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WHAT SUSTAINS WILDLIFE CRIME? RHINO HORN TRADING  
AND THE RESILIENCE OF CRIMINAL NETWORKS

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TRANSNATIONAL ENVIRONMENTAL CRIME PROJECT

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## Transnational Environmental Crime Project

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The project investigates emerging trends in transnational environmental crime and examines the conditions for successful regulatory and enforcement responses. It focuses on three themes:

- advancing our understanding of the ways in which environmental commodities that are either sourced illegally or destined for illegal markets are traded and the ways in which profits are then laundered into the legal economy;
- applying conceptual tools to advance our understanding of the organisation of TEC and the asset structures that sustain illicit chains of custody and profit laundering; and
- mapping and analysing existing transnational and intergovernmental practices in the areas of policy-making, compliance and enforcement.

The Project is led by three Chief Investigators:

- Professor Lorraine Elliott, Department of International Relations, The Australian National University
- Professor Greg Rose, Faculty of Law, University of Wollongong
- Julie Ayling, Fellow, Regulatory Institutions Network, The Australian National University

The Project team also includes a Research Assistant and a PhD student funded by an Australian Postgraduate Award (Industry) scholarship and an ANU HDR Merit Scholarship. Five Partner Organisation Visiting Fellows will join the project team, based at the ANU, for a period of three months each to bring specific policy and operational expertise to the research project.

## Working Papers

The TEC Project's Working Paper series provides access to the Project's current research and findings. Circulation of the manuscripts as Working Papers does not preclude their subsequent publication as journal articles or book chapters.

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## Abstract

The problem of illegal trading in wildlife is a long-standing one. Humans have always regarded other sentient and non-sentient species as resources and tradeable commodities, frequently resulting in negative effects for biodiversity. However, the illegal trade in wildlife is increasingly meeting with resistance from states and the international community in the form of law enforcement and regulatory initiatives. So why does it persist? What makes the criminal networks involved in it resilient? In this paper we consider the networks involved in the illegal trade in rhinoceros horn that is currently posing an existential threat to most rhino species. The paper considers possible sources of these networks' resilience, both internal and external, and the implications for how the trade could be tackled.

## About the author

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# What sustains wildlife crime? Rhino horn trading and the resilience of criminal networks

JULIE AYLING

## INTRODUCTION

There is plenty of evidence of man's hand in the extinction of species over the last several thousand years. Humans have always regarded other sentient and non-sentient species as resources and tradeable commodities and this perspective has often had negative impacts on biodiversity. However the regulation and criminalisation of transnational trading in wildlife did not occur until the twentieth century. Implementation of international agreements such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) have involved a range of practical measures at both state and international levels as well as an outpouring of rhetoric. Yet illegal trading in wildlife continues. Given that the trade is increasingly meeting with resistance from the state and the international community in the form of law enforcement and regulatory initiatives, the question arises as to why it persists. What makes it sustainable and provides support to those involved in it? Clearly it is highly profitable. But while this explains the motivation for continuation of the illegal trade, it does not by itself determine its sustainability in the face of challenge. This paper addresses this issue.

In order to understand the persistence of the illegal wildlife trade, an untangling of the criminal networks involved is needed.<sup>1</sup> Understanding those networks is important because, as stated by Felbab-Brown (2011: 13), '[p]olicies to curb the illegal trade in wildlife and ensure its conservation and biodiversity preservation need to address the diverse and actor-specific drivers of illegal wildlife trade.' In other words, it is difficult to design an effective policy to deal with wildlife crime without having a good knowledge of the networks involved in and driving that crime, which will be specific to the geographical area and species. This issue has largely been dealt with tangentially in the relevant academic literature, which has mainly focused on the plight of various species and the advantages and disadvantages of possible solutions, ranging from stricter enforcement mechanisms and greater efforts to enforce (Webb 2000–2001; Wellsmith 2011; Zimmerman 2003) to the application of situational crime prevention techniques (Schneider 2008; Graycar and Felson 2010; Wellsmith 2010; Pires and Moreto 2011) and community-based solutions (Felbab-Brown 2011). The actor networks involved have rarely been described in more than general terms. Exceptions include Warchol's (2004) description of the various networks involved in trafficking of South African and Namibian wildlife (which is now somewhat out of date due to changing trafficking patterns); and South and Wyatt's (2011) recent discussion of the associations and networks involved in the illegal wildlife trade in Russia, comparing that trade to the illicit market in drugs and using a typology developed in the latter context that relies in large part on motivations. A comprehensive report published by TRAFFIC (Milliken and Shaw 2012) on the trafficking of South African rhino horn to Vietnam, released while this paper was being written, deals in more detail with the networks involved in that particular trade and is an overdue but welcome addition to the available information.

Knowledge of these networks is therefore slowly growing. However it does not as yet include a consideration of what makes those networks strong, or what gives them resilience when external forces (including law enforcement) make their operations difficult. The more resilient a network, the harder it is to disrupt. Clearly, both the sources of a network's resilience and the necessary policies to deal with those

<sup>1</sup> Nohria (1992: 4) defines a network as 'a set of nodes (e.g. persons, organizations) linked by a set of social relationships (e.g. friendship, transfer of funds, overlapping membership) of a specified type.' The term 'criminal networks' is used in this paper to mean forms of criminal organising where linkages of communication and exchange among actors are predominantly lateral or horizontal, giving these forms of organising more flexibility and adaptive capacity than vertically configured hierarchies (Williams 2001). The term as used here may include organisations, groups, gangs, syndicates and other collectivities. This is not to say that hierarchies cannot form parts of networks.

sources will be different for poor villagers poaching wildlife for subsistence purposes than for an organised criminal gang seeking to make huge profits from international sales.

This paper addresses this issue by examining the illegal trade in rhinoceros horn that is now posing an existential threat to most rhino species. It begins by briefly situating the illegal trade in wildlife in historical context, and then briefly describes the rhino horn trade as it currently stands. We then turn to the kinds of networks involved in the trade (in broad terms) and make some observations about their organisation. Moving on to the question of the trade's persistence, the concept of resilience is explored. Possible sources of resilience for the networks involved in illicit rhino horn trading that are both internal and external to the networks are examined. The implications for how the trade should or could be dealt with and for future research directions are considered in the final section of the paper.

