THOUGHT PIECE • AUGUST 2021

Nature Crime: Understanding and Tackling a Key Threat to the Climate and Land Use Agenda

Climate and Forests 2030

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Background

The Climate and Land Use Alliance (CLUA), with the support of Meridian Institute, is exploring the integration of climate and land use with justice, equity, health, and economic recovery through Climate and Forests 2030: Resources for Funders. This focus is intended to inspire innovation and investment in integrated work on forests, rights, and sustainable land use and will inform a new strategic plan for CLUA for the period 2021 to 2030.

To inform the thinking, CLUA commissioned a series of "thought pieces" to provide diverse inputs into developing a more integrated approach for forests and land use. These are meant to stimulate discussion and debate and are not intended to reflect the views of CLUA, its member foundations, or Meridian Institute. The views expressed in this paper are those of the authors: **Charles Victor Barber** (World Resources Institute), **Karen Winfield** (Conservation Analytics), and **Rachael Petersen** (Earthrise Services Consulting). They have been informed by commentary and input by a range of experts.

The authors would like to thank the expert reviewers **Jessica Graham**, President, JG Global Advisory (USA); **Fiachra Kearney**, Chief Executive Officer, Forever Wild (Australia); **Chen Hin Keong**, Senior Advisor, Forest, Governance and Trade, TRAFFIC (Malaysia); **Mas Achmad Santosa**, Chief Executive Officer, Indonesia Ocean Justice Initiative (Indonesia); and **John Scanlon,** Chair, Global Initiative to End Wildlife Crime (Switzerland). The authors would also like to extend their thanks to **Yasmina Aspinall**, McGill University Faculty of Law/World Resources Institute (Canada) and **Scott Hajost**, Senior Wildlife Policy Advisor, National Whistleblower Center (USA) for their invaluable comments.

I. Introduction

Nature crime[1] occurs when individuals or criminal networks illegally exploit natural ecosystems to extract natural resources. Nature crimes include illegal logging, illegal mining, illegal fishing, illegal wildlife trade,[2] and the illegal conversion of forests and wetlands for agriculture or other uses. These crimes are often associated with financial crime of various types, as well as labor and human violations and official corruption. The prevalence of nature crime and associated corruption and criminal behavior constitutes a serious barrier to progress in tackling climate change, slowing biodiversity loss, reducing the risk of future zoonotic pandemics, and achieving sustainable, peaceful, and equitable human development.

The scale of the nature crime economy is immense. It is variably estimated to be the third- or fourth-largest illicit economy in the world (after drug trafficking and trade in counterfeit goods) with an annual value of as much as $281 billion, but this figure underestimates its indirect impacts: governments are deprived annually of some $7-12 billion in timber and fisheries revenues, while the indirect costs of undermining ecosystem services may be as high as $1-2 trillion per year (World Bank 2019a).

Nature crime has a devastating impact on critical ecosystems and their constituent species and thus constitutes a key barrier to scaling "nature-based solutions" to climate change such as REDD+. A recent study found that of the nearly two-thirds of tropical forest loss driven by commercial agriculture between 2013 and 2019, 69% was conducted in violation of national laws and regulations, with significant impacts on climate, biodiversity, and the ecosystem services that underpin global agricultural production (Dummett and Blundell 2021). Illegal mining destroys forests and poisons rivers across the Amazon Basin and other critical forest ecosystems. Illegal fishing disrupts food webs that are important for people and ocean-dwelling creatures alike. Wildlife trafficking threatens the very existence in the wild of many iconic and keystone species such as tigers, jaguars, elephants, rhinos, sea turtles, and sharks.

Socially, nature crime fuels criminal networks that sometimes exploit poor and otherwise vulnerable local people and communities to run their operations, although the socio-cultural and economic motivations of those who engage in nature crime are diverse and complex.

While some nature crime is directly related to the illegal use or destruction of land, forest, and marine resources, it also often involves associated crimes that take place far from the "scene of the crime," such as corruption, extortion and bribery, money laundering, and numerous types of fraud (Egmont Group 2021; GFI 2021; FATF 2020; Searby 2018).

Nature crime is also often connected to other forms of criminal activity including narcotics, human trafficking, human rights violations, and financing of terrorism (Feltham 2021; van Uhm & Nijman 2020; Nakamura 2018; Verité 2016). Nature crime thus directly contributes to corruption, civil conflict, and erosion of the rule of law. Indigenous Peoples in resource-rich regions often most directly bear the tragic consequences (Vallejos *et al.* 2020).

Promising strategies for combating nature crime already exist. But turning this potential into results at scale will require much greater political attention, strengthened legal frameworks, greater cooperation across jurisdictional and professional siloes, building capacity at all levels and, of course, a great deal more funding. Philanthropic and bilateral donors can play a key role in making this happen by increasing funding to proven approaches and efforts, and by testing and empowering new approaches, technologies, and partnerships. Donors can also play a key role in avoiding duplication of activities and in deconflicting among the many actors competing on a relatively small playing field.

[1] "Nature crime" is defined for the purposes of this paper as the theft, degradation, or destruction of natural resources and ecosystems that violates national or international laws. It often includes both a "predicate offense" (e.g., illegally taking timber, fish, or wildlife) and related violation of laws of general application (e.g., money laundering, receiving, or taking bribes, tax evasion, etc.).

[2] The term "wildlife" is used variably and inconsistently in the nature crime discourse, and its scope is defined differently under the statutes and policies of various countries. Some consider the term to include all species of wild fauna and flora, but much policy discourse on "international wildlife trafficking" is restricted to wild animals, particularly terrestrial vertebrates. In this report, we strive to specify the scope of the terms "wildlife trade" and "wildlife trafficking" in the particular instances where those terms are used.

II. Types of Nature Crime

The "nature crimes" this paper focuses on are part of a broader spectrum of "environmental crime." While there is no universally-accepted definition of environmental crime, Manguiat and Smagadi (2020), following the UN Environment Programme's (UNEP) approach, define it as "a collective term to describe illegal activities harming the environment and aimed at benefiting individuals or groups or companies from the exploitation of, damage to, trade or theft of natural resources, including, but not limited to serious crimes and transnational organized crime." Environmental crime thus encompasses illegal activities that impact the natural environment — such as illegal trade in hydrofluorocarbons, illegal disposal of medical waste, or dumping of toxic chemicals — but that do not involve illegal extraction or destruction of living natural resources as their primary motivation.

Even within the subset of environmental crimes that we address in this paper under the rubric of "nature crime," there are significant differences. Illegal logging, forest conversion, and fishing, for example, all take place in the context of huge legal industries, often "hiding in plain sight" within that context. Illegal gold mining does not involve extraction of a living resource from nature but has immediate and devastating impacts on some of the planet's most critical and sensitive ecosystems due to the methods by which it is carried out. A good deal of fishing activity may be "unregulated" or "unreported" but does not contravene the laws or take place within the jurisdiction of any state. And in the case of mining and logging in particular, the line between "informal" or "artisanal" — versus "illegal" — activity is variable under the laws of different jurisdictions, and often difficult to discern in practice.

2.1 — Forest Crime: Illegal Logging and Illegal Deforestation

Illegal logging[3] causes forest degradation and serves as a catalyst for deforestation. Tackling illegal logging is therefore a foundation for conserving forests and biodiversity, reducing emissions from the forest sector, and sustainably managing production forestry. "Illegal logging" for timber, versus "illegal deforestation" to make way for expansion of plantation commodities such as cattle, soy and palm oil, are sometimes characterized as distinct issues, but this is rarely the case in the field, where these two manifestations of forest crime are often sequential and synergistic (although specific legal violations may differ).

Illegal logging for timber is frequently the initial catalyst for wider forest degradation in a particular area, due to both the direct removal of trees and the collateral damage to forests caused by road-building and the careless and destructive felling and transport practices (often including wildlife poaching and fire-setting) that are characteristic of illegal logging operations. Such operations are most often followed by clearing, burning, and conversion of forests to agriculture or, all too often, degraded wastelands not even used for crops or pastures (Barber and Canby 2018).

Indeed, a significant proportion of the timber supply in many tropical countries does not come from logging concessions in areas of "permanent forest estate." More than 30% of the world's timber is estimated by UNEP (Nellemann *et al.* 2016) to be "conversion timber" cut during the illegal clearing of forests to produce palm oil and other commodities. Lawson (2014) estimated that 30–50% of the world's internationally traded tropical timber is sourced from forests illegally cleared for agriculture or cattle pasture. A more recent study (Dummett and Blundell 2021) concluded that illegal tropical forest clearing for agriculture has increased since 2014, so one must infer that illegal conversion timber continues to make up a considerable percentage of the tropical timber trade.

Like other forms of nature crime, illegal logging and forest clearing are often associated with corruption, civil conflict, human rights violations, and organized crime (see Human Rights Watch 2019 on the example of the Brazilian Amazon). More broadly, poor governance and corruption undermine economic and social development by weakening the rule of law and the institutional foundation on which sustainable

[3] *For the purposes of this paper, illegal logging refers to the cutting, sale, and/or trade of timber felled in violation of applicable local, national, or international laws and regulations. Illegal deforestation refers to violations of laws governing acquisition of land — or the rights to use land — involving the conversion of natural forests for non-forest uses such as industrial-scale agriculture, timber plantations, and cattle-raising.*

economic growth depends — with particular harm to the rights and livelihoods of Indigenous Peoples and other forest-dependent communities. Quite apart from the conservation implications, these are core security challenges that many countries are confronting in their forested hinterlands (Schoonover *et al.* 2021).

