
An Assessment of Tonry and Farrington's Four Major Crime Prevention Strategies as Applied to Environmental Crime and Harm

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Purpose:

To apply the findings and debates arising from the “mainstream” literature on crime prevention to the increasingly urgent issue of crimes and harms that damage the environment. This is also a missing dimension in the rapidly growing field of green criminology.

Design/Methods/Approach:

The method is literature review, including analysis and synthesis of earlier summaries and typologies. Search and selection was aimed at identifying different forms of and strategies for crime prevention that might then be applied to environmental harms and crimes. This leads to a discussion of key findings and models in relation to the theoretical and practical concerns of green criminology.

Findings:

Examining theory and practice concerning the prevention of environmental crimes and harms opens up important new questions and projects for criminology. The framework explored holds promise but in the future a passive prevention approach will need to be supplemented by active interventions to discourage environmentally damaging behaviours.

Research Limitations/Implications:

The process of studying prevention of environmental crimes and harms is still in its infancy and requires further work. It is clear that there are obstacles both to further research and to implementation of measures, however, due to the fact that powerful commercial and political interests may not wish to draw attention to such crimes and harms, may prefer light-touch systems of regulation, and may contest attempts to publicise or prosecute offences.

Practical Implications:

Measures taken to protect persons and property have a long history but a focus on how to prevent individuals and groups from committing crime is more recent. Green criminologists frequently extend their concerns beyond crime and harm covered by existing (criminal) law and, as such, the prevention

of environmental harm and crime is broad in scope and more difficult to effect. Furthermore, such harm and crime is frequently not viewed as "real" crime and not "valued" sufficiently by the law, which also impedes efforts to prevent its occurrence. The more that traditional crime prevention agendas, practice and literature incorporate the subject of the environment, the more effective future efforts may be.

Originality/Value:

It has been argued that if we compare rates of "ordinary crime" to environmental harms and crimes, the latter would significantly outnumber the former (Lynch, 2013). Yet although there is a substantial literature on "ordinary crime prevention", there is relatively little discussion in the literature about the application of crime prevention approaches to environmental harms and crimes. This is one of very few reviews of this field and therefore makes a contribution to theory and practice in both mainstream and green criminology, which have both neglected this topic.

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Keywords: crime prevention, environmental crime, environmental harm, green criminology, strategies, typologies

Ocena štirih glavnih strategij preprečevanja kriminalitete Tonryja in Farringtona, uporabljenih pri ekološki kriminaliteti in okoljski škodi

Namen prispevka:

Namen prispevka je uporaba ugotovitev in razprav, ki izhajajo iz sodobne literature o preprečevanju kriminalitete pri vse bolj nujnem vprašanju kriminalitete in škod, ki ogrožajo okolje. To je tudi manjkajoča dimenzija na področju hitro razvijajočega se področja ekološke kriminologije.

Metode:

Uporabili smo pregled literature, vključno z analizo in sintezo predhodnih povzetkov in tipologij. Iskanje in izbor sta bila namenjena prepoznavanju različnih oblik in strategij preprečevanja kriminalitete, ki bi jih lahko nato uporabili na primerih okoljske škode in kriminalitete zoper okolje. To vodi k razpravi o ključnih ugotovitvah in modelih v povezavi s teoretičnim in praktičnim preučevanjem ekološke kriminologije.

Ugotovitve:

Pregled teorije in prakse o preprečevanju kriminalitete zoper okolje in okoljske škode odpira za kriminologijo nova pomembna vprašanja in projekte. Raziskani okvir je obetajoč, vendar pa bo treba v prihodnosti pasiven pristop k preprečevanju dopolniti z aktivnimi posegi za odvrčanje okolju škodljivih vedenj.

Omejitve/uporabnost raziskave:

Proces preučevanja preprečevanja kriminalitete zoper okolje in okoljske škode je še vedno v povojih in potrebuje nadaljnje delo. Jasno je, da obstajajo ovire, tako

za nadaljnje raziskovanje kot tudi za izvajanje ukrepov. Zaradi dejstva, da močni trgovski in politični interesi ne želijo pritegniti pozornosti do takšnih zločinov in škode, le-ti dajejo prednost "milim" sistemom regulacije in lahko izpodbijajo poskuse medijskih objav ali pregona kaznivih dejanj.

Praktična uporabnost:

Ukrepi, ki so bili sprejeti za zaščito oseb in premoženja, imajo dolgo zgodovino, toda poudarek na tem, kako posameznikom in skupinam preprečiti storitev kaznivega dejanja, je novejši. Ekološki kriminologi svoje pomisleke pogosto razširijo onstran kriminalitete in škode, ki jo pokriva obstoječe (kazensko) pravo, zato je področje preprečevanja okoljske škode in kriminalitete široko glede obsega in še težje glede učinkovitosti. Poleg tega takšna škoda in kriminaliteta pogosto nista dojeti kot "pravi" kriminal in ju zakon ne "ceni" dovolj, kar prav tako ovira prizadevanja za preprečevanje njenega pojava. Bolj kot bodo tradicionalni načrti preprečevanja kriminalitete, praksa in literatura vključevali okolje kot predmet, bolj bodo prihodnja prizadevanja lahko učinkovita.

Izvirnost/pomembnost prispevka:

Lynch (2013) navaja, da če primerjamo stopnjo "običajne kriminalitete" z okoljsko škodo in ekološko kriminaliteto, bi slednje znatno prekašalo prejšnje. Vendar kljub temu, da obstaja izdatna literatura o "preprečevanju običajne kriminalitete", je v njej razmeroma malo razprave o uporabi pristopov preprečevanja kriminalitete v primerih ekološke kriminalitete in okoljske škode. To je eden od redkih pregledov na tem področju in zato prispeva k teoriji in praksi tako moderne kriminologije kot ekološke kriminologije, ki sta obe zanemarili to temo.