## THE ILLEGAL WILDLIFE TRADE IN CONTEXT

The practice of procuring and trading in 'exotic' animals can be traced back to ancient times. Mackinnon (2006) notes that exotic animals were collected by both the Egyptians (dating from 2500BC) and the Greeks (from the seventh century BC). In Roman times demand escalated significantly because of the use of animals for entertainment in the amphitheatre games between as early as 186BC until the last games in AD523 (Mackinnon 2006). Representations of the hunting of African and Indian animals can still be seen in mosaics in Piazza Armerina in Sicily and at other sites in North Africa and Turkey (Mackinnon 2006). The numbers of animals procured by the Romans was huge.<sup>2</sup> For example, in just 100 days of games held for the opening of the Flavian Amphitheatre (the Colosseum) in AD80, for instance, the Emperor Titus had killed up to 9,000 domestic and wild animals (Futrell 2006: 113, quoting Cassius Dio 66.25). Animal harvesting by the Romans may have resulted in extinctions or, at least, severe reductions in populations. The Atlas or Carthaginian elephant that lived right across North Africa, for instance, became extinct in that region around the second century BC due to overhunting to supply the games, for use in war and for ivory (Leakey and Lewin 1995).<sup>3</sup> Undoubtedly, many exotic animals would have died because of inhumane conditions for their transport and keeping. Research suggests that the Romans used native hunters to capture the fiercest of the species, and this indicates a system of payments for these services would have existed (Mackinnon 2006).

Not until centuries later was international trade in exotics regulated. CITES was agreed between 80 countries in Washington, DC in 1973, and came into force on 1 July 1975. There are currently 176 parties. CITES aims to ensure that the international trade in specimens of wild animals and plants does not threaten their survival. A listing mechanism has been used to place close to 35,000 species of animals and plants in one of three appendices to the Convention. Each appendix grants a different level of protection to the species within it.<sup>4</sup> Parties to CITES are required to implement the Convention in their national laws including taking appropriate measures to penalise trade in or possession of relevant specimens. Complementing CITES are a number of other international agreements. For example, the Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention), signed on 23 June 1979, aims to conserve terrestrial, aquatic and avian migratory species throughout their range. It now has 117 members.

Along with implementing international agreements, states take practical actions to curb poaching and trading. In some whose wildlife constitutes their economic lifeblood through tourism, such as South Africa and Kenya, governments are increasingly resorting to paramilitary training for, and equipping of, rangers in nature reserves and game parks. Sometimes the military are deployed to patrol poaching

<sup>2</sup> No figures exist, but Mackinnon (2006: 142) suggests that the number would have been 'quite impressive', given that there were amphitheatres both inside and outside Italy that would have boosted demand and that hunts continued for close to 700 years.

<sup>3</sup> There is an ongoing debate about whether this elephant was a distinct sub-species (*Loxodonta africana pharaoensis*) or actually a type of African forest elephant (*Loxodonta cyclotis*) or bush elephant (*Loxodonta africana*). Forest elephants still live in the Congo basin today; bush elephants are more widely distributed across Africa.

<sup>4</sup> Rivalan *et al.* (2007) note that CITES 'uplisting' (from the less protected Appendix II to the more protected Appendix I) may lead to an increase in a species' commercial value and consequentially to more illegal trading in that species. They give as an example rhino horn. Its price on Korean markets increased by more than 400 per cent within two years of listing, and this coincided with an increase in poaching of Black rhinos for the illegal horn trade.

hotspots, especially in border areas such as the long boundary between South Africa and Mozambique that Kruger National Park abuts (BBC News Africa 2012). Training may also be done by private organisations, some of which are run by or employ ex-military personnel (for example, see the International Anti Poaching Foundation (IAPF)). Increasingly the rhetoric used by both the media and those involved in combating wildlife crime is replete with language of war and anti-insurgency.<sup>5</sup> This ‘securitisation’ of the problem is not without justification – poachers have proved quite willing to kill rangers standing in their way, and in return, rangers have been forced to fire upon and sometimes kill poachers.<sup>6</sup>

Despite the wide coverage of the international agreements, despite all the rhetoric and action at both state and international levels, illegal trading in wildlife continues. It brings enormous profits to its perpetrators, profits which provide incentives for further trading. The global value of the illegal trade in wildlife is unknown, although it has been estimated at around US\$7.8–\$10 billion excluding timber and fisheries (Haken 2011). It has been variously ranked as the third most valuable illicit market after drugs and arms (TRAFFIC no date) or the fifth most valuable illicit market after counterfeiting and the trades in drugs, people and oil (Haken 2011).

Illegal poaching has the potential to drastically reduce the biodiversity found on earth by driving species to extinction. For example, in just one century, the number of wild tigers has decreased by up to 97 per cent, three tiger sub-species have become extinct (Bali, Caspian and Javan), and the numbers of wild tigers continue to fall. Overharvesting (including through illegal poaching) together with habitat destruction, pollution and the introduction of invasive species, led to an estimated decline in populations of all vertebrates (excluding humans) of, on average, 30 per cent between 1970 and 2005 (Baillie *et al.* 2010). Clearly the problem of illegal trade in wildlife is a long-standing one, and its effects on biodiversity have been and continue to be far-reaching. The implications of biodiversity loss for humankind are frightening and their extent is not yet fully known. According to some, biodiversity loss today is as serious a problem as climate change in ‘eroding our own life support system from under our feet’ (Steffen 2012).

### THE RHINO HORN TRADE

Historically the transnational trade in rhinoceros horn has two main markets. The first is the market for carved rhino horn handles for traditional daggers or *jambiya* carried by Yemeni men as a sign of social status. Since the importation of rhino horn was banned in Yemen in 1982, demand for horn for this purpose has gradually diminished and now is largely met from substitutes such as water buffalo horn or plastic. Yemen is no longer a significant consumer country for the illegal rhino horn trade (TRAFFIC 1997; Cota-Larson 2010), although Vigne and Martin (2008) report that there remains a stable demand for rhino horn *jambiyas* among northern tribesmen and some demand among younger more prosperous men in the capital Sana’a.

The second market for the horn trade lies in Asia. Rabinowitz (1995) traces trade in rhino horn in China back as far as 2600BC. Rhino horn appeared in the ancient Chinese scriptures such as the Divine Peasant’s Herbal from the first century BC and the Pen Ts’ao Kang Mu (or Bencao Gangmu, 本草綱目) from the sixteenth century (Rabinowitz 1995). From ancient times, cups made from rhino were thought to be able to indicate if the liquid they held was poisonous (Lang 2011). In traditional Chinese medicine (TCM) rhino horn, ground to a powder and taken orally, is regarded as having curative properties ranging from hangover relief to fever, rheumatism, gout and stroke.<sup>7</sup> More recently, a rumour that rhino horn can

<sup>5</sup> The IAPF, for example, invites people to ‘Join the Green Army’. Jabulani Ngubane, Ezemvelo Wildlife Rhino Security Intervention Coordinator in KwaZuluNatal has described the fight against the poaching of wildlife in his region of South Africa as a ‘veritable war against organized crime’ (quoted in Eckhoff 2012). See also Forbes (2012).

<sup>6</sup> The International Ranger Federation reports on the circumstances in which rangers are killed and on some of the poachers killed in its bimonthly newsletter. See, for example, *Guardaparque*, 6(2) March–April 2012, [www.int-ranger.net/resources/GP201202.pdf](http://www.int-ranger.net/resources/GP201202.pdf) (accessed 4 July 2012).