Illegal logging poses particular barriers to implementing REDD+ effectively. Jurisdictions characterized by entrenched illegal logging and associated corruption are unlikely to attract much climate finance from either public or private sources, which might otherwise financially reward a jurisdiction or project area for protecting its forest from degradation or clearing. And otherwise effective ongoing REDD+ initiatives can be swiftly undermined by a rise in illegal logging or clearing. Indeed, it is difficult to imagine how a credible "pay for performance" REDD+ system can be established in places where illegal logging and forest clearing are systemic features of the landscape. Unfortunately, that is the situation faced by many of the tropical developing countries where globally-significant emissions reductions from reducing deforestation and forest degradation might otherwise be achieved.

Illegal logging and clearing also create an unequal playing field for companies that may operate — or desire to operate — legally but must compete with those that break the law to reduce costs and hereby sully the reputation of the entire industry (Seneca Creek Associates 2004).[4]

2.2 — Illegal (IUU) Fishing

Illegal, unreported, and unregulated (IUU) fishing[5] refers to a variety of detrimental fishing practices which, put simply, amount to fishing without permission and outside prescribed limits (Poling and Cronin 2017). From 1980 to 2003, fishery biologists and managers estimated that between 11 and 26 million tons of IUU fish were caught annually (Agnew *et al.* 2009). In addition, one study (Pauly & Zeller 2016) argues that fisheries catches reported by countries to the UN Food and Agriculture Organization (FAO) were systematically under-reported by a factor of up to 50% from 1950 to 2010. Therefore, the real IUU figure is likely to be much higher. One reason for this discrepancy is that officially-reported fishing statistics do not include many significant sources of mortality such as discards, bycatch, and recreational fishing.

The global annual value of IUU fishing globally has been estimated by the FAO to be between $15.5 and $36.4 billion (Shaver and Yozell 2018), while Oceana (2021) estimates that IUU fishing costs the global seafood industry $26-50 billion per year, with up to 32% of wild-caught seafood imported into the United States coming from illegal or unreported fishing. The main culprits are large and well-organized factory fishing fleets run by organized criminals operating under "flags of convenience" (James 2017).

IUU fishing most acutely impacts some of the poorest and most marginalized people in the world (Allison *et al.* 2012), and furthermore, deprives governments of revenue and degrades their fishery resources. Reducing IUU fishing would thus contribute not only to improving the health of our oceans, but also to food security for many countries that need it the most.

China is a key player in IUU fishing, accounting for over half of all industrial fishing vessels fishing on the high seas and 40% of those fishing in the Exclusive Economic Zones (EEZs) of coastal states (McCauley 2019; See Figure 1). Extensive reporting indicates that a very significant proportion of China's fishing effort falls into the IUU category (Urbina 2020). Officially, China's position on IUU fishing is unclear: on the one hand, China has defended illegal activities of its vessels in countries such as Indonesia (Putri 2018), while on the other hand cancelling the registration of other IUU fishing vessels (Greenpeace 2018). And

[4] By documenting this dynamic, the 2004 "Seneca Creek study" was influential in bringing U.S. wood products industry companies into the coalition with environmental groups that convinced the U.S. Congress to amend the Lacey Act in 2008, making it illegal, for the first time, to import timber or forest products that had been illegally harvested in the jurisdiction where they were sourced.

[5] Illegal, unreported, and unregulated (IUU) fishing includes all fishing that breaks fisheries laws and regulations or occurs outside their reach. Illegal fishing usually means without a license, in an area where fishing is banned, with prohibited gear, over a quota, or for protected species. Unreported fishing refers to unreported or under-reported catches by licensed vessels looking to flout quotas or catch prohibited species. And although most of the world's fish are caught in the national waters of coastal states — within 200 nautical miles of their shorelines — a lot of unregulated fishing occurs beyond that on the high seas which cover almost 45% of the planet. Patchy regulation and enforcement in this vast area enables rampant IUU fishing (Aldred 2019).

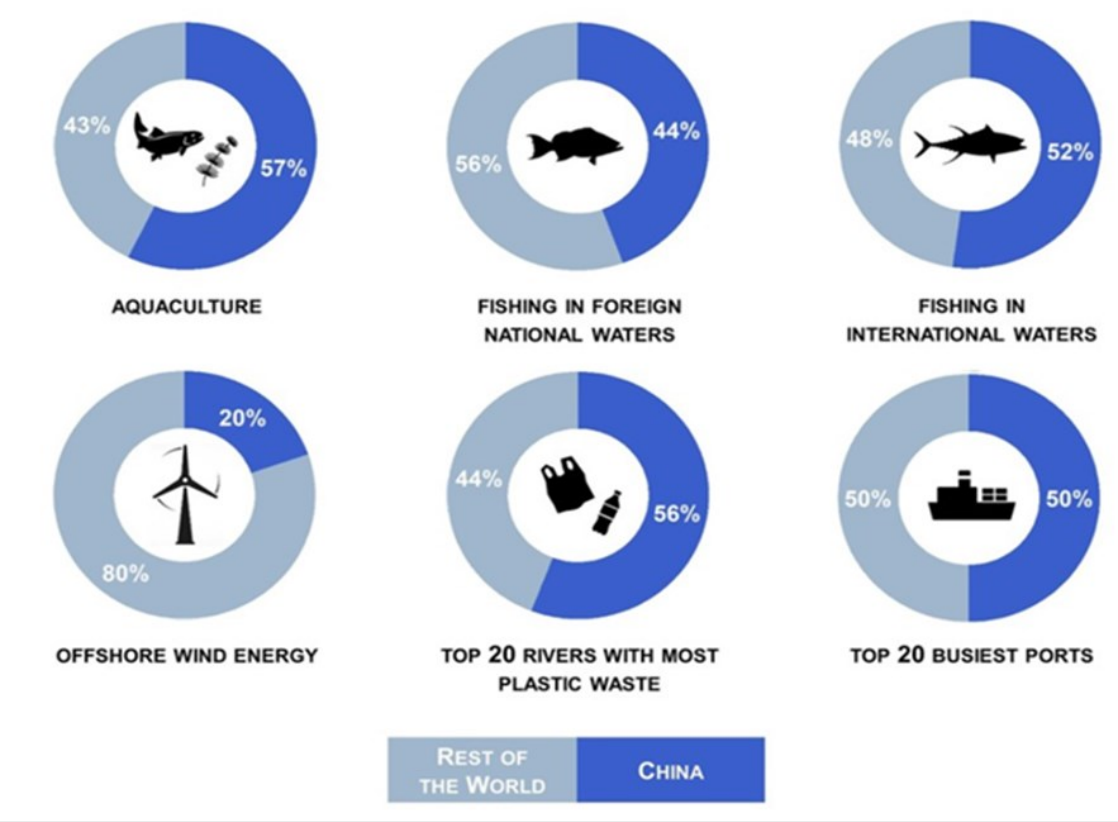
while China has taken some measures to improve the legality and sustainability of fisheries within its own territorial waters (Ling Cao 2017), it has basically "exported" the problem to other nations' waters and to the high seas beyond national jurisdiction. China is not alone in causing this problem; the rest of the world accounts for 56% of fishing vessels fishing in foreign EEZs. The European Union (EU) is another major contributor to this issue, with 28% of their seafood coming from waters external to the EU. In addition, the EU is the largest market for fishery and aquaculture products globally (Johnson *et al.* 2021).

The global failure to effectively address IUU fishing is due in large part to the definition of fish as "seafood" rather than "wildlife" (Monbiot 2021) and the treatment of illegal fishing as a fisheries "resource management" problem, rather than as a serious organized crime and national security issue. If countries contributed even a fraction of the resources to fighting IUU fishing as they do to more conventional national security and anti-terrorism concerns, the problem could be significantly reduced (the same can, of course, be said for other forms of nature crime too). The "fugitive" nature of fisheries resources — constantly moving among the EEZs of different countries and out into the high seas — further complicates the challenge. Illegal fishing is also an area where the convergence of nature crime with human trafficking and other labor and human rights abuses is perhaps most acute.

2.3 — Wildlife Trafficking

In 2020, the United Nations Office of Drugs and Crime (UNODC) reported that between 1999 and 2018 nearly 6,000 different trafficked animal and plant species were seized by law enforcement authorities worldwide (UNODC 2020). The UNODC report, however, only covers the approximately

FIGURE 1: China's Fishing Interests versus the Rest of the World (Macauley 2019)



Original image source: Benioff Ocean Initiative, with data from FAO, Our World in Data, and The World Bank

38,000 species currently listed for varying levels of protection under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) — a mere fraction of the nearly eight million species on Earth.

While most people associate "wildlife trafficking" with species such as elephants, rhinos, and pangolins, UNODC figures indicate that rosewood trafficking is the greatest single category by value, accounting for nearly 41% of the value of seizures from 2009 to 2013 and nearly 32% from 2014 to 2018. Elephant ivory has remained steady at around 30%, with rhino horn, reptiles, birds, other mammals, and marine species comprising most of the remainder.

The illegal trade in wild plants (often referred to as non-timber forest products) gets less attention than wildlife and rosewood trafficking, but it is locally very significant in many places and disproportionately affects many ethnic minorities, Indigenous Peoples, and local communities who depend on these resources for food and medicine (Timoshyna and Drinkwater 2021). Trafficking in live cacti for the ornamental plant market is a critical nature crime problem in many arid environments, including Chile and the southwestern United States (Nuwer 2021).

