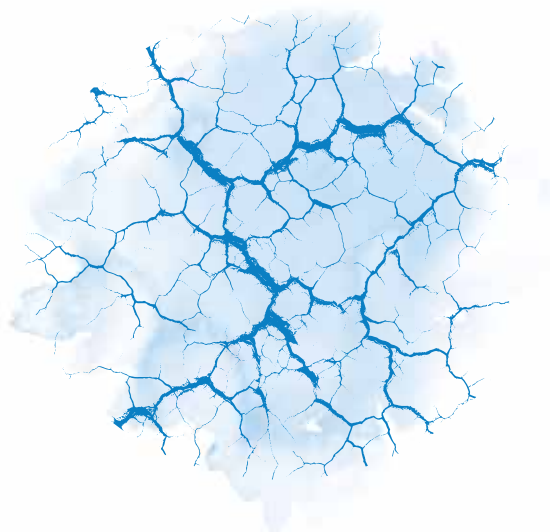


Chapter 3

Impacts
and harms





The impacts and harms of wildlife crime

The preceding chapter of this report provides insights based on seizure data into contemporary patterns and trends in wildlife trafficking and considers evidence of the nature of related criminal activities. This current chapter takes stock of the types of harms that can result from wildlife crime. Such analysis was not a feature of the first two editions of the *World Wildlife Crime Report* but is included here as better understanding of these harms can shape perceptions of wildlife crime's significance and inform both policy responses and prioritization of actions.

Harms resulting from wildlife crime include a range of interlinked negative environmental, social and economic, and governance impacts (Figure 3.1).^{1,2,3,4} Concern about these different types of harm is reflected across national and international policies and law, although the full breadth of impacts is rarely addressed.

Assessing the scale of each of these factors is not always straightforward. In some cases, wildlife crime causes harm that is direct and demonstrable, such as environmental defender casualties during conflict with poachers or the relationship between ivory trade,

poaching and declining elephant populations. Establishing other causal links between crime and harm often involves considerable complexity, such as estimation of lost government revenue or the impact of illegal wildlife harvests on ecosystem functions and human well-being. There are also potential harms (rather than those already realized) for which evaluation requires a risk-based approach, such as assessment of the threat of zoonotic disease emergence.

Often the level of concern is not simply a function of the level of wildlife crime taking place but is also prompted by where and how it takes place. For example, smuggling of potentially invasive species to an island nation home to vulnerable endemic species is likely a greater concern than the same illegal trade between neighbouring continental countries.⁵

Importantly, harms may also result from responses to wildlife trafficking, including policy interventions, regulatory choices and criminal justice action. Some trade-offs between the positive and negative impacts of regulation are likely inevitable.

FIG. 3.1 Conceptual illustration of wildlife crime harms



Source: UNODC

Environmental harms

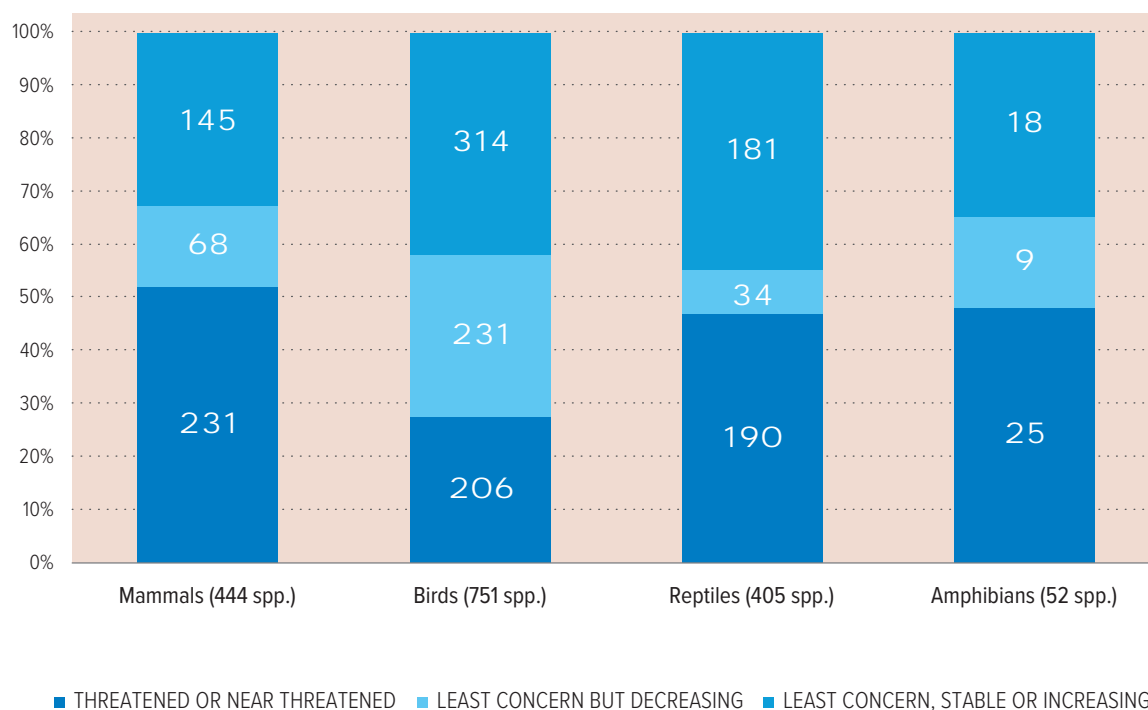
Species overexploitation

The most prominent environmental harm caused by wildlife crime and related illegal wildlife trade is degradation of the world's biological diversity through overexploitation, resulting in population reduction and extinction threats to wild species. Species diversity is a critical aspect of the functioning ecosystems that support all life on earth. The threat of species overexploitation was identified as the second most

significant driver of global biodiversity loss after land-use change by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).⁶ Concern about overexploitation motivates much of the national legislation affecting wildlife trade worldwide and it is the rationale for the international trade regulation measures now subscribed to by 184 states that are contracting Parties to CITES.