<sup>7</sup> Contrary to many media reports, rhino horn has never been prescribed by TCM practitioners as an aphrodisiac, although recent marketing in Vietnam of horn for this purpose has been documented (Milliken and Shaw 2012).

cure cancer has spiked demand for the horn in Vietnam.<sup>8</sup> It should be noted that there is no scientific evidence for any medicinal value for rhino horn which is composed of keratin, just like human hair and fingernails. Recognising this, most TCM countries in Asia (including China, Japan, Taiwan and South Korea, but excluding Vietnam) have removed rhino horn from their traditional medicine pharmacopoeias (Milliken and Shaw 2012). This has not, however, removed demand. Traditional medicine places great emphasis on the 'spirit' of the animal as embodied in its flesh and bones, so an absence of scientific proof for medicinal qualities is not regarded as determinative.

Belief in the curative properties of rhino horn is therefore deep-seated in Chinese-related cultures. Rhino horn also has symbolic value in Chinese culture. A pair of rhino horns is one of eight treasures (the Eight Precious Things or *pa pao*)<sup>9</sup> that were represented on mandarin squares (badges of rank) worn by military officials during the Ming and Qing dynasties (Lee 1969; Welch 2008; Lang 2011). In this 'Asian century', too, rhino horn is regarded as a status symbol. For instance, it is used by Vietnamese elites as a gift to obtain favour and influence and in cultural 'face consumption' practices,<sup>10</sup> which often transpire at corporate events. Mixed with wine, it is promoted on Vietnamese websites as 'the alcoholic drink of millionaires' (Vaughan 2012).

Today there are five species of rhinoceros (all of which sport horns) – two in Africa (the White or Square-lipped rhino, *ceratotherium simum*, and the Black or Hook-lipped rhino, *diceros bicornis*), one in the region of India and Nepal (the Indian or Greater One-Horned Rhino, *rhinoceros unicornis*) and two in Southeast Asia (the Javan or Lesser One-horned rhino, *rhinoceros sondaicus*, and the Sumatran or Hairy rhino, *dicerorhinus sumatrensis*). About 80 per cent of the remaining global rhinoceros population is in South Africa (Scanlon 2012). In the period from 1970 until 1987, 85 per cent of the then world's rhinoceros population was killed. In 1977, recognising that the rhino population was on the road to extinction, parties to CITES listed the rhino in Appendix I of the Convention. Today all species remain on Appendix I except the southern White rhino which was moved to Appendix II (1994 for the South African population; 2004 for the Swaziland population).<sup>11</sup> Listing in Appendix I effectively instituted a ban on international trade in rhino products. In 1987, this prohibition was extended to domestic trade.

The modern rhinoceros family, the Rhinocerotidae, has existed for roughly 35 million years, since the late Eocene. Today, three of the five species (Black, Sumatran and Javan rhinos) have 'critically endangered' status on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species.<sup>12</sup> The Indian rhino is regarded as 'vulnerable' (so still 'threatened') and the White rhino as 'near threatened'.<sup>13</sup> While habitat destruction partially drives the decline in numbers of rhinoceros, poaching for horn is the main culprit. In the last five years the numbers of rhinoceros poached in South Africa alone has increased every year, from 13 in 2007 to 83 in 2008, 122 in 2009, 333 in 2010 and 448 in 2011.<sup>14</sup> South Africa's estimated 20,700 rhino had a population growth rate of 6% a year but rhino poaching escalated by 35 per cent between 2010 and 2011 alone (Blaine 2012).<sup>15</sup> This has given rise to a great deal

<sup>8</sup> This rumour is attributed to a report that a Vietnamese official was cured of his liver cancer by taking it, but neither the officer nor the source of the rumour can be located (TRAFFIC 2011).

<sup>9</sup> According to Lang (2011), the others are a wish granting pearl, double coins, coral, a sceptre, double lozenges, a stone chime, and an ingot.

<sup>10</sup> Milliken and Shaw (2012: 135) explain face consumption as 'acts of conspicuous consumption in order to enhance, maintain or save face.'

<sup>11</sup> White rhino numbers recovered to some extent in southern Africa due in part to the success of the trophy-hunting business and to pioneering wildlife management strategies in South Africa (Milliken and Shaw 2012).

<sup>12</sup> See [www.iucn.org/about/work/programmes/species/our\\_work/the\\_iucn\\_red\\_list/](http://www.iucn.org/about/work/programmes/species/our_work/the_iucn_red_list/). The Red List 'provides taxonomic and conservation status of species to determine the relative risk of extinction and to highlight those taxa facing higher risks of global extinction' (Schneider 2008: 284).

<sup>13</sup> See IUCN (2012a) for a detailed explanation of these terms. The International Rhino Foundation summarises the meaning of 'critically endangered' as at least a 50 per cent chance that a species will become extinct within three generations (about 30–60 years) (see International Rhino Foundation 2012).

<sup>14</sup> The number poached in South Africa as at 17 July this year was 281 (Department of Environmental Affairs 2012b); 164 of these were in Kruger National Park. It is predicted that the number poached in 2012 could reach over 600 (Forbes 2012). Poaching also occurs in a number of other African countries (such as Kenya and Zimbabwe) as well as in parts of Asia where rhinos live. Poaching resulted in the death of the last remaining Javan rhino in Vietnam (*Rhinoceros sondaicus annamiticus*) in October 2011. See WWF Global (no date). The Western Black rhino (*diceros bicornis longipes*) was also declared extinct in 2011 (IUCN 2012b; Scanlon 2012).

<sup>15</sup> The WWF claims that rhino poaching increased 3000 per cent between 2007 and 2011. See WWF 2012.

of concern and debate over what can and should be done to prevent the extinction of the species, especially in Africa. Current populations of the different rhino species are estimated by the International Rhino Foundation as 35–44 Javan rhinos, 152–199 Sumatran rhinos, 3,270 Indian rhinos, 4,837 Black rhinos and 20,143 White rhinos.<sup>16</sup> One forecast of the probable date for the total extinction of wild rhinos in Africa, given current rates of decline, is 2025 (African Wildlife Foundation 2012).

In terms of trade, White rhino can be traded internationally only as live animals ‘to appropriate and acceptable destinations’ or as hunting trophies. All other specimens of White rhino are deemed to be specimens included in Appendix I and the trade in them is regulated accordingly. Black rhino can be traded internationally as hunting trophies but in strictly limited numbers (five from each of South Africa and Namibia per year). This highly regulated trade is allowed in order to ‘provide additional incentives for conservation and habitat protection’ in those areas of these range states where the Black rhino population has been recovering because of effective conservation programmes (see CITES no date). No trade is allowed in Sumatran, Javan and Indian rhino products.