Markets and fashions in illegal wildlife change in line with consumer demand and the serial depletion of species. Seizure data should not be viewed in isolation when trying to understand trafficking trends and supply chains. A lack of seizures does not equate to a lack of trade; rather, it often equates to a lack of suitable intervention methods to detect illegal trade. For example, the UNODC World Wildlife Crime Report (UNODC 2020) reported that illegal trade in pangolins increased from 4% to 13.9% of total value from 2014 to 2018. This gives the impression this is a new trend. However, pangolins were considered "the most trafficked mammal" well before the UNODC report was written.[6]

Escalating poaching of pangolins from the wild in Asia and Africa prompted two separate proposals at the 17th CITES Conference of the Parties (CoP17) to transfer all seven pangolin species from Appendix II to Appendix I in 2016. An Appendix I listing can often act as a catalyst for increased law enforcement effort, and it can also make it more clear-cut for law enforcement to know and understand that a shipment is illegal. Both these factors can combine to result in an increased seizure rate, giving the false impression that there is more trade. In many cases, however, the trafficking rates have remained at the same high levels — they are simply being caught more often due to increased regulation and oversight, instead of making it to their intended market. Conversely, while rosewood seizures declined by some 25% from the first to the second UNODC reporting period (2009-2013 and 2014-2018 respectively), this was most likely due to the severe depletion of the highest value rosewood species and consequent shifting of the market to other substitute species not listed under CITES, rather than due to a reduction in illegal trade.

A lack of seizures does not equate to a lack of trade; rather, it often equates to a lack of suitable intervention methods to detect illegal trade.

Wildlife trafficking not only affects individual species and their wider ecosystems, but it also robs local communities of what may be key local sources of animal protein and reduces their ability to benefit from livelihood opportunities offered by ecotourism and other sustainable wildlife- or ecosystem-based economic activities. It can also increase instability and insecurity within villages where poaching is run by organized criminal gangs that recruit locals to enter the protected areas to poach and bribe local officials. Wildlife trafficking has also been linked in some places to terrorist groups and their financing (Nellemann *et al.* 2016), funding activities that create instability and conflict. Wildlife trafficking also complicates efforts to restrict and regulate the hunting and human consumption of wild bird and mammal species, a practice that has been linked to the emergence of novel zoonotic diseases including HIV-AIDS, SARS, Ebola, and is suspected in the case of Covid-19 (Dobson *et al.* 2020; Gunyup *et al.* 2020).

[6] *See, for example, reports from 2014: edition.cnn.com/interactive/2014/04/opinion/sutter-change-the-list-pangolin-trafficking/ and 2016: www.bbc.com/news/av/world-africa-37449919 and 2019: www.bbc.com/news/science-environment-47200816; https://wildaid.org/the-worlds-most-trafficked-animal-has-scales/*

2.4 — Illegal Gold Mining[7]

The pursuit of gold has been woven into human history since the dawn of time, through iconic episodes like the Spanish Conquistadors' search for "El Dorado" in the 16th Century, the 19th Century California Gold Rush, and the current epidemic of illegal gold mining in the Amazon Basin and other tropical forest areas. Crime and violence are also deeply woven into this history. In the words of Zabyellina and van Uhm (2020):

> *The true worth of precious metals and minerals, however, lies not only in the histories behind them, their timeless beauty and high value, but also in the destructive forces they inspire. The rapid accumulation of wealth made possible by unsustainable mining (and in many cases illegal mining) has lured organized crime groups and unscrupulous corporations whose activities usher in corruption, social harm, and environmental devastation.*

Rising prices for gold since the 1990s (gold prices increased fourfold between 2002 and 2012 and have continued to climb since then) have spurred a new "gold rush" by organized criminal networks. UNEP and INTERPOL estimate that the annual profits of the illegal mining industry lie between $12 and $48 billion, and that a significant percentage[8] of gold extracted in South America is illegal (Nellemann *et al.* 2016).

Gold is inherently suited to criminal enterprise: it is valuable, portable, and untraceable (once fully refined), and unlike narcotics, it is not an inherently illegal substance, so differentiating legal and illegal gold is very difficult. Gold is also extremely useful for concealing and moving assets and serving as the medium for a variety of illegal financial transactions (GFI 2021).

The disastrous environmental impacts of illegal gold mining — including deforestation, pollution of rivers, and increased poaching associated with mining camps — have been widely reported in Brazil (Ionova 2019), Colombia (GFI 2021), Ghana (Aboka *et al.* 2018), Indonesia (Putra 2020), Peru (Catanoso 2019), Venezuela (Rendon *et al.* 2020), and elsewhere. The health impacts of illegal and otherwise unregulated gold mining are also well-known and extensively documented (Obase *et al.* 2018; Earthworks and Oxfam America 2004), arising largely from miners' chronic exposure to dangerous levels of mercury and lead in the mining process.

An in-depth study on Latin America carried out in collaboration with the Global Initiative Against Transnational Organized Crime (Verité 2016) concluded that there is a close link between illegal gold mining and organized crime "which fuels violence, environmental damage, corruption, money laundering, displacement and human trafficking for sexual and labor exploitation."

In addressing illegal gold mining, it is particularly important to bear in mind the distinctions between "legal," "informal," and "illegal." While some operations are clearly "legal" and others clearly "illegal," there is a vast middle ground covering what is often termed "artisanal and small-scale mining" (ASM). There is no commonly-accepted definition of ASM — since its characteristics and legal status vary among countries — but it generally connotes "a broad range of mining-related activities performed by individuals, groups and cooperatives operating without formal oversight but not necessarily in contravention of existing legislation" (Zaybelina and van Uhm 2020).

ASM is often a key part of the "supply chain" feeding gold into criminal networks, but ASM miners are not necessarily "criminals." Indeed, ASM activities have been estimated to contribute some 15–20% of all global mineral production (excluding oil and gas) and are a source of livelihood for approximately 100 million people (Hentschel *et al.* 2002). They are often more likely to be poor workers seeking economic opportunity in difficult circumstances and themselves often subject to human rights violations and health risks. In some cases such as in Peru, government campaigns to suppress illegal mining have occasioned protests by ASM miners who view such crackdowns as a direct threat to their livelihoods (Guidi 2015). Indeed, crackdowns disproportionally affect ASM miners rather than illegal miners directly

[7] *Many of the same dynamics that characterize the illegal gold mining sector are common to the mining of some gemstones and other minerals such as jade and cobalt. But in terms of ubiquity and detrimental impacts on critical ecosystems, illegal gold mining is in a class of its own.*

[8] *The UNEP/INTERPOL study estimated that illegal gold mining is responsible for a significant percentage of the total amounts of gold produced in the following countries: 28% in Peru, 30% in Bolivia, 77% in Ecuador, 80% in Colombia, and 80–90% in Venezuela (Nellemann* et al. *2016, p. 69).*

associated with organized crime because of government corruption and personal safety fears (Caripis 2017).

III. Combating Nature Crime: Cross-Cutting Challenges and Sensitivities

There is fairly broad agreement that nature crime is, in principle, a bad thing and needs to be stopped. But before we turn to what can be done to stop nature crime and, specifically, to what donors should support in order to achieve that goal, it is important to consider some cross-cutting barriers to action and points of controversy and sensitivity.

"The law" is not necessarily a good thing in every country | In the most corrupt and/or authoritarian states, "the law" — as written and as applied — is frequently a tool of repression by the powerful against the powerless, rather than an expression of "the Rule of Law" or a guarantor of rights and justice. In the absence of sufficiently democratic and accountable political and legal systems, calls to "strengthen law enforcement" to save forests, fisheries, or protected areas may backfire against both justice and sustainability and even contribute to human rights violations. This is a particularly acute problem in situations where Indigenous and local conservation defenders are increasingly at risk in many countries, suffering intimidation and physical harm when they speak out against powerful interests despoiling forests and the oceans (Global Witness 2020). This does not mean that international environmental efforts — or donors — should not engage in politically difficult or even violent political environments. But it does mean that this must be done carefully and, above all, in close consultation with local human rights and environmental advocates.

Political and economic elites — and law enforcement officials — are sometimes the protectors and beneficiaries of nature crime | While run-of-the-mill criminals are often involved in nature crime, all too often one finds political and military elites and their private sector cronies at the center of the criminal web. As American folksinger Woody Guthrie wrote some 80 years ago, "As through this world I've wandered I've seen lots of funny men; Some will rob you with a six-gun and some with a fountain pen." It makes it difficult to address nature crime when the officials charged with suppressing it are in fact enablers of the illegal activities in question, via direct involvement or as beneficiaries of bribes and other forms of corruption.[9]

Legal systems tend to disproportionally punish the "little fish" | Those lower down within criminal networks tend to be the ones caught and punished, not the rich and powerful who benefit the most. To be clear, plea bargaining with and offering reduced sentences to "foot soldiers" in exchange for information about more senior criminals can be an effective investigation technique to identify and convict senior members of crime groups. Use of covert human intelligence sources can be conducted ethically, safely, and responsibly. But this power can be abused. Corrupt officials involved in nature crime, for instance, often make examples of lower-level offenders to show they are "doing something" about the problem. Punishing the foot soldiers and letting the crime bosses and corrupt politicians go breeds resentment among rural communities and does little to end nature crime. Truck drivers, sailors, hunters, and day laborers are all replaceable, especially in poor areas where illegal activities may be one of the most lucrative opportunities to make money.

