

**NEW CHALLENGES FOR CRIMINOLOGY IN THE “NEW NORMAL”<sup>1</sup> PHASE  
OF THE RESPONSE TO THE COVID-19 PANDEMIC AND THEREAFTER:  
WILDLIFE TRAFFICKING AS A CYBERCRIME AND A BIOSECURITY  
PROBLEM<sup>2</sup>**

By

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**ABSTRACT:** The measures implemented to control the COVID-19 pandemic caused by the appearance of the SARS-CoV-2 virus have generated a variety of opinions and studies about their influence on behavioral changes in relation to criminal activity. The first studies link variations in the official crime data that have been reported and published by several countries to the increase of cyberactivity due to the transformation and readjustment to the new reality. This implies that criminology will have to face some emerging challenges in the post-COVID-19 era, setting a new stage for researchers. In addition, the current pandemic, in which the trafficking of species is an issue to keep in mind, can be linked to so-called “green criminology.” Given its tradition, methodology and epistemology, this discipline could be consolidated within the field of criminology, which itself includes the fight against cybercrime and the control of biosecurity.

**KEY WORDS:** SARS-CoV-2, *green criminology*, *zoonosis*, *wildlife trafficking*, *new cybercrime opportunities*.

**CONTENTS:** I. INTRODUCTION. II. METHOD. III. NEW OPPORTUNITIES OFFERED BY THE SYSTEMS USED TO CONTROL CYBERCRIME. IV. WILDLIFE TRAFFICKING. V. WHAT CAN BE DONE AGAINST THE TRAFFICKING OF WILDLIFE UNDER CYBERCRIME COVID

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<sup>1</sup> The concept of “new normal” refers to the final phase of the National Spanish Plan to combat the COVID-19 pandemic. This last phase is preceded by three others that regulate from strict confinement to more relaxed measures. The last phase still includes measures and restrictions (attendance to public events, wearing of masks, etc.), it focuses more on the economic crisis, and provides the Autonomous Communities with full power regarding the procurements of health and sanitary provisions, labor contract suspensions, personnel dedicated to the pandemic, treatment of sanitary waste, public transport, etc. See the Royal Decree-law 21/2020, June 9, 2020. <https://www.boe.es/buscar/act.php?id=BOE-A-2020-5895>

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DEVELOPMENTS? VI. THE BIOSECURITY PROBLEM. VII. FURTHER DISCUSSION: THE RELATION BETWEEN BIODIVERSITY LOSS AND POTENTIAL "RISK ZOOSES" AND OTHER HUMAN HEALTH PROBLEMS. VIII. CONCLUSIONS. BIBLIOGRAPHY.

## **NUEVOS RETOS PARA LA CRIMINOLOGÍA EN LA FASE DE "NUEVA NORMALIDAD" DEL PLAN CONTRA LA PANDEMIA COVID-19 Y PARA EL FUTURO: TRÁFICO DE ESPECIES COMO CIBERDELITO Y COMO PROBLEMA DE BIOSEGURIDAD**

**RESUMEN:** Las medidas implementadas con la aparición del virus SARS-CoV-2 han impulsado diferentes estudios y opiniones sobre su influencia en los cambios de comportamiento con relación a la actividad delictiva. Los primeros estudios publicados sobre actividad criminal muestran una variación, que parece ir hacia la transformación y reajuste a la situación actual y que pueden ir hacia una nueva realidad surgida con el aumento de la actividad en la red. La criminología parece que se enfrentará a desafíos emergentes en la era post COVID-19, lo que puede ser un nuevo campo de estudio para los investigadores. Además, la situación de pandemia actual, donde el tráfico de especies es un factor a tener en cuenta, puede vincularse con la denominada "criminología verde," disciplina que podría consolidarse por su tradición, metodología y epistemología como una especialidad de la criminología, que también abarca la lucha contra la ciberdelincuencia y el control de la bioseguridad.

**PALABRAS CLAVE:** SARS-CoV-2, *criminología verde*, *zoonosis*, *tráfico de especies*, *nueva ciberdelincuencia*.

### **I. INTRODUCTION**

In this COVID-19 pandemic global health emergency, analysis of crime by some countries reveals downward trends of such intensity that the figures obtained had never been recorded before in the official data for some types of crime. For example, in Spain, there was a 75% decrease in recorded crime during the first fifteen days of the entry into force of Royal Decree 463/2020, on March 14,<sup>3</sup> through which the state of alarm, a special *status quo* with restriction of rights foreseen by the Spanish Constitution,<sup>4</sup>

<sup>3</sup> <https://www.boe.es/buscar/act.php?id=BOE-A-2020-3692>

<sup>4</sup> This state is regulated by the Spanish Constitution (official English version published in the Spanish Official Journal: <https://www.boe.es/legislacion/documentos/ConstitucionINGLES.pdf>).

Article 116, further detailed by Organic Law 4/1981, June 4, 1981, describes how "state of alarm" should operate as well as which conditions need to be met to have the Government declare it (for a maximum of 15 days), as well as other states/situations that attribute more exceptional powers to the central executive power in the following way:

1. An organic law [a statute that needs more than absolute majority final vote in the lower Chamber of Parliament] shall regulate the states of alarm, emergency and siege (martial law) and the corresponding competences and limitations.
2. A state of alarm shall be declared by the Government, by means of a decree decided upon by the Council of Ministers, for a maximum period of fifteen days. The Congress of Deputies shall be informed and must meet immediately for this purpose. Without their authorization the said period may [sic] not be extended.

was declared for the management of the health crisis due to COVID-19. This downward trend for most types of crime was also confirmed by the official data published for the first six months of the year 2020 (Ministerio del Interior 2020). However, caution is advisable when doing these kinds of analyses, since there is no detailed record for each type of criminal activity; for example, there is no specific data on cybercrimes nor on environmental crimes. This is due to the fact that they both fall under a very general category in which data is specifically offered only for the first ten offenses (such as homicide, murder, kidnapping, sexual indemnity crimes, rape, burglary, car theft, etc.). The final, eleventh category refers to "other crimes." Taking this issue into account, some scholarly analyses based on the data from March 2020, during the full lockdown and confinement period, cite other police sources as denying any increase of online fraud crimes (González 2020).

Additionally, recent research also suggests an increase in some criminal offences encompassed within the computer crime umbrella, such as online fraud or wider cybercrime, even during the strictest periods of lockdown. For example, in the United Kingdom, when referring to citizens' adaptation to the new situation, Buil-Gil *et al.* notice that "the everyday routine activities of millions of individuals have moved from physical to online environments, and opportunities for crime appear to have shifted towards cyber-dependent or cyber-enabled crime" (2020, 10).

If this is what has been really happening, it is legitimate to enquire whether there is a social transformation towards a new criminal format that already exists, but which, in the face of a new reality with greater opportunities to commit crimes, there is evidence of a readjustment. And since this fact seems to be in line with the provisional results published by the said research team (Buil-Gil *et al.* 2020), this could additionally

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The decree shall specify the territorial area to which the effects of the proclamation shall apply.

3. A state of emergency shall be declared by the Government by means of a decree decided upon by the Council of Ministers, after prior authorization by the Congress of Deputies. The authorization for and declaration of a state of emergency must specifically state the effects thereof, the territorial area to which it is to apply and its duration, which may not exceed thirty days, subject to extension for a further thirty-day period, with the same requirements.
4. A state of siege (martial law) shall be declared by absolute majority of the Congress of Deputies, exclusively at the proposal of the Government. Congress shall determine its territorial extension, duration and terms.
5. Congress may not be dissolved while any of the states referred to in the present article remain in operation, and if the Houses are not in session, they must automatically be convened. Their functioning, as well as that of the other constitutional State authorities, may not be interrupted while any of these states are in operation. In the event that Congress has been dissolved or its term has expired, if a situation giving rise to any of these states should occur, the powers of Congress shall be assumed by its Standing Committee.
6. Proclamation of states of alarm, emergency and siege shall not modify the principle of liability of the Government or its agents as recognized in the Constitution and the law.

change the perception of citizens' (in)security, as other scholars assert (Bustos-Aguayo *et al.* 2020). But, once more, one has to be cautious about these results.

For quite a long time, the reliability of the data that is officially recorded and periodically published by the Ministry of the Interior, as well as that of the data retrievable from other sources (police, attorney general office or Ministerio Fiscal, etc.) has been questioned when submitted to careful scrutiny (Serrano Gómez 2011).