This limited trade can be contrasted with the black market for rhinoceros horn. While rhino horn markets have peaked in different Asian countries (China, Japan, South Korea and Taiwan) at various times in the past, currently Vietnam is widely regarded as the main black market. Amongst other things, there has been a rapid increase in South African trophy-hunting permits granted to Vietnamese nationals and of hunts conducted by Vietnamese citizens (which number more than permits granted) since 2003 (Milliken and Shaw 2012). Anecdotal evidence suggests that horn presently fetches as much as US\$75,000 per kg in Vietnam (Mander 2012), more than the price of gold. A single rhino horn may weigh up to 6 or 7 kgs, so the sale of even one would clearly be very lucrative. The view that Vietnam constitutes the principal market for horn, however, is rejected by Vietnamese government officials who claim that it is only a transit country for horn, having too few links with South Africa and being too poor to support such a market (Asia News Network 2012).

#### **NETWORKS INVOLVED IN THE TRADE**

For details of the networks involved in the rhino horn trade in South Africa, expert reports such as that published by TRAFFIC (Milliken and Shaw 2012) should be consulted. The following categorisation of networks involved in the trade is more general, in order to serve as the basis for the paper’s discussion of resilience. The categorisation is also functionalist, that is, it is based on what the networks do rather than their motivations or impacts (cf. South and Wyatt 2011).

#### **Harvesting networks**

Harvesting networks include *poaching networks* of varying degrees of sophistication. Groups of poor villagers from Mozambique are known to slip through holes in the border fence to poach rhino on foot in South Africa’s Kruger National Park. However, organised crime syndicates are also suspected of involvement in poaching (Scanlon 2012), poaching rhino themselves or providing the incentives for villagers to do so. These syndicates have increasingly become the focus of state concern. There is evidence of the use of advanced technologies to kill the animals (helicopters, night vision goggles, infrared sensors, tranquilising drugs, high-powered weapons and silencers, and so on) (Humane Society International 2011a) that are way beyond the financial or technical reach of African villagers. Smuggling methods, too, display high degrees of organisation.<sup>17</sup> It is likely that the technique of using shell companies to obscure the money trail and hide from view the ‘high level’ perpetrators of ivory and caviar trafficking (Cardamone 2012) are also being employed for rhino horn trafficking.

<sup>16</sup> See the International Rhino Foundation website, [www.rhinos.org/](http://www.rhinos.org/) (accessed 22 June 2012). Scanlon (2012: 8) states that there are an estimated 25,000 rhinos left in the wild.

<sup>17</sup> For example, in November 2011 customs officers in Hong Kong opened a shipping container that had come from Cape Town and was declared as scrap plastic. They found 33 rhino horns, 758 ivory chopsticks and 127 ivory bracelets (Smillie 2012). Writing about the illegal reptile trade, Herbig (2010) documents some of ‘the ingenious methods used by poachers to transport their illegal bounty’, many of which are amenable not only to transporting reptiles but also to the smuggling of other wildlife products, including rhino horn. South and Wyatt (2011) document a range of smuggling methods for wildlife and note overlaps between these methods and those for illicit drugs, including the use of bribery to ensure that goods pass borders without inspection and with minimal difficulty.

Harvesting networks also include syndicates that misuse or corrupt the legal avenues available for obtaining horn, such as the trophy hunting scheme in place in various African countries. Under that scheme, a person may only hunt and export one (White) rhino for trophy purposes per year (CITES 2010: Annex I, 2.5). A recent example of the abuse of the hunting permit system in South Africa by a *pseudo-hunting network* involved a Thai national (Chumlong Lemtongthai) who allegedly hired prostitutes and strippers to pose as hunters in order to obtain multiple hunting permits from the South African government. The women were reportedly given a holiday, while the rhino hunting was carried out by a professional hunter under the supervision of a South African game farmer. The women then posed with guns for photographs beside the dead rhinos. The resulting trophies were mounted cheaply and exported to the Thai homes of the women involved (*Bangkok Post* 2011). This case is still before the South African courts and is due to be heard in November 2012.

The apparent abuse of the trophy permit system has recently spurred the South African government to change how permits are granted. Applicants now must provide proof of hunting experience in their country of usual residence or of African species or of membership of a registered hunting association, and their passport. South African authorities must also consider whether the countries in which foreign applicants live have sufficient laws against illegal rhino horn trading (*Huffington Post* 2012). The Department of Environmental Affairs (South Africa) has also recommended to all Provincial Conservation Authorities which are responsible for issuing hunting permits that all applications for White rhinoceros hunting permits by hunters whose state of usual residence is Vietnam be refused, until Vietnam has confirmed that all rhino trophies exported since 2010 are still in the possession of the hunters. These requirements have stopped the flow of applications for hunting permits from Vietnam, China and Thailand (Department of Environmental Affairs 2012a).

Another system that has been abused is the legal domestic trade in rhinos for conservation or game reserves. The criminal networks involved might be termed *pseudo-conservation networks*. The ‘Groenewald gang’ is a South African group comprised of two veterinarians, two safari operators, a professional hunter and several others who are currently on trial in South Africa for racketeering. This gang is alleged, over a period of more than four years, to have legally procured rhinos from game farms, wildlife parks and reserves, purportedly for conservation purposes but actually in order to dehorn them (in the process killing almost all of the rhinos) and thereby profit from the sale of the horns. This is one of the biggest wildlife cases in South Africa’s history, involving 1,872 charges of racketeering.

### **Theft networks**

Another way to obtain rhino horn is through theft. Thefts have been reported from stockpiles of rhino horn, both governmental and private (Humane Society International 2011b; Milliken and Shaw 2012). In addition, thefts from institutions such as museums are increasing. The spate of thefts from institutions has not been limited to range states – in Europe alone, Europol had recorded (as at March 2012) 57 thefts and 12 attempted thefts of rhino horn since the beginning of 2011 from museums and private collections in 15 countries (Hewitt 2012). Police allege that many of these crimes have been perpetrated by an Irish gang (nicknamed the Rathkeale Rovers) that is better known for drug trafficking, robbery, distributing counterfeit products, tarmac fraud and money laundering (Foy 2012). Museums and other institutions have reacted by tightening security and replacing horns with fakes or removing them from public display (Hewitt 2012).

### **Distribution networks**

Harvesting and theft networks are clearly linked to (or part of) distribution networks. Some rhino horn will be taken by poachers for distribution by them or their local contacts in domestic markets (*domestic retail networks*). Other horn is destined for foreign markets (*transnational smuggling networks*). Poachers pass it to middlemen (receivers or couriers) who find buyers with international contacts. Those buyers themselves, or through others involved in the export market, arrange for the horn to be smuggled out of the country (Warchol 2004).

Distribution networks also include *trading networks* in non-source countries. As part of a recent multi-agency operation in the United States, Operation Crash (*crash* being the collective noun for rhinos), search warrants were executed in five different states, resulting in the arrest in February 2012 of eight people including a rodeo cowboy, an expert in antiques, a Vietnamese nail salon owner and a Chinese

businessman. It is alleged the arrestees were involved in buying up rhino horn across the US (mainly trophies), illegally moving it interstate and exporting it without authorisation to buyers in China. Thirty-seven rhino horns were recovered along with gold ingots, cash and other proceeds of crime (Radio Netherlands Worldwide 2012). This case too is still before the courts.