The high seas is literally a lawless zone | With regards to illegal fishing, much illegality occurs on the high seas where no country has jurisdiction, making enforcement next to impossible. Industrial-scale illegal fishing operators also deliberately disguise company ownership and operating structures in complicated ways. Vessels may be owned by companies in one jurisdiction, flagged to another country, and operating in yet another country, often with workers from around the globe. This opaque modus operandi in the fishing industry makes it ripe not only for environmental abuse but also for violations of labor and human rights (McDonald *et al.* 2021). Moreover, the Regional Fisheries Management Organizations (RFMOs) which have theoretical

[9] *For a succinct overview of the meaning and parameters of "corruption," see this summary from the U4 Anti-Corruption Resource Centre: www.u4.no/topics/anti-corruption-basics/basics*

jurisdiction over high seas fisheries have no enforcement authority or investigative capacity (Ewell *et al.* 2020).

Nature crime is increasingly transnational, but legal systems are not | The scope of the law, with some exceptions, is limited by national boundaries. The very concept of "jurisdiction" is tied to the authority and power of sovereign nation states. Nature crime, however, does not respect national borders. While all nature crimes (except those on the high seas) take place in particular states' jurisdictions — and much nature crime is an entirely domestic phenomenon — the supply chains for timber, wildlife, seafood, and gold are global, as are the criminal networks profiting from those supply chains. A few places (Australia, European Union, United States) have taken important steps to criminalize imports of illegally-harvested timber (Barber and Canby 2018), and many countries have laws in place prohibiting imports of illegally-harvested wildlife. Some laws of general application also have international reach (the U.S. Foreign Corrupt Practices Act is an oft-cited example) but these have rarely been used in the cases of nature crime (Searby 2018). While there are numerous treaties and international organizations dedicated to enhancing transnational criminal intelligence and law enforcement cooperation, there are no legal authorities or organizations at the international level comparable to what exists within national governments, and almost all governments want to keep it that way in the name of protecting "national sovereignty."

The globalized and complex nature of natural resources supply chains make traceability (and, therefore, legal accountability) difficult to achieve | The average consumer has little ability to determine where the products they buy came from or how they were produced, whether they be wood products, seafood, a gold ring, a leather belt, a product containing palm oil or soy, or a pet bird or lizard. Numerous voluntary, third-party certification schemes have been established over the past three decades for forest products, seafood and, increasingly, for "forest-risk commodities" like palm oil, beef, and soy. But none of these certification schemes can yet provide evidence of traceability — from source to consumer — sufficiently robust to prove nature crime at the transaction level (although certification schemes can certainly help both companies and consumers exercise due diligence to reduce the risk of buying or selling legally-tainted products). While increasingly effective technologies exist for end-to-end traceability, they have thus far only been implemented for luxury items like lobsters, caviar, bluefin tuna, and high-end musical instruments, and for that small percentage of timber audited by independent certification bodies.

Nature crime has gone online | Modern communication technologies and social media networks also do not respect jurisdictions, further enabling transnational nature crime. Illegal wildlife trafficking is no longer underground, but rather accessible from any smartphone. Social media platforms such as Facebook, WhatsApp, Instagram, WeChat, and others make it easy for organized criminal networks to openly buy, sell, and source illegal goods with little or no oversight by either technology companies or law enforcement authorities (Abano and Chavez 2021). Encrypted messaging apps and payment platforms allow traffickers to streamline business and reach unprecedented customer bases. And while Facebook and other social media firms employ artificial intelligence to help moderate illegal content, some investigators suggest that these companies' algorithms actually connect traffickers faster than moderators can remove them (Stiles 2019).

Media attention to the role of social media platforms in facilitating nature crime has grown recently. As a result, some social media companies including TikTok, Instagram, and Facebook have joined voluntary public efforts such as the Coalition to End Wildlife Trafficking Online to enhance their own staff awareness of this issue, empower users to report crime, and collaborate with researchers and law enforcement. Some, including eBay, have cooperated with law enforcement authorities to track illicit trade and criminal networks. However, this has not driven trade off of the social networks, and few companies have taken proactive, independent actions to halt the trade they facilitate. One study found that illegal trade actually increased on Facebook since it joined the Coalition to End Wildlife Trafficking Online, and that users can still easily purchase live exotic animals such as otters, sun bears, monkeys, and other small carnivores with ease (Paul *et al.* 2020). While traders advertise their products on these open platforms, transactions are almost always conducted on WhatsApp or other encrypted messaging platforms that allow for largely untraceable correspondence.

Actual delivery of animals and other wildlife products must still, however, be conducted through a physical method.

The Covid-19 pandemic has complicated efforts against nature crime | Like every other area of human life and endeavor, the Covid-19 pandemic has raised new challenges in combating nature crime (see Box 1). At the same time, the pandemic has highlighted the role tropical deforestation and the hunting and consumption of wild mammals and birds has played in the "spillover" of pathogens from animals to humans (Dobson *et al.* 2020), perhaps giving some more momentum to controlling forest and wildlife nature crime as part of an integrated effort to prevent future pandemics at the source.

IV. Conquering Nature Crime: Key Areas for Donor Support

Increasing funding to combat nature crime will not, by itself, solve the problem, but it is a foundational step that must be taken to enable and catalyze solutions at scale. From 2010 to 2018, 24 international donors spent $2.35 billion trying to address the nature crimes of illegal logging, fishing, poaching, and wildlife trafficking across 67 countries in Africa and Asia (World Bank 2019b). While this sounds like a lot, it is a trivial amount when compared to either the amounts spent on combating the illegal drug trade or the proceeds of nature crime. The average annual investment was calculated to be $260 million; just a fraction of the value of the trade, estimated at between $91-258 billion (World Bank 2019a).

But what should new resources for combating nature crime be spent on? Who should receive those funds? How will we know whether funded activities are achieving their purposes? We propose four broad priority areas for increased donor attention and investment:

- ***Improving international and national legal frameworks*** and bridging institutional siloes to allow for better cooperation and enforcement efforts within and among governments, enable and empower cooperation with civil society and the private sector, and ensure that the safety and rights of environmental, land, and human rights defenders are assured.

> *The Covid-19 pandemic has vividly demonstrated that that a funding strategy for combating nature crime based largely on tourism dollars is a risky and potentially disastrous way to ensure the maintenance and defense of an irreplaceable public good.*

- ***Supporting civil society organizations*** from the international to the local level, particularly emphasizing empowerment and defense of community-based environment and land defenders and building their linkages to and support from NGOs at national and international levels.
- ***Developing and deploying innovative technologies*** for detection, deterrence, and enforcement at multiple scales including local monitoring; "pinch points" at borders, ports, and other checkpoints along supply chains and in the online environment; and globally-applicable tools such as earth observation and supply chain traceability technologies.
- ***Following the money.*** There is a valuable opportunity to work with the global anti-money laundering regime to help deploy existing red flag detection capabilities more effectively against the proceeds of nature crime.

4.1 — Strengthening Legal and Institutional Frameworks

Crime tends to respond quickly to change because it is, by its very nature, unregulated. Transnational conservation criminals have therefore adapted quickly to the rapid changes brought about by globalized trade, travel, and financial flows and the explosion of the Internet and online social networks — more quickly, it often seems, than governments and their enforcement agencies. National and international legal frameworks and strategies have not caught up.

Reform of state and intergovernmental laws and institutions requires mobilizing political will. Donor dollars cannot "buy" political will, but they can support the efforts of civil society and reformist elements within government and the private sector

BOX 1: Covid-19 Impacts on Efforts to Combat Nature Crime

Initiatives to engage local communities in conservation activities — and to combat nature crime — have for years been supported by tourism revenues, particularly wildlife tourism in Africa and elsewhere, and dive tourism linked to tropical coral reef areas of Southeast Asia and the Caribbean. While not a solution in areas without significant tourist traffic, especially unstable or war-torn areas, it has been a successful funding strategy in many places. But Covid-19 has changed the landscape.

During 2020, the pandemic forced countries into various degrees of lockdown, including closing borders to tourists and restricting movement of natural resources management and enforcement personnel. The pandemic has also been used in some countries to justify suspending and weakening enforcement of laws against nature crime in the name of "economic recovery." Disbursement of donor funding for key protected areas and species conservation initiatives has also been delayed. Affected activities are likely to include protected area management capacities, enforcement of regulations to curb illegal logging, fishing, mining, and wildlife exploitation, and support to local communities involved in conservation activities such as wildlife tourism and the promotion of deforestation-free commodity supply chains.

The global tourist industry is estimated to have shrunk by up to 25% in 2020, while the total cost of Covid-19 to the African tourism and travel sector could be $50 billion and 2 million direct and indirect jobs. The collapse of nature-based tourism threatens to compromise decades of development and conservation work. For communities dependent on tourism for their income, 2021 is critical to saving not only livelihoods, but decades of community welfare and conservation gains and the viability of local efforts to combat nature crime. Until tourism becomes viable again, governments and donors need to support key organizations in priority conservation areas through targeted grants to private sector enterprises, community-based organizations, and conservation NGOs (Global Goal for Nature Group 2020).

Beyond these critical stop-gap measures, Covid-19 has highlighted some structural flaws in a system that conditions anti-nature crime measures on the flow of tourist dollars. The sometimes over-broad assertion that "conservation can pay for itself" has never been true for places lacking tourist traffic or natural resources that can be utilized sustainably as a source of income. Deprived of tourism-generated operating income, national parks and other conservation areas across the world are suffering (Hockings *et al.* 2020). Poaching resurged in 2020 in many places, due in part to reduced ranger patrols and to drastically lower visitor numbers — factors that normally act as deterrents — but also due in some cases to the desperation of many millions thrown out of work by the pandemic.

