodile, lizard, etc.) are used at illegal leather markets, while pythons are also poached for their meat as food, their gall bladders are used in traditional Chinese medicine, and they are also illegally collected for the pet market (UNODC 2016). To correctly understand the nature and extend of wildlife trade, UNODC suggests assessing the problem as a series of related but distinct illicit markets where each of them is independent and has unique characteristics (UNODC 2016). UNODC report categorizes current global wildlife trade into seven large industrial sectors that make use of wildlife: seafood; pets, zoos and breeding; food, medicine and tonics; art, décor and jewelry; cosmetics and perfume; fashion; and, lastly, furniture (UNODC 2016).

Wildlife crime has also been studied through the prism of **unequal distribution of natural resources**, their exploitation, such as mining, oil refining and wildlife trade (Challender *et al.* 2015; Roe 2002; van Uhm 2016b). From this perspective, general **wildlife trade flows** are moving from developing to developed countries (Roe 2002). Traffickers exploit poverty and inequality that induce people to poach, especially on those territories where governmental control is weak or absent and life of local residents is very poor (Challender *et al.* 2015; Haken 2011). International **demand for wildlife** can also provide opportunities for local livelihoods of poor communities in developing countries in terms of their better income, assets and wellbeing (Cooney *et al.* 2015). However, international wildlife trade can marginalize these communities and create dependency on unsustainable harvest levels of wildlife, posing a threat to certain species (Cooney *et al.* 2015).

3. Global policy measures in addressing wildlife crime

Most of the international laws on anti-poaching were enacted after the adoption of the Stockholm Declaration at the United Nations Conference on the Human Environment held in 1973 in Sweden (Carter *et al.* 2017; Sohn 1973). The declaration urges governments to safeguard natural resources of the earth, "including the air, water, land, flora and fauna, and especially representative samples of natural ecosystems" for the benefit of future generations "through careful planning and management" (Sohn 1973). This Declaration was later followed by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 2016g).

3.1 Convention on International Trade in Endangered Species of Wild Fauna and Flora

Convention on International Trade in Endangered Species of wild fauna and flora (usually referred to as CITES) is an international agreement between the countries that ensures that trade in species, their parts and derivatives does not threaten the survival of the species. It is one of the oldest multilateral environmental agreements and arguably the most powerful (Oldfield 2003; Weber *et al.* 2015).

The Convention came into being because of the IUCN resolution adopted by the members in 1963. However, only 10 years later, on March 3rd, 1973, the text of the Convention was agreed upon by the representatives of 80 countries and then finally came into force on July 1st, 1975. At present, 183 countries have adhered to the Convention voluntarily (CITES 2016i). Those countries that agreed to join the Convention are called Parties to the Convention.

CITES works by controlling international trade in selected species included in the list through various mechanisms for export, re-export and import procedures and licensing mechanisms. Each party to the Convention should designate a Management Authority (MA) in their own

country to manage the administration of the licensing system and one or more Scientific Authorities to provide recommendations on the status, level of trade and any possible effects of trade to the species. It is up to the Party to decide whether it is required to designate one or more Management Authorities or Scientific Authorities, as well as where and how these institutions should fit within the government structure.

At present, the Convention enlists more than 35,000 species of animals and plants whether they are traded as live specimens, parts, derivatives, processed items or dried herbs (CITES 2016i). All the species are enlisted in three Appendices according to the level of protection required. Appendix I enlists species threatened with extinction, no commercial trade is permitted, apart from exceptional cases, provided that the species will not be used for commercial purposes and their shipment will not be detrimental to the species survival (CITES 2016g). In case of import, export or re-export of Appendix I species special permits are required by the Management Authorities of both countries of departure and destination of the species. All Asian big cat species, including all Tiger sub-species, are listed in Appendix I.

Species listed in Appendix II may not be threatened with extinction, but trade in these species must be controlled to avoid their further exploitation that might endanger their survival. Species listed in Appendix III should be under the protection in at least one country which has requested other countries to assist in controlling trade of these species. Species listed in Appendix II and III have a less vigorous trade control system. For shipment of Appendix II species, only export or re-export special permits are required by a Managing Authority of the country of departure, no import permit is needed. For Appendix III species, an export permit is required from a country which has unilaterally enlisted the species provided that it was legally obtained or extracted in that country.

Tiger trade is regulated by CITES under the Resolution Conference 12.5 "Conservation of and trade in tigers and other Appendix-I Asian big cat species". CITES is the only international Agreement regulating illegal Trade in Tigers.

3.1.1 CITES structure

CITES has a permanent administration body, CITES Secretariat, which is administrated by UNEP located in Geneva. It plays a coordinating, advisory and monitoring role of the Convention. Every two to three years all member states meet to review the implementation of the Convention, which is called Conference of the Parties, usually referred as "CoPs". The CoPs review the progress made on conservation of the species enlisted in the Appendices, consider proposals made to amend the Appendices on certain species, review reports and documents prepared by the working groups, Committees, Parties and the Secretariat, recommend measures to improve the effectiveness of the Convention and, most importantly, provide a platform to discuss the most pertinent problems and successes among the Party members and various representatives of the international community. There is also a Standing Committee, which provides general guidance and policy advice to the Secretariat on Convention implementation, reviews reports from working groups and other committees. The Standing Committee consists of Parties representing each of the six major geographical regions and meets every year apart from the one year before and after the CoPs. There are also Animals and Plants Committees. Their role is to provide scientific advice to the CoPs, prepare reviews of the species status and provide relevant recommendations as well as draft resolutions on matters related to animals and plants for further consideration at the CoP. These committees meet twice between the Conferences of the Parties and consist of individuals representing each of the six geographical regions and international community. Full CITES structure is presented on Figure 6.
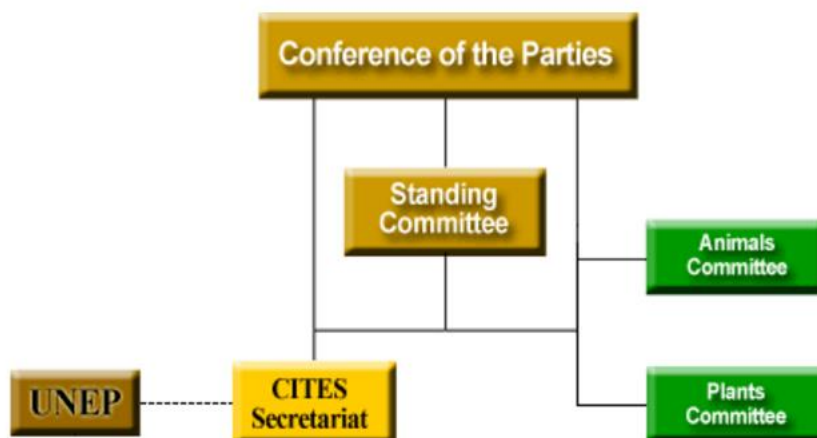
Figure 6: CITES structure (source: CITES 2016)

CITES has many partners and official observers among international organizations, coalitions and NGOs. Quite often NGO's are contracted by the Secretariat to provide technical qualified assistance in conservation and protection of species, particularly World Conservation Union (IUCN), TRAFFIC (Trade Records Analysis of Fauna and Flora in Commerce), FFI (Fauna and Flora international) or EIA (Environmental Investigation Agency).

3.1.2 The power of CITES

CITES implementation is a complicated process that covers a wide array of species, their parts, derivatives and processed products. It prescribes a mechanism for wildlife trade regulation at international and national levels with many different parties and organizations involved. Even though it is widely recognized as the most effective, it has not been holistically assessed (Oldfield 2003; Phelps *et al.* 2010). The level of Convention's complexity has inevitably increased since its inception. Historically there have been general provisions to the Convention set out for Parties for assessing their compliance specified in various treaties and CITES documents (Reeve 2006):

1. Parties report regularly to the Convention on their measures taken to enforce and effectively implement CITES;

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2. The Secretariat reviews the progress and makes recommendations;

3. Parties respond with some actions and report to the Secretariat, Standing Committee or Conference of the Parties (depends on the recommendations made earlier by the Secretariat);

4. The Secretariat, Standing Committee or Conference of the Parties review the report and make further recommendations.

Although the Convention is legally binding, the countries are free in the extent of their will to implement its provisions in national legislation and governmental structure. CITES only recommends a framework to be adopted by each Party to ensure that Convention is reflected in national laws and its major provisions are respected (CITES 2016i). CITES as any other international agreement or treaty should prevail over the national legislation once the country has adhered to it and has agreed to comply with its provisions following one of the founding principles of international law "pacta sunt servanda" ("agreements are to be kept") (Janis 2015). However, CITES is not a self-executing agreement, which means that it cannot be fully implemented unless all domestic measures and conditions have been adopted for its implementation (CITES 2016i). Therefore, it is critical that countries should have the laws, regulations, institutions and financial resources in place to implement the Convention. At the same time, even though the country might have adequate national legislation in place, it should be effectively implemented inside the country and at the border, which eventually falls on the shoulders of enforcement officials.

Often complicated and financially demanding mechanism for wildlife trade regulation and control might lead to various level of CITES implementation by the signatory countries. This can become an obstacle to regulate the exploitation and extraction of endangered species and potentially contribute to the expansion of illegal wildlife trade. Such situation often refers to

naturally rich but financially poor countries with weak government and lax legislation, particularly in Africa or South East Asia (Phelps *et al.* 2010).

According to the UNODC Global Crime report, CITES as global inventory of traded endangered and threatened species, also has some limitations. Such as, CITES does not regulate the poaching of animals and illegal harvesting of plants within the protected areas. Similarly, CITES has no jurisdiction over the domestic market (e.g. as long as the product cannot be confirmed to have crossed the border, the Convention has no authority to regulate or penalize the offence) (UNODC 2016).

Nevertheless, CITES has a direct effect on species exploitation, extraction and further conservation in comparison with other international environmental agreements that might not have much of a legal binding power (Phelps *et al.* 2010). By default, customs authorities of any CITES Party represent the executing national power of the Convention as customs oversee controlling the movement of goods and commodities across the border and ensure that all necessary documents for customs clearance are in place and authentic. Customs execute enforcement power to seize transportation of goods, people and commodities in case of any illegal activity.
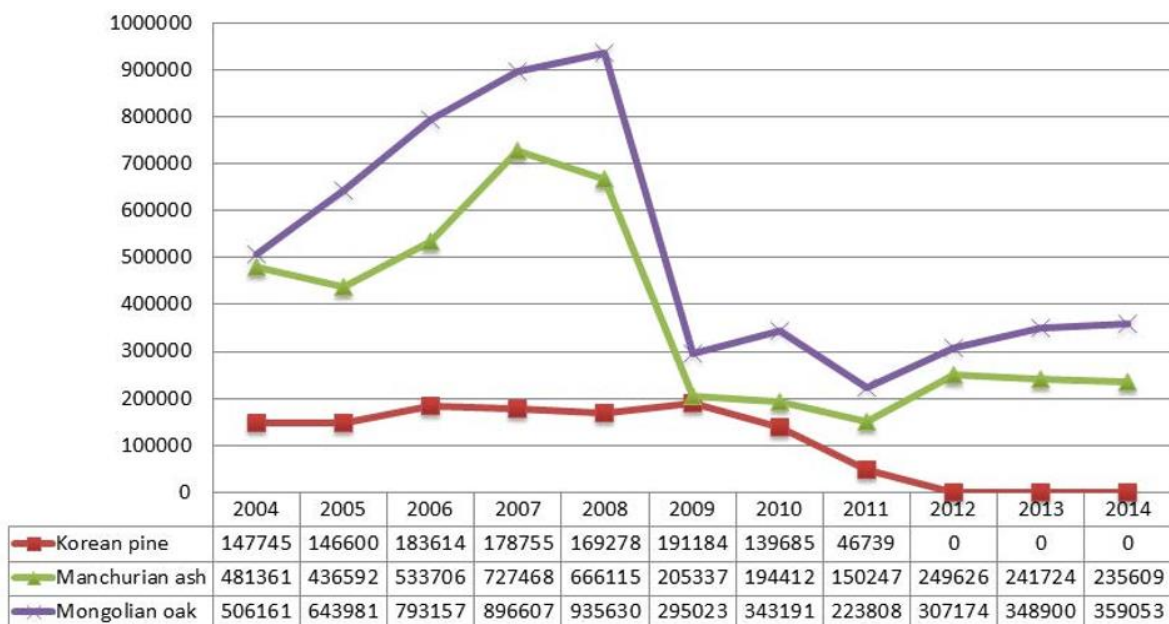
Figure 7: Export of selected timber species: Mongolian oak, Manchurian ash and Korean Pine in 2004-2014, cubic meters (source: WWF Russia)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Korean pine	147745	146600	183614	178755	169278	191184	139685	46739	0	0	0
Manchurian ash	481361	436592	533706	727468	666115	205337	194412	150247	249626	241724	235609
Mongolian oak	506161	643981	793157	896607	935630	295023	343191	223808	307174	348900	359053

As an example, the inclusion of Manchurian ash (*Fráxinus mandshurica*), Mongolian oak (*Quercus mongolica*) and Korean pine (*Pínus koraiénsis*) into CITES Appendix III in Russia in 2010 has contributed to the decrease of export of these timber species from the Russian Far East. The three species are on high demand in timber industry for flooring, furniture and interior design, at the same time serve as the basis of Korean pine broadleaved forests, main habitat for Amur tigers. Nuts of Korean pine and Manchurian oak serve as the main forage for all ungulate species, wild boars and other animals on the Russian Far East, what in turn composes the main diet for Amur tiger. According to official customs export data in the Russian Far East, export volume of these timber species was 1.3 mln cubic meters in 2004, which went up to 1.7 mln cubic meters in 2007, then decreased to 680,000 mln cubic meters in 2010 and went further down to 420,000 mln cubic meters in 2011 (Figure 7). This export decrease had several reasons, firstly, global financial crisis in 2008 that dropped down global consumer demands for timber products generally, secondly, enlisting of these timber species in CITES Appendix III and, thirdly, a complete ban by the Russian government on logging of Korean Pine in 2011.

3.2 Convention on Biological Diversity

Convention on Biological Diversity (usually referred to as CBD) signed in 1992 has the objectives to conserve biological diversity, sustainable use of its major components and fair sharing of benefits from commercial and other utilization of genetic recourses (CBD 2017). The Convention covers three key features of biodiversity: ecosystems, species, and genetic resources. Given that the CBD was signed nearly twenty years after CITES, it reflects broader focus and approach to address the threats to biodiversity, as well as, *inter alia*, conservation concerns and provisions of equitable access and use of genetic resources, the role of development in environment degradation (CBD-CITES synergy workshop 2004).

Studies focused on the relationship of CITES and CBD indicate that even though both conventions are not identical, they are broadly compatible as they are focused on the sustainable use and prevention of biodiversity loss (CBD-CITES synergy workshop 2004). The text of CBD does not explicitly mention any terms related to wildlife trade, wildlife crime or poaching, as it is stated in CITES. While CBD focuses on a broader range of biodiversity threats such as climate change, habitat destruction, pollution, etc, CITES focuses only on one aspect of it - trade (van Uhm 2016a).

Even though CBD does not provide a clear framework for addressing wildlife crime, the Convention acknowledges the need to strengthen efforts to solve the problem and synchronize activities nationally, internationally and along with other major biodiversity documents. Such as, the issues of wildlife trade and crime have been included into Convention's major Protocols, partnerships, programs and regular CBD Conferences of the Parties (CoPs) and meetings (CBD 2017). Major ones focusing on the problem are CBD Aichi Biodiversity Targets, Biodiversity and Community Health Initiative (BaCH), Global Strategy on Plant

Conservation (GSPC), CBD current strategic plan on Biodiversity 2011-2020 and many other side events and initiatives (CBD 2017).

With regards to tigers, CBD does not specify special provisions for tigers only, however acknowledges the need and urgency for strengthening tiger conservation efforts.

3.3 Convention on the Conservation of Migratory Species of Wild Animals

The Convention on the Conservation of Migratory Species of Wild Animals (usually referred to as CMS), also known as Bonn Convention, has the objective of conservation of wide array of endangered migratory species and their habitats through the implementation of agreements and species action plans (CMS 2017). It brings together countries to establish the mechanisms and agree on conditions for migratory species' free passes and laying down the legal regulations for their conservation (UNEP and CMS Secretariat 2014). At the moment, the Convention has a hundred and twenty member states. Endangered migratory species receive protection under the Convention through listing in its two Appendices, implementation of the global and regional agreements and species action plans (CMS 2017). CMS acknowledges illegal wildlife trade as a serious threat to migratory, endangered species conservation, especially with regards to migratory birds, Tibetan antelope *(Pantholops hodgsonii)*, Snow leopard *(Oncia uncia)*, African elephant, Wild Bactrian camel, Saiga antelope, marine turtles and cetacean species (UNEP and CMS Secretariat 2014).

In 2008 CMS adopted a COP Recommendation on tigers and other Asian big cats (Recommendation 9.3), acknowledging tigers as migratory species along with other Asian big cats, whose habitat and population have significantly declined. This Recommendation, however, did not specify trade, anti-poaching or anti-trafficking measures, but instead urged

the countries to strengthen transboundary collaboration on conservation and management of the species, thus leaving trade regulation under CITES (CMS 2008a).

In 2014 CMS adopted COP Resolution on fighting wildlife crime and offences within and beyond borders, which focuses on increasing awareness, strengthening legislation, transboundary enforcement and cooperation on repatriation of live and illegally-traded wildlife, promotion of alternative livelihoods, intelligence sharing and etc. (Res.11.31) (CMS 2014). It should be stressed that CMS Res.11.31 does not provide any directive or framework, but merely offers a list of recommendations, requests, and acknowledgments.

With regards to tigers, CMS has a separate Recommendation 9.3 on tigers and Other Asian big cats, which urges the countries to strengthen transboundary cooperation in tiger conservation efforts and explore the areas for complementing ongoing global activities in tiger conservation (CMS 2008b). In response to Recommendation 9.3, tiger has been proposed to be included on CMS Appendix I at the CMS COP10 (CMS 2010a). However, CMS COP 10 decided that CMS listing of tiger would not add value to the existing institutional framework in tiger conservation, thus tiger has not been listed till present day (CMS 2010b).

3.4 Other policy initiatives

3.4.1 International Consortium on Combating Wildlife Crime

At the International Tiger Forum in St. Petersburg in November 2010, the international organizations agreed to bring a coordinated effort that would address wildlife crime. CITES Secretariat, INTERPOL, the United Nations Office on Drugs and Crime (UNODC), the World Bank and the World Customs Organization (WCO) formed an alliance titled International Consortium on Combatting Wildlife Crime (ICCWC) (CITES 2017).

Figure 8: ICCWC Strategic Programme 2016-2020 (source: CITES 2016a)

Since its inception, ICCWC has put forward its main objectives in the Strategic mission 2014-2016, which outlined the focus areas: strengthening cooperation, facilitating analysis of national responses, capacity building, raising awareness and better use of innovations and knowledge (ICCWC 2014). By that period, the consortium had developed and employed the ICCWC Wildlife and Forest Crime analytic toolkit that allowed to review and analyze national practices on addressing forest and wildlife crime (ICCWC 2012). The toolkit was later complemented by the ICCWC indicator framework for wildlife and forest crime that provided a standardized approach to measure the effectiveness of national efforts (ICCWC 2014). In 2016 the alliance agreed on the ICCWC Strategic Program 2016-2020 that outlined further the priorities and activities to reduce poaching and trafficking in wildlife and forest products (Figure 8) (CITES 2016d).

3.4.2 International Conferences

Some high-level international events have been held within the last four years, focusing on wildlife trafficking. Mostly these events have been supported by other governments, such as the United Kingdom or Germany. The first such conference on Illegal Wildlife Trade (IWT) was organized in London in February 2014, organized and supported by the UK government. Later in March 2015, there was another similar conference on illegal wildlife organized in

Kasane, Botswana, that was re-affirming commitments made in London a year ago (Pyle 2015). The Third IWT Conference was held in Vietnam in November 2016. The Government of Vietnam organized it with the support of the UK Government (Vietnam Government 2016). The latest IWT Conference was organized in October in 2018 in London.

4. Tiger species

Tiger *(Panthera tigris)* is one of the most iconic and most recognizable species in the world, which has awakened fascination in humans for centuries (IUCN Red List 2015). Tigers are endangered throughout their distribution range (Dinerstein *et al.* 2007).

An adult tiger can grow as long as four meters (including the tail, which is about a meter) and weighing up to 250 kg. Females are usually smaller than the males. Tigers' stripes differ among individuals and are as unique as human fingerprints (WWF 2018c). This distinct characteristic of tiger pelt pattern is used for photo-trapping for the estimation of tiger populations and identifying each animal (Karanth *et al.* 2006).

Figure 9: Bengal Tiger in Kanha Tiger reserve (source: WWF 2018c)

It is often considered that Amur tigers (*Panthera tigris altaica*) are the largest sub-species, although they are the same size as Bengal tigers (*Panthera tigris Tigris*) (Natesh *et al.* 2017; Thapa *et al.* 2018). Bengal tigers may even weigh more due to higher prey density in their habitat, thus less effort needed to get a fresh kill, while Amur tigers have to stroll long distances to get a prey due to lower prey density, large habitats and lower tiger density, which can be as low as 0.13-0.45 per every hundred square kilometers (Goodrich *et al.* 2010) (Figure 9).

4.1 Biological characteristics and questioned taxonomy

Despite the abundance of literature, reproductive parameters of wild tigers are poorly known. Therefore the majority of information comes from captive animals (Kerley *et al.* 2003). As tiger distribution is very vast in Asia, animal's reproductive parameters may differ in response to climate, habitat type, climate, prey density and other environmental parameters (Kerley *et al.* 2003). On average, tigers give birth to two to five cubs at a time every two years; however, if all cubs die in one litter, the next litter may appear in five months (WWF 2018c). Approximately 50% of cubs die in the first year due to disease, hunger or predation (WCS Russia 2018). Tigers reach the age of sexual maturity by three years and can mate any time of the year.

Literature review analysis revealed that there is no agreement within the tiger expert community on the division of tiger subspecies (Chestin *et al.* 2017; Natesh *et al.* 2017; Thapa *et al.* 2018; Yadvendradev *et al.* 2010). Luo's (2004) study argued that there are six tiger subspecies within one same tiger species (Luo *et al.* 2004), whereas another study by Mazak & Groves suggested separating the species into continental tigers and island tigers (Mazak and Groves 2006).

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Currently, IUCN acknowledges the taxonomy that has been developed by Luo et al. (2004) that distinguishes six tiger subspecies based on the distinctive molecular markers (Luo *et al.* 2004). The following sub-species have been acknowledged: Amur (or Siberian) tiger *(P.t. altaica)* with a distribution in the Russian Far East and Northeast China, Northern Indochinese Tiger (*P.t. corbetti*) with a distribution in Indochina north of the Malayan Peninsula; Malayan Tiger (*P.t. jacksoni*) with a distribution in Peninsular Malaysia; Sumatran Tiger (*P.t.sumatrae*) with a distribution in Sumatra; Bengal Tiger (*P.t. tigris*) with a distribution in Indian sub-continent; South China Tiger (*P.t. amoyensis),* however this subspecies has not been observed in the wild since the 1970s and is most probably extinct (IUCN Red List 2015) (Figure 10). Three tiger subspecies are now extinct: Bali Tiger (*P.t. balica)* with a distribution in Bali; Javan Tiger (*P.t. sondaica*) with a distribution in Java; Caspian Tiger (*P.t. virgate*) with a distribution in the dry river valleys of the Takla Makan, western Tianshan mountains, Amudarya and Syrdarya river valleys, Caspian seashore, Elburz mountains, east of Turkey, Tigris and Euphrates river valleys (IUCN Red List 2015).
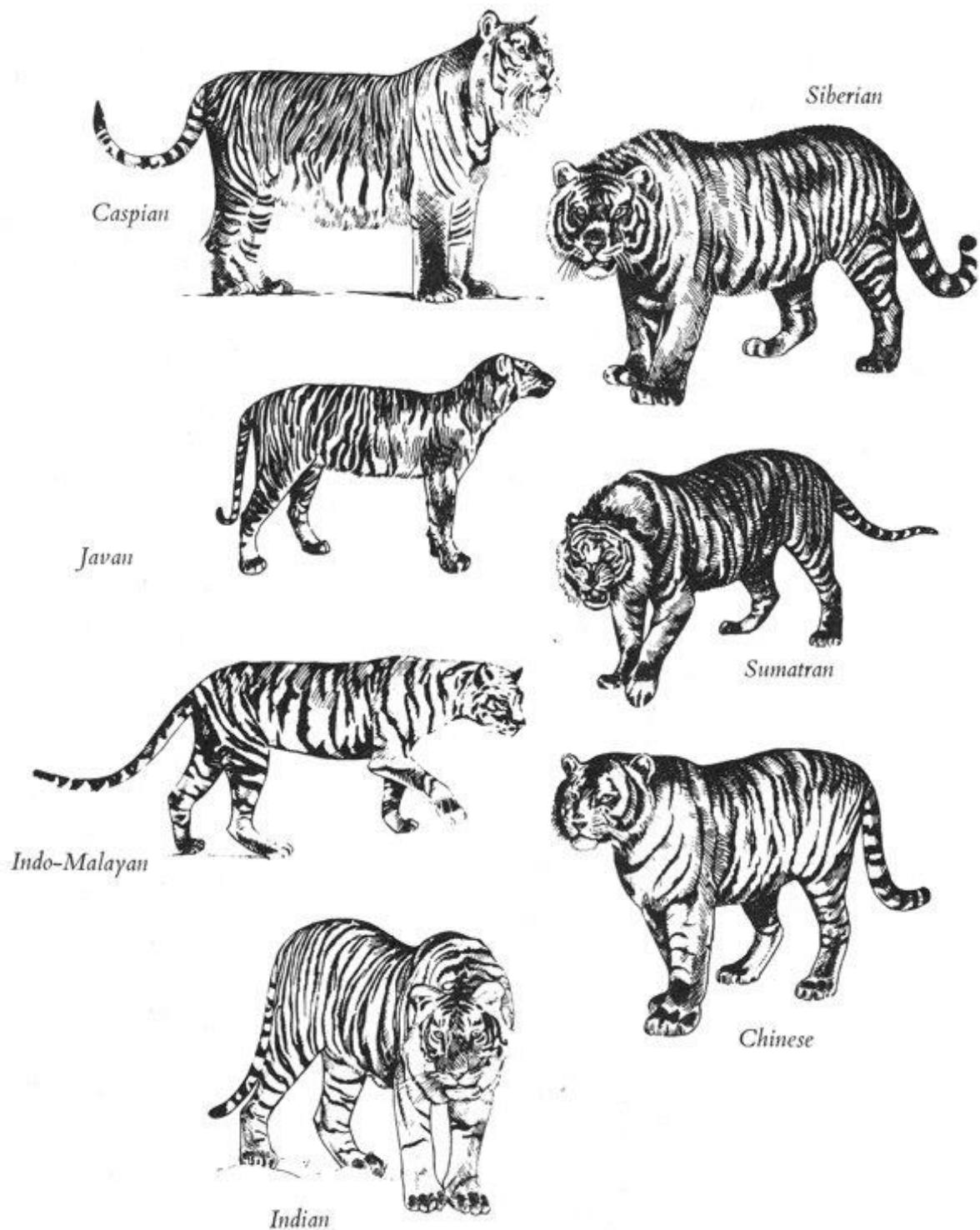
Figure 10: Illustration of some tiger subspecies currently recognized (source: Naish 2017)

Dinerstein (2015) argued that taxonomic approach would only focus on keeping the genetic tiger's diversity, while ecological-based approach is needed for tiger conservation to consider ecological, behavioral and demographic distinction across the range (IUCN Red List 2015). Other authors divide tiger sub-species by biomes or six-bioregions: Indian sub-continent,

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Indochina, Peninsula Malaysia, Sumatra, Russian Far East, China/Korea (IUCN Red List 2015).

In December 2017, the tiger subspecies argument has globally re-emerged after the revision of the *Felidae* taxonomy at the genus, species and subspecies levels made by the panel of twenty-two global experts who comprise the IUCN Cat Specialist Group (Kitchener *et al.* 2017). The authors argue that there is no good information available on certain tigers subspecies, especially Javan and Balinese tiger, whereas (extinct) Caspian Tiger (*P.t. virgate)* might be very similar to Amur (Siberian) tiger *(P.t. altaica);* Malayan tiger (*P.t. jacksoni*) is formed of several populations of Northern Indochinese Tiger (*P.t. corbetti*), and island tigers are highly similar (Kitchener *et al.* 2017). Modern tiger populations are far more distinct and inbred than a few decades ago. As a result, the current subspecies situation might not be accurate than in the past when the subspecies were first named (Naish 2017). The authors of the *Felidae* taxonomy revision have concluded that there should be only two tiger subspecies: *P.t.Tigris* of the mainland of Asia and *P.t.Sondaica* of Sumatra, Java and Bali (Kitchener *et al.* 2017). Notably, though, the authors do not agree completely among themselves (two out of twenty-two disagreed). However, the final conclusion has been the recognition of only two Tiger subspecies and the continuation of further research that will either support or refute the panel's decision (Kitchener *et al.* 2017). It should be stressed, however, that IUCN Red List specifies that Tiger (*Panthera tigris*) "taxonomy is currently under review by the IUCN SSC Cat Specialist Group" and they "currently follow Luo *et al.* (2004), who confirmed the division of tiger into six extant subspecies" (IUCN Red List 2015). No comment or statement by any major tiger conservation organization on the taxonomy revision has been released yet.

4.2 Habitat and ecology

Tigers occupy a variety of habitats: tropical forests, woodlands, evergreen forests, mangrove forests, swamps, rocky hills. Historically, they resided more in a dryer and colder climate (IUCN Red List 2015). Availability of sufficient amount of prey base is the major requirement for a tiger habitat (IUCN Red List 2015).

Tigers are mostly solitary, apart from the association of mother and offspring or during mating seasons. Individual tigers are fiercely territorial; they roam their massive territory, or home range, searching for prey. The size of the home range is determined by the availability of the prey base and the tiger's strength to cover large territories. Adult males maintain exclusive territories, while the female range seldom overlaps (IUCN Red List 2015). Usually, the male tiger has a much larger territory in comparison with the one of a tigress. A strong, healthy adult male tiger has a large territory with several (up to three) female tigers residing in his territory. This is a common felid pattern of social organization. For example, females home range in Chitwan, Nepal, is about twenty square kilometers, while in the Russian Far East the range can reach up to four hundred square kilometers (Goodrich *et al.* 2010). The stronger and the healthier the adult male tiger, the larger the home range.

A tiger can consume up to forty kg of meat at a time (Seidensticker and Tops 1993; WWF 2018c). The predator needs to kill 50-60 large prey animals a year (Miller *et al.* 2013). The most common prey for them is a deer, pig, sometimes crocodiles, leopards, young elephants, monkeys, birds, fish, dogs, insects, amphibians, reptiles or even their kind (Seidensticker and Tops 1993). A tiger can take an ungulate prey much larger than its size, including large bovids, rhinos, bears, and elephants (IUCN Red List 2015). Humans are not a common prey for a tiger; however, if a tiger has been wounded or it is not healthy and weak, it will attack a human. The

tiger is not the most successful hunter. Usually, the success rate is one to every ten to twenty (Big Cat Rescue 2015).

4.3 Global range distribution and population discourse

The tigers range spanned across Asia, from Turkey to the Far East of Russia (IUCN 2016a). Over the last century, tigers disappeared from Central Asia, Bali and Java and large areas of Southeast and East Asia (WWF 2018c). Currently, tigers inhabit only 6% of their historical range (Figure 11) (IUCN Red List 2015). Russia, India, Malaysia, Indonesia, Thailand, Bangladesh, Nepal, and Bhutan have breeding tiger populations, while there is some evidence of tiger presence in Northeast China (border with Russia) and Myanmar (mostly on the border with Thailand). Countries, where tigers are possibly extinct, are Vietnam, Cambodia, Democratic Republic of Korea, Lao PDR (IUCN Red List 2015). However, Cambodia, Lao PDR, and Vietnam appear as tiger range countries (TRCs) with tiger presence on global population assessment reports by the international organizations, such as, inter alia, World Bank's Global Tiger Initiative (GTI) Global Tiger Recovery Program (GTRP) (Global Tiger Initiative 2011). IUCN Red List assessment also enlists the regional extinction of tigers in Afghanistan, Islamic Republic of Iran, Kazakhstan, Kyrgyzstan, Pakistan, Singapore, Tajikistan, Turkey, Turkmenistan and Uzbekistan (IUCN Red List 2015). India and Nepal have reported recovery of their populations. Tiger populations in countries, where tiger habitat has been lost, have no potential for recovery (IUCN Red List 2015).
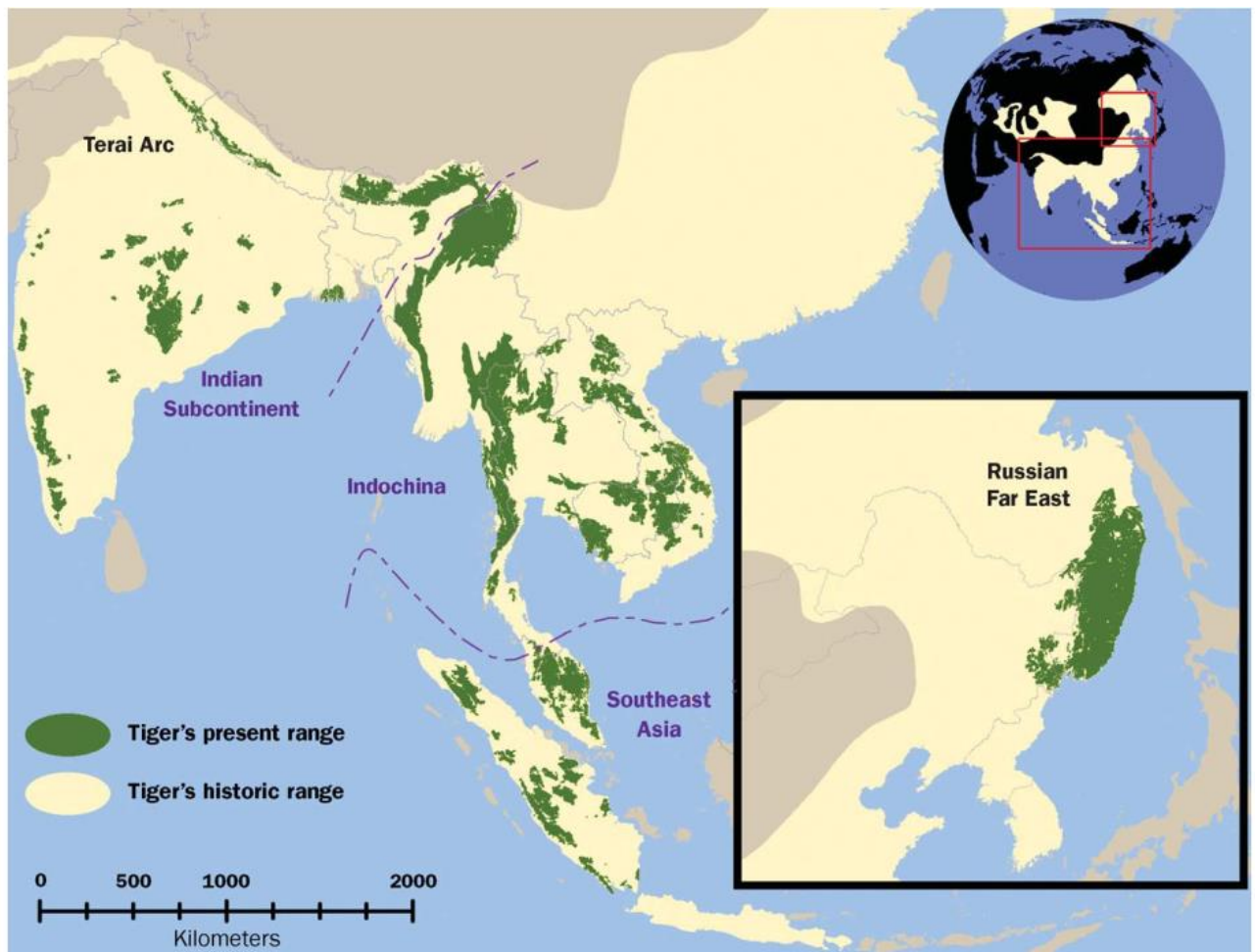
Figure 11: Historical (circa 1830) and present distribution of Tigers (source: Dinerstein, Loucks et.al. 2007)

A dramatic loss of tiger habitat indicates that urgent conservation measures should be taken to sustain tiger populations. As a tiger is a solitary animal, intensive habitat loss is a key indicator of a dramatic decline in tiger populations (Dinerstein *et al.* 2007) (Figure 11).

The global tiger population was estimated to be between 5,000 to 7,000 animals in 1998, however, in 2010, there was an estimation of only 2,154 animals in 42 protected tiger source sites that showed strong breeding evidence at that time (IUCN Red List 2015).

The guidelines stress the definition of "mature individuals is to allow the estimate of the number of mature individuals to take account of all the factors that may put a tax on them to make them more vulnerable than otherwise might be expected" (IUCN Red List 2015). The guidelines stress the definition of "mature individuals is to allow the estimate of the number of

mature individuals to take account of all the factors that may make a taxon more vulnerable than otherwise might be expected" (IUCN Red List 2015). Tigers require a large population to persist, while mature female's survival is the critical parameter. The population is considered to decline when the mortality of breeding females is above 15% (IUCN Red List 2015). The IUCN guidelines advice that mature individuals that will never reproduce should not be counted, thus 2010 global tiger population assessment focused only on tiger protected sites (IUCN Red List 2015).

Table 2: National tiger population estimates (2009 - 2014) (source: Goodrich 2015)

Country	Estimate based on field data, 2009-2014	Official Government Estimate
Bangladesh	Not available	300-500
Bhutan	50 (43-61)	115-150
Cambodia	0	10-30
China	>7	20
India	1,706 (1,520 to 1,909)	2,226 (1,945 to 2,491)
Indonesia	670 (371 – 1,273)	>250
Lao PDR	2	17 (9 to 23)
Malaysia	300 (250 – 340)	250 - 340
Myanmar	Not available	85
Nepal	198 (163 – 235)	198 (163 – 235)
North Korea	Not available	None
Russia	Not available	360 (330 – 390)
Thailand	221 (189 – 252)	189 - 252
Viet Nam	< 5	>10
Total	3,159	Approx. 4,240

It is acknowledged that the tiger population is much poorer outside the source sites where tiger survival rates are low due to continuous threats such as poaching, habitat destruction, and prey depletion. This has been verified by the highest tiger extirpation rate outside of protected areas. Despite this general conception, most of Amur tiger population resides outside of protected areas and continues to persist. Thus the 2010 global tiger population number was incomplete (IUCN Red List 2015).

Latest IUCN Red List assessment of *Panthera tigris* population refers to the current estimate of 3,159 Tigers based on the surveys conducted. However this number does not show the Amur

tigers population as there had been no current estimates available at that time (Table 2) (Goodrich 2015). Even though 3,159 number might indicate an increase in comparison with the 2,154 number, the IUCN Red List assessment suggests that the latest figure merely reflects a complete assessment (Goodrich 2015).

Table 3: Updated National tiger population (source: WWF & GTF 2016)

Country	Total (April 2016)	Source
Bangladesh	106	National survey 2015
Bhutan	103	National survey 2015
Cambodia	0	IUCN 2015
China	>7	IUCN 2015
India	2,226	National survey 2014
Indonesia	371	IUCN 2015 (lower range)
Lao PDR	2	IUCN 2015
Malaysia	250	IUCN 2015 (lower range)
Myanmar	No current data available	IUCN 2015
Nepal	198	National survey 2013
Russia	433	National survey 2015
Thailand	189	IUCN 2015 (lower range)
Viet Nam	<5	IUCN 2015
Global total	3,890	

In 2016, World Wildlife Fund (WWF) and Global Tiger Fund (GTF) compiled the updated tiger population number deriving from the IUCN 2015 figure (WWF 2016a). Since IUCN Assessment, India, Bangladesh, Bhutan, and Russia published the results of their national surveys. WWF& GTF updated the IUCN number and have come up with a figure of 3,890 (Table 3) (WWF 2016a).

4.4 Major threats

Review of scientific literature identified three main threats to tigers: poaching for trade, habitat destruction and human-tiger conflict (IUCN Red List 2015).

4.4.1 Poaching for illegal trade

Poaching is driven by illegal trade of tiger's parts and products. This threat has led to the tigers' disappearance from large suitable habitats and continues to persist at unsustainable rates

across Asia. Authors of the IUCN assessment mention over a million hectares of suitable tiger habitats are available with no current traces of tiger , which indicates that poaching is the biggest threat to their survival (IUCN Red List 2015).

In the 1990-s tiger poaching for trade in their bones used in traditional Chinese medicine has been feared to drive tigers to complete extirpation (Nowell 2000). However, despite strong international efforts and global acknowledgment of tiger poaching and trade problem, the tiger trade persists and continues to threaten tiger survival (Nowell and Pervushina 2015). Tiger bone has been traditionally considered to have anti-inflammatory effects, however there has been no scientific evidence to prove it (Nowell and Ling 2007). TRAFFIC reports, covering the issue, mainly refer to psychological effects rather than any medical treatment (Nowell and Ling 2007).

Even though most of countries have banned the use and trade in tiger parts, some Asian countries, such as China, Malaysia and Viet Nam, have been still continuing these practices until very recently, but little detailed information is available (IUCN Red List 2015).

Existing demand for tiger products is driving the poaching problem globally. Poaching has been acknowledged to be driven more by demand from wealth, rather than poverty (IUCN Red List 2015). Usually poaching involves not only tiger, but also tiger prey, which has a tremendous negative impact on tiger survival. Prey poaching methods include arms and various types of snares. There have been instances of catching prey and poisoning it's carcasses with a Carbofuran pesticide to kill a tiger in India and Bangladesh (Aziz *et al.* 2017a). Other authors also cover the problem of tiger poaching in India as the country hosting the largest tiger population and, thus, having the highest poaching rates (Burke 2015; Guynup 2017; Kulkarni and Nathan 2016; Sharma *et al.* 2014; Vipin *et al.* 2016).

There is a quite limited amount of academic literature devoted to the problem of tiger poaching and tiger trade globally, regionally or nationally. However, there is wide coverage in grey literature.

Many international NGOs and organizations enlist anti-poaching activities as their main focus for tiger conservation work globally, including World Wildlife Fund (WWF), Wildlife Conservation Society (WCS), Flora and Fauna International (FFI), Global Tiger Fund (GTF), International Union for Conservation of Nature (IUCN), National Tiger Conservation Authority (NTCA), Global Tiger Initiative (GTI), Save the Tiger Fund, Panthera Corporation, Zoological Society of London (ZSL), Wild Team, Wildlife Trust of India, TRAFFIC, Phoenix Fund and other smaller organizations.

An extensive amount of sources have been found on the topic of tiger trade and tiger farming in Asian countries, especially from the point of economic and ecological justification of tiger farming (Abbott and van Kooten 2011; EIA 2013b; Graham-Rowe 2006; Gratwicke *et al.* 2008; Linacre and Tobe 2008; Nijman and Shepherd 2015; Platt 2016; Stoner and Pervushina 2013; Stoner *et al.* 2016; Tobe and Linacre 2011; Verheij *et al.* 2010; WWF 2013). However, not much academic literature has been found covering tiger range countries policies and practices addressing the issue.

4.4.2 Habitat destruction

Asia is currently the most populated region globally which has had a tremendous pressure on forests and other habitats suitable for tigers. Conversion of land into sites for agriculture and silviculture, construction of roads and transportation hubs, massive logging, as well as human settlements have been major drivers for the tigers' disappearance. Massive human settlements, especially in Southeast and South Asian countries, and China, had a strong impact on prey base

availability for tigers. Tigers and humans act as competitors for a similar food base, while humans have historically prevailed.
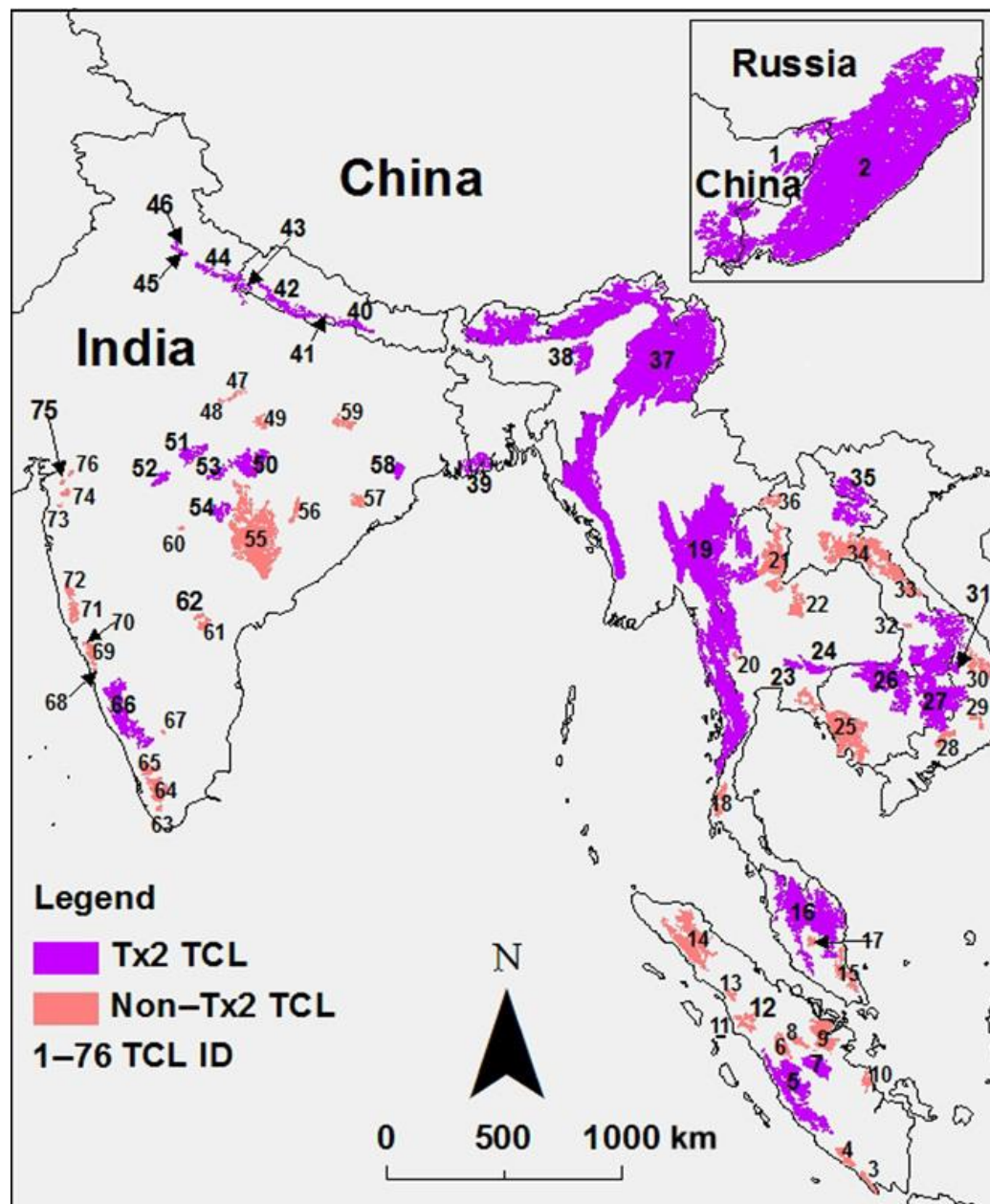
Figure 12: 76 Global tiger conservation landscapes (TCLs) (source: Joshi, Dinerstein et.al. 2016)
*Tx2 TCLs (n=29) are landscapes that have the potential to double the wild tiger population by 2022

Dinerstein did the first comprehensive assessment of global tiger range in 1994 (Dinerstein *et al.* 2007). In 2006, Sanderson did another tiger range assessment, where 76 Tiger Conservation Landscapes (TCL) were delineated (Dinerstein *et al.* 2007). TCL is defined as an area where there is sufficient territory to conserve at least five tigers (IUCN Red List 2015). In 2006

assessment the tiger range was estimated at 1.1 million km^2 in 76 TCLs, which had 42%

decrease from the range described over a decade earlier (IUCN Red List 2015). Habitat loss

has been mainly attributed to deforestation, especially in Sumatra and Myanmar, and poaching

(Dinerstein *et al.* 2007). A review done on land management within TCLs identified that only

21% of the area was legally protected, whereas management effectiveness in those PAs was

poor (IUCN Red List 2015).
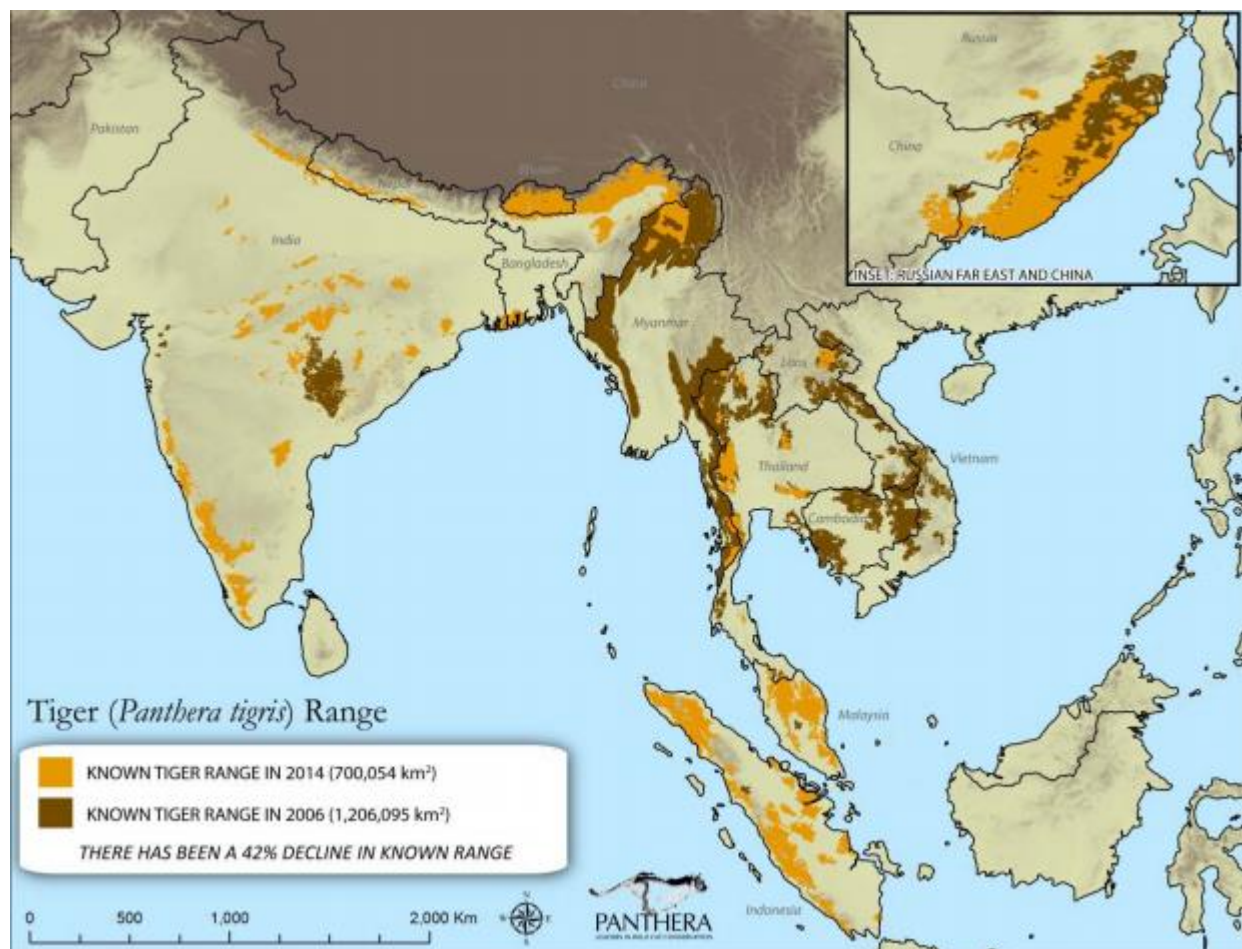
Figure 13: Known Tiger range decline during 2006-2014 (source: Panthera 2015)

The tiger range was again assessed in 2009 when the tiger crisis had become evident. The

analysis showed that most of the Southeast Asian countries that were considered to have

significant areas with Tigers resulted in obtaining no wild tigers and depleted of any prey

extirpated by poachers (IUCN Red List 2015). This time, the authors used different

methodology to identify source sites (presence and current evidence of breeding populations of

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>25 females, legal status, the potential for holding >50 breeding females) and identified only 42 sites with a total area of 90,000 km^2 (IUCN Red List 2015). In 2014, Panthera Organization, the only international organization, which focuses exclusively on the conservation of big cats, identified 42% tiger range decline since 2006 (Figure 13).
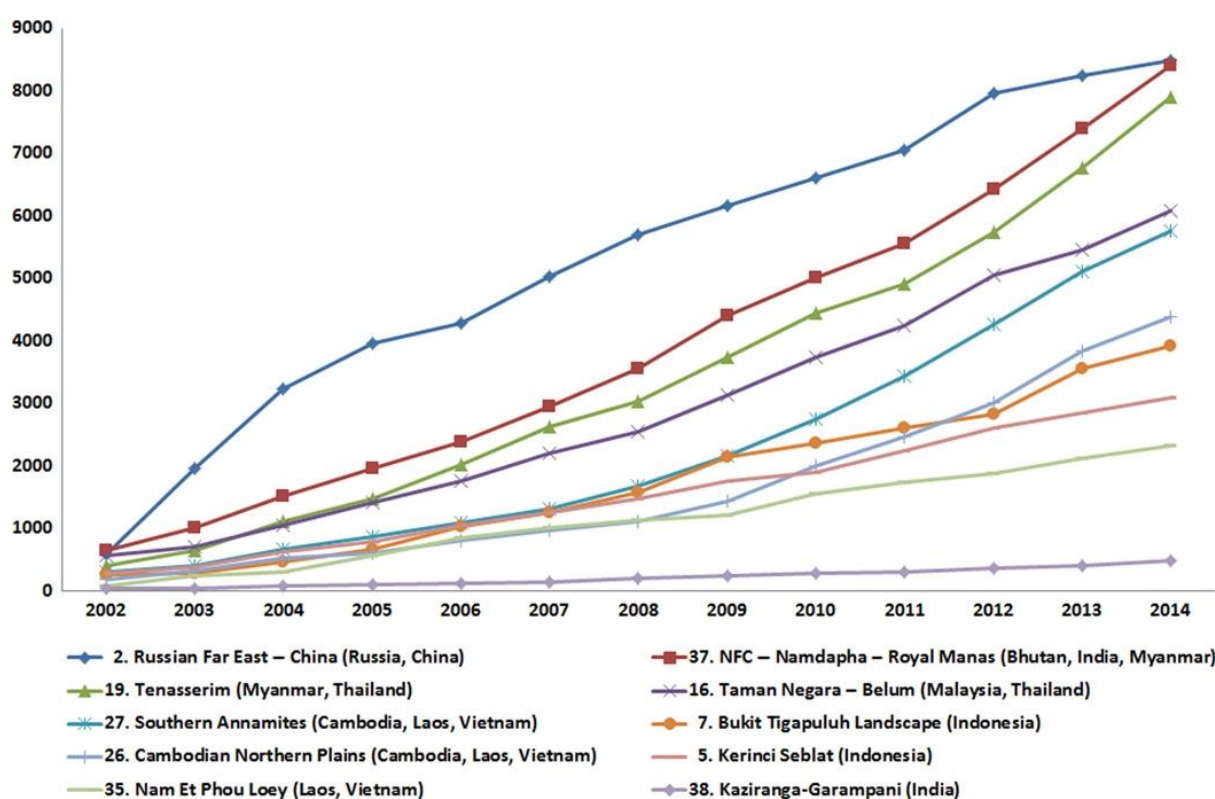
Figure 14: Global forest loss in 10 core TCLs with the highest forest loss between 2001 and 2014 (in square meters) (source: Joshi, Dinerstein et.al. 2016)

In contrast, Joshi et al. (2016) analyzed global 76 core tiger conservation landscapes (TSLs) over the period of 14 years (2001-2014) applying geospatial tools to evaluate habitat loss and fragmentation within the landscapes and estimate tiger conservation progress (Joshi *et al.* 2016). The authors identified a global total of only 7,7% (79,597 ± 22,629 km^2) loss of forest cover as a percentage to 2000 baseline (1,040,023 km^2) (Joshi *et al.* 2016). The greatest reduction in forest cover has been identified in Malaysia and Indonesia (22% and 67 % respectively) where palm oil concessions overlap with the majority of the TCLs (Joshi *et al.* 2016) (Figure 14). Figure 14 also shows three largest transborder landscapes: 1) Russian Far

East-China; 2) Northern Forest Complex–Namdapha–Royal Manas (Bhutan-India-Myanmar) and 3) the Tenasserims (Myanmar-Thailand) that lost a combined $24,798 \pm 7050$ km^2 of forest habitat, accounting for <4% of the total landscape areas. Joshi et. al. concluded that given the current trend with forest loss, enough wild habitat remains for securing and restoring wild tiger population as essential tiger corridors are being restored, source sites suffer no further erosion, countries leaders implement smart green infrastructure, and translocation and reintroduction programs are being implemented (Joshi *et al.* 2016).

As can be seen from the review, habitat destruction is another contentious topic in tiger conservation where various organizations operate with different sets of data to provide conclusions and produce models for tiger conservation to predict their fate.

4.4.3 Human-tiger conflict

Retaliation killings by the local population and human-tiger conflicts have been another major threat to tigers. Felids are more predisposed to conflicts with humans due to their wide home range and diet (Kartika and Koopmans 2013; Nyhus and Tilson 2004). Tiger killing of livestock and tiger attacks on humans lead to intolerance of locals towards tigers which constitutes a great challenge for tiger conservation efforts (Goodrich 2010; IUCN Red List 2015; Kartika and Koopmans 2013). In regions where population density is high, such as mangrove forests in India and Bangladesh, the death toll has reached 40 people during the period between 2000-2010 (IUCN Red List 2015). Bangladesh Sundarbans area has a wide coverage in the academic literature on the issue of human-tiger conflict, while the tiger has the highest problematic factor (over 50%) among the locals, (Inskip *et al.* 2014; Inskip *et al.* 2013). In the island of Sumatra, Indonesia, tigers reportedly killed 146 people between 1978 and 1997, however little information is available about the scope of the problem and national relevant policies to address it (Nyhus and Tilson 2004).

Usually conflict situations are less common in protected areas and more common in intermediate disturbance areas such as multiple-use forests where tigers and people share a living space (Nyhus and Tilson 2004). Conflicts exacerbate two major threats for tigers: they lead to death or removal of tigers from the wild and worsen negative attitudes of locals towards tigers (Goodrich 2010). Given current governmental initiatives to strengthen tiger conservation efforts, human-tiger conflicts will increase which could undermine successful tiger conservation efforts, if proactive steps are not taken to reduce conflict situations (Goodrich 2010; Nyhus and Tilson 2004).

4.5 Major tiger conservation efforts

In November 2010 the heads of 13 tiger range countries (TRCs) gathered in St. Petersburg, Russia, for the International Tiger Conservation Forum (or Tiger Summit). There TRC adopted the Global Tiger Recovery Program (GTRP) endorsed by St. Petersburg Declaration on Tiger Conservation. The program has an ambitious goal of doubling the number of tigers by the next Lunar year of the Tiger, 2022, with financial backing of $127 million in new funding to support the global plan to achieve the goal (WWF 2010). The GTRP plan focuses on preserving tiger habitats; eradicating poaching; smuggling and illegal trade in tiger parts; cooperation in transboundary landscape management and illegal tiger trade; engagement with local and indigenous communities; increasing effectiveness of tiger habitats and restoring tigers to their former range (reintroduction) (IUCN Red List 2015). Despite the new funding being put forward, TRCs agreed that they still require additional $350 million from the international community to complete the plan and save tigers (WWF 2010). The heads of state from Russia, China, Bangladesh, Nepal and Lao PDR attended the Tiger Summit, which represented a major commitment to tiger conservation (IUCN Red List 2015).