There are also suspicions, fueled by extraordinarily high prices fetched at auctions of antique horn products such as mounted horns and Chinese libation cups,<sup>18</sup> that some of these products are also being sent to Asia for eventual grinding down and use in traditional medicine (Humane Society International 2011b). For this reason, in February 2011 the European Union (following an early lead on this issue by the UK) published a guidance note urging stringent restrictions on the re-export of rhino horn products (Department for Environment, Food and Rural Affairs 2011). This was renewed and strengthened in Brussels in February 2012 at the 58th Meeting of the Committee on Trade in Wild Fauna and Flora.

### **ORGANISED CRIME OR CRIMES THAT ARE ORGANISED?**

Each of the groups that constitute the links in the supply chain for the illegal rhino horn trade may or may not meet the definition of ‘organised crime’ that is set out in the United Nations Convention against Transnational Organized Crime (UNTOC).<sup>19</sup> The Convention does not apply to groups that are ‘randomly formed for the immediate commission of an offence’ (Article 2(c)). A ‘structured group’ therefore needs to have a degree of permanence, although it need not have formally defined roles, continuity of membership or a developed structure (Article 2(c)). Some rhino horn networks may nevertheless be opportunistic collectivities set up solely for the purpose of committing an offence, which afterwards fade back into the ‘criminal macro network’ (Spapens 2010), that is, the criminal milieu from which they coalesced. These groups commit ‘crimes that are organised’ (Finckenauer 2005) but would not qualify as organised criminal groups as defined by UNTOC. However, other groups involved in the trade do appear to be longer term arrangements, for example, the Groenewald gang and the Rathkeale Rovers mentioned earlier. Milliken and Shaw (2012: 82) suggest that the current trade in rhino horn from South Africa to Vietnam is largely the work of Asian syndicates involving individuals living and working in South Africa, including diplomatic personnel, who ‘recruit and orchestrate the movements of a highly fluid network of couriers and “mules”’ to move the horn along the supply chain.

A diversity of actors and organisational arrangements is not unusual in the field of wildlife crime. Like elephant poaching in parts of Africa and sturgeon poaching for the caviar trade in the Caspian Sea (Pires and Moreto 2011), the rhino horn trade appears to involve a mix of opportunists (including those who commit crime in order to survive) and organised criminal groups. Pires and Moreto (2011: 104) note that:

[d]epending on the species and region of the world, “organised” can simply mean anything from three individuals who are loosely organised together to a vast criminal enterprise that comprises all stages of the wildlife trade (i.e. vertically integrated organisations).

Understanding the constitution of different markets and how its networks are organised is important for building an understanding of how particular wildlife trades can be controlled and disrupted at each stage in the supply chain. So too is an understanding of how these networks withstand and deal with law enforcement attacks.

### **THE CONCEPT OF RESILIENCE**

In the fields of ecology and disaster management, the resilience of species, of habitats and of socio-ecological systems is regarded as a good thing. However, in considering criminal networks, the concept of resilience takes on a different, more ominous meaning. Both institutionalised criminal groups (such as the mafia, yakuza and triads) and some of the more fluid criminal networks that are becoming prevalent in the area of transnational environmental crime demonstrate resilience in the face both of

<sup>18</sup> Libation cups were used for pouring liquids (such as rice wine, tea or water) on ceremonial occasions, for example as an offering to the gods or to honour the dead. Some Chinese libation cups are elaborately carved.

<sup>19</sup> UNTOC obliges signatories to criminalise serious transnational crime committed by an organised criminal group (Article 3 (1)), defining serious crime broadly and an ‘organized criminal group’ (Article 2(a)) 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.’

opposition from authorities and of changes in the economic and social conditions in which they operate. There is evidence, for example, of 'persistent offenders' operating the trade in tiger and other big cat products from India through Nepal into China (Environmental Investigation Agency 2011), of long-standing mafia involvement in hazardous waste disposal both domestic and transnational (in countries such as Somalia, Lebanon and Romania) (Massari and Monzini 2004), and of drug gangs in Mexico having moved into the illegal timber trade (Wylter 2011). This suggests that the persistence of transnational environmental crime markets is assured, at least for the foreseeable future.

What do we mean by resilience? Resilience relates to the stability of systems, their ability to 'jump back' (the meaning of the Latin *resilio* (*resili* 're')) when subjected to disturbance. Elsewhere I have noted that the concept of 'ecological resilience' has been applied to a variety of different fields beyond ecology, including organisational studies (Ayling 2009). Resilience in these fields is seen as involving two capacities: the ability to absorb and therefore withstand disruption (denoted by Bouchard 2007, in talking about illegal markets, as 'elasticity') and the capacity to adapt, when necessary, to changes arising from that disruption (Ayling 2009; Bouchard 2007).

In the field of business, whether legal or illegal, the ability to absorb disturbances and adapt to change is integral to sustainability. Adaptation can involve anything from minor adjustments up to robust transformation of business structures, modes of operation and activities. In the case of illegal business, for example, a law enforcement intervention that results in the arrest of a participant or the seizure of an illegal shipment may mean that someone else has to take over the arrestee's role (a minor adjustment) or that a new smuggling route or technology has to be adopted (perhaps a more major adaptation). Kenney (2007), for example, reports that in 1981 the US law enforcement interception of cocaine being smuggled by air between Colombia and Florida led to the relevant smuggling group developing a system of air drops of well-wrapped cocaine bales into the Gulf of Mexico (where they floated) for eventual collection and transportation by boat.

The dynamism of illicit business thus makes the job of regulators and law enforcement officials more difficult because it requires of them a degree of 'co-evolution' (or, as Kenney (2007: 104) terms it, 'competitive adaptation'). In other words, they need to both keep abreast of any adaptations made by illegal businesses and be adaptive themselves in order to continue to effectively deal with those businesses.

Resilience does not necessarily require a fixed coterie of participants. The criminal networks that constitute an illicit market, be it for drugs, exotic animals or other illegal product, often endure despite personnel changes due to arrests, imprisonment, desistance, death and new recruits. Replenishment of participants can be easy or difficult, depending on the nature of the market. As Bouchard (2007) points out, where a market is highly rewarding and there are low barriers to market entry, replenishment of participants either through recruitment into existing networks or the creation of new networks is unlikely to be a problem. The market for illegal wildlife products is one such high-value market, as noted earlier. Due to years of neglect by states and international organisations, most of which have given it a low priority as reflected in lower penalties and less rigorous enforcement than other forms of organised crimes, it is also relatively low risk. Offences are not too difficult to carry out (particularly if combined with other kinds of illegal goods trade, Zimmerman 2003) and the illegal trade is hence highly attractive.