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Ključne besede: preprečevanje kriminalitete, ekološka kriminaliteta, okoljska škoda, ekološka kriminologija, strategije, tipologije

1 GENERAL OVERVIEW

"Crime prevention", as defined by Hughes (2001: 63), refers to "any action taken or technique employed by private individuals or public agencies aimed at the reduction of damage caused by acts defined as criminal by the state". While measures taken to protect persons and property have a long history, attention by criminal justice institutions to who commits crime, why and how they do so, and *how they might be kept from committing crime* is much more recent (see, e.g., Hughes, 2001; Lemieux, 2014a; Weber, Fishwick, & Marmo, 2014). The question of how to avert and thwart crime deserves accentuation and, as White and Heckenberg (2014: 277, 259) assert, "the best way to respond to crime is to prevent it before it occurs. [...] The overall aim of criminal law is to prevent certain kinds of behaviour regarded as harmful or potentially harmful". Tonry and Farrington (1995a: vii) suggest that crime bedevils Western societies but the same is true of most societies, including those of Eastern Europe, Asia and the rest of the world. Furthermore, most societies will share the experience that "criminal sanctions are

increasingly understood to have only modest effects on crime rates or patterns". On this point the authors (Tonry & Farrington, 1995a: vii) note that:

Criminal sanctions, especially incarceration, are expensive to administer and cause collateral damage to offenders and their spouses and children. Prison and jail sentences in many cases increase the likelihood that offenders will reoffend and further handicap typically disadvantaged offenders from later achieving satisfying law-abiding lives. For all these reasons, preventive approaches to crime, as distinguished from law enforcement or criminal justice approaches, are receiving new and renewed emphasis in many countries.

Various typologies have been offered to distinguish different strategies of crime prevention. One approach is to differentiate between "situational" and "social" strategies of prevention, wherein the former focuses on "opportunity reduction" (such as the installation of surveillance technologies in public places) and the latter centres on "changing social environments and the motivations of offenders" (Hughes, 2001: 63). As Weber et al. (2014: 109) explain, while "social crime prevention is concerned with economic, social and cultural conditions associated with crime and criminalization" – on deterring potential or actual offenders from future offending – "situational crime prevention, which also encompasses crime prevention through environmental design, focuses on reducing opportunities for crime to occur. To some extent situational crime prevention rejects the idea that crime is linked to social and economic factors, and instead criminal actions are considered to be the result of a rational choice by an offender in weighing up the benefits and advantages when a crime opportunity is presented."

A second attempt to classify different types of crime prevention entails conceptualizing it on three levels: "primary" crime prevention, which involves reducing criminal opportunities with little consideration of the criminals themselves; "secondary" crime prevention, which focuses on changing individuals prior to their engaging in criminal behaviour; and "tertiary" crime prevention, which concentrates on truncating the criminal career (Hughes, 2001; Last, 1980; Weber et al., 2014). Thus, "primary" crime prevention's orientation is to the *criminal event* (rather than the motivated offender), while "secondary" crime prevention is focused on averting *criminality* and "tertiary" crime prevention is directed towards targeting *known offenders*.

Finally, Tonry and Farrington (1995b) reject the typology of primary, secondary and tertiary prevention and, instead, have suggested distinguishing between four major strategies of crime prevention: (1) law enforcement strategies (through the enactment and enforcement of criminal laws that seek to deter, incapacitate and rehabilitate); (2) developmental preventive interventions (established with the goal of thwarting the development of criminal potential in "at risk" individuals); (3) community prevention (intended to transform the social conditions that affect offending in residential communities); and (4) situational prevention interventions (designed to diminish the occurrences of crimes, especially by reducing opportunities and increasing risks).

Environmental crime – as distinct from the socio-spatial patterns of urban crime studied by some criminologists – involves offenses or transgressions that harm, damage or destroy our natural environments and thereby affect humans,

nonhuman species, specific environments and the Earth as a whole (see, e.g., Eman, 2013; Eman, Meško, & Fields, 2013; White & Heckenberg, 2014). The study of environmental crime – often referred to as “green criminology” – has tended to focus on describing how, why, and the ways in which, environmental harms occur, as well as who – individuals and groups or organizations (e.g., corporations, criminal combines or syndicates, states) – can be identified as responsible for such harm (e.g., Lynch & Stretesky, 2003; White, 2003).¹ Green criminology is also concerned with identifying where such harms are occurring, who is being harmed and the scope and extent of such harm (Eman, Meško, & Fields, 2009; Halsey & White, 1998; South, Eman, & Meško, 2014), and the meaning and representation of such harm (Brisman, 2015; Brisman & South, 2013a, 2014a; Brisman, McClanahan, & South, 2014). But, as White and Heckenberg (2014: 2) remind us, “knowing about the damage and about criminality is one thing. [...] In the end it is how groups, organizations, institutions and societies respond to environmental harm that ultimately counts.” Accordingly, green criminology has considered the diverse and complex attempts to protect the environment and nonhuman animals and to prevent climate change, natural resource depletion, loss of biodiversity, pollution, and the like (see South et al., 2013) – a task confounded by the fact that much environmentally degrading and destructive behaviour is not only *legal* but *encouraged* by capitalism’s mandate of perpetual and infinite growth (see, e.g., Brisman & South, 2014a; Leech, 2012; Ruggiero & South, 2013a, 2013b; Sahramäki, Korsell, & Kankaanranta, 2015; Walters, 2013; White, 2013; White & Heckenberg, 2014; see generally Larsson, 2012). Indeed, while “crime prevention”, as conceptualized by Hughes (2001) and others, refers to reducing or blocking the damage caused to people and property as a result of acts or omissions *proscribed by law*, because green criminologists frequently do not limit their inquiry to the study of injury encapsulated under existing (criminal) law (see, e.g., Brisman, 2008; Halsey & White, 1998; South et al., 2013), the prevention of environmental harm and crime is thus broader in scope and more difficult to effect. That environmental harm and crime is frequently not viewed as “real” crime and not “valued” sufficiently by the law (White & Heckenberg, 2014; see also White, 2010) further confounds efforts to prevent its occurrence.

In this article, we discuss some of the ways in which the prevention of environmental crime and harm might be conceptualized and undertaken, including problems, challenges and limitations thereto.