In short, the Covid-19 pandemic has vividly demonstrated that that a funding strategy for combating nature crime based largely on tourism dollars is a risky and potentially disastrous way to ensure the maintenance and defense of an irreplaceable public good.

to raise awareness, incubate strategies and solutions, and mobilize political activism — fundamental building blocks for catalyzing legal and policy changes. And donors can do this through a combination of an "outside game" — empowering activists and watchdog organizations demanding change — and an "inside game" — supporting reformist elements within both governments and the private sector to push for change from within government agencies and key industry actors.

At the national level, donors should support thinkers, activists and reformers in the following areas:

- ***Reviewing and promoting reforms*** to strengthen laws prohibiting nature crimes, as well as procedural aspects of law and policymaking in areas like modernizing rules of evidence (e.g., to allow use of remote sensing data in court), expanding the extent to which nature crimes may serve as a "predicate offense" for laws of general application (e.g., money laundering or fraud), modernizing investigative and judicial procedures, revisiting the authority and jurisdiction of various branches of law enforcement and how they coordinate, strengthening whistleblower provisions and protections, etc.

- ***Strengthening legal requirements for transparency of information*** on key legal and policy decisions in areas prone to nature crime and associated offenses (e.g., forest land allocation, issuance of concessions, wildlife trade and export, flagging of fishing vessels, etc.).

- ***Strengthening and ensuring effective implementation of environmental and social impact assessment laws and regulations***, including provisions for public participation and transparency.

- ***Securing and effectively enforcing land, resource, and human rights protections*** for Indigenous Peoples and local communities.

Donors may also wish, at the national or jurisdictional levels to support legal and institutional "mapping exercises" to better understand the problems, gaps, and contradictions in the above areas, identify key legal reform institutions that need support, and provide expertise where it is needed (e.g., linking national legal measures to transnational agreement, processes and institutions).[10]

At the international level, donors should ramp up support for both intergovernmental and civil society institutions, focusing on:

- ***Strengthening the "soft law" attention to nature crime*** within the UN system and other multilateral and regional bodies. These include resolutions by the UN General Assembly and its affiliated entities (such as the UN Convention on Transnational Organized Crime) as well as codes of conduct and best practice produced by UN specialized agencies such as the UN Office on Drugs and Crime (UNODC) and the UN Food and Agriculture Agency (FAO).

- ***Facilitating stronger cooperation among international bodies with a mandate to combat nature crime***. Some examples include the International Consortium on Combating Wildlife Crime (ICCWC), United for Wildlife, and the Norway-supported Law Enforcement Assistance Program (LEAP), a consortium on forest crime including UNODC and INTERPOL.

- ***Supporting institutions working to strengthen the effectiveness of the CITES Convention in combating nature crime*** (See Box 2), while exploring more comprehensive international legal solutions, including the proposal to develop a wildlife crime protocol under the UN Convention on Transnational Crime.[11]

Given the unique jurisdictional and other features of the illegal fishing challenge, significant reforms in fisheries law and policy are also needed at the international level:

- **Port state measures:** The 2016 Agreement on Port State Measures contains important provisions to discourage IUU fishing, but only 60 countries have ratified the agreement, and implementation measures so far have been inadequate (Pew Charitable Trusts 2018). Donors should support an aggressive awareness and lobbying effort by civil society campaigners to

[10] *One particularly useful information source on the area of legal reform is The Legal Atlas.*
[11] *See: www.endwildlifecrime.org/untoc-wildlife-protocol/*

BOX 2: Nature Crime and the CITES Convention

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is the only universal, intergovernmental treaty including binding legal obligations and compliance measures related to the conservation and sustainable use of species of wild fauna and flora that are, or may be at risk of, extinction in the wild due to pressures of international trade. In force since 1975, CITES has grown to encompass various levels of protection for more than 38,000 species.

Originally focused on highly threatened iconic animal species such as elephants, rhinos, tigers, and whales, the treaty has expanded over the past decade to encompass protections for a much wider variety of terrestrial and marine species, including some species of timber and commercially-fished marine species. It is thus playing a more significant role in regulating international trade in certain timber and fish species, and it has an important, yet narrowly defined, role in the evolving international regime to combat at least some forms of nature crime. It is distinctive within the family of global environmental agreements in the extent to which it welcomes and facilitates the involvement of scientific institutions, the private sector, and NGOs. Those stakeholder groups have, in turn, provided considerable technical and financial support to CITES processes — both internationally, and through the national Scientific and Management Authorities which are the primary vehicles for implementation of the Convention by Parties at the national and field levels.

Despite its strengths and its important role in the nature crime sphere, it has its limits. CITES' narrow focus does not provide a suitable organizing principle or foundation for a broader, more effective international legal approach to the full scope of nature crime discussed in this paper, for a number of reasons:

1. First, CITES is fundamentally a trade-related mechanism to avoid overexploitation of a species through international trade, not a treaty on international cooperation to fight nature crime. And while it obliges Parties to "penalize" violations, it does not oblige them to criminalize breaches of the Convention. It creates national Management and Scientific authorities, but not Enforcement authorities, and is thus not a natural forum for cooperation among police or other enforcement officials (Scanlon 2020).

2. Second, the treaty, by design, is highly selective with regard to the species that it regulates. The process of "listing" a species for protection can be lengthy and generally only occurs once a species is already under a high level of threat.

3. Third, CITES focuses only on species affected by international trade — a species may be highly threatened by domestic over-exploitation and consumption, but if it is not in international trade, it is not a CITES matter.

4. Finally, as a species-focused treaty, CITES does not (and was not designed to) address illegal activities that threaten entire ecosystems, but are not directed at the exploitation and international trade in a particular species. This means that it cannot be used to counter illegal forest conversion for commodity agriculture, illegal gold mining that destroys forests and rivers, or most forms of illegal fishing.

encourage states to ratify and effectively implement this agreement.

- **Flags of convenience:** The term "flags of convenience" refers to the common situation where a vessel is flagged (legally registered) in a state other than the state where the vessel is owned. The state under which a vessel is flagged theoretically governs the rules and laws that are applicable to the operation of that vessel. A number of jurisdictions have established a kind of "industry" out of allowing vessels from all over the world to pay for flags under lax and often unenforced national regulations. Such "flags of convenience" states are often chosen by IUU fishing vessels to evade taxes and escape prosecution for labor and conservation practices that are illegal in the jurisdictions where they actually operate (Cutlip 2017). There is some legal basis for addressing this structural legal deficiency: a 2015 ruling by The International Tribunal for the Law of the Sea states that flag states can be held liable for the actions of their vessels (Kaye 2015). Yet, little action has followed this ruling.
- **Transshipment at sea:** The lack of effective regulations governing the transshipment at sea of fish catches from one ship to another is another structural impediment to reducing IUU fishing. It is difficult to envision how any kind of system to trace fisheries catches from capture to port and beyond can be instituted until such transshipment is banned or, where permitted, strictly monitored and reported. The CITES convention is one of the few international legal instruments that attempts to address this problem, through its provisions on *introduction from the sea*, defined as "transportation of specimens of any species which were taken in the marine environment not under the jurisdiction of any State" (Wold *et al.* 2010). CITES, however, only covers a very selective group of species.

International measures can only function, of course, with the support and engagement of national authorities. Indonesia has taken a novel national approach to the issue of IUU fishing in their waters. It has not only banned transshipment at sea, but it is seizing all fishing vessels suspected of IUU fishing and sinking them. This has sent a strong message to illegal operators, although it has also ruffled the feathers of some flag states. Shortly after the Covid-19 pandemic began, Indonesia saw an increase in IUU fishing vessels in their waters, as operators expected there to be a reduction in enforcement. Indonesia largely persisted, however, and during March and April 2020 alone, Indonesia seized 17 IUU fishing vessels (Gokkon 2020).

4.2 — Empowering and Mobilizing Civil Society

Civil society organizations (CSOs) have become more important actors in efforts to detect and combat nature crime, and their potential as sources of intelligence and information has been increasingly recognized by many enforcement authorities . Two developments have been driving this trend. First, the democratization of access to data and information catalyzed by revolutions in earth observation, social networks, traceability technologies, and machine learning have allowed CSOs to carry out more sophisticated investigations and analyses than in the past. Second, growing political attention to environment crime has not been matched by increased budgets for governmental and intergovernmental crime-fighting institutions, who therefore often welcome assistance from civil society researchers and activists.

CSOs active on nature crime fall into four broad categories, with some organizations working across several categories.

Policy and platform organizations

These are generally larger, international NGOs who work in the policy arena to raise the profile of nature crime and have developed numerous data and information tools and platforms (these tools and platforms are discussed in detail in Section 4.3, below).

"Name and shame" advocacy organizations

Other international and sometimes national CSOs draw on their own investigations — as well as information from intelligence-focused CSOs (discussed below) — to mobilize action against nature crime in particular places and supply chains (e.g., ivory, rosewood, palm oil, gold, high-value fish species), publishing "name and shame" reports and providing the basis for advocacy campaigns promoting legal and policy reforms, consumer

boycotts, and the like. Many of these organizations are well-known to donors, journalists, and the public, such as Greenpeace, Rainforest Action Network, Global Witness, the Environmental Investigation Agency, the Wildlife Justice Commission, Earth League International, and Mighty Earth. These international groups frequently team up with national and local counterparts for particular investigations and campaigns.