The threat to species as a result of wildlife crime is typically highlighted using prominent and well-documented examples, such as poaching of elephants, rhinoceros, and tigers to supply illegal markets. Such species attract significant research attention and

FIG. 3.2 IUCN Red List conservation status of individual mammal, bird, reptile, and amphibian species recorded in seizures 2015–2021



Source: CITES Illegal Trade Database and World WISE (WWCR3 analytical dataset), IUCN Red List database

resources. Consequently, there is comparatively extensive information about population numbers, breeding biology, poaching levels, and trade flows. This knowledge provides a solid basis for assessing the impact of illegal trade.⁷ However, this is not the case for most species affected by wildlife crime. Some of the clearest examples of conservation harm caused by wildlife crime receive comparatively little attention. For example, illegal collection for trade is believed to have caused the recent extinction of several succulent plant species with extremely limited areas of distribution in South Africa.⁸ Illegal trade has also led to severe depletion of rare orchids, including newly described species stripped from their habitat soon after discovery.⁹ Other examples include species of reptiles, fish, birds, and mammals for which illegal trade appears to have played a major role in local or global extinctions.¹⁰

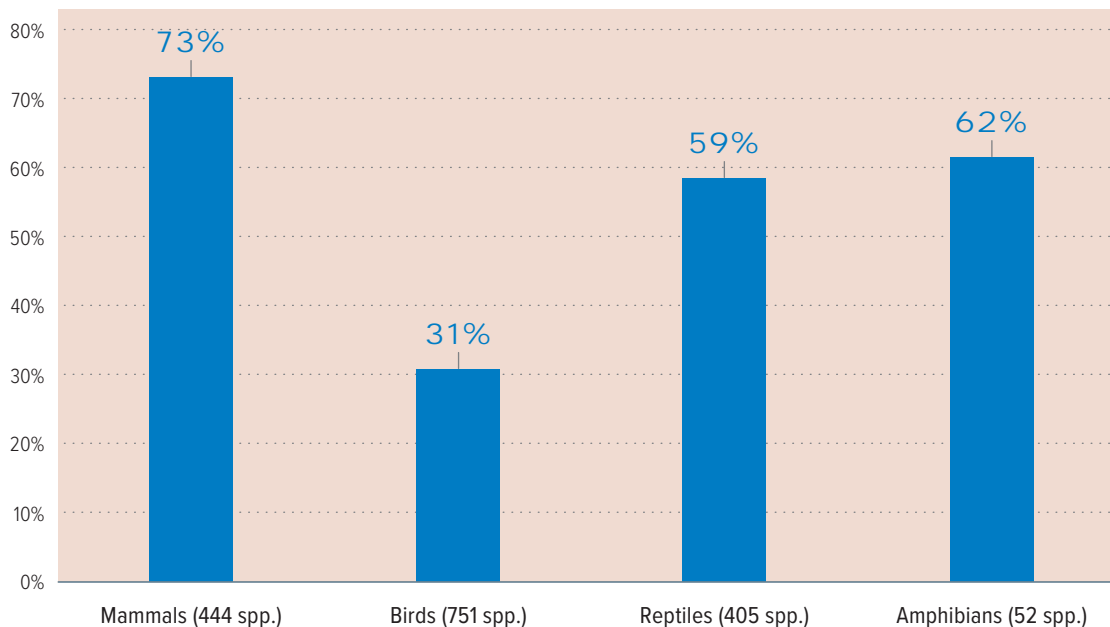
To gain some insight into the relationship between wildlife crime and extinction risk, an analysis was

carried out of the assessed conservation status and threats to wildlife species recorded in recent seizure data available to UNODC. For each species recorded as seized during the period 2015–2021 in the WWCR3 analytical dataset, information on its global conservation status and current population trend was extracted from the *IUCN Red List of Threatened Species*, the most comprehensive global information source available on extinction risk to species.¹¹

This analysis was carried out for all mammal, bird, reptile, and amphibian species recorded as seized as these are the most comprehensively assessed species groups in the *IUCN Red List* (Figure 3.2). Combined these four species groups represent just over 40 per cent of all recorded seized species in the WWCR3 analytical dataset.

Across the four species groups recorded in seizure data, totalling 1,652 species, 40 per cent have been classified as threatened or Near Threatened species

FIG. 3.3 Percentage of species recorded in seizures identified in the *IUCN Red List* database as subject to ongoing threat from intentional harvest 2015–2021



Source: CITES Illegal Trade Database and World WISE (WWCR3 analytical dataset), *IUCN Red List* database

and a further 20 per cent of those classified as Least Concern have been flagged as experiencing a decreasing global population trend. Only the bird species diverge from this pattern significantly with a smaller proportion of the species recorded in seizures classified as threatened.¹²

Since this assessment does not take account of the volume of illegal trade inferred by seizures nor the actual causes of extinction risk for each species recorded, it should not be interpreted as a direct measure of conservation impact. However, it does demonstrate that wildlife crime involves a very wide range of species of conservation concern.

Using the same datasets, it is possible to probe the question of threat attribution in more depth. The *IUCN Red List* database also includes expert assessment of the significance of different threats that have contributed or still contribute to the conservation status and population trend of a species. Across the four species

groups, around 50 per cent of the species recorded in seizures are identified in the *IUCN Red List* database as subject to ongoing threat from intentional harvest (Figure 3.3). For mammals the proportion is higher (73 per cent) and for birds it is lower (31 per cent).