¹ At this stage in its development, it seems that criminologists most frequently employ the term “green criminology” to describe the study of ecological, environmental or green crime or harm, and related matters of speciesism and of environmental (in)justice. But as South, Brisman, and Beirne (2013) note, there is not yet universal agreement on the appropriate name or label for this sub-field or perspective. For example, White (2008) has argued that the term “environmental criminology” should be reclaimed from what is more properly considered “place-based criminology”, to cover the study of environmental harms and threats, environmental legislation and related research activity. This usage is an obvious reflection of the way that the word “environment” is frequently employed in everyday discussion and contemporary media but suffers the drawback of being too easily confused with its longer established usage in criminology to describe relationships between the incidence of crime and the spatial features of the built and urban environment. That said, it bears mention that in the latest (fifth) edition of *The Oxford Handbook of Criminology*, the chapter on this area of criminology is now titled “Developing Socio-spatial Criminology”. One reason for this name change, the author of the chapter explains, is that the use of “environmental crime” as a description could generate confusion “because it is sometimes used to refer to the important emerging field of ‘green’ criminology” (Bottoms, 2012: 451).

2 POLICY AND PRACTICE

Societies tend to minimise the significance of environmental crime and damage – in part, because “much of the economy is based on the exploitation of natural resources” and because “many of the most serious forms of environmental risk come from ‘normal social practice’” (Skinnider, 2013: 3; see also Eman et al., 2009; Sahramäki et al., 2015; South et al., 2014). According to Lynch (2013), if we were to compare rates of “ordinary crime” to environmental harms and negative impacts, the latter would significantly outweigh the former. Lynch (2013: 49) argues that for this reason, we need to re-think our categorizations regarding victims: “The definitions of victims and victimization incidents commonly found within criminological literature illustrate the restrictive scope of the traditional criminological gaze and frame of reference.” Indeed, as Skinnider (2013: 2–3) points out, “criminal law generally focuses on individual victims whereas environmental legislation often describes the environmental harm as an offence against public interest”. When one realizes that (1) the damage caused by environmental crime may be difficult to identify because it may not be immediate or may have a future impact, (2) identifying the perpetrator of environmental crime and establishing criminal liability can be challenging given lengthy and complex chains of causation, and (3) the victims of environmental crime are not always aware of the fact that they have been victimized and, even if they are, they might not consider themselves to be “crime victims” (Skinnider, 2013; see also Sahramäki et al., 2015; White, 2010; White & Heckenberg, 2014), it becomes understandable that instances of environmental crime are frequently underestimated and their severity minimized. “By taking a broader frame of reference,” Lynch (2013: 49) argues, “green criminology calls attention to the extensive array of violence humans produce and the large number of victim and victim incidents that escape the attention of orthodox criminological approaches”.

Weber et al. (2014: 233) suggest that “the study of transnational crimes such as trafficking of human beings, cross-border trade in illicit goods, and environmental destruction opens up important new frontiers in criminological inquiry, and invites researchers, practitioners and students to engage with international legal instruments and UN-sanctioned crime prevention techniques.” On this note, these authors draw attention to the “Guidelines for Crime Prevention”, developed in 2002 by the United Nations Economic and Social Council (ECOSOC) as an annex to a resolution. The “Guidelines for Crime Prevention”, which are intentionally broad and define the benefits of crime prevention in a way that we can easily see as applicable if directed at environmental breaches and harms, state that: “There is clear evidence that well-planned crime prevention strategies not only prevent crime and victimization, but also promote community safety and contribute to the sustainable development of countries. Effective, responsible crime prevention enhances the quality of life of all citizens” (United Nations Economic and Social Council, 2002; see also Weber et al., 2014: 111).

While the “Guidelines for Crime Prevention” call upon government institutions and all segments of civil society, including the corporate sector, to play a part in preventing crime, the reality is that environmental crimes are committed

at the individual, organizational, corporate and state levels (see, e.g., White, 2010; White & Heckenberg, 2014). Accordingly, White (2010: 365, 370, 375) has suggested approaching environmental crime prevention from three perspectives: (1) engaging law enforcement agencies and using criminal law against environmental offenders; (2) shifting the focus away from criminal sanctions toward regulatory strategies, where a combination of cooperation and coercive measures are used to improve environmental performance; and (3) “fundamental social transformation” that demands “new ways of thinking about the world [...] and a commitment to the ‘environment’ [...]”. White (2010: 365–366) stresses that the three approaches “are not mutually exclusive. Indeed, the increasing strength of one reinforces the possibilities of the others. If environmental wellbeing is to be secured, then a variety of legal, economic and social strategies will be needed to change behaviour and modify human practices in positive ecological directions.” Part of the reason why such a broad spectrum approach is required stems from the diverse nature of environmental offenses and offenders and the preference in many market societies, with economic imperatives at the core of ideology and practice, for “education, promotion and self-regulation [...] rather than directive legislation and active enforcement and prosecution” (White 2010: 367 (footnote omitted)). White (2010: 372, 371) also notes that the use of criminal sanctions to punish environmental offenses and prevent continued or future ones is stymied by “the international character of capital and the trans-border nature of [...] harm [which] make[s] prosecution and regulation extremely difficult” and, more generally, by the fact that powerful groups in society, such as corporations, “have considerable financial and legal resources to contest prosecution, making such prosecutions enormously expensive to run”. While White (2010: 376, 379) stresses the importance of the “‘big stick’ of prosecution” with sentencing regimes that include custodial sanctions and fines, he is not overly sanguine about the prosecution and sentencing of environmental crimes as a means of punishment and prevention: “the criminalisation of environmental crime does not necessarily equate with the prosecution and punishment of environmental offenders”; all too frequently, he concludes, “the key actors involved in such crimes are global creatures, able to take advantage of different systems of regulation and legal compliance”.

More recently, White and Heckenberg (2014) have adopted a more capacious conceptualization of environmental crime prevention and link *intervention* and *prevention* in their consideration of “what is to be done about environmental crime”. As such, the third part of their book consists of separate chapters on: the nature of environmental regulation (reasons, models, limits and opportunities regarding regulation); the dynamics of environmental law enforcement (including networks and collaborative practices); the limits and possibilities of environmental forensic science and studies; the role of environmental courts in stemming the tide of environmentally destructive conduct and practices; and a survey of environmental crime prevention initiatives (e.g., situational/technologies-oriented, social/developmental and communal-oriented).