Some enforcement authorities grumble that high profile "name and shame" reports and campaigns can hamper official efforts to act by politicizing situations and making it riskier for potential informants to come forward. This may be true in some situations, but in others, it has undeniably been the pressure generated by CSO-led name and shame campaigns that pressured officials into taking action. This was the case with the U.S. Department of Justice action against flooring firm Lumber Liquidators. One organization had for years quietly been providing the agency with ample evidence of the company's violations of the U.S. Lacey Act, with respect to timber illegally cut in Russia, imported into China, and then sold as flooring in the United States. But the Justice Department took no action against the firm until publication of a public report and associated media campaign helped force the issue.

Journalists play a strong role in amplifying the kind of information that name and shame advocacy organizations produce. Organizations like Mongabay, the Pulitzer Center's Rainforest Journalism Fund, Ojo Publico, and the Organized Crime and Corruption Reporting Project are just a few examples.

Intelligence-focused organizations

Some CSOs focus on generating and quietly providing intelligence to investigative and enforcement authorities or to private sector firms and financial institutions engaged in improving their own due diligence on potential environmental crime within their supply chains or financial operations. Intelligence-led investigative CSOs who work in collaboration with official intelligence and enforcement agencies have great potential to support action against conservation criminals. This potential is not, however, always easy to realize.

While CSOs can gather a great deal of open source intelligence — and can also employ confidential informants — they have no access to classified information, cannot set up controlled "buy-and-bust" operations on their own, and have no powers of arrest or authority to use force. For their part, enforcement agencies often exhibit an absence of political will — and resulting lack of dedicated financial and human resources — to act on information provided by CSOs, no matter how complete and compelling that information is. Sometimes this is a result of bureaucratic inertia, or of enforcement agencies just failing to follow their own protocols and procedures. This lack of follow-through by government, for whatever reason, is frequently the reason why even the most well-documented CSO intelligence dossiers end up languishing without meaningful action by government. This dynamic is sometimes compounded by high staff turnover in government agencies, as well as turf battles and structural siloes between different agencies (or even branches of the same agency).

Corruption is also a serious compounding problem that impacts efforts by CSOs to gather intelligence on nature crime and see it through to official action. Corruption makes it more difficult and expensive for intelligence-focused CSOs to run operations, as the risk of operatives and informants being compromised increases. Corruption also compromises the very authorities upon which CSOs may have to depend to take intelligence and evidence forward — the classic "fox guarding the henhouse" problem.

Some of the more successful examples of intelligence -led work by CSOs are coming out of Africa, where NGOs in various countries including Zambia, Malawi, Tanzania, Mozambique, and Zimbabwe are creating partnerships with their local police and the Departments of Wildlife. These partnerships could be characterized as symbiotic, where the local wildlife departments and police forces receive much-needed resources and capacity building, while the local NGOs get the much-needed cover that is necessary to conduct operations safely and effectively, on the time-sensitive basis required to intercept wildlife and timber trafficking networks. Reducing the bureaucracy needed to collaborate and run an interception operation is essential to being nimble enough to respond to the changing methods used by traffickers.

Front-line environment and land defenders

Numerous organizations across the world are embedded in local communities directly impacted by

nature crime. Less organized than larger actors, they may be just a nascent organization coalescing around a specific threat and mobilized by a few individual leaders. Whether organizing against illegal logging, fishing, poaching, or land-grabbing, these actors typically have extensive knowledge of local political and economic dynamics. But they typically lack the information, skills, and external connections that would enable them to fully understand the bigger picture of what is driving threats to their local environment and how they might best leverage external allies. Such groups are also at greatest risk of legal and economic intimidation, violence, and even death, and their causes are often as much about human rights and economic justice as they are about the associated nature crime component. Global Witness (2020), an international NGO that collects annual data on violence and intimidation against environmental defenders, reported in 2020 that such attacks had increased in number and intensity over the past few years.

The common thread amongst these front-line organizations is the clear power imbalance between grassroots defenders and the mining, logging, and fishing companies — and frequently-associated criminal enterprises and corrupt officials — that profit from the illegal extraction of resources. Many of these companies are backed by either private militias or government forces keen to make their own money off the projects through export levies or outright bribery. In many cases, forestry, agricultural, or mining projects are legitimized by way of sub-par or outright falsification of "environmental and social impacts assessments" in order to provide a veneer of legality and thereby strengthen impunity.

Given this asymmetric power dynamic, there are two main ways that donors can support and empower grassroots environmental and land defenders:

(a) Fight the power | Donors and international NGOs can provide environment and land defenders with access to legal tools and mechanisms to resist threats from companies or governments. There are, for example, community-focused legal centers in urban centers and internationally that can serve as mentors and resource providers concerning legal strategies and tactics tailored to particular struggles. The Australia-based Environmental Defenders Office (EDO), for example, partners with the Centre for Environmental Law and Community Rights in Papua New Guinea, the Landowners Advocacy and Legal Support Unit and the Environmental Law Association in the Solomon Islands, the Fiji Environmental Law Association, and the Vanuatu Environmental Law Association in order to bring cases to courts in their respective countries against mining companies and/or the government. In 2019, a key partner to EDO was able to secure an historic refusal of a bauxite mine on the Solomon Islands that was first proposed in 2013 (Ramsey and Fonseca 2019).

That victory in the Solomon Islands was hard-won, taking over six years and requiring considerable pro bono work by a number of lawyers. Such cases are, however, often the only way that front-line defenders can actually change the state of play in their countries, and they rarely can do it alone. Increased funding to non-profit community legal centers with a mandate to represent Indigenous Peoples and local communities is an area where donor support can have lasting impact on the battles being waged by front line environmental defenders. But it is important to remember that fighting entirely on a case-by-case basis is challenging and often tedious. In addition to institution and capacity building around particular cases, donors also need to identify and support cases that hold potential to bring change at the level of national legal, policy, and even constitutional change.

Donors can also support this kind of work at the international level, by supporting a stronger role for UN Special Rapporteurs, the Inter-American Commission, and similar human rights entities that promote the rights of environmental defenders, the rule of law, and equal justice.

(b) Watch your backs, cover your tracks | Many grassroots environmental activists have very little understanding of the basics of operational security and are thus vulnerable to infiltration, intimidation, and violence perpetrated by the powerful actors they confront. Many view publicity for their cause and its leaders as an important advocacy strategy, but this can make activists easy targets for their adversaries. Grassroots environmental activists thus often need assistance from experts in organizational, cyber, and personal security to safeguard their operations and their own safety. In short, they need to learn to operate more "in the shadows" while still achieving the desired outcomes of their campaigns. Relatively simple steps include obfuscating leadership of

campaigns (e.g., by creating multiple fictitious avatars on social media); keeping staff names and contacts confidential; and developing campaign tactics that are more nuanced and difficult to penetrate by adversaries.

This kind of program was designed and implemented by Global Eye, an initiative active on wildlife trafficking and illegal logging from 2014 to 2019 that worked with environmental activists in Asia and Africa.[12] The program was successful in teaching activists about their operational security, creating campaigns against targeted individuals that were not able to be traced back to them, while still achieving their desired disruption methods. For those activists that implemented the recommendations, formerly-frequent death threats were effectively neutralized. The strategy may not be effective for activists who want to serve as the public face, or the "spear point," of public campaigns, and feel unable to change their approach. In those cases, most were obliged to relocate in order to not become another statistic in the Global Witness annual report.

> *In addition to institution and capacity building around particular cases, donors also need to identify and support cases that hold potential to bring change at the level of national legal, policy, and even constitutional change.*

Unfortunately, relatively few donor resources have supported environmental defenders and legal activists to prepare for, confront, and respond to risks inherent in the work of confronting nature crime. There is an urgent need to scale donor support for environmental defenders and their allies in the face of rising levels of criminalization and attacks. Private philanthropy in particular can take risks and be nimble, establishing responsive funds that can quickly support costs of strategic interventions and actions. Such funds could finance legal action in response to attacks on defenders and their communities, with particular emphasis on emblematic cases in which a just outcome could deter continued illegal or corrupt action by corporations and/or governments. Rapid response legal funds could provide agile funding to enable organizations to respond quickly to emerging threats or needs, such as legal fees or rapid communications outreach. One such pooled donor response, the Environmental Defenders Collaborative, offers an efficient mechanism to direct funding to a pipeline of environmental defenders globally, and could be scaled.

Donors can also support proactive measures to increase the safety and security of frontline defenders, including through trainings on personal, digital, and organizational security — as per the Global Eye example noted above — and for longer-term capacity building work for national and regional level civil society organizations.

Local and regional news media should also be supported to increase coverage of nature crime and environmental defender attacks in priority regions. There is a delicate balance, however, between the attention and support activists can bring to a campaign by speaking out in the media and becoming "the face" of an issue on the one hand, and the increased risks and potential backlash that this kind of a high-profile approach may trigger. The San Francisco-based Goldman Environmental Prize embodies this tension. The Goldman Prize has been awarded to environmental defenders around the world for their grassroots activism against mining, logging, and other detrimental developments in their local areas since 1989. Six winners are selected from regions around the world every year, and the honorees participate in high-profile events in San Francisco and Washington DC, meet with political leaders, and are widely covered in the press. The focus is on individuals (although prizewinners are usually the first to say how they are just part of a broader movement).