Two difficult challenges frustrate deeper evaluation of the extent to which wildlife crime threatens individual species. First, seizure records alone only provide a partial insight into actual illegal trade levels. Second, conservation impact assessment would require knowledge of precisely where the trade originated, the number of individuals harvested to supply the trade, the age and gender of individuals harvested, when and how they are harvested, and a range of other factors related to population and habitat health. Moreover, the conservation status of a species often varies across its range so that illegal trade may have lower impacts in areas where the species is abundant than it has in areas where it is scarce.

Ecosystem impacts

The conservation harm caused by illegal wildlife trade is not only the overexploitation threat to the survival of a species. The decline in abundance of a species' population also contributes to degradation of the range of functions and processes the impacted species provide in their ecosystems.¹³ These harms to ecosystem stability and resilience undermine their various environmental, social, and economic values.¹⁴ Interdependence between different species and overall ecosystem functionality is complicated and recovery from disruption is hard to predict.¹⁵ Wildlife crime affects a wide range of species with different ecological roles, so its ecosystem impact cannot be simply generalized. For example, poaching of big cats or other predators can lead to increased herbivore prey populations, leading to changes in grazing intensity that may alter plant diversity and overall ecosystem function.¹⁶ Conversely, poaching and excessive illegal trade in meat of herbivores that are a food source for big cats, although possibly not a conservation threat to the target species, may have a serious negative impact on predator populations.¹⁷ Other species targeted for illegal trade may play important roles in seed dispersal, as pollinators or in habitat structure. Disruption of ecosystems can reduce availability of the goods and services used by people and negatively impact associated soil and water resources.

Although ecosystem-level conservation is increasingly referenced in natural resource management policy and practice, harm to ecosystems is rarely designated as the primary threat that wildlife trade legislation is enacted to prevent. Nevertheless, there is a requirement to consider the role of species in their ecosystems as a pre-condition for regulated wildlife trade under Article IV of CITES,¹⁸ and a recent Food and Agriculture Organization of the United Nations (FAO) study noted there is a growing body of international, regional and national legislation requiring ecosystem approaches to fisheries and trade in fisheries products.¹⁹

Climate impacts

Ecosystem disruption resulting from species overexploitation driven by wildlife crime also has considerable potential to affect carbon storage and emissions and to undermine the critical role that natural ecosystems play in long-term climate stability and mitigation of climate change impacts. In 2022, a

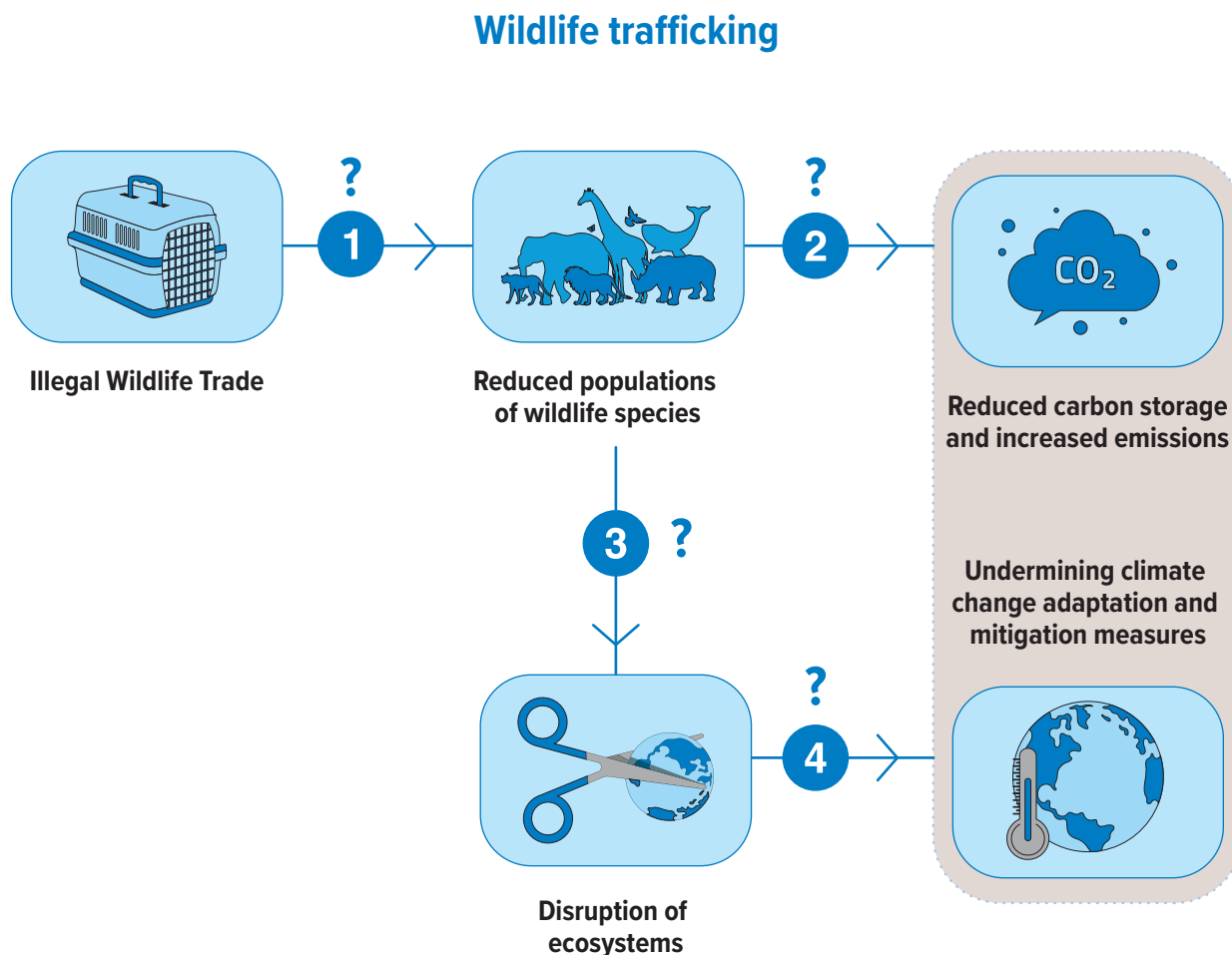
UNODC review of available evidence demonstrated that the pathway of cause and effect between illegal wildlife trade, species depletion, disruption of ecosystems, and processes that affect the climate is diverse, complex and not comprehensively documented (Figure 3.4).²⁰