An expansive conceptualization of environmental crime prevention – indeed, one that intertwines *intervention* and *prevention* – not only serves to

underscore that “not enough is being done to detect, prevent, prosecute and respond to environmental crime” (White & Heckenberg, 2014: 228 (citing White, 2011)), but helps to demonstrate the *instrumental* and *symbolic* dimensions of environmental crime prevention. Environmental crime prevention, like crime prevention, more generally, should strive to protect specific persons and places/property and educate and raise awareness of that which we hold – or *should hold* – dear. Given the space constraints of this article, we are unable to contemplate environmental crime prevention quite as broadly as White and Heckenberg (2014). As such – and following White and Heckenberg’s (2014) suggestion that the approaches and techniques of conventional criminology may prove useful in preventing environmental harm and crime – we find it fruitful to think through the applicability of Tonry and Farrington’s four-pronged typology of strategies of crime prevention (discussed in the previous section) to *environmental* crime prevention in the hopes of illuminating the similarities and differences between conventional crime and environmental crime, and identifying what has worked to prevent environmental crime, what has not and what promising avenues for environmental crime prevention may be worthy of further consideration. Before doing so, however, we wish to note that a “social-action approach” (White & Heckenberg, 2014; see also White, 2008) – one that emphasizes the need for fundamental social change and attempts to engage in social transformation – should not be discounted, despite our decision not to explore it here. Indeed, of all the approaches and strategies presented in this article, it may represent the best hope for protecting the environment from degradation and despoliation; we leave such a discussion, however, for another day.

We turn now to an application and evaluation of Tonry and Farrington’s four major strategies of crime prevention as they might pertain to environmental crime and harm. In the following section, we contemplate problems, challenges and limitations related to the prevention of environmental crime and harm.

2.1 Law Enforcement Strategies

According to Tonry and Farrington (1995b: 3), “most people see crime prevention as the primary reason why criminal laws are enacted and why the criminal law is enforced. H. L. A. Hart (1968), this century’s most influential writer in English on the philosophy of punishment, for example, took it as a given that criminal laws exist and are enacted in order that fewer of the proscribed behaviours should take place and that general prevention is the primary justification for maintaining a system of criminal punishment.” As such, Tonry and Farrington (1995b) conceptualize “law enforcement strategies” as the enactment and enforcement of criminal laws that seek to deter, incapacitate and rehabilitate. In the context of environmental harm, however, it is important to remember that most environmental violations are resolved via administrative, regulatory, or civil mechanisms and rarely result in criminal charges or penalties (Brisman & South, 2013b). Consequently, enacting and enforcing environmental laws and regulations (which may or may not involve the criminal justice system) is an important ingredient in protecting the environment and preventing or reducing environmental harm (Tomkins, 2005)

– and may include both “command and control” regulations, which focus on preventing environmental problems by specifying how a business or corporation will manage a pollution-generating process, and “performance oriented” regulations, whereby each facility is left to determine the best method to achieve specific environmental performance goals (such as a reduction in the amount of pollution associated with a particular process) (see Stuart, 2013).

A substantial amount of literature exists in green criminology on environmental law enforcement and the challenges of environmental regulation. For example, Tomkins (2005) provides an overview and case studies of organizations engaged in international, regional, federal, state/provincial and local law enforcement. Akella and Cannon (2004) focus less on different levels, types and jurisdictions of police interventions/organizations, as Tomkins (2005) does, and more on emphasizing instead that “enforcement” is not a discrete entity but a process or chain that includes detection and the subsequent steps of arrest, prosecution and conviction. “For an enforcement system to effectively deter environmental crime,” they argue, “each of those steps must happen efficiently. The system is only as strong as the weakest link in this chain” (Akella & Cannon, 2004: 3).

Evoking Akella and Cannon (2004), Sahramäki et al. (2015), in a recent article, analyse the prevention of environmental crime via the enforcement chain, arguing that improving the enforcement of environmental crime legislation is an essential part of prevention of environmental crimes, provided that it is supported by other prevention strategies, such as command-and-control (described above), “self-policing” (based on an assumption about the movement from traditional enforcement methods to market-based incentives, wherein economic incentives are offered to companies to report their own environmental violations to the public authorities), “self-regulation” (prevention strategies whereby norms and values work in concert with compliance systems inside the corporations to lead to compliance), “smart regulation” (which relies on the flexibility of regulators and whereby a variety of interventions are used according to the specific characteristics of the business or company, instead of creating more and more extensive rules that prohibit transactions) and “tailored enforcement” (which moves away from the “one-size-fits-all” approach of command-and-control strategies so that industry – and corporation-specific characteristics – are taken into account when choosing the most efficient enforcement strategy). More specifically, Sahramäki et al. (2015: 53) compare the enforcement chain (detection, prosecution and sanctioning) of environmental crimes in Finland and Sweden, and find that 1) command-and-control strategies alone are insufficient in the prevention of environmental crimes; and 2) criminal sanctions for environmental crimes can educate potential criminals by indicating the moral consequences of their actions, and should be inversely related to the probability of detection – “to account for the possibility that only a minor proportion of the offenders will be caught, bigger sanctions are needed”. The authors note that while their study is unable to demonstrate if harsher penalties would in effect lead to more effective prevention of environmental crimes, prevention of environmental crime through criminal sanctions is, indeed, effective because the sanctions are imposed on corporate managers who generally have a social status and reputation that they

wish to protect. That said, the authors urge that if the goal of enforcement is to improve compliance, flexibility is needed from the regulatory and enforcement regimes (e.g., combining administrative sanctions and methods with criminal sanctions) and that overall, a wide range of crime prevention strategies are necessary. Essentially, Sahramäki et al. (2015: 56) maintain, “focusing only on single aspects of enforcement, such as detection, prosecution or sanctions, is unlikely to be sufficient in improving prevention. Therefore, the focus of the analysis must be directed to the entire enforcement chain.” As such, “prevention should not be based solely on criminal law enforcement,” the authors underscore; “enforcement needs to be supported by other crime prevention strategies, such as self-regulation, smart regulation and self-policing in order for it to be effective” (Sahramäki et al., 2015: 56) – thereby bolstering the assertion at the beginning of this section that in the context of environmental harm and crime, law enforcement strategies need to extend beyond the enactment and enforcement of criminal law to administrative, regulatory, or civil mechanisms. The authors conclude by stressing the importance of comparative research in the field of crime prevention, in general, and environmental crime prevention, in particular, due to the transnational character of environmental crimes: “States have [a] clear need to work together in order to prevent cross-border criminality effectively. However, differences in legislation and distribution of responsibilities between authorities may affect the concrete prevention efforts. As such, more comparative research is needed to identify the differences and similarities in the enforcement efforts of different countries, and furthermore to pinpoint the bottlenecks in prevention of environmental crime” (Sahramäki et al., 2015: 55).