The Tiger Summit created necessary political momentum for tiger conservation, as well as established a forum of an international tiger expert community working on achieving the GTRP plan. This community, apart from the governments of 13 TRCs, consists of international organizations, such as World Bank (which later established Global Tiger Initiative hosted in the USA), Asian Development Bank, IUCN, WWF, UNODC, Wildlife Conservation Trust, CITES Secretariat, Global Tiger Forum (based in India), Fauna and Flora International (FFI), National Tiger Conservation Authority (under the Government of India) and TRAFFIC. Each party of the international tiger experts' community, as well as each TRC, has a responsibility to self-report on their efforts in tiger conservation along the GTRP plan. However, range country reports are the most important in implementing the program. At the Summit, the TRCs agreed to organize Ministerial level meetings every two to three years. The latest Third Asia Ministerial conference on tiger conservation was held in New Delhi, India in 2016 (IUCN 2016b). The previous two were held in Thailand in 2010 and Bhutan in 2012 (IUCN 2016b). Apart from Ministerial meetings, other global tiger expert meetings are being organized regularly under the GTRP umbrella. The most recent Second Global Tiger Stocktaking Conference was held in 2014 in Bangladesh (IUCN 2016b). Each Ministerial Meeting or Stocktaking Conference is accompanied by TRC reports and reports from GTRP party members on their progress. All meetings also end up with concluding statements or declarations; however, they do not have any binding force, but rather generic statements.

5. Conclusion

This chapter showed that even though the issue of wildlife crime is vastly covered in academic literature, it is not rigidly defined by the boundaries of one theoretical approach but rather spread across the disciplines. There currently exists the gap in describing the phenomenon

holistically in the scientific body of knowledge. For that reason, a multidisciplinary approach is needed when developing a theoretical framework for a certain type of wildlife crime problem.

Analogous situation is observed with the current global policy measures aimed at addressing the problem of wildlife crime. Some global policy tools are less detailed and inclusive, while CITES proves to be the most pertinent tool with a historically developed framework for assessing the problem of wildlife crime related to a specific species.

A review of tiger species and its major threats has shown that large amount of literature is devoted to the species' description. A vast volume of grey, non-academic, literature is devoted to the problem of poaching driven by trade, while meager attention is given to it in the academic world. This shows a clear gap in the realm of academic knowledge, which is also an appealing opportunity and substantial need to explore the problem further.

Given the complex and cross-disciplinary nature of the research problem, Chapter III provides the justification and outline of the research design as well as the description of the employed research techniques.

Chapter III. Methodology

In this section, the justification of the theoretical research type and analytical framework will be provided based on the research questions and associated objectives. Moreover, the description of research techniques will be given, including validity and ethical considerations.

1. Theoretical and conceptual considerations

Given the breadth and complexity of wildlife crime and tiger related crime, the research problem cannot be researched with reference to only one theory or concepts aligned to one theory. As present research is based on theories and employing concepts from disparate disciplines, the theoretical approach is **interdisciplinary** in nature.

Repko (2017) distinguishes instrumental interdisciplinarity (focusing on methodological borrowing and practical problem solving) and conceptual interdisciplinarity (integration of knowledge, concepts and posing questions with no single disciplinary basis) (Repko and Szostak 2017). Both forms are pragmatic in nature. The third form that he recognizes is critical interdisciplinarity, which aims to dismantle and transform the boundaries among the disciplines and create a new realm of knowledge without merely constructing the bridges among the disciplines as pursued by pragmatic forms (Repko and Szostak 2017). Current research has mostly **pragmatic** forms of interdisciplinarity (**instrumental and conceptual**). However, as Repko specifies, when describing environmental problems, the distinction between the pragmatic and critical forms of interdisciplinarity are not absolute (Repko and Szostak 2017).

The research has **inductive** approach to analysis. Imenda (2017) argues that inductive research "tends to lead to the development of a conceptual framework" rather than make use of a theory (Imenda 2017). The conceptual framework is defined as an "end result of bringing together a

number of related concepts to explain or predict a given event, or give a broader understanding of the research problem ... [and] to tell a bigger map of possible relationships" (Imenda 2017).The conceptual framework is limited in scope; it is carefully put together and immediately applicable to a particular case (Imenda 2017).

Current research is based on the conceptual framework, which was designed by joining concepts and employing methods from four theoretical realms: ecology, anthropology, criminology and economy (see Table 1).

With regards to **ecology**, tigers are a keystone species whose population has been declining due to anthropological pressure *inter alia* illegal trade and poaching. Tiger related crime driving extirpation of tigers represent a vivid example of the anthropogenic **Allee effect** as described by Courchamp (Courchamp *et al.* 2006). Moreover, tiger as top predator heavily relies on prey base, which is also hunted by people, there is a competition for prey species between humans and tigers, especially in population dense areas (Seidensticker and Tops 1993). Another limiting factor to tigers to thrive is the need for vast habitats that are also continuously degradation and decreased across the range states (Joshi *et al.* 2016). Existing demand for tiger products on the black market drives the prices for tiger products to go up and contributes to the disappearance of wild tiger populations. While genetic variety and reproduction rate of tigers is also relatively slow (WCS Russia 2018), which is diminishing the chances for tigers survival as described by the Allee effect (contribution to **Objective 2**).

With regards to **anthropology**, research explores the reasons driving tiger related crime, including the practice of wildlife use in Traditional Chinese Medicine (TCM) and purported effects of Tiger products on human health (contribution to **Objective 3**). The research covers historical reasons driving illegal wildlife trade in the Russian Far East what falls under

Acheson's framework of **informal nature management** practices that are pre-conditioned by weak governmental and legislative framework (contribution to **Objective 8**) (Acheson 2006). Anthropologic perspective of the research and participatory observation method allows evaluating how the issue of illegal trade in tigers has been resolved by CITES (contribution to **Objective 5**) and evaluates the measures taken by other tiger range countries (contribution to **Objective 7**).

With regards to **criminology,** the research is heavily based on the analysis of tiger related crime, identifying global and regional **major trends** in crime using **Tiger seizure records analysis** (contribution to **Objective 4** and **Objective 10**). The author also argues that **the wildlife crime pipeline model** developed by van Uhm helps to address the problem of tiger related crime holistically (van Uhm 2016a) (contribution to **Objective 9**). The model can be used by governmental agencies when developing holistic legislation and measures for wildlife crime, rather than limiting them within a certain stage and omitting offenders at other stages.

With regards to **economy,** the research attempts to analyze the issue from the economic perspective. The research also investigates main trends in trade such as the **online trade** and latest trends in seized Tiger products (contribution to **Objective 4**). The research explores the nature of **tiger farming**, particularly in China, and the case of selling farmed Tiger products in Chinese markets (contribution to **Objective 7**). The researcher also employs field a **wildlife market** survey method to explore the wildlife trade situation on the Sino-Russian border and identify the availability of illegal tiger products on the market (contribution to **Objective 11**).

Instrumental interdisciplinarity of the research can be observed through the application of methods from other fields. The author employs several mixed-method research techniques in the dissertation, such as **game theory method** to evaluate the prospects for addressing tiger

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related crime in CITES (contribution to **Objective 6**) and **geospatial analysis** to evaluate the forest cover and spatiotemporal concentrations of Amur tiger seizure records (contribution to **Objective 8** and **Objective 10**). The author also applies a holistic **indicator framework** for combating wildlife and forest crime to assess the efforts in the Amur-Heilong region (contribution to **Objective 12**).

2. Mixed method approach and justification

The complexity and breadth of the study area means that special care needs to be taken when choosing the research approach (Anthony 2006; Johnson *et al.* 2007). Interdisciplinarity of the research affords a flexibility of choice with a certain level of creativity, which needs to be managed skillfully to achieve formulated research goals and objectives.

The research is based on **mixed method approach** (or mixed research as a synonym) by employing predominantly qualitative and some elements of quantitative research techniques.

The logical framework is given on Table 4 which explains the connection between the research questions and objectives as well as relevance and the use of chosen research techniques. Multi-method approach allows better understanding of the complex phenomenon and providing a tradeoff between the breadth and the depth of the phenomenon of interest. Where quantitative methods help to identity certain variables and observe certain trends, qualitative methods allow an explanation in the connections between these variables and a further investigation into the circumstances under which these variables have evolved (Anthony 2006). Johnson and Onwuegbuzie (2007) named the mixed method as the third research paradigm in education that offers great promise for practicing researchers (Johnson *et al.* 2007). Moreover, growth in the mixed method (i.e. pragmatist) movement has the potential to reduce some difficulties associated with singular methods (Johnson and Onwuegbuzie 2004).

Teddlie and Tashakkori (2012) coin the term of **methodological eclecticism,** according to which mixed-method approach practitioner selects and creatively integrates the most appropriate research techniques from a variety of quantitative and qualitative methods to thoroughly investigate the area of interest (Teddlie and Tashakkori 2012). A researcher employing methodological eclecticism acts as a *connoisseur of methods* who intuitively and strategically selects the most pertinent and best available research techniques to answer research questions as the study unfolds (Heaton 2004; Johnson *et al.* 2007; Teddlie and Tashakkori 2012). It is intrinsic for the researcher to be fully competent in a full spectrum of research methods and theoretical approaches to select the best directions to answer formulated research methods that correspond to what the researcher uses in practice. In this analysis the author develops her methodological eclecticism based on the data collected from the **participant observations** and **interviews** that were implemented in the course of the three years data collection period (see Chapter 1, Section 7. Time dimension).

Johnson and Onwuegbuzie (2007) argue that the mixed method approach has several benefits at various stages of the research: at the research design, data collection and data analysis stages (Johnson *et al.* 2007). At the design stages, qualitative data can assist the quantitative component by helping with instruments' development; while at the data collection stage, qualitative data can help in facilitating the data collection process. At the research analysis stages quantitative data can facilitate the assessment of the generalizability of the qualitative data and shed the light on the new data, and conversely, qualitative data can play an important role by clarifying, interpreting and validating quantitative results (Johnson *et al.* 2007).

According to Johnson and Onwuegbuzie (2007), the research can be methodologically legitimated by recognizing the dimensionality of the aim of the research and research questions (Johnson *et al.* 2007). This relates to the research phenomenon (what?), purpose (why?),

process (how?) and potential scope of results (Johnson *et al.* 2007). The necessity to employ mixed method approach in this research had the following founding reasons:

1. The research explored complex phenomenon of tiger related crime, which is insufficiently covered in the academic literature and mostly covered in "grey" literature.

2. The object of research (tiger related crime) was challenging to analyze directly and observe openly as it is illegal in nature and thus needs particular care when choosing necessary research techniques.

3. The research focused on a smaller aspect of wildlife crime such as illegal trade in tigers. The wild tiger population is much smaller in comparison with other species involved in illegal trade (elephants, rhinos, marine species, timber species and etc.) (IUCN Red List 2015; UNODC 2016).

4. The research sought to understand the links between the levels and trends in tiger related crime and employed counter-measures that have the potential to benefit both practitioners in the field as well as researchers.

Greene, Caracelli and Graham identified five purposes for the mixed-method approach: *triangulation* (seeks to converge, corroborate or correspond the findings of various methods to study the same phenomenon); *complementarity* (when results of one analysis type (for example, qualitative) are overlapped to expand, illustrate or clarify the findings of another analysis type (for example, quantitative) of the same phenomenon; *development* (when the data is collected sequentially and the findings from one analysis type are used to develop or inform the data for the other method; *initiation* (seeks to discover paradoxes or contradictions that might reshape the research questions); and *expansion* (when the results of the qualitative and

quantitative analysis are used to expand the scope of inquiry) (Greene *et al.* 1989; Onwuegbuzie and Combs 2011).

This research benefits from the **triangulation of methods**. Triangulation serves the aim to bring validity, objectivity and reliability of the research (Anthony 2006; Greene *et al.* 1989). Denzin suggests that this can be achieved through one of the following outcomes of the triangulation: convergence, inconsistency and contradiction (Denzin and Lincoln 2005; Johnson *et al.* 2007). Whichever of these outcomes prevails, the researcher can develop thorough explanation of the analyzed phenomenon.

In this research, the triangulation consisted of the following three types, according to Denzin's criteria (Denzin and Lincoln 2005; Johnson *et al.* 2007):

1. Data triangulation - use of variety of data sources and variety of data types (qualitative and quantitative)
2. Theory triangulation - use of multiple theoretical perspectives
3. Methodological triangulation - use of multiple methods.

3. Logical framework

The logical framework of the research is given on Table 4, which explains the connection between the research questions and objectives as well as relevance and the use of the applied research techniques in the relevant dissertation sections.

Table 4: Logical framework with research questions, objectives and methods employed in present research

Research Questions	Objectives	Methods	Relevant sections
1) What are the extent, causes and characteristics of tiger related crime?	Objective 1: to identify how wildlife crime is framed in academic literature and what global policy measures exist	Literature review Analysis of reports, policy documents, conventions, experts' literature	Chapter II Literature review, Sections 1 - 2
	Objective 2: to give an overview of the global tiger population and specify major threats	Literature review Analysis of reports, policy documents, conventions, experts' literature	Chapter II Literature review, Section 3
	Objective 3: to identify reasons driving illegal trade and the trafficking of tigers	Literature review Analysis of reports, policy documents, conventions, experts' literature Participant observations	Chapter IV, Section 2
	Objective 4: to identify and analyze global trends and characteristics of tiger related crime	Analysis of reports, policy documents, conventions, experts' literature Participant observations	Chapter IV, Sections 3-5
2) How is tiger related crime addressed at the global level?	Objective 5: to evaluate how illegal trade and the trafficking of tigers have been resolved by CITES as the most pertinent wildlife trade policy instrument	Historical analysis of policy documents Analysis of reports, policy documents, conventions, experts' literature Participant observations Interviews	Chapter V, Section 2
	Objective 6: to formulate the prospects in addressing tiger related crime by CITES	Participant observations Qualitative game theory method	Chapter V, Sections 3-4
	Objective 7: to identify and assess main measures taken and policies used to address illegal trade and the trafficking of tigers by the range countries	Analysis of reports, policy documents, conventions, experts' literature Participant observations Interviews	Chapter VI

3) How successful are the countermeasures for illegal trade and trafficking of tigers in the Amur-Heilong region?	Objective 8: to review and assess current regional environmental issues, the state of the Amur tigers population and major threats	Spatial analysis of forest cover and Amur tiger range Participant observations Analysis of reports, policy documents, conventions, experts' literature Interviews	Chapter VII
	Objective 9: to review and analyze regional legislative and regulative measures to address the problem	Analysis of legislative and policy documents Interviews	Chapter VIII, Section 2
	Objective 10: to identify the characteristics and analyze the trends in Amur tiger poaching and trafficking	Tiger seizure records analysis Analysis of spatiotemporal concentrations of seizure records	Chapter VIII, Section 3
	Objective 11: to determine the level of illegal trade in tigers and other wildlife on the Sino-Russian border	Field market surveys of wildlife trade Analysis of reports, policy documents, experts' literature	Chapter VIII, Section 4
	Objective 12: to evaluate and compare countermeasures in Russia and China for Tiger related crime	Application of ICCWC Indicator Framework for Combating Wildlife and Forest crime	Chapter VIII, Section 5
	Objective 13: to develop recommendations and future perspectives for the Amur-Heilong region		Chapter IX, Section 2

4. Research techniques

This research is based on data collected over a three-year process of participant observations and interviews, followed by nine days field trip to the Sino-Russian border in China during the dates of 19-27 June 2016. The research techniques used in this study are: literature review and analysis of various types of documents and literature, participant observations, semi-structured interviews, tiger seizures records analysis, qualitative game theory method, spatial analysis including assessment of spatiotemporal concentrations of Amur tiger seizures in the Amur-Heilong, field market surveys of wildlife markets in China on the Sino-Russian border, and application of the indicator framework for combating forest and wildlife crime.

4.1 Literature review

A broad literature review was implemented as part of the research, especially for the theoretical and conceptual frameworks for the wildlife crime. For the Amur-Heilong region chapters of the research, a vast review of the experts' literature was implemented in Russian and English. Some strategic literature sources were translated from Chinese.

For the Amur tiger seizures records data verification, a lot of media resources were reviewed in Russian and Chinese. The same refers to the latest wildlife crime legislation documents issued in Russia and China.

Given meager coverage of tiger related crime topic in the academic literature, a vast review of "grey" literature was implemented, especially for the case study analysis. Most relevant strategic "grey" literature sources were verified for consistency with other sources, such as data from interviews, media reports, meetings notes, legislation and policy documents to ensure conformance with the triangulation principles.

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4.2 Analysis of policy and regulatory documents

Large body of specialized policy and regulatory documents was analyzed for the global tiger related crime topic, such as various CITES documents (CITES Decisions, CITES Resolutions from the Conference of the Parties (CoPs) and Standing Committee (SC) meetings, CITES Secretariat Notifications, official letters to the Parties, country reports, CITES Animal committee documents, CITES meeting records and other relevant scientific and media materials). Tiger specific countries' reports, government documents, minutes and notes from the international conferences and meetings dedicated to tiger conservation and wildlife crime were also analyzed. The same refers to the review of major conventions related to wildlife crime such as CITES, CBD and CMS and relevant governmental multi-lateral and bilateral agreements.

With regards to the assessment of countermeasures for tiger poaching and trafficking in the Amur-Heilong region, the author analyzed a large number of regulative documents on wildlife trade and penalizing poaching and trafficking in Russia and China. The normative documents were primarily in Russian, English and Chinese. When reading policy and regulative documents in Chinese, the author utilized "Google Translate" Web application or consulted ex-colleagues who are native Chinese speakers.

4.3 Participant observations

The author used participant observation method as one of the main methods of data collection over a three-year period of employment in the World Wildlife Fund and TRAFFIC organizations.

When using this method as a method of data collection, a researcher observes people in a natural or structured environment. Observation is an important method of data collection as

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people tend to behave differently from what they say they do (Johnson *et al.* 2007). Observation might have a problem of **reactivity**, however this can be significantly decreased over a longer period of time of observation (Tashakkori *et al.* 2003). When observing, it is also important to keep in mind the fact most social behavior is **frontstage behavior** (what people want or allow us to see) rather than **backstage behavior** (what people do or act with their closest friends when they act naturally) (Tashakkori *et al.* 2003). Thus, it is intrinsic to consider that people tend to play the role in researcher's presence once they know that they are observed.

Johnson and Turner distinguish three types of observation as data collection method in a in a mixed research: **qualitative observation** (exploratory and open-ended, when the researcher takes extensive field notes, may use video or audio devices for later analysis); **quantitative observation** (use of standardized coding instruments, observations are coded and videotaped for using by coding schemes); and **intramethod mixed observation** (mixed characteristics of qualitative and quantitative observation, such as use of protocol and extensive field notes). When doing qualitative observation, the researcher make take four different roles: **complete participant** (researcher is a full member of the group without informing the group members that they are being observed); **participant-as-observer** (researcher spends extensive amount of time inside the group and informs the participants that they are being observed); **observer-as-participant** (observer spends limited amount of time inside the group and informs the members about the observation); and lastly, **complete observer** (researcher observes from the outside) (Johnson *et al.* 2007; Tashakkori *et al.* 2003). Reactivity will be significantly decreased as a problem in the first and the last-mentioned types of qualitative observation, but it is important to consider ethical issues that might arise. In this research, the author used **qualitative observation** being a **complete participant** over the course of over three years of work. This allowed collecting an extensive amount of field data, notes from the meetings and

conferences, and avoiding the issue of **frontstage behavior**, mentioned above. Ethical considerations of this research are discussed in the Section below.

During the data collection period, the author attended four high level International Ministerial tiger meetings organized by the World Bank and Global Tiger Initiative from 2012 to 2016, one CITES CoP 16 in Bangkok, Thailand in 3-14 March, 2013; two governmental workshops organized by INTERPOL on wildlife and tiger related crime; two transborder Amur-Heilong WWF Steering Committee meetings for Russia, China and Mongolia and a number of various thematic tiger and Wildlife crime related meetings, workshops and conferences organized by various NGOs, government agencies and other strategic partners involved in the topic of wildlife crime and tiger conservation. The minutes and field notes of the most strategic meetings and conferences were employed in the present research (Table 5). During data collection the author observed the process of how illegal trade and the trafficking of tigers are addressed globally and regionally. The goal of the author was not to observe involved participants to evaluate their behaviors and attitudes, but rather to observe and learn about the process.

Participant observation method is often used in mixed research as an inter-method mixing, whereby the data is collected and analyzed by employing several methods. Examples of inter-method mixing include, *inter alia,* participant observations and interviews or participant observations and questionnaire. In this research the participant observation method was mixed with interviews, policy documents collection and analysis, including tiger seizures data collection and analysis. Johnson and Turner argue that by combining the observations with other methods the researcher is capable to collect "*relatively objective firsthand*" data and can supplement it with the self-report and personal notes from the individuals or situations observed (Tashakkori *et al.* 2003).

Table 5: The list of the most important tiger related events attended by the author during the participant observation period from July 2012 to March 2016

Meeting/Conference	Where	Date
1) INTERPOL Information & Intelligence training intelligence workshop for tiger range countries	Kathmandu, Nepal	15-16 December, 2012
2) CITES COP16	Bangkok, Thailand	3-14 March, 2013
3) GTI Multi-donor trust fund meeting	Bangkok, Thailand	9 March, 2013
4) GTI tiger experts workshop	Bangkok, Thailand	15 March, 2013
5) International Workshop for Transboundary Conservation of Tigers and Other Endangered Species	Kunming, China	29-31 July, 2013
6) WWF Amur-Heilong Ecoregion Steering Committee meeting	Harbin, China	7-13 February, 2014
7) INTERPOL Tiger range countries analysts consultation	Lyon, France	19-23 May, 2014
8) PANTHERA Tigers Forever Meeting	Jakarta, Indonesia	29 July – 2 August, 2014
9) GTI 2nd Stocktaking conference	Dhaka, Bangladesh	14-16 September, 2014
10) Harimau Kita (tiger conservation) Forum Fifth Annual Meeting	Jakarta, Indonesia	21-23 December, 2014
11) Meeting of GTF and WWF Amur-Heilong Ecoregion Steering Committee	Vladivostok, Russia	20-27 September, 2015
12) Zero Poaching Symposium	Kathmandu, Nepal	2-6 February, 2015

Qualitative data gathered during the participant observations for this study was not used to understand the meanings and perceptions of the participants involved in the process, but rather as a factual source of information, providing justification. Given the lack of academic analysis on the studied subject, this primary data often served as the direction for further analysis.

4.4 Interviews

The author used interviews as a supporting data collection method to better understand the problem of illegal trade and the trafficking of tigers as well as to evaluate the countermeasures globally and regionally. It is intrinsic that the interviewer remains nonjudgmental to the responses to reduce the potentially biasing effect of the interviewer (Tashakkori *et al.* 2003). A significant advantage of the interview method is that it allows probing the respondent and clarifying the information when needed (Tashakkori *et al.* 2003).

Given scarce coverage of the topic in academic literature, it was fundamental for the author to explore the nature of the problem, identify its driving forces as well as evaluate the scope of the problem based not only on policy reports and "grey" literature review. Qualitative data gathered during the interviews served as a justification and support for the argument, directing the author to certain areas of the issue that have not been explored or mentioned in other sources. Thus, interviews served a purpose of data and method triangulation rather than an attempt to explore the meanings and perceptions of participants who are related to either tiger related crime or countermeasures for tiger related crime.

Semi-structured interviews are thought to be a prevalent data collection method in social and mixed research (Gill *et al.* 2008; Harrell *et al.* 2009; Tashakkori *et al.* 2003). This dissertation is not the exception to this rule. The author conducted **semi-structured** and, when deemed necessary, a series of **informal open-ended interviews** with experts related to the field of wildlife crime and tiger related crime, key persons and relevant people from the following governmental agencies and NGO's.

- EIA
- Far Eastern branch of the Russian Academy of Sciences in Vladivostok, Geography & Ecology Departments, Russia
- Far Eastern Operative Customs, Russia
- FFI Vietnam
- GTI
- Ministry of Natural Resources, Russia
- Okhotnadzor in Primorsky and Khabarovsky provinces, Russia
- SABZ PA, Russia
- SEPA, China

- Vladivostok branch of the Russian Customs Academy, Customs Control Department, Russia

- TRAFFIC China

- WWF offices in Russia, China, Indonesia, India, Nepal and Myanmar

- Zov Tigra PA, Russia

- Local wildlife traders in Russia

- Local wildlife traders in China

- Hunters and rangers in Russia and China

4.5 Tiger seizures analysis

For the quantitative analysis part of the research, the author employed tiger seizures analysis method. Two types of tiger seizures data were used in current research. Secondary seizure data was used for the analysis of global trends in illegal trade and trafficking of tigers (Chapter Chapter IV."), while primary seizures data was used for the analysis of trends in illegal trade and trafficking of tigers in the Amur-Heilong region (Chapter Chapter VIII. Assessment of countermeasures on the Sino-Russian border).

Secondary data used in this research was mainly taken from the latest report on tiger seizures analysis from the 13 range countries, published by TRAFFIC in 2016 (see more details on data acquisition in Section 5.1 of the current chapter). Due to the mentioned gap in the academic literature, "grey" literature sources played a key role for data collection of global tiger seizures. Participant observations as well as literature review showed that TRAFFIC is the only organization, which regularly publishes such data on a global scale. The data used in these reports is verified by the government agencies of the range countries, as well as by other environmental NGOs, it is also used by CITES for tiger related analysis to be published in policy documents. In this research, TRAFFIC report data was used to analyze the global

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tiger trade trends and global geographical trends. To analyze geographic trends in global tiger seizures, the author also used visual results of Trademapper, which is an interactive tool designed by TRAFFIC and WWF to visualize wildlife trade data

The author used primary data for the Amur tiger seizures analysis in the Amur-Heilong region. Details of data acquisition of Amur tiger seizures reported by Russia and China are given in Section 5.1 in the current chapter. All collected seizures that were analyzed occurred within the territories of Russia and China. Other seizures that have occurred outside of the two countries were not included.

The author compared the tiger analysis results for Russia with the secondary data results presented in latest global tiger seizures report to identify trends or inconsistencies. Primary data on tiger seizures in China and secondary data from the report was incompatible, as primary data showed Amur tiger seizures that occurred only in the Amur-Heilong part of China, while secondary data presented the seizures occurred in entire country.

To render all seizure data comparable, the author used the same technique that was developed in the first report on global tiger seizures analysis published in 2010 (Verheij *et al.* 2010). The method was also used by other researchers for the estimation of Asian big cats trade in Southeast Asia (Nijman and Shepherd 2015). All following global tiger seizures reports, including the one published in 2016, employed the same method (Stoner and Pervushina 2013; Stoner *et al.* 2016; Verheij *et al.* 2010).

The author tallied all seized items as units that could be used to calculate the number of tigers involved in each seizure. These are the following as suggested by Verheij (Verheij *et al.* 2010):

1. **Quantities of body parts that are equivalent to one or more tigers:** calculating claws, canine teeth, heads, nails, legs, penises, skulls, jaw bones. If the seizure involves "teeth" in the report, it was treated as canine teeth, as it is most common to observe Tiger canine teeth in trafficking

2. **Complete pieces that represented whole tigers -** calculating skins, full skeletons, carcasses, live animals, taxidermy mounts

3. **Quantities of tiger derivatives** - calculating meat, bones, spirits with bones, tiger bone bracelets

Verheij adapts the method of wildlife seizure analysis and estimates the maximum and the minimum number of tigers according to three types of seized tiger items. She also gives a detailed description for the minimum and the maximum methods for calculating tigers (Verheij *et al.* 2010). To render primary research data comparable with the secondary data published in the reports, current research uses the minimum method of calculating tigers. The same method was applied in all global tiger seizure reports published by TRAFFIC to avoid an exorbitant number for the maximum number of tigers.

The author adopts the following conservative (minimum) method of calculating tigers for the suggested three categories:

1. **Minimum calculation method for the quantities of body parts equivalent to one or more Tigers**: for each seizure the minimum numbers of whole tigers that the seizure items could yield were calculated. Calculations were always to estimate the whole tigers based on the items seized. For example, one seizure with 10 nails was equated to 1 tiger as a tiger has 10 nails. Instances where seized items were less in number than a tiger has in total, one tiger was still calculated.

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2. **Minimum calculation method for complete pieces that represented whole tigers:** such instances required no minimum or maximum calculations as, for example, 1 skull or 1 tiger pelt represented 1 tiger.

3. **Minimum calculation method for quantities of tiger derivatives:** for each seizure where for example 10 kilos of tiger meat were calculated as 1 tiger for the purposes of the analysis. In instances where the exact dimensions of skins pieces and bone pieces were not reported, they were calculated as 1 tiger.

It cannot be omitted that some seized tiger parts reported by the authorities might be fake or originated from other animals (such as lions or leopards)(Stoner *et al.* 2016). Equally, it is not often possible to differentiate wild from captive bred animals. Presence of fake items or substitutes is common on the Asian markets as argued in the research; however, all calculated items were assumed to be originated from tigers. This is specifically pertinent for tiger seizures in the Amur-Heilong region where authorities adhere to the results of bio-morphological expertise and train law enforcement staff on wildlife identification.

4.6 Game theory method

Game theory is a mathematical framework that aims to predict the performance of the individuals or groups by evaluating the interaction among them (European Commission 2010). This method appeared in 1940s by the famed economist from Princeton University, John Nash, who won the Nobel Prize in 1994. It has been applied in many fields: military strategies, diplomacy, economy and business. The approach aims to investigate the behavior of people (or groups of people) when the success of their choices is dependent from the choices and actions of others who are involved in the same situation (or "the game").

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The researchers in conservation biology and nature resource management have also attempted to employ this method to resolve and predict the outcome of the intricate conservation and nature management problems (Colyvan *et al.* 2011; DeSombre 2005; Dodds 2005, 2008; European Commission 2010; Frank and Sarkar 2010). Decisions in these fields occur in the conflicting interests' environment with multiple actors (community actors, conservation agencies, governments, industries and etc.) (Colyvan *et al.* 2011). Attempting to build a consensus for such problems is "futile if the conflict is irreconcilable and the cooperation is stubbornly partial" (Colyvan *et al.* 2011). Game theory is an appropriate framework for finding solutions to these problems, especially in the realm of biodiversity conservation. The method can identify the behavior where stakeholders attempt to protect themselves from unexpected actions and choices of others, which appears to yield the worst conservation outcomes (Frank and Sarkar 2010). Thus, application of game theory to biodiversity conservation problems is a form of adaptive management tool for conservation advocates who can adapt their strategy based on expected choices of business interests, governments, community representatives and other stakeholders.

Current research attempted to employ game theory reasoning to the situation that has historically evolved in CITES with tiger trade discourse resulting from the active proliferation of tiger captive breeding facilities across Asia. The approach is the last method to be employed in Chapter Chapter V. Fighting behind the front lines: global policy efforts. The author used the results from participant observations, policy documents analysis and interviews to set the scene of a conflicting situation with regards to tigers in CITES in Chapter V, while the game theory method attempted to suggest viable solutions to the stagnating problem and expected outcomes given the expected behavior of involved stakeholders.

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4.7 Spatial analysis

For the quantitative analysis part of the present analysis, the author employed spatial analysis tools to identify and assess habitat loss as indirect threat to Amur tigers in the Amur-Heilong region.

Spatial analysis has become one of the major methods for researchers in nature and biodiversity conservation fields (Carlos and Dale G 2006; Goodrich *et al.* 2010; Hansen *et al.* 2013; Karanth *et al.* 2006; Lorini *et al.* 2011; Miller *et al.* 2013; Sadhu *et al.* 2017). Spatial analysis is essential when evaluating the range and the population dynamics of such territorial endangered species as tigers. Significant advantage of this method is that it allows getting precise and spatially explicit results when merging different sets of data and criteria.

Spatial data for the present analysis was collected from various sources that are described in Section 7.1 Data acquisition below. For the assessment of the Amur tiger range the author combined the following spatial datasets:

1. Current Amur tiger range in Russia and China

2. Forest cover change in Russia and China, 2000-2016

3. Protected areas in Russia and China in the Amur-Heilong region

4. Border and major towns in the Amur-Heilong region

Spatial analysis was performed with the help of ArcGIS software by utilizing free access data from near-real-time global tree cover[1]loss alert system called FORMA (Forest Monitoring and Action) offered by the Global Forest Watch platform (www.globalforestwatch.org). The

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[1] Global Forest Watch tool defines tree cover as "all vegetation taller than 5 meters in height" which is a "biophysical presence of trees and may take form of natural forests or plantations over the range of canopy densities" Hansen, M.C., Potapov, P.V., Moore, R., Hancher, M., Turubanova, S.A., Tyukavina, A., Thau, D., Stehman, S.V., Goetz, S.J., Loveland, T.R., Kommareddy, A., Egorov, A., Chini, L., Justice, C.O. and Townshend, J.R.G. 2013. High-Resolution Global Maps of 21st-Century Forest Cover Change. *Science* 342 (6160): 850-853.

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author from various sources acquired Amur tiger habitat range and protected areas spatial data. Analysis of the Amur tiger range yielded spatially explicit results on the extent and precise locations of forest changes within the modern Amur tiger habitat and protected areas in the Amur-Heilong region during the sixteen years' period. The results are presented in Chapter VII. Amur-Heilong and Amur **tigers** of the research (Figure 30).

4.7.1 Analysis of spatiotemporal concentrations of seizures

Analysis of spatiotemporal concentrations of the Amur tiger seizures is another quantitative method employed in this research. With the emergence of wildlife poaching crisis, especially for African rhinos and elephants within the last three to four years, new research techniques have been developed for analyzing the problem. Spatiotemporal analysis has been widely utilized for studying mostly criminal activities by criminologists, however this method has attracted significant attention from biologists, nature conservationists and other researchers studying the problem of wildlife poaching and trafficking (Critchlow *et al.* 2015; Gholami *et al.* 2017; K. Maingi *et al.* 2012; Kurland *et al.* 2017; Rashidi *et al.* 2017; Rashidi *et al.* 2015).

Based on reviewed literature, this method has been mostly employed by researchers to analyze poaching crisis in Africa with regards to elephants and rhinos in protected areas. For this research, the author utilized the same primary data on Amur tiger seizures, which has been used for Tiger seizures analysis described above in Section 4.5 Tiger seizures analysis. Spatiotemporal method allowed analysis of the Amur tiger seizures from another spatial angle tied to temporal characteristics.

The data for spatiotemporal analysis was collected from various sources that are described in Section 7.1 Data acquisition below. The following datasets have been utilized for this analysis:

1. Amur tiger seizure records in Russia from 2000 to June 2018

2. Amur tiger seizure records in China from 2010 to December 2017

3. Border and major towns in the Amur-Heilong region

4. Protected areas in Russia and China in the Amur-Heilong region

Given that 80% of the Amur tiger habitat is outside of the protected areas, major part of the analyzed seizures occurred outside of the protected areas hence the author analyzed both poaching and trafficking seizure data. To show the distinction between poaching and trafficking seizures, the author manually categorized the seizure records into poaching and trafficking. The categorization was based on the seizure reports and incriminated articles of the Administrative or Criminal Codes as reported by the law enforcement authorities in Russia and China.

To show temporal trends, the seizures data was divided into three seven-year time periods from 2000 to the end of June 2018. The author divided the seizures data into three periods to identify changes with the Amur tiger seizures before and after the criminalization of the penalties for poaching and trafficking of endangered wildlife in Russia in 2013.

The spatiotemporal analysis occurred in the following stages:

1. Consolidation of the Amur tiger seizures in Russia and China

2. Division of the Amur tiger seizures into poaching and trafficking categories

3. Division of the poaching and trafficking seizures into time periods

4. Reduction of the data on border and major towns in the Amur-Heilong

5. Reduction of the data on protection areas in Russia and China

6. Data integration and representation by ArcGIS software

7. Results interpretation

The analysis results are presented in Chapter VIII Section 3.1 Analysis of spatiotemporal concentrations of seizures. The results highlight two different outcomes: spatiotemporal concentrations of Amur tiger seizures over three seven-year periods (Figure 37, Figure 38 and Figure 39) and proximity of the Amur tiger seizures to protected areas in Russia (Figure 40).

4.8 Wildlife market surveys along the Sino-Russian border

Field wildlife market surveys were organized during the period of 19-27 June 2016 in China along the Sino-Russian border. Eight Chinese cities were visited and eleven permanent wildlife markets (either wholesale TCM markets or specific wildlife trade markets) were surveyed. The survey was the first ever wildlife survey organized along the Sino-Russian border on Chinese side. Previous similar wildlife market surveys were implemented on the Russian side in the past organized collaboratively by WWF Russia Amur branch and Vladivostok branch of the Russian Customs Academy.

The survey was organized by the author in cooperation with other wildlife trade experts. Other organizations involved in survey preparations were Vladivostok branch of the Russian Customs Academy, WWF Russia Amur branch (based in Vladivostok, Russia) and TRAFFIC China (based in Beijing, China). Given that little information is available about the state of wildlife trade on Chinese side of the Sino-Russian border, the aim of the survey was to evaluate the state of legal and illegal wildlife trade along the border, identify availability of Amur tiger products in border town markets, assess the presence of illegal wildlife products originated from Russia on the Chinese wildlife border markets.

Table 6: Wildlife markets surveys route in China, 19-27 June 2016

No.	Dates	City/Town	Description	Markets surveyed
1.	19–20 June	Heihe	Prefecture level city of the northern part of Heilongjiang province, located on the border of Russia across the river Amur, straight opposite to city Blagoveschensk, Amursky province	1 wildlife trade market 1 antique & jewelry market
2.	20 – 22 June	Harbin	Capital of Heilongjiang province, most northern province of China	1 wholesale TCM market (biggest in Heilongjiang) 1 wildlife trade market
3.	22 June	Manzhouli	Sub-prefecture level city in Hulunbuir province, on the north borders with Russian city Zabaykalsk, Zabaykalsky province	1 wildlife trade market
4.	23 June	Hei Shan Tou border check point	Inner Mongolia Autonomous region of China, located 2-hour drive from Mazhouli, historically hosts a large mixed Russian-Chinese-Mongolian national group	No special market, but specialized shops
5.	24 June	Mishan	Prefecture city level in Heilongjiang province, shares Khanka lake with Russia	2 wildlife trade & TCM markets
6.	25 June	Hulin	county-level town on the Muling River in southeastern Heilongjiang province, shares border with several Russian villages	1 wildlife trade & TCM market
7.	26 June	Raohe	Smaller town in Heilongjiang province, shares the border with Russia along Ussuri river	1 wildlife trade 1 antique & jewelry market
8.	26-27 June	Tongjiang	Smaller border town in northeastern part of Heilongjiang province, located on the border side of Amur river across several smaller Russian villages	1 wildlife trade market

The survey was implemented in two stages: the first one was organized from 19 to 23 June 2016 by the author and TRAFFIC China project coordinator, Xiao Yu, in the cities Heihe and Harbin (both in Heilongjiang province), Manzhouli (or "Manchuria" in Russian) in Hulunbuir province and Hei Shan Tou border check point in Inner Mongolia province (Table 6). The second stage was from 23 to 27 June in border towns Mishan, Hulin, Raohe, Tongjiang (all located in Heilongjiang province). During the second stage the head of Customs Control Department of the Vladivostok branch of the Russian Customs Academy joined us.

The list of border towns for market surveys in China was pre-selected based on the preliminary desktop analysis of available literature in Russian, Chinese and English, governmental and NGOs reports, media releases in Russian and Chinese, law-enforcement data of Russian and Chinese Customs and forest police services. In addition to permanent

markets, temporary markets were surveyed if those were present in a town, major trade centers that were reported to have been selling wildlife products, smaller private or semi-private wildlife or antique shops or stalls, TCM pharmacies. On average circa twenty to forty trading spots were surveyed a day based on the intensity of ongoing wildlife trade in a certain border town.

Unstructured interviews were carried out with the dealers or traders during the surveys with questions regarding the trends, the origins, awareness about the legality or illegality of the product, the mode of transportation (if that was an illegal product) as carried out in the studies by (Shepherd *et al.* 2004) and (Lyapustin *et al.* 2010). Usually all Chinese traders or dealers were quite open and relaxed during surveys, no conflicting situations occurred. On the contrary, as informal conversations unfolded, the traders or dealers were more open and willing to discuss their business, their obstacles and potential benefits. This technique allowed identifying the awareness of these traders about the illegality of the product and relevant potential risks involving penalties or fines. High level of awareness of these consequences by traders would signal a good level of enforcement and public awareness by local authorities, and on the opposite end, low or no awareness by traders or dealers would signal that local authorities do not recognize illegal wildlife trade as a serious crime.

All the products were displayed openly on the markets or presented personally by the traders if such situation occurred, thus there was no need to resort to undercover techniques. No goods or products were purchased during the survey. All products on sale made of endangered or allegedly illegally imported wildlife were recorded and, if the situation allowed, photographed.

4.9 ICCWC Indicator Framework for Combating Wildlife and Forest Crime

ICCWC is an International Consortium on Combating Wildlife Crime consisting of five major international organizations: INTERPOL, UNODC, CITES, World Bank and World Customs Organization. For more details on ICCWC work and outputs such as ICCWC Toolkit, please see Literature review, Section 3.4.1 International Consortium on Combating Wildlife Crime

The ICCWC Indicator Framework for Combating Wildlife and Forest Crime (here and after referred to as Indicator Framework) has been developed after the ICCWC Toolkit that was designed to provide technical support for the countries. While the ICCWC Toolkit provides the inventory of measures needed to be taken, the Indicators Framework allows for a rapid assessment on the national level of law enforcement response to wildlife and forest crime (ICCWC 2016). The Indicators Framework has been introduced in 2016, thus this is a relatively new assessment method. The ICCWC uses this framework for countries to implement self-assessment, which is fulfilled best when completed on a collaborative basis by several representatives from various government agencies, such as Customs, police, wildlife regulative agencies and relevant experts.

The Indicator Framework consists of 50 indicators (also called by ICCWC performance measures) arranged along eight desired outcomes of effective law enforcement efforts. The indicators have been designed in line with these eight outcomes (Table 7), which represent critical areas identified by the ICCWC that need to be measured and monitored to determine effective law enforcement and legislation implementation with regards to forest and wildlife crime on a national level. While fifty indicators have been designed to provide assessment on the national level, the framework also allows assessment on a thematic level or, alternatively, global or regional levels.

It should be stressed that historically there has been no comprehensive assessment tool developed that would allow to estimate the effectiveness of measures taken to combat forest and wildlife crime holistically from national legislation and its implementation, to enforcement effort and court decisions. Even though CITEC does provide guidance for assessment of national efforts on wildlife policies and regulations under certain thematic projects, literature review and documents analysis have not showed any other available comprehensive methodologies for wildlife crime assessment. Therefore, ICCWC Indicators Framework represents a unique universal assessment tool that is applicable, universal and holistic.

The Framework is supplemented with the description of recommended timescales, phases of the assessment process and guidance on results interpretation. Both phases and timescale can be adjusted and modified.

In case study analysis chapter on Amur-Heilong region (Chapter VIII, Section 5. Application of ICCWC Indicator Framework for Combating Wildlife and Forest Crime) the author employed ICCWC Indicators framework to assess the efforts of the governments of Russia and China to address wildlife crime, with a focus on endangered species. Provided that Indicator Framework is completed in several phases in a collaborative process, the author implemented this assessment as the last stage of research after data collection, data analysis and series of interviews to ensure complete and thorough understanding of regional and national situation. The indicators questions were answered based on the author's expertise knowledge, literature review analysis (documents, legislation review and media reports) and regular consultations with national wildlife trade experts. The questions for the Russian side were filled in consultation with WWF Russia Amur branch and Vladivostok branch of the Russian Customs Academy, Customs Control Department. The questions for the Chinese side

were filled in consultation with experts from TRAFFIC China (wildlife trade monitoring network) and WWF China based in Beijing and Shanghai.

The Framework was designed with three types of indicators, which are represented in Appendix I:

1. expert-based (EA), which is a qualitative answer scale with four options scored between 0 to 3

2. process or document based (PA), which evaluates presence or absence of a document or enforcement response with "no" response scored as 0 and "yes" response scored as 3

3. data-based (DA), which uses specific datasets that provide useful information, not scored but considered alongside the indicators

Table 7: Maximum possible "scores" for eight outcomes in ICCWC indicator framework (source: ICCWC 2016)

Outcomes	Number of indicators & scores	Max score
Outcome 1 Proactive enforcement is deterring wildlife crime	9 indicators, of which 9 are scored 8 EA indicators rated as 0,1,2,3 1 PA indicator rated as 0 or 3	27
Outcome 2 Wildlife crime can be detected by law enforcement agencies	8 indicators, of which 6 are scored 6 EA indicators rated as 0,1,2,3	18
Outcome 3 Wildlife crime is thoroughly investigated using an intelligence-led approach	6 indicators, of which 5 are scored 5 EA indicators rated as 0,1,2,3	15
Outcome 4 Specialized investigation techniques are used to combat wildlife crime as required	4 indicators, of which 4 are scored 2 EA indicators rated as 0,1,2,3 2 PA indicator rated as 0 or 3	12
Outcome 5 There is a strong basis to combat wildlife crime	5 indicators, of which 5 are scored 3 EA indicators rated as 0,1,2,3 2 PA indicator rated as 0 or 3	15
Outcome 6 Wildlife crime is prosecuted in accordance with the severity of the crime	7 indicators of which 4 are scored 3 EA indicators rated as 0,1,2,3 1 PA indicator rated as 0 or 3	12
Outcome 7 Wildlife crime offenders are appropriately penalized	5 indicators, of which 5 are scored 2 EA indicators rated as 0,1,2,3 3 PA indicators rated as 0 or 3	15
Outcome 8 A holistic approach is deployed to combat wildlife crime	6 indicators, of which 6 are scored 6 EA indicators rated as 0,1,2,3	18
TOTAL SCORE		132

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As the framework is comprehensive, DA indicators need access to specific information, which is not openly available, especially for the Chinese side. Given that DA indicators information was not be available for present research, the author omitted these indicator questions for both Russia and China to ensure the assessment is done on equal basis. Given that DA indicators have no score as initially designed, this had no effect on the score of eight outcomes, as well as on the final national score. For full representation of data on visualization outputs, the author showed DA indicators for both countries with zero score. Table 7 provides maximum possible scores of eight outcomes, while total maximum possible score equals to 132.

The questions to EA indicators were answered in accordance with ICCWC guidance. The EA and PA indicator results were scored and then summarized into outcomes results and then summed up into a final score (Figure 44). This allowed comparing across outcomes and final national scores, as well as identifying relative strengths and weaknesses across the outcomes. Eight outcome results of the framework application are shown on Figures 46-53.

5. Validity

The underlying principle of validity is a matter of trustworthiness, utility and dependability that the researcher has placed into the work (Zohrabi 2013). In other words, validity is concerned whether the research is true, believable and assesses what it is supposed or purports to assess. It is the primary responsibility of the researcher to enshrine validity into all stages of research from its design and data collection to data analysis and interpretation.

As mixed research involves "combining complementary strengths and non-overlapping weaknesses of quantitative and qualitative research, assessing the validity of findings is particularly complex" (Onwuegbuzie and Johnson 2006). However, employing different

types of research techniques and acquiring the data from different sources can significantly augment the validity of data and its interpretation in mixed research (Zohrabi 2013).

The following procedures have been undertaken by the researcher to ensure the data, employed techniques and the outcomes of the present research are validated (Table 8):

Table 8: Validating procedures taken

Validity type	Procedures taken
Content	-wide based literature review, policy documents analysis, participant observation, discussions with the experts to ensure the transparency and the trustworthiness of the content and clarification of ambiguous definitions
Internal validity	- triangulation of data, theory and methods - long term observation during participant observation data collection period - peer examination by non-members in the field -participatory mode of research during field work and application of the ICCWC indicator framework
Utility criterion	- practicality and applicability of the research based on the practical collected data and findings, as well as analysis of legislative and policy documents
External validity	- research findings are relevant for research for other types of wildlife crime - theoretical and conceptual contributions are relevant for researchers dealing with wildlife crime - findings are applicable for other tiger range countries, as tiger poaching and trafficking persist in all range countries

6. Ethical considerations

Validity and integrity of the research are heavily dependent on researcher's ethics, which is comprised of the norms and standards for conduct. As research employs mixed methods, it is imperative to consider ethical principles for both qualitative and quantitative research.

Complete observer type of the participant observation method during data collection requires special ethical considerations on the part of the observer. When present analysis adhered to participant observers' notes from the meetings, the author preserved anonymity of the participants in the final write up to prevent their identification as it was appropriate for the participant observation data collection technique (Kawulich 2005). Additionally, the author involved and consulted with wildlife trade experts during the research data collection period to ensure the appropriateness of the findings and research techniques. Lastly, the author

presented some research findings to nonmembers of the "wildlife experts" community to minimize potential bias.

During face-to-face interviews, the researcher followed ethical requirements of the code of conduct when conducting the interviews. Qualitative data gained during interviews was utilized as the direction for research, rather than interpretation of the meanings (see Section 7 on Data sources below).

All quantitative data collected for present research, especially enforcement data in the Amur-Heilong region, has been verified and acquired using official contacts and ethical procedures.

Separately, it should be mentioned that the field wildlife market survey method had to be discrete as recommended by the experts (Lyapustin *et al.* 2010; Nijman 2010; Nijman and Shepherd 2015; Shepherd 2008). Special training and support team was required for implementing field market surveys on wildlife markets, especially in border towns of Northeast China. The author has been involved in similar projects for over five years in her professional career previously, where she had developed her skills in implementing such surveys. A Chinese native speaker colleague from TRAFFIC China was involved during the market surveys (19-27 June 2016) to ensure successful implementation of the field study work and collection of the data.

During the wildlife market surveys, it was impossible to mention that it was an academic survey or mention any ethical issue as the trader would then not be willing to be candid, show the products assortment or have a private chat about the origins of products. During the informal conversations usually, the Chinese speaking partner would present himself as an interpreter, while the other two participants would present themselves as potential buyers or suppliers from Russia (depending on the context). Building relationship with a dealer or

trader is the key element of successful surveys based on previous wildlife survey experience, consultations with the experts and reviewed relevant literature (Lyapustin *et al.* 2010; Nijman 2010; Nijman and Shepherd 2015; Shepherd 2008). Dealers and traders offered valuable information via various informal conversations and interviews that happened during the visits of the shops. The trader or dealer had to feel secure and relaxed to reveal the information and demonstrate available products, recommend a friend who would be also involved in trade or etc.

Cases involving trade in endangered species that were prohibited (such as tigers, pangolins, saiga horns or ivory) were later compiled and passed to regional law enforcement authorities in China and Russia to ensure that necessary enforcement action would take place. All recorded collected and analyzed data was shared among the participants of the surveys.

7. *Data sources*

Given the complexity and clandestine nature of tiger related crime, especially the challenges related to direct observations and exact estimations of crime, it is imperative to have full breadth and availability of direct and indirect features describing the phenomenon. Additionally, as this crime is analyzed in several countries, data access and relevant contacts in those countries providing data play a key role.

7.1 Data acquisition

The data for this research can be broken into two major parts thematically: global tiger related crime and tiger related crime in the Amur-Heilong region. Thematic division is justified by the need to use different sets of contacts and sources to obtain it, different skills and levels of detail to analyze it. While data on global tiger related crime was all in English, the data for Amur-Heilong region was in Russian, English and Chinese. When data in

Chinese was analyzed, the author received assistance from Chinese speaking colleagues for translation. Table 9 gives an overview of data type and characteristics with data sources analyzed in present research.

Table 9: Data type and data sources

Theme	Data type	Data characteristic	Data source
Global tiger related crime	Secondary data, tiger seizures reported by 13 range countries (2000-2015)	Quantitative	1) TRAFFIC report on analysis of tiger seizures from 13 countries 2) Indian Government Tiger database "Tigernet" website (http://www.tigernet.nic.in/) 3) WWF & TRAFFIC interactive tool "Trademapper" (https://trademapper.aptivate.org/)
	Relevant national laws, regulations and policy documents	Qualitative	1) CITES website (https://cites.org/) 2) Government agencies websites of tiger range countries (in English only)
	Notes, Memos and MoUs from tiger related governmental, CITES and NGO, academic meetings and conferences	Qualitative	1) Participant observations 2) Various professional contacts during data collection period
	Academic literature	Qualitative	CEU library, other open library sources
Tiger related crime in the Amur-Heilong region	Amur tiger seizures reported by Russia (2000-July 2018)	Quantitative	1) Customs control Department, Vladivostok branch of the Russian Customs Academy 2) WWF Russia Amur branch 3) Russian media sources (in Russian & English)
	Amur Tiger seizures reported by China (2010- December 2017)	Quantitative	1) WWF Russia Amur branch 2) TRAFFIC China in Beijing 3) Chinese media sources (in Chinese & English)
	Protected areas and current Amur tiger range cover for Amur-Heilong	Spatial	1) GIS department of the Far Eastern branch of the Russian Academy of Sciences in Vladivostok
	Forest cover change for Amur-Heilong	Spatial	1) Global Forest Watch, open-source web application (https://www.globalforestwatch.org/)
	Russian relevant laws and regulations	Qualitative	1) Customs control Department, Vladivostok branch of the Russian Customs Academy 2) WWF Russia Amur branch 3) Russian government agencies websites (in Russian) 4) Russian media sources (in Russian & English)
	Court decisions on Amur tiger related cases in Russia	Qualitative	1) Legal department of WWF Russia Amur branch 2) Legal Department, Vladivostok branch of the Russian Customs Academy 3) Russian media sources (in Russian & English)
	Chinese relevant laws and regulations	Qualitative	1) TRAFFIC China in Beijing 2) Chinese government agencies websites (in English) 3) Chinese media sources (in Chinese & English) 4) Reports of various organizations (in English)
	Pictures of traded wildlife on Chinese wildlife markets on the Sino-Russian border	Qualitative	1) Field market surveys of wildlife markets along the Sino-Russian border, 19-27 June, 2016

7.2 Limitations of the data

Quantitative data from "grey" literature sources provided key input for this dissertation, especially for the global tiger seizure records analysis. As mentioned above, even though, a large amount of data and publications are available on wildlife crime in academic literature, none of the statistical data-sets have been specifically designed to measure and analyze tiger related crime in academic literature. The only data-set is available in "grey" literature, such as reports from non-governmental organizations, especially TRAFFIC. Statistical data-set of tiger related crime in the Amur-Heilong region have been assembled from various Russian and Chinese sources and, where possible, verified by the reports in the Russian and Chinese media.

Wildlife seizure records are not openly available for China as the government agencies dot not release it for various reasons explained in the analysis. Amur tiger seizure records data-set for China might not be complete. Nevertheless, it provides some snapshots of the situation in the region on the Chinese side. However, wildlife market survey observations from Chinese wildlife markets on the Sino-Russian border (implemented during 19-27 June 2016) compensate and fill in the potential gaps in Chinese government seizure data. Market survey findings help to examine wildlife crime situation on the Chinese side of the Amur-Heilong border from the inside rather than from the governmental seizure records.

Qualitative data collected through interviews and participant observations employed in this study was not used as a source of symbolic information, i.e. it has not been used to understand the meaning and driving forces of tiger related crime, or how effectively it has been addressed on global and national scales. On the contrary, participant observation data and interviews were used as a primary source of information providing the factual justification for the scale and effectiveness of countermeasures for tiger related crime

globally and in the Amur-Heilong region. However, the information gained through interviews and participant observations was verified for consistency with other sources, such as literature and quantitative data as required by the triangulation principles.

Given the complexity and clandestine nature of tiger related crime, it is challenging to analyze and evaluate the measures objectively and fully with only one method. Thus, a mixed method approach was used to cover potential gaps in the analysis that could appear when using only one type of method. Similar reason is valid for using multiple sources of data when developing tiger related crime datasets. Multiple sources of data make possible to verify data according to the principles of triangulation.

8. Summary

This chapter has provided the justification for the research design type, logical framework based on the formulated research problem, linked research questions and objectives. Moreover, the chapter described in detail selected research techniques, including author's experience while employing these techniques, their justification, limitations and benefits. The author also emphasized the issues of validity and relevant ethical considerations, as well as separately described data acquisition sources and limitations of data.

Now when the background for the research has been set up, the following chapters (Chapters IV, V, VI, VII and VIII) will present the results of the analysis, followed by the discussion and final conclusions chapters (Chapter IX and X).

Chapter IV. What is tiger related crime and why does it persist?

1. Introduction

The Tiger conservation issue gained political interest globally in 2010 when major international environmental organizations announced that the species is on the brink of extinction and called for immediate action and political support. This is when the leaders of the 13 tiger range countries gathered for the Tiger Summit in Saint Petersburg, Russia, to take stock of global tiger conservation efforts and agree on future plans to reverse the dwindling tiger population. Back then range countries agreed that poaching and illegal trade in tigers, their parts and derivatives were one of the major threats to survival of wild tigers globally.

The present chapter takes stock of the most current data and publications on the illegal tiger trade and trafficking globally, analyzing the latest reports of governments on poaching and trade in tigers, reports from international organizations and leading environmental NGOs as well as CITES documents and media reports.

1.1. Adopted definitions of crime, poaching and trade

As highlighted in the Literature review above, there are no clear definitions in academic literature on the subject of crime, poaching and trade. Going further with the global policy documents, it should be highlighted that none of the international treaties related to wildlife poaching and trade defines an actual term for poaching. CITES requires its members to penalize the trade in and possession of endangered species, their products, and derivatives. CMS prohibits taking of migratory species (Carter *et al.* 2017; CMS 2017). CBD urges country members to take measures to conserve species as elements of biodiversity (CBD 2017).

If we refer to legal terminology, poaching is defined as illegal hunting, illegal killing or taking of wildlife in violation of national or international environmental laws (Ramsey 2016; US Legal 2017). While CMS gives a definition of "**taking**," which means "taking, hunting, fishing, capturing, harassing, deliberate killing, or attempting to engage in any such conduct" (CMS 2017).

CITES gives a precise definition of **wildlife trade**, which means "export, re-export, import and introduction from the sea" (CITES 2016i). However, the term is usually referred to legal practices covering a broad spectrum of items and activities such as timber, exotic flowers, pets and plants, fish, ingredients for medicine and cosmetics, shoes and bags (WWF 2017).

As for illegal wildlife trade activities, CITES gives the term of "**wildlife crime**," which refers to "acts committed contrary to national laws and regulations intended to protect natural resources and to administer their management and use" (CITES 2017). These activities include illicit exploitation of natural resources, such as poaching of the tiger or elephant, uprooting of a rare orchid, illegal tree logging, unlicensed netting of sturgeons (CITES 2017). Wildlife crime includes processing these fauna and flora objects into products and derivatives (any processed part of an animal or plant), their transportation, sale and possession (CITES 2017). It also involves concealment and laundering of financial benefits derived from this illegal activity, while some of these crimes will occur in the country of origin and others will occur in the country of destination, where live or dead fauna or flora specimens, parts, and derivatives are consumed or used (CITES 2017). For that reason, wildlife crime is not different from any other form of illegal activity, in many ways it shares the characteristics of a transnational crime, such as drugs and narcotics (CITES 2017). For the sake of consistency, a common definition of poaching will be used here and below in the analysis. The terms of illegal wildlife trade and wildlife crime will be used interchangeably.

2. Use of tigers in traditional Chinese medicine

Traditional Chinese medicine (TCM), also referred to as Traditional Asian medicine, is now used all over the world and has gained interest in many countries, especially in Asia. This alternative medicine has developed for over a thousand years in China (Huang and Liang 2017). TCM uses medicines made of herbs and animal products, various mind and body treatments, such as acupuncture and tai chi to treat and prevent health problems (Hu *et al.* 2016). Nowadays, TCM is officially an entirely developed medical industry. If a person gets sick in China, there is an option to turn to a modern pharmacy (or, as Chinese call it, "Western pharmacy") or to a TCM pharmacy where qualified staff will help choose an appropriate TCM medicine or will assemble a necessary mix of herbal and animal medicines according to the TCM doctor prescription (Figure 15).