A prominent negative impact of wildlife crime on carbon storage and emissions is its role in driving excessive removal of large-bodied species that store significant amounts of carbon, notably trees illegally harvested for timber. The level of impact depends on the characteristics of the tree species affected and the subsequent management of the impacted forest area, although corruption, illegal timber harvests and illegal trade typically undermine sustainable forest stewardship efforts.²¹

There is an emerging body of research on potential climate impacts of population reductions of various species affected by wildlife crime. A recent study on forest-dwelling elephants in Africa examined their impacts as herbivores on forest structure and estimated that their removal through poaching or other threats could result in a 6–9 per cent decrease in the above ground carbon stocks in Central African rainforests.²² An economic analysis based on these estimates claimed that elephant poaching would result in \$2–7 billion of lost carbon services within the next 10–30 years.²³ Similarly a study of white rhinoceros, also threatened by poaching and illegal trade, showed positive impacts on soil carbon levels in grassland habitats in Southern Africa compared to domestic livestock.²⁴ A simulation study on the impact of poaching of large-bodied frugivores in South-East Asia considered a reduction in seed dispersal led to a reduction in carbon storage in tropical forests.²⁵ Greater clarity about climate-related impacts of wildlife crime is likely to emerge as further research on this topic is published.

It is critical to keep in mind that this relationship works in both directions: climate change is likely to exacerbate natural resource conflicts as human and wildlife populations adapt to evolving living conditions and people compete for increasingly scarce resources. Furthermore, climate change impacts, such as extreme weather, drought, floods, famine, and migration have been predicted to cause profound social changes that will provide fertile conditions for crime to proliferate.²⁶ This will likely lead to new motivations and opportunities for wildlife crime and new patterns of illegal wildlife trade.²⁷

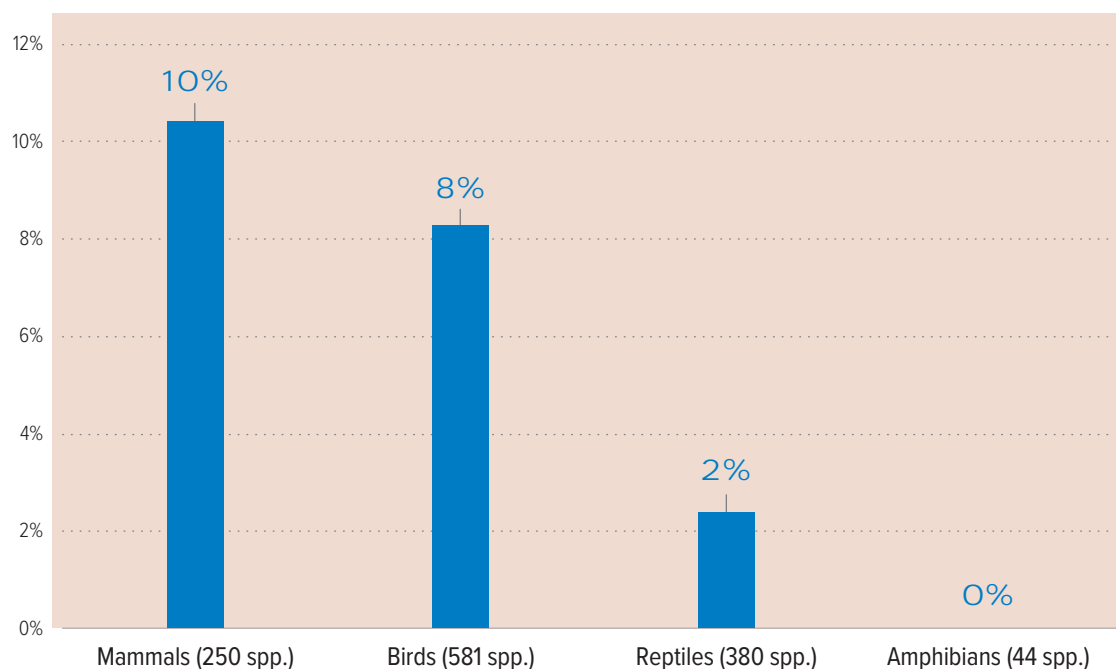
FIG. 3.4 Assessing impacts of illegal wildlife trade on species, ecosystems and climate



- | | |
|--|--|
| <p>1 Is wildlife trade reducing wildlife populations?</p> <p>2 Is there a significant direct loss of carbon storage?</p> | <p>3 Is there a significant detrimental impact on ecosystems?</p> <p>4 Is there a significant indirect impact on the climate-relevant functions of ecosystems?</p> |
|--|--|

Source: UNODC research brief²⁸

FIG. 3.5 Percentage of species listed as invasive in the Global Invasive Species Database for which seizures of live specimens were recorded 2015–2022



Source: CITES Illegal Trade Database and World WISE (WWCR3 analytical dataset), Global Invasive Species Database

Dispersal of invasive species

Another important environmental harm potentially linked to illegal wildlife trade is the damage caused as increasing numbers of wild species are introduced by human activity outside their natural range. Sometimes such introduced species become invasive, causing negative and in some cases irreversible impacts on nature and natural resources upon which people depend. Wildlife trade has been identified as an important introduction pathway for dispersal of invasive alien species.²⁹ Although not widespread, there are cases in which this concern has been specifically addressed through legislation governing wildlife trade, such as the European Union Invasive Alien Species Regulation, which provides for trade prohibitions for species at risk of becoming invasive, rather than the threat of their overexploitation.³⁰