Criminal networks experience a number of challenges, some of which are specifically due to the fact that that which is traded is illegal. One of the main challenges, of course, comes from law enforcement. The ability of any system to adapt to the 'environmental jolts' that might be caused by a sustained or sudden onslaught from external sources (such as the state) depends on its resilience. As the sources of its resilience increase, so does the system's ability to adapt (Nelson, Adger and Brown 2007). The converse is also true. When considering how to deal with criminal networks, then, identifying and reducing these sources of resilience needs to be a priority for states (Ayling 2009).

The sources of resilience of illicit networks are numerous. Research suggests there are two main categories: the characteristics of the networks themselves and the environments in which they operate (Williams 2001; Bouchard 2007; Ayling 2009). These give the networks social, political and economic assets essential to their longevity.

The criminological literature has mostly focused on a network's structure as its primary source of resilience. Structure includes aspects like its size and architecture or nodal configuration (for example, 'flat' or hierarchical), trust between participants, role and skill distribution among network nodes and the nature of leadership. Horizontal structures (as opposed to hierarchical ones) are thought to bestow advantages in terms of information transmission and secrecy, creativity and organisational learning (Williams 2001; Kenney 2007; Ayling 2009). In relation to size, Bouchard (2007) notes that a market constituted by small firms is more likely to persist because smallness reduces costs and means that firms can often avoid the inertia that larger organisations may suffer.

Also of significance to the resilience of criminal trading networks is the environment in which they operate. Illicit markets flourish all over the world, and many are transnational, but certain environments make survival easier. 'Thick' crime habitats (Felson 2006), that is, environments that host a multitude of opportunities for crime to be both planned and conducted and contain few 'discouragers of crime' (Felson 1995), are conducive to resilience because they facilitate the transfer of knowledge and skills between criminals and the building of strategic alliances, providing a powerful tool for adaptation (Williams 1995; Ayling 2009). The nature of 'place' may therefore play an important role in building resilient organisations and markets: thick crime habitats are plentiful in (although not necessarily limited to) large urban conglomerates, particularly in weak or failing states.

Similarly, the amount of community support for criminal activity may be significant to the sustainability of an illicit business. Wildlife poaching, for example, may be at least tacitly supported by poor communities because the financial benefits to the community it brings outweigh those available from legitimate employment or state welfare services. And finally symbiotic relationships between licit and illicit spheres provide another source of resilience. As White (2008: 173) has noted, 'Part of the success of business done at the licit/illicit interface is that it can embody several different types of organisational relationship and entrepreneurial activity.' Some illegal trade could not be conducted at all without the corruption of public officials who in exchange for money or a cut of the action are willing to provide official permits and authorisations, or to otherwise 'bend the rules'. Legitimate actors may be willing participants but they may also be unwilling (coerced) or unwitting facilitators of crime (Passas 2002). While the corruption of legitimate business and public office by criminal networks is a well-known and well-studied phenomenon, Morselli and Giguère (2006) argue that the interdependence is more extensive. Legitimate actors are not always 'orchestrated' by criminals, but instead may play a positive role in structuring criminal networks by voluntarily providing them with services and facilitating their operations.

## **THE RESILIENCE OF RHINO HORN NETWORKS AND THE PERSISTENCE OF MARKETS**

### **Network challenges**

Resilience is a quality that is only tested under challenge from external sources (Bouchard 2007). While neglect by states of transnational environmental crime has been and to some extent continues to be the norm (Wright 2011), in the case of the illegal rhino horn trade, there is currently a strong movement towards a much more proactive anti-poaching stance by range states and others in the global community. This is based on the perceived urgency of the situation. In southern Africa particularly, the government, non-governmental organisations, private individuals (particularly business people) and community groups have over the past few years developed a plethora of strategies aimed at reducing poaching and catching the offenders. These include:

- increased penalties and strengthened enforcement strategies – such as more rangers on the ground, improvements in training, communications and detection technologies and weaponry, military patrols, and the use of dogs to track poachers (SAPA 2012a);
- specific enforcement operations (also known as National Enforcement Blitzes) conducted by regulatory agencies, examining compliance with the regulatory framework relating to the hunting of wildlife and post-hunt treatment of trophies (an example being the August 2012 *Operation Skhumba* targeting regulatory compliance by tanneries and taxidermists, Department of Environmental Affairs 2012b);

- science-based interventions – such as dehorning animals (Hunter 2012), dyeing and poisoning of horns (AFP 2011), technologies to monitor rhinos (such as tracking devices inserted in horns and microchipping of rhinos) and to spot poachers (such as thermal imaging, radar and ultra-light aerial patrols) (Tugman 2012; SanParks 2012; Hunter 2012), and forensic tracking of rhinos and horns through DNA ‘barcoding’ (Reed 2012), both for use in prosecutions and to identify hot spots for poaching;
- registration of private horn stockpiles (Dube 2012; Milliken and Shaw 2012);
- investment in community-based eco-tourism projects (conservancies and so on); and
- entry into bilateral agreements (usually memorandums of understanding) with other countries (such as China and Vietnam) to work together to curb the illegal rhino horn trade (Mkhwanazi 2012; SABC News 2012).

As at 23 August 2012, a total of 192 arrests related to the illegal rhino horn trade had been made in South Africa for 2012 (Department of Environmental Affairs 2012b). This compares to total arrest figures of 165 for 2010 and 232 for 2011. Although arrest data represent only the ‘tip of the iceberg’ of those involved in the trade, these statistics do signify some of the pressures under which these networks now operate. There is no shortage of challenges for them.

### **Sources of resilience**

It is clear then that rhino horn trading networks are required to demonstrate a certain degree of resilience in order to survive. Where could that resilience come from and what kinds of assets does it afford these networks?

In terms of internal sources of resilience, this will depend on the structure of those networks. What do we know about that structure? Warchol (2004: 65) has noted that in the past the illegal wildlife networks operating in South Africa and Namibia had ‘no one distinct profile’ but that both poachers and traffickers of rhino horn and ivory tended to be predominantly individuals or informal groups rather than organised criminal gangs. Poachers were relatively unsophisticated, middlemen who bought from them were numerous, and those middlemen in turn found it fairly simple to find buyers with international contacts and secretly pass the goods on to them. However in 2004 the context was different to today’s: ‘[e]lephant and rhinoceros poachers in South Africa and Namibia are few in number and no longer constitute much of a threat’ (Warchol 2004: 65).

In 2012, while a few of the harvesting networks may still consist of poor rural unsophisticated folk, many are proving to be just the opposite. Features of these more sophisticated networks include:

- small size syndicates;
- participants with particular types of expertise (for example, hunting, veterinary, book-keeping, logistics, and so on);
- highly specialised roles within the network;
- access to expensive equipment;
- a willingness to cooperate across nationality/ethnicity lines; and
- connections beyond the network itself that facilitate smuggling.