Figure 15: Pharmacists sorting the medicines in governmental TCM pharmacy in Harbin, Heilongjiang province, China. Photo taken by the author during the field wildlife market surveys along the Sino-Russian border, 21 June, 2016

Until late 1980-s, most of tiger biologists regarded habitat loss as the main limiting factor for a long-term tiger survival, until it became evident that traditional Chinese medicine posed a

significant threat to the species. The first mention of tiger bone as an ingredient to traditional Chinese wildlife medicine along with medicinal plants and other wildlife was over 1,500 years ago (Nowell 2010). The industry and knowledge of TCM have spread to Hong Kong, Korea, Japan and other countries. In modern times, it is still believed that tiger products have pain relieving, anti-inflammatory and strengthening qualities (Li *et al.* 2017; Still 2003).

Table 10: Perceived benefit of tiger parts used in TCM or home remedy (collated from interviews, reports and various publications)

Tiger part / organ	Purported benefit in TCM
Bile	Convulsions in children
Blood	Strengthen the constitution, improve willpower
Bone (most valued)	It is cleaned of flesh, toasted in oil or vinegar, and then grounded into powder to be used in plasters, balms and/or wine. Anti-inflammatory treating arthritis, rheumatism, back problem, paralysis of muscles and bones, headaches, improve willpower In Vietnam it is used as the main ingredient to a glue-like substance, called cao, believed to cure rheumatism and general weakness
Humerus bone (upper leg bone)	Believed to be the most precious bone in a tiger and purported to contain the strongest healing powers
Brain	Laziness, pimples treatment
Claws	Sedative effect, insomnia treatment
Eye balls	Malaria, epilepsy, nervousness, convulsions, cataracts
Fat	Leprosy and rheumatism in Indian Ayurveda
Feces	Treatment of boils, hemorrhoids, alcoholism
Flesh	Nausea, malaria, treatment of spleen, bringing vitality and tone to the stomach
Feet	Used to scare off evil spirits
Fur	Burnt to scare away centipedes
Nose skins	Different bites, wounds, children convulsions, epilepsy
Penis	Aphrodisiac, love potion
Skin	Mental illness
Stomach	Stomach pains
Teeth	Asthma, rabies, genital sores, fever
Tail	Skin diseases
Whiskers	Toothaches
Bones found in tiger feces	Sooth burns, treat alcoholism
Genital organs	Various home Asian remedies, mostly used as aphrodisiac for men and to cure infertility for women

Nearly every tiger part has a prescribed benefit in Chinese medicine according to traditional beliefs (Table 10). Wild tiger products by Chinese users are believed to have a stronger healing power than those from a farmed animal, while tiger bone plaster and tiger bone wine are the most popular products (Gratwicke *et al.* 2008). Active medical ingredients according to Chinese texts are calcium, protein and collagen (Li *et al.* 2017; Mills and Jackson 1994). A

publication issued by Chinese authors in the 1990s claimed that tiger bone medicine had a beneficial effect on mice and rats, however true medical efficacy of tiger bone as compared to any other animal bone has not yet been proved (Mills and Jackson 1994).

Aside from the long history of tiger part usage in traditional Chinese medicine, there is a documented local usage of tiger parts in South Asia, in particular in the Bangladesh Sundarbans region (Saif *et al.* 2016). Some of these uses are quite unique, such as soil of tiger pugmarks consumed by the women as a means of contraception or pugmarks were filled with rice and then fed to children or dogs to give them "courage of a tiger" (Saif *et al.* 2016). However, unlike traditional Chinese medicine, this type of use has no specific prescription or method of preparation and is mainly built on local prejudice and spiritual beliefs. In the absence of a specific tiger part, it was replaced by some other tiger part or animal.

A study published by Chinese experts in early 2017 showed bionic tiger bone to be effective and safe in prevention of musculoskeletal pains as compared to placebo (Li *et al.* 2017). It should be mentioned, however, that this study was published in open access electronic journal about alternative medicine. No other considerable research proving tiger products efficacy has been found so far in peer reviewed scientific journals or publications.

3. Current global tiger trade trends

There still exist problematic border areas where tiger trafficking is ongoing or even progressing. At present, TRAFFIC is the only organization that has been regularly publishing global tiger seizure records analysis during the last ten years.

The last global analysis of tiger seizure records was released in November 2016 "Reduced to skin and bones re-examined: an analysis of tiger seizures from the thirteen tiger range

countries (2000-2015)". The report showed that a total of 801 tiger seizures were reported in the thirteen tiger range countries over a 16-year period (2000-2015) with an equivalent of an estimated minimum of 1,755 tigers seized (Stoner *et al.* 2016). According to these estimations, 50 tiger seizures were reported annually on average, equivalent to a minimum of 110 tigers seized a year.

China, Indonesia and Thailand were the top three countries that had a consistent increase in seizures throughout the 16-year period, whereas Indonesia and Thailand showed a consistent increase in the number of tigers seized throughout the years (Stoner *et al.* 2016). At least 17 % of all seized tigers during the 16-year period (297 of the 1755) were those that have been reportedly seized or originated from captive breeding facilities. At the same time, this percentage significantly increased up to 30 % during the last quarter period (2012-2016).

Ten out of thirteen range countries had seizures of live tigers with a total number of 263 live tigers seized during the overall a 16-year period (Stoner *et al.* 2016). Vietnam and Thailand had the highest number of seized live tigers. These facts might be explained by the proliferation and expansion of tiger captive breeding facilities in South East Asia, particularly in Thailand, Laos and Vietnam during the last four to five years.

An interesting case is in Thailand that seized 166 tigers during the period of 2012-2016, in contrast with 68 tigers seized during the period of 2008-2011. This dramatic increase is due to tiger temple seizures that occurred in 2015 and 2016 which gained significant mass media attention globally (Guynup 2016; Stoner *et al.* 2016). Thailand has made the biggest ever seizure of captive tigers in 2015 when 100 live tigers were seized in a Tiger Temple, known as Wat Pa Luang Ta Bua, in Kanchanaburi Province, a three-hour drive from Bangkok. The

temple has been a popular attraction to tourists. These events caused a further investigation by the Thai authorities and led to removal of another 137 live tigers in May 2016.

Table 11: Total number of seizures reported by tiger range countries broken into four quarters (source: Stoner, Krishnasamy et al. 2016)

Country	2000-2003		2004-2007		2008-2011		2012 - 2015		Total	
Bangladesh	2	1%	1	1%	6	2%	11	6%	20	2%
Bhutan	1	1%	1	1%	1	0%	3	2%	6	1%
Cambodia	3	2%	0	0%	0	0%	1	1%	4	0%
China	11	7%	19	11%	22	8%	26	13%	78	10%
India	116	75%	89	50%	110	40%	40	21%	355	44%
Indonesia	0	0%	13	7%	21	8%	36	19%	70	9%
Lao PDR	0	0%	4	2%	4	1%	1	1%	9	1%
Malaysia	7	5%	5	3%	21	8%	7	4%	40	5%
Myanmar	0	0%	0	0%	1	0%	2	1%	3	0%
Nepal	9	6%	25	14%	36	13%	14	7%	84	10%
Russia	4	3%	6	3%	8	3%	12	6%	30	4%
Thailand	1	1%	6	3%	17	6%	17	9%	41	5%
Viet Nam	0	0%	8	5%	29	11%	24	12%	61	8%
Total	154	100%	177	100%	276	100%	194	100%	801	100%

India had the greatest number of seizures globally accounting for 44 % (355 seizures) of all reported seizures (Table 11). Indeed, India hosts the largest wild tiger population what eventually leads to the highest number of seizures in comparison with other counties. However, as TRAFFIC indicated in its last report, India's seizures significantly declined over the last 4-year period which can be the result of effective law enforcement throughout the previous years and thus reduce rates of tiger poaching. On the other hand, on a less optimistic side of things, this might also indicate that less seizure cases might have been recorded by official Indian sources to evade further investigation and public scrutiny from their national media as the result of high political and social attention to tiger conservation. However, due to the fact that India reported about a 30% increase of its wild tiger population from 1706 in

2011 to 2226 in 2015 with an overall decrease in the number of reported law enforcement seizures, this indicates that India has significantly stepped up its tiger conservation activities throughout the years (Burke 2015).

Both China and Russia have had a consistent increase in the number of seizures through the years according to TRAFFIC data (Table 11). Russia indicated an increase in its wild Amur tiger population in the last years which signifies positive dynamics in tiger conservation efforts. The latest whole Amur tiger range survey in Russia showed a tiger population increase from 500 individuals in 2005 to 540 individuals in 2015 (WWF 2015). Even though China has not held a whole range scale Amur tiger population survey yet, there have been several occasions of spotting tigers with cubs on the Chinese side of the tiger range which has not happened for many years on the Chinese side (Vaughan 2015). These facts signify effective tiger conservation activities in Russia and China through the years.

Table 12: Total minimum number of tigers seized reported by countries broken into four quarters (source: Stoner, Krishnasamy et al. 2016)

Country	2000-2003		2004-2007		2008-2011		2012-2015		Total	
Bangladesh	13	4%	1	0%	9	2%	18	4%	41	2%
Bhutan	1	0%	1	0%	1	0%	3	1%	6	0%
Cambodia	7	2%	0	0%	0	0%	1	0%	8	0%
China	52	16%	35	10%	33	6%	55	11%	175	10%
India	182	57%	162	44%	147	26%	49	10%	540	31%
Indonesia	0	0%	19	5%	38	7%	79	16%	136	8%
Lao PDR	0	0%	8	2%	20	4%	11	2%	39	2%
Malaysia	15	5%	5	1%	55	10%	28	6%	103	7%
Myanmar	0	0%	0	0%	1	0%	2	0%	3	0%
Nepal	11	3%	79	21%	65	11%	31	5%	186	11%
Russia	30	9%	33	9%	15	3%	24	5%	102	7%
Thailand	11	3%	13	4%	64	11%	166	33%	254	14%
Viet Nam	0	0%	12	3%	116	21%	34	7%	162	9%
Total	322	100%	368	100%	564	100%	501	100%	1755	100%

As the last global seizure analysis report analyzed a 16-year period, the entire period was broken into four quarters. A minimum of 1,755 and a maximum of 2,011 of tigers were estimated to be seized during this period as estimated by 801 seizures (Stoner *et al.* 2016). As shown in Table 12, the highest number of tigers was seized during the third quarter period (2008-2011). This increase might also be explained to some extent by higher than usual attention to tiger related crime accumulated by the Ministerial Global Tiger Summit organized in 2010 in Saint Petersburg, Russia. As a result, there was more pressure on law enforcement authorities across the tiger range counties to pay more attention to tiger trafficking. As analysis shows, the proportion of tigers seized in Indonesia and Thailand has increased significantly through the years and declined in India (Table 12).

Table 13: Total minimum of tiger parts seized reported by countries broken into four quarters (source: Stoner, Krishnasamy et al. 2016)

	2000-2003	2004-2007	2008 - 2011	2012 - 2015	Total
Complete parts					
Dead specimen	17	52	146	50	265
Live specimen	17	3	64	179	263
Skeleton	34	18	18	5	75
Whole skin (including skin pieces)	214	207	191	146	758
Quantities					
Body		1	22		23
Body parts not elsewhere specified	4	1	9		14
Bone	23	264	256	404	947
Canine / Teeth	26	38	41	227	332
Claw	245	506	267	114	1132
Gall bladder				6	6
Genitalia	5				5
Head	1		1	5	7
Paw	5	10	18	31	64
Skin pieces		105	212	13	330
Skull	27	11	27	30	95
Tail			1	9	10
Whiskers				18	18
Kilograms					
Bone	417.58	424.67	526.6	324.89	1693.74
Meat	23.7	40		100	163.7

			Other		
Unknown				1	1
Wallets				13	13
Wine			10	60	70

The variety of seized tiger parts and derivatives has been analyzed across the countries throughout the years. There has been a significant increase in seizures of live tigers during the last eight years and decrease in seizures of tiger pelts and skin pieces (Table 13). More tiger canine teeth have been seized during the last four-year period, whereas the amount of seized meat, bones, claws and other parts has stayed at the same significant level across the years. More tiger part variety such as gall bladder, genitalia, whiskers, heads and other products have been seized during the past four-year period (Table 13).

Table 14: Total number of seized live tigers by quarters (source: Stoner, Krishnasamy et al. 2016)

Country	2000-2003	2004-2007	2008-2011	2012 - 2015	Total
Bangladesh	1	0	0	3	4
Cambodia	7	0	0	0	7
China	0	0	4	0	4
India	3	1	0	0	4
Indonesia	0	0	0	1	1
Lao PDR	0	0	0	11	11
Malaysia	0	0	3	0	3
Russia	0	0	1	1	2
Thailand	6	0	9	153	168
Viet Nam	0	2	47	10	59
Total	17	3	64	179	263

As seen in the Table 14 there has been a rapid growth of seized live tigers for in the last sixteen years. The number has more than doubled within the last four years mainly due to big seizures in Thailand, Laos PDR and Vietnam. Both Laos and Vietnam do not support known breeding populations according to the IUCN Red List data as well as do not have any official records of wild tiger sightings for a few years (IUCN Red List 2015).

Another trend has been prevalent is purportedly fake tiger products for sale across the Tiger range countries. A major tiger seizure happened in Malaysia in 2015 when 1,241 units of parts claimed to be from tigers, including skins, claws, paws, teeth and pieces of skin turned out to be entirely fake (Stoner *et al.* 2016). The investigation showed the involvement of a highly organized crime group, mainly consisting of Indian nationals. The products were smuggled into Malaysia to service the local demand, mainly in jewelry and curios. The skins turned out to be made of dog.

Such practice of selling fake tiger products is not new across the range countries. There is evidence of fake tiger products on sale in India, China and Russia. The spread of fake tiger skins and fake tiger amulets made of dog derivatives is common across India (Sinha 2008). Wildlife market online surveys as well as on the ground surveys done by the environmental NGOs and governmental agencies showed a high presence of fake tiger products in the border areas of China and Russia (Lyapustin and Pervushina 2016; Nowell and Ling 2007).

4. Global geographical trends

The analysis of tiger seizures data across the tiger range countries identified the following border areas of most concern for the illegal tiger trade: India-Nepal-Tibetan Autonomous region, China border, India-Bangladesh border, Russia Far East-North East China border, Indonesia-Malaysia, Malaysia-Thailand (CITES 2016h; EIA 2014; INTERPOL 2014, 2015, 2017; Nowell and Pervushina 2015; Stoner and Pervushina 2013; Stoner *et al.* 2016). Figure 16 shows rough estimations of global routes using seizures data presented using Trademapper, which is an interactive tool designed by TRAFFIC and WWF to visualize wildlife trade data. Even though the map does not show all details of the trade routes and does not represent all seizure cases, it does have interesting findings. For example, African countries (Angola and South Africa) are shown as countries of origin. This can be explained

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by the presence of tiger farming facilities in Africa, that already serve as a source for illegal trade.

According to the Trademapper dataset (Figure 16), China was the most common destination country for most of the seizures, whereas Chinese nationals were involved in almost every other case for all tiger seizures (Stoner *et al.* 2016).

Figure 16: Extended routes of tiger seizures by routes, transit and destination points created using trade mapper interactive tool developed by WWF and TRAFFIC (source: Stoner, Krishnasamy et al. 2016)

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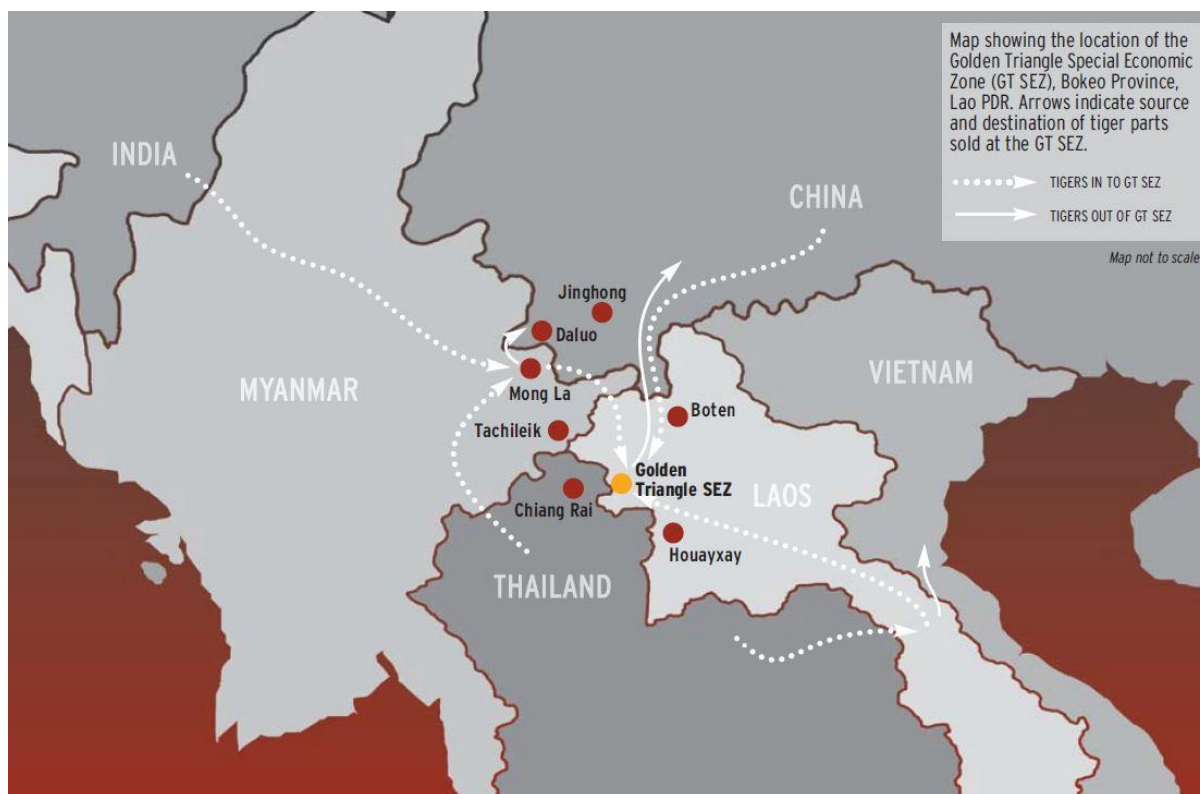
Figure 17: Location of GT SEZ, Bokeo Province, Laos PDR (source: EIA 2015)

Another problematic region is the so-called "golden triangle" in Southeast Asia (import and export and intra-regional illegal tiger trade among the countries): Lao PDR, Vietnam, Thailand and Myanmar, as well as Southern borders of China with Lao PDR, Myanmar and Vietnam (Figure 16). In 2015 two environmental NGOs specializing on addressing wildlife crime: Environmental Investigation agency (EIA) and Education for Nature Vietnam (ENV) conducted a wildlife investigation in the Golden Triangle Special Economic Zone (GT SEZ) in Bokeo province, which is located on the Laos bank of the Mekong River (Figure 17). The two NGOs produced a video documentary how GT SEZ, which is also a duty-free area, has become a lawless playground for visiting Chinese gamblers and tourists with all types of exotic interests and desires, including buying and consuming illegal products made from endangered wildlife. The GT SEZ is run by a Chinese company with 99-year lease and 80% stake in all operations on SEZ territory, other 20% belong to the government of Laos (EIA 2015b). Clocks are run by Chinese time and all business operations are made in Chinese currency. Laos' laws are weak, and their implementation is even weaker due to many

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political, economic and social reasons. Traders and buyers can trade freely any types of endangered animals and their products from across Asia as well as Africa. The territory has been labeled by wildlife trade experts as a "wildlife crime heaven" (EIA 2015b; Stoner *et al.* 2016). Similar lawless zones are operating in Mong La and Tachilek in Shan state in Myanmar, other ones are Boten and Ton Pheung in Laos' Luang Namtha and Bokeo Provinces, respectively (EIA 2015b; Nijman and Shepherd 2015).

This casino-led model of duty free economic zone for Chinese tourists and gamblers is not uncommon in the region. These zones are located not far from Chinese border checkpoints and are created specifically to cater to the interests of Chinese tourists. According to NGOs reports, Chinese government is aware of this illegal "footprint" of Chinese business, consumers and tourists, but has not taken serious counter measures. Thus, while no crime is allowed and strictly prosecuted within Chinese territory, its nationals seeking an "exotic" experience and semi-legal or illegal business operations are moving to the countries where government control is weak, and legislation is slack.

5. Online trade

The online wildlife trade poses a big threat and has been widely developed with the expansion of the internet and electronic commerce services. In 2014 IFAW made an online survey over a six week period on 280 online selling websites in 16 countries and found over 33,000 items of endangered wildlife or wildlife parts from species listed in CITES Appendix I and II (IFAW 2014). The threat posed by the online wildlife trade to endangered species has been acknowledged by CITES at the CITES CoP14 in the Document CoP14 Doc. 28 where the Internet was identified as the key perceived factor to increased illegal wildlife trade for the previous five years (CITES 2007b).

Other countries also officially acknowledge the role of the internet in promoting wildlife crime and the need to curb cyber trafficking. The US Government has committed in 2014 to develop technical tools to address cyber trafficking in its "National Strategy for combating wildlife trafficking" (US Government 2014). At the same time, the EU stressed the role of e-commerce in legal and illegal wildlife trade in its policy documents, especially for "linking up consumers and producers of wildlife products" (European Parliament 2016).

At the workshop for the tiger range countries who gathered to report against Global Tiger Recovery Program (GTRP) results in Hanoi in 2011, China announced that it would launch a national program against online trade in tiger parts that can be clearly seen as best practices (Nowell and Pervushina 2015). And indeed, China stepped in with the best example to address online trade when in June 2012 fifteen major e-commerce sellers in China including Alibaba, Taobao, and Tencent signed a declaration adopting a "zero tolerance" policy in their services toward online illegal wildlife trade. After this declaration, TRAFFIC continued to monitor online wildlife trade and showed that online trade declined by 79,6% on Chinese websites during the period of June to December 2013 (Stoner 2014) which proves that the efforts have been effective.

Other tiger range countries have been trying to address this problem. For example, in Indonesia forum Harimau Kita (Sumatran Tiger Conservation Forum) which consists of tiger activists, NGOs, scientists and government representatives in Indonesia, had announced the results of their own research that potentially anyone from around the world was able to buy parts of Sumatran tigers online. This forced enforcement agencies to initiate an investigation. As a result, parts and derivatives of at least 22 Sumatran tigers have been seized by authorities from online traders in the course of 2011 and 2012 (Stoner 2014).

The following characteristics of the online trade were defined by TRAFFIC in reports (Stoner 2014). These characteristics explain massive use of the internet for wildlife trafficking:

1. Autonomy of online sales such as wildlife trade is usually not regulated and therefore often and seldom monitored and controlled;

2. Online sales have a global outreach with no boundaries, time difference and geographic limitations aiming at small audiences;

3. Online auctions are obtaining more popularity with each day and will likely become more wide-spread;

4. It is hard and time consuming to identify the location of the seller unless there is special jurisdiction of the authority;

5. Most online illegal wildlife trade happens within closed networks with limited and password protected access;

6. Clandestine terms are used to evade from detection   usually known to illegal traders. For example, "ox bone" in Mandarin was known to describe ivory on Chinese illegal auction sites per TRAFFIC findings;

7. Online auctions provide a very flexible and instant connection with easily adaptable and easy world-wide access.

Table 15: Main categories of tiger products found online on Chinese websites during the survey from July 2012 to May 2013 (source: Stoner 2014)

Jewelry	Tiger bone	Traditional medicine	Curios	Other tiger products	Total
202	76	58	52	50	438
46 %	17 %	13%	12%	11%	100%

TRAFFIC identified top tiger products sold online on Chinese websites during the online survey executed during the period of July 2012 to May 2013 on twenty-five Chinese language websites. Overall 438 advertisements were found online to purportedly contain tiger

bone or other tiger part (Stoner 2014). The products found online could be categorized as follows: jewelry, tiger bone, traditional Chinese medicine, curio and other tiger products (Table 15). No tiger skins or tiger chubas (traditional Tibetan costume) were found to be sold online during the survey.

6. The lion bone trade

A recent trend has been identified in Asia, which is the use of a lion bone instead of tiger bone. Given anatomic resemblance of tiger and lion skeletons and lack of expertise to differentiate the species, this type of illegal trade is proliferating and potentially affecting the lion species.

Back in 2015, TRAFFIC and Wildlife Conservation Research Unit (WildCRU) at the University of Oxford, published a report on the lion trade. The report highlighted an exponential growth of the lion bones traded from South Africa to Asia, especially to China, Vietnam and Lao PDR (Williams *et al.* 2015). The CITES export documentation for 2005-2014 states that derivatives were exported mostly as a hunting trophy, for personal and commercial purposes (CITES 2016a). Even though Asiatic lion *(Panthera leo persica)* is listed in CITES Appendix I, all sub-species of African lion (*Panthera leo)* are included into Appendix II, which allows commercial trade in these species.

Even though there is no culture of lion bone consumption in traditional Chinese medicine, the two largest captive tiger facilities in China have received a license to produce wine from lion bone (Nowell and Pervushina 2015). It is not possible to search the Chinese government database by species and this information is not publicly available, nevertheless, there have been tiger bone wine bottles on sale to purportedly contain lion bone as reported by the individual researchers (Nowell and Pervushina 2015).

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There is still no available method to distinguish the captive bred lions from the wild ones, unless special electronic chips are implanted (not to mention the bones and other parts). Only a feline biology expert can distinguish lion bones from tiger bones. Moreover, a special DNA or isotope test is needed to identify processed bones in a derivative product.

7. Conclusion

The analysis of tiger seizures for the last sixteen years shows that the illegal tiger trade remains unabated and on average 110 tigers have been seized annually across tiger range countries. The following conclusions can be drawn after analyzing the tiger seizure records, CITES and governmental documents, media reports and other relevant data.

1. Each year there is an increase in seized tigers, their parts and derivatives. This happened as the result of the following factors that have changed over time:
    a. Better availability of tiger seizures data, shared by government agencies, through online and mass media sources.
    b. The quality of reported data has improved in some countries due to governmental efforts and general increased interest of the public and the government concerning the issue of tiger conservation (for example, in India, China and Russia).
    c. Better law enforcement in some countries with high political interest and more pressure on national law enforcement agencies
    d. The appearance of captive tigers, their parts and derivatives in illegal trading for the last five to six years has significantly affected overall seizure rates

2. There is more of a variety in seized items overall by the law enforcement authorities across tiger range countries for the last four-year period. This can be explained by better capacity of law enforcement officers on the ground to detect and identify the parts and derivatives of the tigers, apart from commonly trafficked items such as skins, pelts and bones

3. There is a significant increase in the number of seized live tigers during the last 4 to 5 years, especially in Southeast Asian countries such as Thailand, Vietnam and Laos PDR (countries with generally very low viable tiger populations). At the same time the number of seized tiger skins and pelts has reduced across the countries.

4. Increased number of live tigers, especially in the countries where captive breeding facilities have significantly grown during the last couple of years, suggests that these facilities are considerably contributing to the illegal tiger trade.

5. India, Russia, China and Nepal are the countries with the best available practices for addressing the tiger trade problem. These are the countries where law enforcement efforts have been effective and wild tiger numbers have risen according to the latest national whole range tiger survey.

6. The destination country of the most of seized tiger items across the tiger range countries is China. This means that China still needs to significantly step up its law enforcement operations and address the issue of demand for tiger products nationally

7. With the development of IT technology, internet and online sales platforms, online trade has become a new massive crime enabling trend for wildlife crime. The trend is increasingly popular in Asian countries where the number of internet users has exponentially increased recently. The problem has been already acknowledged by international organizations and environmental NGOS and some government agencies. However, the governments of tiger range countries still need to contribute in addressing the issue.

8. Appearance of fake tiger parts and lion bones used to replace tiger parts is another serious trend that must be addressed in both Asia and Africa.

9. There are remaining problematic areas of concern, the so-called tiger trade routes where government authorities have to pay special attention to wildlife and tiger crime: India-Nepal-Tibetan Autonomous region, China border, India-Bangladesh border, Russia Far East-North East China border, Indonesia-Malaysia, Malaysia-Thailand. Another problematic area is the so-called "golden triangle" in Southeast Asia: Lao PDR, Vietnam, Thailand and Myanmar, as well involving the Southern border of China.

Chapter V. Fighting behind the front lines: global policy efforts

1. Introduction

Present chapter analyses the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as the main global policy tool regulating wildlife trade, using tigers as a case study. Literature review of the global policy measures addressing wildlife crime showed that CITES is the most pertinent global policy instrument dealing with the issue of illegal trade in endangered species. Other relevant environmental international agreements such as CBD, CMS or other agreements focus on other aspects, however illustrates their role in the overall international mechanism of regulating global wildlife trade.

The current chapter aims to answer the second research question, namely "How is tiger related crime addressed globally?" The chapter covers only one aspect of global efforts, such as countermeasures for illegal trade and the trafficking of tigers in the global policy realm, in contrast to the range counties' efforts that are analyzed in Chapter VI.

The chapter analyses the development of global tiger trade agenda in CITES as it evolved historically till the present day. The author analyses the work of the Convention with regards to Asian big cats through the prism of relevant UN documents, countries' reports in response to those documents, national reports on the actual situation on the ground as well by analyzing the data gathered from participant observations, interviews and consultations.

2. CITES and tiger trade

It should be noted that there is no consistency in literature or available CITES official documents on the overview of tigers and other Asian big cat agendas in CITES. The information presented below was analyzed with a consultation of experts from the

environmental NGOs, who have been involved in wildlife trade policy issues in CITES over the years (Figure 18).
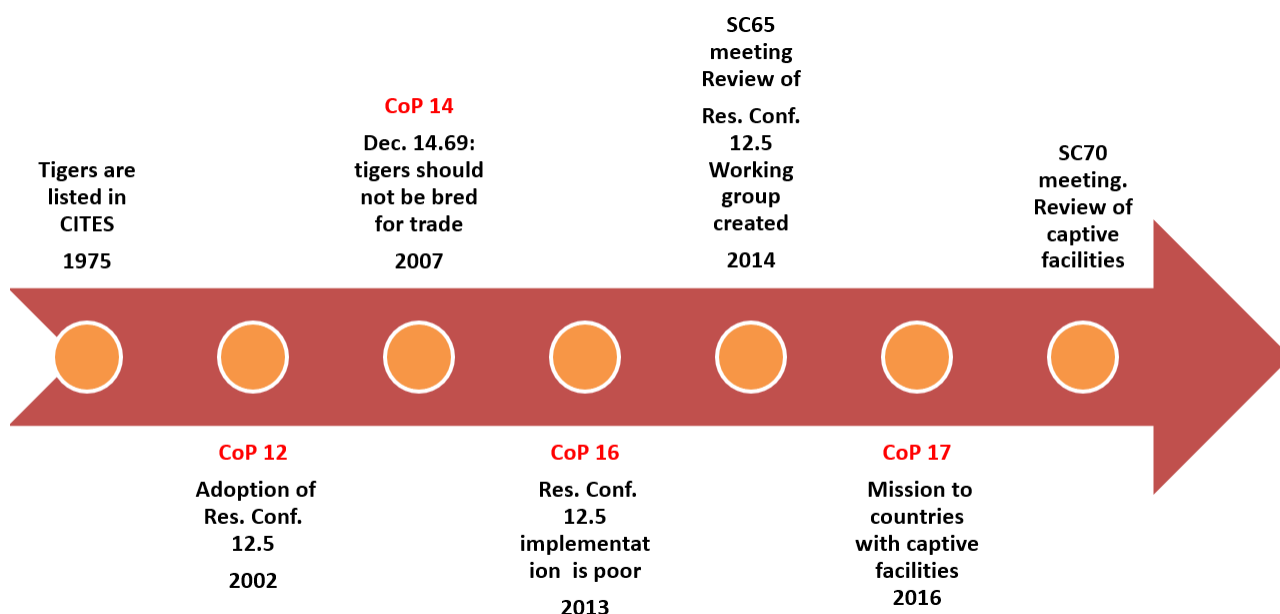
Figure 18: Progress of tiger agenda in CITES over the years

2.1 Resolution Conference 9.13

From its inception CITES had recognized that all tigers were endangered and on July 3, 1975 the species was listed in CITES Appendix I (apart from Amur tiger *(Panthera tigris ssp. Altaica)* that was in Appendix II), acknowledging that tigers are threatened with extinction and no international trade is permitted with exceptional circumstances such as sizeable trade in captive-bred animals for example (Nowell and Pervushina 2015). The Amur tiger was later transferred to Appendix I in 1987 (CITES 2016i).

In March 1995, CITES Standing Committee (SC) addressed the issue of tiger trade for the first time and requested Parties to take all necessary measures to stop trade in tigers and their parts and report to the SC (CITES Notification No. 738) (Mainka 1997). Later there was CITES Notification No. 774 outlining minimum criteria for the protection of the species. As illegal trade and the trafficking in tigers continued to proliferate, practice showed that those measures were not sufficient. This led to the adoption of the Resolution 9.13 (Res. Conf.

9.13) at the 9th CITES Conference of the Parties in 1993. The Resolution was the first high-level international document to acknowledge that "the use of medicines and products containing tiger parts and derivatives exists in many countries of the world" (CITES 1993).

In 1996 and 1997 TRAFFIC undertook a survey of legislation enforcement and tiger conservation activities in 14 tiger range states and 15 tiger consumer countries to assess the implementation of Res. Conf. 9.13 and provide further recommendations to the Secretariat. The overall outcome of the report was that "response to the Resolution Conf. 9.13 has been poor" (Mainka 1997).

2.2 Technical and political tiger missions

Unfortunate for tigers report findings were presented at the 10th CITES COP in 1997 where they served as the main argument for further lobbying to instruct the SC to prioritize tigers and initiate technical and political missions to tiger range and consumer states. The Secretariat implemented technical missions to 14 range states and consumer states including Western countries in 1998 (Reeve 2002). A detailed report with country specific recommendations was presented at the 42nd CITES SC in 1998 (Reeve 2002).

The outcomes of Political missions were presented at the CITES Eleventh meeting of the Conference of the Parties (COP11) in Kenya, in 2000. India, the country with the largest tiger population and largest source of wild tigers was strongly criticized in the final Political missions' report. However, the report recommendations and main findings for India were weakened in the final COP11 report of the tiger working group (Reeve 2002). The main concerns for India were very little communication and information sharing on tiger poaching and trade among the tiger reserves, state governments and law-enforcement departments as well as very low level of professional law enforcement. As the report stated, there was no

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evidence of any measures to be taken in India at any level to stop poaching and smuggling of tiger or any other wildlife (CITES 2000a). Prominent level of corruption was highlighted as the core problem of high level funds not reaching the field. This was occurring despite Project tiger launched by the Indian Prime Minister 27 years ago, when approximately USD 130-150 million was spent by the Union and State governments of India and USD 8-10 million was transferred to India from overseas governmental and non-governmental bodies for tiger conservation (CITES 2000a).

In reaction to this, the political mission called for the immediate stop of the flow of funds for all governmental and international tiger conservation projects until the mechanism for disbursing the funds was in place. Following strong resistance from India at the COP11, these recommendations were waived from the final Tiger working group report (CITES 2000a; Reeve 2002). Instead, final COP11 recommendations were "encouraging" the Parties and organizations to provide funds to India, whereas India was encouraged to show progress in "efficient disbursement of funds for tiger conservation" as stated in the Decision 11.49 (CITES 2000b).

China got favorable feedback from the Political mission report in terms of addressing the recommendations of Technical mission report. Nevertheless, China refused to destroy its domestic stocks of tiger parts and derivatives, even though it was recommended to do so in Technical missions report, claiming they were "legally acquired pre-convention material" (Reeve 2002).

It should be highlighted that in 2000 according to CITES Political mission report, China claimed to have obtained four of the five surviving tiger sub-species: Amur or Siberian sub-species (8-10 individuals), South-China sub-species (20-30 individuals), Bengal sub-species

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in the Tibetan region (20 individuals) and Indo-China sub-species in western border areas (30-40 individuals) (CITES 2000a). However, no national level tiger census was ever organized in China at that time. Ten years later at the Global Tiger Summit in Saint Petersburg, Russia, in 2010, China would participate as the range country with only Amur Tiger sub-species as stated in official Global Tiger Initiative reports (Global Tiger Initiative 2010). This puts the effectiveness of tiger conservation activities in China throughout the last 10-15 years under question, as well as the authenticity of the real state of facts in CITES documents with regards to tiger population in China regardless of favorable high-level international reports at that time.

2.3 Tiger Enforcement Task Force

CITES COP11 made decisions that were vastly endorsed by the majority of the Parties. One of them was to create a tiger Enforcement Task Force (TETF) with main objectives to fight tiger crime and collate the information on tiger poaching and trade. New Resolution Conf. 11.5 was adopted to replace the Res. Conf. 9.13 reinforcing the need to share information and strengthen law enforcement.

Figure 19: Tiger reserves in India (source: National Tiger Conservation Authority/Project Tiger)

The first meeting of CITES TETF was organized in 2001 in New Delhi (CITES 2001; UNEP 2001). The second meeting of the TETF was organized only four years later in 2005 attended only by the experts from India, China and Nepal and had no major impact apart from strong restructuring of tiger conservation institutions in India. This meeting was prompted by the reports of dramatic decline in localized tiger populations in India. In December 2004, India got under the spotlight in the wake of the news that tigers disappeared from Sariska tiger reserve in Rajastan (Figure 19). This was later confirmed by the Wildlife Institute of India

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interim report in March 2005 (WCCB 2016). The Central Bureau of investigation in India was requested to inquire the disappearance of tigers and revealed that since July 2002 poachers have been killing tigers in the reserve and the last six tigers were killed in 2004 (WCCB 2016). These reports of tiger extirpation in India got so worrisome that CITES Secretary General, Willem Wijnstekers, sent a letter of concern with the offer of technical advice and support to the Prime Minister of India, Manmohan Singh. In his letter the Secretary-General requested a meeting with the Prime-Minister "in order to accelerate cooperation between CITES and India and to fully engage the international community in addressing the tiger crisis" (CITES 2005).

Indeed, according to CITES COP12 reports, problems with funding disbursement still remained at the same level and specialized wildlife crime enforcement unit has not yet been created (CITES 2002). In the year of 2000 significant wildlife seizures happened in Ghaziabad and Khaga, Uttar Pradesh province bordering Nepal, indicated that wildlife crime was proliferating in the country (Figure 19). Corruption of state government officials and their involvement in illegal activity was still an issue especially in the states of Jammu and Kashmir which were involved in the processing of wool of the highly-endangered Tibetan antelope according to CITES reports (CITES 2005). In response to raised massive concern from the national media and pressure from the international community, India hosted the Second meeting of the CITES Tiger Enforcement Task Force in 2005 and created national level Tiger Enforcement Task Force. This finally led to reshaping of India's National Tiger Conservation Authority (NTCA) or so-called Project Tiger created in 1972 that was a Statutory Body under the Ministry of Environment, Forests and Climate Change. NTCA had a supervisory and coordinating role for all tiger reserves in India and provided a country level assessments of the tiger population, tiger habitats and prey as provided in the Wildlife (Protection) Act, 1972 (NTCA 2016). At the same time, in response to the news about the

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disappearance of tigers in Sariska, National Wildlife Crime Control Bureau was created under the Ministry of Environment, Forests and Climate Change in 2007, however it became operational only in 2008. This time the Indian Prime Minister personally endorsed the creation of WCCB and all incidents of tiger poaching and tiger mortality in the country would need to be reported to the Government during the Parliamentary hearings.

It is worth mentioning that analysis of Indian official documents described a different perspective on the situation with the tiger population in India during that period and the role of CITES in pushing India to take some measures. The report of the Tiger Task Force that was set up by the Ministry of Environment and Forests (Project Tiger) in 2003 stated that reports of CITES technical and political missions were too much praising China's efforts in tiger conservation, such as not using tiger stockpiles (what was doubtful in India's perspective) and omitting the work of the Project Tiger in India that was established many years ago (Government of India 2005). The report also stated that throughout all those years CITES continued to "applaud China's commitment to combating illegal trade" while the country has always been the major demand market for tiger products. At the same time, CITES failed to notice any significant progress in India on tiger conservation and tried to influence India by suggesting organizing an immediate meeting with the Prime-Minister with the big lobbying from the US government or suggesting suspending commercial trade in CITES-listed species for India as it was failing to comply with the commitments. The Indian government report clearly states that "global community working through CITES has been ineffective in checking international trade in tiger parts" and that the Convention has become "extremely malleable to petty country politics" (Government of India 2005). The report further states that the ban on trade in tigers and efforts of the international community "pushed the [tiger] trade underground and made it even more difficult to detect", while it was still happening in China and even the United States (Government of India 2005).

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2.4 Resolution Conference 12.5

After the review of CITES recommendations and implemented activities with regards to tiger trade, it was evident that the same problems of poaching and habitat loss were facing other big cat species in Asia, especially snow leopard (*Uncia uncia)*, clouded leopard (*Neofelis nebulosa*), all subspecies of leopard (*Panthera pardus)* within their Asian range, and Asiatic lion (*Panthera leo persica*) (CITES 2013a). At the 12th CITES Conference of the Parties in 2002, the Parties agreed to broaden Res.Conf.11.5 to include all Asian big cat species and adopted the Resolution Conference 12.5 "Conservation of and trade in tigers and other Appendix-I Asian big cat species". Given that all Asian big cats have already been included into Appendix I species, trade in their parts and derivatives has been prohibited by the Convention since 1975 (with the exception of the Asiatic lion and Amur tiger that got became listed in 1977 and 1987, respectively) (CITES 2013a). The new resolution repealed the Res. Conf. 11.5 and till present date it is widely recognized as the main CITES document regulating international trade in tigers and other Asian big cat species.

The resolution has been revised at the 14th and 15th CoPs (Nowell 2004). The largest revision of the Resolution took place during the CoP15 in Doha, Qatar, in 2010. The most concern was raised with regards to domestic trade in Asian big cats versus international trade. The EU raised a concern that Convention was giving a permissive extension of its interpretation and that domestic trade in tigers and other Asian big cat species should be controlled as long as it was affecting international trade what should be reflected in the text of the Resolution (CITES 2010). As a solution to this, the EU (supported by the US) suggested to specify measures to address domestic trade and adopt new reporting mechanisms for better compliance. China (supported by India, Myanmar, Thailand and Vietnam) opposed the suggestion and argued that including domestic trade would go beyond CITES mandate as it was a domestic issue and that CITES as an international agreement had no bearing over its

national policies. However, there have been CITES decisions in the past recognizing that domestic markets stimulate the international trade (Nowell *et al.* 2007). China also opposed (supported by the most of range states) the introduction of special reporting requirements arguing that it would create an unnecessary burden for range states (CITES 2010). Nevertheless, the Res.Conf.12.5 was revised at the CoP15 after lengthy session debates, some definitions were clarified and reporting systems for range states were better specified.

It should be mentioned that present-date text of the Resolution is no longer mentioning "domestic trade" and has no reference to compliance with regards to any domestic activity apart from general recommendations "to ensure that adequate management practices and controls are in place to prevent parts and derivatives from entering illegal trade" (CITES 2013a). The last time Res.Conf.12.5 was revised at the CoP16 in Bangkok, Thailand, in 2013.

2.5 Captive breeding and CITES Decisions

At the Fourteenth Conference of the Parties (CoP14) CITES adopted a series of Decisions (14.65-14.72) to prevent the illegal trade in tigers. Among these decisions 14.66 and 14.69 were related to the regulation and control of domestic trade and prevention of trade of products from captive-bred tigers. These two decisions relate to one of the most politically perplexing, sensitive and non-transparent issues in tiger conservation and CITES until present day.

The Chinese government gave two responses to the tiger crisis in the beginning of 90s: one was to introduce a strict domestic policy on trade in tiger bone products and promote alternative substitutes for tiger products, and the other was to initiate intensive breeding operations of tigers to fulfill the demands of the traditional Chinese medicine market.

In 1993 China issued a special Notification by the State Council (highest political body) introducing a ban in any commercial trade in tiger bone products, even those that were not readily recognizable as Tiger products. Tiger bone was excluded from the national list of traditional pharmaceutical ingredients and national factories were ordered to stop the production of tiger bone derived medicine (Nowell 2010). Tiger bones stockpiles had to be declared to the government and sealed. Penalties for tiger poaching and trade in tiger parts reached up to life imprisonment and the death penalty.

Simultaneously with the trade ban, the Chinese government launched a vast program of developing captive tiger breeding facilities as an alternative source for consumer markets. According to government reports, the captive tiger population in 2007 reached 5,000 individuals which was more than a hundred times larger than the most optimistic estimation of the wild tiger population in China (Nowell 2010). Approximately half of those tigers are kept in breeding facilities sponsored and monitored by the Chinese government. Each facility started with only a few tigers in early 90s, however according to experts' estimates, each facility already had over a thousand tigers by 2010 (Nowell 2010).

China has become a pioneer in introducing tiger captive breeding facilities whereby setting an example to other countries in South East Asia that have a long history of using tiger products in traditional Chinese medicine. Significant increase in seizures of live tigers and tiger parts when about five years ago these countries had a low wild tiger population (Lao People's Democratic Republic, Thailand and Vietnam) has become a foremost indicator of flourishing captive breeding facilities in those countries (EIA 2014, 2015a; Nijman and Shepherd 2015; Nowell 2010; Nowell and Pervushina 2015; Stoner and Pervushina 2013).

China has historically been open in governmental reports on CITES Res.Conf.12.5 about their captive breeding program and research plans to develop a plan for traditional Chinese medicine "at the precondition of ensuring it is beneficial to the conservation of the endangered species" (CITES 2012). The captive breeding issue raised overwhelming concerns from the international community that it might have a detrimental effect on the global wild tiger population and contribute to the international trade. The situation got more intense when China announced about its consideration to legalize the domestic legal market of tiger products at the CoP14 in Hague in 2007. This initiative raised a considerable concern among the international tiger conservation community over the extent to which tiger range countries would oppose re-opening of domestic markets in China and re-affirm that they were against tiger farming (Nowell *et al.* 2007). In response China's initiative at the CoP14 the Parties adopted the Decision 14.66 stating that "domestic tiger trade control policies should reflect the view of the CITES Parties" as expressed in the Res. Conf.12.5, "especially those [Parties] evaluating their domestic tiger trade control policies" (Nowell 2007).

At the same time, China announced that it was conducting a review of its domestic policy to ensure that any changes would benefit wild tigers and requested for international input into their domestic policy review (Nowell 2010). This was an outstanding step for China in the international arena proving that the Chinese government understands the impact of China's internal policies concerning the global tiger population status beyond its borders. International input was provided by global tiger experts, particularly from the IUCN SSC Cat Specialist Group and world government representatives who participated in the poll. The overall response (34 out of 37 global experts) was that legalizing internal trade would most likely increase the pressure of poaching of wild tigers globally (Nowell 2007, 2010).

After long debate on domestic trade policies, Parties at the CoP14 adopted a decision 14.69 stating that "Parties with intensive operations breeding tigers on a commercial scale shall implement measures to restrict the captive population to a level supportive only to conserving wild tigers; tigers should not be bred for trade in their parts and derivatives" (Nowell 2007). It should be mentioned that at the CoP14 China proposed to amend the text to read that tigers should not be bred for "international" trade arguing that CITES as an international agreement cannot interfere with national policies. Nevertheless, other tiger states opposed the suggestion with a majority vote (Nowell 2010).

Even though the Decision was adopted by majority votes, the guidance on the reporting mechanism to the decision was issued only a year later by the Notification No. 2008/059. The Notification gave a wide array of items to report such as individual animal registration process, integrating a marking system using microchips or DNA profiling, segregation of sexes to avoid further breeding, strategic plans for phasing out intensive breeding operations, development of plans for further fate of bred tigers and many others. No country has submitted a report for this Notification. Later CITES Secretariat issued another Notification 2012/054 urging the states to submit the report on implementation of the Decisions, but still no Party has submitted the report in compliance with the decision (EIA 2013a).

It must be mentioned that given the level of details required by the Notification, many Parties with intensive breeding operations had neither financial resources, nor data available for assessing the state, quantity and quality of tiger breeding facilities, especially those not controlled by the government. Majority of tiger breeding facilities have either illegal or semi-legal status usually owned by some rich businessmen (EIA 2015a; Nijman and Shepherd 2015). Taking this into account, it is a complicated task for the governments, especially the

ones with limited resources, to provide all requirements outlined in the Notification guidelines.

Semi-legal status of breeding facilities, sensitivity of the tiger breeding issue, complexity and amount of Notification reporting guidelines coupled with high expectations from the international community from range states explains the non-transparency and perplexity of the tiger breeding issue globally. At the same time, neither international, nor the scientific community have found a reasonable solution for captive bred tigers if tiger breeding facilities are to be phased out permanently, even though there are continuous conversations about this at the international level.

3. Current tiger trade discourse in CITES - a deadlock?

Historically there has been a consistent lack of reporting in CITES on Asian big cats, especially from the range states, which has been mentioned in several CITES reviews and reports (CITES 2011, 2013c, 2016h; Nowell 2007; Nowell and Pervushina 2015). From CoPs to Standing Committee meetings the Secretariat has been regularly noting a poor response from the Parties on the implementation of the Res.Conf.12.5, whereas it's overview of

Figure 20: Author presenting TRAFFIC report on Tigers trade together with TRAFFIC and WWF at the CITES COP16, 3-14 March 2013, Bangkok, Thailand

international poaching and illegal trade in tigers "cannot be regarded as having been particularly successful" (CITES 2011). At the same time, reports submitted by the Parties to the Secretariat have not provided full information as requested by the Resolution (EIA 2013a).

At the CoP16 in Bangkok in 2013, the Parties again acknowledged poor implementation of the Resolution 12.5 and agreed to review "the conservation of and trade in Appendix-I Asian big cat species at its 65th and 66th [CITES] meetings, and determine any actions deemed necessary to combat illegal trade in Asian big cats" (CITES 2013b) (Figure 20). CITES Secretariat prepared a questionnaire for the Parties to report on their progress. Only five countries responded (three out of which were tiger range countries). Considering the very low level of response, it was decided to hire a third party to implement the review and develop recommendations. The third party was supposed to directly contact the CITES Management Authorities (MAs) of those range countries that have not responded to the questionnaire of the Secretariat. IUCN and TRAFFIC were requested to assist with the report preparation. It was not the first time a third party was hired to implement such an assessment. A similar review was prepared by IUCN and TRAFFIC in 1997, then twelve years later by IUCN, WWF and TRAFFIC in 2009.

The report was presented at the CITES 65th Standing Committee meeting in Geneva in 2015. The author was involved as a co-author and tiger trade expert from WWF and TRAFFIC in partnership with the IUCN SSC CAT specialist group expert. The findings of the report stressed again that Parties failed to regularly submit their progress on the Res.Conf.12.5. Overall, the report had a strong and detailed analysis of captive breeding activities of the range states, especially the ones implemented in China as the country with the largest captive bred tiger population.

Even though the report had an extensive list of recommendations and requests for clarifications, the final report recommendations outlined by the CITES Secretariat in Notification to the Parties at the Standing Committee meeting were weakened and significantly scaled up. Such as, no challenges related to specific countries, but only best practices were mentioned in the Notification (CITES 2014b). The captive breeding issue, which constituted a large part of consultant's analysis, was omitted in the document (CITES 2014b).

The consultant's report presented at the 65th CITES Standing Committee initiated the creation of Inter-Sessional Working Group for Asian big cats during the Committee meeting (CITES 2014a). The government of China volunteered to chair the working group. Considering that the report had a strong focus on the captive breeding issue and criticism of China's national activities, China's chairmanship was perceived by tiger trade experts, NGOs and international organizations as a strategic maneuver of the Chinese government at CITES. Interestingly, most working group members were international organizations and NGOs (11 organizations in total) and only seven Parties to the Convention (five of which were ranges countries: China, India, Malaysia, Indonesia and Vietnam). This again highlights the willingness (or un-willingness) of range states to participate in the working process of the Convention on Asian big cats. The author has been involved in the working as a representative for WWF and TRAFFIC.

The working group agreed to review and address the recommendations made in the consultants' report and outline outstanding issues of concern as well as develop a template that would form a basis for consistent reporting for the range countries (CITES 2015). Based on the responses to the questionnaire, the working group had several rounds of discussions over the emails and managed to reach consensus on some issues, however, as mentioned in

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the final working group report prepared for the 66th CITES Standing Committee meeting in January 2016, "there remain issues or important issues over which consensus has not been achieved" (CITES 2016f).

From the author's observations while participating in discussions, the working group opened the "Pandora Box" and reached a deadlock situation over certain issues which came forth between the states with captive breeding operations and other range states supported by non-range countries (mainly the United Kingdom and the United States) and international community comprising of international organizations and NGOs. In the working group report, prepared and coordinated by the chair, there were two crucial issues of concern. One was related to captive breeding and Decision 14.69 on management of captive breeding operations. The major concern was that the Decision 14.69 has not been historically implemented despite the strong support from the Parties and the Secretariat. The Chair of the working group expressed concern that neither Secretariat, nor the CoPs endorsed the definition or explained the terms "level supportive only to conserving wild tigers", "internal trade" and "commercial purposes for internal trade" (CITES 2016f). This discussion led to the recommendation to convene a separate investigation of captive breeding practices to evaluate the impact of captive breeding on the wild tigers population, poaching and illegal trade. The chair of the working group put the recommendation forward, however the group members reached no agreement whether this analysis was needed. The counterarguments were that such analysis was beyond the working group mandate and that scope of the analysis would need to be agreed separately. It should be mentioned that this disagreement brought long internal discussions and consultations between the range states and NGOs, as well as among NGOs themselves that formed various internal coalitions to formulate their positions on the final recommendation.

It should be added that Chinese government has mentioned the need to conduct such analysis for several years at various expert conferences and via different channels in national media. The messages were coming from different governmental departments and Chinese semi-governmental NGOs. These messages clearly show the official stance of the Chinese government that they need scientifically proven evidence that captive breeding is indeed an obstacle to wild tiger conservation. To some extent, such analysis is indeed needed as there has been no science-based analysis investigating the problem and showcasing its impact on wild populations. Given that most of captive breeding is illegal or semi-legal and that tiger trade is covert and hard to measure, such analysis would be particularly challenging to implement in practice. Additionally, the author of such analysis should be subjective to one or the other position on captive breeding.

The Secretariat's report prepared for the 66th Standing Committee meeting (same time when the working group report was presented) explains that the definitions related to captive breeding were never endorsed due to the sensitivity and challenged sovereignty of the states when referring to domestic breeding operations (CITES 2016e). According to the Secretariat, the language on captive breeding in Decision 14.69, Resolution 12.5 (Rev. CoP16) and recommendations formulated in the consultant's report are different. At the same time, Decision 14.69 relates more to the internal trade but does not specify how to implement it. Further to this, the Secretariat acknowledged that the captive breeding issue is very sensitive and the history surrounding the adoption and application of Decision 14.69 on captive breeding is very intricate and complicated. Due to this, the Secretariat suggested in its report to postpone the issue till the next CITES CoP (CITES 2016e). Such a suggestion from the Secretariat seemed to be imitating previous past decisions when consensus was not achieved, and discussion was postponed till the next Standing Committee meeting or the next Conference of the Parties. This tactic might have reduced the pressure and tensions during the

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discussions at a given moment, however, it did not help to resolve the issue in the long term. As a result, the issue stays unresolved from one CoP or Committee meeting to another.

Another stumbling block of the working group discussions was the consultant's report presented at the 65th CITES Standing Committee. The biggest concern (mainly coming from the Chair) was that some parts of the report "were based on unverified or incomplete information and had flawed findings" (CITES 2016f). This was mostly related to the parts describing captive breeding facilities in China and tiger parts and derivatives potentially entering the illegal market out of these facilities. Indeed, the arguments and findings for this part of the report were based on interviews with experts, consultations and reports from the NGOs and the media. Given the illegal or semi-legal nature of captive breeding facilities and their operations in Asia, it might be challenging (if possible at all) to obtain official evidence. Nevertheless, the majority of the working group members insisted on keeping the recommendations of the consultant's report stressing their importance. Interestingly, this stumbling block of the working group was not mentioned in the report of the Secretariat to the 66th Standing Committee meeting (CITES 2016e). It might be explained that the Secretariat oversaw the management and preparation of the report as well as presented the final recommendations, however significantly refined, in its Notification at the 65th CITES Standing Committee meeting in 2014.

The issues of captive breeding and management of the stockpiles also came up in the final recommendations of the working group among other generic ones that came up from the consultant's report (CITES 2016f). Good practices and outstanding issues were highlighted in the report and were passed on for further discussions during the Seventeenth meeting of the Conference of the Parties in Johannesburg, South Africa, in October 2016.

Interestingly, the new Notification from the Secretariat for the COP17 suggested to change the term "captive breeding facilities" to "facilities keeping tigers in captivity" (CITES 2016h). There is no specification of what the new term means or what its scope is. Moreover, the latter term seems to be more generic and unclear than the previous one. Logically, the new term may also include such facilities as circuses, zoos or any other parks keeping tigers, however, these facilities might not be involved in captive breeding operations on some commercial scale as captive breeding facilities in China and Vietnam, for example. From the observer's point of view, such change in the terminology does not clarify, but rather reduces the term even more. It aims at shifting the focus from captive breeding facilities and concurrent illegal trade operations emanating from these facilities. Keeping in mind that unclarified terminology problem was brought up before during the working group discussions, the new term will (using the language of the Secretariat in previous documents on captive breeding) "further contributing to ongoing debates and differences of opinion among Parties, with regard to what is expected from them" (CITES 2016e). Imprecision of the newly adopted definition of "tigers in captivity" the Resolution text will lead to further discussions on the issue, while the problem has remained far from being resolved at CITES.

During the debates at the CITES COP17 in Johannesburg, China government unilaterally proposed to remove the Decision 14.69 arguing that the document "preempted the outcome of the review process set out in the new draft decisions" (Zain 2016). The proposal was overruled by India, Nepal, the USA, the EU and Lao PDR, as a result, the proposal was not adopted (EIA 2016a).

The intercessional working group on Asian big cats also had a separate meeting during CITES COP17 trying to address the points of disagreement. The group meeting showed that division of opinions stayed the same after the 65th and 66th SC meetings. Nevertheless, the

working group adopted a series of recommendations aimed at resolving the points of disagreement, especially with regards to captive breeding. The group directed to the Secretariat to conduct a review of a number of captive breeding facilities in Asia, review legal and illegal trade from these facilities and, finally, undertake a mission to those Parties in whose territories there are facilities of concern to gain better understanding of their operation and activities (CITES 2016c). Bearing in mind that discussion led to a stumbling block over the need for review, the group however managed to reach an agreement on developing the recommendation.

3.1 China's domestic position

Official position of the Chinese Government with regards to the tiger breeding issue has its own complexities. A few months prior to CITES COP17, an interview with two Chinese high-officials was published by Xinhua news agency in Chinese. Wen Jianmin, the head of Orthopedics at Chinese Academy of Traditional Medicine Wangjing hospital and Shi Dazhao, Vice President of Chinese Academy of Traditional Medicine Xiyuan hospital, were sharing their opinions on tiger breeding and use of tiger products in TCM in the article titled "Beware of the West attacking TCM under the name of wildlife protection". Both officials are also members of the Chinese government - CPPCC (Chinese People's Political Consultative conference), which indicates that their position has a solid weight in Beijing (Jin 2016). When asked about the TCM, Wen Jianmin states that "we are the nation that created TCM which has a tradition of millennia of use. We should not ignore our cultural background and blindly adopt Western values", while "foreign influences want to kill off traditional Chinese medicine". At the same time, they argue that "effects of tiger bone on muscle and ligament treatment can't be replicated. Their efficacy has been proven over several millennia". However, "certain animal protection organizations that receive funding from Western pharmaceutical companies have used "animal protection" to manipulate public

opinion to put pressure on legislative bodies and departments to ban captive breeding of animals for medicinal use and thus monopolize Chinese pharmaceutical markets". As a result of this, "China's medicinal captive breeding industry and pharmaceutical companies are weak and vulnerable, and [China's] failure to support them sufficiently has led them to repeatedly suffer distortion, vilification and attacks at the hands of animal protection organizations and individuals with ulterior motives". Eventually "the image of TCM will be completely lost and TCM will no longer be traditional Chinese medicine". To avoid this, they warn to "be alert that there are hostile foreign influences, animal protection organizations and individuals both in China and abroad with the backing of Western pharmaceutical companies, that are attacking TCM culture and our national industry in the name of "animal protection"[2] (Jin 2016).