Although it is true that a lot of progress has been made in the reliability thereof, there is still controversy. In particular and as it relates to the adaptation of people to the "new normal" brought on by the global COVID-19 pandemic, reference must be made to the illegal trade of wildlife, also known as trafficking of exotic species, which, in most cases, focuses on endangered species explicitly listed in several categories of protection. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (hereinafter CITES)<sup>5</sup> includes the most endangered species (Appendix I of CITES), those species that are not necessarily now threatened with extinction but that may become so unless trade is closely controlled (Appendix II), species that are threatened but only in some countries and not worldwide (Appendix III), or "look alike" species. These are those that are visibly so similar to other species that are endangered or threatened by uncontrolled trade that misidentification becomes common and statistically significant enough to require mechanisms for their control. Such control aims to ensure that when "look-alike" specimens are traded, endangered or threatened species are not hidden and smuggled among them (see Alfino and Roberts 2019).

There is, however, due to COVID-19 (as well as to other animal or human health risks), an additional concern regarding the legal trade of some species since public health might be at risk: that of biosecurity in relation to animal hosts. Increased risk of transmission of viral diseases and microbes from wild to domestic or non-threatened exotic animals has become a central issue. The spreading of such diseases that were originally only presented in wild species (many of which were subject to trade restrictions) has made other animals vectors of transmission, either because of the increase in the loss of biodiversity, because of insects or carriers that are moving to new areas due to climate change, or simply because their trade has increased (in line with the global trade of all sorts of commodities). This certainly contributes to more risks in the spreading of epizooties or zoonoses; or even of new types of zoonoses that could have a serious impact on human health.

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<sup>5</sup> <https://www.cites.org/eng/disc/text.php>

## II. METHOD

There is a need to focus on the crime of wildlife trafficking from a multidisciplinary approach with innovative methodologies in order to address its control in the new COVID and post-COVID-19 era. The ecosystem approach, in particular, is of special interest in order to increase the efficacy of legal frameworks against one of the greatest problems that has been in existence for a long time, and that is the loss of biodiversity due to the illegal wildlife trade. The focus being on trade, this type of crime seems to be inextricably linked to the changes and assimilation of new living conditions as much as to the increase of cybercrime during the pandemic. Therefore, it comes as no surprise to see that this type of criminal activity has readjusted and adapted itself to the new circumstances, just like any other criminal activity (and especially some cybercrimes).

The methodology used to investigate this connection is based on Rob White's (2011; 2017) ideas on international research in environmental and ecological matters of a global nature. His methods to combat transnational environmental crime, which have advanced what is today known as "Eco-global Criminology" (White 2011), fit into this approach because the objective is focused on analysing one of the global dynamics of the Anthropocene with a direct impact on nature. Using the ecosystem with a multilevel analysis of different areas of knowledge is of particular interest since in order to address the link between wildlife trafficking and the current situation, an eco-global vision is required. In order to proceed, this study first describes the research stemming from the works of different scholars that focus on wildlife trafficking, cybercrime and cybermarkets. It also explores both quantitative and qualitative data provided on the issue, with a holistic, integrated approach which includes environmental damage and its consequences for all species as part of the legal and criminal analysis.

At the same time, exposing the link between wildlife trafficking and the appearance of diseases due to human interaction with the environment and to our abuse of natural resources is also a necessity. As mentioned above, the increase of zoonoses and epizootic diseases suggests that we are also witnessing a biosecurity problem, and facing a situation where not only the biodiversity of the planet might be affected, but also human health. Comprehensive solutions with a holistic approach are needed. This methodology, with a clear ecosystem-centred concern, suggests that "green criminology" may be the adequate mechanism to take into account. Green criminology also addresses climate change and its concomitant problems, and what this paper suggests is that it is a valid method through which to analyze illegal trafficking and/or further control of public health.

### **III. NEW OPPORTUNITIES OFFERED BY THE SYSTEMS USED TO CONTROL CYBERCRIME**

The situation arising from COVID-19 has forced governments worldwide to adopt measures to strengthen security systems against new threats such as attacks on the security systems of hospitals or health networks in order to ensure the protection of essential critical facilities and the proper functioning of essential services. The strong demand for certain pharmaceutical and health products, the significant decrease in personal mobility on an international scale, and the global increase of remote working with limitations in terms of computer security due mainly to a lack of training, are just some of the examples cited as factors to be addressed, given that they can stimulate this breeding ground for new criminal opportunities (EUROPOL 2020). As noted by Buil-Gil *et al.* (2020), it is even possible that new data on cybercrime will emerge in the future and show that this trend will continue even after the pandemic.

The increase in cyberattacks has been analysed by INTERPOL (2020). It envisions a scenario where defence mechanisms appear to be unprepared for the intensity of the attacks detected. Confinement measures, including social distancing, have led to the emergence of an unknown or insufficiently explored work format: remote working. In some countries, such as Spain, institutions were not prepared for this radical change, because as indicated in the data provided by Eurostat (2020), the country was at the bottom of the EU list for this labor format. This fact has led to an increase in the use of communications at a global level, promoting scenarios that were already known to cybercriminals, but that have provided them with more criminal opportunities.

The last INTERPOL report lists some types of cyberattacks: malicious domains, data-harvesting malware or disruptive malware, ransomware, and other forms such as business attacks (which are one of the most complicated conducts to detect because the extreme need for key supplies provides cybercriminals with the opportunity to harvest details). It also briefly describes how each of these operates and what the expected future developments are regarding online scams and phishing, the vulnerability stemming from working from home (INTERPOL 2020).

Malware has been one of the most popular forms of attack, at both an individual and corporate level, with a significant increase of malware, spyware and even Trojans being integrated into some of the files received (INCIBE 2020). COVID-19 ransomware has also been one of the problems that has been reported due to the significance and consequences that it could have. The cybersecurity of public companies, especially of the

health sector, was one of the targets of this sort of attack (Ortega Dolz and Pérez Colomé 2020), with the aim of rendering the systems of affected companies or entities inoperative and requesting ransoms (S21sec 2020). Checking installed software and security systems, taking precautions and protecting information were measures already incorporated into the pre-COVID-19 situation (INTERPOL 2020). However, in the face of this type of cyber behavior, the measures recommended by INTERPOL (2020) seem insufficient, since they do not represent any real, effective strategy for dealing with this new scenario.

#### **IV. WILDLIFE TRAFFICKING**

Undoubtedly, one of the issues that has emerged and garnered a strong focus in the media has been the trafficking of wildlife due to its link to SARS-CoV2 (Peretó 2020), which is the root cause of the situation created by COVID-19, as the evolutionary result of the SARS-CoV-2 virus over other species (Andersen *et al.* 2020). For some time now, some criminology experts have emphasised the significance of this type of illegal activity not only for the protection of biodiversity, but also for the well-being of the planet as a whole, going on to criticise the regulatory framework, such as the CITES Convention.

At this point it is pertinent to refer to the concept of "green criminology," originally introduced in 1990 by Michael J. Lynch, which is a perspective that focuses on environmental harms within Criminology. As defined by Gary R. Potter,

Green Criminology is the analysis of environmental harms from a criminological perspective, or the application of criminological thought to environmental issues. As elsewhere in criminology, this means thinking about offences (what crimes or harms are inflicted on the environment, and how), offenders (who commits crime against the environment, and why) and victims (who suffers as a result of environmental damage, and how), and also about responses to environmental crimes: policing, punishment and crime prevention. On a more theoretical level, green criminology is interested in the social, economic and political conditions that lead to environmental crimes; on a philosophical level it is concerned with which types of harms should be considered as 'crimes' and therefore within the remit of a green criminology. (Potter 2012)

Other authors such as Eman, Mesko and Fields (2009, 580) also explain that the term "green criminology" needs a combination of disciplines, and should not be limited to the legal perspective, because Criminology is an empirical science and criminologists use knowledge from multidisciplinary empirical research, where other disciplines can be of great help for the analysis of environmental issues. Pecar was the

first author to propose research about green issues from a criminology perspective, and his work was important for the discipline because a new form of deviation that was based on a new form of causality had appeared in our society (1981, 41).

With the confluence of other disciplines in the research and analysis of environmental issues, the focus from a criminological perspective also gains much more depth (Morelle Hungría 2020, 12); new challenges appear and criminologists can study, from an integrated perspective, their impacts and consequences, which are not only environmental but also social, economic and, of course, legal.