These features are clearly evident to different degrees in different harvesting and distribution networks such as the Groenewald gang, the Chumlong Lemtongthai group and the syndicate uncovered by Operation Crash. This suggests that the trade is becoming more organised – and perhaps that more ‘organised crime’ is now involved. Certainly the latter view is increasingly favoured at the international level. Interpol’s Environmental Crime Programme, for example, is predicated on the proposition that ‘[a] significant proportion of both wildlife and pollution crime is carried out by organized criminal networks’ and ‘environmental crime often occurs hand in hand with other offences such as passport fraud, corruption, money laundering and murder’ (Interpol 2012). Milliken and Shaw (2012: 76) report that an organised crime dimension to the rhino horn syndicates trafficking between South Africa and Vietnam is

undoubtedly present, not only in terms of internal organisational structures but also in relation to their involvement in other illegal wildlife trades (live animals, abalone, ivory and so on) and other types of organised crime (drug smuggling, vehicle theft and so on).

The apparent smallness of the various networks involved constituting the illegal taking and trade in rhino horn is a feature that may contribute to the ability of those networks to avoid detection through reducing the need for intra-network transactions. Small networks may also have more flexibility than larger, more cumbersome networks to adapt their modes of operation if necessary, opening up new avenues of trade when others are closed down. On the other hand, smallness and high levels of participant specialisation may indicate that there is little inbuilt redundancy in the network, so that if one participant ceases to be operative for whatever reason (such as ill health, desistance or arrest) the operation may be stymied until such time as a new player with similar skills can be located (Williams 2001; Ayling 2009). Small size in that case would suggest vulnerability rather than resilience.

From the small numbers of examples of networks freely available to researchers, it is difficult to assess the degree to which rhino horn trading networks are resilient, and how flexible and adaptable they will prove to be when challenged. It is therefore essential that the structures and modes of operation of detected syndicates should be mapped by those with the relevant information (mostly law enforcement agencies), so that a clearer picture of these networks can emerge. A couple of important gaps in the knowledge base are evident. The first concerns how network participants locate each other and establish trusting relationships. This is a particularly interesting question because of the apparent prevalence in some of these networks of first-time offenders, many of whom are professionals in other fields. The second is about how these networks communicate and trade across national borders. Are they networks that only have 'loose couplings' and 'weak ties' with overseas buyers, or are those ties such that the syndicates might be considered as integral parts of larger (perhaps organised crime) networks? Only a clear mapping of the networks involved will indicate the shape those networks take (chain, hub and spoke, centre/periphery, web and so on).<sup>20</sup> Mapping of networks would indicate whether there are ways in which incipient trust relationships might be disrupted, and whether there are key positions that could be targeted, such as 'brokers' who link otherwise disconnected clusters within a network, or indeed different networks, and upon whom these clusters/networks rely for access to resources beyond their reach (Morselli 2009).

However, the mapping of network structures is only half the picture. Any strategy of 'taking out' network members may not break up that network if its environment still provides it with sources of resilience. As pointed out earlier, participants can usually be replaced.

Relatively unsophisticated poaching networks that are based in rural environments may gain resilience because they are supported in their activities by the communities from whence they come. This is nothing new. Hay (1975), for instance, refers to the solid popular support for poachers that existed in eighteenth century England. To target the kind of resilience that community support gives poachers of rhino horn would require that those communities are provided with or can themselves acquire other equivalent sources of income, sufficient to dissuade them from participating in criminal acts. It is here that a government-supported scheme for community-driven conservancies can assist.<sup>21</sup> As the film *Milking the Rhino* suggests, in order to be protected by a community, wildlife may be required to 'pay back' to the community in another way, such as by constituting a tourist attraction.<sup>22</sup> However much one may regard as unfortunate the view that wildlife is primarily a resource for humans, it is a view widely held across the globe.

<sup>20</sup> For a discussion of different types of criminal networks and network patterns, see Williams (2001).

<sup>21</sup> A conservancy is defined by the National Association of Conservancies (South Africa) as 'a registered voluntary association between land users/owners who cooperatively wish to manage their natural resources in an environmentally sustainable manner without necessarily changing the land-use of their properties.' Conservancies are examples *par excellence* of free market environmentalism as they provide a means to avoid the 'tragedy of the commons' (Anderson and Leal 2001: ch.11).

<sup>22</sup> See *Milking the Rhino* (Kartemquin Films, 2009) for an excellent illustration of how conservancies and similar community-based strategies are being used in Namibia (amongst the Himba in the Marienfluss Valley) and Kenya (amongst the Maasai in the Il Ngwesi area) to further the conservation of wildlife and defend it from poaching.

More sophisticated poaching, distribution and trading networks are a different story. There is no doubt that environmental features can play a part in providing these networks with resilience, through making their operating environments 'safe', thus warranting continued investment in the criminal exploitation of wildlife even in the face of setbacks like the occasional prosecution. Examples of these environmental features include:

- a practical disconnect between rules and their implementation (such as may be produced through lax law enforcement or weak penalties);
- the existence of social norms that conflict with rules (for example, the cultural use of wildlife in traditional medicines in China and Vietnam); and
- the existence of complex or ambiguous rules (such as those in the US banning the sale of horn across state lines and restricting the import and export of horn, as revealed by Operation Crash).

Sometimes confronting these types of problems appears simple, requiring only a greater investment in law enforcement, a tightening of rules (such as has occurred in relation to the grant of hunting permits in South Africa) or the launch of campaigns to help remind people of their legal obligations or to educate them about the consequences of their consumption of wildlife product. Efforts may be made to increase the risks and difficulties of trading illegally and to decrease its rewards, à la situational crime prevention theory (Clarke 1995). And such solutions can be effective. However, where one is dealing with sophisticated organised criminal networks, their capacity to evolve and adapt must also be recognised and taken into account (Kenney 2007; Ayling 2011). One-time and narrowly targeted solutions are unlikely to be sufficient. Adaption and evolution by organised networks may, for example, involve a displacement of activities to alternative modes of operating for which there is currently insufficient regulation, to other commodities for which protective measures have not yet been put in place (such as other wildlife products), or to other places more conducive to trade. The detection of displacement requires authorities to be cognizant of these possibilities. An assumption cannot be made that arresting several network participants necessarily puts an end to the network's criminal activities, or that more stringent rules or better enforcement will necessarily stop the trade.

Corruption, another environmental factor, can also provide a source of resilience for criminal networks. Unfortunately many of the range countries for rhino are low on the scale of Transparency International's 2011 Corruption Perceptions Index (see Transparency International 2012).<sup>23</sup> A number of the South African networks so far identified have involved people in public and private positions of power over the fate of rhinos (game farmers, vets, National Park rangers and officials) but the effective distribution and smuggling of horn to overseas markets almost certainly requires participation by further, currently unidentified, private and public sector individuals and businesses. Such individuals and businesses cooperate with criminal networks in providing appropriate documentation, laundering facilities (be it for the products or the wildlife) and transport and holding facilities. As yet undiscovered resilience-enhancing intersections between the illicit and licit spheres could therefore be turned up by, for example, investigating financial institutions and facilities (using follow-the-money strategies), transit points (ports, airports, and so on), transport providers, export agents and storage facilities. The probability that the trade is being facilitated by delinquent professionals (for example, lawyers, accountants, estate agents and chemists) should also be a focus for investigations.