Whereas Sahramäki et al. (2015) contend that analysing the prevention of environmental crime via the *entire* enforcement chain is more fruitful than considering one particular prevention strategy, Assunção, Gandour, & Romero (2013: 3) evaluate the impact of law enforcement and monitoring on deforestation, focusing on the Real-Time System for Detection of Deforestation (DETER) – “a satellite-based system that captures and processes georeferenced imagery on Amazon forest cover in 15-day intervals. These images are used to identify deforestation hot spots and issue alerts signalling areas in need of immediate attention, which then serve as the basis for targeting of law enforcement activity.” As the authors explain, “prior to the activation of the real-time remote sensing system, Amazon monitoring depended on voluntary and anonymous reports of threatened areas” (Assunção et al., 2013: 7). With the adoption of the new remote sensing system, “the Brazilian environmental authority was able to better identify, more closely monitor, and more quickly act upon areas with illegal deforestation activity” (Assunção et al., 2013: 3). Assunção et al. (2013: 3) note, however, that “DETER is incapable of detecting land cover patterns in areas covered by clouds,” meaning that “no deforestation activity is identified in these areas and, thus, no alerts are issued. As they explain (Assunção et al., 2013: 9), “due to DETER’s inability to detect land cover patterns beneath clouds, law enforcers have a lower chance of being allocated to areas that are covered by clouds during remote sensing, even if deforestation activity is occurring in these areas”. The authors conclude that monitoring and law enforcement activities have a substantial effect

on deforestation activity – that DETER-based monitoring and law enforcement have played a crucial role in curbing Amazon deforestation (as compared to other recent conservation efforts adopted in Brazil) and consequently containing carbon dioxide (CO₂) emissions, without adversely affecting local/municipality-level agricultural production (Assunção et al., 2013).

Finally, Stretesky (2006) considers the U.S. Environmental Protection Agency's (EPA) Self-Policing Policy (more commonly referred to as the "Audit Policy"), which waives or reduces penalties when regulatory entities voluntarily discover, disclose, and correct environmental violations; he finds that while large companies are more likely to use the Audit Policy than small companies, companies are more likely to self-police minor violations (such as reporting violations) than more serious emissions or violations that breach their permits, leading to the conclusion that regulatory agencies like the EPA can do relatively little to increase the self-policing of environmental violations. Such findings are particularly depressing given that at the other end of the spectrum, the EPA and the U.S. Department of Justice (DOJ) largely decline to bring criminal charges against those violating environmental laws (see, e.g., Jacobs, 2015). Indeed, of the more than 64,000 facilities that are currently listed in U.S. environmental agency databases as being in violation of federal environmental laws, fewer than one-half of one percent of violations trigger criminal investigations (Kates, 2014).

Thus, in the context of environmental law enforcement strategies (which we have expanded beyond the enactment and enforcement of criminal laws that seek to deter, incapacitate and rehabilitate to include administrative, regulatory, or civil mechanisms), it appears that self-policing and criminal prosecution do not offer much promise. Instead, the consensus seems to favour a multi-jurisdictional approach that seeks to strengthen the "enforcement chain" and employ a range of prevention strategies, with "command-and-control" regulation, "self-policing," "self-regulation," "smart regulation," "tailored enforcement," and criminal prosecution. Before moving to "developmental prevention" – the second of Tonry and Farrington's (1995b) strategies – one last approach bears mention. In late 2014/early 2015, in the USA, *National Public Radio* and *Mine Safety and Health News* reported that safety penalty fines of nearly \$70 million had been imposed on delinquent operations at more than 4,000 coal and mineral mines. All the while, the companies responsible continued to manage these dangerous and sometimes deadly mining facilities. The airing of this news prompted the federal Mine Safety and Health Administration (MSHA) to threaten to shut down a coal mine that had failed to pay \$30,000 in overdue penalties. When the owner refused to pay, the MSHA shut down the mine. Within forty minutes, mine officials agreed to a payment plan and the mine reopened. While there is some question as to whether the MSHA has the legal authority to shut down mines simply because they have not paid their penalties, this type of straightforward and tough response merits further consideration (see Berkes, 2015).

2.2 Developmental Prevention

Tonry and Farrington (1995b: 2) conceptualize "developmental prevention" as "interventions designed to prevent the development of criminal potential in

individuals, especially those targeting risk and protective factors discovered in studies of human development". As they explain, "interventions that improve parenting skills, children's physical and mental health, and children's school performance and reduce risks of child abuse are also likely to reduce later offending" (Tonry & Farrington, 1995b: 10).

For the most part, this has been an under-explored area in the context of environmental crime (cf. Agnew (1998), who notes data suggesting correlations between animal abuse and violent crime against humans, and who describes how certain individual traits and socialization regarding animals may cause animal abuse). But there is little reason to suggest that if interventions can be designed to prevent the development of potential in individuals to commit crimes against persons and property, they cannot also be created to thwart the development of *environmental* crime potential in individuals. Indeed, as White and Heckenberg (2014: 280) suggest, using recreational fishing as an example:

Social crime-prevention methods might introduce school children to programmes that reshape their concepts of 'the environment', 'fish' and 'fishing'. This could include strategic solutions ranging from 'catch and release' as an imperative for recreational fishing, through to doing assignments on the effects of climate change on fish species. Young people who are known to, or who seem likely to, degrade environments or abuse animals could be encouraged to participate in programmes and projects aimed at challenging and changing attitudes and behaviour.