The Goldman Prize has provided many campaigns and their leaders with crucial visibility and support. 1991 Africa prize-winner Wangari Maathai, for example, went on to win the Nobel Peace Prize in 2004. Others have paid a steep price: Honduran activist Berta Cáceres was the first Goldman Prize winner to be murdered, in 2016. The Asia Prize went that year to a Cambodian anti-illegal logging activist, Leng Ouch, whose close associate, Chut Wutty, had

[12] *Pers. Comm. Former Global Eye staff 2021 (name withheld for security reasons).*

BOX 3: Community Responses to Nature Crime — Some Promising Examples from East Africa, Indonesia, and Brazil

While systematic evaluations of the efficacy of community-based interventions to combat nature crime are limited (recent exceptions are Kurland *et al.* 2017 and Delpech *et al.* 2021), it appears that when initiatives are carefully targeted, strongly supported by most community members, assisted through cooperation with external actors, and self-sustaining over time, they tend to be the most successful. Examples can be found throughout the tropics.

TANZANIA: In Tanzania's Ruaha Province, Oxford University's Wildlife Conservation Research Unit (WILDCRU) has been supporting local communities in running a camera trap program for 10 years, along with a number of complementary programs targeted at community livelihoods and security. The programs work to reduce both wildlife poaching as well as community conflict with large carnivores such as lions and leopards. The community is incentivized to support healthy wildlife populations — the camera traps, maintained by the community, provide evidence of this — through the benefits accrued from wildlife tourism, as well as community health care and educational improvements (Ruaha Carnivore Project 2019). The program appears to have been successful in reducing both poaching and human—wildlife conflict at the National Park, highlighting what is possible when multiple drivers of poaching and negative attitudes towards wildlife are tackled at once.

INDONESIA: In 2007 the CSO Health in Harmony (HiH) began working around Indonesia's Gunung Palung National Park (GPNP), a rainforest containing carbon-rich peat swamp on the island of Borneo. Deploying a "radical listening" model of community engagement, HiH discovered that most households depended on illegal logging, especially to pay for healthcare, and that the average logger cuts 533 large trees per year. Supported by HiH and its sister local organization Alam Sehat Lestari, the community established a local medical center with discounts offered to communities that decreased illegal logging. Associated program activities included alternative payment methods (including rainforest seedlings); training former loggers as well as women farmers in sustainable agriculture; and establishing reforestation projects. More than a decade on, a recent peer-reviewed study conducted by Stanford University researchers found that these programs have led to a 90% decrease in households engaged in illegal logging, a 67% decrease in infant mortality, stabilization of primary forest in GPNP, and 21,000 hectares of secondary regrowth underway (Jones *et al.* 2020)

BRAZIL: Kayapo indigenous territory forms the last large block (110,000 km^2) of forest surviving in the southeastern Amazon. An island in a sea of illegal logging and forest land invasions, surveys show that most of Kayapo territory remains undisturbed as judged by population densities of the most sensitive game, fish, and high-value timber species. By conserving their forests, the Kayapo have protected more than 1.1 billion tons of carbon from premature release into the atmosphere. Without the Kayapo's long struggle to secure legal rights to their land, the story would be very different. International partnerships have been important as well: 25 years of philanthropic support has helped the Kayapo maintain their culture and develop livelihoods based on non-extractive activities. The annual baseline budget for the three Kayapo CSOs to function and provide basic program support — including their territorial surveillance and guard post program, sustainable enterprise development, and political mobilization (defense of indigenous rights) — is only about $2.5 million per year with over $1 million of that raised by the Kayapo NGOs themselves (Zimmerman *et al.* 2020).

been murdered in 2012. Less than a year later, another Prize winner, Isidro Baldenegro López, a Mexican subsistence farmer who won the award in 2005, was murdered. Each year, Goldman Prize winners are subjected to multiple and serious death threats, which only increase with the attention that winning the prize can bring. The Goldman Prize has intensified its efforts to support the security of its prizewinners, but in the end, these activists are for the most part keenly aware of the risks they are taking, and their choice to utilize the public spotlight to further their cause is ultimately theirs to make.

4.3 — Innovative Technologies: Development and Uptake

A range of innovative technologies developed over the past decade have greatly expanded the toolbox available to governments, civil society, and the private sector for preventing, detecting, and prosecuting nature crime. Donor support is required both to test and develop new tools and methods, but more importantly, to deploy them at scale and ensure the right tools are put into the hands of the right users for the right uses.

An important and often overlooked consideration for technology is updating and maintaining these systems, which will require substantial donor investments over the coming decade. It is particularly important that donors rally around financing for the basic "operating systems" — literally and figuratively — behind these technology platforms. Everyone wants to support the use cases — be it Indigenous Peoples using drones to defend their borders, or rangers catching poachers — but none of those applications are possible without significant ongoing investment in the "global public good" of the basic operating systems, technologies, and associated management and R&D costs behind them, as well as last-mile investments in the hardware and physical infrastructure (like servers and smartphones) often needed to operate them in regions on the frontlines of nature crime. And finally, many emerging technologies listed below require robust libraries of training and reference data (such as ground-truthed data on deforestation or species sample libraries) to be successful — a vital but often "unsexy" upfront investment.

Promising tools and technologies for combating nature crime include the following:

Donor support is required both to test and develop new tools and methods, but more importantly, to deploy them at scale and ensure the right tools are put into the hands of the right users for the right uses.

Real-time earth observation data | Advancements in satellite sensors and artificial intelligence have enabled rapid detection of land-use changes. Satellite -based forest monitoring and alerting systems — be they national systems like Brazil's DETER or independent global systems like Global Forest Watch — are well-documented to help interdict illegal logging. Freely available satellite data, such as from NASA and the European Space Agency, offer high enough resolution to identify features like illegal logging roads and mining operations; while proprietary high-resolution imagery, such as from Digital Globe, is required to identify more small-scale disturbances like selective logging. In Peru, the Monitoring of the Andean Amazon Project (MAAP), with support from USAID, has used remote sensing to support efforts to reduce illegal gold mining and to verify the impressive results of "Operation Mercury" — a reduction in illegal gold mining from 2019 to 2020 of some 78%.

Wood species and origin identification technologies | Scientists are developing a host of techniques that can identify the species and country of origin from wood samples using machine vision and chemical and genetic "fingerprinting" techniques (UNODC 2016; Irwin 2019). A growing number of enforcement authorities are beginning to use these techniques for screening shipments in ports and to identify the species and origin of seized timber. And a multi-stakeholder consortium, World Forest ID (which includes the U.S. government, Kew Botanic Gardens, Forest Stewardship Council, and the World Resources Institute), is rapidly assembling the first reliable global timber species reference database.

Timber and agricultural commodity supply chain traceability platforms | Several initiatives, such as the Open Timber Portal and the ILAT Risk Tool, have assembled platforms that enable stakeholders to analyze a variety of data on timber legality risks in particular supply chains. Others, such as Global

Forest Watch Pro, SPOTT, and TRASE, are providing unprecedented access to information on supply chains and trade flows for forest-risk agricultural commodities.

Radio frequency ID (RFID) tags | RFID tags, or radio frequency identification tags are often used for tracking merchandise; but they are increasingly used to trace timber and to track animals in the wild. For example, a system called SharkTrack is using RFID to identify and trace legally-fished shark products from point of capture to end markets. SharkTrack relies on a combination of electronic (RFID) tags and easy-to-use apps for tracking shark products from ship to shore to shop.

Vessel tracking and monitoring | Technology is also enabling monitoring of maritime transport, which is relevant not only to commercial fishing activity, but also to the transport of illegal timber and other smuggling activities across the world. Several initiatives — notably, Global Fishing Watch, Vulcan Skylight, and OceanMind — use vessel tracking data from the automatic identification system (AIS), a GPS -like device that large ships use to broadcast their locations and avoid collisions. This data can be run through sophisticated machine learning algorithms that look for patterns that may signal illegal activity — such as switching off the AIS — as well as cross-referenced with geospatial information on the location of EEZs and marine protected areas to identify when potential violations occur. Apart from fisheries, such technologies have also been used to monitor the movements of ships suspected of carrying illegal timber. Vessel tracking can also help with nature crimes that use maritime transport to move illegal timber, fish, and other products derived from natural resources.

Camera traps and acoustic sensors | Motion-triggered trail cameras (also known as camera traps) are widely used to help conservation biologists identify ranges and populations of key species. There are new efforts to quickly automate the identification of species, such as the Google-led Wildlife Insights platform, which uses advanced algorithms to quickly identify species from camera trap images. In addition, acoustic sensor-based systems like Rainforest Connection gather data that can be processed via algorithms to detect not only the location of certain species, but also the sound signature of threats such as chainsaws and gunshots. Government agencies, such as the Thai National Parks department, use these sensors to detect illegal logging, quickly dispatching patrol teams to areas triggered by activity.

Materials detection tools technologies | Vast quantities of goods and people move around the globe and across borders every day. Governments and their partners in detecting wildlife contraband are thus faced with an enormous challenge in stopping, inspecting, and confiscating illicit wildlife products. A range of detection tools and technologies — some new, some very old — are improving the odds of detection. These range from familiar "sniffer dogs" to X-ray scanning equipment, and the application of artificial intelligence (also discussed below) to automate the process of scanning massive flows of luggage and cargo (Esipova *et al.* 2021).

Patrol planning software | Programs like Instant Wild, SMART, and EarthRanger are easy-to-use field solutions that help protected area managers plan more impactful and efficient patrols. These systems integrate remote sensing data, *in situ* sensor data from camera traps and acoustic sensors, and historical information on animal movement and ecological threats in order to identify priority areas for enforcement and addressing human-wildlife conflict.