The tiger farming problem will not be easily solved both inside and outside of China. Despite external pressure through CITES and other international mechanisms, internal support for maintaining and keeping tiger breeding facilities is strong inside the government. The issue is complicated by other polemics used by the proponents of tiger farming, such as "true cultural values" and "Western hostility" and lobbying of "Western pharmaceutical companies".

On October 29, 2018 the government of China legalized internal trade in tiger bone and rhino horn from the captive breeding facilities by introducing the Notification No. 36. The statement reads as follows:

> *"Rhino horns and tiger bones used in medical research or in healing can only be*
> *obtained from farmed rhinos and tigers, not including those raised in zoos.*
> *Powdered forms of rhino horn and bones from dead tigers can only be used in*

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[2] The text in Chinese was translated by a colleague who is Mandarin native speaker. The style and wording were saved

qualified hospitals by qualified doctors recognized by the State Administration of

Traditional Chinese Medicine" (Government of China 2018).

With this Notification, the Government of China lifted the 25-year old ban on the trade in tiger bone and rhino horn from captive facilities, which has raised a big wave of concern and criticism from the international environmental NGOs, Western and Indian media, which expressed concern about the future of the largest wild tiger population (NDTV 2018; Shih 2018; Watts 2018; WWF 2018b). The newly introduced Notification would prevail all other legal provisions contradicting the new law.

With this new legislation, China has opened a new chapter in global tiger conservation, while outcomes and consequences are yet to be seen. However, several observations can be made already. Firstly, this is the second time when the Chinese Government re-opened the "Pandora's Box" of changing its national policies with regards to tiger breeding facilities, however, more successful this time. The first time China did that in 2007 but failed due to external pressure (as discussed in Section 2.5 above). This time, instead of approaching it publicly like before, China dealt with it as its domestic internal issue without prior consultations or announcements to the international community. Secondly, China was always open about its national plans in its governmental reports that it was implementing research on possible TCM use of tiger products from the breeding facilities, which was submitted during the CITES COP 16 and CITES CO17. Therefore, this news has not come as a game changer.

Interestingly, this legislation changes happened during the same month of October 2018, which was just a few weeks after the largest Illegal Wildlife Trade Conference in London and the 70-th CITES Standing Committee where the review on the implementation of Res. Conf.12.5 and the review of the Asian big cats' captive breeding facilities were presented.

China was present at all these events. It is evident that China is treating this issue as insignificant and internal, whereas any possible external criticism for the country might be somehow irritating, but not that substantial. However, several weeks after the announcement, Chinese government decided to delay the implementation of the internal decision until further investigation.

No doubt, there will be more "fights" to come in international arena on tiger and rhino breeding issues, particularly in CITES forum, as this legalization has become a notable change for the global wildlife conservation community. Wild rhino populations are also on the brink of extinction; however, the situation has just started to improve along with the restoration of rhino populations and law enforcement pressure in Africa and Asia on rhino poachers and traffickers. For now, the future of rhinos is not certain.

4. Discussion: way forward

Current situation with the Asian big cats and tiger breeding facilities in CITES brings the question of CITES Administrative body role in addressing most contentious issues in tiger conservation. The Secretariat seems to be hesitant to face complex issues and tends to avoid potential conflictive disputes. Such reluctance eventually leads to the stagnation of the problem and deadlock situation. It might seem that the Secretariat, playing a role of an acknowledged neutral third party, could have taken a more proactive role in resolving the issue of captive breeding and develop workable solutions instead.

Informal conversations with the CITES Secretariat representatives during CITES COP16 in Bangkok in 2013, and later during other international conferences on tiger conservation made clear that the Secretariat was concerned with very little response from the range countries and was working hard on motivating them to report. CITES, as a neutral third party with no

coercive power, cannot demand anything from the Parties if no sufficient information is provided in the reports. Moreover, there is a risk that if the Secretariat takes stronger stand on problematic issues, this could lead to an even lesser response in return, what could lead to compliance failure of the Res.Conf.12.5. Nevertheless, in the vision of the Secretariat, CITES should provide a platform for open discussions and give way to initiatives coming either from the Parties or from other external players, such as international organizations or acknowledged environmental NGOs. This current set up of roles in CITES on Asian big cats' global agenda allows the Secretariat to keep the balance that more or less accommodates the majority of Range states with different positions and gives a way to other actors to push the boundaries on certain issues. However, such an arrangement does not help tigers' conservation overall by delaying or dwelling on some problematic issues for years from one CITES COP to another.

Current deadlock situation in CITES with tiger captive breeding could be analyzed through the prism of game theory applied to global conservation issues that typically involve groups with competing objectives and strategies (Colyvan *et al.* 2011). Global wild tiger conservation issue here perfectly fits the **tragedy of the commons** definition where there is under constrained consumption of **common pool resources** (Dodds 2005). Under these conditions each individual independently attempts to maximize personal gain from the common pool resource, whereas removal of resource resulted from its overuse is shared across all individuals (Colyvan *et al.* 2011). While attitudes to environmental values might differ across cultures, communal use of resources seem to follow the universal rules (Dodds 2005).

The solution to the common pool resources dilemma has traditionally been to impose top-down regulation for all resource users through sanctions, individual limits, incentives as in

the case of CITES, other conventions and commissions such as CBD and International

whaling Commission (Colyvan *et al.* 2011; DeSombre 2005; Dodds 2005). Put in the context

of wildlife trade regulation and CITES, the Convention oversees the **"game of chicken"**

where some players agree to cooperate while others might refuse or cooperate very little.

When applying this model to the tiger trade deadlock dilemma and CITES regulations, the

game represents a **multi-national cooperation model** with multiple players. The nature of

the game evolves with a time depending on the status and amount of the resource, the

consequences of the prior decisions and actions (Colyvan *et al.* 2011).

If conservation success requires all nations to cooperate completely, the game is multiple

player "stag hunt" where each party can unilaterally achieve result with less cost and

cooperative conservation is preferable. When using game theoretical reasoning to addressing

tiger trade dilemma in CITES context, it becomes evident that not all range countries have

been participating. Through the years very few range states (mostly India and China in the

forefront) and non-range states and international organizations have been responsive to

CITES requests to report and pushing certain agenda. Indeed, the tiger trade agenda evolved

around the captive breeding issue in CITES even though there has been very little response

from the range countries. This setting of the "game players" around the captive breeding

operations allows to define the nature of the game and brings to the conclusion that there

might not be big necessity for all range states to fully contribute into the game, despite

general concern from the Secretariat mentioned in CITES documents over the years. For

example, Russia, as the country with one of the most viable tiger populations, has not been

actively involved in CITES captive breeding discussions, while its wild tiger population

remained stable.

When effective enforcement of resource management is not feasible, the **free rider problem** arises, which comprises the **core of the tragedy of commons**. The users who would willingly reduce their use of resource, need to sacrifice for the benefit of the larger number of free riders. At the same time, if every user defects to regulate its use, this leads to overall conservation failure. In such situation, **cooperation, at least partial, is essential for successful common resource regulation** (Colyvan *et al.* 2011). Applied to the case of illegal tiger trade, China who is the major consumer of tiger products with a small national wild tiger population (in comparison with other range countries), is consuming the products of wild tiger populations from other countries until the resource (here - tigers) becomes extinct. Other countries with a larger tiger population and neighboring China would need to continuously sacrifice their tigers to supply the persistent demand from China. Thus, China represents an important player in addressing the tiger trade dilemma in CITES context as the major driver of tiger products consumption. Therefore, it is crucial to motivate China to cooperate, while it might not be necessary to motivate all other players as their overall contribution to tiger trade consumption is insignificant in comparison with the one emanating from China. In line with this logic, **failure to motivate China to cooperate in CITES context would significantly diminish the countermeasures for illegal trade and the trafficking of tigers**. In the long run this scenario could lead to general tiger conservation failure. Moreover, criticizing China would also not yield big results, as proven in 2007 when China tried to publicly discuss the legalization of tiger trade from breeding facilities, while later China internally simply introduced the new legislation without prior public announcements in October 2018.

Coming back to CITES context and following the logic of chicken game model, to achieve result in resolving the issue and moving away from the current stumbling block, either China as a separate player or opposing to captive breeding Parties would need to yield. Suppose

opposing to captive breeding Parties would yield, the conservation result is unpredictable as it is unclear whether completely approving captive breeding would benefit wild tigers due to continuous demand, leakage of illegal tiger parts to the black market, non-transparent management of captive breeding facilities and supposedly legalized trade of tiger part. This can happen only after all regulations are in place, transparent certification scheme for tiger parts is developed and agreed, all other necessary conditions for legal trade are met. As of present state, very few of these conditions are met. It would take years to develop, agree and provide them technically, financially and legally (given that certain national legislation is adopted). While these requirements would become fulfilled, the global agenda would keep on stagnating as it happened in the past and the wild tiger populations would continue to perish fortified by the constant illegal leakage of tigers from the captive breeding facilities. At the same time, the potential illegal consumer would receive mixed messaging on the official government position in China (or any other country with breeding operations) with regards to trade in tiger parts.

Suppose China yields its position and agrees to close captive breeding facilities or at least significantly reduce them and make their management more transparent, efficient and non-threatening to wild tigers. In this case, there would be less potential illegal tiger parts entering the trade and no negative criticism of China, what has been described in its national media as an attempt to interfere into China's internal affairs and a threat to China's TCM industry. Additionally, transparency in China's tiger captive operations would significantly soften the criticism from the international community inside CITES and outside from the environmental NGOs. Another benefit is that it will perfectly fit new "Ecological Civilization " course of the Chinese government, which is now an inseparable part of the 13th Five-year plan for the Government of China (please see chapter VII, section Discussion: reintroduction feasibility in China for more details).

In a situation when tiger breeding operations are strongly regulated and transparent, there would still be pressure on wild tiger populations due to continuous demand for tiger parts from China. Nevertheless, there would be significantly less tiger parts entering the trade based on the number of live tigers' seizures in the last years. One might argue that it would put more pressure on wild tiger populations due to the absence of captive bred tiger parts on the market. However, it is quite challenging to measure yet, given that personal consumption of tiger parts in China is prohibited. Thus, removing parts of captive tigers from the market would send consistent messaging to consumers in China (or any other countries using tiger products) that the government strongly disapproves of the consumption of tiger parts and does not allow any leakage from the breeding facilities. This would dissuade consumption and eventually benefit to wild tiger population. This would also benefit China in the long run by reducing western focus on the captive breeding debate.

5. Conclusion

Analyzing the development of tiger trade agenda in CITES from the very inclusion of tigers and later Asian big cats in CITES and developing separate CITES Conventions and Notifications, the following conclusions can be made with regards to the Convention and its role in addressing tiger trade issue. These conclusions can be separated into negative and positive ones for tigers in general.

Problematic issues of the Convention with regards to addressing tiger trade:

1. Constant lack of reporting by the range states in response to the requests of the CITES Secretariat has been contributing to the problem of compliance with the Convention by the range states. Concerns with regards to compliance have been brought up by the Secretariat and CITES Parties at the CITES CoP9, CoP11,

CoP15, CoP16 and very recently at the CITES CoP17 in Johannesburg in October 2016.

2. Complicated and unclear language of the Convention as well as unclear reporting guidelines for the range states outlined in the Resolution 12.5 Rev.CoP17 with regards to Asian big cats contribute to the problem of consistent lack of compliance by the range states.

3. Some country reports for the Res.Conf. 12.5 (Rev. CoP16) on Asian big cats provided by the range states lack transparency and scientific evidence. These are, for example China's numbers on tiger population that have been continuously diminishing, China's efforts on management of captive breeding facilities or India's efforts on law enforcement to crack down on tiger poaching and illegal trade. This brings to the conclusion that Convention does not fully monitor and control the actual situation with tiger trade on the ground.

4. Political sensitivity of certain problematic issues, especially on management and transparency of captive breeding facilities, constraints from open dialogue on global prevention of illegal tiger trade in CITES and development of innovative approaches to address the problem. Moreover, this situation has led to a current deadlock in CITES when little constructive dialogue is happening, and unresolved issue keeps travelling from one Conference of the Parties to another.

5. International relations and current political agenda define decisions and priority focus of CITES documents emanating from the CoPs and meetings. This relates to the India's concern in the past with too much critique of its national efforts to address tiger poaching and favoring China on certain aspects.

6. CITES Administrative body does not play a leading role trying to resolve the issues of concern, but rather delaying them till other CITES CoPs or meetings. This relates to watering down contentious issues in the Secretariat's Notifications and continuous postponing of the captive breeding issue throughout the years.

Strengths of the Convention with regards to addressing the problem of illegal trade and the trafficking of tigers:

1. Despite challenges, CITES remains one of the most powerful international treaties in tiger conservation due to its implementing power by the enforcement agencies of the signatory countries.

2. CITES does effect national wildlife conservation efforts due to the pressure of the international community. This relates to the shaming of India tiger conservation efforts at the CoP12 and following India's better practices and Russia's enlisting of timber species in 2008 that are paramount for tiger habitats.

3. Despite sensitivity and complications, CITES provides a platform for open discussions among the countries, international organisations and environmental NGO's on intricate issues. This allows to push the boundaries in finding innovative solutions for old problems and address the issue.

4. CITES Res. Conf. 12.5 (Rev. CoP16) provides a framework for assessment of country's efforts to address illegal tiger trade that allows to identify challenges on a national level and highlight best practices.

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5. Game theory analysis applied to CITES context and CITES platform for discussion provides an opportunity for moving forward with the current deadlock situation on addressing tiger crime globally.

Chapter VI. Fighting on the front lines: range countries' efforts

1. Introduction

Present chapter focuses on the assessment of best practices and challenges in tiger range countries in addressing illegal trade and the trafficking of tigers. It takes stock from the analysis of global policy efforts and contributes to answering the second research question from the aspect of on-the-ground measures taken by the tiger range countries.

For assessing the countermeasures for tiger related crime, the author applied the framework of the CITES Res. Conf. 12.5 (Rev. Cop16). This framework was also suggested to the TRCs by the CITES Secretariat for self-assessment on the implementation of CITES with regards to Asian big cats at the CITES SC65.

The assessment framework has the following key elements that constitute the main parts of the Resolution:

1. Progress in legislation and regulatory measures with regards to Asian big cats and the tiger trade;
2. Law enforcement activities;
3. International cooperation among the countries;
4. Recording and analysis of data on illegal trade and killings;
5. Activities on reducing demand and building awareness among the local population and prevention of trade from captive breeding facilities and/or privately held stockpiles.

In the present chapter, the author focuses on these key elements of the Convention with regards to tigers and limited in scope to tiger range states only.

2.   *Legislative and regulatory measures*

The Resolution urges the range and consumer states "to adopt comprehensive legislation and enforcement controls which clearly define the administrative responsibilities of various government agencies responsible for regulating trade" in tiger species in the protected areas and beyond, such as shops, markets and etc. (CITES 2013a). Also the Resolution urges the Parties willing to improve their legislation to adopt adequate penalties to halt the illegal trade and facilitate the implementation of the Convention "such as voluntarily prohibiting internal trade in parts, derivatives and products" including those claiming to contain tiger products (CITES 2013a).

Table 16: Evaluation (as of July 2018) of national legislation specific to CITES implementation in tiger range and non-range consumer states

Tiger range states	Evaluation of national CITES implementing legislation	Non-range consumer states*	Evaluation of national CITES implementing legislation
Bangladesh	2	Canada	1
Bhutan	3	Denmark	1
Cambodia	1	France	1
China	1	Germany	1
India	2	Japan	1
Indonesia	1	The Netherlands	1
Lao PDR	3	Republic of Korea	1
Malaysia	1	Singapore	1
Myanmar	2	UK	1
Nepal	2	US	1
Russian Federation	1		
Thailand	1		
Viet Nam	1		

*Non-range consumer states were identified through seizures analysis in CITES trade data and EU-TWIX databases managed by the European Union (source: CoP17 Doc. 22 Annex 3 (Rev. 1), CITES 2016)

Table 16 shows categories for countries under CITES project evaluating National Legislation as of July 2018 (CITES 2018b). The project prescribes four main requirements for Parties' domestic measures to implement CITES (CITES 2016b, 2018b):

i) designate at least one Management Authority and one Scientific Authority;

ii) prohibit trade in specimens in violation of the Convention;

iii) penalize such trade;

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iv) confiscate specimens illegally traded or possessed.

According to these requirements member Parties fall under one of three main categories (CITES 2016b):

> 1st category: legislation is believed generally to meet all four requirements for effective implementation of CITES;

> 2nd category: legislation is believed generally to meet one to three of the four requirements for effective implementation of CITES;

> 3rd category: legislation is believed generally not to meet any of the four requirements for effective implementation of CITES.

As shown on Table 16, all tiger range and consumer-states are the members to CITES. Out of thirteen range states, six require improvements to effectively implement the Convention. Countries in Category 1 still have a significant level of illegal tiger trade as per seizure reports from the government agencies, NGOs and the media.

While analysis showed that range and consumer states have restrictions in trade in wild sourced tigers, this does not necessarily apply to captive bred tigers. For example, China has practices supported by the Government of trading skins from captive bred species (Nowell 2010; EIA 2014).

Russia, Bhutan and Viet Nam increased penalties for crimes related to tigers in 2013. Bhutan increased penalties with regards to the tiger and snow leopard, the penalties are different depending on the type of body part (Nowell 2018). Viet Nam introduced a maximum financial penalty for illegal wildlife trade up to USD 87,000 and raised the maximum prison sentence from seven to fifteen years (Nowell 2018).

In 2014, China strengthened its local legislation with regards to the consumption of products made of endangered species stating that eating or buying such products for any purposes will be deemed as a criminal offence with a jail term of five to ten years (Nowell and Pervushina 2015).

Table 17: Maximum penalties for wildlife crime involving tigers and other Asian big cats in 2018 (source: CITES SC70 Doc. 51 Annex 4)

Party	Maximum jail sentence	Maximum financial penalty (USD)
Cambodia	5-10 years	According to wildlife product valuation notifications
China	Life imprisonment	$1,68 million
India	7 years	$415
Indonesia	5 years	$7,476
Japan	5 years	$1,04 million
Lao PDR	5 years	$1,225
Malaysia	7 years	$255,820
Myanmar	10 years	$38 (under current revision)
Nepal	15 years	$96,300
Thailand	4 years	$1,282
Viet Nam	15 years	$87,600

With regards to other countries and their penalties for crime involving tigers and other Asian big cats, the findings are presented in Table 17. It is evident that a more thorough analysis is needed for assessing the legislation mechanisms and penalties on crimes against tigers across Asian countries.

With regards to challenges in legislative and regulatory measures, several countries were put in the spotlight. For example, even though India has a massive amount of regulations in regards to protection of endangered species and prevention of wildlife trade, its financial penalties date back to 1972 which might not be a strong deterrent in present circumstances (Nowell 2018; Nowell and Pervushina 2015). Cambodia, for example, protects its wildlife under more general forestry and environment regulations, that are not clearly defined and specified (Nowell and Pervushina 2015).

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Another challenge exists in Indonesia, where only the sub-species of tigers (Sumatran and Javan, the latter is now extinct) are listed in national laws and regulations for killing, transportation and trade in endangered species. Therefore, a DNA or isotope test should be in place for identifying sub-species after law enforcement agencies have made a seizure (Stoner and Pervushina 2013).

Figure 21: A tiger skin offered for sale was tagged with a government certificate for domestic trade in China (B after Panthera tigris Altaica refers to bred in captivity) (source: Nowell and Pervushina 2015)

Figure 22: Government certificate for tiger skin, which appears to be authentic as it was posted on a website of a company granted governmental license (source: Nowell and Pervushina 2015)

China's State Forestry Administration (SFA) issued several Notifications approving several enterprises and businesses allowing trade in wildlife products affixed with a certain mark. Despite the fact that Chinese legislation stipulated that trade in Asian big cats should be restricted to non-commercial activity only, the copies of certificates issued by government and websites of approved companies offering tiger products did not have reference to this restriction (Figure 21) (EIA 2013b; Nowell and Ling 2007; Nowell and Pervushina 2015).

Additionally, copies of certificates for tiger skins had very low resolution and little picture size which did not allow in distinguishing a pattern in identifying the animal even if it was labeled and came from a licensed tiger farm (Figure 22) (EIA 2013b).

As widely known in wildlife conservation, each tiger has a specific stripe pattern on its fur, similar to human fingerprints. It is unclear how permitted sales are monitored and controlled by the Chinese government, which creates criticism towards China's government with regards to its internal policies as discussed in Chapter V.

3. *National law enforcement*

The Resolution urges the Parties, especially range and consumer states "to introduce innovative methods", strengthen enforcement efforts in border regions and further develop enforcement networks (CITES 2013a).

Several global activities have been held with regards to strengthening enforcement against illegal tiger trade. One of them was organized by INTERPOL in Singapore in November 2015 where ten tiger range countries and various organizations agreed on Transnational Enforcement Strategy to combat tiger crime. Even though the strategy included the word "strategic" on many occasions throughout the text, the strategy document was not different from other previous international agreements with generic recommendations, no affiliation to any action and responsible party.

In 2013 and 2018 Nepal reached a "Zero Poaching" year when no tiger was killed during those years (Himalayan News Service 2018). This was due to organized patrols of army soldiers and rangers from the Department of National Parks and Wildlife Conservation (DNPWC) in Chitwan National Park (CNP) (home to most of the tiger population in Nepal).

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CNP is also historically popular for engaging closely with the local communities on anti-poaching, preventing illegal wildlife trade and organizing ecological tourism (Nowell and Pervushina 2015).

Several tiger range countries are actively using anti-poaching patrol software in tiger range areas called SMART (Special Monitoring and Reporting Tool). This open source software is used for monitoring, measuring, evaluating and improving the effectiveness of wildlife enforcement patrols and site-based conservation activities (SMART Consortium 2016). The following countries are using SMART at present: China, India, Lao PDR, Malaysia, Myanmar, Thailand, Nepal and Vietnam (Nowell and Pervushina 2015).

Inter-agency anti-poaching ranger squads focused on tiger conservation activities are regularly operating in Thailand and Russia. Large support for anti-poaching work from various international NGOs is happening in Lao PDR, Indonesia and Myanmar. Another good practice is introducing national level multi-agency enforcement networks addressing wildlife crime as recommended by CITES (CITES 2013a). Such networks are in place in China, Lao PDR, Nepal and Vietnam (Nowell and Pervushina 2015).

Lack of forensics tools and forensics capacity across Asia has been identified as a challenge to the law enforcement in country reports (Nowell and Pervushina 2015; Stoner and Pervushina 2013). Forensics plays an important role for effective crime investigation by helping to identify the origin of the species and enhancing prosecutorial ability. Sometimes forensics is crucial for choosing the punishment as in the case of Indonesia mentioned above where only certain tiger sub-species is under the protection of national law.

4. *International cooperation*

CITES Res. Conf.12.5 (Rev. COP16) urges the Parties to cooperate on the law-enforcement and conservation efforts through bilateral and multilateral agreements and arrangements. Most range states are members either of either ASEAN-WEN (wildlife enforcement network for ASEAN[3] states established in 2005) or SAWEN (wildlife enforcement network for South Asia countries established in 2012). An exploratory workshop has been held in 2013 on the establishment of West Asia WEN, however, it has not yet been created.

ASEAN-WEN has eight member countries: Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam with its headquarters in Bangkok, Thailand. The aim of the network was to coordinate law-enforcement efforts for member states and strengthen the response to wildlife crime in the region. Even though Southeast Asia has a very high level of illegal wildlife crime, the network is not very productive, to say the least. The last ASEAN-WEN action plan and action plan report was published in 2012. Judging from the ASEAN-WEN website and verbal consultations with regional wildlife trade experts, the network did not play a coordinating role in organizing transborder law-enforcement events or pushing forward any collaborative proactive actions on the ground, but merely a role of collecting seizures data from member states. However, Thailand is best represented and most active member, probably due to the fact that the network HQ is based in Thailand.

SAWEN has eight member countries: Afghanistan, Bangladesh, Bhutan, Nepal, India, Maldives, Nepal, Pakistan and Sri Lanka with the headquarters based in Kathmandu, Nepal. Two of the member states (India and Nepal) have good success on the ground with wildlife

CEU eTD Collection

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[3] ASEAN member states are: Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

conservation and law enforcement efforts, these countries also have the largest tiger populations among the SAWEN members. In 2015, Bhutan, announced that it had higher tiger population than previously anticipated (103 tigers up from the previous estimate of 75) (Press Association 2015).

Successful nature conservation efforts of its members explain a more active position of SAWEN with updated actions plans and reports with the most recent progress on the ground published on the SAWEN website. The network has law-enforcement initiative such as "Trilateral Transborder Wildlife Interception" focusing on the India-Nepal-China border and several others. SAWEN also faces difficulties due to bureaucratic and political complications of its member states on national levels. For example, the SAWEN statute document has been endorsed only by four member states (India, Nepal, Sri Lanka and Pakistan) (SAWEN 2016). This leaves the rest of the states as unofficial members with less responsibility and less activity concerning SAWEN in these countries.

Table 18: Ratified and non-ratified international agreements on conservation, wildlife trade control (source: CITES SC65, Doc. 38)

Established (ratified)	In development (not ratified)
Bangladesh and China	Afghanistan, China, Kyrgyzstan and Tajikistan
Bhutan and India	China and Indonesia
Cambodia and Vietnam	China and Vietnam
China and India	India and Myanmar
China and Nepal	India and Russia
China, India and Nepal	Kyrgyzstan and Tajikistan (other ABC range states)
China and Russia	Malaysia and Thailand
India and Nepal	
Indonesia and Vietnam	

Russia and China are not official members of any WEN, although China has unofficial cooperation with both ASEAN-WEN and SAWEN, while Russia has transborder agreements on tiger conservation with neighboring China (Nowell and Pervushina 2015). There are several bilateral and multi-lateral cooperation and enforcement agreements among tiger range states on wildlife trade and conservation as presented on Table 18.

Additionally, there are other framework agreements among the states, such as between China and Russia or India and Russia on specific customs transborder regulations that might relate to wildlife trade agreements.

5.   *Recording and data analysis*

The Resolution urges the countries "to implement systems for the recording of information relating to illegal trade in Asian big cats and to share this information as appropriate to ensure coordinated investigations and enforcement" (CITES 2013a).

Most of the tiger range countries record and collect data on tiger poaching and seizures, but it is not usually in any standardized format that can be shared. Regardless of financial and technical resources provided for tiger legislation globally, there is still no centralized data collection center within the states. Similar constraints refer to the global data collection center on tiger seizures. Even though the CITES Secretariat collects data provided in the reports by the range states, this data does not reflect the full picture due to the low level of response from range states.

INTEPROL hosted a project "Predator" that aims at enhancing governance and law enforcement capacity to address the poaching and trade in Asian big cats species. One of the activities of the project is to collect and analyze data and provide investigative support to range states (INTERPOL 2017). In 2014 INTERPOL published an analysis of tiger seizure records across range countries which gave recommendations and identified major trends as well as to informed other range states about the progress of tiger investigations (INTERPOL 2014). However, report findings with somewhat scattered data proved that the "Predator" project was still far from creating a unified central database on criminal records for tigers. Additionally, based on the informal conversations with country representatives during the

meetings, very few range countries are providing seizure data through official channels due to various reasons.
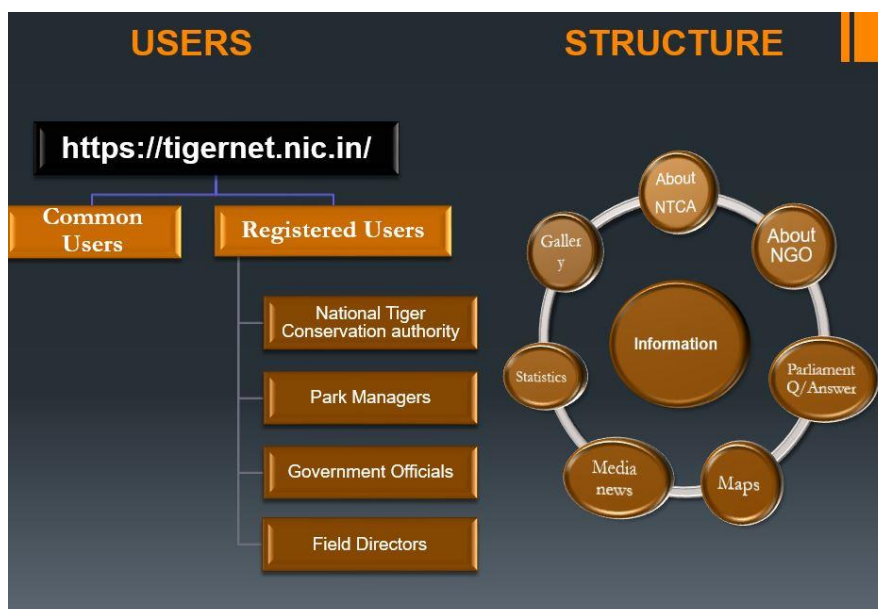
Figure 23: Tigernet users and structure description (source: Author's presentation "Creating consolidated database on tiger mortality and poaching in Indonesia" at the Harimau Kita (tiger conservation) Forum Fifth Annual meeting, 21-23 December, 2014.)

As for tiger trade database on national level among tiger range countries, India stands out with Tigernet open database as a good practice. Tigernet is an online public database of mortality and illegal trade seizures of tigers and other wildlife. It is the first consolidated database in India on mortality and poaching related to tigers and other protected species within tiger reserves (NTCA and TRAFFIC 2017). The database has several levels of security on inserting data from forest wardens, officers from NTCA, park managers and government officials. All database cases of seizures and mortality of Tigers that appear on Tigernet are verified by the NTCA and other Indian authorities. Tigernet is currently the only example of a tiger database, which is open to the public and supported by government agencies (see Figure 23).

However, Tigernet could be improved. For example, the system indicated separately the cases of mortality and poaching. However, there is no follow up on poaching cases as seen in

2016. All twenty-two seizure cases for 2016 on Tigernet were under "details awaited" with no specification of causes of death or any follow up. This means that none of the seizure cases for 2016 have been investigated and led to conviction or simply the Indian government was not willing to provide any details. At the same time, the numbers for tiger mortality for 2016 were much higher than tiger poaching cases (29 cases versus 7 cases), whereas 53 cases did not have any follow up details. This means that the difference between tiger killings and tiger poaching on Tigernet was very unclear, whereas Indian government officials tended to report on tiger mortality rather than on tiger poaching which showed a lower crime rate in their respective district and would probably bring less urgency in investigating cases.

6.   *Demand reduction, education and awareness*

The Resolution recommends to "work with traditional medicine communities and industries to develop and implement strategies for gradually reducing and eventually eliminating the use of Asian big cat parts and derivatives" as well as "to carry out appropriate education and awareness campaigns to eliminate the illegal trade" in Asian big cat parts (CITES 2013a).

A study focused on analyzing the demands for wildlife products was carried out by TRAFFIC in 2008. The results confirmed that the **most common factor driving the demand for tiger products is the use in traditional Chinese medicine**, especially in China (Linacre and Tobe 2008; Nijman and Shepherd 2015; Nowell 2010; Nowell and Ling 2007; Stoner and Pervushina 2013; Tobe and Linacre 2011; TRAFFIC 2008; Verheij *et al.* 2010). Such demand also exists in the Republic of Korea, Singapore, Malaysia, Vietnam and Japan (TRAFFIC 2008).

When analyzing the entire tiger trade chain, demand study concluded that most of hunting was done by professional or semi-professional hunters who sell directly to traders, whereas

the trade is driven by wealthy consumers (TRAFFIC 2008). Some portion of tigers is killed in the result of human-tiger conflict by local communities with further aim to sell the products on the black market, however most of the tigers are killed deliberately for commercial purposes (Nijman and Shepherd 2015; Nowell 2007; TRAFFIC 2008).

THE FIVE STEPS TO BEHAVIOUR CHANGE

Figure 24: The Five steps to behavior change for wildlife products (source: TRAFFIC)

Demand reduction (also referred to as behavior change in tiger conservation documents, these are different terms for behaviorists) is different from the general understanding of awareness raising. When awareness raising only deals with providing the information to the public (be it any type of information on the legislation change, impact on species population or anything else) it does not usually lead to any action. Awareness raising is therefore the first step to changing behavior of the public (Zain 2012).

As for behavior change for wildlife products, this subject has been high on the wildlife conservation agenda for the last five or six years for the environmental organizations, especially with regards for highly-endangered wildlife species such as tiger, rhinos, elephants, marine turtles and others. Based on the behavior change theory, the following steps were identified for behavior change model for wildlife products: identifying the behavior, understanding the influences by audience, developing a practical model of influences on

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behavior, building a marketing strategy to trigger the desired behavior and developing a communications strategy and campaign to support the strategy (Zain 2012) (Figure 24).

Some range countries have taken the initiative with implementing demand reduction in their countries. For example, in 2013 Vietnam launched a GEF-funded project based on the workplan designed by the government and NGOs to introduce a campaign and activities aimed at reducing the demand for wildlife products. However, it is not clear yet whether these events have had any effect on internal tiger consumption.

China has also taken several demand reduction activities on national and provincial levels. Behavior change projects have been the priority for China's internal NICE-CG (national level inter-agency coalition established in 2011 aimed at combating wildlife trade).

7. *Prevention of trade from captive breeding facilities and privately held stock-piles*

With regards to captive breeding facilities the Resolution urges that "those Parties and non-Parties on whose territories tigers and are bred in captivity to ensure that adequate management practices and controls are in place to prevent parts and derivatives from entering illegal trade from or through such facilities" (CITES 2013a). With regards to stockpiles, the Resolution urges that "those Parties and non-Parties on whose territories there exist stocks of parts and derivatives of tiger (such as tiger bone stocks) to consolidate and ensure adequate control of such stocks, and where possible destroy the same, with the exception of those used for educational and scientific purposes" (CITES 2013a).

There are two types of tiger stockpiles: parts and derivatives seized by the authorities which belong to the State and stock held by the private entities (Nowell and Pervushina 2015).

Private entity stocks usually hold pre-Conventional or pre-National ban items (as in the case with China) as they have been acquired when such operations were permitted. Management of privately-held stocks is not prescribed by the Resolution.

Back in 2007, China reported to the CITES Secretariat that circa 625 kilos of pre-National trade ban tiger bones have been held by provincial level agencies across the country (Nowell and Ling 2007). At the same time, only China has publicly announced that stock-piling of post-conventional/post internal trade ban by private entities was permitted.

As per government reports on stockpile management, some countries keep tiger stockpiles, such as Thailand and Malaysia. Other countries decided to destroy their stockpiles such as Nepal, Lao PDR and Vietnam. No other range state, apart from Nepal, has reported on the current size of their stockpiles, thus the information on the volume of national held stockpiles is scarce and incomprehensive.

Despite international documents on captive breeding, parts and derivatives from captive bred animals are entering the illegal market. This has been confirmed in the latest tiger seizures analysis reports published by TRAFFIC, INTERPOL and EIA (EIA 2016b; INTERPOL 2014, 2015; Stoner and Pervushina 2013; Stoner *et al.* 2016).

Table 19: Best available information on captive and wild tiger population in countries with the most captive breeding facilities

Countries with the most number of captive breeding facilities	Wild population (WWF, 2016)	Captive tiger population (2016) (data for China, Thailand, Laos and Vietnam from EIA (EIA 2016b)	Captive tiger population (2018) CITES SC70 Doc. 51 Annex 2 (Rev. 1)
China	>7	6,000	6,057
Laos PDR	2	435	380
Thailand	189	1,450	1,595
Vietnam	<5	241	186
USA	0	Circa 5,000 (year of 2014)	2,727
South Africa	0	280 (year of 2015)	186
Total in the countries	203	Circa **13,406**	11,131
Total globally	3,890		12,574

There was no accurate data on the exact number of captive breeding facilities and captive tigers in Asia. EIA states that there are at least 200 captive breeding facilities across Asia (EIA 2013a). These centers vary in size and conditions for tigers and house circa 8000 animals (with approximately 1300 tigers in Southeast Asia and the rest in China) (Stoner *et al.* 2016). At the same time, there are at least 44 tiger breeding facilities in South Africa, housing approximately 280 tigers (Table 19).

Over the years CITES have been issuing documents requesting transparency on management of captive breeding facilities and stockpiles. Only at the latest 70th CITES Standing Committee held in October 2018 the Secretariat published the review of breeding facilities for all Asian big cats. According to these estimations, 12,574 animals are kept in 1,038 facilities across 68 countries, whereas 49% of animals are held in East Asia, 22% in Northern America, 18 % in Southeast Asia and only 3% in South Asia (CITES 2018a). Table 19 shows the findings from the latest CITES report. It should be stressed that even though the official CITES reports are much more recent than the findings estimated by NGOs in 2016, the official number of tigers is still lower. Given that majority of these facilities in Asia are not registered, the current final number might be much higher.

There is some success in the range states. Thailand has made the biggest ever seizure of captive tigers in 2015 when 100 live tigers were seized in a Tiger Temple, known as Wat Pa Luang Ta Bua, in Kanchanaburi Province. The temple has been a high attraction point for tourists. The seizure gained worldwide attention and was depicted in many global media sources (Guynup 2016; Stoner *et al.* 2016). This caused a further investigation by Thai authorities and led to a removal of another 137 live tigers and confiscated 60 frozen and preserved tiger cubs in May 2016. The raid started as the result of NGO and media

investigations of temple's involvement in the illegal tiger trade and animal abuse. After these seizures the authorities announced their plans to inspect 30 similar facilities in Thailand. This case has not yet reached the prosecution stage (Nowell 2018). More seizures have occurred since then in 2016 and 2017 in Thailand what can be regarded as strong will of law enforcement to investigate the illegal tiger trade.

At the sixty-seventh CITES SC meeting in September 2016, Laos PDR Minister of Natural Resources and Environment announced about the country's intention to phase out tiger and bear farms (WWF 2016b). The official announcement came out after the Laotian government had been criticized by CITES for the lack of action in addressing the severe situation with illegal tiger trade in the country (Dasgupta 2016). Indeed, tiger crime analysis reports mention Laos as one of the major trade hubs in the golden triangle region (especially in the Golden Triangle special economic zone) with international wildlife criminal gangs also operating in Thailand and Vietnam (Nowell and Pervushina 2015; Stoner and Pervushina 2013; Stoner *et al.* 2016). In May 2018 the Prime-Minister's Office issued an order on strengthening the regulation of captive bred facilities, prohibiting trade in Asian big cats and forbidding the establishment of new facilities (Nowell 2018).

8.   Conclusion

The key elements of the CITES Res. Conf. 12.5 present a fine framework for the general assessment of countries efforts in addressing illegal tiger trade problem. Based on surface comparative assessment, the following conclusions can be made:

1. With regards to best practices India, Nepal, China and Russia can share their practices in addressing tiger trafficking. The countries have progressed in

adopting legislative and regulatory measures, national law enforcement, international cooperation and recording data analysis.

2. Given the fact that China remains the destination country for the majority of the all seized tiger products, the national government still must reinforce its efforts in addressing the issue, especially with regards to reducing the demand from the Chinese population. Management non-transparency and complications related with China's national captive breeding facilities and privately held stockpiles raise major concern and questions from the international community with regards to the country's success in tiger conservation practices. A decision has to be made on a higher level with regards to the official stance on these facilities, which has been somewhat unclear and purposefully pushed aside.

3. The so called Golden Triangle in South East Asia, especially border areas of Myanmar with Chin, Thailand and Laos PDR remain a major global trade hub for tiger populations.

4. Countries must adopt more good practices with regards to recording and data analysis for tiger seizure information. Even though existing practices might not be ideal (as in the case of Tigernet in India), such a database evaluates the situation with tiger poaching and trafficking on the ground and gives more information to the public about the status of tiger conservation.

5. International cooperation of the tiger range countries remains to be desired. Despite all the high level political commitments and International tiger meetings, law enforcement agencies are slow to share any sensitive information, if at all. Even though many environmental NGOs proactively lobby the support of

Wildlife Enforcement Networks (WENs) they do not tend to be very effective when it comes to addressing the problem effectively on the ground. Thus, there might be a need to reconsider the practical importance of such international transborder enforcement networks.

6. Demand reduction and awareness seem to be an effective mechanism in addressing the problem, however its long terms effects are not clear and sometimes raise questions from the skeptics, especially in academia.

7. Captive breeding facilities that have grown exponentially throughout Asia as well as USA, need to be better maintained due to many reasons. First, their management is non-transparent, and secondly, there is not an effective system to prevent the leakage of tigers into the illegal market from these facilities, which significantly boosts the number of seized tigers each year.

8. Amur-Heilong presents a solid study case for thorough analysis in terms of saving the Amur tiger population (due its viable stable population over the years) and addressing the tiger trade as the result of highlighted best practices in the TRCs assessment.

Chapter VII. Amur-Heilong and Amur tigers

1. Introduction

This chapter moves away from the analysis of global practices in addressing illegal trade and the trafficking of tigers to an in-depth analysis of the Amur-Heilong. The current chapter aims to answer the third, final, research question of the dissertation, namely:

How successful are the countermeasures for illegal trade and the trafficking

of tigers in the Amur-Heilong region?

The case study analysis is broken into two main parts that are presented by the current chapter and the following Chapter VIII. The first part aims to provide the situational analysis of the Amur-Heilong region, while the second part is devoted to the assessment of the countermeasures for tiger related crime, including field work findings and application of the indicators framework.

Even though Amur-Heilong region has been widely covered in academic literature in Russia and China, a limited amount of academic literature is available in English. Data for this chapter was taken from Russian language sources that were translated into English by the author. Similarly, scarce amount of English language sources was published by Chinese scholars on the subject. Most of the English language publications utilized in this chapter were published by the international environmental organizations, individual regional experts, national and regional research institutions or other inter-governmental bodies.

The present chapter shows desktop research results that are schematically put on Figure 2. The chapter merges the findings from qualitative and quantitative research techniques such as participant observations, interviews and spatial analysis, as well as regulative documents

analysis. The chapter provides situational analysis of the region, including the assessment of environmental problems, such as logging, fires and illegal trade in wildlife resources. Special attention is paid to current governmental policy context between Russia and China, as well as tiger conservation framework in both countries. Findings of the current chapter set the scene for further analysis of the counter-measures taken in Russia and China. These findings are presented in the following chapter.

2. Amur-Heilong region

Amur-Heilong is the eleventh largest river basin in the world and the longest river in the Eastern Hemisphere with an approximate length of its main channel of 4,444 kilometers (Simonov and Dahmer 2008). Unlike many rivers in Siberia that run from the north to the south, Amur-Heilong runs from the west to the east to the Tatar strait to the sea of Okhotsk which makes the river peculiar. With a total basin area of more than 1,850 square kilometers, the river encompasses three countries: Russia, China, and Mongolia. Amur-Heilong is one of the world's longest river borders. Between Russia and China it stretches over 3,000 kilometers. Sparsely inhabited basins on the Russian and Mongolian side strongly differ from the densely-populated Chinese side.

The Amur-Heilong basin boasts some of the world's most outstanding ecosystems and most charismatic plants and animals as the result of the intensive and lengthy merge of fauna and flora species. Interpenetration of species occurred mainly in the valleys and main tributaries of the river that have different types of landscapes: desert, steppe, grassland, taiga, mix-broadleaved coniferous forests and tundra (Ptitsyn 2007). This factor contributes to the exclusiveness of Amur-Heilong biodiversity. Basin flora accounts for 9,000 species of vascular plants, whereas fauna - around 700 species of vertebrate animals, about 135 species of fish including the world's biggest freshwater fish – Kaluga (*Huso dauricus*). Many wildlife

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species are recognized as globally threatened by the IUCN Red List (Andronova *et al.* ; Darman *et al.* 2003; IUCN Red List 2015; Pervushina 2011; Ptitsyn 2007; Simonov and Dahmer 2008). The region hosts the most diverse temperate forests, vast grasslands and wide fertile belts of wetlands. Only the Russian Far East ecoregional complex possesses about 50% of the species richness of Russia and about 5% of all species living on the planet and contains some of the richest temperate forests in the world (Bocharnikov *et al.* 2004; Darman *et al.* 2003).

2.1 Population density

Estimates of the total region population accounted for approximately 80 million people according to various estimations (Voronov 2007). Circa 75 million reside on the Chinese side where population density is high, and settlement is scattered; the rest is spread across the Russian and Mongolian sides: 5 million people in Russia and around 50,000 people in Mongolia (Voronov 2007). The population density and land use on the Russian side is so scarce that the Russian government introduced a law allowing Russian citizens to borrow one hectare of land for five years for free on the territory of nine Far Eastern provinces in 2016 (Government of Russia 2015). This normative act is supposed to motivate further land development and attract more population.

The Russian side has the following administrative division: five administrative units on Russian side (Primorsky (or Primorye) and Khabarovsky provinces, Evreisky (or Jewish) Autonomous Province, Amursky and Zabaikalsky provinces.

Three administrative regions are located on the Chinese side (Heilongjiang, Jilin and Inner Mongolia provinces), two of which have been suffering from desertification for the last thirty

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years (Karakin 2011a). From Mongolian side of the Amur-Heilong region, there are two provinces: Hentiy and Dornod.

Even though the history of human settlement in the Amur-Heilong region is relatively short, the damage done by the excessive resource exploitation in the twentieth and twenty-first centuries severely depleted natural resources, as well as the capacity of some renewable resources (fisheries, wetlands and forests) to recover, especially on the Chinese side (Darman *et al.* 2003; Karakin 2011a; Pervushina 2011; Ptitsyn 2007; Simonov and Dahmer 2008).

2.2 Environmental problems

Amur-Heilong has environmental problems that are mainly caused by the anthropogenic factor (Karakin 2011a; Simonov and Dahmer 2008; Simonov *et al.* 2011; Voronov 2007):

- Unsustainable timber logging;

- Forest fires;

- Illegal hunting and poaching;

- Water ecosystem pollution from untreated/not-properly treated wastewater from agriculture, industrial and community services activities;

- Development of urbanized landscapes, especially on the Chinese side;

- Unsustainable fishing;

- Industrial and agricultural construction;

- Economy, forest and water management un-adapted to ecological standards;

- Non-developed network of protected areas (PA) (according to the last WWF estimates: 16% of total region area under PA are on China side, which covers 6.4 million hectares; only 9% - on Russian side, which comprises 15.800 million hectares) (Lomakina 2010; WWF China 2017; WWF Russia 2017).

- High population density in the region on the Chinese side.

Out of these transformation and destruction of historically formed ecosystems, productivity and biological diversity are of the most concern (Itigilova *et al.* 2007; Karakin 2011a; Voronov 2007). These factors led to a cumulative decrease in quality and ecological capacity of natural resources. If the region were viewed from the river basin perspective, its current environmental condition would have been regarded as close to critical, and in lower Amur-Heilong as critical (Karakin 2011a). Nature use, water use, illegal timber logging and fishing are not balanced in providing the resilience capacity for the ecosystem (Simonov *et al.* 2011).

2.2.1 Logging and fires

Unsustainable legal and illegal logging, fragmentation of intact forests and fires pose a serious threat to regional biodiversity (Karakin 2011a; Simonov and Dahmer 2008). The problem of illegal logging started to have a severe effect after the collapse of the Soviet Union when the system of government forest management was in ruins. Instead, liberalization of forest trade and forest industry privatization emerged (Simonov and Dahmer 2008). The Russian government no longer had a monopoly over forests. According to WWF Russia estimates dating eight years, about 1.5 million cubic meters of timber were cut illegally in Primorsky province alone (Simonov and Dahmer 2008). The problem is especially severe in Russia due to a combination of reasons: imperfect legislation and forest policy; inadequate control of forest operations; limited capacity for wood processing in Russia; unsustainable behavior of large timber traders; low standard of living and high unemployment in wood-producing areas (Simonov and Dahmer 2008).

Domestic Chinese policies such as a local logging ban in 1998, coupled with rising domestic consumption have led to a dramatic rise in the Russian-Chinese timber trade. In the meantime, while China has become the world's largest importer of wood products and

exporter of wooden manufactories, Russia has been by far China's most important supplier (WWF Russia 2007). As a frequent practice, large-scale illegal logging and timber exports from Russia are associated with corruption, tax and customs violations. This contributed to the stable growth of suspect companies in Russia to meet Chinese demand.

Most of the Russian Far East hard timber species have high economic value on the world timber market, such as Mongolian oak (Quercus mongolica), Manchurian ash (Fraxinus mandschurica), Japanese elm (Ulmus propinqua), Amur linden (Tilia amurensis) and Manchurian linden (Tilia manshurica). Most of logged timber goes for export to Asian Pacific countries, but many finished products such as Chinese produced furniture and flooring are destined for US, Japanese and EU markets (WWF 2014). This goes in violation of relevant legislation such as US Lacey Act, EU timber regulations, and Japanese Green Purchasing Policy. WWF Russia's investigation of the illegal logging in 2014 showed that regional forest management had become deeply criminalized allowing illegal loggers to steal large volumes of high-value timber species with impunity (WWF 2014; WWF Russia 2017).

Forest fires have the most wide-spread impact factor for forests, wetlands, and grasslands in the region. Over 1 million hectares of forest was destroyed by fires in the Russian Far East in 2016, which is more than 4 times more than in the previous year, according to TASS News Agency (TASS Dalnii Vostok [ТАСС Дальнии Восток] 2016). The most effected provinces on the Russian side are Amursky and Khabarovsky provinces (TASS Dalnii Vostok [ТАСС Дальнии Восток] 2016). Poor logging practices on the Russian side when loggers left behind loads of dry fuel, extensive network of access roads in the forest, abandoned fields with dry grasses, uncontrolled collection of non-timber forest products, careless recreation and burning of hayfields lead to the development of forest fires (Simonov and Dahmer 2008). The situation has worsened by climate change impacts and lack of precipitation in the region

during the last years. Illegal logging and fires affect the whole forest ecosystem including its integrity and biodiversity (such as highly vulnerable tiger, roe deer, wild boar, bear and Siberian spruce) (Simonov and Dahmer 2008; WWF Russia 2017).

2.2.2 Illegal trade in wildlife resources

The problem of regional illegal trade in wildlife (often referred to as "biological resources" in Russian literature) has been mainly covered by the NGOs or educational and training institutions for government agencies such as Customs, Police, Border Services, hunting control departments in Russia and wildlife management and forestry management departments in China. The cases of illegal wildlife trade and wildlife seizures have been often covered in the media, such as local newspapers or television. There has been more coverage in textbooks or methodological guidance books for law enforcement and forestry officers working on the ground, than for analytical research for scientific purposes.

Illegal hunting and poaching, including illegal collection of wild plants, impose a serious threat to flora and fauna in the Amur-Heilong, especially on the Russian side due to its rich biodiversity. The pressure has intensified with the growth in density of population, development of trade, and advances in technology. Poaching and smuggling involved more than 160 species of wild fauna and flora in the Russian Far East (Lyapustin and Fomenko 2015; Lyapustin and Pervushina 2016; Lyapustin *et al.* 2010; Simonov and Dahmer 2008). Many of these species are enlisted in the International and National Red Data books.

The following socio-economic factors have affected the wildlife trade situation in the region: rich and unique biodiversity; close proximity to Asian markets with diverse and high demand for such products; increasing demand resulted from growing wealth; impoverishment of rural communities on both sides; unemployment; deterioration of welfare systems of the post-

socialist era; cessation of the government regulated wildlife trapping industry in Russia; inefficient legal systems and inadequate management capacity of customs and wildlife enforcement agencies (Lyapustin *et al.* 2007; Lyapustin *et al.* 2010) (Figure 25).

External factors
- TCM demand
- CN population growth
- Asian wealth growth
- Asian market proximity

Poaching & wildlife smuggling

Internal factors
- Rich biodiversity
- Impoverished regions & unemployment
- Cessation of trapping industry in the 90-s
- Inefficient legislation
- Weak government control
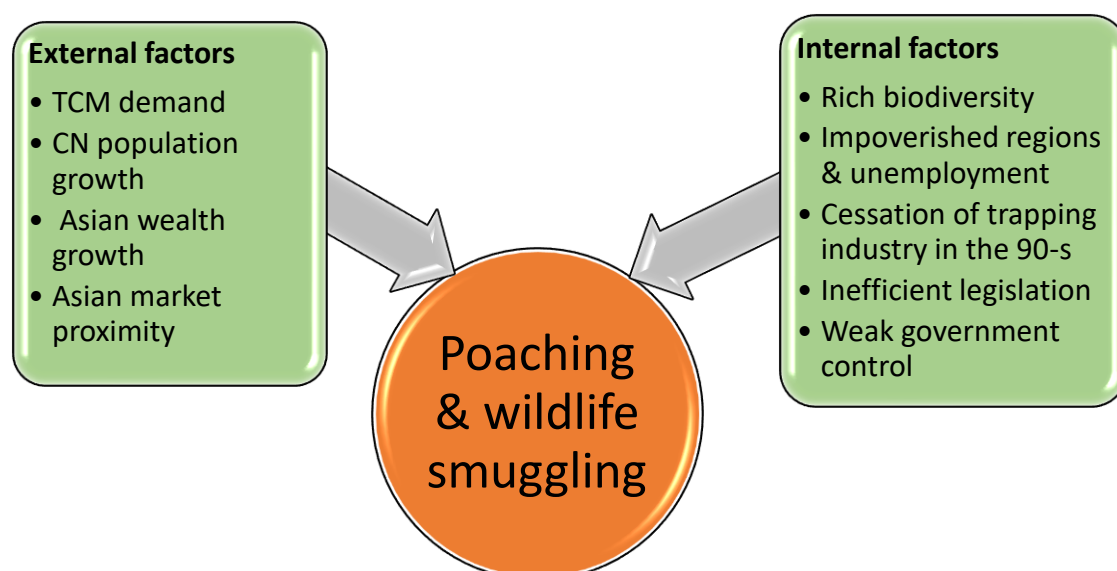
Figure 25: Socio-economic factors effecting wildlife crime in the Amur-Heilong region

A significant part of the regional analysis on wildlife crime and relevant government control was published by regional experts from the Vladivostok branch of the Russian Customs Academy. The last review of regional wildlife poaching and trafficking was published in 2015 (Lyapustin and Fomenko 2015). The authors argued that the problem still persists despite the tightening of administrative and criminal regulations in Russia. However, wildlife poaching was significantly reduced. The number of incidents of poaching and trafficking in the Amur tiger and Amur leopard has significantly decreased in comparison with previous years (Lyapustin and Fomenko 2015).

During the years of 2003 and 2008, the regional customs authorities halted 10 attempts of illegal transportation of the Amur tiger parts, while during the year of 2009 and 2014 there were only 4 seizures (Lyapustin and Fomenko 2015). This has been the result of the law enforcement authorities' work in Russia, such as Ministry of Internal Affairs (Police), Federal

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Security Service (known as "FSB") and Federal Customs Service (FCS), as well as special authorized government services responsible for protection, regulation and federal management of wildlife (Lyapustin and Fomenko 2015). During the period from 2009 to 2014 the Far Eastern Customs implemented 305 seizures related to the illegal trade and the trafficking of wildlife, including endangered species (Lyapustin and Fomenko 2015).

Biodiversity and wildlife species availability defines the nature and characteristics of wildlife trafficking per region and province in Russia. For example, Primorsky and Kahabrovsky provinces are characterized by the presence of poaching of Amur tigers and Amur leopards (only in Primorsky) for their parts and derivatives. Other species poached in two provinces are Ussuri brown bear (Ursus arctos lasiotus) and Asiatic black bear (Ursus thibetanus), Siberian musk deer (Moschus moschiferus) and other deer species such as Siberian roe deer (Capreolus pygargus) and red deer (Cervus elaphus), tree frog (Hyla), toads, snakes, Chinese soft-shell turtles (Pelodiscus sinensis), as well as Asian ginseng (Panax ginseng C.A. Mey) (Lyapustin and Fomenko 2015). Whereas Magadan, Kamchatka and Chukotka, and Sakha (Yakutia) are characterized by the presence of illegal trapping of Saker falcons (Falco cherrug). Kamchatka and Chukotka are the source sites for walrus (Odobenus rosmarus) tusks and Sperm whale (cachalot) (Physeter macrocephalus) teeth.

No wildlife trade review on the Chinese side of the Amur-Heilong region has been found, only some press-releases of local NGOs. Several experts' publications were published in Russian, but only from the perspective of wildlife poached in Russia and illegally transported to Northeast China.

2.3 Current policy context

With the political crisis in Ukraine in 2012, followed by the Western sanctions against Russia and recession caused by a sharp decline in prices for oil and raw materials on world markets, the combined GDP of the Eurasian Economic Union (EAEU) countries dropped by 3 % in 2015 (3,8 % drop in Russia) (Xin 2016). To compensate for losses caused by the Western economic blockade, Russia and EAEU member countries strengthened their collaboration with the Shanghai Cooperation Organization (SCO), ASEAN and the Government of China.

According to other views, Russia failed it's post-Soviet prospects in becoming a legitimate partner in the European integration process and to become an equal member of the West (Korolev 2016). As a result, Russia shifted its interests towards Asia to establish and lead the creation of a transcontinental Eurasian space (Korolev 2016). Therefore, Russia's aspiration to strongly integrate into the Eurasian continent is not just a development project, but rather an intention to reaffirm Russia's role on the continent and an effort to define its Asian identity, rather than trying to hedge against China as often depicted in the literature (Wishnick 2017).

The results of this major geopolitical and economic reorientation have yet to be seen. This initiative might face the same fate as previous Kremlin's initiatives due to low effectiveness of Moscow's policies (Simonov and Egidarev 2017). Several mega-scale cooperative Asia oriented projects failed by the end of 2016. One of them is the Programme of Cooperation of Russia's regions of East Siberia and Russian Far East with North East China for the period of 2009-2018, most of the objectives have not been fulfilled (Simonov and Egidarev 2017; Simonov *et al.* 2011).

As for China, with the rapid and massive industrialization process that came after the Great Leap Forward in late 1950s and Campaign of Following the Example of Dazhai in Agricultural Development introduced by Mao Zedong in 1960s, irreversible damage was done to nature, accompanied by soil and water erosion in China (Pan 2016). Slowly the Chinese government started to develop the concept of Ecological civilization which was first introduced in 1973 during the first National level Environmental Protection conference (UNEP 2016). Only in 2012, the concept of "Ecological Civilization" was officially elevated to the level of national strategy of governance and, four years later, it was incorporated as an essential part of the 13th Five-Year plan (UNEP 2016). The concept encompasses the principles of efficient utilization of natural resources and energy, reducing pollution emissions and adopting sustainable development (Pan 2016).

In September 2013, Chinese President Xi Jinping announced the national initiative to create the Silk Road Economic Belt (SREB) and a twenty-first century Maritime Silk Road in cooperation with ASEAN countries that China officially calls "One Belt, One Road" (Xin 2016). The initiative promotes trade, international investment, infrastructure development and sharing China's industrial capacity with more than 60 countries, which is viewed by China's government as a plan for continental economic integration (Dong 2015; Simonov and Egidarev 2017; UNEP 2016).

Figure 26: Geographic coverage of One Belt - One Road initiative (source: Sidaway and Wood 2007)

"One Belt, One Road" project is aimed at a free flow of economic sectors, efficient allocation of resources and deep integration, encouraging the involved countries for broader and more balanced regional collaboration that benefits all (Xin 2016). Whereas, SREB focuses on linking China, Central Asia, Russia and Europe (to the Baltic Sea), also linking China with the Persian Gulf and the Mediterranean Sea through Central and West Asia; and connecting China with Southeast Asia, South Asia and the Indian Ocean (Sidaway and Woon 2017; Xin 2016). "Financial Times" called this initiative China's "road to empire" through new Silk Road projects, naming it the most massive project of the economic diplomacy since US-led Marshall plan of Europe's reconstruction after the World War II (Clover and Hornby 2015). Indeed, the scale is massive: 900 deals underway, worth US 890 billion, such as a gaspipeline from the Bay of Bengal to Southwest China and rail line between Beijing and Duisburg, Germany (Sidaway and Woon 2017).

The initiative is expected to have a strong influence on the resource exploitation and the natural environment across Eurasia (Dong 2015). It is not with surprise to observe that "One

Belt – One Road" initiative has been adopted in parallel with the "Ecological Chinese Civilization concept". Given the pace of previous Chinese industrialization, accumulated financial and political resources on par with the country's global involvement in large-scale development and resource extraction projects, it might mean that China is seeking the ways to export environmentally -un-friendly production to other areas with weaker government controls (Simonov and Egidarev 2017; Xin 2016). This brings the subject of "Ecological Chinese Civilization" as opposed to any civilization somewhere else, such as the Russian Far East, East Siberia, or South East Asia and Africa. These vast areas remain resource-rich and industrially not or lesser developed, located just across the border from resource-hungry China.