A 2019 study found that the animal pet trade has already led to the establishment of several hundred non-native and invasive animal species globally and

was likely to contribute to the establishment of more in the future.³¹ Likewise, a study of plant trade claimed that it was acting as an important pathway for introduction of invasive flora in the United States.³² However, these studies largely focus on legal trade as a pathway for introduction of invasive species. The specific harms from illegal wildlife trade in this regard have not been explored in depth although a study of the risks associated with illegal import of exotic live reptiles into Australia raised concerns about the potential negative impact on native fauna if these animals are released into the wild.³³

To explore this further, UNODC examined the extent to which known invasive alien wildlife species are recorded in recent seizure data. Seizures of live mammal, bird, reptile, and amphibian specimens recorded in the WWCR3 analytical dataset during the period 2015–2021 were examined to see if they concerned species listed as invasive in the Global Invasive Species Database.³⁴ Some 83 species (6 per cent) of the 1,255 live species seized across the four species

groups were flagged as invasive in the Database, the majority of them mammal or bird species (Figure 3.5).

While invasive species make up a small minority of all trafficked species, it appears that a significant proportion of invasive species are trafficked. The 83 live seized species represent 27 per cent of the 304 wild species from the four species groups examined that are designated as invasive in the Global Invasive Species Database. However, the significance of these results should be treated with caution as the seized invasive species include many animals, such as brown rat, red fox, wild boar, Canada goose, budgerigar and red-eared terrapin, already widespread outside their natural range. The subset of 48 of these traded and potentially invasive species that are subject to CITES trade controls are without exception also commonly recorded in legal trade. Nevertheless, this analysis does demonstrate that a wide range of known invasive species do appear in illegal trade, undermining monitoring and regulation efforts aimed to assess and address risks from the movement of invasive species.

Social and economic harms

Well-being and livelihoods

Species depletion and ecosystem disruption caused by wildlife crime can undermine the many benefits that people derive from nature. These include material contributions to livelihoods, such as food, medicines, and energy, as well as non-material contributions to identity, culture and learning, and the role nature plays in the environmental processes upon which life support systems such as agriculture and water supply depend. The IPBES *Global Assessment Report on Biodiversity and Ecosystem Services* stated that, since 1970, 14 of the 18 categories of nature's contributions to good quality of life had declined (Figure 3.6).³⁵

Discerning the specific contribution of illegal wildlife trade to overall global declines in benefits to people from nature at a global scale is not straightforward. A World Bank 2019 study estimated long-term global economic losses associated with illegal logging, fishing, and other components of illegal wildlife trade

of about \$1–2 trillion per year, more than 90 per cent of this figure derived from the estimated value of ecosystem, regulating and cultural services that are not priced by markets.³⁶ The study stressed limitations and uncertainties with the underlying data, but highlighted the critical message that, however quantified in economic terms, very significant benefits to human well-being and livelihoods may be undermined or lost because of wildlife crime. Loss of such benefits is seldom explicitly considered when legislation is designed, cost-benefit analyses are conducted, or when enforcement priorities, policies and implementation strategies are elaborated.^{37,38}

Importantly, although often overlooked, wildlife crime can also cause a range of cascading, non-monetary harms to human well-being associated with the various values that people place on wildlife. These include a range of cultural, religious and spiritual, historical, relational, and scientific values, as well as existence, intrinsic and bequest values for wildlife species that shape many human–nature relationships and are important constituents of human well-being. The IPBES *Global Assessment Report on Biodiversity and Ecosystem Services* specifically highlighted that recognizing these types of diverse values and ontologies in policies is key to delivering greater sustainability but is often dismissed in decision-making and policy systems dominated by economic rationale.³⁹

Harms to human well-being caused by wildlife crime extend beyond those related to income and access to resources. Other impacts can include reduced security, exposure to violence, undermining community cohesion, and increased vulnerability to abusive employment practices and human trafficking. Impacts of environmental degradation may be race, class and gender-differentiated; men and women may have different perceptions and experiences of the costs of biodiversity loss. Mounting evidence reveals that gender equality is causally linked with socioenvironmental well-being.^{40,41} A UNODC case study on gender dimensions in South America highlighted several vulnerabilities that women may experience in direct relation to wildlife crime. Women frequently take roles with the least power and greatest personal risk under conditions that men in similar positions rarely face. Conversely, men are more often exposed to violence.⁴²

FIG. 3.6 Global trends in the capacity of nature to sustain contributions to good quality of life from 1970 to the present

Nature's contribution to people		50-year global trend	Directional trend across regions	Selected indicator
ENVIRONMENTAL REGULATION OF PROCESSES	1 Habitat creation and maintenance			► Extent of suitable habitat ► Biodiversity intactness
	2 Pollination and dispersal of seeds and other propagules			► Pollinator diversity ► Extent of natural habitat in agricultural areas
	3 Regulation of air quality			► Retention and prevented emissions of air pollutants by ecosystems
	4 Regulation of climate			► Prevented emissions and uptake of greenhouse gases by ecosystems
	5 Regulation of ocean acidification			► Capacity to sequester carbon by marine and terrestrial environments
	6 Regulation of freshwater quantity, location and timing			► Ecosystem impact on air-surface-ground water partitioning
	7 Regulation of freshwater and coastal water quality			► Extent of ecosystems that filter or add constituent components to water
	8 Formation, protection and decontamination of soils and sediments			► Soil organic carbon
	9 Regulation of hazards and extreme events			► Ability of ecosystems to absorb and buffer hazards
	10 Regulation of detrimental organisms and biological processes			► Extent of natural habitat in agricultural areas ► Diversity of competent hosts of vector-borne diseases
MATERIALS AND ASSISTANCE	11 Energy			► Extent of agricultural land—potential land for bioenergy production ► Extent of forested land
	12 Food and feed			► Extent of agricultural land—potential land for food and feed production ► Abundance of marine fish stocks
	13 Materials and assistance			► Extent of agricultural land—potential land for material production ► Extent of forested land
	14 Medicinal, biochemical and genetic resources			► Fraction of species locally known and used medicinally ► Phylogenetic diversity
NON-MATERIAL	15 Learning and inspiration			► Number of people in close proximity to nature ► Diversity of life from which to learn
	16 Physical and psychological experiences			► Area of natural and traditional landscapes and seascapes
	17 Supporting identities			► Stability of land use and land cover
	18 Maintenance of options			► Species' survival probability ► Phylogenetic diversity