Although the above cited summary by Potter of “green criminology” is quite descriptive, it certainly is a more complex concept that needs further in-depth answers (see e.g. Potter 2012; 2010; and Morelle Hungría 2018; 2019). This complexity and enrichment of what “green criminology” implies leads to the need to innovate the justice system by acknowledging the therapeutic benefits of human-animal interaction (in particular in the domestic context, by caring for animals and animals companionship), and by engaging offenders with communities, countering extremism, and sustaining innovation (see Graham and White 2015). In fact, “green criminology,” from the perspective of the analysis of victimology (see Agnew 2013), has finally started to percolate the broader discipline of Criminology itself. Until then, victimology had been almost exclusively anthropocentric (only humans can be victims), without encompassing the whole ecosystem, other living beings or landscapes, and without even considering the broader social impact that such crimes have (including the economic impact). It is not the aim of this work to expand on these aspects of this new area of knowledge. However, it should be remarked that notwithstanding some efforts in the early 2000s (see Beirne 1999; 2007; 2009), it has not been until quite recently that the notion of victimization of nonhuman animals has been taken more seriously (Flynn and Hall 2017; White 2018). This transgressive approach to the situation of animals is more directly related to animal welfare law than to classic environmental law, in which animals are only studied as species and not as individuals.

Getting back to the topic of this work, illegal wildlife trafficking has certainly been included as one of the hot areas of “green criminology” (Wyatt 2012; 2013; Sollund 2017; 2019) since, as Fajardo del Castillo states when reviewing Sollund’s 2019 book,

legal trade promotes growing exploitation and a parallel illegal trade that instrumentalises it for the laundering of species abducted from nature to pass them off as bred in captivity. The transposition and enforcement of this Convention by states show that free-born animals are considered part of species or as a mere commodity. (Fajardo 2019, 145, translation from Spanish by the author of this work)



Sollund's complete analysis of CITES, an international rule, indeed demonstrates that the anthropocentric logic does not allow us to understand it correctly. "Green ecology" is needed to reach its real meaning and consequences. She approaches CITES rules as the notion of "crime" is approached by classic "green ecology." She admits that "green criminology" is right when it discards "legalistic" definitions of crime and, instead, bases the inquiry on notions of harm, inequality, social exclusion, and suffering and pain. She agrees with the extension of victimology to include nonhuman victims of "green criminology" (Sollund 2017, 5; citing South, Brisman and Beirne 2013, 33; Beirne 2007). However, she insists that despising all legal (versus legalistic) definitions and provisions does not help much, since "to totally discard legal definitions however, would prevent one from seeing how the normative climate in society are reflected through legislation (and wording)" (Sollund 2017, 5). Abandoning legal definitions would make the evaluation of societal efforts to combat criminal conducts very difficult since the ways in which legislation is enforced is an indicator also of the human-animal relationship and can regulate humans' relationship to non-human animals (Nurse 2015). In other words, "analysis of enforcement (or lack of enforcement) can show the influence of general norms on legislation and vice versa and whether duties towards wildlife are respected" (Sollund 2017, 5).

The existing socioeconomic gaps between territories also represent an entire paradigm in the fight against wildlife trafficking since there is evidence of significant differences between high- or middle-income countries and those with fewer economic resources and high poverty rates, which combined with the economic difficulties of some social sectors, may be the cause why this activity survives.

The new challenges that arise after this pandemic are also reflected in the COVID-19 Bio-Logging initiative research project, which will investigate the movements and behaviors of various species of animals over the different phases of the pandemic, in order to analyse the interaction between the human species and wildlife in this atypical situation (Rutz *et al.* 2020).

It would be interesting to know if the international measures implemented to halt the rapid spread of SARS-CoV-2 could have had some impact on wildlife trafficking. If the global situation caused by COVID-19 transformed criminal cyberspace opportunities, it is likely that this also had an effect on wildlife trafficking. There are certainly some factors that have started to draw considerable attention. For instance, one would expect the closing of borders to impact over traffickers' transport of products and their access to markets and customers (Wildlife Justice Commission 2020). However, collected data shows that far from the expected results, new flaws in the system allow wildlife trafficking to continue. Examples of such include changes in aviation from scheduled flights to

unplanned emergency flights, with last minute flight diversions that suggest a corruption of airport personnel; and the increase of poaching incidents during the lockdown period, as criminal networks take advantage of the closing of parks, the reduction of patrols in protected areas, or the reallocation of law enforcement resources to deal with COVID-19 issues (Wildlife Justice Commission 2020). To this we may add new stockpiles of materials/parts of wildlife that are being reported to enable the reactivation of the illegal market as soon as possible (Wildlife Justice Commission 2020; Vives 2020). Another characteristic feature, as Fajardo del Castillo (2018) points out, is facing not only the trafficking of wildlife itself, but also everything that this type of activity generates, including the crimes that can be associated therewith, such as poaching, money laundering or even corruption, as will be discussed below.

The problem is resurfacing now with the pandemic crisis, but there had been some warnings for a long time. For example, from 2017 to 2019, the trafficking of African pangolins into eastern countries increased significantly, and measures aimed at combating the ivory trade, for example, could have been the cause for the increase in the supply of other products, such as pangolin scales (Wildlife Justice Commission 2020, 8), even with the measures against these practices being implemented by the authorities, such as the seizure of over 96 tonnes confiscated in Asia (Krishnasamy and Zavagli 2020).

COVID-19 has had a deep effect on daily routines and therefore on criminal activities as well, given that criminality is frequently entangled and carried out through the exercise and performance of daily non-criminal routine activities. (see Cohen and Felson 1979). Illicit behaviors and their criminal strategies are immersed in social interactions (Cabezas 2017; Arostegui *et al.* 2015; Redondo Illescas 2015). This theory has also been analyzed in "green criminology," since ordinary activities can contribute to various actions that damage nature, as for example polluting and degrading or destroying the environment, all of which decrease the number of species (South 2009). Some behaviors can even contribute to ecocide, that is, to the massive loss of species as a consequence of anthropic activities (Agnew 2013). So, the changes in routine triggered the rapid advancement of cybercriminality, leading to the reappearance of virtual marketplaces, including those used in wildlife trafficking (Mackey *et al.* 2017; Xu *et al.* 2020). The use of social networks and new technologies has been conducive to this readjustment to the current situation; the development of the illegal trade in wildlife is just one click away, the use of social networks being linked to a certain criminogenic effect (Carpio-Domínguez *et al.* 2018). This criminal activity is not unlike that of drug or arms trafficking, operating between 8 and 20 billion euros per year (Ibero Solana and Suárez 2016, 4). However, as these researchers indicate, the legal measures employed to deal with these types of

practices are not as effective as they should be. The increase in the demand for certain species threatens the survival of some species that are already included on special protection lists (WWF España 2018). Some studies indicate a slight decline in the number of daily advertisements of new wildlife products (Xin and Xiao 2019; WWF España 2018), but Xu *et al.* (2020) found that some species are in a critical situation all the more worsened by possibly structured and organized groups (Wyatt *et al.* 2020).

Administrative intervention to implement CITES-related Spanish law is essential to control illegal wildlife trafficking. The 1973 CITES treaty, which entered into force worldwide on January 1, 1975, did so in Spain only on August 28, 1986,<sup>6</sup> almost coinciding with the entry of Spain in the European Union on January 1, 1986. Formally, ratifying CITES had nothing to do with entering the EU, as the EU itself did not become a Party to CITES until 2015 (it took the rest of the Parties more than thirty years to ratify the Gaborone Amendment that allowed for the "regional economic integration organizations," i.e., the Union, along with its member States, to become parties). However, given the changing and shifting nature of the borders of member States (including borders that were supposed to control the entrance, exit or transit of live animals or animal parts), the EU coordinated their implementation of CITES in 1982 through Regulation (EEC) n° 3626/82, December 3, 1982,<sup>7</sup> and then through Regulation (EC) 338/1997 of December 9, 1996,<sup>8</sup> which has been afterwards amended multiple times.

CITES is structured in accordance with a system of commercial permits to verify that parts of, or live, specimens of regulated species of the Appendices can leave, enter a country, or transit through it. With this mechanism, a homogeneous international legal framework is in place to control trafficking. However, different limitations intrinsic to the system have been detected, including, namely, that of resources, economic and human, dedicated and needed to control illegal trafficking and the lack of general awareness of this problem. Also, measures are needed to increase sustainable alternatives to certain practices that may be used in certain communities that resort to this trade as a means of subsistence (Brufao Curiel 2017).

CITES includes the regulation not only of parts, products and derivatives from animals, but also of individual live animals. It should also be noted that one of the worst effects of illegal trafficking is on animal welfare, since the animals instead of travelling in regular transportation vehicles, ships or airplanes, which have strict regulations on the transport conditions based on their welfare, are smuggled, thus precluding usual welfare

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<sup>6</sup> <https://www.boe.es/buscar/doc.php?id=BOE-A-1986-20403>

<sup>7</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A31982R3626>

<sup>8</sup> <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A31997R0338>

standards such as water, tolerable temperatures, spatial requirements, etc. In fact, for traffic to be totally legal, beyond the official permits and the rest of the conditions required by CITES and the Resolutions of the Parties approved in each Conference of the Parties or through special mailing systems of voting, several animal welfare provisions need to be implemented both at departure and destination, as well as during transport or while in transit in a third country (see Mulà Arribas 2015). It lacks adequate provision, though, on live animals that are confiscated by enforcement officials fighting illegal trafficking. For example, in Norway, the resolution is to kill all such confiscated animals (Sollund 2017).