In other words, just as interventions might be designed to prevent young people who are known to – or who seem prone to – engage in crime and delinquency from taking part in such activities or adopting such behaviors – White and Heckenberg (2014) suggest that young people who have despoiled the(ir) environment(s) or demonstrated a disrespect for flora and fauna could be steered towards programs intended to positively affect their ecological beliefs and practices.

2.3 Community Prevention

Community prevention is intended to transform the social conditions that affect offending in residential communities and "has included efforts to control crime by altering building and neighbourhood design to increase natural surveillance and guardianship, by improving the physical appearance of areas, by organizing community residents to take preventive actions and to solicit additional political and material resources, and by organizing self-conscious community crime prevention strategies such as recreational programs for children" (Tonry & Farrington, 1995b: 9). Thus, for example, while Groff and McCord (2012) have posited that offenders may be attracted to neighbourhood parks in urban areas with little formal or informal control (and where dense foliage and poor lighting may reduce natural surveillance) and have found that neighbourhood parks are associated with increased levels of crime in surrounding areas, their work has also suggested that the more "activity generators" a park has (e.g., recreation centres,

pools, playgrounds) – especially those related to organized sports – the more legitimate users are attracted to the park and the less crime occurs in the park environs. As such, they recommend that city planners contemplate developing parks that include activity generators related to organized sports because their presence is associated with diminished crime in the park environs, and that community groups can play a crucial role in reducing crime by organizing and supporting activities designed to maximize use of park facilities.

Whether it is in the context of preventing violent crime, property crime and disorder events, as Groff and McCord (2012) find, or environmental crime, citizen groups and community involvement are key. As White and Heckenberg (2014: 293) explain,

Environmental crime prevention, as with all good crime-prevention approaches, ought to incorporate the activities of ordinary people as part and parcel of the overall strategy ... For example, some types of engagement may be based upon Neighbourhood Watch models of citizen surveillance and monitoring – as in the case of coastal watch projects intended to alert authorities to changes in environmental conditions or the presence of illegal fishers ... In other types of community participation, local residents in urban areas may well play an important and vigilant role in exposing toxic waste spills, release of pollutants into the air, water and land, and illegal harvesting of flora and fauna.

But community crime prevention is more elaborate and dynamic than just this. Whereas White and Heckenberg (2014) draw on community (street crime) prevention strategies as suggested by Tonry and Farrington (1995b) and Groff and McCord (2012) and apply them to environmental crime scenarios, Pretty, Wood, Bragg, and Barton (2013) describe how various crimes unrelated to nature and the environment might be mitigated or addressed with “nature-based interventions.”

As Pretty et al. (2013) argue, rather than viewing parks as potential sites of crime and foliage as cover for illicit activities, nature and green space should be seen as providing important benefits for human well-being, both through contact with and the ability to view and access nature (see also Hine, Peacock, & Pretty, 2007; Pretty, Peacock, Sellens, & Griffin, 2005). Indeed, the use of nature-based interventions has also been demonstrated to increase health and well-being in vulnerable groups of people (Hine, Peacock, & Pretty, 2008; Sempik, Hine, & Wilcox, 2010). According to Pretty et al. (2013), youth at risk of involvement in crime, individuals who are on parole or probation, ex-offenders and victims of crime could all be considered to be part of a vulnerable group for whom nature-based interventions can be useful (see also Carter & Hanna, 2007; Hine et al., 2008; Peacock, Hine, & Pretty, 2008). For example, Carter and Pycroft (2010) describe how prisoners and probationers can be diverted from future crime through engaging them in “Offenders and Nature”-type schemes bringing them into contact with nature and those who work in forest and conservation management. The use of nature-based interventions for individuals involved in or at-risk of participation in crime can foster positive behavioural change by addressing many of the issues directly related to their criminal activity and

helping them to avoid and overcome these problems (Pretty et al., 2013; see also Hine et al., 2008; Peacock et al., 2008; Pretty et al., 2009). For individuals who have been victims of crime, interactions and experiences with nature can help them to deal with the trauma that they have experienced and reintegrate them into society (Hine, Pretty, & Barton, 2009).

Essentially, Pretty et al. (2013) contend, the reductions in criminal activity achieved through the use of nature and nature-based interventions have direct (and, we might add, broad) implications for contemporary criminological theory. Natural environments can foster the development of social cohesion, trust and friendships for neighbourhoods, social groups and young people (Kuo & Sullivan, 2001a, 2001b; see also Brisman, 2007, 2009; see generally Brown, 2014), and can also provide a suitable environment whereby young people can interact in positive ways (Peacock et al., 2008). These benefits can result in increased levels of collective efficacy and social organization – both of which influence criminal activity (Browning, Feinberg, & Dietz, 2004; Sampson & Groves, 1989; Sampson, Raudenbush, & Earls, 1997).

Others have also suggested that natural environments can contribute to crime prevention (see, e.g., Clarke, 1997; Crowe & Zahm, 1994) – that natural areas, such as bushes and trees can affect access to areas where criminal activity may take place (Crowe & Zahm, 1994), whilst natural interventions can moderate wayward behaviour, change self-perceptions and self-worth, and thus reduce both the opportunities and the desire to take part in criminal behaviour (Carter, 2007; Hine et al., 2008; Peacock et al., 2008). Nature and natural interventions can be effective at rehabilitating individuals both within or at risk of entering the criminal justice system (see Ministry of Justice, 2010).

In sum, the community (street crime) prevention strategies suggested by Tonry and Farrington (1995b) and Groff and McCord (2012) can be applied to environmental crime and environmental crime prevention, as articulated by White and Heckenberg (2014). But we must also bear in mind the work of Pretty et al. (2013) and others, who demonstrate how the creation and maintenance of urban nature and green space, as well as contact with rural natural environments, can function to provide innovative directions for community (street crime) prevention strategy and offender reform and redirection.