DIRECTIONAL TREND

Global trends: Decrease ← → Increase

Across regions: Consistent Variable

LEVELS OF CERTAINTY

- Well established
- Established but incomplete
- Unresolved

Source: IPBES Global Assessment Report on Biodiversity and Ecosystem Services

Private sector costs and losses

Wildlife crime can have direct negative impact on economies by increasing costs and losses for private sector stakeholders, including businesses and both private and customary land holders. Those affected include operations engaged in legal wildlife trade, along with businesses providing trade facilitation services, such as banking, transport and marketing. The impact of such economic harm also extends to operations dependent on thriving wildlife populations, most obviously tourism operators and others gaining income from facilitation of wildlife viewing experiences.

Wildlife crime-related income losses for operations engaged in legal wildlife trade may result from reduced access to resources, unfair competition, and potentially also from sectorial reputational damage caused by association with illegal activities. Additional costs also may accrue from the need to identify and acquire alternative supply, to invest in legality verification and traceability systems, and from competition in the market with illegal actors.^{43,44,45}

Assessing losses from wildlife crime to private sector tourism operations is not straightforward. The relationship between tourism motivations and the status of wildlife populations is complicated, with strong focus typically on a small number of species of interest in any location.⁴⁶ Most analyses have a restricted geographical scope although one 2016 study carried out a continental assessment of the economic losses to tourism in Africa from the illegal killing of elephants.⁴⁷ Annual losses to both public and private sector interests were estimated to be around \$25 million, although it should be acknowledged that this is likely an atypical example owing to the prominence of this species in safari tourism.

Health risks

Disease risks associated with wildlife trade have regularly been flagged in recent decades by specialists in the human and animal health fields. Concerns are related both to direct risks of disease transmission to people from live animals and plants, wildlife meat and other products, and also to the threat to wildlife populations, natural ecosystems, livestock and agricultural food production systems.⁴⁸ It had long been predicted

that the expanding scope and volume of wildlife commerce as a component of the growing and increasingly interconnected globalized world economy increased the risk of emergence and spread of new dangerous diseases from animals to people.⁴⁹ It is therefore not surprising that attention to this issue rose sharply in 2020 when early commentary on the possible origin of the COVID-19 pandemic suggested links to markets where wild animals were believed to have been on sale as pets and for food.^{50,51} Although subsequent research on the origin of the disease has not reached a definitive conclusion, a comprehensive evidence review published in late 2022 noted that most papers on this topic point to a zoonotic origin of the coronavirus.⁵²

An IUCN situation analysis in 2022 examined evidence of the relationship between wildlife and emerging diseases and human pathogens, their origins, drivers, and risk factors.⁵³ It concluded that the vast majority of such diseases and infections derive from domesticated animals or as a result of human disruption of natural habitats. For wildlife trade, the study found that evidence of human disease and pathogen emergence from trade in wild-sourced animals was sparse and restricted to a few events, though cautioned that this could simply reflect gaps in knowledge. Other reviews have noted evidence of significant levels of pathogen occurrence of public health concern in live animals and wildlife meat found in illegal trade, so risks of spillover to the human population cannot be discounted.^{54,55} The IUCN analysis urged improved surveillance of disease cases linked to wildlife trade and highlighted wildlife breeding operations and larger scale trade flows involving live animals and wildlife meat as priorities for pathogen monitoring. The report stressed that illegal trade posed particular risks, in part because it was likely to bypass health screening and control measures.⁵⁶

Many countries have significant legal provisions aimed to prevent disease and infection from movements of animals, plants and their products. These include risk-based trade restrictions, quarantine, animal health and phytosanitary inspection in trade and in the marketplace. Such regulation is typically designed primarily to address risks from high volume production, trade and consumption from domesticated livestock and crops although their application is usually inclusive of wild animal and plant trade.⁵⁷ Some

countries have adopted additional health-focused restrictions on specific types of wildlife trade. A prominent example is the European Union ban on import of live wild birds, first adopted in 2005 and amended in 2013 as a measure aimed to combat avian influenza.^{58,59}

Potential and realized health-related harm has clear relevance as a consideration when assessing the significance of wildlife crime. Illegal trade by its very nature may be routed to avoid border inspections, quarantine and other control measures aimed to reduce health-related risks, making it more risky than legal trade. Examination of supplementary data in seizure records in the WWCR3 analytical dataset on the reason for confiscation and the agency making the seizure shows that many wildlife contraband interdictions involve contraventions of veterinary or phytosanitary regulations and enforcement action by animal and plant health inspection agencies. When legal and illegal trade channels intercept: in holding facilities, markets or because of laundering illegally supplied specimens into breeding or farming operations, there are added health-related risks.⁶⁰

There are no simple metrics for assessment of risk or the impacts of such harm. One recent study based on seizure data assessed the presence in illegal trade of live animals of wild species associated with 11 priority diseases—known as the WHO R&D Blueprint priority diseases—that are considered by the World Health Organization (WHO) to pose the greatest public health risk owing to their epidemic potential and the absence of sufficient countermeasures.⁶¹ Species from 31 families of mammals, birds, and reptiles associated with the priority diseases were identified in global seizure data for 2011–2020. Important caveats were noted with respect to potential sampling and reporting biases for both species and pathogens; the fact that zoonotic spillover may not have been confirmed in all species/disease associations included in the dataset; and that the study did not take into account variations in risk caused by differing conditions in rearing, housing, or transporting wildlife products. The study recommended that future exploration of this topic should include other higher risk commodity types (such as meat), trade routes, and estimated volumes of illegal trade, as well as the impact that factors such as concealment methods may have on spillover risk.