Regarding the intervention of criminal law to combat this illegal activity, the Spanish Criminal Code regulates crimes related to the protection of the environment from Articles 332 to 337, and includes some crimes such as the destruction of, or damage to fauna (Article 332), the introduction of non-native species (Article 333), hunting of non-protected species without legal authorisation (Article 335), the use of poison, explosives or other dangerous instruments to capture animals without having legal authorisation (Article 336), and animal abuse in general, applicable to exotic or wild animals when they are completely under the control of the abuser and not in their wildlife environment (articles 337 ff). Illegal trafficking of protected species itself is *per se* a crime under the Criminal Code (Article 332) and also under another law that regulates illegal smuggling under CITES, mentioning it explicitly (Article 2.2.b) of Organic Act 12/1995, December 12). Other related crimes that are usually committed when engaging in illegal trafficking activities are poaching, money laundering or even corruption, not all of which harm the environment, indeed, but nevertheless consisting in other types of offenses also sanctioned under other rules of the Criminal Code (Fajardo del Castillo 2018). The Spanish system of deposit of live animals confiscated in police enforcement operatives is regulated in Royal Decree 1333/2006, of November 21, 2006, on the fate of confiscated animals under CITES.<sup>9</sup>

For these crimes to be punished (or even for this trade to be considered a crime), a violation of administrative conditions is also required. This “technicality” that the criminal justice system in Spain establishes (that for an activity to be a crime, it is necessary to violate an administrative rule) is called “blank criminal law,” since the criminal code, when defining punishable conduct, remands to the standards set by administrative law.

By way of conclusion, it is clear that efforts to increase the effectiveness of the instruments against this type of illegal trade need to be strengthened. It is now more urgent than ever, perhaps as a consequence of the spreading of COVID-19, since

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<sup>9</sup> <https://www.boe.es/buscar/act.php?id=BOE-A-2006-20847&p=20061130&tn=6>

cyberactivities, including e-commerce, and thus cybercrime have become more usual than ever.

Spain is situated in an ideal position to fight this illegal trade because, given its strategic location, it serves as a geographic transit point for wildlife trafficking. Additionally, it is also one of the countries with the highest number of police and courts seizures (for example of reptile skins) and it is a route of entry for exotic birds. It is therefore necessary to adopt measures not only of national scope, but also of a transnational one (Brufao Curiel 2017; Fajardo del Castillo 2018).

But the pandemic has also raised an additional problem, or rather, it has increased the risk that another pre-existing problem creates in terms of public health. We will return to this biosecurity problem in Section VI further below.

## **V. WHAT CAN BE DONE AGAINST THE TRAFFICKING OF WILDLIFE UNDER CYBERCRIME COVID DEVELOPMENTS?**

The current situation has not only made it very clear that these practices affect biodiversity, the extinction of some species having a great potential ecological impact which will have an effect on the worldwide economy (including the additional biosecurity problem that will be addressed later in sections VI and VII but that is left aside for the moment being).

The effectiveness of the measures implemented by national governments would improve if technological companies would strengthen control measures, given that an increase in the use of some social networks for the acquisition of wildlife through black markets has been detected.

A description of a case that hit the headlines in Spain during the early phases of the pandemic, while there were still generalized confinement rules in place (Europa Press 2020), shows how the use of technologies can, nevertheless, also combat illegal trafficking. Two female lesser white-nosed monkeys (*Cercopithecus petaurista*), Marta and Eider, were stolen from one of the sanctuaries<sup>10</sup> that under the abovementioned Royal Decree 1333/2006, on the fate of confiscated animals under CITES, has a special status. This status consists in that although it is entirely private, it dedicates part of its rescue and rehabilitation efforts and facilities to host and care for primates who, as a

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<sup>10</sup> The Rainfer Primates Rescue Center was founded in 1995 and its work is dedicated to the rescue, rehabilitation and lifelong care of primates in Spain. These primates come from wildlife trafficking and/or exploitation in shows (circuses, advertising and photography), having suffered abandonment and mistreatment.

consequence of CITES implementation operatives, are provisionally seized by the police, and definitively confiscated and removed by the Department of Commerce, or the courts, from the premises, stores, or transport units used by the smugglers. The two stolen monkeys, Marta and Eider, had been part of CITES regulated illegal wildlife trafficking enforcement and had been confiscated in 1999 and placed under the custody of the sanctuary. They were already more than twenty years old in 2020 and had spent there most of their lives (*El País* 2020).

But the monkeys were quickly abandoned by the thieves, and the active, widespread concern for the specimens in social networks probably had much to do with this. The case was, in fact, somewhat absurd, and could be considered an amateurish move, one that was clearly not representative of the sophisticated illegal trafficking typical of criminal organizations as described, for example, by Fajardo del Castillo (2018). However, it reflects the connection between daily-life activities and daily crimes that has been described in the previous sections of this work. The daily use of the Internet and online interaction with other people could have made the thieves think they could easily contact potential buyers. But at the same time, social networks were put to good use by responsible people who knew about the sanctuary, and were extensively used to spread the news and call for everybody to be vigilant, sharing pictures of Marta and Eider (Llanos Martínez 2020). Because of the fuss that was generated and spread through social networks, it would be plausible to hypothesize that the pressure was too much for the thieves to handle, hence their resolution to abandon the monkeys in as transited a space as a bus stop.

Due to the massive use of the web, some companies launched prevention and intervention practices against different types of cybercriminality with very promising results, leading to the closure of open accounts that had been detected for the use of illegal trade. Some big companies are collaborating to create a coalition to end online wildlife trafficking. Already in 2018, some of the world's biggest companies and environmental associations launched the Coalition, with the objective "to reduce wildlife trafficking online on company platforms by 80% by 2020" (TRAFFIC, WWF, IFAW 2020). In 2020 they announced the removal or blocking of three million ads related to wildlife trafficking (WWF 2020). However, some conservation associations and activists indicate that the biggest companies can do much more (Semana Sostenible 2019).

Fighting illegal wildlife trafficking by using the technical advancements of cybercriminology in areas such as money laundering, corruption, tax evasion, dark web markets of illegal commodities (historic or artistic heritage, drugs, etc.), and so on, is not at all new, although it has started to capture the attention of law enforcement authorities in a systemic way not too long ago. One could trace its initial serious steps, as applied to

illegal wildlife trafficking, back to around 2015, when the United Nations Secretary General officially declared on March 3, 2015 that "it's time to get serious about wildlife crime."<sup>11</sup>

Barely a year later, on February 26, 2016, the European Union approved its *EU Action Plan against Wildlife Trafficking*,<sup>12</sup> which includes the obligation of member States "to ensure, in line with international commitments made, that organized wildlife trafficking constitutes throughout the EU a serious crime under the UN Convention against Transnational Organized Crime."

Objective 2.1 of the Plan aims at ensuring more uniform application of EU wildlife trade rules and taking a more strategic approach to controlling and enforcing wildlife trade rules. And, in particular, when addressing the use of the web for illegal trafficking, it formulates as the second action in priority of Objective 2.3 ("Fight organised wildlife crime more effectively") the need to "boost capacity of relevant experts to tackle the links of wildlife trafficking with organised crime, including cybercrime and related illicit financial flows." The expected results should be, by the end of the implementation of the Plan, to have enough "capacity built to tackle online wildlife trafficking within competent units and ensured [*sic*] that channels exist to trigger assistance from units specialised in cybercrime in specific cases (e.g. darkweb investigations, abuse of virtual currencies)."

Other expected results include the "training on investigations into illicit financial flows related to organized wildlife trafficking" and putting wildlife trafficking "on the agenda of the FATF<sup>13</sup> [EU Financial Action Task Force], of CARIN<sup>14</sup> [the UN sponsored Camden Assets Recovery Interagency Network] and of the Egmont Group of Financial Intelligence Units,"<sup>15</sup> requesting from the first one, FATF, in particular, "to prepare guidance on links between money laundering and wildlife trafficking."