#### **A TIME FOR AD HOCERY, TARGETED RESEARCH OR GRAND EXPERIMENTS?**

One of the problems that must be faced in dealing with and proposing solutions for the illegal trade in wildlife is that there is too little information about the markets that constitute it. In particular, the channels of communication between participants and their modes of operation are sketchy. Thanks to the work of a multitude of mainly non-state actors, the effects of poaching on global populations of rhino and other fauna is well-established, and this enables estimation of the value of the various wildlife markets. Seizures of wildlife products give a general picture of global trade routes and

<sup>23</sup> This index ranks countries on perceived levels of public sector corruption.

smuggling methods<sup>24</sup> and a restricted glimpse of smuggling volumes (given that seizures constitute an unknown proportion of products smuggled). Arrests and prosecutions of perpetrators (such as exist), however, provide only a patchy and inaccurate picture of the harvesting, theft and distribution networks involved. The networks being confronted need to be better understood. Furthermore their sources of resilience, which enable them to bounce back from challenges put in their way by the state and others, have not been considered, let alone systematically studied. It is in this context that strategies to fight wildlife crime are being developed. While those strategies constitute quite a large and varied toolkit, it is one that so far has been developed and employed in an ad hoc way.

To illuminate the identity of network participants and how they operate in practice across an entire market – establishing trust, communicating and organising the trade – will clearly require vastly more research. One initial step that can be taken in the direction of understanding and controlling the trade is to reflect upon the possible sources of the resilience of the networks involved. A resilience perspective highlights that there are many sites of possible intervention. Identifying the sources of resilience means that more targeted strategic and operational approaches to criminal wildlife trading networks can be designed. Law enforcement agencies and other government and international agencies possess databases of individual cases and should be using these to detect network structures and connections, looking into the features of the environments in which they are thriving, and pinpointing knowledge gaps that need to be filled. Extra resources may be needed for this task. Without the willing participation and determination of states to deepen the knowledge of these networks, they will continue to illegally trade wildlife with relative impunity, with drastic consequences for the Earth's biodiversity and humanity's well-being. International organisations and non-state actors, including academics, might also play a valuable role in network identification and mapping, given access to the necessary data.

It may be, however, that in the case of some species such as wild rhinos, there is insufficient time, money or political will to conduct the detailed research required to plug knowledge gaps before extinction takes place. In this context of an absence of solid detailed knowledge about the trade, a debate over the regulated legalisation of the rhino horn trade is currently underway in South Africa. In mid-July 2012, well-known South African conservationists from Ezemvelo KZN (KwaZulu Natal) Wildlife presented a formal proposal to the International Wildlife Management Congress to establish a government-owned central agency that would sell 'clean' rhino horn (public and private stockpiles and safely and legally harvested horns from live rhinos) to Chinese pharmaceutical companies in a regulated manner three to four times a year (SAPA 2012b). Horns would be certified by chemical analysis and transponder chips. Buyers would also be certified. The objective would be to flood the market for rhino horn with the legal version, undercutting the criminal networks and thus reducing demand for the illegally obtained product. Some of the money derived from sales would be used in funding rhino conservation efforts, and the plan would be reviewed for its success after five years. It is acknowledged by those presenting the proposal that there is no guarantee that poaching will be stopped.

Critics of legalising the trade in this or any other way argue that an increase in horn on the market will only increase demand, driving prices up and making it impossible to 'flood' the market, thus ensuring that the poachers will always have customers (Jones 2012). Legalisation, they say, sends the wrong message. They also contend that legalisation simply makes way for profit-making by business people who have a stake in rhinos (Rice 2012) through stockpiling and rhino 'farming'. They suggest that, as much of the trade now rides on the back of the little legal trade that exists, further legalisation would just create more opportunities for this (see, for example, Swanepoel 1997). Regarding its effectiveness in reducing poaching, opponents cite the lack of a long-term reduction in elephant poaching after CITES-endorsed one-off auctions of ivory stocks in 1997 and 2008 by Namibia, Botswana, Zimbabwe and South Africa. (Jones 2012).

It is difficult to judge the validity of arguments for and against the legalisation of the trade. It might be argued that a precautionary approach dictates that, in a situation of a low knowledge base, and where current strategies do not appear to be working, action should nevertheless be taken that could have the desired effects of reducing poaching and quashing the illegal trade. For this reason, and because time is

<sup>24</sup> Milliken and Shaw (2012: 131ff), for example, discusses routes and methods for trafficking of rhino horn from South Africa to Vietnam.

short for the rhino, it may be that the moment has come not only for strategic ad hocery and further targeted research but also for grand experiments, the outcomes of which can only be a matter of conjecture.

For several reasons it is important to focus not only on demand-side but also on supply-side strategies. While demand-reduction strategies could have a positive outcome in the long run, it is doubtful that demand rooted in thousands of years of culture and tradition can ever be completely eliminated, especially when it is coupled with the increasing affluence that is currently being experienced in China and Vietnam. Furthermore, in the case of the rhino there may be no 'long run'. On the supply side, current strategies as outlined above do not appear to be working well enough to prevent the eventual extinction of the wild rhino. A grand experiment in regulated trade (whether along the lines of Ezemvelo KZN's proposal or another) could only add to the knowledge base – whether or not it works. Such an experiment would need to be under review from the moment it began, and would have to be given a finite period to produce results (as Ezemvelo KZN Wildlife suggests in its proposal). There would need to be a commitment to end the experiment if it was not achieving its objectives. Stringent oversight to keep the price of legal horn below that of the illegal equivalent, to prevent any trade becoming an avenue for laundering illegal horn and to ensure that corruption does not corrode processes would also be essential.

There would be a lot to gain if such an experiment worked. As well as reducing the rhino horn trade, it may well provide an insight into how other wildlife commodities under threat from illegal poaching and trading might be saved. What is there to lose? If nothing else is done, the wild rhino and several other species are already well on their way to being lost. Acquiescing to that loss, too, is an available option of course – some would argue it is preferable to encouraging 'farming' that would effectively result in the end of the wild species.<sup>25</sup> But if that choice is to be made, it needs to be made deliberately and in the light of the best information available. In the meantime, implementing ad hoc solutions, conducting further research and cautiously undertaking grand experiments may yet lead to eventual suppression of the illegal wildlife trade.

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<sup>25</sup> Ritchie and Martin (2012) argues that 'domestication removes the animal from its evolutionary and ecological context. ... A consequence of domestication is the loss or gross modification of natural social and reproductive behaviours, and the web of trophic and mutualistic relationships of which the species was an evolved part does not accompany it into the domestic sphere.'

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