Harm to environmental defenders

Various roles embody the function of “environmental defender”, including community defenders who do not hold the position as a technical profession. These environmental defenders can play a critical role in wildlife protection, including prevention of wildlife crime, but also can be victims or harassment, violence and in some cases, loss of life.^{62,63,64} A direct manifestation of the harms of wildlife crime is injury to and loss of life of people engaged in wildlife protection. The International Ranger Federation’s annual roll of honour of wildlife rangers who are reported to have lost their lives in the line of duty recorded a total of 2,351 deaths between 2006–2021, over 80 per cent of them in Africa and Asia.⁶⁵ Felonious deaths including homicides made up more than 40 per cent of the total ranger lives lost, with causes for the remainder including vehicle and aircraft accidents, firefighting, drowning, illness and others. Many other fatalities are not recorded and there are no comparable data on non-fatal injuries, which in some cases may lead to permanent disability, nor on other harms, such as intimidation and harassment. Risks were reported to be exacerbated by a range of factors, including remoteness of work locations, conflict-derived firearm availability, inadequate first aid training, and poor living conditions.⁶⁶

Women and men rangers and other environmental defenders have distinct experiences of harm on the job, and for women many of these conditions are doubly challenging as they often additionally face hostility from male colleagues. Similarly, women and men in many defender positions, notably community defenders, face considerable threats that distinctly reflect gender differences.^{67,68}

Although less well-documented, threats of physical harm and other forms of coercion are risks at other levels of the criminal justice system, including police, customs officials, prosecutors and the judiciary.^{69,70} Such threats are often linked to corruption, as explored in chapter four.

Governance harms

Undermining the rule of law

As a globally significant crime sector, illegal wildlife trade raises concerns about its negative impacts on the robustness of government institutions. As with other forms of criminality, wildlife crime undermines the rule of law and functions of government institutions through corruption, money-laundering, illicit financial movements and cross investment between crime sectors.⁷¹ Although these are generally difficult issues to assess systematically, there is a growing body of work examining their relationship to wildlife crime.

Corruption linked to wildlife crime plays a major role in undermining the impact of legislative measures aimed to address environmental and other harms. It facilitates illegal wildlife trade, weakens natural resource management and criminal justice responses, and in extreme cases can undermine political stability.^{72,73} This is explored in more depth in chapter four of this report.

Money-laundering, the processing of proceeds from crime to disguise their illegal origin, is a key element of criminal activity undermining the rule of law. A 2020 report by the Financial Action Task Force drew particular attention to the linkages between money-laundering and illegal wildlife trade.⁷⁴ However, it noted that owing to the rarity of financial investigations of this crime sector, both the private and public sector had a less developed knowledge of the trends, methods and techniques used to launder proceeds from illegal wildlife trade than for other major transnational crimes.

Reducing illicit cross-border financial flows was highlighted in the 2030 Agenda for Sustainable Development as a priority to build peaceful societies around the world.⁷⁵ A study published in 2020 as part of the second edition of the *World Wildlife Crime Report* reviewed evidence of illicit financial flows across national borders arising from illegal elephant and rhinoceros trade, taking account of both potential income from illegal sales and the costs of doing business, with combined estimates between \$34–960 million per year.⁷⁶ Even for these species for which data on populations, illegal trade flows and market

data are reasonably accessible, there is a wide variance in these estimates depending on underlying assumptions. For most species and commodities in illegal wildlife trade available data are far less complete and such calculations are not possible.

Loss of government revenues

As in other sectors, one potential harm of wildlife crime is the loss of government revenues, particularly those of source countries. Usually payable through legal harvest and trade licence fees and taxation, these can represent significant losses to national economies. However, they can also involve losses such as tourism revenues, which in some contexts are significant to local and national economies and key elements of funding conservation. A 2019 World Bank report estimated that governments lose \$7–12 billion per year in potential fiscal revenues from illegal logging, fishing, and other wildlife trade.⁷⁷ This was based on estimates of both direct taxation and user fees that might have been paid if the same trade had been carried out legally. It also includes some estimation of lost indirect income from taxation of tourism if visitors are deterred by reductions in wildlife populations or security concerns linked to illegal trade.

Another recent study focused specifically on illicit trade in marine fish catch and estimated global losses to tax revenues of \$2–4 billion, affecting maritime African and Asian countries much more than other parts of the world.⁷⁸

Lost revenue estimates rely on assumptions that are difficult to test in practice, and wildlife crimes vary. As illustrated in previous editions of the *World Wildlife Crime Report*, while some exclusively involve illegal transactions along their value chain, other goods may enter the legal market at some stages of the supply chain (for example through falsified documentation or laundering operations), and so some user fees and taxes may be paid even within wildlife trade flows that are illegal at some point along their course.

Financial costs of enforcement

The prevalence and importance of wildlife crimes have necessitated increased public and private investments into conservation, law enforcement and other criminal justice functions globally. Financial costs can be

substantial and tend to be borne largely by government budgets, potentially diverting funds from other uses.