In order to implement the 2016 EU Action Plan, Spain started to put in place its own plan (Fajardo del Castillo 2018), which was approved and published in 2018 and started to be applied in 2019. The Plan is known by its initials in Spanish: "Plan TIFIES" - *Plan de Acción Español contra el Tráfico Ilegal y el Furtivismo Internacional de Especies*

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<sup>11</sup> <https://www.un.org/sg/en/content/sg/statement/2015-03-03/secretary-generals-message-world-wildlife-day-scroll-down-french>

<sup>12</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2016) 87 final. Brussels, 26.2.2016. <https://ec.europa.eu/transparency/regdoc/rep/1/2016/EN/1-2016-87-EN-F1-1.PDF>

<sup>13</sup> <https://www.fatf-gafi.org/pages/europeancommission.html>

<sup>14</sup> <https://www.carin.network/>

<sup>15</sup> <https://egmontgroup.org/en>

*Silvestres*.<sup>16</sup> It follows the ecosystem approach and includes measures similar to those of the 2016 *EU Action Plan*, although referring the actions to Spanish enforcement authorities and interested parties (see its objective 2.4). Its implementation is delayed due to the internal reorganization of the administrative and scientific authorities in charge of ensuring the application of CITES in Spain (about this reorganization, see article 9.1.j) and transitional provision number 7, of Royal Decree 500/2020, April 28).<sup>17</sup> There are also ongoing discussions about whether the control and enforcement system should be better managed under administrative law techniques rather than under criminal law ones since criminal law courts have more difficulties and lack enough resources to adequately deal with confiscated live animals (Brufao Curiel 2017; Alonso García 2017).

## VI. THE BIOSECURITY PROBLEM

As advanced at the end of Section IV, the COVID-19 pandemic has also raised an additional problem, or rather, it has increased the risk of another pre-existing one that affects human public health control and management. The increase of illegal wildlife trafficking, both in quantitative and qualitative terms, entails a growing number of wildlife-associated pathogens and diseases. Although the matter is being taken more and more seriously, the resources dedicated to their control are still limited and the management of a large number of diseases and diversity of hosts is “prohibitively expensive” (Hwang *et al.* 2018). Currently, some provisional measures have been taken to curb the public health impacts that the illegal trade in exotic wildlife can generate. There is also a dichotomy between ‘legal’ and ‘illegal’ markets for some species. Given the current situation, some countries have temporarily closed factories and breeding centres for some species. However, this may be an insufficient, as well as a highly controversial measure as it may increase demand for this type of service (Evans 2020).

The impact that human beings have on nature as a result of the abuse of natural resources is such that we are faced with one of the greatest threats to date. Scientists have been warning us for a long time that certain pathogens could contribute to the resurgence or emergence of diseases, many of them almost forgotten, thus threatening the health of the planet. Another indirect impact of this problem is the effect of the pathogens on animals, because it could be hundreds of billions of dollars in damages

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<sup>16</sup> Published in the Official Journal of April 10, 2018. <https://www.boe.es/boe/dias/2018/04/10/pdfs/BOE-A-2018-4891.pdf>

<sup>17</sup> <https://www.boe.es/buscar/doc.php?id=BOE-A-2020-4814>



(Karesh *et al.* 2005). The alteration of ecosystems is actively increasing these risks that are the result of anthropogenic action and that have led to high mortality rates among animal species (Monsalve *et al.* 2009).

The trafficking of wildlife stands as one of the risks linked to the appearance of epizootic diseases and zoonoses (Valvere Fernández *et al.* 2017), and represents a real threat that not long ago seemed very far from our everyday lives. Throughout history, we have had other diseases and outbreaks that have had a strong impact in both human and non-human species (Chomel *et al.* 2007; Pavlin *et al.* 2009). Perhaps initially these consequences seemed unlikely, but the COVID-19 pandemic has ultimately made those risks real and quite factual. There are many species that can serve as a means of transmission through their interaction with the human species. Birds, for example, which are also traded illegally, can be carriers of viruses, bacteria and parasites (Fidalgo 2020). Avian influenza and eastern equine encephalitis are just two examples of these infectious diseases, which even domestic birds like chickens can spread to humans (CDCP 2015). Many more zoonoses pathogens have been identified by Pavlin *et al.* (2009) in their extensive assessment of zoonotic diseases at risk due to imports of animals in the United States (usually referred to as "risk zoonoses").

On the other hand, the fight against those outbreaks might also be affected by the impact of the pandemic on the regulatory framework for medicines and medical products, which has proven to be a weak system since transnational organised crime seems to have easily adapted to the new criminal opportunities. Thus, the manufacture and trafficking of pharmaceutical or health products have been affected by similar behaviors in cyberspace as those present in illegal trafficking of animal parts, products, derivatives and live animals themselves. Fraud, phishing, scams and data manipulation for acquisition of material to combat the pandemic are some of the known cybercrimes that the UNODC (2020) has reported to have been detected online during the health crisis. More particular examples include offers of false cures or miracle drugs and fake campaigns on the shortage of some products necessary for the fight against COVID-19:

Cybercriminals are increasingly preying on people's fear of the COVID19 virus: offering fake cures for sale on the Internet and defrauding through the sale of non-existent hand-sanitizer and medical Personal Protective Equipment (PPE), medicines or hygiene products. Other frauds include the offer of services such as unsound investment advice (including cryptocurrencies) and incorrect medical advice and diagnosis. (UNODC 2020, 2)

The United Nations itself indicates that the transformation of this crime will not cease when a vaccine appears, as criminals may well adapt and target the vaccine trade.

In order to solve these types of issues, global measures that represent an unprecedented change in international cooperation are necessary. We cannot be tempted to ignore countries that do not have the means to deal with this situation. Establishing lines of cyber protection with a global scope will be necessary to halt these transnational activities. Increasing resources in training and implementing means to fight against cybercrime may strengthen the effectiveness of these measures in the current situation.

The training of security forces is essential in this new scenario, which represents a challenge for humanity. INTERPOL is supporting two projects focused on international cooperation to strengthen the reaction capacity in the fight against cybercrime. One of them is the ASEAN project, which includes different actions within a double line of action: proactive and reactive (INTERPOL 2019). Another project that is being carried out in cooperation with the Council of Europe and the European Union (Instrument Contributing to Peace and Stability), is the Global Action on Cybercrime Extended (GLACY+),<sup>18</sup> the aim of which is to increase the capacity of twelve countries. In this case, it focuses on regulatory and judicial aspects, strengthening the measures that can be implemented in these countries with the cooperation of others that have developed effective and efficient instruments against cybercrime (INTERPOL 2017).

In the case of Spain, as far as the movement from and to “third” (non-EU members) countries of live animals species that imply an animal health risk (both of epizootic diseases and of zoonoses) is concerned, the Ministry of Agriculture, Food and Fisheries of the Spanish Government passed on July 16, 2020 a new regulation, Order APA/660/2020.<sup>19</sup> This Order streamlines the controls of imports of animals whose introduction into EU territory is not yet harmonized under European Union law. It sets the necessary mechanisms at the borders to ensure full control of animals that are imported into the territory of the member States and which may bring health risks to domestic animals, local fauna and flora, or humans. Most of the animals the import of which is not harmonized under EU import regulations are animals of exotic species (*Animal's Health* 2020). This type of border control system is very similar to the also recent control system on the entry of potentially invasive allochthonous species (species that might imply a risk for Spanish biodiversity by displacing, hybridizing or simply occupying the ecological niches of endemic local species). This system refers to the actions implemented under article 8 (h) of the Convention on Biological Diversity in order to prevent further global biodiversity loss: “Each Contracting Party shall, as far as possible and as appropriate: . . .

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<sup>18</sup> <https://www.coe.int/en/web/cybercrime/glacyplus>

<sup>19</sup> <https://boe.es/buscar/doc.php?id=BOE-A-2020-8229>

(h) Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.”<sup>20</sup> This control system of invasive species had been regulated a month before by Royal Decree 570/2020, of June 10.<sup>21</sup>

Certainly, their approval was a coincidence in time with the pandemic because both regulations had been drafted and submitted to public participation and environmental and other regulatory assessments since long before.<sup>22</sup> But the pandemic made them clearly even more necessary and gave them both additional meaning.