2.4. Russian-Chinese nature conservation legal framework

The first agreement between Russia and China on environmental issues was "On cooperation in protection of the natural environment" signed in 1994. This was a general agreement, focused on environmental issues (Simonov and Dahmer 2008). However, the agreement was not implemented as the result of low interaction between the agencies on both sides, low prioritization of environmental issues for Beijing and Moscow, and no clear strategy (Simonov and Dahmer 2008). In 1996, Russia and China signed the agreement on the creation of a transborder protected area "Lake Khanka" (or lake Xingkai in Chinese) (Rabochaya gruppa po voprosam transgranichnyh ohranyaemyh prirodnyh territorii i sohraneniya biologicheskogo raznoobraziya [Рабочая группа по вопросам трансграничных охраняемых природных территорий и сохранения биологического разнообразия] 2017). Later there was a "Memorandum on Tiger Protection" signed in 1997, which was intended to prevent poaching, smuggling, and illegal trade in tigers and their parts, but it was never fully implemented (Simonov and Dahmer 2008). In 2013, another agreement was signed between Russia and China on migratory birds and their habitats.

"Treaty on good neighbor relations, friendship and cooperation" between Russia and China signed by the Heads of State in 2001 became the first agreement, which had practical follow up. Only in 2004 there was an "Action plan for implementation of the Treaty on good neighbor relations, friendship, and cooperation for 2005-2008" signed by Putin and Hu Jintao. Despite expressed intentions, the action plan, however, had no clear instruments for implementation (Simonov and Dahmer 2008).

The Songhua chemical spill became a starting point for a new greener and cleaner mode of collaboration between two countries. Apart from general environmental agreement, other bilateral agreements were signed focusing on fisheries, water, energy, forestry and fires prevention.

A special Russian—Chinese working group on transborder protected areas and biodiversity was created in 2007. The working group operates under the umbrella of Russia-China sub-commission on nature protection. The working group organized 10 collaborative meetings during the period of 2007 to 2016 (Rabochaya gruppa po voprosam transgranichnyh ohranyaemyh prirodnyh territorii i sohraneniya biologicheskogo raznoobraziya [Рабочая группа по вопросам трансграничных охраняемых природных территорий и сохранения биологического разнообразия] 2017). In light of China's "One Belt-One Road" initiative and establishment of Russia, China and Mongolia transborder economic corridor, new agreements focusing of biodiversity conservation, protected areas and wetlands preservation were signed in 2016.

Several provincial level agreements have been agreed upon between Russia and China. One of them is the collaboration agreement on Amur tiger and Amur leopard conservation between the Forestry Department of Heilongjiang province in China and Hunting Estate

Department of Primorsky province signed in 2013. Another multi-agency agreement between the Forestry Department of Heilongjiang province and several environmental protection agencies of the Primorsky and Amursky province on transborder conservation of natural resources was signed in 2016. There is a number of bilateral agreements between the bordering national parks and nature reserves, such as, the agreement between National parks in Hunchun, Jilin province, and recently created national park "Land of Leopard" on the South of Primorye (Amur tiger and Amur leopard main) (Rabochaya gruppa po voprosam transgranichnyh ohranyaemyh prirodnyh territorii i sohraneniya biologicheskogo raznoobraziya [Рабочая группа по вопросам трансграничных охраняемых природных территорий и сохранения биологического разнообразия] 2017).

3. Amur tigers

Amur tiger is the world most northern sub-species of a tiger (*Panthera tigris altaica Temminck,* 1844). It primarily inhabits Russia, where the population was restored significantly after a major drop of as few as 20-30 animals in the wild (IUCN Red List 2015).

In early-19th century the Amur tiger was present in Amur, Jewish Autonomous, Primorsky and Khabarovsky regions, but was extirpated significantly as the result of unregulated poaching and hunting from the early-19th century to late 1930-s (Ministry of Natural Resources and Environment of the Russian Federation 2010). The total ban on Amur tiger hunting was introduced in the Soviet Union only in 1947. This allowed for recovery and stabilization of the population, albeit the habitat became fragmented (Ministry of Natural Resources and Environment of the Russian Federation 2010). From the 1960s up to 1990s tigers recolonized most of its old range in Sikhote-Alin in Russia. A population censuses conducted in 1995 and 2005 showed that tigers were present across all forested areas within their range in Sikhote-Alin and that the range was no longer fragmented (Ministry of Natural

Resources and Environment of the Russian Federation 2010). Detailed description of the history of the Amur tiger population and range in the Russian Far East is provided by Russian tiger biologist Pikunov in his works in English and Russian (Pikunov 2015).
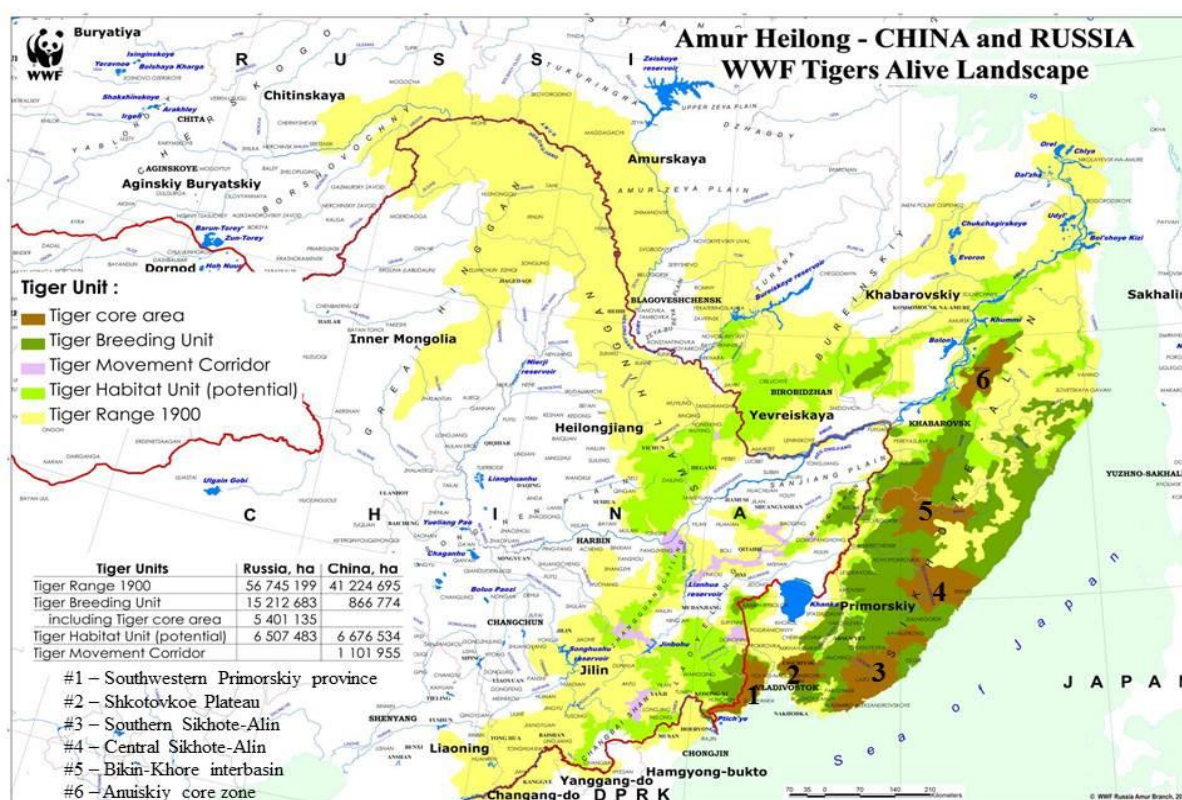
Figure 27: Historic and current Amur tiger range (source: WWF Russia 2016)

Figure 27 illustrates the historic (in 1990) and current Amur tiger range (geographical distribution of the species) in Russia, China and Korean Peninsula with identified core tiger breeding areas and movement corridors. The current total size of the Amur tiger range in Russia approaches 180,000 km^2 (Amur Information Center 2018; Ministry of Natural Resources and Environment of the Russian Federation 2010). With the increase of the range and tiger population, especially in the South-western Primorye, tiger movements between the mountainous forests of Russia and China became more frequent which required special attention for saving the animals (Ministry of Natural Resources and Environment of the Russian Federation 2010).

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As for the Chinese side, during 1970s, tigers were still present in the Greater Khingan Mountains and west Wandanshan Mountains. By late 1990s, tigers were found only in east Wandashan Mountains, eastern part of Jilin province and border region of Jilin-Heilongjiang province (WCS 2007). Currently in China, the Amur tiger is only present is small forested areas of Heilongjiang and Jilin Provinces mainly on the border with Russia (Figure 27) (WCS 2007). As for South Korea, the tiger has been extinct for over 50 years and its current presence is uncertain (IUCN Red List 2015; WCS 2007).

Amur tigers prefer mixed cedar pine and broad leaf forests, oak forests and broad-leaf and riparian forests. The key parameters to determine the quality of the Amur tiger habitat are suitability for the main tiger's prey and level of human impact (Ministry of Natural Resources and Environment of the Russian Federation 2010). Its main diet are mostly ungulates, wild boar, and red deer, roe deer and sika deer. In seasons with little or no snow, tigers can prey on Himalayan or brown bear, badger, raccoon and dog (Ministry of Natural Resources and Environment of the Russian Federation 2010). The well-being of the Amur tiger is considered secure if there is an availability of 400-500 large ungulates in the tiger's range, however this is not common everywhere (Ministry of Natural Resources and Environment of the Russian Federation 2010).

Latest monitoring results show that the number of large ungulates is continuously declining in Russia together with capacity due to the degradation of natural habitats (Ministry of Natural Resources and Environment of the Russian Federation 2010). If the tiger is facing a shortage of prey, it will supplement it by killing and eating livestock by leaving forests and introducing itself into human settlements. This kind of tiger behavior leads to human-tiger conflicts and may result in the tiger being illegally shot or removed from the wild (Ministry of Natural Resources and Environment of the Russian Federation 2010).

3.1 Amur tiger population

Tiger numbers in Russia have been recorded in a special register in Russia since 1949, while the first full range tiger census was implemented in 1959 (Ministry of Natural Resources and Environment of the Russian Federation 2010). Full range Amur tiger census is organized in Russia every ten years, while partial census in special monitoring plots (sample areas) is organized regularly throughout the year (WWF 2015). Every new entire range census improves the range coverage information, data collection and processing. In March 2005 a special decree No. 63 was issued by the Ministry of Natural Resources to set the "Methodical Recommendations for Conducting and Organization of the Amur tiger Census in the Russian Federation" (Ministry of Natural Resources and Environment of the Russian Federation 2010).
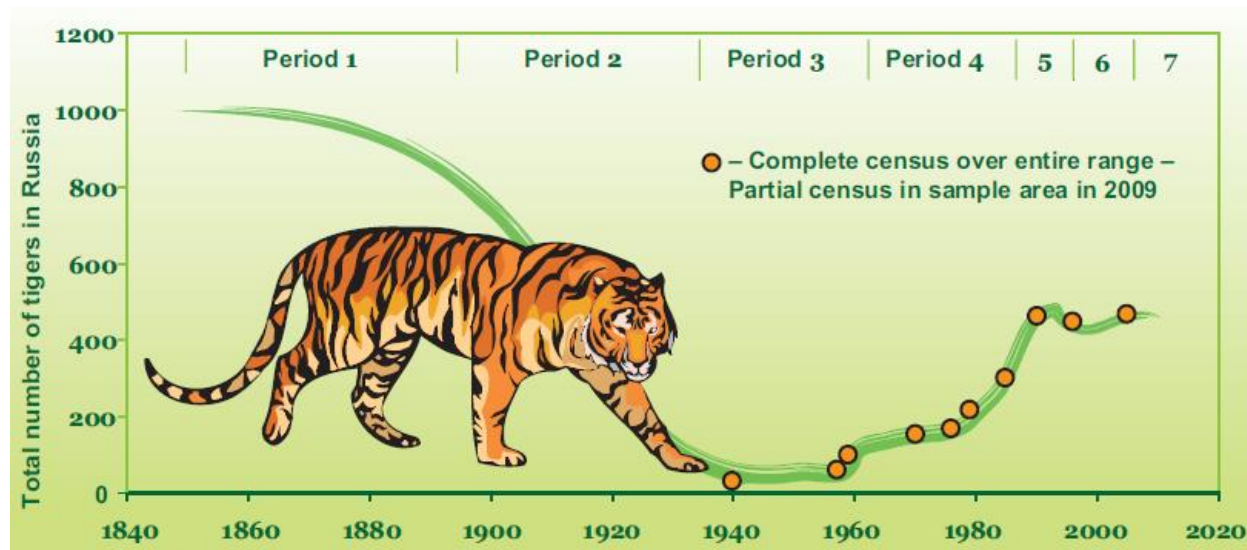
Figure 28: Amur tiger population in Russia (source: Ministry of Natural Resources and Environment of the Russian Federation 2010)

The last entire range tiger census in Russia was organized in 2015 and showed a population increase up to as many as 540 animals, with around 100 of these known to be cubs born within the last ten years (WWF 2015) (Figure 28). Previous census organized in 2005 showed that there were between 423 to 502 individuals. 2015 census covered over 150,000 square kilometers and involved over 2000 specialists in field research (WWF 2015).

A genetic analysis of the Amur tiger population in Russia shows that a genetically effective population is low and represents only 35 animals, which is 15 times smaller than the actual population (Ministry of Natural Resources and Environment of the Russian Federation 2010). According to available genetic research, there are only two genetically distinct tiger populations within the Russian range (Ministry of Natural Resources and Environment of the Russian Federation 2010). These are Sikhote-Alin and Southwestern population groups separated by the extensive industrial development along the Razdolnayar River (Ministry of Natural Resources and Environment of the Russian Federation 2010). Even though genetic loss is common for most of the large cats species due to sharp population decline and irreversible degradation of the sub-species, these facts require further research for the long term conservation of the Amur tiger (Ministry of Natural Resources and Environment of the Russian Federation 2010).

3.1.1 The Amur tiger's future in China: reintroduction plans

Chinese government officially announced that it will organize an entire range tiger census next year after Russia (WWF 2015). However, until now it has not yet been organized. Official statistics shows that China's Amur tiger population has 20 individuals, while IUCN and WWF states it to be >7 based on field data (IUCN Red List 2015).

Official announcements were made about the plans to return tigers back to Northeast China that were included into the "National Siberian Tiger and Northeast Leopard conservation project plan (2016-2025)" endorsed by the SFA, according to Xinhua news agency, official press agency of the People's Republic of China (Yusu 2016). The plan is to reintroduce tigers from tiger breeding facilities in Northeast China to Taipinggou National Nature Reserve in Heilongjiang Province by 2020. This reserve is planned to become the first site for the reintroduction of captive bred Amur tigers according to the official news agency reports.

Figure 29: China's new Amur Tiger and Leopard Park (source: Standaerts 2018)

The Chinese Government has been straight-forward and deliberate in implementing its plans. In 2017 the Government announced the creation of the Northeast tiger and Leopard park in Changchun on the border with Russia and North Korea (People's Government of Jilin Province 2017). The newly created park, which will be 60% larger than Yellowstone National park, it will start operations in 2020 and could potentially support 75 tigers according to experts' estimates (Figure 29) (Standaerts 2018).

To create enough space for these tigers, the Government is planning to relocate 70,000 to 80,000 local residents. Some first steps have already been made by the Government: implementing of the regional logging ban to restore critical habitats of Korean pine, Amur linden, birch, scrub oak and elm; banning of regional mining projects, introduction of educational programs for local residents to ensure peaceful co-existence of people and predators, and the creation of the eco-managers from the local villages for regular snare removal (Standaerts 2018).

It should be stressed that the snare problem has been mentioned by a Russian tiger expert Pavel Fomenko during interviews, as a major obstacle for potential tiger reintroduction and restoration of tiger prey in China. Given current ambitious plans of the Chinese Government, previous situations with illegal logging, and previous level of poaching and tiger population on the Chinese side, these proactive measures will certainly contribute to the future restoration of the tiger population.

Discussion: reintroduction feasibility in China

Despite announced optimistic plans to reintroduce captive tigers into the wild in China, it should be stressed that historically it has been rare when captive animals managed to survive in the wild after being released. This especially relates to a solitary predator, such as tiger who learns to hunt prey, survive in the forest and avoid humans for about two and a half years after birth (Seidensticker and Tops 1993). Based on conversations with tiger biologists in India, there are successful examples of releasing captive Tiger cubs into the wild in India, when animals continued to strive and breed. However, this required special technical equipment, vast territory and special training for tigers from the very early days to make sure that animals learn to hunt and don't get too accustomed to humans.

In August 2008, the author had a work trip to Harbin with a Russian ecologist delegation and visited Siberian tiger Park in Heilongjiang province, which is currently the largest tiger breeding facility in China. At the time of the visit, visitors were not allowed to take photos, however were given a very detailed tour around the park and could observe the animals. From the author's memories, the overall impression was quite gruesome. The animals seemed to be sedated as they were non-active yet looking well fed (it was impossible to identify or find out if there was any medication given to the animals). The tigers were lying in packs on small patches of land surrounded by a barbed wire fence. The animals were ignorant to the

visitors, who were cruising around them in queues in jeeps, and not paying much attention to what was happening around them. The author also observed a small jeep driving among the animals and throwing out live chickens. The tigers paid no or very little attention to the chickens and seemed to have no desire to eat. It was hard to estimate whether this was a normal behavior for a predator in the middle of the day, or if it was the timing of the visit, or the animals were over-fed, hence no interest in the chickens.

Overall, the visit left an impression of a farm, rather than a park with one of the biggest predator in the animals' kingdom. Given these impressions, it is hard to evaluate the feasibility of the current Chinese Government's plans to reintroduce Amur tigers from breeding facilities, unless there have been dramatic changes in tiger parks management since 2008 or new special facilities were constructed for further reintroduction of tigers into the wild.

Little information was found on this topic in available Government reports, apart from the comments from the WWF China experts that the government launched special academic working groups of national tiger experts to research wilderness training and requirements for releasing captive tigers into the wild (Yusu 2016).

3.1.2 Conservation strategy in Russia

Given the scale and seriousness of Amur tiger poaching and smuggling in the Russian Far East in 1990s, the Federal Government developed a National program on "Amur tiger conservation" in 1997. This program was based on the Amur tiger Conservation strategy endorsed in 1996 (State Committee of Russian Federation on Nature Conservation *et al.* 1997). The first goal of the strategy was to halt poaching and smuggling of tiger parts and derivatives, then followed by other goals such as creating tiger habitats, restoring tiger prey

base, awareness raising of the local population (State Committee of Russian Federation on Nature Conservation *et al.* 1997).

The 1996 strategy was replaced in 2001 by the general Federal strategy "Ecology and Natural Resources of Russia" for 2001 - 2010. In 2001 strategy, Amur tiger conservation activities were included into sub-program for the conservation of rare and endangered species such as Amur leopard, polar bear, sea otter, walrus, fur seal and all cetaceans. However, this time the strategy was more generic and not specific as the previous one. These efforts in late 1990s and early 2000s led to the restoration of the Amur tiger population what has been proven by tiger monitoring results over the years.

The current Amur tiger Conservation strategy of the Russian Federation is an 88-page document, which was approved by the Ministry of Nature Resources (Order No. 25-p on the 2[nd]July 2010). It gives a detailed description of the status, distribution, threats, conservation priorities and measures taken to conserve the species. The document provides detailed multi-stakeholder plans (including government agencies and nature conservation NGOs) for tiger conservation until the year 2020 with a certain timeline, responsible stakeholder and expected outputs (Ministry of Natural Resources and Environment of the Russian Federation 2010). The document considerably stands out from the previous strategic documents on tiger conservation in Russia and shows stronger governmental commitment and responsibility. The approval of the strategy coincided with the year of tiger according to Chinese calendar and the first global Ministerial meeting on tiger conservation organized in Saint Petersburg in 2010.

Another big step for tiger conservation was the establishment of the "Amur Tiger Center" in 2013 by the Russian Geographic Society at the initiative of the President of the Russian

Federation Vladimir Putin (Amur Tiger Center 2013). The center is an autonomous non-commercial organization, which aims to enhance tiger related research, coordinate joint efforts on conservation, preserve and increase population and establish a harmonized relationship with the residence. The center has its own charter and supervisory council consisting of the Deputy Prime Minister and other high level governmental officials and senior officials of major corporations. Judging from the scope, high level politicians and wide coverage of activities described in the annual reports of the center, the Amur Tiger Center has high political support at Federal and regional levels as well as significant financial backing.

3.2 Major threats

Most modern literature on Amur tiger conservation is covering the problems related to tiger preservation and increasing the current population in Russia. As for Chinese tiger population, most of the available literature from Chinese experts is focused on the reintroduction of Amur Tigers to China and securing safe living space for them. Therefore, when talking about the current Amur tiger threats, a major part of the discussion should be built around the threats for tigers on the Russian side. Similarly, these threats would be pertinent for the current tiger populations in China, including future re-introduced tigers and similar habitats on the both sides of the Amur-Heilong habitat.

A wide spectrum of threats to Amur tiger has been described in the Strategy for Conservation of the Amur Tiger in the Russian Federation approved by the Ministry of Natural Resources and Environment of the Russian Federation in 2010 (Ministry of Natural Resources and Environment of the Russian Federation 2010). The document does not use the word "threat", however mentions an extensive list of "limiting factors" that are divided into direct (poaching and necessary removal of tigers) and indirect (forest fires, logging, roads infrastructure,

human population density and hunting activity) (Ministry of Natural Resources and Environment of the Russian Federation 2010).

As for the international NGOs working on Amur tiger conservation, they use the word "threat". The main threats mentioned by NGOs are poaching as the result of illegal wildlife trade, habitat loss, illegal hunting of ungulates and road construction (Amur Information Center 2018; WCS Russia 2018; WWF 2015).

3.2.1 Direct threats

As for direct threats, the strategy describes removal of animals from the wild for educational and scientific purposes (e.g. zoos, circuses and etc.), illegal removal from the wild (including occasional and intended, which is driven by the trade for skins and other tiger products). After the early 1990s illegal removal of tigers from the wild grew much larger in scale as the result of reduced control by law enforcement agencies inside the country and on the border, more accessible firearms, greater demand from Chinese traders and wealthy Russians, as well as a complicated economic environment pushed locals to search for alternative sources of income.

At present, the reason for the illegal removal of tigers from the wild remained the same, albeit the exact number of tigers killed every year cannot be identified, even though it is still quite significant and affecting the tigers' ability to strive (Ministry of Natural Resources and Environment of the Russian Federation 2010). Among other reasons for intentional illegal removal are retaliatory killings for killed livestock; unintentional shootings when encountering humans and attacking them (the number of humans killed by tigers is relatively low – on average one human death every two years within a 40 year period) and, finally, intentional killing of a tiger to get rid of a competitor for ungulates on hunting grounds by

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locals or professional hunters (Ministry of Natural Resources and Environment of the Russian Federation 2010). A dead Amur tiger had no monetary value in Russia until the beginning of the 1990s. A carcass of a killed tiger was most likely left in the forest if there was an accidental killing.

Other direct limiting factors are necessary shootings of problematic tigers, disturbing factors (e.g. usage of logging roads in the forest by locals and tigers, Korean pine nuts collectors, hunters killing tiger prey) as well as spread of contagious diseases.

3.2.2 Indirect threats: range assessment

As for indirect limiting factors, the strategy mentions reduction and destruction of tiger habitats resulting from economic development. These include clear felling that change the natural habitat and eliminate a food resource base for main tiger prey (ungulates and wild boar), construction of roads and other infrastructure, hunting and poor game management (Ministry of Natural Resources and Environment of the Russian Federation 2010). Road construction causes the fragmentation of tiger habitats, raises the disturbance factor, and increases the number of tiger and ungulate deaths on the highways.

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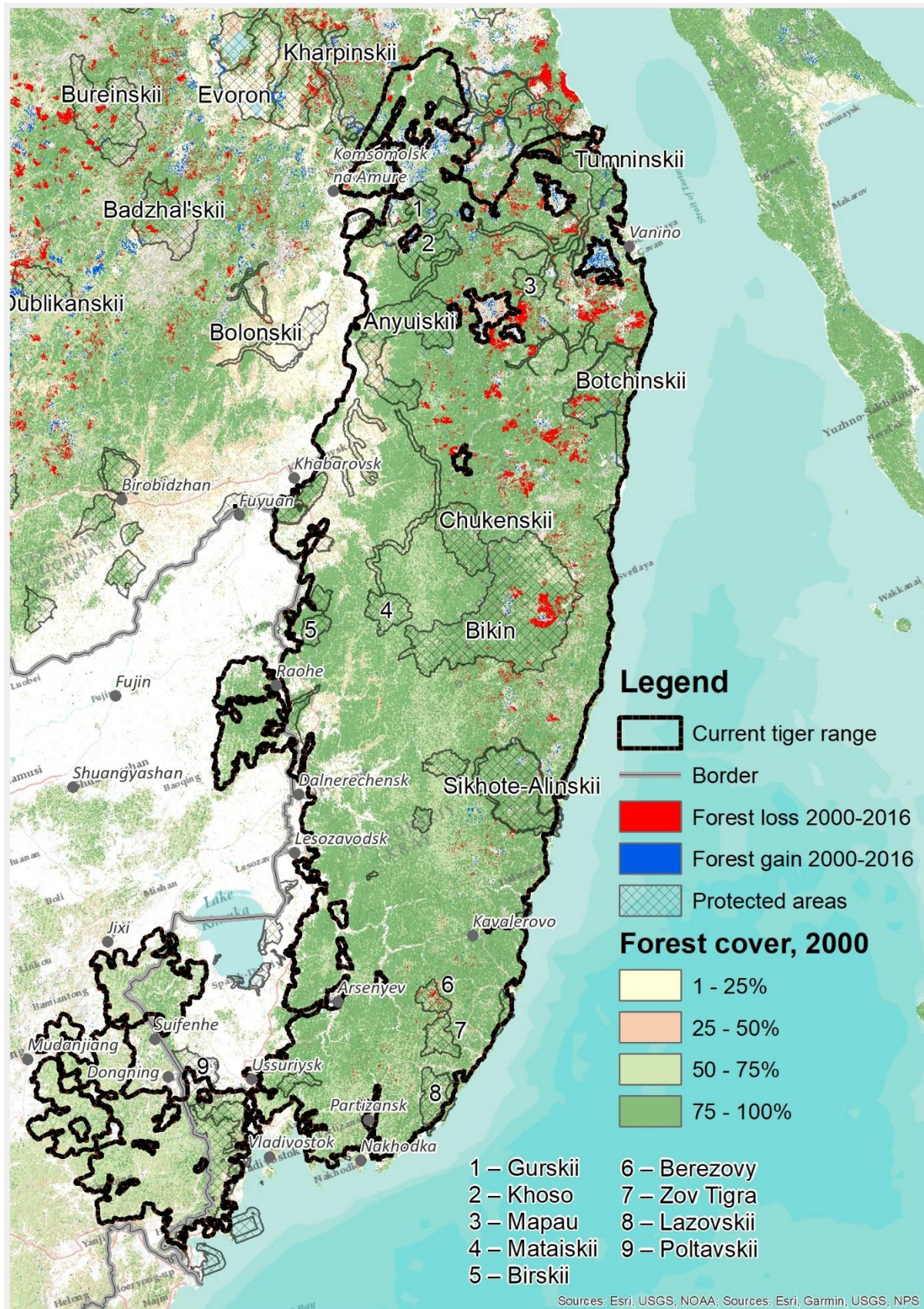
Figure 30: Forest loss and forest gain cover in the Amur tiger range between 2000 and 2016

Figure 30 shows forest cover loss and forest cover gain in the Amur tiger habitat between 2000 and 2016. The data used in this spatial analysis have been combined from various sources (see Chapter III section 7.1 Data acquisition for more details). Analysis illustrates that majority of the forest cover losses within the range have been occurring on the north of the habitat, mainly in Khabarovsky province. While some of the major forest cover losses have been occurring within the protected areas region on the Russian side. Protected areas of most concern are Bikin National Park, Botchnskii Nature Reserve or Zapovednik (meaning that any human activity is prohibited) and Berezovyi provincial wildlife refuge.

Another curious observation is scarce presence of forest cover along the Russian-Chinese border on both sides, where forest cover is the least on the Chinese side (apart from the Southern part where the Chinese government established protected areas) (Figure 30). Scarce forest cover along the border can be explained by historically uneven population distribution and thus uneven land resource use described in Section 2.1 Population density.

Bikin national park is the protected area of the most concern. Recently established park hosts more than 1,16 million hectares of forest and was created by a Russian Federation Government Decree in 2015 as one of the major protected homes for Amur tigers. Closer spatial analysis of satellite data showed that major forest cover changes at the national park occurred during the period between 2003-2005, which is before the creation of the park in 2015 (Figure 30).

It is hard to estimate whether forest cover changes occurred as the result of forest fires or logging in Amur tiger habitats. Further GIS research supported by the onsite investigation is needed to identify true reasons for forest cover changes in that area.

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Bikin has been included into UNESCO World Natural Heritage List in in July 2018 (UN News 2018). According to local media reports two thirds of the park's territory have been allocated for traditional use by the local ethnic minorities (Lebedev 2016). Given the pace of the forest cover losses in Bikin national park presented on the map, traditional use might have been compromised.

Forest cover analysis results re-affirm the opinion of regional experts regarding the unsustainable level of illegal logging and fires as well as urgent need for implementing stronger measures for monitoring the forest use.

3.3 Amur tiger trade and smuggling: historic setting

Since the development and exploitation of the Russian Far East, especially with the public use of the multiplayer weapon by hunters in Russia and China, the threat to Amur tiger population survival has become the most imminent. According to historical records of the Russian prominent explorer of the Far East in XIX-XX century, V. K. Arsenyev, the Amur tiger was widely hunted and poached by Russians and Chinese in Ussuri taiga forests, while Chinese traders were buying entire tiger body carcasses for further transportation to China and use in traditional Chinese medicine (Lyapustin 2010).

In the 20-30s of the XX century were marked by high level of trade and export of tiger skins from the Russian Far East, despite a drastic fall of the Amur tiger population. Tigers were mostly hunted in autumn-winter season when the fur was the thickest and fleeciest. Tiger bodies were frozen, not skinned, so that all other body parts such as claws, eyes, whiskers and tail were kept. The carcasses were fully wrapped in a thick cloth to keep the body intact and shipped in wooden containers.

According to historical records at the time, the price of Amur tiger skin in the 20-30s of the XX century was about 200-300 Mexican dollars[4], while dark colored fur was the most valued. A whole tiger body was sold for 50-75 Mexican dollars for 16 kg (1 pood)[5] (Lyapustin 2010). A mature tiger male was valued higher than a tiger female or a tiger cub. As for tiger parts, the most valued were eyes, whiskers, bones, blood, heart, liver and penis, as they were used in traditional Chinese medicine.

Right after the Civil war in Russia, approximately 25 Amur tigers were regularly killed in Amursky and Primorsky provinces and transported to China through Chifa and Shanghai, mostly for the internal market in Beijing and Tianjin (Lyapustin 2010). At the same time, the Amur tiger was greatly valued as the most northern tiger species abroad. A special commercial service was established for catchment of live tigers and their further transportation to European zoos. Historical records show that Hamburg zoo owner paid 1000 British pounds for a male Amur tiger and 500 British pounds for female and a cub separately (Lyapustin 2010). Such high prices encouraged more poaching and removal of tigers from the wild. The procedure of catchment of wild Amur tigers from the wild has been operating till the 1980s. Entire methodologies on tigers' removal and catchment have been published in Soviet literature and a special Soviet zoological agency was established in 1957 that was organizing catchment and further export of all big cats: tigers, leopards and lynxes. In the 1980s when the Amur tiger was listed in the Soviet Red Data book, the population size had finally been restored, because no commercial hunting and catchment was permitted.

The fall of the Soviet Union and the turbulent period of 1990s brought another threat to the Amur tiger – poaching. As mentioned by the regional expert in wildlife trade on the Russian

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[4] Mexican dollar (also called Peso or Spanish dollar) a silver coin, which was a popular trade coin used for foreign trade operations in Europe, Asia, Africa and America throughout XVI-XX centuries
[5] Russian old unit of mass equal to 40 pounds or approx. 16 kg

Far East, head of the Customs Control Department at the Vladivostok branch of the Russian Customs Academy, Dr. Sergey Lyapustin: "*1990s period was characterized by porous governmental borders, influx of Chinese immigrants, weak customs and border control and tremendously high demand for the Far Eastern wild nature resources on the black market*". The Amur tiger was under serious poaching pressure, while illegal trade in its parts has become an immensely lucrative business. The Primorsky Committee for Nature Conservation has established a special inspection for the conservation of endangered animals and plants named "Inspection Tiger" in 1994. This inspection was technically well equipped, had close connections with Police, Customs and the Federal Security Service (commonly known as FSB). "Inspection Tiger" was also collaborating with regional NGOs, such as WWF, and had several operative patrolling ranger brigades. Just during the year of its inception, the Inspection confiscated 14 Amur tiger skins and tiger carcasses (Lyapustin 2010).

Russian Far East Customs also had several confiscations in the 1990s. The first customs confiscation of Amur tiger skin happened in 1992, three skins were confiscated in 1993 and one skin was confiscated in 1994 (Lyapustin *et al.* 2010). All confiscated skins were destined to China and Japan. According to the opinion of the leading Amur tiger biologist in WWF Russia, poaching was the reason for a 15-20% decline in the Amur tiger population in Russia in the 1990s, while massive poaching and illegal trade in endangered wildlife in general plagued the entire Russian Far East region.

4. Conclusion

Based on the desktop analysis of the Amur-Heilong region and Amur tiger population conservation practices in Russia and China, the following conclusions can be made:

1. The transborder environmental agenda in the Amur-Heilong region might fall victim to the current governmental priorities between the two countries. Given clear subordination between Russia and China, some contentious sensitive transborder environmental issues might not appear in high-level bilateral governmental agendas.

2. Currently the Amur Tiger population is rising, especially in Russia as the result of governmental prioritization of Amur tigers and a creation of the specialized institutional and legislation framework for protecting the species (Amur Tiger center, Special Inspection "Tiger", Amur tiger conservation strategy for the government and other practices).

3. Even though Amur tiger population is stable in Russia, the genetic diversity of the population is low and needs further analysis.

4. Amur tiger numbers on the Chinese side are still not known as the Amur tiger census has never been organized, however it has been promised by the Chinese Government.

5. The Chinese Government has taken serious national measures to restore Amur tigers in Northeast China within the last 3 years (creation of the transborder PAs, logging ban, eco-brigades for snare removal).

6. Despite strong measures taken in China to bring tigers back, the reintroduction plans are still not fully clear. The plans to relocate tigers from breeding facilities in China might not be feasible.

7. Even though the population of the Amur tigers is rising in Russia, the population is still facing many threats, especially the destruction of tiger habitats, poaching of tigers and tiger prey. The human-tiger conflict has become more critical in the last two years.

8. Range assessment analysis showed that Amur Tiger habitat destruction might potentially become a deterrent for future Amur Tigers recovery in Russia. The most serious threat is posed by fires and unsustainable logging practices in Tiger range areas, including some PAs. The issue must be analyzed separately and addressed by the Russian government authorities.

Chapter VIII. Assessment of countermeasures on the Sino-Russian border

1. Introduction

The present chapter is the final analytical chapter that aims to answer the last research question on the assessment of the countermeasures for illegal trade and trafficking in tigers in the Amur-Heilong region. The chapter adds the findings of the field work and application of the qualitative and quantitative research techniques to the desktop research results presented in Chapter VII.

The current chapter aims to analyze the practices of addressing the problem in the Amur-Heilong region from various angles. Given the complexity and clandestine nature of the topic, desktop analysis might not be sufficient to understand and fully evaluate the efforts made by Russia and China in the region. Therefore, current chapter blends the findings of several research techniques that were used during the research to analyze the problem.

The chapter starts with the detailed analyses of regulative and institutional framework in Russia and China that deal with crime in endangered species, then moving to the analysis of the trends and characteristics of Amur tiger crime in the Amur-Heilong. The chapter also highlights the findings of field wildlife market surveys that were implemented along the Sino-Russian border on the Chinese side. The final, the conclusion of the chapter presents the findings of the application of the ICCWC indicator framework. The final part of the chapter combines the findings described in Chapter VII and previous sections of the current chapter (see Figure 2 for more details). The indicator's analysis allows estimating the success or failure of efforts made by the Amur-Heilong countries at addressing tiger related crime.

The data used in the current chapter was collected from various sources as presented in Table 9. The chapter is followed by Discussion that combines and analyses all the findings in the entire dissertation.

2. Analysis of the regulative and institutional frameworks

2.1. In Russia

As Amur Tiger is endangered species listed in the Red Data book of the Russian Federation, it falls under the legislation for the protection of endangered and rare species listed in the national and provincial Red Data books. The following regulative documents provide a legal basis for the protection and conservation of the Amur Tiger:

1. Nature Conservation Federal Law of the Russian Federation №. 7- ФЗ from 10.01.2002 (edited 31.12.2017)

2. Federal Law on Fauna of the Russian Federation № 52-ФЗ from 24.04.1995

3. On approval of the Regulation for the Ministry of Natural Resources and Ecology of the Russian Federation: Decree of the Government of the Russian Federation № 1219 from 11.11.2015

4. On the Procedure for issuing permits (administrative licenses) for the turnover of wild animals listed in the Red Book of the Russian Federation: Decree of the Government of the Russian Federation № 156 from 19.02.1996 (edited 18.04.2014)

5. On the approval of the Rules for the Procurement of wildlife species listed in the Red Book of the Russian Federation, apart from water biological resources: Decree of the Government of the Russian Federation № 13 from 06.01.1997 (edited 05.06.2013)

6. Regulations on the procedure for keeping the Red Book of the Russian Federation: Decree of the Ministry of Natural Resources № 306 from 23.05.2016

7. Strategy for the Conservation of rare and endangered species of animals, plants and fungi in the Russian Federation for the period till 2030, adopted by the Russian Federation Government Decree № 212-p of February 17, 2014. The strategy outlines main goals and objectives of the government policy and activity with regards to conservation of rare and endangered wildlife. The issue of poaching and smuggling of rare and endangered species is mentioned as one of the imminent problems that can be resolved through better coordination and stronger government control of natural resources management.

8. On the approval of the methodology for calculating the amount of damage caused to the Fauna objects listed in Red Book of the Russian Federation, and other Fauna objects that do not belong to hunting species, fisheries and their habitats: Decree of the Ministry of the Natural Resources № 107 from 28.04.2008 (edited 12.12.2012)

Several regulative acts were adopted in the period of 2009-2014 by the Government to improve the efficiency of state control management, protection and use of natural resources, such as game species, forest resources, fisheries and other wildlife. The same refers to the protection of endangered species, including Tigers. On 02.07.2013 the Government introduced changes in the Criminal Code by adopting the Federal Law № 150-ФЗ which introduced the Article No. 258.1 УК РФ titled "Illegal procurement, keeping, acquisition, storage, transportation, posting and selling of especially valuable wild animals their parts and derivatives, and aquatic biological resources listed in the Red Book of the Russian Federation and (or) protected by international treaties of the Russian Federation". The maximum penalty under the newly introduced criminal Article No. 258.1 can reach up to 3 years of

imprisonment with a fine up to 1 million rubles (circa 16,000 USD). It should be specified that transportation here refers only to the transportation inside the country borders.

To further strengthen the protection, the Government included endangered species and their products into the list of national strategic goods and resources, while introducing criminal liability for their movements across the border (smuggling) through introducing the new article to the Criminal Code No. 226.1 УКРФ. The new Criminal Code article on smuggling enlarges the list of strategic goods and resources by adding endangered species and their products listed in Red book and other international agreements that Russia is a member (such as CITES)[6]. The maximum penalty for smuggling of such goods and products according to Article No. 226.1 УКРФ is 3 to 7 years of imprisonment with a fine, and if executed by an organized group - from 7 to 12 years of imprisonment with a fine. A major change that came with this new regulation is that a criminal penalty would now be charged in smuggling of Red listed endangered species regardless of its estimated monetary value. Previously criminal incrimination was dependent on the estimated value of a seized wildlife product. For example, if a seized smuggled endangered species or part of it had an estimated monetary value below a certain limit for criminal charges, then the culprit would get away with an administrative fine. Thus, the result of a wildlife smuggling case was fully dependent on a biological expert who would evaluate the endangered seized product. The expert had to ensure that the estimated value would be above the limit for the criminal charge. Given that all trade in endangered species is prohibited in Russia and there was no official data on the estimated value, the biological identification and appraisal would usually be a complicated procedure involving vague calculations. With a newly introduced criminal article this was no longer an issue.

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[6]Government Decree No. 978 from 31.10.2013 provides the list of endangered Red listed species for the Articles No. 226.1 and 258.1. These species are: Amur tiger, polar bear, Altai mountain sheep, leopard, zubr, saiga antelope, snow leopard, all falcon species, golden eagle, all sturgeon species, Sakhalin taimen and spike

Similar situation was with the Article No. 258 of the Russian Criminal Code, which included only illegal hunting (poaching), thus leaving behind the major culprits involved in crime according to the wildlife crime model (Figure 4).

Criminalizing the rest of the activity beyond poaching has been timely and needed, according to the wildlife legal expert's opinion mentioned during the interviews. According to the analysis conducted by the WWF Russia senior wildlife legal expert, only within a year after introducing the law, the Courts of the Russian Federation passed 33 convictions on criminal cases related to Article No. 258.1 УК РФ (two of which were in Primorsky Province). According to the expert's opinion, earlier the culprits involved in other stages of wildlife crime managed to escape from any penalty, sometimes getting administrative fines only.
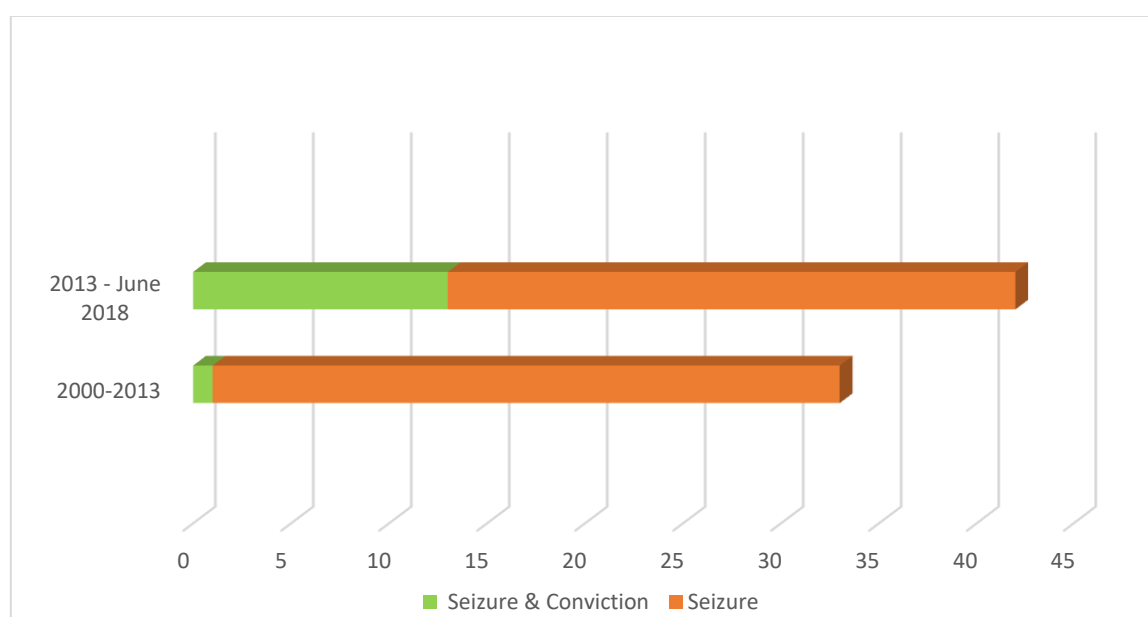
Figure 31: Criminal cases related to Amur tigers poaching & trafficking in Russia (2000- June 2018)

Figure 31 illustrates the efficiency of Article No. 258.1 УК РФ with regards to cases related to crimes involving Amur tigers in Russia. The data on cases was obtained and verified from various sources: media reports, law-enforcement press-releases (see Table 9 for more details on data acquisition). The graph compares the number of Amur tiger cases instigated and

convicted before the criminalization of other stages of wildlife crime in 2013 and after their criminalization till the end of June 2018 (the last data acquisition date).

The analysis results show that not only the number of criminal cases has risen since 2013, but also the total number of cases has significantly increased. This might be explained by a higher incentive of law enforcement agencies to investigate crimes related to endangered species as this would bring more significant results. Thus, the Article No. 258.1 has played a double role: putting a stronger obstacle to crime associated with Amur tigers and secondly, motivating law enforcement officers to pay more attention to environmental crime as opposed to other types of crime.

However, according to interviews held with Russian wildlife experts and data analyzed, it is evident that the capacity of Russian law enforcement and the judicial system to investigate and prosecute crimes against wildlife (in this case, against Amur tiger) still leaves a lot of space for improvement. Historically the situation with investigating and convicting criminal cases related to the Amur tiger in the region was worse in the past. For example, according to Zherebkin, only 14 criminal cases related to Amur tiger (where 17 animals died) were instigated and 3 cases were instigated related to Amur leopard in Primorsky province during the period of 2000 to 2008 (Zherebkin 2009). Out of these cases only 1 case related to the Amur tiger was passed to the court, 1 case was stopped by prosecution and the remaining 14 cases never reached court for various reasons (Lyapustina *et al.* 2010). In many ways it relates to the general capacity to compile and record the evidence, proceed with the investigation and present the case to the court. There might be other factors involved, such as lack of willingness to investigate ecological crime and presence of local corruption and/or cronyism.

Historically, the Russian Far East region (and Primorsky province, in particular) has been considered one of the most corrupted regions in Russia due to many factors, such as richness of natural resources and distant location from the central government. Primorsky province has been notorious in national media for the most prominent corruption scandals since 1990s. According to the President Representative in the Far East Federal region, Yuri Trutnev, the most corrupted industrial areas in the region are natural resources extraction, forestry and fisheries (TASS Informacionnoe agentstvo Rossii [ТАСС Информационное агентство России] 2015). Based on the results published by the anti-corruption project "Far Eastern ratings", Primorsky province has taken the lead in 2015 Far Eastern corruption ratings with 226 identified corruption cases for every 1000 employed state and municipal civil workers (Pervoe antikorrupcionnoe SMI [Первое антикоррупционное СМИ] 2015). This is aside from the fact that Russia ranked 136 out of 180 countries on the Corruption Perception Index in 2017 being historically perceived as one of the most corrupted countries in Eastern and Central Europe (Transparency International 2018). According to interviewed regional experts, poaching in rare and endangered wildlife by organized groups with the involvement of civil servants has generally been one of the obstacles for cases investigation.

Given the dynamics for the investigation of cases related to tiger poaching and smuggling after 2013, the current conviction rate is only 35 % (13 out of 37) meaning that major part of crimes against Amur tigers still remains uninvestigated and passes unpunished.

At the same time, analysis exemplifies that wildlife model approach can become an operational method to understand the nature of wildlife crime and, therefore, develop and establish effective tools to address it. The model allows successfully employing pre-emptive, rather than reactive, law enforcement, legal and judicial tools and methods. However, in many ways the final result of these activities depends on internal motivations, capacity and

awareness of personnel involved in investigation (from law enforcement officer or ranger, inquirer, investigator, judge and, finally, bailiff).

Institutional framework

In addition to the newly introduced laws and regulations, more attention was paid by the Russian Government to the law enforcement agencies by entitling them with more responsibilities and authorities to fight wildlife crime. Special regulations and prescriptions focused on wildlife crime and control over biological resources were issued for the Border service and Police by the Government Decrees in 2011 and 2012.
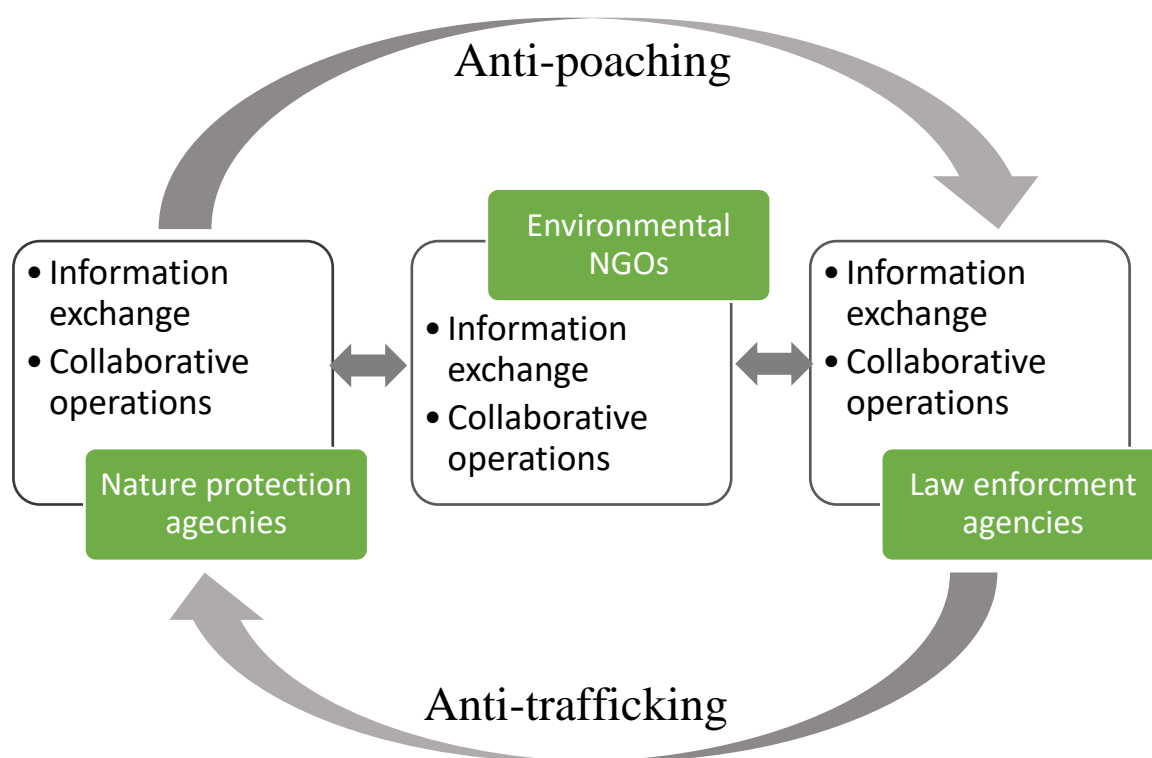
Figure 32: Inter-agency collaboration on wildlife crime in the Russian Far East

With more authority and responsibilities given to law enforcement agencies by the new legislation, more attention had to be paid to inter agency-collaboration. The main law enforcement A special division dedicated to wildlife anti-trafficking work was established under the Directorate of Economic Security in Police service in 2013 (Lyapustin and

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Fomenko 2015). Similar divisions have already been operating for several years under Far Eastern Operative Customs and Federal Security Service agencies in the Russian Far East that are entitled to execute wildlife anti-trafficking and anti-poaching activities since 2009 have been: Police (Ministry of Internal Affairs, in Russian - УМВД), Federal Security Service (in Russian - УФСБ), Customs (Far Eastern Customs Directorate, in Russian - ДВТУ), Operative Customs (Far Eastern Operative Customs, in Russian – ДВОТ), Okhotnadzor (Wildlife and hunting Department, in Russian – Охотнадзор). Figure 32 illustrates inter-agency collaboration scheme of regional governmental nature protection and law enforcement agencies. Major collaborative activities usually include information exchange (regular or ad hoc depending on the level of established collaboration and existing agreements) and organization of collaborative enforcement operations.

Based on consultations with regional experts and an analysis of media reports, environmental NGOs play an important role in enforcing this collaboration by providing on the ground information to enforcement agencies, often playing a role of biological experts for criminal and administrative cases by assisting with identifying biological species. NGO representatives also participated in the collaborative law enforcement operations along with enforcement operative officers. For example, biodiversity experts of WWF Russia Amur branch have a license to act as biological experts during the court hearings of criminal cases related to poaching and trafficking of endangered animals. According to interviewed experts, this type of collaboration usually had a stronger outcome resulting in a higher rate of wildlife seizures.
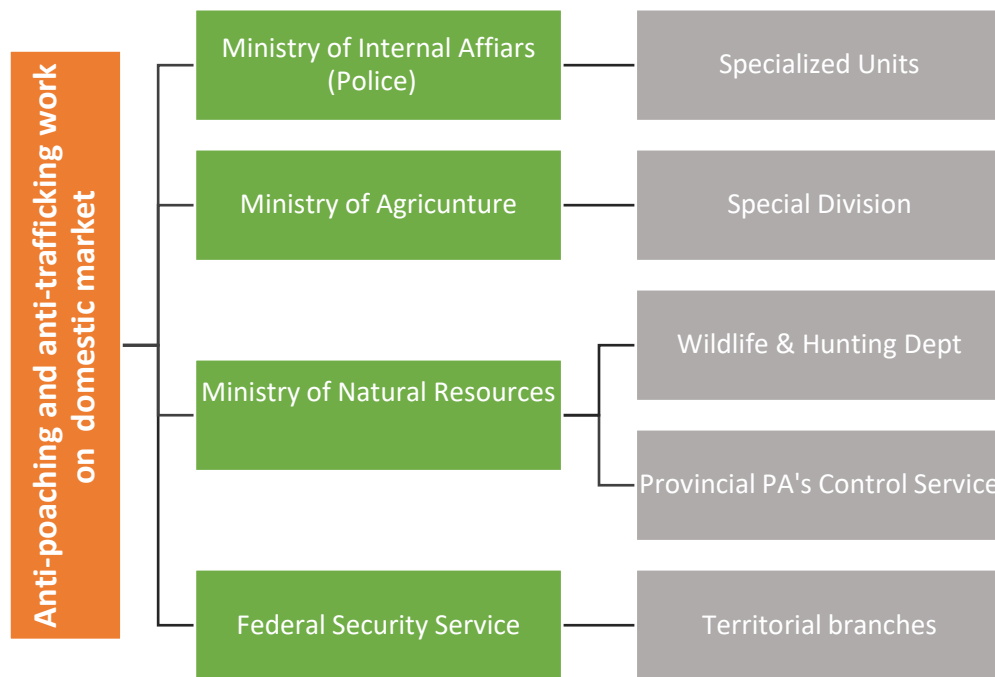
Figure 33: Government agencies involved in anti-poaching and anti-trafficking of endangered wildlife on domestic market

Law enforcement activities in Russia aimed at wildlife crime (including crime against Tigers) can be separated intro two main areas: anti-poaching or anti-smuggling work in domestic markets and anti-smuggling work in the transboundary region. Figure 33 depicts the structure and units responsible for addressing wildlife crime on the domestic market in the Russian Far East. Each agency has a dedicated unit focusing on nature protection. Police and Federal Security Service are key agencies responsible for controlling illegal activity related to wildlife trade in domestic market. Police has been also authorized by the Federal Law on Police to assist environmental protection agencies in environmental protection and prevention of ecological crimes.

According to interviews with the regional experts and informal conversations with law enforcement officers, the priority is given to collaborative inter-agency enforcement operations focused on identifying and preventing wildlife crime on domestic markets. These activities usually include collaborative inspection of hunted animals and transportation on the roads or rivers, collaborative patrolling, prevention of poaching, official inquiries with

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regards to hunted or traded wildlife species. Government statistics and reports indicate high number of these activities throughout the years in the region, however it is hard to estimate their efficiency based only on reports.
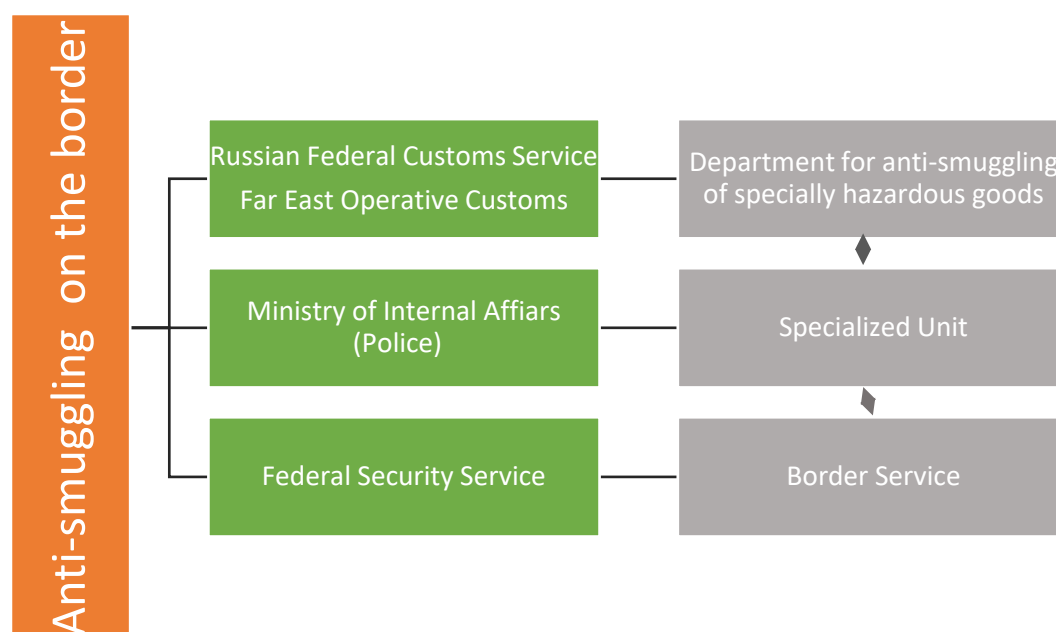
Figure 34: Government agencies involved in anti-trafficking in the border region

Figure 34 describes agencies involved in the prevention of wildlife trafficking in the border region in Russia. Here other dedicated units are responsible for the anti-trafficking activities, while Customs plays a key role through controlling the movement of people and goods through Customs check points and Operative Customs specialized unit executes investigations and enforcement operations in cases related to smuggling of wildlife. According to interviews held with enforcement officers, major accomplishments in anti-trafficking work were made during the inter-agency collaborative enforcement operations. However, this type of activity usually required many months or years of preparation, investigation and coordination.

2.2 In China

Amur Tiger (or any other tiger sub-species) is a Category I protected animal (meaning highest protection) in China. China became a member of CITES in 1981, thus the country has to comply with the requirements of the Convention, including those related to CITES Appendices. Given that China has a long historic record of tiger product consumption in the TCM industry, majority of the legislation relates to regulation of trade and use of tiger products rather than prohibiting poaching as in the case with Russia. However, there is also legislation prohibiting hunting and trade in endangered animals and relevant high penalties. The following legislation documents ensure Amur tiger protection and regulation of trade in China:

1. Law of the People's Republic of China on the Protection of Wildlife (or usually referred to as Wild Animal Protection Law) from November 8, 1988, came into force March 1, 1989. The law provided first legal basis for protection of rare and endangered wildlife, ensured that hunting and trade of tigers is prohibited, but mentioned captive breeding operations. The law was revised and came into force on January 1, 2017.

2. Circular on Banning the Trade of Rhinoceros Horn and Tiger Bone issued by State Council in 1993. The ban excluded Tiger bones from TCM official listings.

3. "Labeling system" has been introduced in 2003 that introduced regulation system for legal trade in endangered species coming from captive breeding facilities, thus allowing trade in skins of Tigers (and other endangered species). The system also introduced the list of registered owners of captive breeding facilities.

4. Notification on the implementation of a labeling system for tiger and leopard skins as well as their products, and further regulation of their utilization, issued by State Forestry Administration (SFA) and State Ethnic Affairs Commission in

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2007. The Notification ensured that Tiger and leopard skins and their products obtained before 1989, or from captive breeding can be registered as the legal sources. These legal sources should be marked with specific labels, which can be processed and sold at authorized locations.

5. Government Notice No.7 on the management and utilization of wild animals in China, issued by SFA, which ensured that tiger and leopard skin products from legal sources can be legally marked from January 1, 2008.