Few estimates of the financial costs of enforcement action to address wildlife crime have been published, but they can be significant especially in the context of developing economies. A national study in Namibia estimated in 2021 that expenditure required to curb illegal wildlife trade in the country was about 250 million Namibian dollars (\$17 million) per year.⁷⁹ A report on expenditure on protecting rhinoceros species from poaching and illegal trade in the Greater Kruger Region of South Africa estimated that interventions had cost 1.1 billion rand (\$61 million) over the period 2017–2021, with the majority spent on security staffing, fencing, air support, detection technology, and access control.⁸⁰

Significant investments from partner governments, foundations and non-governmental organizations (NGOs) have been made to support such government efforts through provision of training, equipment, and technical support. A World Bank review of international funding committed to combat illegal wildlife trade during 2010–2016 estimated annual investment by donor agencies of about \$190 million a year globally.⁸¹ Updated figures are planned for publication by the World Bank in 2024.

Harms from wildlife crime responses

Some harms result from responses to wildlife crime, rather than the crime itself. Criminal justice systems are normally designed to inflict higher penalties on those who commit higher levels of crime.⁸² However, there has been no comprehensive assessment to date of whether criminal justice system impacts on wildlife crime perpetrators is proportional across different jurisdictions and different population groups. Indeed, there is mounting evidence from studies in different countries that lower-level participants are disproportionately targeted for criminal enforcement in comparison to higher-level participants and those operating across jurisdictions.^{83,84}

There is also a growing body of research aimed at understanding—through offender interviews and other methods—the circumstances in which people

in the earliest stages of the trade chain become involved in wildlife crime and the socioeconomic consequences of detection. Findings from Nepal and Southern Africa show that many offenders are imprisoned for participation in activities that were not the primary source of their livelihoods. Offenders often claimed to have underestimated the risk of detection and serious sanctions and reported very serious negative impacts on family well-being resulting from their incarceration.^{85,86,87}

As part of the research for the current report, a study was initiated by UNODC to gain additional insights from convicted wildlife crime offenders in Indonesia.⁸⁸ Preliminary findings mirror those from elsewhere: many of those incarcerated appear to have been low-level participants in poaching and delivery of illegal wildlife goods. The majority claimed it was their first involvement and they had been motivated by the opportunity to gain additional income to their main livelihood. Although most offenders admitted to knowing that they were participating in illegal activity, again the social impacts of incarceration in terms of reputation and employment appeared to have been discounted.⁸⁹

The social impacts of law enforcement may be gender differentiated. Most imprisoned offenders are men and their removal from households can leave female-headed households in economic instability and facing other types of insecurity. Preliminary evidence suggests that women and men are treated differently in wildlife trafficking enforcement—women may be overlooked or not taken seriously as (possible) offenders.⁹⁰

Similarly, other stakeholders can face increased costs in dealing with wildlife crime responses. For example, businesses providing trade facilitation services risk potential legal liability if implicated in facilitating illegal wildlife trade. In the banking sector there is an increasing focus on the imperative to apply money-laundering controls to obstruct financial flows arising from wildlife crime in line with Financial Action Task Force standards and related national compliance measures.^{91,92} Although sectoral initiatives to prevent wildlife crime in the transport and online commerce sectors do not articulate loss avoidance as a primary motivation, concern about business risks is at least implicit in the public promotion of their actions.⁹³

Accounting for wildlife crime harms

This chapter aimed to take stock of the diverse harms associated with wildlife crime and to examine available evidence on their extent to inform considerations of their significance and the prioritization of responses. It also considers how additional harms can be caused by the responses aimed to reduce wildlife trafficking.

Although instances of illegal wildlife trade may contravene legal measures aimed to reduce different environmental, social and institutional harms, the predominant institutional framing of wildlife crime concern remains the conservation-focused policy and law aimed to prevent the overexploitation and extinction risk to wildlife species. The cascade of harm described in this chapter is rarely represented in legislation, policy or enforcement responses. On the contrary, legal and policy responses are typically associated with administrative and criminal sanctions to stop and punish harm (e.g. fines, imprisonment, removal of permits). Although such responses are important, such mainstream approaches often overlook the importance of providing remedies to harm.⁹⁴

Better accounting for harms will likely challenge many mainstream enforcement priorities and practices. For example, there has been a strong focus on illegal trade flows affecting high-profile species, such as elephants, pangolins and rhinoceros.⁹⁵ This emphasis is likely reflected in the frequent occurrence of products from these species in the seizure records summarized in chapter two of this report. However, analysis in the current chapter makes it clear that illegal trade involves a wide range of threatened wildlife species and reveals a greater range of types of harm. Better recognition of and accounting for diverse types of harm could improve recognition of risk and inform priority-setting.

Similarly, enforcement may be guided by perceptions about crime, notably measures of criminality are often associated with their monetary value. This leads to a focus on illegal wildlife trade expected to afford the greatest profits to criminal organizations, those linked to conflict and security concerns, impacts on government revenues, or convergence with other crime types. Although these can be important variables on which to set priorities, they are often difficult to define and measure and there is a tendency to fall back on metrics such as gross valuation of trade flows.

There is tension between these two generalized perspectives on harm from wildlife crime. Some of the most dangerous illegal trade flows from a conservation perspective may involve quite small numbers of individual animals or plants that are highly threatened and for which such illicit commerce has a genuine risk of driving a species towards extinction. However, the monetary value and the obvious social and institutional harms associated with such trade are likely small compared with those related to other trafficked species. If there is a solution to this disconnect between different classes of concern, it is likely to be through greater attention to the interdependence between environmental, social and institutional factors. Accounting for wildlife crime harms requires policy broadening, improved communication and exploration of broader legal tools that can hold offenders responsible for remedying the harms they cause.

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