## **VII. FURTHER DISCUSSION: THE RELATION BETWEEN BIODIVERSITY LOSS AND POTENTIAL “RISK ZONOSSES” AND OTHER HUMAN HEALTH PROBLEMS**

One of the issues that has arisen in the midst of the health crisis is the preservation of biodiversity as an allied measure to confront these types of danger. As has already been stated, viruses, bacteria, parasites and other microorganisms have been present throughout the history of the planet. In principle, loss of biodiversity could either increase or decrease disease transmission since in theory the alteration of nature entails biodiversity loss, and a reduction in the possibilities of facing public health situations by weakening the natural systems, and the hosts, that contain these types of pathogens. But studies from a decade ago started to show scientific evidence of the opposite; that biodiversity loss frequently increases disease transmission (Keesing *et al.* 2010). Impacts related to deforestation, for example, involve establishing contact with species that we previously had no contact with, and the same happens when other wildlife habitats are destroyed by human action. Wildlife trade exposes people to pathogens carried by the animal host or vector, either through the consumption of their meat or through mere physical contact with them. Climate change, with its effects on the weather (temperature, humidity, etc.), is changing the migratory patterns of vector and host species, thus spreading microorganisms and causing outbreaks and the emergence or re-emergence of diseases (Suárez *et al.* 2020), further deepening this existing imbalance caused by our species (Morelle Hungría 2019). We see how species are appearing in territories where they had never previously been found. With the thawing of the permafrost and of the poles, pathogens may appear where they were believed to

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<sup>20</sup> <https://www.cbd.int/convention/articles/?a=cbd-08>

<sup>21</sup> <https://www.boe.es/buscar/act.php?id=BOE-A-2020-7277>

<sup>22</sup> See legal opinions of the Council of State 672/2019 (<https://www.boe.es/buscar/doc.php?id=CE-D-2019-672>) and 720/2019 (<https://www.boe.es/buscar/doc.php?id=CE-D-2019-720>).

have disappeared; even pathogens unknown to our species to date may emerge (Fidalgo 2020).

Comprehensive measures are necessary to address the complexity of such a situation, on a planet where the relationships between the different species are directly or indirectly connected. Mechanisms with that holistic perspective, including measures against climate change and the mitigation of its effects, are needed in order to face the current situation.

## VIII. CONCLUSIONS

In the course of the existing pandemic and a situation of global crisis that not only affects health, it seems that the opportunities generated by the use of information technology have opened up a new arena in criminology. This is not so much because of the appearance of new behaviors, but due to the readjustment to the current situation.

Given this juncture, institutions and governments need to readjust the data provided in terms of crime. Establishing a new classification system in the information provided seems to be a good measure, as the types of crime that we are discussing are being ignored in current times, given that the category of "other crimes" remains too broad and does not address the type of crimes that are the subject of this work. Wildlife trafficking is one of the activities that demands particular attention insofar as to how it is being influenced by the pandemic. The data provided comes mostly from conservationist or nature protection associations or institutions. The link between this type of crime and organized crime, and the need to safeguard public health, are some of the reasons that justify this demand. Likewise, the link between the illegal and legal trade in protected species and the use of social networks also demands more attention from a cybercrime legal framework. Thus, measures must be triply focussed on regulatory efficiency, administrative efficiency and international cooperation, in order to more effectively combat this commercial activity, which entails much more than just environmental or ecological damage (Brufao Curiel 2017). To this, we can add the training plans for security forces that have been discussed above and that have led to positive results. The role of conservationist or non-governmental organisations in environmental protection should not be overlooked; they are key in environmental education and should be taken into account to promote extracurricular programmes on the importance of guaranteeing the proper sustainable use of natural resources and of nature itself.

This type of illegal activity not only poses a threat to biodiversity - there are social and economic factors, as well as public health issues, of considerable urgency that

must determine the type of measures and mechanisms needed. Coordination and cooperation at a global level is essential for the designing of efficient cybersecurity protection projects that, among other things, focus on biosecurity.

Green criminology can be an ally in this long-awaited increase in regulatory effectiveness. It is certainly true that it has not been taken into account by the legislator or even included in any part of the specialized doctrine. However, it is possible to link this perspective with that necessary readjustment for the preservation and conservation of wildlife (Wyatt 2013). Likewise, this discipline's broad understanding of environmental crimes must be taken into account, in view of the environmental and social damages that an activity can cause. This holistic, integrated, ecosystem and transnational vision is part of the methodology and epistemology that has been used and can be useful in dealing with this problem from the perspective of green criminology.

Fortunately, the seed was already there in the pre-COVID-19 plans of the European Union and of the Spanish Government, but the path from the planning stage to real efficiency is an arduous one. The techniques to combat cybercrime and other similar crimes should be streamlined in the calendar and strengthened in a coordinated manner.

## **BIBLIOGRAPHY**

- Agnew, R. 2013. "The Ordinary Acts that Contribute to Ecocide: A Criminological Analysis." In *Routledge International Handbook of Green Criminology*, edited by N. South, N. and A. Brisman, 58-72. Routledge.
- Alfino, S., and D. L. Roberts. 2019. "Estimating Identification Uncertainties in CITES 'Look-Alike' Species." *Global Ecology and Conservation* 18: e00648. doi: 10.1016/j.gecco.2019.e00648
- Alonso García, E. 2012. *Introduction to International Environmental Law: Handbook with Cases and Materials for American Lawyers. Friends of Thoreau Program Series Nº 1, 3<sup>rd</sup> ed.*, Instituto Universitario de Estudios Norteamericanos, Universidad de Alcalá. Servicio de Publicaciones de la Universidad Rey Juan Carlos.
- . 2017. "Ficción y realidad en la implementación de las normas animales de protección de animales de compañía." Lecture presented at the Curso de Derecho animal en el ámbito administrativo, Colegio de Abogados de Valencia, Nov. 5.
- Andersen, K. G., A. Rambaut, W. I. Liplin, E. C. Holmes, and R. F. Garry. 2020. "The Proximal Origin of SARS-CoV-2." *Nature Medicine* 26: 450-452. doi: 10.1038/s41591-020-0820-9

- Animal's Health*. 2020. "Agricultura actualiza los requisitos sanitarios para importar especies exóticas." *Animal's Health*, Jul. 21. Accessed Sept. 27, 2020. <https://www.animalshealth.es/politica/agricultura-actualiza-requisitos-sanitarios-importar-especies-exoticas>
- Arostegui Moreno, J., L. M. Díaz Cortés, A. García Alfaraz, P. Puente Guerrero, M. J. Rodríguez Mesa, and F. Santa Cecilia García. 2015. *Introducción a la Criminología*, 2<sup>nd</sup> ed., edited by F. Pérez Barros, and coordinated by L. M. Díaz Cortés. Ratio Legis.
- Beirne, P. 1999. "For a Nonspeciesist Criminology: Animal Abuse as an Object of Study." *Criminology* 37 (1): 117-148. doi: 10.1111/j.1745-9125.1999.tb00481.x
- . 2007. "Animal Rights, Animal Abuse and Green Criminology." In *Issues in Green Criminology: Confronting Harms Against Environments, Humanity and Other Animals*, edited by P. Beirne and N. South, 55-87. Routledge.
- . 2009. *Confronting Animal Abuse: Law, Criminology, and Human-Animal Relationships*. Rowman & Littlefield.
- Brufao Curiel, P. 2017. "Propuestas jurídicas y administrativas sobre el Convenio CITES y el tráfico internacional de vida silvestre en Europa y España." *Actualidad Jurídica Ambiental* 74: 1-8.
- Buil-Gil, D., F. Miró-Llinares, A. Moneva, S. Kemp, and N. Díaz-Castaño. 2020. "Cybercrime and Shifts in Opportunities During COVID-19: A Preliminary Analysis in the UK." *European Societies*. doi: 10.1080/14616696.2020.1804973
- Bustos-Aguayo, J. M., C. García-Lirios, and M. Juárez-Najera. 2020. "Percepción de seguridad frente a la COVID-19." *Revista de Investigación Académica Sin Frontera* 13 (32): 1-20.
- Cabezas, S. 2017. "Aproximación a las principales teorías de la criminología medioambiental." *Quadernos de Criminología* 37. Accessed August 13, 2020. <https://revistaqdc.es/aproximacion-a-las-principales-teorias-de-la-criminologia-medioambiental>
- Carpio-Domínguez, J. L., C. M. Vargas-Orozco, M. Meraz-Esquivel, and K. Villarreal-Sotelo. 2018. "Las redes sociales como factor criminógeno de la venta ilegal de especies en Tamaulipas (México): el caso de Facebook." *CienciaUAT* 13 (1): 19-34.
- CDCP, Center for Disease Control and Prevention. 2015. "Asian Avian Influenza A (H5N1). Highly Pathogenic Avian Influenza A (H5N1) in Birds and Other Animals." Accessed Aug. 13, 2020. <https://www.cdc.gov/flu/avianflu/h5n1-animals.htm>