6. Government Notification on strengthening of wild Tiger conservation and management of tiger captive breeding facilities issued in 2009. The Notification significantly improves conservation efforts on wild tiger populations and their natural habitats; introduces national crackdown on smuggling and illegal domestic trade in tiger products and other criminal activities; ensures that tiger breeding is strictly regulated. Notification also prescribes that public should be educated by Government agencies not to buy illegal tiger bone products, wear tiger skins, or participate in other illegal activities.

7. Various legislation related to judicial implementation of law related to smuggling, hunting, purchase and transportation of endangered wildlife

Unlike Russian legislation, Chinese "Wild Animal Protection Law", adopted in 1989, already prohibited poaching, illegal trade (buying and selling) and illegal transportation of endangered wildlife and introduced very strict penalties for such wrongdoings. Moreover, poaching of the wild tiger was penalised by the death penalty until 2011 when the death penalty was abolished and replaced with life imprisonment. Despite these strict regulations, the author did not manage to find any data related to a tiger poaching case or government investigation in China. Based on the interviews with Chinese wildlife trade experts from environmental NGOs, the last tiger poaching case occurred over twenty-five years ago.

Given the pressure of the international community and nature conservation organisations (also in line with the "Green Civilization" concept") China introduced several laws related to stricter regulation of endangered wildlife consumption, *inter alia* criminalising such activities as eating and ordering endangered wildlife in restaurants. For more details, please refer to the Section on Legislative and regulatory measures in Chapter VI explaining changes made in Chinese legislation.

Specific attention should be paid to revised "Wild Animal Protection Law" adopted in 2017. While previous version of the Law encouraged and generally legalized adoption and captive breeding of rare and endangered wildlife, the new version moved away from this language and allowed captive breeding only for scientific and preservation purposes by the research institutions (Zhang 2016).

It should be added that the Chinese Government does not openly share data on wildlife seizures (be it poaching or trade) due to internal restrictions. However, sometimes law enforcement agencies publish press-releases in Chinese with the most notorious and significant wildlife seizures on governmental websites. At the same time, the information on court hearings and court decisions of cases related to endangered wildlife is also not publicly available, thus it is impossible to estimate the efficiency of the Chinese judicial system with regards to such cases. This gap could potentially become an area for future academic research provided access to such information is granted.

Institutional framework

The following institutions in China are involved in preventing poaching and smuggling of endangered wildlife: Department of Forest Police (State Forestry Administration) – major

national institution dealing with wildlife regulations, Customs, Wildlife Authorities that oversee administrative wildlife cases and CITES Management Authority (CITES MA).

It should be stressed that China has the world's largest CITES Management Authority administration (CITES Secretariat 2013a). Every province in China has a CITES representation office, whereas only one CITES representation office is available in Moscow, Russia for the entire country.

In 2011 Chinese CITES MA formally institutionalized National inter-agency CITES enforcement coordination group called NICE-CG (for more details please refer to Chapter 6, section 6 above) and provincial inter-agency CITES enforcement coordination groups called PICE-CG. At present practically all provinces in China have PICE-CGs based on the consultation with Chinese wildlife experts. The enforcement coordination groups consist of Police departments of Customs and Borders Control Services who are dealing with criminal investigations, Department of Forestry Administration and Agriculture & Wildlife Administration, Customs Administration, market and quarantine services for administrative wildlife investigations. NICE-CG discusses issues related to wildlife enforcement on a national level and meet on a regular basis, while PICE-CG consists of only provincial representations of the same institutions as on the national level and also meet on a regular monthly or bi-monthly basis depending on the internal agreements.

Based on the feedback received from Chinese experts, these inter-agency enforcement groups have authority to revise and enact laws related to wildlife, organizing intra-agency enforcement operations on national and provincial levels, wildlife enforcement trainings, establishing forensic labs, information sharing and inter-agency investigations. Moreover, these coordination groups regularly report on their results, have certain plans for inter-agency

operative activities, authorize responsible dedicated agency representatives. It should be stressed that China has been one of the first countries to come up with such a coherent and institutionalized national and regional scheme for inter-agency enforcement collaboration on wildlife crime what has been widely acknowledged by CITES globally.

Another interesting factor is that these enforcement groups are coordinated by Chinese CITES MA representations that play an equal role in enforcement coordination. In comparison, Russian CITES MA is not really involved in any type of enforcement coordination (if at all) what surely exemplifies the role and authority of CITES MA department nationally and regionally in Russia.

Similar to Russian authorities, Chinese inter-agency enforcement coordination groups share information and get guidance from the international nature conservation NGOs that often act as on-the-ground experts providing inside data on the wildlife trade situation, especially from the wholesale wildlife markets or assisting with various training. For example, Chinese TRAFFIC organization is the only wildlife NGO involved in NICE-CG and PICE-CG regular meetings.

Table 20: Wildlife criminal cases instigated by Chinese Customs (2004-2013) (source: Ziming 2013)

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Cases	56	77	62	85	94	74	72	116	142	152

Based on the government official data provided by the NICE-CG coordinator and representative of the Chinese CITES MA, Wan Ziming, Chinese customs handled 930 criminal cases and over 10,000 administrative cases related to wildlife from 2004 to 2013 (Ziming 2013) (Table 20). As can be seen from Table 20 the seizure numbers are continuously growing with each year. This might be explained either by better results of the Chinese law enforcement agencies or higher pressure on the wildlife market and thus more

seized trafficked goods. It should be stressed that no seizure data is available on seizure results at the provincial level in China as the government does not openly disclose this type of information, unless most prominent seizures are covered in the media or by press department of the enforcement agencies.

3. Amur Tiger related crime analysis

Despite the breadth of available data on Amur tiger poaching and trafficking, there is no consistency in seizure records information for Russia and China. The data for the statistical analysis of Amur Tiger seizure records for Russia was updated till the end of June 2018 to provide maximum possible coverage and time relevance of the analysis. For seizure records in Russia and China, please see Table 9 for the details on data acquisition.

Table 21: Comparison of data on total number of killed Amur Tigers in Russia (2000 – June 2018)

Source	2000-2003	2004-2007	2008-2011	2012-2015	2016- June 2018	Total	Possible maximum
Global report	30	33	15	24	N/A	102	158
Field data	4	14	11	50	30	109	

Table 22: Comparison of data on total number of Amur tiger seizures made by Russian authorities (2000 – June 2018)

Source	2000-2003	2004-2007	2008-2011	2012-2015	2016-June 2018	Total
Global report	4	6	8	12	N/A	30
Field data	3	12	9	34	19	77

For Russian seizures, the author compared the collated data with the findings for Russia from the last global analysis of tiger seizure records "Reduced to skin and bones re-examined: an analysis of tiger seizures from 13 tiger range countries (2000-2015)". The report and its findings are described in Chapter IV in Section 3 on current global tiger trade trends.

The latest global seizure records report covers tiger seizures from 2000 till 2015 broken into four quarters (see Table 11 and Table 12 for more details). To update and compare the results

for Russia with the report findings, the author broke collected data into same time periods and updated data by adding another time period from 2016 till June 2018 for Russia only.

The comparison results for seizure records showed strong discrepancy for both the number of tigers killed and number of enforcement seizures made presented in Table 21 and Table 22. The comparison of seizure data showed that global tiger crime report findings had more tigers killed for the period from 2000 to 2011 in comparison with the author's findings. Similarly, less seizures were made by the authorities according to the global tiger crime report during the period from 2004 to 2015 according to the author's findings.

Capitalizing on discrepancies, Table 21 shows the possible maximum of 158 tigers killed during the period of 2000 to June 2018, which is a significant amount for the current population of Amur tigers in Russia.

Table 23: Available data on total number of tiger trafficking seizures by Chinese authorities on the border with Russia

	2000-2003	2004-2007	2010-2011[7]	2012-2015	2016-December 2017	Total
Seizures	N/A	N/A	3	4	0	7

Given that seizure records for China are not openly available for reasons mentioned in the section 2.2 above, the data used for the current analysis was obtained from TRAFFIC China office in Beijing who compiles this information on a regular basis by monitoring media sources (see Table 9 for more details on data acquisition).

Table 23 shows the results from available data on Chinese trafficking seizures related to Tiger on Sino-Russian border originating from Russia. The data was only available for the

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[7] Data for 2008 and 2009 was not available for China

period from 2010 till the end of 2017. The difference in the amount of tiger seizures in China and Russia during the same time periods is significant.

It should be stressed that no information on tiger poaching in Northeast China was found. It might be due to limited availability of data or inefficient anti-poaching activities in the region or simply lack of wild tigers in Chinese forests.
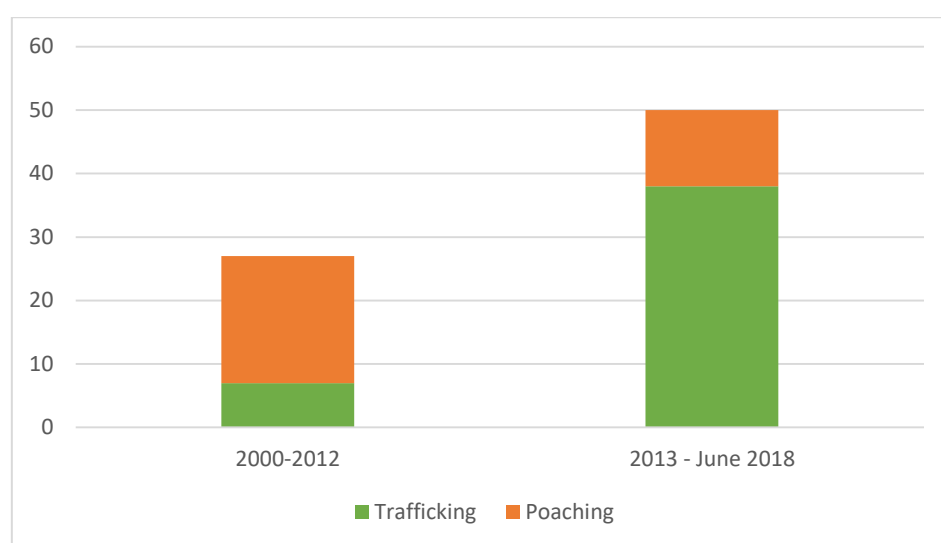
Figure 35: Trafficking and poaching cases related to Amur tiger in Russia (2000 – June 2018)

Figure 35 shows the distribution of Amur tiger related crimes in Russia broken into two main periods before and after 2013 when the government toughened penalties with regards to smuggling of endangered wildlife as analyzed in Section 2.1. Interestingly, the number of trafficking cases has significantly increased after 2013 (38 trafficking cases were initiated during 4.5-years period versus only 7 cases initiated in the previous twelve-year period).
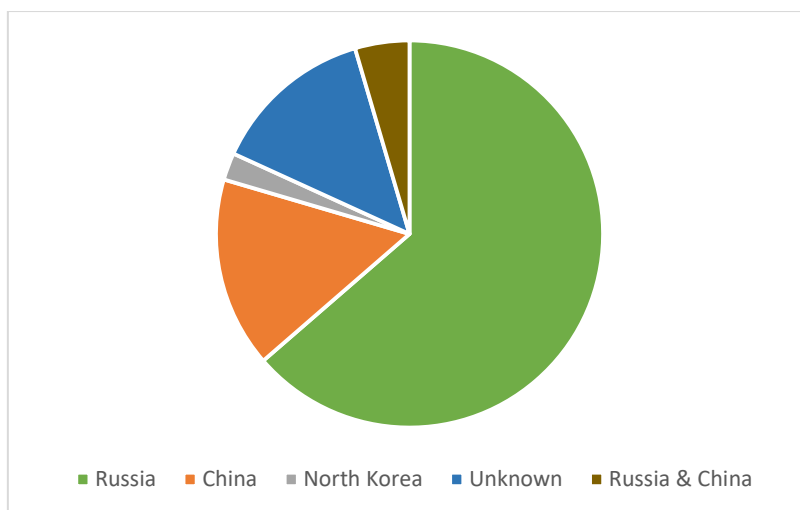
Figure 36: Nationality of tiger offenders (trafficking) arrested by the Russian authorities on the border (2000 -June 2018)

When describing the main type of Amur tiger offenders, it should be stressed that all offenders in poaching cases had Russian nationality. Figure 36 shows the nationality of tiger offenders for Amur tiger trafficking cases in Russia, where the majority are Russians (28), followed by Chinese nationals (7). In 6 cases the nationality was not identified, while 2 cases involved both Russian and Chinese criminals (organized international crime pitching for much higher penalties in Russian legislation), and 1 North Korean national.

Table 24: Total minimum of Amur tiger parts seized by Russian authorities (2000-June 2018)

	2000-2012	2013 - June 2018	Total
Skins	26	20	46
Skeletons		4	4
Whole dead bodies	3	5	8
Bones	1	13	14
Skulls		2	2
Humerus bones		4	4
Paws		8	8
Nails		18	18
Other			
Bracelets		1	1
Other identified parts		belong to 8 tigers	8
Spirits with bones		2	2

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Table 24 shows the total minimum of Amur tiger parts seized by the Russian authorities broken into two main periods: before the legislation strengthening in 2013 and after. The results show that not only the amount of seized tiger products has increased in a short period of time, but also the variety of products has significantly expanded. This again proves that authorities prioritized tiger trafficking and became better "equipped" for identifying and seizing different types of tiger products. For example, such products as tiger nails or bracelets are hard to identify without prior special training.

3.1 Analysis of spatiotemporal concentrations of seizures

The author analyzed same Amur tiger seizures collected during the data collection period by employing the method of spatiotemporal concentrations of seizures for Russia and China from 2000 to June 2018. The analysis results were broken into three main seven-year periods: from 2000 to 2006, from 2007 to 2012 and from 2013 to the end of June 2018. A seven-year period was chosen to be able to identify the trends that were potentially affected by the legislation changes in Russia. For more details on the method description please see Chapter III, Section 4.5 Tiger seizures analysis.

The seizure records for Russia cover the period from 2000 to June 2018, while seizure records for China only cover the period from 2010 to the end of December 2017 (see Table 23 for more details).

Figure 37: Tiger poaching and trafficking cases (2000-2006)

Figure 37 represents the distribution of Amur tiger seizures in the Russian Far East during the period from 2000 to 2006. The analysis shows that the amount of seizures during this period was quite scarce, while poaching cases occurred mainly around major cities or towns. As explained above, the scarcity of data can be explained either by the lack of data collected during this period or by the lack of the enforcement effort. The highest number of cases occurring in one place was two, while poaching seizures further away from the border were prevalent. Vladivostok is presented as the regional crime hot spot for both Amur tiger poaching and trafficking, while majority of poaching seizures occur outside of the main residential areas.

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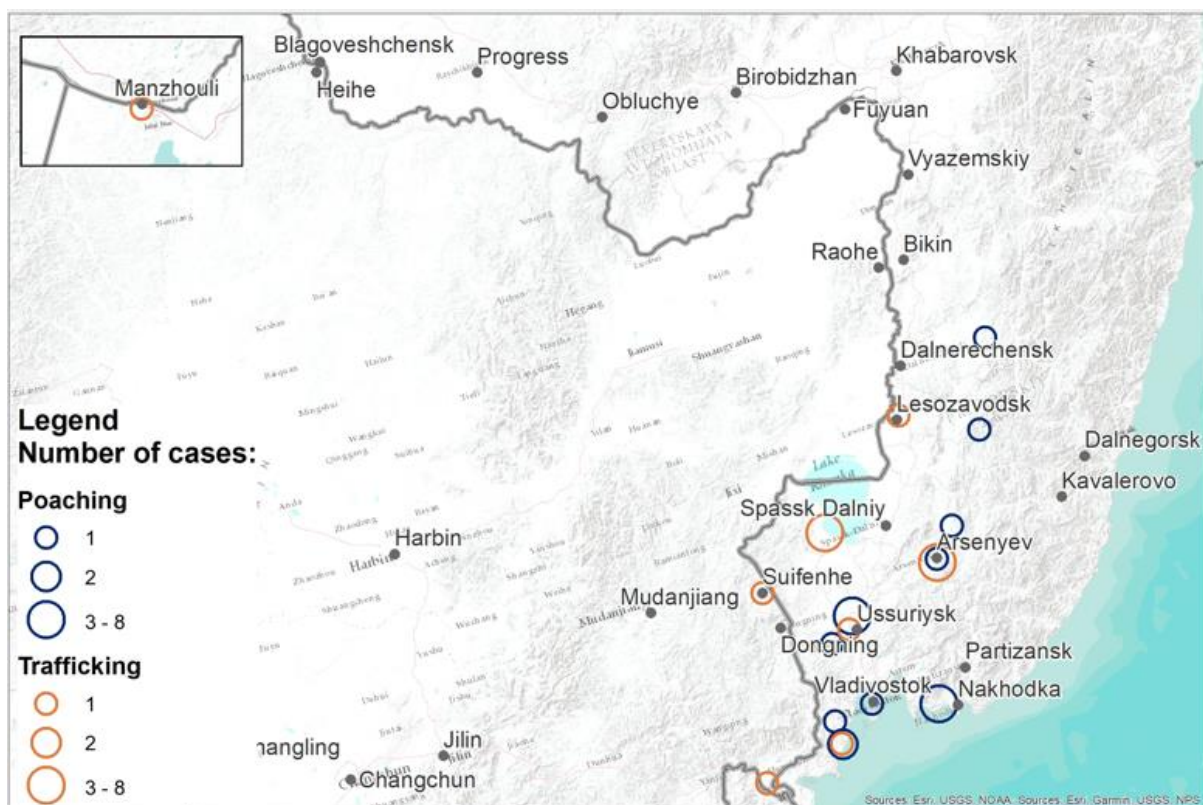
Figure 38: Tiger poaching and trafficking cases (2007-2012)
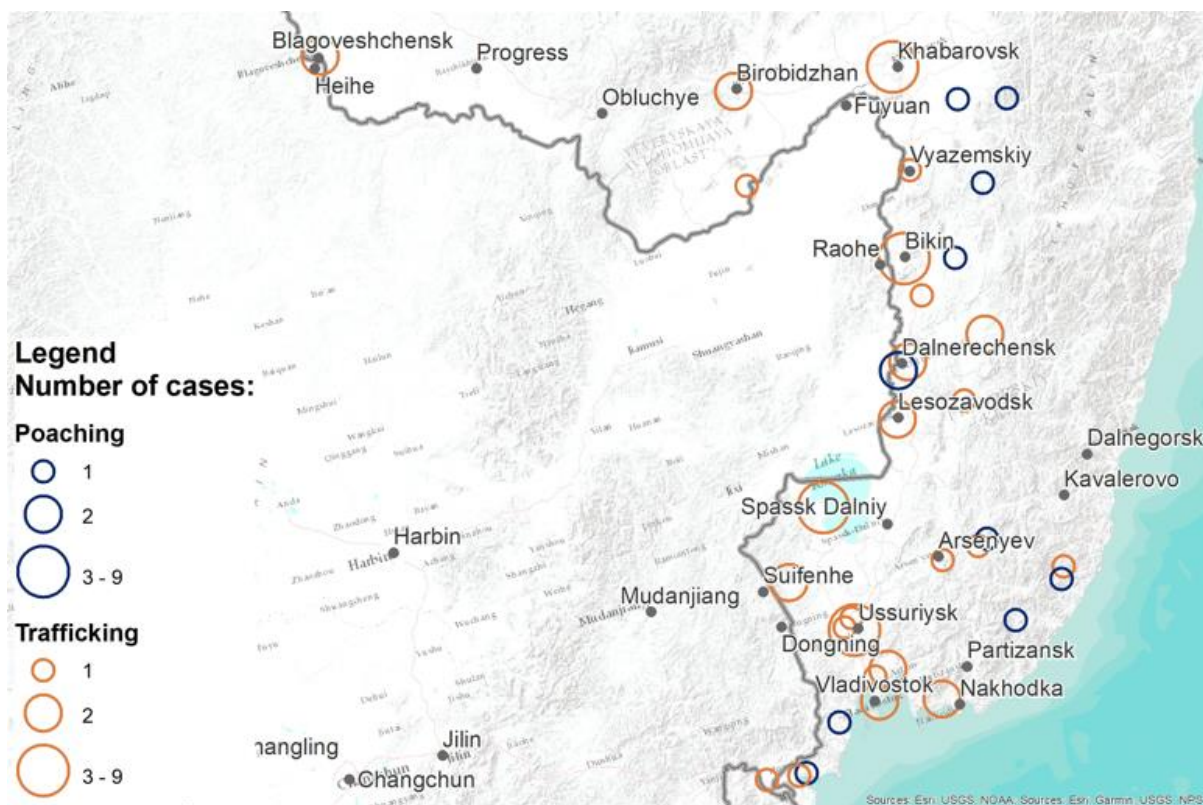
Figure 39: Tiger poaching and trafficking cases (2013 -June 2018)

Figure 38 represents Amur tiger poaching and trafficking cases for the period from 2007 to 2012. Here the amount of cases has increased since the previous analyzed period, while

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evident crime hotspots are clearly defined, such as Vladivostok (capital of Primorsky province) and areas around it, Arsenyev, Ussuriisk (second largest city in Primorsky province), Dal'nerechensk, Khabarovsk (capital of Khabarovsky province) and Spassk-Dalnyiy. The analysis presented on the Figure 37 and Figure 38 shows that seizures mainly occurred close to residential areas and Tiger habitats and further away from the Sino-Russian border. Again, the amount of poaching cases is prevalent in the second analyzed period. Figure 38 also shows two seizures on the Chinese side, where cities of Roahe and Heihe (both located very close to Russian border towns) are prominent. Another major transborder crime hub is Suifenhe and Pogranichnyi, a border town in Russia.

Figure 39 shows rising amount of seizures, especially the number of trafficking cases, where the seizure was done by either Customs or border services. More seizures occurred in Russia along the border close to Chinese border towns, while all Chinese tiger seizures occurred along the border with Russia. Figure 39 exemplifies that the enforcement effort on the Russian side has significantly increased in comparison with the previous two periods. Serious transborder crime hubs have been identified, such as Heihe-Blagoveshchensk, Raohe-Bikin, Suhfenhe – Pogranichnyi, transborder Khanka Lake, Dongning – Ussuriisk. Hotspots in Russia are: Vladivostok, Khabarovsk, Birobidzhan, Nakhodka, Lesozavodsk, and Dalnerechensk.

Figure 40 shows the total number of Amur tiger poaching and trafficking cases in Russia and China, which was also compared with the proximity to the protected areas in Russia. As the map shows, majority of the seizures occurred outside the protected areas, along the Sino-Russian border and in largest cities in Russia. Absence of seizures inside the protected areas in Russia can be explained by various reasons: either this data has not been collected from the protected areas by the primary source in WWF Russia and Vladivostok Customs Academy

(however, no data on seizures inside the protected areas in Russia has been observed in regional media sources by the author). Other reason is that the level of anti-poaching protection in Russian PAs is either excellent or poor inside the parks. However, a very good level of protection might be doubtful given the level of forest cover change in the parks shown on Figure 14 above. Lastly, another explanation might be that there might be a little level of Amur tiger poaching in protected areas, as it is technically much harder to organize and riskier for the poacher, given that the Amur tiger habitat spans way beyond the protected areas in Russia. This means that outside of the PAs the logistics of organizing illegal activity is easier and "safer" for poachers.

Legend
Number of cases:

Poaching

○ 1

◯ 2

◯ 3 - 9

◯ 20

Trafficking

○ 1

○ 2

○ 3 - 9

○ 20

▨ Protected areas

Blagoveshchensk

Heihe

Birobidzhan

Obluchye

Bolonskii

Anyuiskii

Botchinskii

Khabarovsk

Fuyuan

Chukenskii

Vyazemskiy

1

Bikin

2

Raohe

Bikin

Dalnerechensk

Sikhote-Alinskii

Hulin

Lesozavodsk

Dalnegorsk

Kavalerovo

Spassk Dalniy

Suifenhe

6

Arsenyev

3

4

Ussuriysk

Partizansk *5*

Vladivostok

Nakhodka

1 - Mataiskii
2 - Birskii
3 - Berezovy
4 - Zov Tigra
5 - Lazovskii
6 - Poltavskii

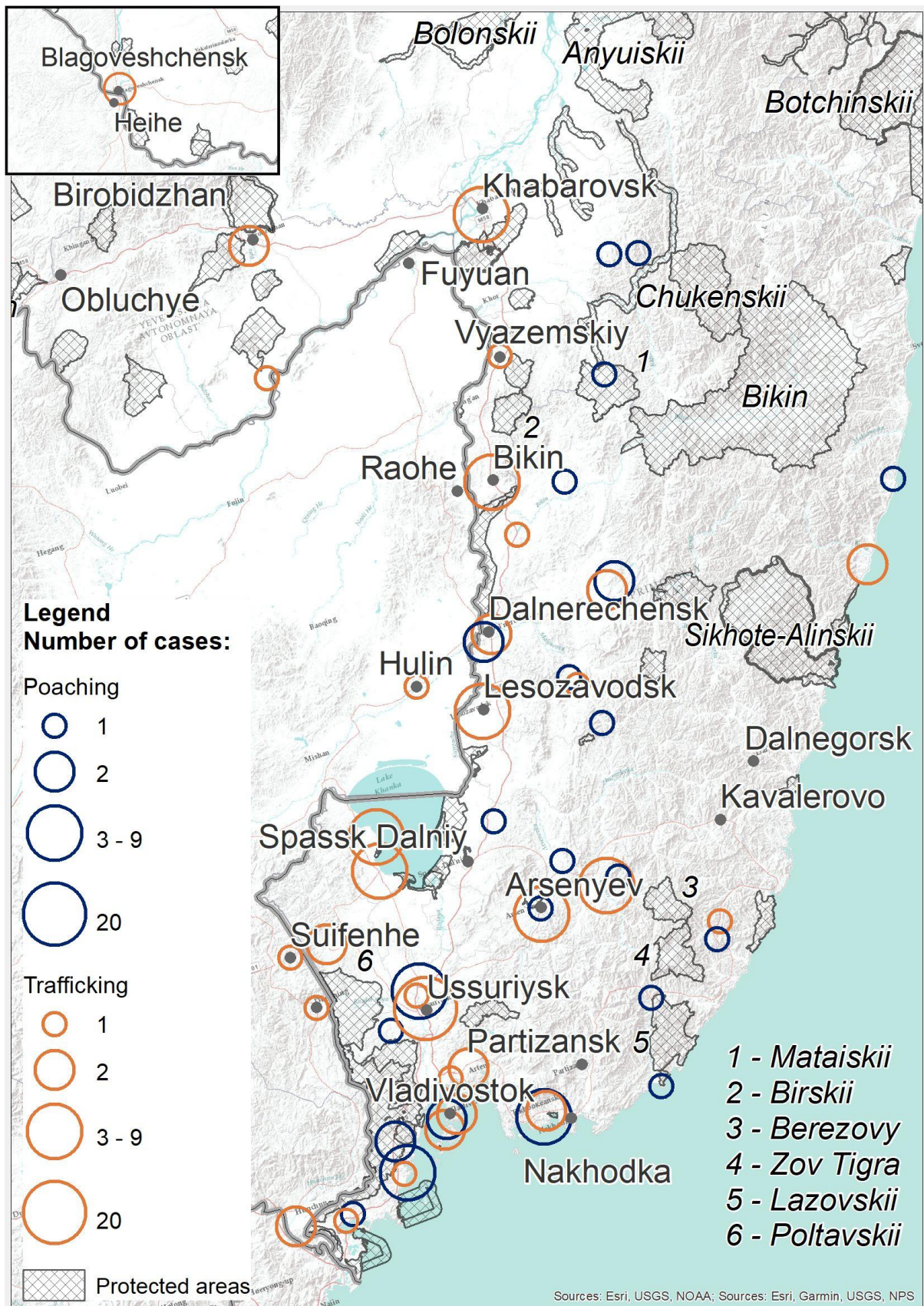Sources: Esri, USGS, NOAA; Sources: Esri, Garmin, USGS, NPS

Figure 40: Total tiger poaching and trafficking cases (2000-June 2018) and Russian PAs

4. Field wildlife market surveys along the Sino-Russian border in China

Field wildlife market surveys organized during the period of 19-27 June 2016 in China along the Sino-Russian border exposed legal and illegal trade in wildlife objects, including those originating from endangered species in various types of trade spots: licensed and not-licensed, including TCM pharmacies.

Table 25: Products made of rare & endangered species identified on wildlife markets during surveys in China, 19-27 June 2016

Species name	Products	Status	Alleged origin
Ussuri brown bear (Ursus arctos lasiotus)	Dried whole bile, powdered bile, bile in tablet, wine with a powdered bile, canine tooth, claws	CITES II Appendix	Russia or farmed in China
Asiatic black bear (*Ursus thibetanus*)	Dried whole bile, powdered bile, bile in tablet, wine with a powdered bile, canine tooth, claws	CITES I Appendix IUCN Red List	Russia or farmed in China
Siberian musk deer(Moschus moschiferus)	Musk deer pod dried whole, powdered, diluted with other ingredients	CITES II Appendix IUCN Red List	Russia or farmed in China (majority comes from farms in China)
Sturgeon (*Acipenseridae)*	Caviar	CITES I and II Appendix IUCN Red List	Russia
Amur tiger (Panthera tigris altaica)	Tiger bone wine	CITES I Appendix IUCN Red List	Russia or farmed in China
Asian ginseng (Panax ginseng C.A. Mey)	Dried whole, dried sliced, dried & powdered, diluted with other ingredients	II Appendix	Russia or farmed in China
Chinese soft-shell turtle (*Pelodiscus sinensis*)	Live	II Appendix IUCN Red List	Russia or China
Pangolin (*Manidae)*	Dried scales, dried with salt, smoked, powdered	I and II Appendices IUCN Red List	Mostly Indonesia, sometimes from Africa
Saiga antelope (Saiga tatarica)	Whole, shredded in strips, in pills	II Appendix IUCN Red List	Russia or Kazakhstan
Walrus (Odobenus rosmarus)	Whole tusks, encrusted with metal, carved	III Appendix (Canada) IUCN Red List	Russia
Hornbill	Beak	I and II Appendices IUCN Red List	Southeast Asian countries
Sea cucumber (Stichopodidae)	Whole dried, whole dried with salt	IUCN Red List	Russia or farmed from China
Ivory (Elephantidae)	Various jewelry or accessory	I and II Appendices IUCN Red List	African countries
Sperm whale (cachalot) (*Physeter macrocephalus*)	Teeth, whole or carved	I Appendix IUCN Red List	Russia
Mammoth (Mammuthus primigenius)	Bones, tusks, whole or carved	Not protected as the species is extinct, but export requires special license from Russian Ministry of Culture	Russia

The list of identified products made of rare or endangered species is given in Table 25 describing the species, products made from it, current conservation status and the origin according to the trader. Sometimes a trader would mention a different origin for a farmed species to ask for a higher price, especially in small shops. In the Chinese perspective TCM products made of wildlife species coming from the wild are generally believed to have higher efficacy in healing.

In cases involving trade in sturgeon caviar, saiga horns in small shops, pangolin scales, walrus tusks, mammoth and sperm whale products, it was evident that the origin of products was from outside of China as there are currently no farming facilities for such products and majority of these products come from the wild in Russia, Indonesia, Mongolia, North Korea or the African continent. These products were prepared from the species that are protected by Russian, Chinese or international legislation, thus their trade, export and import is either prohibited or restricted (Table 25). Interestingly, according to Chinese wildlife experts information, a trader does not need to present a copy of CITES permit from the Russian Administrative Authority to a potential buyer when selling CITES listed products in China. A different practice occurs in Russia when a trader has to show legal justification for selling imported CITES listed product in Russia.

According to Chinese traders' responses, some identified products such as brown or Himalayan bear bile or musk deer pods were made either directly from species or from raw materials produced on the breeding farms in China. Availability of wildlife products indicates that China has a massive farming industry of various animals, plants and mushrooms used for TCM industry. This especially relates to various bear products, frog products, musk deer products, Red deer and Roe deer products, ginseng, various mushrooms and plants, as well as sturgeon.

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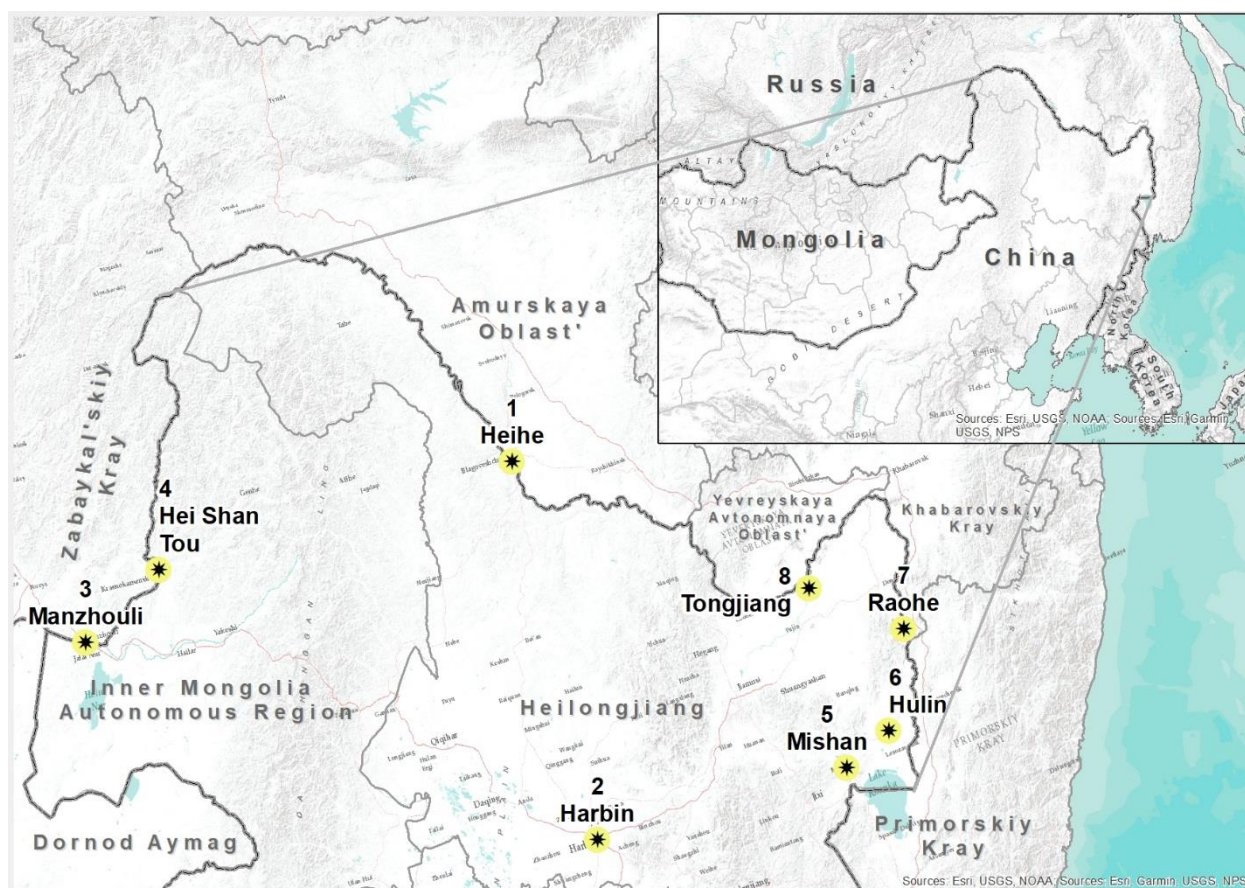
Figure 41: Field wildlife market surveys route along the Sino-Russian border (19-27 June 2016)

Another observation was the availability of wild meat (wild boar, wild deer, wild bear meat and paws) in the restaurants of border towns in Manchuria (9 restaurants) and Heihe (7 restaurants) for tourists with an exotic taste (Figure 41). According to the respondent's information, the meat in the restaurants mostly come from the breeding facilities, however some had a wild origin from Russia. One restaurant in Manchuria had a wolf meat on the menu. Even though China has a well-developed industry of bear farms (Nijman *et al.* 2017; Willcox *et al.* 2016), outgoing seizures of bear paws on the Russian side still constitute a major part of wildlife seizures on the Sino-Russian border. For example, Russian customs seized 116 bear paws only in the first six months of 2016 (Lyapustin and Pervushina 2016).

A better picture was observed in surveyed governmental TCM pharmacies in China where all products on sale had legal origin (licensed packaging) from legally operating farm facilities. Moreover, interviewed pharmacists were aware of the existing bans on selling TCM products

made of endangered wildlife. No illegal sale of endangered wildlife in governmental pharmacies was observed during the surveys.

A less positive observation was made during the surveys of private TCM pharmacies or private shops selling TCM products. Majority of TCM shops in the wholesale market in Harbin did not have licensed packaging for such goods as saiga antelope horns (whole or shredded), musk deer pods, deer antlers (whole or shredded), dried bear bile and pangolin scales. One of the TCM shop owners on the wholesale market in Harbin offered a Tiger bone for the price of 90 RMB per gram (~14 USD). The tiger bone was said to have originated from a breeding farm.

14 TCM shops on the wholesale market in Harbin offered saiga antelope horns (whole or shredded) on sale for 288 RMB per 6 grams (~44 USD). According to interviewed traders, all saiga antelope horns originated from Russia. It should be specified that according to the Russian Federation Government Decree No. 978 from 31.10.2013 (see section 4.1.1 above), saiga antelope was listed as a strategically valuable species. All trade or trafficking operations with this species would automatically be incriminated with a criminal penalty in Russia. A similar situation was observed for musk deer, where some TCM shops in Harbin were selling musk deer pods originating from Russia. According to interviewed traders, musk deer products came to China from Russia via Manchuria, Heihe or Suifenhe (transborder towns with Russia). Siberian musk deer is CITES Appendix II (Table 25), trade and transportation of this species and its products requires special CITES permits. Following this logic, musk deer products coming from Russia were of the illegal origin.

Bear claws

Pangolin scales dried with salt

Shredded saiga horn

Dried frogs

Whole saiga horn from Russia
(according to the trader)

Dried whole bear bile

Figure 42: Identified wildlife products on Sino-Russian border (a)

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Bear bile medicine in governmental TCM pharmacy	Various farmed deer products
"Tiger" wine (old packaging)	"Tiger" wine (new packaging)
Bracelet made of "tiger" bone according to the trader	Live Chinese soft-shell turtles

Figure 43: Identified wildlife products on Sino-Russian border (b)

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Another interesting observation mentioned by several traders in TCM shops in several border towns was the latest trend in selling fake wildlife products to Chinese TCM shop owners. For example, musk deer pods, bear bile or deer genital organs were the most frequently sold as fake. Given the price of the musk deer product for 200 RMB per gram (~31 USD)[8] and high demand for this product, selling fake musk deer pods was a lucrative business. Usually fake musk deer pods were filled with some other substance that was hard to identify.

Special attention should be given to Tiger products found during the surveys (Figure 42 & Figure 43). The only available product sold openly was Tiger bone wine sold in Mishan, Harbin and Manchuria at multiple locations. It should be stressed that only a chemical test can prove a presence of Tiger bone in the alcoholic substance, thus it is hard to estimate whether the product did contain Tiger bone. All identified bottles had a sticker with a date of production before 1993 or stating that a Tiger was killed before 1993. As discussed earlier, Chinese government introduced a ban on selling Tiger bone wine in 1993, thus all Tiger wine produced before the ban is still considered legal. The price for the bottle ranged from 150 RMB (~23 USD) to 1000 RMB (~153 USD). According to interviewed traders, the wine was produced mainly from the bones of captive bred Tigers. In particular, a trader in Mishan mentioned that there was a company selling Tiger bone wine made of Tiger bones from the Tiger breeding farm located in Heilongjiang province. As mentioned above, only special chemical test can identify whether the wine was produced before 1993 or it was just a producer's pre-caution to print an older date of production.

In Manchuria the author found bracelets allegedly made of Tiger dried phalanx bone and claimed Tiger canine tooth according to the trader's comments. Morphological characteristics

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[8] Average musk deer pod weights approximately 40-60 grams

of the bones and tooth did not resemble Tiger biological characteristics; thus, these identified products were most probably fake.

Another trader in Harbin TCM shop suggested us to buy Tiger skin (allegedly from Amur tiger); however it was not available in the shop at that moment. Based on the long conversation we had with a Chinese shop owner in Heihe, who claimed that he was involved in the Tiger skin trade in the past, it is no longer beneficial to trade in Tiger products. According to him, Tiger skin trade, especially from Russia, is of a high risk due to high penalties, secondly, it is not financially beneficial due to the drop in the Ruble rate several years ago. He continued that it is much more financially profitable to trade in skins of other animals such as polar bear skin[9], for example, that is currently in high demand in China. He also mentioned that a Tiger skin would cost around 25000 RMB (~3,820 USD) in Northern China and about 15000 RMB (~2,293 USD) in Southern China.

According to our wildlife market surveys and interviews with traders, all wildlife products entering the border markets have the following origin:

- From wholesale TCM and wildlife markets, Harbin was most often mentioned
- From Chinese suppliers or traders specializing on trade in wildlife and TCM goods
- From various Chinese breeding facilities across the country
- From suppliers from other countries (Russia, Indonesia, North Korea, Africa and etc.), including illegal wildlife suppliers

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[9] Polar bear is included into the list of strategically valuable goods according to the Russian Federation Government Decree No. 978 from 31.10.2013

5. Application of ICCWC Indicator Framework for Combating Wildlife and Forest Crime

ICCWC Indicator Framework was adapted and deployed to Amur-Heilong region to assess national level enforcement efforts on combating crime related to endangered wildlife species in Russia and China (see Chapter III, section 4.9 ICCWC Indicator Framework for Combating Wildlife and Forest Crime for more details).

Final analysis results showed high effectiveness level of national efforts in both countries as opposed to possible maximum score of the indicator framework. Figure 44 shows final national results for Russia and China across eight outcomes (result areas) of the ICCWC indicator framework, while Figure 45 explains these eight outcomes. According to the indicator response results, the final score for Russia was 119, while it was 113 for China as opposed to possible total maximum 132.
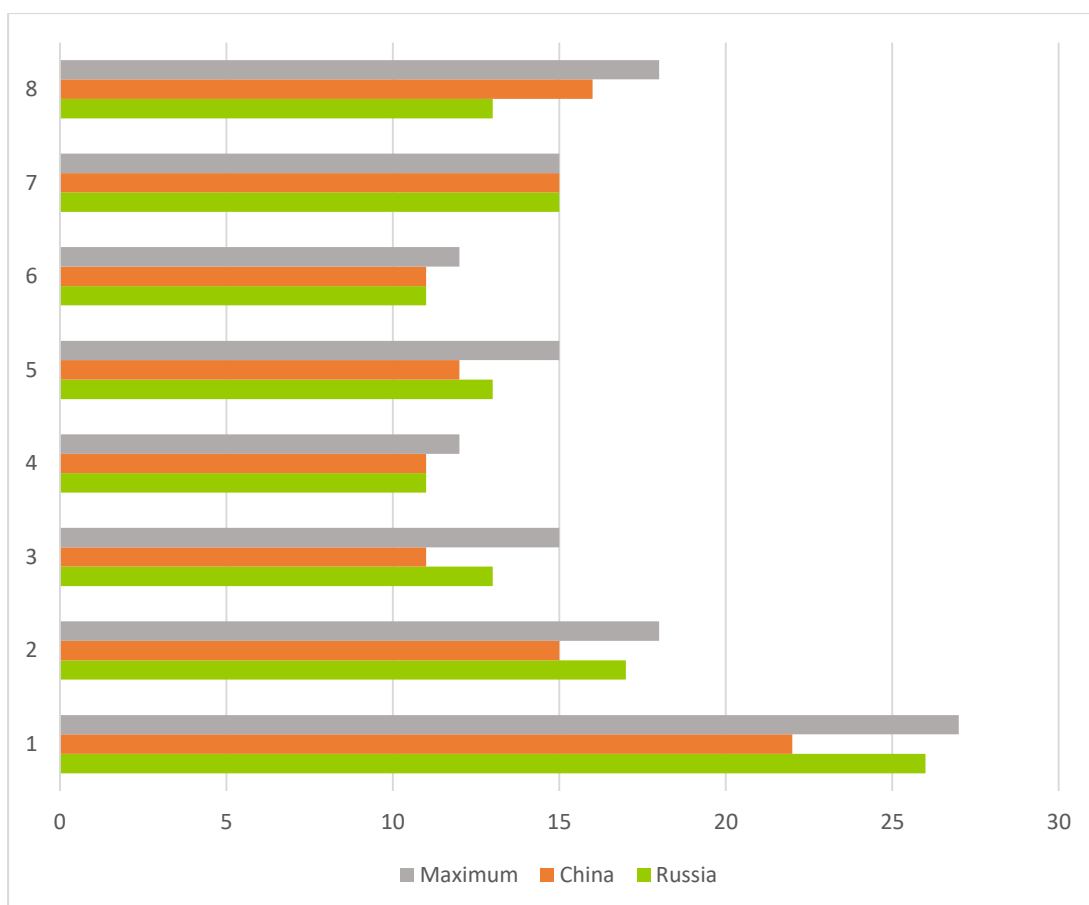
Figure 44: Total scores for Russia and China according to the ICCWC indicator framework

Outcome 1

Proactive enforcement is deterring wildlife crime

9 indicators

Outcome 2

Wildlife crime can be detected by law enforcement agencies

8 indicators

Outcome 3

Wildlife crime is thoroughly investigated using an intelligence-led approach

6 indicators

Outcome 4

Specialized investigation techniques are used to combat wildlfie crime as required

4 indicators

Outcome 5

There is a strong basis to combat wildlife crime

5 indicators

Outcome 6

Wildlife crime is prosecuted in accordance with the severity of the crime

7 indicators

Outcome 7

Wildlife crime offenders are appropriately penalized

5 indicators

Outcome 8

A holistic approach is deployed to combat wildlife crime

6 indicatoras

Figure 45: Eight outcomes of the ICCWC Indicator Framework for combating wildlife and forest crime (source: ICCWC 2016)

240
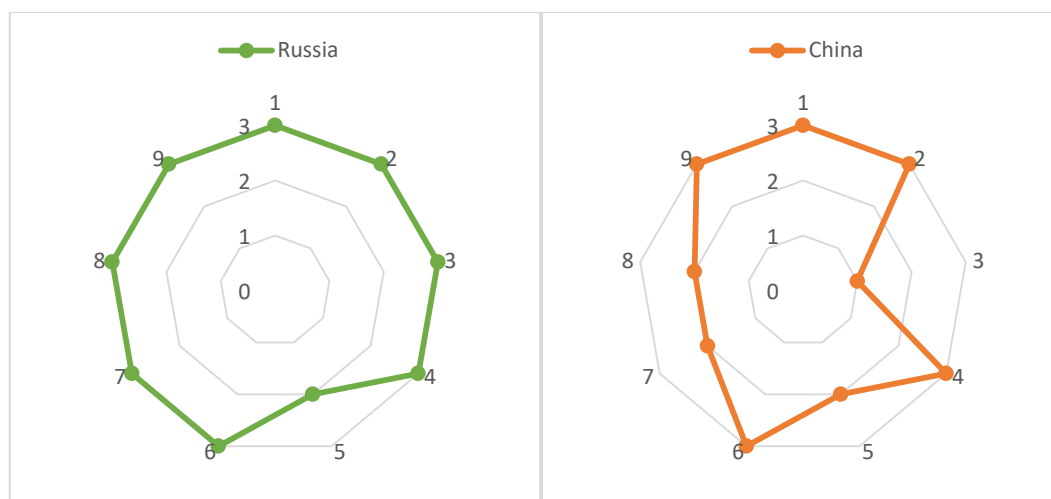
Figure 46: Outcome 1 – Proactive enforcement

Figure 46 displays a radar chart for Outcome 1 on Proactive enforcement for Russia and China. Here Russia and China scored the same amount for such indicators as prioritizing wildlife crime for national law enforcement agencies (Indicator 1) and acknowledging the seriousness of the crime (Indicator 2), national cooperation among the agencies (Indicator 4), presence of strategic risk management practices (Indicator 6) and enforcement training programs (Indicator 9). However, China scored lower due to the absence of a national wildlife crime enforcement strategy (Indicator 3), less proactive wildlife crime investigations (which implies targeting prominent crime threats rather than being responsive) (Indicator 7) and sometimes less enforcement staff focusing on wildlife crime (Indicator 8). Both Russia and China scored less on international cooperation between the enforcement agencies on the regional level (Indicator 5) as this cooperation might happen but not always be focused on wildlife crime according to expertise opinion and responses. Given that Russia scored a bit higher on Outcome 1, the government clearly prioritizes wildlife crime through adopting strategically developed legislation and appointing necessary enforcement staff to address the problem.

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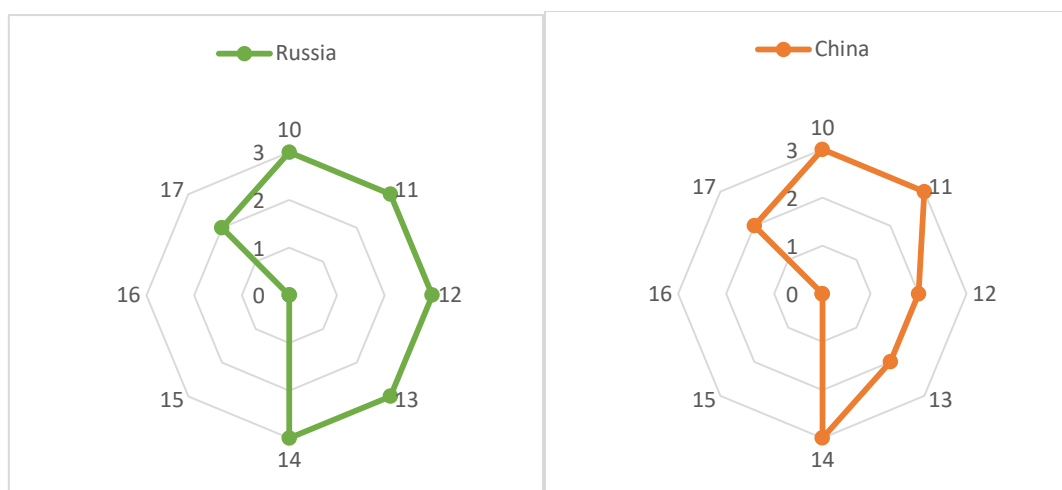
Figure 47: Outcome 2 - Ability of enforcement agencies to detect wildlife crime

Figure 47 displays a radar chart for Outcome 2 on the ability of the law enforcement agencies to detect wildlife crime. Here Russia and China scored the same high amount for targeted enforcement presence (meaning employing strategically targeted places) (Indicator 10), implementing multi-agency joint enforcement operations (Indicator 11), and strong agency power to inspect and seize criminals (Indicator 14). China scored a bit lower on such aspects as the need for more training of border staff (Indicator 12) (according to Chinese expert's response border staff require more training in comparison to Customs staff) and need for better border control equipment to detect wildlife (Indicator 13). As this Output included DA indicator (see Chapter 3, section 4.19 for more details) this data was not included (Indicators 15 & 16). Both DA indicators in this Outcome related to wildlife seizures data was not openly available on the Chinese side. Interestingly, both countries scored lower on disposal systems for confiscated wildlife specimens (Indicator 17). Final scores for Russia show that regional enforcement agencies generally have a strong capacity to detect and stop wildlife crime, which is in line with the national governmental priorities discussed above.

Figure 48 displays a radar chart for Outcome 3, which assesses the level of wildlife crime investigation through the intelligence led approach. Here Russia scored a bit higher than China on the sufficient availability of trained and qualified enforcement staff (Indicator 18) and the availability of information management systems (Indicator 19). Russia and China received the same high score for intelligence led analysis and verification of data (Indicator 20). Both countries scored a bit lower on intelligence led investigations and follow up investigations (Indicator 21 & 22), especially on aspects of sharing data with other countries and implementing international follow-up investigations. It should be specified that this type of information sharing does not occur regularly on the regional level as it involves information classifying procedures and requires certain procedures for sharing personal data. Both countries scored zero on transnational crime reporting to various international organizations as this data was not available (DA Indicator 23). However, this indicator also relates to data sharing complications.
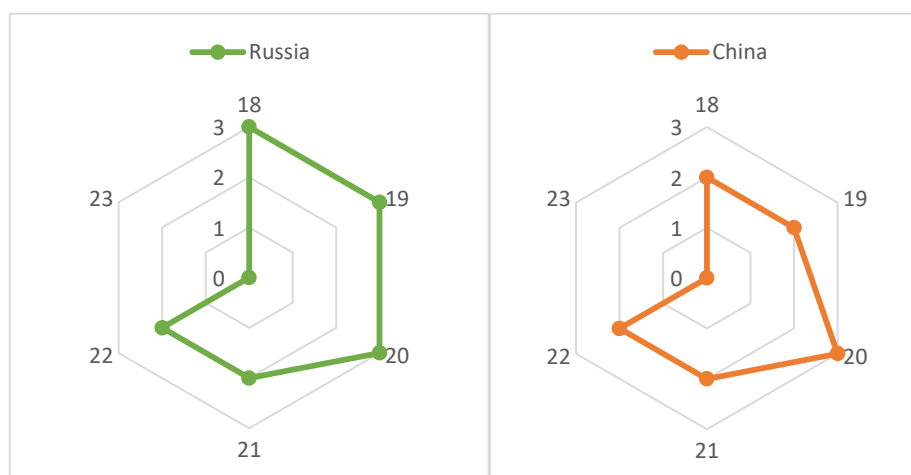
Figure 48: Outcome 3 - Use of intelligence-led approach

Figure 49 represents the findings for Outcome 4 on the use of specialized investigation techniques. It should be stressed that here both countries scored the same amount across all four indicators. Both countries scored highest for the existence of a legal authority to use specialized investigation techniques (Indicators 24 & 25) and capacity to implement financial

investigations (Indicator 27). However, they scored a bit less on use of forensic technology (Indicator 26), as sometimes government agencies do not have full access to adequate equipment, using only basic equipment. According to the Outcome 4 results, law enforcement agencies in Russia and China are well equipped to execute various type of investigations.
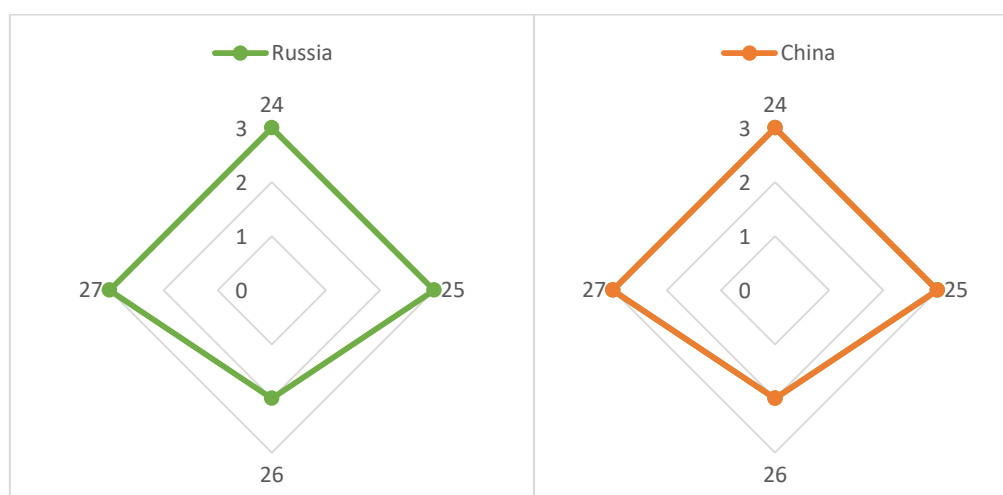
Figure 49: Outcome 4 - Use of specialised investigation techniques
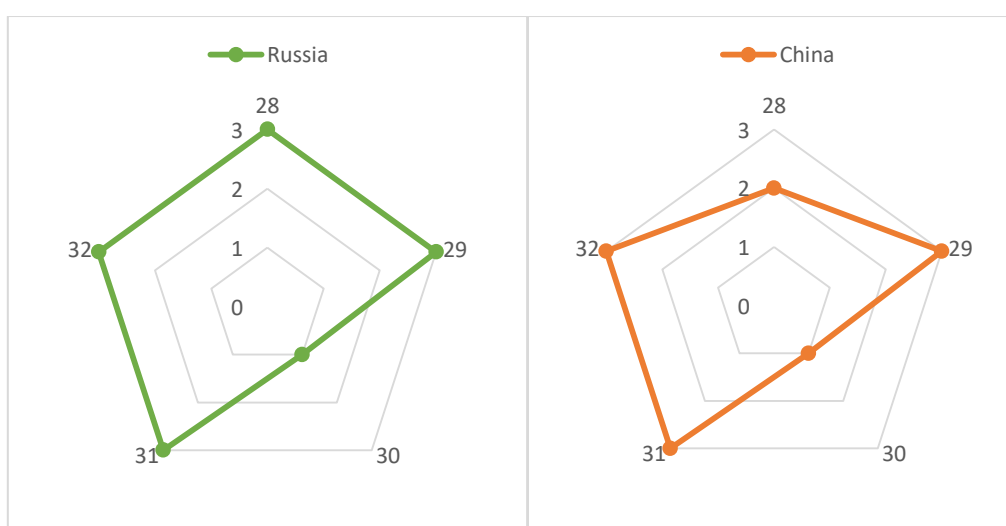
Figure 50: Outcome 5 -Legal basis for wildlife crime

Figure 50 shows results for Outcome 5 on legal basis for wildlife crime. Here Russia scored slightly higher on availability of comprehensive national legislation (Indicator 28), its management and use as China's legislation is not always supported by suitable subsidiary legislation. Both countries scored highest on CITES legislation assessment (Indicator 29),

legislation on corruption and organized crime (Indicators 31 & 32). However, both countries scored low on the use of bilateral treaties and cooperation on criminal matters (Indicator 30) as usually regional investigation do not encompass wildlife crime offences. Usually it relates to the centralization of the law enforcement systems. Collaborative investigations need to be implemented via Moscow and Beijing which takes extra effort, time or sometimes it is not possible at all. Therefore, regional authorities very seldom, if at all, implement these types of collaboration. Clearly, both countries have a profound legislation, however international cooperation on criminal investigations remain complicated. Interesting findings were observed on Outcome 6, which represents prosecution according to the severity of crime. Both China and Russia scored the same amount, which shows that the level of prosecution is adequate to the level of crime committed. This relates to use of the criminal law for wildlife offences (Indicator 33), compiling a criminal case (Indicator 34) and existence of prosecution guidelines (Indicator 38). However, countries scored lower on prosecutor's capacity with regards to those cases (Indicator 37). Outcome 6 had three DA indictors (Indicators 35, 36 & 39) that were not calculated. Indicator 39 represents conviction rates that are available for Russia (see Figure 31 in Section 4.1.1 above); however this data is not available for China, and thus Indicator 39 had to be omitted.
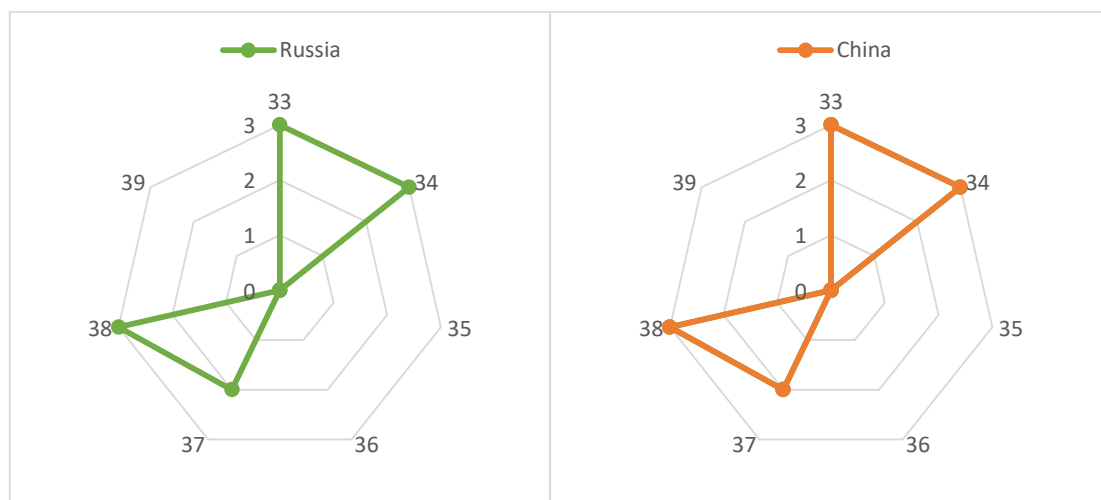
Figure 51: Outcome 6 – Adequate prosecution of wildlife crime

Best possible results were observed with Outcome 7 where Russia and China scored the same on adequate penalties and sentencing of crime offenders (Figure 52). Both countries scored highest on all five indicators. These reflect available penalties, sentencing guidelines, judicial awareness, legal provisions and use of asset forfeiture (Indicators 40, 41, 42, 43, and 44). This exemplifies that both countries have strict penalties and sentencing guidelines reflecting the severity of crime.
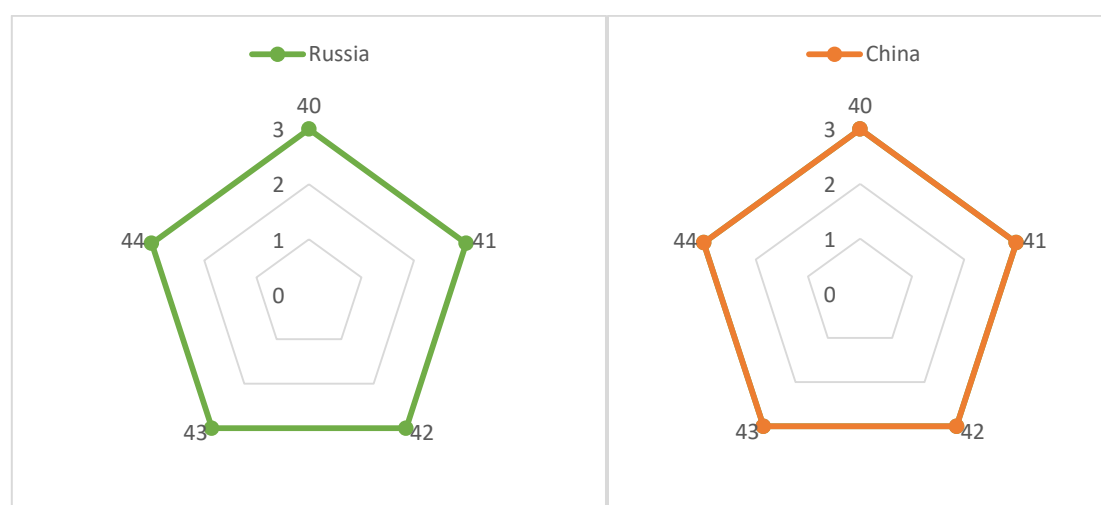
Figure 52: Outcome 7 - Adequate penalty & sentencing of crime offenders

Figure 53 shows the last Outcome 8 that covers deployment of holistic approach to wildlife crime. Here China scored significantly higher than Russia, especially on deployment of demand reduction activities (Indicator 46). China has become a pioneer in these activities, (see Chapter 6, Section 6). Russian government has little experience with these activities, while current work there resembles more awareness raising, which has different goals and approaches. Chinese experts specified that Chinese Government currently does not use the term "demand reduction", calling it "change of consumer behavior" thus eliminating negative connotation of the word "demand". However, these types of activities are being implemented in China, even though called differently.
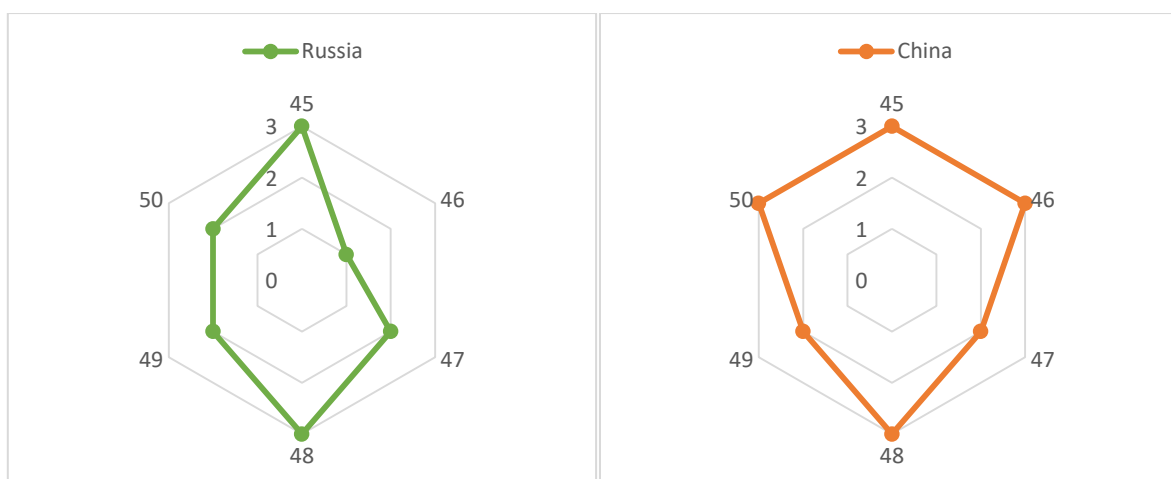
Figure 53: Outcome 8 - Use of holistic approach to wildlife crime

Russia scored the same on local community engagement (Russia actively involves hunting communities, while China involves local eco-brigades) (Indicator 48). However, Russia scored lower on public awareness efforts that are usually ad hoc and do not have a campaign level (Indicator 50). Countries scored the same high results on understanding the drivers of crime (Indicator 45). Also, both countries scored lower on awareness raising of the regulated community (who are licensed harvesters, gatherers, sellers, buyers and etc.) (Indicator 47) and consideration of livelihoods and social factors when implementing activities to combat wildlife crime (Indicator 49). It should be stressed that the area of holistic approach in Russia has not been properly investigated and studied; the questions were answered mainly based on the experts' opinion, rather than available official records. Thus, this subject could potentially become a new area of research.