DNA barcoding | DNA barcoding can help scientists and customs agents identify whether goods came from endangered species. For example, the International Barcode of Life project, an initiative of scientists and conservationists in 25 countries, is creating a global DNA barcode library of species to help in this effort.

Drones | Unmanned aerial vehicles (drones) are increasingly used to gather species and ecosystem data as well as detect potentially illegal activities on both land and at sea. Use of drones to monitor protected areas and indigenous territories, as well as species abundance and movements on land, are relatively well-known and expanding (Shapiro *et al.* 2020). At sea, drones are enabling both fisheries compliance officers and CSOs to increase the reach of their monitoring efforts. Illegal fishing watchdog group Sea Shepherd, for example, has at least one drone onboard its vessels allowing for collection of evidence of illegal activities at a distance. Governments are also deploying drones to help monitor marine protected areas and fishing activity in Belize, the Seychelles, and Australia (Orlowski 2020).

Australia's Queensland Department of Fisheries has been using drones for surveillance since 2019.

Artificial intelligence and data mining | Though less developed than other technologies mentioned, there are ongoing proofs of concept underway to test how AI can be trained to analyze a vast array of input data to detect illegal activity. For example, algorithms can comb official documents such as bill of lading information, invoices, and customs statistics to help flag potential anomalies in trade and shipments for further investigation. Text mining algorithms can also be used to detect language indicating the illegal sale of certain species on social media platforms, as well as be used to identify them in online photos posted to social media and e-commerce platforms to identify trafficking patterns. Finally, with the immense volume of goods moving through ports of entry every day, inspectors are often overwhelmed by the task of scanning all containers for contraband. AI could be a game changer to more consistently, accurately, and efficiently analyze scanned images of luggage or shipping containers, alerting the operator to inspect the container's contents.

It is important to keep in mind that none of these technologies, by themselves, are effective in suppressing nature crime. Too often, attention focuses on the "bright shiny object" of a new platform, tool, or application without considering which tools are right for what purposes and under what conditions; the policy and institutional matrix in which they might or might not be effective; capacity and training needs; and initial and recurrent costs. All of that said, these and other technologies do have the potential to fundamentally sway the odds in the battle against nature crime, if thoughtfully deployed at scale in the context of broader reform, advocacy, and capacity-building strategies.

4.4 — Follow the Money: The Nexus of Conservation and Financial Crimes

Money laundering and other financial crimes are generally an integral element of criminal enterprises engaged in nature crime, and "environmental crime" is designated by the intergovernmental Financial Action Task Force (FATF) as a designated category of "predicate offense" (Wingard and Pascual 2019) for financial crime. Financial transactions related to nature crime are often conducted in cash and use many other forms of subterfuge to reduce the risk of detection by banks and monetary authorities. But eventually, the money must somehow be "laundered" so that proceeds of crime can be used legally.

Often, such laundered proceeds are used to purchase real estate, vehicles, gold, and luxury goods and services, or are placed in seemingly legitimate bank accounts and financial instruments. The ability to identify such proceeds and track them back to their source is one of the most effective and challenging means for the prosecution of nature crime. Tracking laundered money is, however, immensely complex, as it typically moves through a labyrinth of offshore accounts, shell companies, and other complex avenues.

To make matters more complicated, some countries intentionally obscure such transactions within their jurisdictions to either profit from serving as international "tax havens" or to shield their own political leaders and economic elite from legal scrutiny for illegal activities. In most cases, official investigations must obtain information and cooperation from actors in the financial industry, many of whom may not physically reside — or be legally resident — in the country, and may not be eager to cooperate, in order to shield their clients from scrutiny and thereby maintain their business.

Too often in the past, seizures of wildlife, timber, or illegal fishing vessels and their catch occur without any follow-on investigation into the financial avenues associated with the trafficking of those products. A 2017 UNODC report concluded, for example, that globally only 26% of respondents were carrying out financial investigations pursuant to wildlife trafficking seizure cases. The report also found that inter-agency coordination was generally poor. Another study (Wingard and Pascual 2019) reviewed anti-money laundering (AML) laws for their adequacy and applicability to international wildlife trafficking in 110 jurisdictions and found 45 of those to be unsatisfactory. More recently, as the scope of financial flows related to nature crime has become more apparent, official attention has grown, as shown by the nascent attention to wildlife trafficking and other nature crimes by the intergovernmental Financial Action Task Force (FATF 2020) and the Egmont Group of national Financial Intelligence Units (Egmont Group 2021).

FATF's 2020 report on money laundering and the illegal wildlife trade (FATF 2020), which paved the

way for a broader FATF focus in 2021-2022 on environmental crimes, identified some key methods used by those laundering the proceeds of wildlife crime and related risk indicators (methods also very applicable to illegal fishing proceeds and some illegal logging, such as for high-value rosewoods):

- Using front companies to move products and co-mingle legal and illegal product in shipments (such as private zoos and pet stores in the case of wild animal trafficking).
- Registering bank accounts in fake names or utilizing "money mules" — people forced or enticed into allowing their names on accounts to be used for money laundering.
- Using money or value transfer systems where money is deposited or given to an intermediary in one country while associates in another country provide the cash to the recipient.
- Employing encrypted online apps that may be being used to transfer money.
- Using pre-paid cards — iTunes cards, for example — which provide ample opportunity for money launderers to send currency outside countries that can be redeemed for cash or electronic products in foreign countries.

Can donors help CSOs play a stronger role in combating financial crime linked to nature crime? They can, but there are significant barriers. First, only governmental law enforcement agencies, financial intelligence units (FIUs), and banks may legally obtain access to most financial records. CSOs can and do scrutinize anomalies in open-source data on financial flows, corporate ownership, and trade, but they face significant barriers in piercing the veil of corporate and financial system secrecy.

What CSOs *can* do — and what donors should support — is to use what information they *are* able to obtain to educate financial institutions and companies about financial crimes and the financial and reputational risks that banks and firms may face if they do not act. They can also provide information on the latest methods and technologies that financial actors and companies can employ to reduce the risk of nature crime proceeds flowing through their systems.

Liberty Shared — a CSO focused largely on combating human trafficking — is, for example, educating banks about how nature crime functions, and the typologies for how money is moved for these criminal enterprises. Liberty Shared has also collaborated with other CSOs to develop analytical typologies on human trafficking on illegal fishing vessels, the illegal rosewood trade, and ivory trafficking. These typologies are then presented to banks' risk and audit groups or other interested stakeholders. However, it is hard to determine the impact of these typologies on the operating methods or risk analysis processes within the banks. Banks are bound by confidentiality rules and are unable to divulge whether they have taken any steps against individuals based on the typologies presented.

CSOs such as Global Witness (2018) also lobby for systemic legal change to increase transparency in the banking and financial services industry, particularly with respect to the complex and murky barriers to determining "beneficial ownership",[13] since concealment of beneficial ownership is a frequent element of financial crimes linked to conservation and other types of crime (FATF-Egmont Group 2018). Others, notably the U.S.-based National Whistleblower Center, work to strengthen whistleblower laws, and assist whistleblowers and protect them from retaliation, focusing in part on the fossil fuel and forest sectors. United for Wildlife's Financial Task Force has done innovative work to enlist support within the financial services industry. Other groups that focus on combating financial crime more generally have recently turned their attention to the finance elements of nature crime, including the World Economic Forum-hosted Global Coalition to Fight Financial Crime, and the U.S.-based think tank Global Financial Integrity.

Recent work by the CSO TRAFFIC is particularly notable for carefully unpacking the complicated linkages between financial and nature crime. Their recent report *Financial Flows and Payment Mechanisms Behind Wildlife and Forest Crime*

[13] *Beneficial ownership refers to the situation where a person enjoys the benefits of ownership (such as income) although the legal ownership of the property or company generating the benefit is in someone else's name.*

(TRAFFIC 2020) analyses 11 case studies spanning diverse geographies and types of nature crime. This kind of work makes it increasingly difficult for actors in the financial services industry to deny their close involvement, whether unwitting or complicit, in moving and hiding the financial proceeds of nature crime.

Scrutiny of technology and media giants such as Apple, Google, and Facebook/Instagram — already discussed in relationship to their role in facilitating online nature crime — is also increasing with respect to their technologies' growing role in facilitating money laundering and other financial crimes. The widespread diffusion of Apple's technology, for example, has made it possible for money launderers to easily transfer currency and value around the world with minimal risk of detection, via the use of their pre -paid cards.

Donors urgently need to support analysts and campaigners working to pressure these companies from the outside, and work with those open to reform on the inside. These companies need to stop facilitating nature crime and instead use their capacities to expose and suppress it. Facebook in particular has tremendous potential power to create intelligence dossiers on users conducting illegal activity on its platforms that violates its Terms of Service. Beyond whatever voluntary actions such companies might take, new laws are also needed to make social media technology companies take more responsibility for illegal activity occurring on their platforms. At a minimum, the law should at least incentivize them to actively participate in nature crime law enforcement efforts.

Legislation could, for example, require tech companies, social media platforms, and encrypted apps to collect data and report on all suspicious activity indicative of illicit transactions being conducted over their platforms, and could hold companies liable for failing to do so. In many instances, it should be noted, these platforms are also making money while such illicit transactions are being conducted on their platforms, through advertising and/or selling the data they gather to third parties. It is a tricky issue, though, since end-to-end encryption means that many companies cannot in fact access messages on their networks — and this is viewed as good practice by privacy advocates.

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