- Chomel, B., A. Belotto, and F. Meslin. 2007. "Wildlife, Exotic Pets, and Emerging Zoonoses." *Emerging Infectious Diseases* 13 (1): 6. doi: 10.320/eid1301.060480
- Cohen, L. E., and M. Felson. 1979. "Social Change and Crime Rate Trends: A Routine Activity Approach." *American Sociological Review* 44 (4): 588-608.
- El País*. 2020. "En busca de Marta y Eider, dos primates robadas de un centro de rescate madrileño." *El País*, May 15. Accessed Sept. 12, 2020. <https://elpais.com/espana/madrid/2020-05-15/en-busca-de-marta-y-eider-dos-primates-robadas-de-un-centro-de-rescate-madrileno.html>
- Eman, K., G. Mesko, and C. B. Fields. 2009. "Crimes Against the Environment: Green Criminology and Research Challenges in Slovenia." *VARSTVOSLOVJE, Journal of Criminal Justice and Security* 11 (4): 574-592.
- Europa Press. 2020. "Roban dos primates ancianas de un centro de rescate de Fuente el Saz." *La Vanguardia*, May 15. Accessed Sept. 17, 2020. <https://www.lavanguardia.com/local/madrid/20200515/481151843806/roban-dos-primates-ancianas-de-un-centro-de-rescate-de-fuente-el-saz.html>
- EUROPOL. 2020. *Pandemic Profiteering: How Criminals Exploit the COVID-19 Crisis*. European Union Agency for Law Enforcement Cooperation. [https://www.europol.europa.eu/sites/default/files/documents/pandemic\\_profiteering-how\\_criminals\\_exploit\\_the\\_covid-19\\_crisis.pdf](https://www.europol.europa.eu/sites/default/files/documents/pandemic_profiteering-how_criminals_exploit_the_covid-19_crisis.pdf)
- Eurostat. 2020. *Eurostat*. Accessed Aug. 11, 2020. <https://ec.europa.eu/eurostat/web/digital-economy-and-society/data/database>
- Evans, S. 2020. "El coronavirus y el comercio ilegal de fauna." *National Geographic España*, Mar. 26. Accessed August 10, 2020. [https://www.nationalgeographic.com.es/ciencia/coronavirus-y-comercio-ilegal-fauna\\_15366](https://www.nationalgeographic.com.es/ciencia/coronavirus-y-comercio-ilegal-fauna_15366)
- Fajardo del Castillo, T. 2018. "El plan de acción español contra el tráfico ilegal y el furtivismo internacional de especies silvestres." *Revista General de Derecho Animal y Estudios Interdisciplinarios de Bienestar Animal / Journal of Animal Law & Interdisciplinary Animal Welfare Studies* 1: RI §420414.
- . 2019. Review of *The Crimes of Wildlife Trafficking: Issues of Justice, Legality and Morality* by R. A. Sollund. *International Journal for Crime, Justice and Social Democracy* 8 (3): 105-107.
- Fidalgo, P. 2020. "La destrucción de hábitats y el tráfico ilegal de especies favorecen zoonosis como el COVID-19." *El Plural*, May 1. Accessed Aug. 13, 2020. [https://www.elplural.com/leequid/voces/destruccion-habitats-trafico-ilegal-especies-favorecen-zoonosis-covid-19\\_238947102](https://www.elplural.com/leequid/voces/destruccion-habitats-trafico-ilegal-especies-favorecen-zoonosis-covid-19_238947102)

- Flynn, M., and M. Hall. 2017. "The Case for A Victimology of Nonhuman Animal Harms." *Contemporary Justice Review* 20 (3): 299-318. doi: 10.1080/10282580.2017.1348898
- González, A. 2020. "Crisis COVID-19 y delincuencia ¿Qué ha cambiado y qué cambiará?" Universidad a Distancia de Madrid. Accessed Aug. 10, 2020. <https://www.udima.es/es/articulo-delincuencia-criminologia-coronavirus-por-abel-garcia.html>
- Graham, H., and R. White. 2015. *Innovative Justice*. Routledge.
- Hwang, J., K. Lee, D. Walsh, S. W. Kim, J. M. Sleeman, and H. Lee. 2018. "Semi-quantitative Assessment of Disease Risks at the Human, Livestock, Wildlife Interface for the Republic of Korea Using a Nationwide Survey of Experts: A Model for Other Countries." *Transboundary and Emerging Diseases* 65 (1): e155-e164. doi: 10.1111/tbed.12705
- Ibero Solana, C., and L. Suárez. 2016. *El negocio de la extinción en España*. WWF España. [http://awsassets.wwf.es/downloads/wwf\\_negocioextincionespana\\_final\\_2.pdf](http://awsassets.wwf.es/downloads/wwf_negocioextincionespana_final_2.pdf). Accessed Aug. 14, 2020.
- INCIBE, Instituto Nacional de Ciberseguridad. 2020. "Distribución de malware vinculado a Covid-19 suplantando varias empresas." Accessed Aug. 13, 2020. <https://www.incibe.es/protege-tu-empresa/avisos-seguridad/distribucion-malware-vinculado-covid-19-suplantando-varias>
- INTERPOL. 2017. *GLACY+ International Workshop on Criminal Justice Statistics on Cybercrime and Electronic Evidence*. The European Union and the Council of Europe. Accessed Aug. 13, 2020. <https://rm.coe.int/report-criminal-justice-statistics-cyber-ee-ghana/16809676a2>
- . 2019. "ASEAN Cyber Capacity Development Project." Accessed Aug. 11, 2020. <https://www.interpol.int/es/Delitos/Ciberdelincuencia/Formacion-sobre-ciberdelincuencia-para-los-servicios-policiales/ASEAN-Cyber-Capacity-Development-Project>
- . 2020. "Global Landscape on COVID-19 Cyberthreat." INTERPOL General Secretariat. Accessed Aug. 13, 2020. <https://www.interpol.int/es/content/download/15217/file/Global%20landscape%20on%20COVID-19%20cyberthreat.pdf?inLanguage=eng-GB>
- Karesh, W. B., R. Cook, E. L. Bennett, and J. Newcomb. 2005. "Wildlife Trade and Global Disease Emergence." *Emerging Infectious Diseases* 11 (7): 1000-1002. doi: 10.3201/eid1107.050194



- Keesing, F., L. K. Belden, P. Daszak, A. Dobson, C. D. Harvell, R. D. Holt, P. Hudson, A. Jolles, K. E. Jones, C. E. Mitchell, S. S. Myers, T. Bogich, and R. S. Ostfeld. 2010. "Impacts of Biodiversity on the Emergence and Transmission of Infectious Diseases." *Nature* 468: 647-652. doi: 10.1038/nature09575
- Krishnasamy, K., and M. Zavagli. 2020. *Southeast Asia: At the Heart of Wildlife Trade*. TRAFFIC, Southeast Asia Regional Office. <https://www.traffic.org/site/assets/files/12648/sea-traps-february-2020.pdf>
- Llanos Martínez, H. 2020. "Detenido un hombre de 23 años por el robo de Marta y Eider, dos primates de un centro de rescate madrileño." *El País*, June 4. Accessed Sept. 12, 2020 <https://elpais.com/espana/madrid/2020-06-04/detenido-un-hombre-de-23-anos-por-el-robo-de-marta-y-eider-dos-primates-de-un-centro-de-rescate-madrileno.html>
- Lynch, M. J. 1990. "The Greening of Criminology: A Perspective on the 1990s." *The Critical Criminologist* 2 (3): 3-12. Also reprinted in 2006 as Chapter 7 of *Green Criminology*, edited by N. South. Routledge. doi: 10.4324/9781315093390 <https://www.taylorfrancis.com/books/e/9781315093390>
- Lynch, M. J., M. A. Long, P. B. Stretesky, and K. L. Barrett. 2017. *Green Criminology: Crime, Justice, and the Environment*. University of California Press.
- Mackey, T., J. Kalyanam, T. Katsuki, and G. Lanckriet. 2017. "Twitter-Based Detection of Illegal Online Sale of Prescription Opioid." *American Journal of Public Health* 107 (12): 1910-1915. doi: 10.2105/AJPH.2017.303994
- Ministerio del Interior. 2020. "Balance de criminalidad, 2º semestre." <http://www.interior.gob.es/documents/10180/11389243/Balance+de+Criminalidad+Segundo+Trimestre+2020.pdf/4edb6d45-8761-4730-aafe-a8ef2bc96181>
- Monsalve, S., S. Mattar, and M. González. 2009. "Zoonosis transmitidas por animales silvestres y su impacto en las enfermedades emergentes y reemergentes." *Revista MVZ Córdoba* 14 (2): 1762-1773.
- Morelle Hungría, E. 2018. "Posidonia oceanica: destrucción por fondeos y su concepción como delito ambiental en las Illes Balears." *Actualidad Jurídica Ambiental* 78: 44-71.
- 2019. "Crimen y cambio climático: una mirada desde la Criminología verde." *Quórum: Revista de artes, letras e ciencias sociais e jurídicas* 2: 11-25. doi: 10.5281/zenodo.3748704
- 2020. "Ecocriminología, la necesaria visión ecosistémica en el siglo XXI." *Revista Electrónica de Criminología* 03 (2): 1-14.