6. Conclusion

The Amur-Heilong transborder regions indeed represents an interesting case as it sets good practices in addressing the problem of Amur tiger related crime. The Amur tiger population stays viable and persists despite the existing level of poaching and trafficking and strong law enforcement. The following conclusions can be made in the result of analysis:

1) Strengthening legislation with regards to toughened control and harsh penalties for poaching and trafficking can significantly contribute to addressing the problem of wildlife crime. However, another important point is that the legislation must be properly enforced and implemented.

2) The problem of Tiger poaching and trafficking should be addressed from the pipe line model approach where each stage of the crime and each participant of the crime must be addressed. Addressing only one stage of the crime will not bring significant results, but rather will redistribute the crime to other stages/participants.

3) Inter-agency cooperation of various governmental institutions is a key to success in law enforcement efforts on a bigger scale. Here Russia and China set the example with the largest seizures made in the result of the inter-agency operations.

4) Intelligence investigations and proactive enforcement by government agencies in Russia and China comprise a major success factor in law enforcement operations.

5) ICCWC indicators framework represents a fine framework for assessment of the country's efforts that allows an evaluation assessment on various levels as well as comparison with other countries and in different time periods.

6) Despite efforts, there still exist certain problems in regions with regards to Tiger related crime such as slow level of Tiger related crime investigations in court (in Russia), presence of corruption, high level of illegal logging in Russia, little or no transparency in governmental seizure records (in China).

7) Field wildlife market surveys showed that there is still presence of Tiger products on sale in China along the border, however it is hard to identify their origin without special laboratory testing. Large amount of wildlife on sale originated from Russia in China indicate the need to strengthen cross-border efforts for Russia and China and strengthen enforcement efforts in China in these markets.

8) Inconsistency of data in Amur tiger seizure records in Russia and China indicate the need to unite and improve information sharing both inside the countries and between the countries. Whereas, absence of open data on Chinese seizure records does not allow for evaluating government Tiger conservation efforts adequately. Therefore, creating transborder database on Amur tiger seizures records would be a possible solution to the problem in avoiding duplication or missing certain data. This would also allow to estimate law enforcement efforts on both sides of the border and strengthen transborder cooperation.

9) Role of civil society in addressing the problem of Tiger related crime has been critical, especially when it related to monitoring the situation with poaching and trade in Russia and China, assisting the government in crime investigations and lobbying necessary legal acts in Russia. However, this role has diminished with the creation of semi-governmental structures on Tiger conservation in Russia and better training of the law enforcement staff on the border in Russia and China.

10) ICCWC analysis showed that local communities' aspect in governmental efforts still require more attention, especially in Russia where the Amur tiger lives in close proximity to humans.

11) The work of protected areas has yet to be investigated and the level of their enforcement with regards to counter-measures for poaching, especially in Russia.

12) Cross-border enforcement cooperation of Russian and Chinese authorities is still at quite low levels despite clear evidence that border towns and cities play a crucial role as regional crime hubs for tiger products trafficking.

13) The level of government interest and awareness about the problem has significantly increased in both Russia and China throughout the years. The ability to identify tiger products by the law enforcement has also significantly improved in Russia, it can be seen in the variety and increased quantity of seized products on the border.

Chapter IX. Discussion

1. Introduction

This chapter discusses the central research aim formulated in the Introduction chapter, namely:

> *To evaluate the efficiency of countermeasures for the illegal trade and trafficking of tigers through analyzing policies and practices globally and locally in the Amur-Heilong region.*

The discussion chapter is based on the findings presented in the preceding five chapters that individually concentrated on tiger related crime as a phenomenon (Chapter IV), global policy measures (Chapter V), measures taken by tiger range states (Chapter VI), Amur-Heilong region examination (Chapter VII), countermeasures for illegal trade and the trafficking of tigers in the Amur-Heilong region (Chapter VIII).

The analysis in this section explains the findings in the context of Chapter II linked to the theoretical and conceptual considerations, logical framework. The discussion is centered around the three formulated research questions with the following discussion on research contributions and reflections on the methodology.

2. What are the extent, causes and characteristics of tiger related crime?

Given the lack of academic literature devoted to the topic of illegal trade and trafficking in tigers, to answer this question, this research brings significant contribution by utilizing the data collected during the participant observations, as well as from "grey" literature and mass media reports. As consumption for purported effects believed in traditional Chinese medicine

is one of the major causes of tiger related crime, meagre coverage of this subject has been given in Western literature sources.

<u>Causes</u>

As presented in Table 10 in Chapter IV, nearly every part and organ of a tiger has a use in prescriptions for Chinese traditional medicine (Li *et al.* 2017; Mills and Jackson 1994). Moreover, even water from tiger footprints or tiger feces are purported to have healing affect in some rural communities in Sundarbans, Bangladesh (Aziz *et al.* 2017b; Inskip *et al.* 2014; Saif *et al.* 2016).

Chinese wildlife trade experts when asked about the historic justification for tiger use in TCM, mention deep cultural belief and acknowledgement of tigers as majestic and the strongest creature in animal kingdom. In traditional Chinese perspective, to have the qualities of this animal, a person needs to eat a part of it or possess a product made of it. Along with the sudden economic development of China there recently emerged of a wealthy Chinese class. The resurgence of tiger product consumption is not only for medical reasons, but is also as a symbol of status and wealth (Dinerstein *et al.* 2007; Gratwicke *et al.* 2008; Mills and Jackson 1994; Nijman and Shepherd 2015). Latest research of consumption patterns in China identified that there has been a shift in the consumption of tiger bone from "traditional" medicine to a more general consumption as a health stimulant or tonic, sometimes used for social occasions or recommended by a doctor (Nowell 2018).

Additionally, it should be noted that tiger poaching and trafficking results from a combination of factors. For instance, as identified by the researchers in Indonesia's Seblat Kerinchi National Park, tiger poaching rates have a strong correlation with the average tiger skins prices, while there is a positive correlation between the skin price and Indonesia's GDP

fluctuations (Linkie *et al.* 2018). Therefore, tiger poaching and consumption patterns are strongly linked to the economic growth of Southeast and East Asia.

<u>Extent</u>

Demand for tiger products triggered illegal trade and the trafficking of tigers across range countries. TRAFFIC is the only non-governmental organization, which continuously publishes reports on estimated numbers of tiger killings by 13 range states for over nine years. The analysis of the report findings is presented in Chapter IV, section 3. Current global tiger trade trends and section

4. Global geographical trends.

Each tiger crime report published by TRAFFIC showed that the number of seized tigers has been increasing from year to year. This can be explained by several reasons. First, the quality and volume of data collected for analysis has been improving with each report, due to more agencies providing information and better data availability. Second, with each year, government officials of tiger range countries have invested more effort into recording and detecting tiger crimes officially. Third, due to generally increased global interest to tiger conservation, more and more information on tiger crime is covered by the media and made available to online sources. Lastly, some of the poached or seized live tigers might come from captive breeding facilities, whereas the number of these facilities has significantly increased in the last eight to ten years. This might not necessarily mean that more tigers are being killed in the wild, than there have been in the past. However, it is evident that the killings are not diminishing, and illegal trade continues unabated despite global efforts, more interest in a charismatic species and resources invested into tiger conservation globally and nationally.

Findings from the latest report on tiger trade and trafficking presented in Table 13 show the amount and types of seized wildlife products. Seized products include nearly every part of a tiger or tiger derivative. Report findings presented in Table 11, Table 12 and Table 13 show that law enforcement authorities across tiger range countries have significantly stepped up in addressing wildlife crime in the last four years (in comparison with the previous published report on illegal trade and trafficking in tigers). The increased variety of seized products (Table 13) indicates higher capacity of law enforcement officers on the ground to identify and record seized items that have been omitted in the past and, thus, not recorded. This especially relates to seized items small in size that are much harder to identify for a law enforcement officer, such as derivatives (tails, gall bladder and whiskers) and processed products (tiger wine and wallets). The increased capacity of law enforcement agencies might originate from strong political will and consequently, more robust pressure on government agencies to identify products and parts of a politically sensitive animal. Similarly, better awareness and more law enforcement training aimed at recognizing wildlife items, might have also resulted in a higher rate of seizures of small and processed tiger products. Alternatively, it might indicate more demand for such items and thus more seizures of these types of items, as argued by the authors of the last tiger trade report (Stoner *et al.* 2016).

Nevertheless, it is hard to estimate the level of increased demand for illegal tiger products, while there have been historical records of seized smaller tiger parts over ten years ago on the Russian Far East based on the conversations with regional tiger experts. There are historical records from the early XIX century made by Russian geographers on the Far East describing Chinese traders and hunters buying entire tiger body carcasses, while tiger whiskers, heart and kidneys were the most valued on the market at that time (Lyapustin 2010). This signifies that smaller tiger products have already been in demand historically, even though not widely identified and seized.

Characteristics

The presence of seized live animals in tiger seizure records presented in the Table 14 is one of the major characteristics of the current tiger related crime. Bearing this in mind, as well as wide spread breeding facilities across South East Asia for the last five to seven years, seizure data suggests that seized live tigers most likely originated from the captive sources.

Online trade as described in chapter IV, Section 5. Online trade appears to be another major characteristic of tiger related crime. Inevitably illegal online wildlife trade threatens not only tigers, but all other species, especially those that are globally threatened, as it has certain characteristics that enable this problem to widely spread. It should be stressed that this subject has been mainly studied by the organizations dealing with wildlife trade, but it has not yet caught much attention from academia or research institutions.

Research done by the environmental NGOs working on wildlife trade such as TRAFFIC, IFAW and WJS (Wildlife Justice Commission) shows that wildlife traders widely use Facebook, as it provides a massive platform for uploading pictures and advertisements for the sale of ivory, rhino horn, tiger parts and other endangered wildlife. Over an 18 month investigation by the WJC showed that Facebook is widely used by illegal wildlife sellers in Vietnam who create closed or secret special groups through auctions all across South East Asia and payment is done via We Chat Wallet (Hance 2016). Facebook has the capacity to shut down entire accounts and delete suspicious groups but it largely depends on how severe this crime is considered according to specific community standards (Hance 2016). This comes back to the question of strengthening the legislation in a specific country and bringing together online companies and law enforcement to follow up on most severe cases. As a good practice, in April 2016 WhatsApp service (owned by Facebook) announced that it will

encrypt the messaging service of its 1 billion users worldwide what would create greater challenges for any illegal activity (Naughton 2016).

It should be stressed that it is very difficult, if possible, to identify the authenticity of products sold online. Thus, judgment on the authenticity could only be made by experts from the photos if the product was a skin or whole part of a tiger (provided the quality of the picture). If sold product was a medicine, curio or tonic, it is nearly impossible to identity whether it does contain tiger part traits. Nevertheless, identified items online allow access to what type of products are in demand on the illegal market.

3. How is tiger related crime addressed at the global level?

To answer this research question, the author analyses the phenomenon in two different settings: one is in the global policy context, which is the realm of CITES convention as the most pertinent global policy instrument, and the other is in the context the overall efforts made by the thirteen tiger range countries (chapters V and VI).

3.1 Tigers in CITES deadlock

In chapter V on global policy efforts the author identified both strengths and weaknesses of the CITES Convention with regards to addressing the problem of illegal tiger trade and highlights such issues as non-compliance, unclear reporting guidelines, lack of transparency and scientific evidence of information provided by the tiger range countries.

Setting the scene

Based on the analysis of policy documents and participant observations, development of tiger trade agenda in CITES is very much influenced by the current political agenda and balance of powers and overall sensitivity of the issue due to the development of captive breeding

operations in China and other Southeast Asian countries. However, the Convention remains one of the most effective international treaties due to its regulating power by the law enforcement on the ground and international political pressure bringing change for tigers. At the same time, CITES provides the platform for open but complicated discussions and as well as the framework for assessing countries' efforts in saving the tiger population and cracking down on illegal trade and the trafficking of tigers.

When trying to answer the research question on how is tiger related crime addressed in CITES as the most pertinent policy instrument, the author comes to the conclusion that current tiger agenda in CITES has reached a stumbling block mainly due to two conflicting positions on captive breeding between the countries that have extensive captive breeding facilities but small wild tiger populations and other range states with larger tiger populations (mostly India) and international environmental conservation organizations that criticize captive breeding practices.

Captive breeding topic has historically materialized into a "Pandora's Box" of problems in CITES tiger agenda: be it CITES tiger related documents or Parties' discussions during the CoP meetings. Gathering evidence from participant observations, policy documents analysis and interviews, the author concluded that overall tiger conservation agenda in CITES has historically been side-tracked by the captive breeding discussions what is impeding global tiger conservation successes in the long run. Another down side of this situation is the diminishing trust in the power of CITES as a global policy instrument from the side of range states. Non-compliance and lack of reporting to CITES on Asian big cats and tiger conservation efforts has become a common situation observed in CITES, which is also troublesome for the Secretariat.

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Moving forward

The author analyzed current situation through the prism of the game theory method in environmental context and developed recommendations for further actions for moving forward with the global tiger agenda in CITES. The game theory method application allowed for identifying how imperative it is to motivate China to cooperate in CITES context, as it will be beneficial for tiger conservation efforts overall, as well as for China's international image with less criticism over its internal policies with regards to trade in tiger skins from breeding facilities.

As findings showed, a non-transparent labeling system in tiger breeding facilities in China leaves plenty of room for retaining and re-using the government certificate for various products and gives an avenue for self-motivated companies and traders to sell various types of tiger products under fake or re-used government licenses. Even though China has legislation prohibiting medicinal use of tiger bone, there are regulations issued by the SFA allowing trade exceptions in Asian big cats for scientific research, domestication, breeding, exhibiting and other special circumstances, provided national government permission is granted (Nowell and Pervushina 2015).

Now with the latest attempt of China to change the domestic legislation, it is not certain what will be the fate of the wild tiger population (and rhinos) and whether the Chinese government will manage to strike a balance between the internal legalization of trade and keeping adequate law enforcement control to ensure no wild tigers are entering the trade (it failed to do so with the introduction of the domestic ivory trade ban in January 2018 resulting from massive lobbying campaigns as well as reinvigorated elephant poaching crisis in Africa for the last five years).

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Many domestic measures and precautions would need to be taken in China to ensure that the threat to wild tigers is minimized. First, the Chinese government has to introduce a thorough labeling system for farmed tigers and each tiger part to ensure these documents cannot be falsified and replicated many times with different animals (as argued in Chapter VI, Section 7, this procedure is quite simple with the current labeling system). Second, all farmed tigers would need to be included into national DNA or isotope system to enable their identification for law enforcement. Moreover, recent studies prove isotope markers to be effective in identifying wild from farmed pythons, as well as their geographic origin due to their different diet (Natusch *et al.* 2017). Third, management of these facilities must become more open and transparent to the international community, the same refers to the utilization or management process of dead tiger bodies. Implementation of these basic conditions and their conveyance to the international community would significantly ease the pressure from wild tigers, as well as reduce the external critique on Chinese Government, which has also adopted the policy of Green Civilization.

At the same time, the issue of internal legalization of the tiger trade in China has been sometimes discussed among tiger conservationists as a potential way for reducing or regulating breeding facilities, which are also quite costly to maintain. However, several potential complications and implications can already be foreseen as the legislation was first adopted in October 2018, but then delayed in implementation.

First, given that TCM consumption of tiger bone from captive facilities could become legitimized, while personal consumption of endangered species for food is not (in light of the previous Chinese legislation), there is mixed-messaging to the public as well as confusing legislation of what is considered legal or not. There is a high risk that personal consumption of tiger products will increase. Given that the latest identified consumption pattern is that

CEU eTD Collection

tiger products are now viewed as a symbol of status, rather than a remedy, there is a risk that tiger bones from breeding facilities will also satisfy the demand from tiger wine producers (Nowell 2018).

Second, is not yet clear what would be the response of the Chinese TCM community, which officially announced their refusal to use tiger bone in TCM practices in 2010.

Third, given that China has set an example with breeding facilities for other Southeast Asia countries in the past, the same might happen with the potential legalization of internal trade with breeding facilities, especially in Thailand or Laos. Traditionally, these countries have been under economic and political influence in the region. It is possible that China could again set a "bad example".

Critique

It is worth emphasizing that empirical studies on wildlife conservation show that cooperation in the sense of game theory application is likely to be more successful with bottom up community based programs than a top down approach (Colyvan *et al.* 2011). Efforts to regulate the illegal tiger trade in CITES context represent a top down approach to common-pool resource regulation. In a bottom up approach, local communities seem to be more open for cooperation as they traditionally rely on the use of the resource (DeSombre 2005). Applied to the illegal tiger trade problem, local communities would be more responsive to cooperate in addressing tiger trade as they co-exist in the same habitat with tigers and might have certain cultural values to wild tigers (as in the case of India, Bangladesh, Nepal and Bhutan where the tiger is considered a sacred animal historically and highly respected in religion and culture). This, however, might not apply to such local communities where the

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tiger represents a threat or a competitor for food with humans rather than a sacred animal, this eventually leads to human-tiger conflicts.

Moving away from analyzing global policy efforts, it should be mentioned that the game theory approach has been criticized in academic literature for ignoring the possibility of multiple non-cooperative solutions, especially with regards to determining the effectiveness of international environmental agreements (DeSombre 2005). This could have been relevant for present research if the author had analyzed the effectiveness of CITES, for example. However, it has not been the author's research goal to assess the effectiveness of CITES, but rather to see how tiger agenda has evolved historically in CITES. Additionally, as DeSombre argues, any attempt to evaluate the effectiveness of an international environmental agreement would need to determine the effectiveness of a scenario in which would have happened without an agreement (DeSombre 2005). Such analysis would be a potential research avenue for researchers aiming to evaluate CITES in the case of tigers, for example.

3.2 Range states' efforts

Analysis of the global practices employing CITES Res. Conf. 12.5 framework has identified the following best practices and problems across the Tiger range states as enumerated below.

Legislative measures & law enforcement

The analysis revealed that a majority of the range states developed legal and regulative systems that are adequate to address the illegal trade and the trafficking of tigers. Similarly, national law enforcement efforts were regarded as the most successful in range states that created permanent inter-agency law enforcement units.

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International cooperation

International cooperation has been regarded by the CITES Res. Conf. 12.5 as the core activity. Even though there are at least two high-level international enforcement coalitions in place, none of them seemed to be operating properly: neither SAWEN, nor ASEAN-WEN could be viewed as successful cooperation models, even though these were praised in CITES reports and policy documents. Both networks were not fully functioning for various reasons. The only successful model of cooperation was between India and Nepal, these countries have traditionally had a good history of cooperation and information exchange, in many ways due to good high-level political relations and cultural similarities.

A similar situation is observed with various meetings and conferences at various levels that are encouraging the exchange of information and cooperation on wildlife crime, including trafficking of tigers. For example, the documents adopted at the London and Hanoi Conferences on wildlife trade (held in 2014, 2016 and the latest held in October 2018) did not include any specific plan of action in any specific country, however it was a statement of good will and intentions. This reiterates that multilateral cooperation agreements that do not have an enforcement mechanism might seem inefficient; however it brings necessary global attention.

Recording and data analysis

Analysis revealed that data sharing does occur among the states when needed, however it does not happen on a regular basis. For example, a unified database, which has been promoted by INTERPOL in various documents (INTERPOL 2014, 2017), seems to be too ambitious for many tiger range governments, especially when it relates to sharing sensitive data on criminal personal records. Sharing such data would require special bilateral and multi-lateral law enforcement agreements, which governments do not usually have or have

very seldom have on specific items (usually such agreements should be signed at the highest level between governments). Additionally, these governments are not well equipped technically and financially, not to mention the fact that wildlife crime has traditionally been a lesser priority for law enforcement agencies in comparison with other types of crime.

Apart from these reasons, there are other issues behind the scenes that need to be overcome. There is an issue of authenticity of data provided. Often tiger killings and poaching happen under different jurisdictions of several law enforcement agencies, for example police, which acts beyond protected areas (or tiger habitats) and forest rangers in protected areas. Unless there is a specialized agreement among the law-enforcement agencies at national, regional and provincial levels, these agencies will not share information or share very limited information and not regularly. Finally, another obstacle is weak political will of a government to investigate and record the seizures. Sometimes, it is easier for the government to neglect the occurrence of the poaching or tiger mortality rather than investigate and invest resources into it. This might be the case when there is big pressure from the media or internationally on tiger killings. One of examples of this is India where public pressure is high or Indonesia where environmental NGOs play a significant role in wildlife crime investigations and thus pushing the government to invest efforts into it. As a tiger crime expert from an Indian NGO once mentioned during the INTERPOL seminar: "No official record of a tiger killed – no problem".

Behavior change and awareness raising

As transpires from the experts' literature, awareness raising does not have long term results as behavior change does. For instance, as recently observed by the researchers in Sumatra, raising environmental knowledge will unlikely curb hunting by the locals (St. John *et al.* 2018). In contrast, behavior change focuses on a set of policies and programs aiming to

reduce desire and preparedness to obtain illegal products (tiger products in present case) (Zain 2012). Behavior change uses educational and/or any other prevention programs to dissuade potential or continuing consumers. At the same time, as we are dealing with conventional beliefs about the purported effect of illegal Tiger products intertwined with the massive use of traditional Chinese medicine, it would require a significant period to achieve desired results in consumer patterns. Therefore, the results of the current work of various organizations aimed at reducing the demand in endangered wildlife species have yet to be achieved and assessed.

However, a less optimistic view on changing social values for the sake of conservation was discussed in the literature. The authors argue that despite widespread hope among the conservation professionals with regards to enduring a massive value shift, their efforts will not be effective (Dietsch *et al.* 2016; Manfredo *et al.* 2016; Manfredo *et al.* 2017). In many ways it relates to meagre investigation effort taken by the conservation practitioners on how these values are formed and changed in societies (Manfredo *et al.* 2017). Furthermore, social values are not just motivational goals that people adhere to, but they are deeply embedded in culture, collective behavior, social institutions and traditions that bind groups, institutions and societies. These values are stable across generations, while only substantial social-ecological shifts in society can bring an abrupt value change (Dietsch *et al.* 2016; Manfredo *et al.* 2016; Manfredo *et al.* 2017). Moreover, new altered values are built upon prior value structures and cannot be fully replaced. Therefore, values need to be studied from a multi-dimensional and dynamic perspective (Dietsch *et al.* 2016). This would enable conservationists to work within the existing value structure, rather than trying to reshape or replace it (Manfredo *et al.* 2017).

Captive breeding facilities and privately held stockpiles

Another contentious point of the CITES Res. Conf. 12.5 framework are captive breeding facilities and privately held stockpiles that are viewed as crime enablers (Nowell 2007, 2010; Nowell and Pervushina 2015). The same is argued about ivory trade bans and stockpiles (Bulte *et al.* 2003). Furthermore, there is a risk expressed by some academics that trade bans can accelerate the species toward extinction if speculators bet on future price increase due to stockpiling (Bulte *et al.* 2003). Stockpiles enable the opportunity to cash in on an extinct species in the future. This logic might explain the reason behind why Chinese private entities have been continuously stockpiling tiger products and derivatives hoping for a significant price increase in the future. Indeed, considering that tigers have almost gone extinct in China (apart from Amur tiger sub-species), the demand for tiger wine in China is still high and the price is rising (Nowell 2010). At the same time, the fact that government agencies of China (who officially announced its intentions to save wild tiger population) openly declare tiger stockpiling practices of private entities show that there is a lack of understanding of stockpiling outcomes for wild tiger species. Indeed, while the country is investing financial and human resources into its national tiger conservation from one side, it is potentially contributing to the extinction of its wild tiger population, on the other, by supporting private stockpiles and demanding transparency in their management.

Even though China has been one of the few range states with regular reporting on breeding operations for tigers in contrast to such countries as Thailand, Vietnam and Laos, it is not sufficient to understand the mechanism of operation of captive facilities in China as well as to judge the level of transparency and proper management of the stockpiles. The transparency is less in other Southeast Asian countries with breeding facilities. This clearly shows a big gap in tiger conservation globally that must be addressed from various perspectives.

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<u>Concluding remarks</u>

The research argues that CITES Res. Conf. 12.5 framework does suggest an inclusive outline for the overview of the efforts. However, as the framework is generic, it does not allow identifying the details of how exactly certain results have been achieved and which measure has been the most successful (or unsuccessful) in addressing the problem. Therefore, a more detailed analysis and application of various research techniques is needed when identifying specific best practices in a certain region or country.

4. How successful are the countermeasures for illegal trade and trafficking of tigers in the Amur-Heilong region?

When setting the scene for assessing the counter-trafficking measures for tiger related crime in the Amur-Heilong region, it is worth spelling out regional political and economic trends. The region is shared by two countries that have a disproportionally different pace of economic and industrial development and significant disparity in population density (75 million reside on the Chinese side and 5 million - on the Russian side). As a result, there is a growing strategic subordination between the two countries, especially with regards to trade and political relationship (Golunov 2017; Simonov and Egidarev 2017; Tracy *et al.* 2017). This implies that Russia has a limited capacity to raise specific concerns in this partnership with China, especially when it relates to environmental problems (Glazyrina and Zabelina 2016; Simonov and Egidarev 2017; Tracy *et al.* 2017). Moreover, some aspects of these environmental concerns might not even appear on governmental high-level agenda discussions between the two countries. Such a regional trend has potential to affect the overall pace of transborder conservation efforts for the Amur tiger, which mostly resides on the Russian side and highly-valued for its TCM qualities on the Chinese side.

Amur tiger range assessment

As discussed in Chapter VII, only 20% of the current Amur tiger range lies within the protected area territories, while the rest 80% of the range lie within the areas of the hunting estates where the tiger is competing for prey with a hunter (Ministry of Natural Resources and Environment of the Russian Federation 2010) (Figure 30). Due to this, it is very important to organize sustainable and effective management of hunting estates, as well as adjust hunting quotas for tiger prey, and ensure that rangers are fully equipped legally and physically to lodge violations and take measures.

According to the estimations of global tiger habitats loss, Russian Far East - China region has the second highest cumulative amount of forest loss for the period 2001-2014 with 8,483 km^2 of forest losses which constitutes 3% of the total TCL area (Figure 14) (Joshi *et al.* 2016).

Spatial analysis of forest cover change in the Amur tiger habitat between 2000 and 2016 in Russia presented on Figure 30 shows forest cover losses in the Amur tiger habitat in more details. While some of the forests cover losses occurred within the PA areas, a major part is observed on the north of the tiger habitat (Figure 30). Additionally, very scant forest cover is present along the border, especially on the Chinese side. It is hard to identify whether forest cover losses were related to unsustainable logging or forest fires, however this requires thorough spatial and on-site analysis and investigation, as well as stronger measures for monitoring the situation by the provincial government. Special attention should be paid to other massive areas of forest loss beyond tiger range areas in Evreysky and Zabaikalksy provinces in Russia, especially further north-west from the border (Figure 30). Closer spatial analysis of these areas and findings from the desktop research, suggest that majority of these areas have been suffering from large scale forest fires during the dry season. This is another major problem for Russian forest management services that has to be immediately addressed.

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Given large tiger range areas and relatively small population residing in the range, this cumulative habitat loss might not be detrimental for the current Amur tiger population in Russia. Even though the forest cover loss area is significant in comparison with other tiger range countries (as shown in Figure 11), available the Amur tiger habitat might still be sufficient to accommodate the current Amur tiger population. However, this situation might change given the pace and the scale of the forest cover loss and continuing Amur tiger population growth. At some point there might be a limit to the population due to the carrying capacity of the continuously deteriorating habitat, which may be another future avenue for Amur tiger conservation research.

Amur tiger conservation and reintroduction efforts

As a majority of the Amur tiger population resides in Russia, it would be more pertinent to discuss Amur tiger conservation efforts in Russia and Amur tiger reintroduction efforts in China (see Section 4.3 Global range distribution and population discourse for details on the latest tiger numbers).

While Russia has a long history of Amur tiger conservation efforts which is discussed in Chapter VII, China has actively started its efforts to bring Amur tigers back only a few years ago (see Figure 29). Considering that the subject of tiger conservation is quite political in China, whereas the topic of Tiger farming is controversial and sensitive, most of the tiger related news in China is focused on the reintroduction and restoration of the Amur tiger population, rather than resolving the tiger farming dilemma.

Reintroduction plans fall in line with the China's Government concept of the Ecological Civilization, which also includes the expansion of the national park system for the Giant Panda on the Northwest and Southwest, the Amur tiger and Amur leopard in Northeast

(Ministry of Ecology and Environment of the People's Republic of China 2017). As argued in Chapter VII, Section 3.1.1 currently Chinese Government plans to reintroduce tigers from the tiger breeding facilities. Additionally, based on informal conversations with the tiger biologists in the Russian Far East, there is an ongoing dialogue between the Russian and Chinese Governments and biologists to relocate Amur tigers from the Russian Far East, however no concrete promises or plans have been developed yet. The Russian Far East could serve as an alternative source of wild tigers to Chinese tiger breeding facilities. Given the complexity of measures that need to be taken to reintroduce tigers from breeding farms, a relocation plan from the Russian side might be more feasible in the future.

Inter-agency law enforcement operations

Analysis of practices across range countries, supported by interviews or informal conversations held with the law enforcement officials from India, Russia, China or Nepal showed that coordinated inter-agency law enforcement operations were regarded as the most successful for breaking the wildlife poaching and smuggling chains (see Chapter VI). As widely known in wildlife conservation, each tiger has a specific stripe pattern on its fur, similar to human fingerprints. It is unclear how permitted sales are monitored and controlled by the Chinese government, which creates criticism towards China's government with regards to its internal policies as discussed in Chapter V.

National law enforcement. Figure 32 in Chapter VII shows the inter-agency collaboration model in the Russian Far East, which has been developed for years and proved to be successful judging by the seizure records in Russia.

Similarly, China is also quite successful in organizing inter-agency collaboration for addressing wildlife poaching and smuggling. Moreover, China has been one of the first

countries to come up with a coherent and institutionalized national level and regional scheme for inter-agency enforcement collaboration on wildlife crime what has been widely acknowledged by CITES globally. Another interesting factor is that these enforcement groups are coordinated by the Chinese CITES MA representations that play an equal partner role in enforcement coordination. In contrast, Russian CITES MA is not involved in any type of enforcement coordination what exemplifies the role and authority of CITES MA agency nationally and regionally in Russia.

Legislation and enforcement effort assessment

With regards to assessing tiger related legislation in China, the issue of commercial tiger breeding arises. Currently, commercial captive breeding is still allowed in China as long as the relevant license was obtained from provincial level government agencies (Zhang 2016). The same refers to trade (sale, purchase and use) in rare and endangered wildlife, which is generally prohibited with the exception of captive breeding, scientific research, exhibitions or performances of wild animals. Given the high sensitivity of the issue and difficulties pertaining to labeling Tiger products from captive breeding facilities explained in Section 7 on Prevention of trade from captive breeding facilities and privately held stock-piles in Chapter VI, current Chinese legislation related to trade and trafficking of tigers is still confusing and even considered contradicting by some international nature conservation organizations.

With regards to enforcement effort in Russia, an analysis of Amur tiger trafficking and poaching presented in Figure 35 show that strengthening of legislation and toughening of the penalties for smuggling became instrumental in addressing the problem. Going further, a holistic approach to wildlife crime is needed when developing and adopting the countermeasures by the government agencies. Previous legislation was only related to tiger

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poaching, which is only one part of the wildlife crime chain, thereby omitting the rest of the criminals involved in the tiger trafficking chain. The newly adopted legislation criminalized all sections of the wildlife crime, including trafficking, transportation and selling of items belonging to endangered species.

The same argument is supported by the analysis of spatiotemporal concentrations of Amur tiger seizures in Russia presented in Figure 37, Figure 38 and Figure 39. As shown in Figure 39, Amur tiger seizures related to trafficking have significantly increased after 2013, which is the year legislation strengthened in Russia. Not only the number of Amur tiger seizures cases has increased, but the trafficking cases have significantly outnumbered the poaching cases since 2013 (Figure 35). Additionally, the diversity of seized Amur tiger parts have significantly increased after 2013 (Table 24), which proves that capacity of Russian law enforcement officers to identify and seize Amur tiger items has significantly improved after 2013. This might result from several factors, such as stronger legislation to arrest and penalize, as well as continuous capacity building work for the regional law enforcement on the identification and prioritization of wildlife organized by the government.

Figure 40 shows total Amur tiger seizures in the region. Interestingly, very few, if any seizures, were recorded inside the PAs, while most of the seizures occurred either on the border or outside of the PAs. This brings the issue of the enforcement effort made inside the PAs. Either the enforcement effort is strong and thus no seizures made or, on the contrary, enforcement effort is absent. Another explanation is the general lack of seizure data recordings and data sharing in the PAs in the Russian Far East, which might be close to the situation on the ground.

Separate discussion is needed for the overall trend on the growing Amur tiger seizures in Russia shown in Figure 37, Figure 38 and Figure 39. The initial expectation would be a growing number of seizures after changes in the legislation and improved enforcement. Stronger enforcement leads to higher seizures numbers. With time, the number of seizures should decrease as criminal attempts decrease, whereas law enforcement efforts become a strong deterrent for potential criminals. The general trend of decreased number of seizures is observed in India and Nepal, for example. Table 26 shows a decreasing number of tiger seizures in India and Nepal in the last observed quarter after major government efforts have been made. The data is taken from Table 11, from the last global tiger seizures analysis report published in 2016. Both India and Nepal are prominent among other tiger range countries for successful law enforcement efforts on the ground and a growing wild tiger population based on the latest national surveys. Even though assessing overall law enforcement effort might be complicated, the growing tiger population serves as a strong success indicator for both countries.

Table 26: Total number of seizures reported by India and Nepal broken into four quarters (source: Stoner, Krishnasamy et al. 2016)

Country	2000-2003		2004-2007		2008-2011		2012 - 2015		Total	
India	116	75%	89	50%	110	40%	40	21%	355	44%
Nepal	9	6%	25	14%	36	13%	14	7%	84	10%

Following this argument, a similar situation with the Amur tiger seizures might occur in Russia with time. To fully assess the effectiveness of the legislation in preventing Amur tiger related crime since 2013, a longer period is needed to observe the trend. This is also another identified future avenue of research on this aspect.

Another observation made in the result of Amur tiger seizure analysis is the discrepancy of seizure data in seizures in Russia, as shown on Table 21 and Table 22. Such strong

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discrepancies between the report results and the author's findings suggest that data was obtained from different sources while there is no unified open access system for collating and systemizing Amur tiger killings in Russia. Even though the data for both global report and present analysis was mostly collected by the environmental NGOs and verified with probably same regional enforcement agencies, there still exist strong discrepancies in the number of tigers killed over the years.

Discrepancy of seizures data brings the issue of national data unity, data sharing practices inside the country and need for the national level database. In order to develop seizures database (similar to the "Tigernet" database in India discussed in Chapter VI, Section 5 Recording and data analysis), there should be a dedicated agency or person who is linked to and trusted by several enforcement agencies on a national level, who has to collect, analyze and verify the data. At the same time, this data should be open and available for analysis. In a situation with no unified data source, mass media, such as websites, newspapers, data portals etc. play a role of a primary source of information. However, such data is not verified and can sometimes be misleading if a seizure did not occur. In such cases close coordination with the law enforcement channels is important.

Another observation is the significant difference of seized Amur tigers in Russia and China as presented in Table 22 and Table 23. This might be due to various reasons. First of all, limited availability of data for China does not allow evaluating the entire picture. However, if the seizure involves endangered species it is usually covered in Chinese media according to interviews. Secondly, Chinese authorities might not be focused at identifying incoming wildlife from Russia as it is not their strategic priority. Even though the turnover of illegal wildlife across the Sino-Russian border is large, it is still smaller than in the southern regions of China bordering Myanmar, Laos, India, Nepal and Vietnam where borders are porous as

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described in Chapter IV, Section 4. Lastly, law enforcement on the Russian side is still significantly strong in comparison to some South East Asian countries bordering China, thus a majority of endangered wildlife might be stopped at the Russian side of the border already.

An additional factor that needs to be considered with the latest developments in China is the need to strengthen even further the enforcement efforts on the Russian side in case the legalization of domestic tiger bone trade on Chinese markets indeed happens. With legalized internal trade in China potentially more poaching pressure would be placed on the Amur tiger population in Russia. As soon as a tiger part is trafficked across the border from Russia, it would be potentially easier to "legalize" and sell it with falsified documents in China. Provided that either special DNA or isotope analysis can distinguish wild from captive tigers, such crime would not require much effort apart from the skill to forge the documents. There can potentially be more motivation for Chinese criminals to sell tiger parts of illegal origin on internal markets given the internal demand is persistent. Therefore, this is another avenue for research for Russian law enforcement and practitioners to evaluate the potential risks and develop possible responses to the latest changes in the national legislation right across the border.

Wildlife market survey results

Among the products found on sale in China that allegedly contained tiger parts, tiger wine bottles need special discussion and scrutiny. All identified bottles had a sticker with a date of production before 1993. Two major conclusions can be drawn from this observation based on interviews and preliminary desktop analysis: either Chinese law enforcement is strong in border towns and neatly followed by the traders or tiger wine producers continue to produce tiger bone wine while putting stickers on bottles with an older production date, which would not raise suspicion from Chinese authorities. Given the fact that the ban for selling products

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containing tiger bone was introduced over 25 years ago and acknowledging the persisting demand for such wine on Chinese markets, there is a certain level of doubt that there can still be tiger wine produced before 1993 available. Identified tiger wine can be either fake with no presence of tiger bone in it (only a chemical test can prove that), or simply use a sticker with a fake production date or indeed having a tiger bone in it, however products made of tiger bones prior-to-1993 stockpiles are still present in China according to the governmental reports. Nevertheless, presence of these stickers on the bottles demonstrates prominent level of awareness about the tiger bone wine regulations among Chinese traders and wine producers.

Overall, field wildlife market surveys implemented across eight border towns in China showed the following observations:

- There is a high variety of wildlife products on Chinese wildlife and TCM markets in border towns;
- There are wildlife products of both legal and illegal origin;
- Products of illegal origin indicate presence of organized transborder criminal trade network with supply and demand chains (saiga antelope horns, musk deer pods, bear bile, polar bear skins, pangolin scales, mammoth horns etc.);
- Tiger products are still available for sale, however mostly as tiger wine products with labelling stated before-1993 date of production and claiming to be produced from farmed facilities;
- Authenticity of tiger wine products is impossible to identify unless a special chemical test is executed;
- There is presence of fake tiger products, which indicates that other type of tiger products might still be in demand;

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- Based on interviews held with traders and observed tiger bone wines stickers, traders and Tiger wine producers are well aware of enforcement regulations in China which indicates a high level of awareness;

- Illegal tiger trade might be not so profitable anymore due to high potential risks involved and other financial reasons.

It should be specified that field market survey was implemented during the summer of 2016, two years prior to announced and then delayed legalization of domestic trade in tiger bones from breeding facilities in China. In case new national regulations in China become implemented, it may strongly change the availability of tiger products on national TCM and wildlife markets. Therefore, another market survey would need to be organized along the same route in the future to evaluate any changes in tiger product availability. Additionally, other factors would need to be considered such as the origin of the tiger bone products and their authenticity. This could be another future avenue of research.

<u>Application of ICCWC Indicator Framework for Combating Wildlife and Forest Crime</u>

It should be stressed that indicators were assessing the situation with combating crime in endangered species (excluding forest) in the Amur-Heilong region, not the entire country, as this would require different sets of expertise and knowledge. Given that both Russia and China are geographically large countries, for example, enforcement cooperation on some aspects might have all the legal provisions on the national level, however not properly implemented at the regional level. Alternatively, there might not be certain legal provisions; however, the activity would still be implemented unilaterally by the region or province within the region (this especially relates to some bilateral activities on provincial levels). The same relates to the efficiency of the enforcement efforts throughout the two countries, as it may be unevenly distributed across the regions depending on various factors. Therefore, the author

assessed the regional situation by answering pertinent indicators that could be interpreted in the regional context.

Nevertheless, results for Outcome 1 and Outcome 5 covering legal national level provisions for enforcement agencies and wildlife crime might also refer to the national level as national legislation effects all the regions (Figure 45). However, indicators relating to international cooperation in the Outcome 1 referred only to the region as this would describe the regional situation more accurately. The remaining Outcomes of the analysis reflect the regional situation, which might be different if the assessment is scaled up to national levels.

According to the results presented by Figure 44 both countries scored high in addressing the illegal trade and trafficking of Tigers as opposed to possible maximum score. Russia's efforts were estimated a bit higher than the ones of China for four out of eight outputs, specifically Outcome 1 on "Proactive enforcement", Outcome 2 "Crime detection by enforcement agencies", Outcome 3 on "Crime investigation" and Outcome 5 on "Strong legal basis to combat wildlife crime". This shows that Russia has quite a successful rate of crime investigation and operative work. This includes not only crime investigation rates, but also the availability and awareness level of law enforcement officers and the availability of regular training. With regards to a strong legal basis, Russia scored higher with the results of the newly adopted legislation system with regards to wildlife crime in general.

China's efforts were scored higher than Russia's efforts on Outcome 8 on "Holistic approach to address wildlife crime". This is mainly due to the behavior change efforts that are widely employed in China by the government, enforcement agencies, big corporate companies, including e-commerce platforms. No behavior change programs are available in Russia, especially introduced by the government agencies. It might be related to the fact that

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traditionally there has been no consumption of tiger-based products in Russia, apart from tiger skins.

Russia and China scored the same for the Output 4 on "Specialized investigation techniques" and Outcome 6 relating to "Wildlife crime prosecution".

Countries scored maximum possible amount for Outcome 7 on "Adequate penalties and sentencing of offenders". Both Russia and China have quite high penalties, whereas Russia has recently strengthened them, and China had the death penalty for killing a tiger, which has been replaced by a life sentence.

5. Theoretical contribution

The research makes a strong theoretical contribution into the field of inter-disciplinary studies and the mixed-method approach. Analyzing the phenomenon from the ecological concepts perspective, tigers population dissipate as the result of an **Anthropogenic Allee effect**, described by Courchamp and colleagues (Courchamp *et al.* 2006), when an already small population of wild tigers are being extirpated at a higher rate than expected due to their lower productivity rate and high anthropologic pressure. Similarly, high prices of tiger products on the black market and high demand for these products driven by perceived benefits of tiger parts consumption in TCM (as seen on Table 10) following the logic of **"water and diamonds paradox".** The value of tiger products is transferred into the value of diamonds that are rare in contrast to the value of water, which is in abundance. Rarity determines the tiger product's higher value on the black market and thus accelerates higher demand (Courchamp *et al.* 2006). Furthermore, a higher price on the black market involved an entire chain of criminals as described in the **wildlife crime model** (chapter II, section 2.3.4 Wildlife crime model). High potential revenue from tiger products shifts into a lucrative but criminal

business that needs to be addressed accordingly. When applied to tiger related crime, the crime pipeline model consists of participants of different nationalities and origins, as the demand drives the wildlife resources from less financially stable, but more biodiversity-rich countries. Thus, the problem of the illegal trade and the trafficking of tigers is international and requires an adequate response with a wide spectrum of participants, starting from law enforcement staff and rangers on the ground to bi-lateral and international mechanisms.

For instance, countermeasures employed in the Russian Far East with strengthening of legislation with regards to trafficking in endangered species provide an example of when the pipeline model of wildlife crime has been adopted at the legislative level in Russia. Higher penalties that address the entire chain of the crime with all involved participants led to higher rates of trafficking seizures as argued in Chapter VIII.

Lastly, research findings prove that the mixed-method approach is the most appropriate for the assessment of such intricate problems as wildlife crime. Application of only one set of methods would not allow the analysis of the problem fully and discovery of the relation between certain variables. Similarly, analysis of the problem from only one disciplinary perspective would not reveal other dimensions of the problem formulated in Chapter III, including reasons for tiger related crime, its characteristics and countermeasures applied by range countries and, specifically, in the Amur-Heilong region.

6. Reflections on methodology

As present research is inter-disciplinary with a mixed-method framework, it is necessary to discuss the contributions made to the nature of the methods used, especially those pertinent to tiger related crime globally and regionally in the Amur-Heilong. The research suggested that a combination of policy document analysis, spatial analysis, and tiger seizure records

analysis, field wildlife market surveys and application of the ICCWC indicators framework reveal completely different domains of the problem in the Amur-Heilong region. Policy document analysis and tiger seizure records analysis showed significant success of the counter-measures for illegal trade and trafficking of tigers in Russia and China. The same result was achieved by employing ICCWC indicator framework, where efforts of both countries scored close to the maximum result. However, a different picture is observed in the results of spatial analysis and field market survey observations. Whereas the enforcement efforts might be successful for saving tigers in Russia, the habitat continues to deteriorate what might eventually have a devastating effect on the Amur tiger population, not to mention higher risks of human-tiger conflicts and shortage of tiger prey. Given that limited forest cover is available for viable tiger populations on the Chinese side of the habitat, this problem might soon become more substantial. Therefore, The Russian government has to pay more attention to habitat conservation and restoration problems to secure tigers and ensure their population growth. Stronger forest conservation and forest management will benefit not only tigers, but also other wildlife and forest ecosystems in general.

Another element that should be highlighted is the combination of field market survey observations, tiger seizure analysis and application of the ICCWC indicator framework in the Amur-Heilong case. Even though seizures analysis and indicator assessment prove that enforcement in Russia and China became a strong deterrent to wildlife crime, there is still an ongoing illegal wildlife trade on the Sino-Russian border as shown by field market survey observations. A large part of wildlife products observed in Chinese border towns have Russian origin. This means that these products have been transported across the border illegally despite Russian and Chinese law enforcement control. However, the level of awareness of Chinese traders with regards to trade in tiger products is quite high, which indicates successful work of Chinese police.

The analysis showed that even though the results of law enforcement efforts and seizures analysis might be presenting excellent outcomes, a different picture might be observed on the ground. Seizures analysis and ICCWC indicator framework might not fully reflect the complicated reality that is occurring on the ground, while field wildlife market survey observations are needed when estimating the real situation with wildlife trade. More field work is needed to implement a full assessment of the problem with trafficking in endangered wildlife and to assess the efforts made. Combining results of several methods would yield a more detailed and accurate assessment of certain problems. This is especially pertinent when assessing counter-measures in timber and wildlife crime in different countries. It would seem logical to complement ICCWC indicators framework assessment with spatial analysis when assessing efforts for fighting timber crime and with field market surveys when implementing assessment of the wildlife crime countermeasures.

Lastly, the research makes a significant contribution to the development of tiger seizure analysis and employment of spatiotemporal concentrations analysis described in Chapter IV and Chapter VIII. Two methods where mentioned in analyzing the seizure results that conceptually comprise successful enforcement efforts while reflecting only a small fraction of illegal wildlife activity (Wellsmith 2011).

It should be considered that enforcement efforts do not always yield success, moreover in a main part of these efforts are largely dependent on the human factor and other variables. Seizures also represent the level of an effort invested by certain law enforcement agency or law enforcement officer. Furthermore, law enforcement officers might have a different attitude, while some can be more dedicated and diligent, and others can be rather negligent. To some extent, the seizures analysis and spatiotemporal concentrations do not only assess the level of illegal trafficking and enforcement effort, but also the level of diligence of an

enforcement unit or law enforcement officer. Therefore, when assessing the trends in trafficking in endangered wildlife it is particularly important to bear in mind the human factor which is contributing to the level of seizure concentration. For example, if very few seizures were made in a certain area or certain time period, it might also relate to the negligent attitude of local enforcement officers, rather than indicate the absence of crime or lack of political will or resources.

Another critical factor that must be taken into consideration when applying wildlife seizures analysis is government political will. Government agencies should have a mechanism to overcome such issues as human and other factors to ensure that the law is enforced. Thus, an increased amount of tiger seizures generally might indicate a combination of factors: strong governmental political will, availability of resources, developed legislation, adequate penalties, and high motivation of law enforcement on the ground, presence of anti-corruption mechanisms and, lastly, presence of wildlife crime.

Based on arguments above, wildlife seizure records analysis is the domain where researchers have to work closely with the practitioners to ensure that human and other factors are considered when analyzing certain trends in crime.

7. Practical contribution

This research has a strong practical relevance to the current wildlife conservation and tiger conservation field in general and regionally on the case of the Amur-Heilong.

First, the research makes a significant contribution to the global analysis of tiger seizures by assessing the global trends and providing alternative insights to the secondary data on

seizures in Chapter IV. This type of analysis would be relevant for the practitioners in the field, as well as researchers interested in wildlife crime.

Second, this research provides an in-depth assessment of the development of the tiger trade agenda within CITES context based on the analysis of the policy documents and participant observations in Chapter V. Moreover, the research provides an assessment of future steps from the deadlock situation created in CITES due to the tiger breeding farms issue, which has taken over majority of CITES tiger related discussions. Additionally, given the latest developments in China with the lifting of the 25-year old ban on national trade in tiger and rhino horn, this analysis becomes especially relevant and pertinent to the current global wildlife conservation agenda. Results of this analysis would be of interest for wildlife conservation practitioners dealing with environmental policy and CITES regulations. Historical analysis of the tiger agenda in CITES would also have historical value for the researcher, given that no similar analysis has been identified in literature.

Third, this research provides a detailed overview of the current effort made by the range countries to address the problem of illegal trade and the trafficking in tigers in Chapter VI. This type of analysis would be of interest for the practitioners and government agencies dealing with tiger conservation in the field as well as researchers.

Fourth, this research makes a significant contribution to the assessment of the countermeasures in the Amur-Heilong region. Not only does the research provide an in-depth analysis of the Amur tiger seizure trends and efforts made by the governments of Russia and China and other organizations to address illegal trafficking, it also gives insight to the current Amur tiger habitat assessment via spatial analysis. Field wildlife market surveys on the Sino-Russian border provide a unique analysis of the on the ground situation with wildlife trade in

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this part of the world. Moreover, the analysis reveals that despite significant successful efforts made by the governments of both transborder countries to address the issue, the problem persists and needs special attention and further investigation. This type of analysis would be especially relevant for the government and law enforcement agencies in Russia and China, regional and international researchers interested in the Amur-Heilong region, Amur tiger conservation and wildlife trade.

Lastly, the research provides an additional case study for the international organizations dealing with wildlife and forest crime by applying holistic indicators framework for wildlife and forest crime to the case of the Amur-Heilong region. The findings of this assessment would be of interest for the international organizations, relevant government agencies in Russia and China and interested researchers.

8. Summary

The discussion centered on three major research questions and assessment of the countermeasures for illegal trade and the trafficking of tigers globally and regionally on the Sino-Russian border. Theoretical and practical research contributions have been identified, while reflections on employed methodology have been covered additionally. The following chapter summarizes the research findings, provides recommendations for policy and practice, and suggests avenues for future research.

Chapter X. Conclusion

1. Resolution to the research problem: the need for a complex approach

The overall aim of the present research was **to evaluate the efficiency of countermeasures for the illegal trade and trafficking of tigers through analyzing the policies and practices globally and locally in the Amur-Heilong region** as stated in Chapter I.

Fundamentally, the thesis argued that despite wide coverage in the media and academic sources, meagre attention is given to the holistic analysis of tiger related crime. From the theoretical side of analysis, the problem is not rigidly defined by the boundaries of one theoretical approach and spread across the disciplines. For that reason, a multidisciplinary approach is best suited when implementing a thorough analysis of a certain type of wildlife crime problem.

The thesis assessed the formulated problem on two levels: on the global scale where the effectiveness of measures undertaken by the governments and international organizations were assessed, and on the regional scale where the countermeasures for tiger trafficking in the Amur-Heilong region have been analyzed. Furthermore, given that tiger related crime involves crossing borders, the problem is best analyzed on a regional scale which allows the evaluation of the efforts undertaken in each area of the region.

With regards to global level countermeasures for illegal trade and the trafficking of tigers the following conclusions have been drawn:

1. CITES proved to be the most pertinent international policy tool with a historically developed framework for assessing the countermeasures for tiger related crime as opposed to other available policy instruments.

2. With regards to the global tiger seizures analysis the following conclusions have been made:

   a. Illegal trade and the trafficking of tigers remain unabated till present date, while 110 tigers have been seized annually on average across the tiger range countries.

   b. Each year there is an increase in seized tigers, their parts and derivatives, what has resulted from: i) better availability of seizure data; improved quality of reported data due to government efforts and higher general interest; ii) better law enforcement in countries with a high political interest to save wild tigers which puts more pressure on the national law enforcement; and, iii) lastly, appearance of captive tigers and their parts in the illegal trade has significantly contributed to the overall seizure rates, especially for countries with low wild tiger numbers.

   c. A higher overall variety of seized tiger parts across tiger range countries observed during the last four year period. This has resulted from a better capacity of law enforcement to detect and identify the products, apart from commonly trafficked items such as skins, pelts and bones.

   d. A significant increase in the number of seized live tigers in the last four-year period observed in the Southeast Asia countries with low viable tiger populations but high number of tiger breeding facilities. This suggests that

breeding facilities are considerably contributing to the illegal trade and the trafficking of tigers.

e. India, Russia, China and Nepal are one of the few countries with the best available data on law enforcement practices. Wild tiger numbers in these countries have also risen according to the latest national whole range tiger surveys, which is best available success indicator. Moreover, India and Nepal share the same trend with higher tiger seizure rates in the first two observed four-year periods (2000-2007), which has significantly fallen in the last two four-year periods (2008-2016). This shows that law enforcement efforts have become a deterrent to tiger related crime in these countries.

f. The destination country of the majority of seized tigers is China, which indicates that China's Government needs to be more aggressive in its law enforcement operations and address the national demand for tiger products.

3. With regards to trends in global tiger related crime, the following have been identified:

a. With the development of online sales platforms, online trade has emerged as an enabler for wildlife crime. The trend is widely observed in Asian countries due to the exponential increase of internet users and has been acknowledged by the international organizations and Asian government agencies.

b. Appearance of fake tiger parts and lion bones from African countries that are used to replace tiger parts.

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   c. Identified problematic geographical area of concern: India-Nepal-Tibetan Autonomous region, Chinese border, India-Bangladesh border, Russia Far East-North East Chinese border, Indonesia-Malaysia, Malaysia-Thailand, and so-called "golden triangle" in Southeast Asia: Lao PDR, Vietnam, Thailand and Myanmar

As CITES has been identified as the most pertinent global policy instrument to address the problem on a global scale, the research analyzed the development of a tiger trade agenda within the CITES context. The research identified the trends that can be separated into positive and negative for the overall agenda of addressing the problem of tiger related crime globally.

The following trends of the tiger agenda in CITES have the potential to negatively affect the overall problem of the tiger trade:

1. Significant lack of compliance by the tiger range states adhering to the requirements of the convention with regards to Asian big cats has been identified as the major obstacle. It has been acknowledged by the CITES Secretariat and CITES Parties at various meetings and conferences. In many ways this has resulted from the unclear language of the Convention and unclear reporting guidelines for range states.