2.4 Situational Prevention

Situational prevention is based on the premise that much crime is contextual and opportunistic (Tonry and Farrington, 1995b). As such, interventions are designed to diminish the occurrence of crimes, especially by reducing opportunities and increasing risks. According to White and Heckenberg (2014: 278),

In regard to environmental crime, great purchase has been derived from the application of 'situational crime prevention' approaches and techniques. Situational crime prevention is based upon the idea that for someone who is capable of, and not adverse to, offending, the decision whether or not to commit a specific crime will be a function of both whether the opportunity presents itself and whether

the likely rewards from exploiting that opportunity are sufficient to offset the perceived efforts and risks (Sutton, Cherney, & White, 2013). Situational prevention revolves around identifying modifiable conditions that are susceptible to intervention, and which can reduce or pre-empt perceived opportunities for crime (Clarke, 1980, 2005; Clarke & Homel, 1997; Tilley, 2006).

Drawing on Clarke and Eck (2005), White and Heckenberg (2014) describe broad approaches and specific techniques of situational prevention: *increase the effort of crime* (through target-hardening, controlling access to facilities, deflecting offenders, and controlling tools/weapons); *increase the risks* (by extending guardianship, facilitating natural surveillance, reducing anonymity, utilizing place managers, and strengthening formal surveillance); *reduce the rewards* (such as concealing targets, removing targets, identifying property, disrupting markets, and denying benefits); *reduce provocations* (reducing frustration and stress, avoiding disputes, reducing emotional arousal, neutralizing peer pressure, and discouraging imitation); and *remove excuses* (via setting rules, posting instructions, alerting conscience, assisting compliance, and controlling access to drugs, alcohol and other facilitators). Applying these approaches and techniques to the example of illegal fishing, White and Heckenberg (2014) propose increasing the effort (e.g., fencing off key areas; ID badges for users; partial park closure; no anchor markers; vessel and employee registration); increasing the risk (e.g., harbour and jetty vessel checks; CCTV, satellite photos, vessel monitoring scheme; boat and aircraft patrols; reporting by public users); reducing the rewards (e.g., preventing access to parks; relocating species; licensing of vessels and fish tagging; disrupting markets/distribution channels; issuing permits and licensing); and inducing guilt or shame (e.g., strengthening moral condemnation of over-fishing; facilitating compliance by setting up community hot-lines; use of warning signs in ports; and information pamphlets about the state of fishing stocks).

Much like arguments in favour of “tailored regulation” or “tailored enforcement,” which attempts to account for the type of environmental actor in question and adjust incentives, penalties, and even standards of proof accordingly (see, e.g., Fortney, 2003), White and Heckenberg (2014: 283) maintain that moulding situational prevention responses to the specific circumstance, context and crime is essential. Thus, for example, preventing elephant poaching might entail closure of logging roads, DNA coding of ivory and the use of pilotless drones, while preventing rhinoceros poaching might be accomplished by increasing the number of on-the-ground rangers and military patrols and dehorning animals (White and Heckenberg, 2014: 283–284 (citing Ayling, 2013; Lemieux & Clarke, 2009; Pires & Clarke, 2011, 2012; Pires & Moreto, 2011; Wellsmith, 2010, 2011)).

Other examples abound. For instance, Bartel (2005) reports on the use of satellites to uncover illegal land clearance – a way of increasing the risks of this crime – while Schneider (2008) assesses the “market reduction approach,” which aims to reduce and disrupt the market for endangered flora and fauna, thereby reducing the rewards and making it more risky for individuals to engage in the illicit trade in endangered wildlife and plant species. Lemieux’s (2014b) entire volume is devoted to determining what opportunity structures favour poaching

(e.g., parrot, rhino, tiger) and how situational crime prevention may reduce its prevalence. Wellsmith (2010) considers the benefits of extending situational crime prevention techniques to environmental harm, using the example of endangered species conservation; these techniques include: increasing the effort by securing reserves; increasing the risks by rewarding vigilance from locals and tourists; reducing rewards by hiding targeted flora within other (non-invasive crops); removing provocations by offering compensation when endangered species destroy crops and/or livestock; and removing excuses by requiring more explicit customs declarations. While such measures may deter potential offenders and disrupt potential markets, Wellsmith (2010) recognizes that some situational crime prevention interventions may result in displacement to other (endangered) species or other locations, ranges or states. She also notes that promoting ecotourism or wildlife tourism may “alter individuals’ behaviour so that non-crime activities are chosen instead,” but that “expanding the tourist infrastructure (e.g. roads) may result in habitat destruction and associated loss of biodiversity,” meaning that solutions that result in the reduction of trade in endangered species and the risk of extinction that they face may still prove problematic from an ecological or species justice perspective (Wellsmith, 2010 (citing Lado, 1992)). Thus, in order for situational crime prevention strategies to be seen as “green solutions,” less anthropocentric approaches that avoid habitat destruction must be employed (Wellsmith, 2010); in order to ensure that situational crime prevention interventions do not simply shift crime to other places, “the structural or underpinning reasons for different types of [poaching]” must be considered and “specific communal circumstances (such as high levels of poverty and unemployment among local residents)” must be taken into account (White & Heckenberg, 2014: 281, 285). In the context of situational prevention, then, as with the other prevention approaches discussed above, “different kinds of places lend themselves to different sorts of environmental harms and different kinds of intervention. [...] The specificity of the harm ought to drive the particular type of intervention that is adopted in any given situation” (White & Heckenberg, 2014: 278, 283).

3 PROBLEMS, CHALLENGES AND LIMITATIONS

Some governments take the issue of environmental crime prevention more seriously than others, stressing that this should be a matter of shared responsibility. As one example, the advice on pollution prevention from the UK Government Environment Agency points out that “businesses and individuals are responsible for complying with environmental regulations and for preventing pollution of air, land and water. Many thousands of pollution incidents occur each year, originating from factories, farms, transport activities and even homes. Each incident is an offence and can result in prosecution as well as environmental damage. However, most cases are avoidable [...]” (Environment Agency et al., 2013).