- Mulà Arribas, A. 2015. "Protection of Animals in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)." Master's Thesis, Universidad Internacional de Andalucía.
- Nurse, A. 2015. *Policing wildlife: Perspectives on the enforcement of wildlife legislation*. Palgrave.
- Ortega Dolz, P., and J. Pérez Colomé. 2020. "La policía detecta un ciberataque al sistema informático de los hospitales." *El País*, Mar. 23. Accessed Aug. 13, 2020. <https://elpais.com/espana/2020-03-23/la-policia-detecta-un-ataque-masivo-al-sistema-informatico-de-los-hospitales.html>
- Pavlin, B., L. M. Schloegel, and P. Daszak. 2009. "Risk of Importing Zoonotic Diseases through Wildlife Trade." *Emerging Infectious Diseases* 15 (11): 1721-1726. doi: 10.3201/eid1511.090467
- Pecar, J. 1981. "Ekoloska kriminaliteta in kriminologija." *Revija za kriminalistiko in kriminologijo* 34 (1): 33-45.
- Peretó, J. 2020. "La COVID19 y el lado oscuro de la promiscuidad de la vida." *Métode* 105. Accessed Aug. 11, 2020. <https://metode.es/revistas-metode/opinio-revistas/la-covid-19-y-el-lado-oscuro-de-la-promiscuidad-de-la-vida.html>
- Potter, G. 2010. "What is Green Criminology?" *Sociology Review* (November): 8-12. <http://www.greencriminology.org/monthly/WhatIsGreenCriminology.pdf>
- . 2012. "What is Green Criminology?" *Green Criminology*. Accessed Oct. 17, 2020. <http://greencriminology.org/about-green-criminology/>
- Redondo Illescas, S. 2015. *El origen de los delitos*. Tirant lo Blanc.
- Rutz, C., M. C. Loretto, A. E. Bates, S. C. Davidson, C. M. Duarte, W. Jetz, M. Johnson, A. Kato, R. Kays, T. Mueller, R. B. Primack, Y. Ropert-Coudert, M. A. Tucker, M. Wikelski, and F. Cagnacci. 2020. "COVID-19 Lockdown Allows Researchers to Quantify the Effects of Human Activity on Wildlife." *Nature: Ecology & Evolution* 4: 1156-1159. doi: 10.1038/s41559-020-1237-z
- S21sec. 2020. *Threat Landscape Report*. First Semester. July 2020. Available, under request, by S21sec cybersesecurity corporation and network in the following webpage: <https://www.s21sec.com/es/threat-landscape-report-es/>
- Semana Sostenible. 2019. "Redes sociales incrementan el tráfico ilegal de fauna silvestre." *Semana*. Accessed Aug. 13, 2020. <https://sostenibilidad.semana.com/medio-ambiente/articulo/redes-sociales-incrementan-el-trafico-ilegal-de-fauna-silvestre/47046>
- Serrano Gómez, A. 2011. "Dudosa fiabilidad de las estadísticas policiales sobre la criminalidad en España." *Revista de Derecho Penal y Criminología* 3ª Época (6): 425-454.

- Sollund, R. 2017. "Legal and Illegal Theriocide of Trafficked Animals". In *The Palgrave International Handbook of Animal Abuse Studies*, edited by J. Maher, H. Pierpoint, and P. Bernie, 453-474. Palgrave Macmillan.
- . 2019. *The Crimes of Wildlife Trafficking. Issues of Justice, Legality and Morality*. Routledge. doi: 10.4324/9781315550428
- South, N. 2009. "Ecocide, Conflict and Climate Change: Challenges for Criminology and the Research Agenda in the 21<sup>st</sup> Century." Chapter 2. 37.54. In *Eco-crime and Justice: Essays on Environmental Crime*, edited by K. Kangaspunta and I. H. Marshall, 37-53. UNICRI, United Nations Interregional Crime and Research Institute.
- South N., A. Brisman and P. Beirne. 2013. "A guide to a green criminology." In *The Routledge International Handbook of Green Criminology*, edited by N. South and A. Brisman, 27-42. Routledge.
- Suárez, L., M. Asunción, L. Rivera, I. Pratesi, M. Galaverni, and M. Antonelli. 2020. *Pérdida de naturaleza y pandemias. Un planeta sano por la salud de la humanidad*. WWF España. [https://wwfes.awsassets.panda.org/downloads/naturaleza\\_y\\_pandemias\\_wwf.pdf](https://wwfes.awsassets.panda.org/downloads/naturaleza_y_pandemias_wwf.pdf)
- TRAFFIC, WWF, IFAW. 2020. *Offline and in the Wild. A Progress Report of the Coalition to End Wildlife Trafficking Online*. <https://static1.squarespace.com/static/5b53e9789772ae59ffa267ee/t/5e5c32496b59fb4dac1baf55/1583100496539/Offline+and+In+the+Wild+-+Coalition+2020+Progress+Report.pdf>
- UN, United Nations. 2020. "Para evitar más pandemias se necesita controlar el tráfico ilegal de fauna y flora silvestre." Accessed Aug. 12, 2020. <https://news.un.org/es/story/2020/07/1477241>
- UNODC, United Nations Office on Drugs and Crime. 2020. *Cybercrime and COVID-19: Risks and Responses*. [https://www.unodc.org/documents/Advocacy-Section/UNODC\\_-\\_CYBERCRIME\\_AND\\_COVID19\\_-\\_Risks\\_and\\_Responses\\_v1.2\\_-\\_14-04-2020\\_-\\_CMLS-COVID19-CYBER1\\_-\\_UNCLASSIFIED\\_BRANDED.pdf](https://www.unodc.org/documents/Advocacy-Section/UNODC_-_CYBERCRIME_AND_COVID19_-_Risks_and_Responses_v1.2_-_14-04-2020_-_CMLS-COVID19-CYBER1_-_UNCLASSIFIED_BRANDED.pdf)
- Valvere Fernández, D., J. M. Sánchez-Vizcaíno, and M. Martínez Avilés. 2017. "Repercusiones sanitarias del tráfico ilegal de aves silvestres." *Revista Complutense de Ciencias Veterinarias* 11 (2): 25.
- Vives, J. 2020. "La crisis mundial por la Covid-19 dificulta pero no hace desaparecer el tráfico de especies." *La Vanguardia*, May 4. Accessed Aug. 14, 2020. <https://www.lavanguardia.com/natural/20200504/48827658289/coronavirus-dificulta-no-frena-trafico-especies.html>

- White, R. 2011. *Transnational Environmental Crime. Toward an Eco-global Criminology*. Routledge.
- . 2018. "Green Victimology and Non-human Victims." *International Review of Victimology* 24 (2): 239-255. doi: 10.1177/0269758017745615
- Wildlife Justice Commission. 2020. *Rapid Assessment of the Impact of COVID-19 on Wildlife Trafficking*. [https://wildlifejustice.org/wp-content/uploads/2020/04/WJC\\_Impact-of-COVID19-on-wildlife-trafficking\\_April2020.pdf](https://wildlifejustice.org/wp-content/uploads/2020/04/WJC_Impact-of-COVID19-on-wildlife-trafficking_April2020.pdf)
- WWF, World Wildlife Fund. 2020. *Empresas tecnológicas eliminan 3 millones de anuncios en Internet relacionados con tráfico ilegal de vida silvestre*. Accessed Aug. 13, 2020. <https://www.worldwildlife.org/press-releases/empresas-tecnologicas-eliminan-3-millones-de-anuncios-en-internet-relacionados-con-trafico-ilegal-de-vida-silvestre>
- Wyatt, T. 2012. *Green Criminology and Wildlife Trafficking: The Illegal Fur and Falcon Trades in Russia Far East*. Lambert Academic Publishing.
- . 2013. *Wildlife Trafficking. A Deconstruction of the Crime, the Victims and the Offenders*. Palgrave Macmillan.
- Wyatt, T., D. van Uhm, and A. Nurse. 2020. "Differentiating Criminal Networks in the Illegal Trade: Organized, Corporate and Disorganized." *Trends in Organized Crime*. doi: 10.1007/s12117-020-09385-9
- Xin, W., and Y. Xiao. 2019. *Wildlife Cyber Crime Trends in China. Online Monitoring Results 2017-2018*. Traffic Briefing. [https://www.traffic.org/site/assets/files/12116/wildlife\\_cyber\\_crime\\_trends\\_in\\_china.pdf](https://www.traffic.org/site/assets/files/12116/wildlife_cyber_crime_trends_in_china.pdf)
- Xu, Q., M. Cai, and T. K. Mackey. 2020. "The Illegal Wildlife Digital Market: An Analysis of Chinese Wildlife Marketing and Sale on Facebook." *Environmental Conservation* 47 (3): 206-212. doi: 10.1017/S0376892920000235