2. Some country reports on Asian big cats provided by the range states lack transparency and scientific evidence. These include the history of China's figures on the diminishing wild tiger population; range states' efforts on management of captive breeding facilities, or India's efforts on law enforcement in the past. This

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brings to the conclusion that the Convention does not fully monitor the actual situation with the tiger trade or rather avoids contentious topics.

3. Political sensitivity of such problematic issues as the management and transparency of tiger captive breeding facilities, constraints from open dialogue on global prevention of illegal tiger trade in CITES. Moreover, this situation has led to a current deadlock in CITES when little constructive dialogue is happening, and unresolved issues keep travelling from one Conference to another.

4. Current international relations and political agendas define decisions and the priority focus of CITES documents. Moreover, the CITES Administrative body does not play a leading role in resolving contentious issues, but rather delays them for future conferences in what contributes to the deadlock situation mentioned above.

Despite these findings, the Convention still plays a key role in addressing the problem globally due to the following arguments:

1. CITES remains one of the most powerful international treaties in tiger conservation due to its implementing power by the enforcement agencies of the signatory countries.

2. CITES has the potential to promote national wildlife conservation efforts due to international community pressure (for example, "shaming" India tiger conservation efforts at the CoP12 or Russia's enlisting of timber species paramount for tiger habitats in 2008). Moreover, CITES Resolution on Asian big

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cats provides a unique framework for assessing range country's efforts to address the illegal trade and the trafficking problem.

3. Despite controversies, CITES provides a platform for open discussions among the countries, international organisations and environmental NGO's on intricate issues.

The research applied game theory analysis to CITES context gave an opportunity to move forward with the current deadlock situation on addressing tiger related crime. Firstly, it is **essential to cooperate within the CITES context** as it provides a perfect forum for open discussions. Secondly, **China plays a crucial role for cooperation within CITES,** whereas there might be a need for all range countries to cooperate and push the tiger agenda. Thirdly, the game theory approach implies participation of two parties at least, however CITES Administrative body does not play a crucial role in moving forward from the present stumbling block in CITES for Asian big cats. And lastly, **it might seem more beneficial for China to yield either fully or partially in its position with regards to captive breeding as it would benefit the wild tiger population and improve China's overall image in the international community despite continuous external criticism**. Strengthening and clarifying the regulations on captive breeding in China will also contribute to China's "Ecological civilization" concept whereby China transpires to the concerned international community as open and transparent in its efforts to save tigers.

Countermeasures of tiger range countries were analyzed by applying CITES Res. Conf.12.5 framework with regards to Asian big cats:

1. The best practices were observed in India, Nepal, China and Russia where success resulted from adopting necessary legislative and regulatory measures and

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strengthening national law enforcement. In contrasts, Golden Triangle in Southeast Asia, especially border areas of Myanmar with Chin, Thailand and Laos PDR, remain a major global challenge as an illegal trade hub of tigers.

2. More range countries must adopt such practices as data recording and analysis of tiger seizures information and strengthening international cooperation. A wildlife crime database enables a better evaluation of on the ground efforts, while current levels of international cooperation do not bring many practical outputs despite high-level governmental commitments. Furthermore, there might be a need to reconsider the practical importance of transborder wildlife enforcement networks (or WENs).

3. Demand reduction or behaviour change activity seems to be an effective mechanism to address the problem from the practitioner's perspective, however the long-term effects are yet not studied and convey scepticism from the social science researchers.

4. Captive breeding facilities grew exponentially throughout Asia as well as the USA. These facilities bring two major concerns: firstly, their management is non-transparent, and secondly, there is no effective system to prevent leakage of farmed tigers into the illegal market from these facilities.

Amur-Heilong presents a solid study case for a thorough regional analysis of countermeasures to address the illegal trade and the trafficking of tigers. **The Amur tiger population stays viable and persists despite a historically high existence of poaching and trafficking, which remains under control as the result of strong law enforcement and political interest of the governments of Russia and China**. The research of regional practices consisted of two stages: desktop and field analysis. The results of these stages have been combined and verified with the help of the mixed-method approach, which included

interviews, spatial analysis, participant observations, legislative documents analysis, tiger seizure analysis, field market surveys, and finally, application of the ICCWC indicators framework for wildlife crime. This allowed in getting a thorough assessment of the regional environmental situation, current governmental priorities, and most importantly, methodically evaluate the effectiveness of countermeasures for the illegal trade and the trafficking of tigers. The following findings have been identified with regards to the overall aim of the current research:

1. Currently the Amur tiger population is rising, especially in Russia as the result of governmental prioritization and the creation of a specialized institutional and legislation framework for protection. However, Amur tiger numbers on the Chinese side are still not known as the national census has not yet been organized.

2. Despite strong measures taken in China to bring wild tigers back, the reintroduction plans are still unclear, due to government intentions to lift the internal ban on trade in tiger bone products, it might pose an additional threat to tigers in Russia.

3. The destruction of habitats, poaching of tigers and their prey might potentially become a deterrent for future Amur tigers' recovery plans in Russia. The most serious threat is posed by fires and unsustainable logging in range areas, including some PAs.

4. Strengthening legislation, toughened control and harsh penalties for poaching and trafficking have played a key role in addressing the problem of wildlife crime of endangered animals in Russia and China.

5. Inter-agency cooperation of various national governmental institutions is key to successful law enforcement efforts on national and regional scales. Russia and China share best practices with the largest seizures made as the result of the inter-agency operations. Similarly, intelligence investigations and proactive enforcement comprise a major success factor in these operations.

6. Despite the efforts, certain problems still exist, such as the slow pace of criminal investigation and judicial procedures, presence of corruption, little or no transparency in governmental seizures records.

7. The large amount of wildlife on sale originated from Russia on the Sino-Russian border markets indicates the need to strengthen cross-border enforcement and information exchange. Furthermore, inconsistency of data in Amur tiger seizure records in both countries justifies the need to improve information sharing nationally and between the countries. The same relates to cross-border enforcement cooperation for wildlife crime prevention between Russia and China.

8. The role of the civil society in addressing the problem of tiger related crime has been critical in the region, especially when it related to monitoring of poaching and illegal trade, assisting in crime investigations and lobbying necessary legal acts.

9. The level of local awareness about the problem is quite high in both countries. The ability to identify tiger parts and products by the regional enforcement agencies has significantly improved within the last five years.

2. Avenues for further research

The research aimed to assess the effectiveness of countermeasures for the illegal trade and trafficking of tigers globally and regionally. Some features of the research were exploratory, while some were more explanatory. In both cases, the findings extracted further questions and uncertainties that should be covered in subsequent research as they surpass the scope of this current research. These aspects include:

1. The research identified a significant gap in analyzing online wildlife crime, which has been mainly studied by international organizations rather than researchers. This new area of research creates an opportunity for a more thorough investigation of wildlife crime and its impacts on biodiversity in the future.

2. The research touches upon the global analysis of the legislation mechanisms and penalties on tiger crime across Asian countries, however it has not been thoroughly investigated. This area would require additional efforts and financial resources from CITES Secretariat and stronger involvement from the range countries.

3. The research argues that demand reduction and behavior change practices are popular among the practitioners; however raise skepticism among social science researchers. More thorough research is needed in collaboration with practitioners

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to investigate whether these activities have the potential to significantly affect the demand for wildlife products.

4. The research identified significant forest cover changes of Amur tiger habitats on the Russian side. Further spatial analysis is needed complemented by onsite investigation to estimate the true reasons behind these changes in the area. This future analysis would also shed light on the prospects of the Amur tiger population growth and further distribution.

5. Given the changes in Chinese legislation with regards to the internal tiger bone trade that have been very recently delayed, more research is needed to estimate the potential risks for tigers in general in Asia and particularly in the Russian Far East.

6. The analysis showed a gap with the availability of information with regards to court decisions on tiger smuggling cases in China. More research is needed to estimate the efficiency of the Chinese judicial system with regards to such cases, provided that access to such information is granted.

7. Research highlighted absence of Amur tiger seizure records in protected areas in Russia. More onsite investigation is needed to identify the true reasons behind this finding.

8. The research argues that general transborder environmental issues might be sidetracked by the current political and economic governmental priorities. However, this issue requires further analysis to identify the connection between

the character of political and economic relationship of Russia and China and transborder Amur tiger conservation plans and their implementation.

9. The research argues that Amur tiger seizures in Russia might decrease with time due to strengthened legislation and toughened law enforcement since 2013. This might follow the trend observed in India and Nepal for the last five-year period as seen from the global tiger seizure record analysis. To fully assess the effectiveness of the Russian legislation in preventing Amur tiger smuggling since 2013, a longer period is needed to observe and analyze the trend.

3. Recommendations for practitioners

As research is very practical in nature, a set of recommendations have been developed for practitioners dealing with wildlife and tiger related crime. The recommendations can be thematically broken into global and regional as derived from research findings.

With regards to the global scale the following recommendations can be made:

1. ICCWC indicators framework assesses national countermeasures for wildlife and forest crime. The framework evaluates government efforts only, while omitting the actual on the ground situation, which might be different from the assessment results. It would seem beneficial for the ICCWC to include other assessment methods into the framework such as field wildlife surveys in problematic areas.

2. Other tiger range countries could adopt best practices with regards to strengthening legislation and enforcement measures in Russia in 2013. The problem of tiger poaching and trafficking should be addressed holistically where each stage of the crime and each participant has to be penalized separately.

Addressing only one stage of the crime will not bring meaningful results, but rather will redistribute the crime to other participants.

3. Practitioners dealing with wildlife crime assessment should consider adopting spatiotemporal concentrations methods in their assessment of enforcement efforts in longer term. This is the domain where researchers have to work closely with practitioners to ensure that the human factor is included when analyzing certain trends in crime.

4. With regards to the CITES deadlock situation relevant to tigers, the participants and CITES Secretariat should consider engaging with China as much as possible on clarifying uncertainties with regards to tiger breeding facilities, while it is advisable for China to adopt a more open and collaborating position to avoid potential international criticism harming the image of the "Ecological civilization". This is particularly pertinent in the current situation with the delayed legislation change in China on lifting the internal ban in tiger bones and rhino horns.

With regards to regional scale the following recommendations can be made:

1. The alarming situation with tiger habitat deterioration, significant forest cover change might pose a potential threat for growing tiger populations. This needs urgent attention from the tiger conservation and forest management authorities in Russia.

2. Russian and Chinese tiger conservation authorities should consider creating a tiger seizure records system, similar to the "Tigernet" database in India, either at national or regional levels.

3. Law enforcement authorities in Russia and China should initiate transborder law enforcement operations and transborder data sharing on wildlife seizure records and detained criminals on either side.

4. Practitioners dealing with the wildlife crime problem should consider organizing regular field wildlife market surveys in Russia and China as these findings are imperative for assessing the scale of the illegal wildlife trade and efficiency of the enforcement efforts on both sides.

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Annex A: ICCWC Indicator Framework for Combating Wildlife and Forest Crime – Assessment Template

OUTCOME 1: Proactive enforcement is deterring wildlife crime

1. Enforcement priority *(EA)*

The recognition of combating wildlife crime as a high priority for national law enforcement agencies.

Question: Is combating wildlife crime identified as a high priority for national law enforcement agencies?

Measurement:

0 ○	1 ○	2 ○	3 ◉
Wildlife and forest crime:	Wildlife and forest crime:	Wildlife and forest crime:	Wildlife and forest crime:
☐ Is rarely identified as a high priority among national law enforcement agencies	☐ Is sometimes identified as a high priority among national law enforcement agencies	☐ Is usually identified as a high priority among national law enforcement agencies ☐ Has not been formally* adopted and/or acknowledged as a high priority	☐ Is usually identified as a high priority among national law enforcement agencies ☐ Has been formally* adopted and/or acknowledged as a high priority

* Formal recognition could include reference to wildlife crime as a priority issue within strategic plan(s), Memoranda of Understanding (MoUs), public statements by heads of agencies and/or Declarations/Decrees by Heads of State.

Comments:

2. Serious crime *(PA)*

The recognition of wildlife crime involving organized criminal groups as serious crime.

Question: Are criminal offences such as poaching and wildlife trafficking involving organized criminal groups recognized as serious crime?*

Measurement:

0 ○	-	-	3 ◉
No	-	-	Yes

* The United Nations Convention against Transnational Organized Crime defines serious crime as conduct constituting an offence punishable by imprisonment for at least four years or a more serious penalty.

Comments:

3. National enforcement strategy *(EA)*

The existence of a national enforcement strategy and/or action plan for wildlife crime.

Question: Is there a national wildlife crime strategy and/or action plan?

Measurement:

0 ◉	1 ○	2 ○	3 ○
A national enforcement strategy and/or action plan(s) for wildlife crime:	A national enforcement strategy and/or action plan(s) for wildlife crime:	A national enforcement strategy and/or action plan(s) for wildlife crime:	A national enforcement strategy and/or action plan(s) for wildlife crime:
☐ Has not been developed ☐ Wildlife crime is not covered by any other relevant enforcement strategies or action plans	☐ Has not been developed ☐ Wildlife crime is covered by any other relevant enforcement strategies or action plans	☐ Has been developed ☐ Has been adopted by some relevant national enforcement agencies ☐ Is not actively implemented by all relevant enforcement agencies	☐ Has been developed ☐ Has been adopted by all relevant national enforcement agencies ☐ Is actively implemented by all relevant enforcement agencies

Comments:

4. National cooperation (EA)

The extent of inter-agency cooperation among national law enforcement agencies to combat wildlife crime.

Question: Are there mechanism(s) in place to facilitate national inter-agency cooperation to combat wildlife crime?

Measurement:

0 ○	1 ○	2 ○	3 ◉
Cooperation among agencies:	Cooperation among agencies:	Cooperation among agencies:	Cooperation among agencies:
☐ Rarely or never occurs	☐ Sometimes occurs	☐ Routinely occurs	☐ Routinely occurs
	☐ Usually takes place on an ad-hoc basis	☐ Is sometimes supported by formal collaboration mechanism(s)*	☐ Is supported by a formal collaboration mechanism(s)*
	☐ Is not supported by any formal collaboration mechanism(s)*	☐ Is sometimes challenged by a lack of engagement or willingness to collaborate	☐ Is rarely challenged by a lack of engagement or willingness to collaborate
			☐ Is usually considered to be meeting the desired collaboration objectives

* Examples of formal mechanisms for inter-agency cooperation include a national inter-agency enforcement committee bringing together agencies with a responsibility for combating wildlife crime (e.g. wildlife agencies, Customs, police) and/or Memoranda of Understanding (MoU) between relevant law enforcement agencies.

Comments:

5. International cooperation (EA)

The extent of international cooperation to combat wildlife crime.

Question: Are there mechanism(s) in place to facilitate international cooperation to combat wildlife crime, such as participation in a wildlife enforcement network and/or regional law enforcement agreements?

Measurement:

0 ○	1 ◉	2 ○	3 ○
International cooperation:	International cooperation:	International cooperation:	International cooperation:
☐ Rarely or never occurs	☐ Sometimes occurs	☐ Routinely occurs	☐ Routinely occurs
	☐ Usually takes place on an ad-hoc basis	☐ Usually includes participation in international enforcement operations and/or international meetings related to wildlife crime	☐ Includes participation in international enforcement operations and/or international meetings related to wildlife crime
	☐ Is not supported by any formal collaboration mechanism(s)*	☐ Is sometimes supported by formal collaboration mechanism(s)*	☐ Is supported by formal collaboration mechanism(s)*

* Examples of formal mechanisms for international cooperation include participation in an international wildlife enforcement network, regional law enforcement agreements related to wildlife crime and/or bilateral MoUs between countries to cooperate on combating wildlife crime.

Comments:

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6. Strategic risk management (EA)

The extent to which strategic risk management is used to target operational enforcement planning and the implementation of measures to combat wildlife crime.

Question: Are risk management practices* used to identify high-risk activities, locations and individuals, and target operation enforcement planning and the implementation of measures to combat wildlife crime?

Measurement:

0 ○	1 ○	2 ○	3 ◉
Risk management practices:	Risk management practices:	Risk management practices:	Risk management practices:
☐ Are not used for wildlife crime	☐ Are sometimes used	☐ Are frequently used	☐ Are frequently used
	☐ Involve some national enforcement agencies	☐ Involve most national enforcement agencies as appropriate	☐ Involve all national enforcement agencies as appropriate
	☐ Are usually constrained by a lack of resources (e.g. human, financial, technical) and capacity	☐ Are sometimes constrained by a lack of resources (e.g. human, financial, technical) and capacity	☐ Are well resourced and capacity is adequate

* Risk management practices are coordinated activities of authorities to direct and control risks. Risk management helps determine where the greatest areas of exposure to risk exist and how resources should be allocated to effectively manage these risks. Among other things, risk management helps to identify activities which require a higher level of control.

Comments:

7. Proactive investigations (EA)

The extent to which proactive investigations are used to target prominent and emerging wildlife crime threats.

Question: Are proactive investigations* used to target prominent and emerging wildlife crime threats and pre-identified targets, individuals and groups?

Measurement:

0 ◉	1 ○	2 ○	3 ○
Proactive investigations:	Proactive investigations:	Proactive investigations:	Proactive investigations:
☐ Are not used for wildlife crime	☐ Are sometimes used for wildlife crime	☐ Are frequently used for wildlife crime	☐ Are frequently used for wildlife crime
	☐ Are usually constrained by a lack of resources (e.g. human, financial, technical) and capacity	☐ Are sometimes constrained by a lack of resources (e.g. human, financial, technical) and capacity	☐ Are well resourced with adequate access to criminal intelligence analysis capacity

* Proactive investigations seek to target prominent and emerging crime threats to reduce the harm they cause, rather than respond to crimes after they have been committed. It is also a method used in response to intelligence regarding ongoing or planned criminal activity.

8. Staffing and recruitment (EA)

The level of staff resources in national law enforcement agencies to combat wildlife crime.

Question: What staff resources* do national law enforcement agencies have to combat wildlife crime?

Measurement:

0 ○	1 ○	2 ○	3 ◉
Law enforcement agencies:	Law enforcement agencies:	Law enforcement agencies:	Law enforcement agencies:
☐ Are significantly under-staffed	☐ Sometimes have a full complement of staff	☐ Usually have a full complement of staff, although it has not always kept up with changing wildlife crime trends	☐ Usually have a full complement of staff, which has generally kept up with changing wildlife crime trends
☐ Are rarely able to recruit and/or attract additional staff	☐ Usually experience staffing* and/or skills shortages	☐ Sometimes experience staffing* and/or skills shortages	☐ Usually have an appropriate mix of staff* and skills
	☐ Usually experience recruitment delays and/or difficulties	☐ Sometimes experience delays in recruitment and/or difficulties attracting suitably-qualified candidates	☐ Usually process recruitment vacancies as they arise with suitably-qualified candidates

* Staffing includes factors such as whether there is an appropriate mix of full-time, part-time and casual staff; experienced and less experienced staff; and professional, technical, investigative and administrative staff as needed to discharge the required activities.

9. Law enforcement training (EA)

The extent to which institutional training programmes for national law enforcement agencies include content to build capacity to combat wildlife crime.

Question: Do institutional training programmes for national law enforcement agencies include content related to wildlife crime?

Measurement:

0 ⦾	1 ◯	2 ◯	3 ⦿
Training programmes:	Training programmes:	Training programmes:	Training programmes:
☐ Are not used for wildlife crime ☐ Are rarely available ☐ Rarely include content* related to wildlife crime ☐ Are not supported by training needs assessments and training needs have usually not been identified	☐ Are rarely available to all relevant enforcement agencies ☐ Sometimes include content* related to wildlife crime ☐ Usually do not respond to identified training needs ☐ Do not meet the demand for training	☐ Are usually available to all relevant enforcement agencies ☐ Sometimes include content* related to wildlife crime ☐ Respond to some identified training needs ☐ Do not fully meet the demand for training	☐ Are available to all relevant enforcement agencies ☐ Routinely include content* related to wildlife crime ☐ Respond to most or all training needs ☐ Largely or fully meet the demand for training

* For example, basic content may include species identification materials, general information on wildlife crime and legal requirements for trade in wildlife.

OUTCOME 2: Wildlife crime can be detected by law enforcement agencies

10. Targeted enforcement presence (EA)

The extent to which law enforcement activities are targeted towards the locations most affected by or used for wildlife crime.

Question: Are law enforcement activities strategically targeted towards the places* that are most affected by or used for wildlife crime?

Measurement:

0 ⦿	1 ◯	2 ◯	3 ◯
Places* most affected by or used for wildlife crime:	Places* most affected by or used for wildlife crime:	Places* most affected by or used for wildlife crime:	Places* most affected by or used for wildlife crime:
☐ Have not been identified	☐ Are rarely targeted through active and/or scaled-up law enforcement presence	☐ Are sometimes targeted through active and/or scaled-up law enforcement presence	☐ Are usually targeted through active and/or scaled-up law enforcement presence

* The places that are most affected by or used for wildlife crime should be identified using intelligence and enforcement information (e.g. generated through risk management practices [#6] or proactive investigations [#7]. For example, places affected by wildlife crime may include protected areas, cross-boundary protected areas, border points , and markets for wildlife specimens.

11. Joint operations (EA)

Participation in multi-disciplinary enforcement operations targeting wildlife crime.

Question: Do national law enforcement agencies participate in or initiate multi-disciplinary law enforcement operations* targeting wildlife crime?

Measurement:

0 ◯	1 ◯	2 ⦿	3 ◯
Multi-disciplinary operations:	Multi-disciplinary operations:	Multi-disciplinary operations:	Multi-disciplinary operations:
☐ Are not conducted	☐ Are conducted on an ad hoc and infrequent# basis ☐ Are conducted at national level ☐ Are not conducted at international level	☐ Are conducted on an ad hoc and infrequent# basis ☐ Are conducted at national level ☐ Are sometimes conducted at international level	☐ Are conducted at least once a year at national level ☐ Are conducted as required at international level

* A multi-disciplinary law enforcement operation is one that involves officers from all relevant enforcement disciplines as appropriate, for example officers from Police, Customs and the wildlife regulatory authority. Operations can be either sub-national, national or international in scope.

\# An infrequent basis can be interpreted as once in every two years.

12. Border control staff *(EA)*

The extent to which ports of entry and exit are staffed with law enforcement officers that are aware of and trained in detecting and responding to wildlife crime.

Question: Are there law enforcement officers at ports of entry and exit* that are aware of and trained in detecting and responding to wildlife crime#?

Measurement:

0 ◯	1 ◯	2 ⦿	3 ◯
Ports of entry and exit:	Ports of entry and exit:	Ports of entry and exit:	Ports of entry and exit:
☐ Are rarely actively staffed by law enforcement officers ☐ Do not have any law enforcement staff that are aware of or trained in detecting and responding to wildlife crime#	☐ Have some law enforcement staff that are aware of or trained in detecting and responding to wildlife crime# ☐ Require a greater number of trained law enforcement staff	☐ Have sufficient law enforcement staff that are aware of or trained in detecting and responding to wildlife crime# ☐ Have staff that could benefit from further training	☐ Have sufficient law enforcement staff that are aware of or trained in detecting and responding to wildlife crime# ☐ Have staff that are adequately trained

* For example, Customs and police officers at ports of entry and exit. Ports of entry and exit covers border controls for both consignments and/or passenger traffic.

For example, training in national and international (e.g. CITES) legal requirements for trade in protected species, identification of CITES-listed species and specimens, CITES permit and certificate requirements, training in investigation techniques such as controlled deliveries.

13. Border control equipment *(EA)*

The extent to which law enforcement officers at ports of entry and exit can access equipment, tools and materials to detect and respond to wildlife crime.

Question: Do law enforcement officers at ports of entry and exit* have equipment, tools and materials (e.g. sniffer dogs, identification manuals, and/or scanners) to detect and respond to wildlife crime?

Measurement:

0 ◯	1 ◯	2 ◯	3 ⦿
Border control equipment and tools to respond to wildlife crime:	Border control equipment and tools to respond to wildlife crime:	Border control equipment and tools to respond to wildlife crime:	Border control equipment and tools to respond to wildlife crime:
☐ Are rarely available ☐ When available, are often used inappropriately as staff do not have the needed skills or training in equipment use	☐ Are sometimes available ☐ Are rarely up-to-date ☐ Are rarely in good condition and working order ☐ Are often used inappropriately as staff do not have the needed skills or training in equipment use	☐ Are sometimes available ☐ Are usually up-to-date ☐ Are usually in good condition and working order ☐ Are sometimes inappropriately as staff do not have the needed skills or training in equipment use	☐ Are available ☐ Are up-to-date ☐ Are in good condition and working order ☐ Are used appropriately by staff who have the necessary skills and/or training in equipment use

* For example, Customs and police officers at ports of entry and exit. Ports of entry and exit covers border controls for both consignments and/or passenger traffic.

14. Inspection and seizure powers *(EA)*

The extent to which national legislation empowers law enforcement agencies to inspect and seize consignments suspected of containing illegal wildlife specimens and confiscate illegal wildlife consignments.

Question: Are law enforcement agencies empowered by national legislation to inspect consignments suspected of containing illegal wildlife specimens, and to seize and confiscate consignments containing illegally-traded wildlife specimens?

Measurement:

0 ○	1 ○	2 ○	3 ◉
Law enforcement agencies:	Law enforcement agencies:	Law enforcement agencies:	Law enforcement agencies:
☐ Are not adequately empowered* by legislation to inspect, seize and confiscate illegal consignments of wildlife specimens	☐ Are not adequately empowered* by legislation to inspect, seize and confiscate illegal consignments of wildlife specimens	☐ Are adequately empowered* by legislation to inspect, seize and confiscate illegal consignments of wildlife specimens	☐ Are adequately empowered* by legislation to inspect, seize and confiscate illegal consignments of wildlife specimens
☐ Rarely notify# the country of destination and any countries through which detected illegal consignments will transit	☐ Usually notify# the country of destination and any countries through which detected illegal consignments will transit		☐ Are empowered by legislation to implement additional measures to combat wildlife trafficking as appropriate (e.g. controlled deliveries)

* Adequately empowered should include consideration of whether all relevant agencies have the powers of inspection, seizure and confiscation that they require to fulfil their law enforcement roles effectively, and whether the powers of any agencies need broadening.

Notification to destination and/or transit countries so that law enforcement agencies in those countries will be able to seize the detected illegal consignment.

15. Wildlife seizures *(DA)*

The number (and type) of seizures of specimens of illicitly-traded wildlife.

Measurement: The number (and type*) of seizures of specimens# of illicitly-traded wildlife

Calculation: 'number of seizures of specimens of illicitly-traded wildlife'

* Depending on the specific characteristics of wildlife seizures, it may also be appropriate to disaggregate data by type of seizures to obtain useful information on any trends in the volume of certain types of seizures. For example, it might be desirable – where data allows – to disaggregate by species or species group, wildlife trade sector (e.g. medicinal products, luxury products), location of seizure, and/or transportation mode.

Article I of CITES defines specimen as: (i) any animal or plant, whether alive or dead; (ii) in the case of an animal: for species included in Appendices I and II, any readily recognizable part or derivative thereof; and for species included in Appendix III, any readily recognizable part or derivative thereof specified in Appendix III in relation to the species; and (iii) in the case of a plant: for species included in Appendix I, any readily recognizable part or derivative thereof; and for species included in Appendices II and III, any readily recognizable part or derivative thereof specified in Appendices II and III in relation to the species.

16. Large-scale wildlife seizures *(DA)*

The number (and type) of large-scale seizures of specimens of illicitly-traded wildlife.

Measurement: The number (and type*) of large-scale# seizures of specimens+ of illicitly-traded wildlife

Calculation: 'number of large-scale seizures of specimens of illicitly-traded wildlife'

* Depending on the specific characteristics of wildlife seizures, it may also be appropriate to disaggregate data by type of seizures to obtain useful information on any trends in the volume of certain types of seizures. For example, it might be desirable – where data allows – to disaggregate by species or species group, wildlife trade sector (e.g. medicinal products, luxury products), location of seizure, and/or transportation mode.

Large-scale seizures are seizures of a size that is considered significant or unusual in its scale, implies the involvement of an organized criminal network, or that would be likely to have a significant impact on the species concerned. For ivory, a large-scale seizure is defined as a seizure of 500kg or more. For other species, a large-scale seizure may need to be defined on the basis of historical seizure data.

+ Article I of CITES defines specimen as: (i) any animal or plant, whether alive or dead; (ii) in the case of an animal: for species included in Appendices I and II, any readily recognizable part or derivative thereof; and for species included in Appendix III, any readily recognizable part or derivative thereof specified in Appendix III in relation to the species; and (iii) in the case of a plant: for species included in Appendix I, any readily recognizable part or derivative thereof; and for species included in Appendices II and III, any readily recognizable part or derivative thereof specified in Appendices II and III in relation to the species.

17. Disposal of confiscated wildlife specimens *(EA)*

The adequacy of the systems and procedures that are in place for the management, secure storage, auditing and disposal of confiscated wildlife specimens, including live specimens.

Question: *What systems and procedures are in place for managing, storing, auditing and disposing of confiscated wildlife specimens*?*

Measurement:

0 ◯	1 ◯	2 ◯	3 ⦿
Systems and procedures for managing and disposing of confiscated wildlife specimens*:	Systems and procedures for managing and disposing of confiscated wildlife specimens*:	Systems and procedures for managing and disposing of confiscated wildlife specimens*:	Systems and procedures for managing and disposing of confiscated wildlife specimens*:
☐ Have not been developed ☐ Do not include storage facilities	☐ Are usually informal ☐ Rarely include up-to-date records ☐ Include storage facilities but these are considered to be inadequate (e.g. poor security, limited capacity, no facilities for live specimens#)	☐ Have been formally adopted (e.g. Standard Operating Procedures, regulations) but are not strictly implemented ☐ Sometimes include up-to-date records ☐ Include storage facilities but these require some improvement (e.g. improved security, addition of facilities for live specimens#)	☐ Have been formally adopted and are strictly implemented, including auditing and inventory of confiscated specimens ☐ Include up-to-date records ☐ Include adequate storage facilities including facilities for the humane storage and disposal# of live specimens

* For further information, see CITES Resolution Conf. 9.10 (Rev. CoP15) on *Disposal of confiscated and accumulated specimens*, https://cites.org/eng/res/09/09-10R15.php.

For further information, see CITES Resolution Conf. 10.7 (Rev. CoP15) on *Disposal of confiscated live specimens of species included in the Appendices*, https://cites.org/eng/res/10/10-07R15.php.

OUTCOME 3: Wildlife crime is thoroughly investigated using an intelligence-led approach

18. Investigative capacity *(EA)*

The capacity of national law enforcement agencies to investigate wildlife crime cases.

Question: *Do national law enforcement agencies have trained and empowered staff to investigate wildlife crime cases?*

Measurement:

0 ◯	1 ◯	2 ◯	3 ◯
Staff investigating wildlife crime:	Staff investigating wildlife crime:	Staff investigating wildlife crime:	Staff investigating wildlife crime:
☐ Are insufficient in number ☐ Do not have the required training* ☐ Do not have the required authority and powers	☐ Are generally sufficient in number ☐ Sometimes have the required training* ☐ Do not have the required authority and powers	☐ Are sufficient in number ☐ Usually have the required training* ☐ Sometimes have the required authority and powers	☐ Are sufficient in number ☐ Have the required training* ☐ Have appropriate authority and powers

* For example, training in crime scene investigation, information and evidence gathering, identification of suspects and interviewing techniques.

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19. Information management *(EA)*

The extent of national procedures and systems to collate information on wildlife crime.

<u>Question</u>: *Have national procedures and systems for consolidating information* on wildlife crime been established?*

<u>Measurement</u>:

0 ⃝	1 ⃝	2 ⃝	3 ⃝
National procedures and systems for consolidating information on wildlife crime:	National procedures and systems for consolidating information on wildlife crime:	National procedures and systems for consolidating information on wildlife crime:	National procedures and systems for consolidating information on wildlife crime:
☐ Do not exist	☐ Have been established	☐ Have been established	☐ Have been established
	☐ Are out of date and/or otherwise inappropriate	☐ Are infrequently used and applied	☐ Are being effectively and widely implemented
		☐ Do not capture all relevant data on wildlife crime	☐ Capture all relevant data on wildlife crime
		☐ Sometimes make provision for the submission of data to international databases	☐ Include the collation of data in a secure national database
			☐ Usually make provision for the submission of data to international databases

* For example, information on poaching incidents, seizures, prosecutions and convictions.

20. Intelligence analysis *(EA)*

The extent to which information on wildlife crime is verified and analyzed to generate intelligence.

<u>Question</u>: *Is information on wildlife crime being verified and analyzed to generate criminal intelligence*?*

<u>Measurement</u>:

0 ⃝	1 ⃝	2 ⃝	3 ⃝
Analysis of information on wildlife crime:	Analysis of information on wildlife crime:	Analysis of information on wildlife crime:	Analysis of information on wildlife crime:
☐ Rarely takes place[#]	☐ Sometimes take place	☐ Regularly takes place	☐ Regularly takes place
	☐ Is challenged by a lack of access to databases	☐ Is sometimes challenged by lack of access to databases	☐ Is conducted by trained intelligence analysis staff
	☐ Is challenged by a lack of trained intelligence analysis staff	☐ Is sometimes challenged by a lack of trained intelligence analysis staff	☐ Is routinely compiled in intelligence reports that are shared as appropriate

* Criminal intelligence is information that is compiled and analyzed in an effort to anticipate, prevent and/or monitor criminal activity. Criminal intelligence is disseminated to direct and support effective law enforcement action.

[#] For example, potential reasons include a lack of consolidated information [#19], insufficient access to relevant databases, and/or a lack of trained staff to analyze data.

21. Intelligence-led investigations *(EA)*

The extent to which criminal intelligence is used to support investigations into wildlife crime.

<u>Question</u>: *Is criminal intelligence* generated through analysis used to support investigations into wildlife crime?*

<u>Measurement</u>:

0 ⃝	1 ⃝	2 ⃝	3 ⃝
Criminal intelligence:	Criminal intelligence:	Criminal intelligence:	Criminal intelligence:
☐ Is not generated	☐ Is rarely used to support investigations	☐ Is sometimes used to support investigations	☐ Is always used to support investigations when available
	☐ Is rarely shared with authorities in countries of origin, transit and destination when appropriate	☐ Is sometimes shared with authorities in countries of origin, transit and destination when appropriate	☐ Is shared with authorities in countries of origin, transit and destination when appropriate

* Criminal intelligence is information that is compiled and analyzed in an effort to anticipate, prevent and/or monitor criminal activity. Criminal intelligence is disseminated to direct and support effective law enforcement action.

[#] For example, potential reasons include a lack of consolidated information [#19], insufficient access to relevant databases, and/or a lack of trained staff to analyze data.

22. Follow-up investigations *(EA)*

The extent to which follow-up investigations are conducted for wildlife crime cases.

Question: **Are follow-up investigations* conducted for wildlife crime cases at national and international levels?**

Measurement:

0 ◯	1 ◯	2 ◯	3 ◯
Follow-up investigations* into wildlife crime cases:	Follow-up investigations* into wildlife crime cases:	Follow-up investigations* into wildlife crime cases:	Follow-up investigations* into wildlife crime cases:
☐ Are rarely conducted	☐ Are sometimes conducted at a national level	☐ Are usually conducted at a national level	☐ Are usually conducted at a national level
	☐ Are rarely conducted at an international level	☐ Are sometimes conducted at an international level	☐ Are usually conducted at an international level

* For example, follow-up investigations could include following up on information and evidence found on seized computers, mobile phones and documents. It includes engaging with authorities in countries of origin, transit and destination, when appropriate, to share or request information.

23. Transnational wildlife crime reporting *(DA)*

The percentage of wildlife crime cases of a transnational nature that were reported to databases of intergovernmental organizations mandated to receive and maintain such data.

Measurement: **The percentage of wildlife crime cases of a transnational nature that were reported* to:**

> **a) INTERPOL**
>
> **b) World Customs Organization (WCO)**
>
> **c) Elephant Trade Information System (ETIS) [ivory seizures only].**

Calculation: ['number of transnational wildlife crime cases that were reported to database' divided by 'total number of transnational wildlife crime cases'], multiplied by 100. Calculate a separate percentage for a), b) and c).

* Depending on the specific characteristics of wildlife seizures, it may also be appropriate to disaggregate data by type of seizures to obtain useful information on any trends in the volume of certain types of seizures. For example, it might be desirable – where data allows – to disaggregate by species or species group, wildlife trade sector (e.g. medicinal products, luxury products), location of seizure, and/or transportation mode.

OUTCOME 4: Specialized investigation techniques are used to combat wildlife crime as required

24. Legal authority to use specialized investigation techniques *(PA)*

The existence of provisions in national legislation to use specialized investigation techniques in the investigation of wildlife crime.

Question: **Does national legislation make provision for the use of specialized investigation techniques* against wildlife crime?**

Measurement:

0 ◯	-	-	3 ◉
No	-	-	Yes

* Specialized investigation techniques are techniques that are deployed against serious and/or organized crime when conventional law enforcement techniques fail to adequately address the activities of crime groups. Examples include controlled deliveries, use of tracking devices and/or covert operations.

25. Use of specialized investigation techniques *(PA)*

The use of specialized investigation techniques by national law enforcement agencies to combat wildlife crime.

*Question: **Have any specialized investigation techniques been used by national law enforcement agencies to combat wildlife crime?***

Measurement:

0 ⊙	-	-	3 ⦿
No	-	-	Yes

* Specialized investigation techniques are techniques that are deployed against serious and/or organized crime when conventional law enforcement techniques fail to adequately address the activities of crime groups. Examples include controlled deliveries, use of tracking devices and/or covert operations.

26. Forensic technology *(EA)*

The capacity of national law enforcement agencies to use forensic technology to support wildlife crime investigations.

*Question: **Do national law enforcement agencies have the capacity to use forensic technology* to support the investigation of wildlife crime?***

Measurement:

0 ⦿	1 ⦿	2 ⦿	3 ⦿
National enforcement agencies:	National enforcement agencies:	National enforcement agencies:	National enforcement agencies:
☐ Have no forensic capacity ☐ Are rarely able to access forensic support from other institutions or countries	☐ Have limited forensic capacity* ☐ Rarely have access to basic equipment ☐ Rarely have staff that have received basic training in sample collection and processing ☐ Can sometimes access forensic support from other institutions or countries	☐ Have some forensic capacity* ☐ Usually have staff that received basic training in sample collection and processing ☐ Usually have access to basic equipment ☐ Can usually access forensic support from other institutions or countries	☐ Have adequate forensic capacity* ☐ Usually have staff that have received basic and, as required, advanced training in sample collection and processing ☐ Usually have access to adequate equipment ☐ Can access forensic support from other institutions or countries as required

* Capacity to use forensic technology means the ability to collect, handle and submit samples from wildlife crime scenes to an appropriate forensic analysis facility located either in the country or in another country.

27. Financial investigations *(EA)*

The capacity of national law enforcement agencies to conduct financial investigations to support the investigation and prosecution of wildlife crime.

*Question: **Do national law enforcement agencies have the capacity to conduct financial investigations* in the investigation and prosecution of wildlife crime?***

Measurement:

0 ⦿	1 ⦿	2 ⦿	3 ⦿
National enforcement agencies:	National enforcement agencies:	National enforcement agencies:	National enforcement agencies:
☐ Have no legal authority to use financial investigations* in the investigation of wildlife crime cases	☐ Have legal authority to use financial investigations* against wildlife crime ☐ Have received no formal training and/or have limited knowledge of and capacity to conduct financial investigations ☐ Require further training and specialized support	☐ Have legal authority to use financial investigations* against wildlife crime ☐ Have received basic training and/or have some knowledge of and capacity to conduct financial investigations ☐ Require further training and specialized support	☐ Have legal authority to use financial investigations* against wildlife crime ☐ Are well trained and have good knowledge of and capacity to conduct financial investigations

* A financial investigation is any investigation into a person or person's financial matters. It could also involve the investigation into the finances of a business or a private limited company. A financial investigation can determine where money comes from, how it is moved and how it is used.

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OUTCOME 5: There is a strong legal basis to combat wildlife crime

28. National wildlife legislation *(EA)*

The comprehensiveness of national legislative provisions for wildlife conservation, management and use, including international trade in protected species of wildlife.

Question: Is there comprehensive national legislation* for wildlife conservation, management and use, including provisions for the regulation of international trade in wildlife or its products?

Measurement:

0 ○	1 ○	2 ○	3 ○
National wildlife legislation: ☐ Has not been enacted	National wildlife legislation: ☐ Does not have adequate provisions to regulate international trade in wildlife and to deter and combat wildlife crime ☐ Is not supported by suitable subsidiary legislation and/or regulations	National wildlife legislation: ☐ Has adequate provisions to regulate international trade in wildlife and to deter and combat wildlife crime ☐ Is not supported by suitable subsidiary legislation and/or regulations	National wildlife legislation: ☐ Has adequate provisions to regulate international trade in wildlife and to deter and combat wildlife crime ☐ Is supported by suitable subsidiary legislation and/or regulations

* The comprehensiveness of provisions in all relevant pieces of national legislation should be considered when answering this question.

29. CITES legislation assessment *(EA)*

The category in which CITES implementation legislation has been placed under the CITES National Legislation Project.

Question: Which category has CITES implementation legislation been placed in under the CITES National Legislation Project?

Measurement:

0 ○	1 ○	2 ○	3 ○
National legislation for CITES: ☐ Has not been enacted ☐ Has not been assessed by CITES*	National wildlife legislation: ☐ Has been assessed by CITES as *Category 3: legislation that is believed generally not to meet the requirements for the implementation of CITES*	National wildlife legislation: ☐ Has been has been assessed by CITES as *Category 2: legislation that is believed generally not to meet all requirements for the implementation of CITES*	National wildlife legislation: ☐ Has been assessed by CITES as *Category 1: legislation that is believed generally to meet the requirements for the implementation of CITES*

* If you have CITES implementing legislation that has not been assessed under the CITES National Legislation Project (NLP), it is recommended that you forward a copy of this legislation to the CITES Secretariat (info@cites.org) so that an assessment can be completed. More information can be found at: https://cites.org/legislation.

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30. Legal provisions for international cooperation (EA)

The extent to which national provisions for international cooperation in criminal matters are applied to wildlife crime.

Question: *Are legislative provisions and/or bilateral treaties for international cooperation in criminal matters* used to support the investigation and prosecution of wildlife crime?*

Measurement:

0 ○	1 ○	2 ○	3 ○
National provisions and/or bilateral treaties to facilitate international cooperation on criminal matters*:	National provisions and/or bilateral treaties to facilitate international cooperation on criminal matters*:	National provisions and/or bilateral treaties to facilitate international cooperation on criminal matters*:	National provisions and/or bilateral treaties to facilitate international cooperation on criminal matters*:
☐ Do not exist	☐ Exist but do not encompass offences related to wildlife crime	☐ Encompass offences related to wildlife crime ☐ Are sometimes applied against wildlife crime ☐ Are sometimes subject to refusal and/or delays	☐ Encompass offences related to wildlife crime ☐ Are applied against wildlife crime ☐ Are usually processed efficiently and in a timely manner

* International cooperation in criminal matters includes legislation through which a formal request for mutual legal assistance and/or extradition of a person for criminal prosecution can be forwarded to another country.

31. Legal provisions to combat corruption (PA)

The existence of provisions against corruption in national legislation that can be used in the investigation and prosecution of wildlife crime.

Question: *Are there legislative provisions against corruption* in national legislation that can be used in the investigation and prosecution of wildlife crime?*

Measurement:

0 ○	-	-	3 ○
No	-	-	Yes

* Provisions against corruption include national laws to implement the United Nations Convention against Corruption, covering offences such as bribery of officials, embezzlement or misappropriation of public funds.

32. Legal provisions to address organized crime (PA)

The existence of national legislation for organized crime that can be used in the investigation and prosecution of wildlife crime.

Question: *Is there specific national legislation to address organized crime* that can be used in the investigation and prosecution of wildlife crime?*

Measurement:

0 ○	-	-	3 ○
No	-	-	Yes

* The United Nations Convention against Transnational Organized Crime defines an organized criminal group as a structured group of three or more persons, existing for a period of time and acting in concert with the aim of committing one or more serious crimes or offences established in accordance with the Convention, in order to obtain, directly or indirectly, a financial or other material benefit.

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OUTCOME 6: Wildlife crime is prosecuted in accordance with the severity of the crime

33. Use of criminal law *(EA)*

The extent to which a combination of relevant national legislation and criminal law is used to prosecute wildlife crime in support of legislation enacted to combat wildlife crime.

Question: **Are wildlife crime cases prosecuted under a combination of relevant national legislation* and criminal law in support of legislation enacted to combat wildlife crime, to ensure that wherever possible and appropriate offenders are charged and tried under relevant laws that carry the highest penalties?**

Measurement:

0	1	2	3
Relevant criminal law:	Relevant criminal law:	Relevant criminal law:	Relevant criminal law:
☐ Cannot be applied to wildlife crime offences	☐ Is rarely applied in wildlife crime cases	☐ Is sometimes applied in wildlife crime cases	☐ Is usually applied in wildlife crime cases, as required ☐ Is supported by mechanisms that harmonize wildlife and other key domestic legislation such as criminal law

* Because of the high value of some illegally-traded wildlife specimens and the involvement of organized crime groups in wildlife crime, mandated maximum fines of legislation enacted to combat wildlife crime often bear little relation to the value of wildlife crime specimens or the severity of the offence. It is therefore important that persons arrested for involvement in wildlife crimes whenever possible and appropriate, are charged and tried under a combination of relevant laws that carry the highest penalties. Includes legislative provisions for international cooperation [#30], combating corruption [#31], and addressing organized crime [#32]. Also includes use of general crime laws that relate to offences such as fraud, conspiracy, possession of weapons and other matters as set out in the national criminal code.

34. Case file preparation *(EA)*

The capacity of national law enforcement agencies to prepare wildlife crime case files and give evidence in court.

Question: **Are staff of national law enforcement agencies responsible for the investigation of wildlife crimes trained in the preparation of case files for court, judicial procedures and the giving of evidence in court?**

Measurement:

0	1	2	3
National enforcement agencies:	National enforcement agencies:	National enforcement agencies:	National enforcement agencies:
☐ Have received no training* on case file preparation and the giving of evidence in court ☐ Have limited capacity to prepare case files and give evidence in court	☐ Have some staff that have received basic training* on case file preparation and the giving of evidence in court ☐ Require further, more intensive, training to build skills and capacity	☐ Have some staff that have received intensive training* in case file preparation and the giving of evidence in court ☐ Require a greater number of trained staff to manage the normal workload	☐ Have some staff that have received intensive training* in case file preparation and the giving of evidence in court ☐ Have sufficient trained staff to manage the normal workload

* Formal training delivered by a trained instructor in a systematic intentional way within a academy, college or institute.

35. Case clearance rate *(DA)*

The percentage of wildlife crime cases that were prosecuted in court.

Measurement: **The percentage of wildlife crime cases that were prosecuted in court.**

Calculation: ['the number of wildlife crime cases submitted to judicial authorities for prosecution and filed in court' divided by 'the total number of reported wildlife crime cases'], multiplied by 100.

36. Administrative penalties *(DA)*

The percentage of wildlife crime cases that were resolved with administrative penalties.

Measurement: **The percentage of wildlife crime cases that were resolved with administrative penalties*.**

Calculation: ['the number of wildlife crime cases resolved with administrative penalties' divided by 'the total number of reported wildlife crime cases'], multiplied by 100.

* For example, fines, bans and suspensions.

37. Prosecutorial capacity *(EA)*

The capacity of prosecutors to manage wildlife crime cases.

Question: **Do prosecutors have the capacity to manage wildlife crime cases?**

Measurement:

0 ⃝	1 ⃝	2 ⃝	3 ⃝
Prosecutors:	Prosecutors:	Prosecutors:	Prosecutors:
☐ Do not have sufficient knowledge of the intricacies of wildlife-related crime ☐ Have not received any training and/or awareness-raising on wildlife crime or the prosecution of cases	☐ Have received limited training on the prosecution of wildlife crime cases ☐ Usually require further training ☐ Are insufficient to address the workload	☐ Have received some training on the prosecution of wildlife crime cases ☐ Sometimes require further training ☐ Are insufficient to address the workload of wildlife crime cases	☐ Have sufficient training and knowledge of the prosecution of wildlife crime cases* ☐ Are sufficient in number to manage the normal workload of wildlife crime cases

* Which may include the appointment of specialized wildlife crime prosecutors as appropriate.

38. Prosecution guidelines *(PA)*

The existence of national guidelines for the prosecution of wildlife crime.

Question: **Are there clearly-defined national guidelines* for the prosecution of wildlife crime?**

Measurement:

0 ⃝	-	-	3 ⃝
No	-	-	Yes

* For example, guidelines can be used to help ensure that administrative measures are only applied to more minor offences and that all serious offences are subject to prosecution. In some instances, it may be more appropriate for guidelines to be developed and implemented at the sub-national level.

39. Conviction rate *(DA)*

The percentage of wildlife crime cases that were brought to trial that resulted in convictions

Measurement: **The percentage of wildlife crime cases that were brought to trial that resulted in convictions.**

Calculation = ['the number of wildlife crime cases securing convictions' divided by 'the total number of wildlife crime cases brought to trial in court'], multiplied by 100.

OUTCOME 7: Wildlife crime offenders are appropriately penalized

40. Available penalties *(EA)*

The extent to which national legislation penalizes wildlife crime offences in a manner that reflects the nature and severity of the crime.

Question: Does national legislation adequately penalize wildlife crime offences?

Measurement:

0 ◯	1 ◯	2 ◯	3 ◯
Penalties for wildlife crime:	Penalties for wildlife crime:	Penalties for wildlife crime:	Penalties for wildlife crime:
☐ Only make provision for administrative penalties (e.g. fines, bans, suspensions)	☐ Are prescribed in legislation and provide for criminal prosecution ☐ Are not proportional to the nature and severity of wildlife crime ☐ Are inadequate as they do not provide an effective deterrent	☐ Are prescribed in legislation and provide for criminal prosecution ☐ Are usually proportional to the nature and severity of wildlife crime ☐ Are reasonably adequate	☐ Are prescribed in legislation and provide for criminal prosecution ☐ Are proportional to the nature and severity of wildlife crime ☐ Are adequate ☐ Treat wildlife crime offences involving organized criminal groups as serious crime* carrying a minimum term of four years imprisonment

* The United Nations Convention against Transnational Organized Crime defines serious crime as conduct constituting an offence punishable by imprisonment for at least four years or a more serious penalty.

41. Sentencing guidelines *(PA)*

The existence of national guidelines for the sentencing of offenders convicted for wildlife crime.

Question: Are there clearly-defined national* guidelines for the sentencing of offenders convicted for wildlife crime?

Measurement:

0 ◯	-	-	3 ◯
No	-	-	Yes

* In some instances, it may be more appropriate for guidelines to be developed and implemented at the sub-national level.

42. Judicial awareness *(EA)*

The extent of awareness of wildlife crime among the judiciary and the appropriateness of the verdicts handed down.

Question: Is the judiciary aware of the serious nature of wildlife crime and does it hand down appropriate verdicts?

Measurement:

0 ◯	1 ⦿	2 ◯	3 ◯
The judiciary:	The judiciary:	The judiciary:	The judiciary:
☐ Has no awareness of the nature and prevalence of wildlife crime, and the impact and potential profits of wildlife crime ☐ Has no awareness of wildlife crime-related charges ☐ Usually treats wildlife crime as a minor offence ☐ Does not adhere to sentencing guidelines where they exist	☐ Has limited awareness of the nature and prevalence of wildlife crime, and the impact and potential profits of wildlife crime ☐ Has limited awareness of wildlife crime-related charges ☐ Hands down verdicts that are sometimes appropriate to the nature and severity of the crime ☐ Rarely adheres to sentencing guidelines where they exist	☐ Has some awareness of the nature and prevalence of wildlife crime, and the impact and potential profits of wildlife crime ☐ Has some awareness of wildlife crime-related charges ☐ Hands down verdicts that are usually appropriate to the nature and severity of the crime ☐ Sometimes adheres to sentencing guidelines where they exist	☐ Is aware of the nature and prevalence of wildlife crime, and the impact and potential profits of wildlife crime ☐ Has a high level of awareness of wildlife crime-related charges ☐ Hands down verdicts that are appropriate to the nature and severity of the crime, and correspond with relevant laws and other serious crimes ☐ Routinely adheres to sentencing guidelines where they exist

* The United Nations Convention against Transnational Organized Crime defines serious crime as conduct constituting an offence punishable by imprisonment for at least four years or a more serious penalty.

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43. Legal provisions for asset forfeiture (PA)

The existence of provisions for asset forfeiture and recovery in national legislation that can be applied to wildlife crime.

Question: Are there legal provisions for asset forfeiture* and recovery in national legislation that can be applied to wildlife crime cases?

Measurement:

0 ⦿	-	-	3 ◯
No	-	-	Yes

* Asset forfeiture is the seizure and confiscation of assets acquired through criminal activities to ensure that criminals do not benefit from the proceeds of their crimes.

44. Use of asset forfeiture legislation (PA)

The use of asset forfeiture and recovery legislation in wildlife crime cases.

Question: Do you apply asset forfeiture* and recovery legal provisions to wildlife crime cases?

Measurement:

0 ◯	-	-	3 ⦿
No	-	-	Yes

* Asset forfeiture is the seizure and confiscation of assets acquired through criminal activities to ensure that criminals do not benefit from the proceeds of their crimes.

OUTCOME 8: A holistic approach is deployed to combat wildlife crime

45. Drivers of wildlife crime (EA)

The extent to which the drivers of wildlife crime in the country are known and understood.

Question: Is there awareness of the drivers* of wildlife crime in your country, including drivers of both supply of illicit products and consumer demand?

Measurement:

0 ◯	1 ◯	2 ◯	3 ◯
Knowledge of the drivers of wildlife crime: ☐ Is limited as very little information is available	Knowledge of the drivers of wildlife crime: ☐ Is basic ☐ Is typically anecdotal ☐ Is based on limited information	Knowledge of the drivers of wildlife crime: ☐ Is reasonable ☐ Involves gaps in knowledge ☐ Is based on information from multiple sources	Knowledge of the drivers of wildlife crime: ☐ Is good ☐ Is reasonably comprehensive ☐ Is based on information from a variety of sources including scientific research

* 'Drivers' are the underlying factors that are behind wildlife crime. Wildlife and forest offences can be driven by multiple factors, including rural poverty, food insecurity, unequal distribution of available agricultural lands, economic interests, legal markets of timber and non-timber products, as well as social upheavals such as war and famine.

46. Demand-side activities (EA)

The extent to which activities to address the demand of illicit wildlife products are implemented.

Question: **Are activities implemented to address the demand* for illicit wildlife products?**

Measurement:

0 ○	1 ○	2 ○	3 ○
Demand-side activities:	Demand-side activities:	Demand-side activities:	Demand-side activities:
☐ Have not been developed or implemented ☐ There is no information available on the demand for illicit wildlife products in the country	☐ Have been developed ☐ Are rarely implemented in full due to a lack of available resources (e.g. technical, human, financial) ☐ Are based on information confirming demand for illicit wildlife products in the country	☐ Have been developed and implemented ☐ Are rarely reviewed to identify the outcomes achieved ☐ Are based on information confirming demand for illicit wildlife products in the country	☐ Have been developed and implemented ☐ Are usually reviewed to identify the outcomes achieved ☐ Are not needed as data confirms that there is very little demand for illicit wildlife products in the country#

* 'Demand-side activities are activities developed and implemented to reduce the demand for a particular illegally-traded wildlife product, or for illegally-traded wildlife more general. In many instances, they may be closely associated with awareness-raising activities [#50] to build public awareness of the legal requirements that applies to trade in wildlife. When answering this question please consider activities that the government has conducted and/or participated in, including activities which may have been developed or implemented in partnership with other countries and/or non-government organizations.

\# This indicator is intended to measure the delivery of demand reduction efforts within the country, although it is noted that countries which have confirmed that there is no demand for illicit wildlife products in their country (e.g. through targeted research) may also support demand reduction efforts in other countries.

47. Regulated community (EA)

The extent of awareness-raising materials and/or programmes in place to increase the awareness of the regulated community of the laws that apply to the sustainable use of wildlife.

Question: **Are efforts taken to increase the awareness of the regulated community* of the requirements of legislation related to the sustainable use of wildlife and the penalties for non-compliance?**

Measurement:

0 ○	1 ○	2 ○	3 ○
Efforts to increase awareness of the regulated community:	Efforts to increase awareness of the regulated community:	Efforts to raise awareness of the regulated community of relevant laws:	Efforts to raise awareness of the regulated community of relevant laws:
☐ Are not undertaken	☐ Are usually informal and reactive ☐ Are not comprehensive or widespread	☐ Are based on awareness-raising materials that have been developed ☐ Are sometimes up-to-date ☐ Are sometimes comprehensive or widespread	☐ Are based on well-developed and up-to-date awareness-raising materials ☐ Comprehensively target the different types of user and permit holder(s)

* The regulated community could include harvesters, sellers, traders (including on-line traders) and/or any individual or group that is issued a permit and/or licence to take, use and/or trade in wildlife and wildlife products, and/or that conducts business activities related to the trade in wildlife and wildlife products.

48. Local community engagement (EA)

The extent to which local communities are engaged in law enforcement activities to combat wildlife crime.

Question: **Are local communities engaged in efforts to combat wildlife crime?**

Measurement:

0 ○	1 ○	2 ○	3 ○
Engagement of local communities: ☐ Does not occur	Engagement of local communities: ☐ Sometimes occurs ☐ Is usually ad hoc and informal ☐ Is not supported by any formal mechanism(s)* for consultation and/or engagement	Engagement of local communities: ☐ Sometimes occurs ☐ Is supported by a formal mechanism(s)* for consultation and/or engagement	Engagement of local communities: ☐ Routinely occurs ☐ Is supported by a formal mechanism(s)* for consultation and/or engagement ☐ Is sometimes supported by community-level interventions to combat wildlife crime

* Formal mechanisms and structures for engagement include the use of Community Police Forums, crime notification hotlines (e.g. Crimestoppers), the development of informant networks, and/or the use of incentives, as appropriate.

49. Livelihoods (EA)

The extent to which livelihoods and social capacity building are considered in activities to combat wildlife crime.

Question: **Are livelihoods and social factors that relate to the use of wildlife products considered when developing and implementing activities to combat wildlife crime?**

Measurement:

0 ○	1 ○	2 ⦿	3 ○
Livelihoods and social factors: ☐ Are largely unknown ☐ Are not considered in the development and implementation of activities to combat wildlife crime	Livelihoods and social factors: ☑ Have sometimes been identified ☑ Are rarely considered in the development and implementation of activities to combat wildlife crime due to a lack of resources (e.g. technical, human, financial)	Livelihoods and social factors: ☐ Have usually been identified ☐ Are sometimes considered in the development and implementation of activities to combat wildlife crime	Livelihoods and social factors: ☐ Have usually been identified ☐ Are routinely considered in the development and implementation of activities to combat wildlife crime ☐ Are often supported by programmes to build social capacity and promote sustainable alternative livelihoods

50. Public awareness *(EA)*

The extent of awareness-raising materials and/or programmes in place to increase public awareness of wildlife crime.

Question: *Are efforts taken to increase public awareness* of wildlife crime and its environmental, social and economic impacts?*

Measurement:

0 ○	1 ○	2 ○	3 ○
Efforts to increase awareness*: ☐ Are not undertaken	Efforts to increase awareness*: ☐ Are usually informal and reactive ☐ Are rarely comprehensive or widespread	Efforts to increase awareness*: ☐ Are based on awareness-raising materials and/or campaigns that have been developed ☐ Have usually not been recently reviewed or updated ☐ Are sometimes comprehensive or widespread	Efforts to increase awareness*: ☐ Are based on well-developed and up-to-date awareness-raising materials and/or campaigns ☐ Are usually widespread ☐ Include information on the severity and impacts of wildlife crime

* Awareness-raising activities may include public campaigns, awareness-raising materials at key locations such as international airports, public meetings, and/or the promotion of crime notification hotlines. When answering this question please include activities that the government has conducted and/or participated in, including activities which may have been developed or implemented in partnership with other countries and/or non-government organizations.