As we have already noted, in many – if not most – jurisdictions, it is not the police but environmental regulators that have primary responsibility for the application of law and securing of compliance, often demonstrating a preference for use of non-criminal penalties and adoption of a civil sanctions regime (see

Eman (2013) for a discussion of the entities in Slovenia that deal with offences against the environment). Such regimes may depend upon administrative, paper-based monitoring and encouragement of compliance, and this is probably easier to apply when dealing with relatively low-level and minor offences. In political contexts where there is hesitancy about being seen as “anti-business” and where public funds are scarce and scrutinised, then a focus on the “low-level and minor” may be encouraged and constitute the bulk of occurrences processed. Indeed, as Eman (2013: 247) observes, “one of the major problems in Slovenia is the dependence of municipalities (regions and people) on industry and the businesses in their area. [...] These companies are often major polluters, but the local representatives are indulgent, compassionate and tolerant towards the pollution due to the dependence on the business, which among other things represents needed working places.”

Prevention and avoidance of breaches of laws and regulations are desirable for many reasons but the idea of shared responsibility for prevention is not always accepted. Or the “message is received” but “the meaning is not understood”. The strategies of denial and techniques of neutralization that are so familiar to us from the criminological literature on other subjects (Cohen, 1993; Sykes & Matza, 1957) are often at work here (Brisman & South, 2015b). Furthermore, as McGarrell and Hipple (2014: 250) note, a wide range of criminological research evidence suggests that “the adoption of new policy or practice often suffers from implementation failure” stemming from “ideological conflict, resource constraints, opposition from line-level actors, poor communication, and lack of clarity and consistency in policy or intended practice,” and that “even in cases where [...] support by key decision-makers and resource constraints [is] not an issue,” weak implementation can hinder impact. In essence, politics and law enforcement frequently share a short-term horizon dictated by seeking the approval of the general public, superiors and peers and avoiding the uncomfortable and unpopular.

As with many other kinds of crime or cases of non-criminal breaking of rules or regulations, the failure to take measures to avoid the problem is significant. For businesses, non-compliance with “good practice” and with efforts aimed at prevention can follow from short-term assumptions about cost-savings and familiar narratives of denial: “whatever I do won’t matter or make a difference,” “no-one will catch me,” “others are more guilty of this than I,” and so on. Because there have always been problems with the inadequacy of resources for enforcement of such rules and laws, it is quite possible that offenders will remain undetected or not prosecuted (de Prez, 2000; du Réés, 2001; Sahramäki et al., 2015; White, 2010; White & Heckenberg, 2014; see generally Eman, Meško, & Ivančič, 2012; Larsson, 2012) – a phenomenon that has made the thwarting of waste trafficking and illegal waste disposal, animal and plant species trafficking, and poaching and illegal fishing in South-Eastern Europe particularly vexatious (see, e.g., Eman, 2013; Eman & Meško, 2013). But it is also the case, that the *victims* of environmental crimes and harms are easily overlooked, as Skinnider (2013: 1) acknowledges, noting that “the complexity of victimization—in terms of time, space, impact, and who or what is victimized – is one of the reasons why governments and the enforcement community have trouble in finding proper responses” (footnote

omitted). Furthermore, in terms of both time and geography, while the effects of a single offence at one location or at one point in time may not appear significant, as Skinnider (2013: 1) recognises, “the cumulative environmental consequences of repeated violations over time can be considerable”.

4 DISCUSSION/CONCLUSION

Environmental issues have come to assume a position of some greater prominence on policy, enforcement and criminological agendas (see Assunção et al., 2013). For all the desirability and promise of crime prevention orientated toward environmental offending, however, it is an underdeveloped field, especially in regions of South-Eastern Europe (Eman & Meško, 2013). Meanwhile, legislation, enforcement, prosecution and meaningful punishment face considerable challenges ranging from apathy to resistance (see, e.g., Brack, 2002; de Prez, 2000; du Rées, 2001; Elliott, 2007; see generally Assunção et al., 2013; Eman & Meško, 2013; Sahramäki et al., 2015). Nonetheless, with regard to the future momentum of initiatives to take environmental law enforcement and regulatory compliance seriously, it is important to recognise that even though the political profile of environmental issues may fall as well as rise, some of the key features of actions and frameworks of response *are* being consistently pursued.

Tonry and Farrington (1995b: 7) note that “different crimes have different causes, different offenders commit crimes for different reasons, and sensible prevention policies should take account of those differences”. As such, they contend that “crime prevention strategies should be based on wide-ranging theories about the development of criminal potential in individuals and about the interaction between potential offenders and potential victims in situations that provide opportunities for crime” (Tonry & Farrington, 1995b: 11). With this in mind, rather than relying on the apparatus of the criminal justice system, environmental crime prevention might be (better) achieved through greater public education about the harmful environmental consequences of individual and collective patterns and practices, as well as through greater public engagement and participation in the detection and reduction of environmental harms (see Eman, 2013; White & Heckenberg, 2014; see generally Larsson, 2012) – not least in enhancing the perceived status, importance and legitimacy of such preventative and mitigating activities (see Sahramäki et al., 2015). Indeed, the most promising scenario for future crime prevention is one in which we recognise that we are individually and collectively responsible for the health of our environment (Agnew, 2013) and that we or future generations will suffer if we do not preserve it (Brisman & South, 2014b, 2014c, 2015a; Eman, 2013).

From the point of view of a green criminology, while humans and nonhuman animals are differentially affected and women, children, ethnic minorities and the poor are frequently disproportionately impacted, the ultimate environmental victim is the planet, which we share and which sustains life. There cannot be any better argument for developing and implementing strategies to prevent crimes and harms that damage the environment and for crafting and enforcing laws that are designed to protect it. Borrowing from Young (1999: 130; see also Aas, 2013:

67), we might suggest that while environmental harm and crime cause problems for human society and the Earth as a whole and while environmental preservation is in the interest of all humanity (Meško, Dimitrijević, & Fields, 2011), it is human society's growth-oriented economic processes that cause the problems of environmental harm and crime. Unfortunately, given neoliberalism's emphasis on individual responsibility, coupled with a major retreat of the state in the area of corporate regulation, preventing environmental harm and crime will continue to be an imposing challenge (Aas, 2013; Brisman, 2013; White & Heckenberg, 2014).

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