



Water Theft Maleficence in Australia

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Abstract

The United Nations (2020) has repeatedly recognised that freshwater security is one of the greatest challenges facing humanity, and that water theft is a global problem exacerbating human conflict, denying human rights and accelerating environmental despoliation. Australia is the world's driest inhabited continent where water security is seriously threatened and constantly monitored by federal, state and local authorities. The devastating 2019–2020 bushfires across Australia serve as a stark reminder of the nation's vulnerabilities to drought and the imperatives of water security and sustainability. While some threats are undoubtedly climate induced, it is widely reported that the 'theft' of water is playing an increasingly significant role in compromising Australia's water security. This article provides a critical overview of the contemporary significance of water theft and its governance. It interrogates official documents of government inquiries, examines court proceedings, and critiques water theft within a green criminology perspective.

Keywords

Water theft; Australia; water security; water regulation; Murray–Darling Basin.

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Introduction

Fresh water is a basic essential of life. It is fundamental to human wellbeing, global ecosystems and to flora and fauna. It constitutes the lifeblood of many industries, from tourism to mining, and agriculture to aquaculture.

Globally, the topic of water crimes is steadily rising in importance, as nation-states and enforcement agencies realise the scope and nature of the problem (Eman et al. 2020). Activities and events that threaten the quantity and quality of fresh water have major consequences for health, business success and national security. In part, this is because the amount of fresh water on Earth (from both surface and groundwater sources) is limited, and drought, high temperatures—leading to increased rates of evaporation—and the world's growing population have all contributed to its increasing scarcity.

The uneven distribution of water around the world has led to a situation in which water theft is on the rise. As long as climate change, conflict and poverty continue to aggravate the Earth's dwindling water supply, water theft will remain both a reoccurring and an intensifying global problem. While water theft is an issue affecting multiple countries around the globe (Brisman et al. 2018), the focus of this article is on the Australian context. This is partly because of its lived immediacy (it is where the authors reside), but also due to the urgency of the issue here.

Australia is the world's driest inhabited continent where freshwater supply is an issue of national security and political priority (De Wild and Feely 2019; Steffen et al. 2018). Successive Australian Chief Scientists have declared the critical importance of water management, governance and security for the nation's ongoing social and economic innovation, progression and productivity (Chubb 2015). The illegal taking and loss of millions of litres of fresh water has resulted in the destruction of ecosystems and of hundreds of millions of dollars in government subsidies subsequently being paid to commercial and local government entities for lost revenue. These developments have recently led to the Australian Federal Minister for Water Resources, Drought, Rural Finance, Natural Disaster and Emergency Management appointing a 'water theft sheriff' as part of a national inspectorate to oversee Basin state water management and enforcement policies (Clark 2019). Therefore, water theft is a criminological issue that can no longer be ignored and, accordingly, warrants comprehensive analyses.

This paper explores water theft through the lens of green criminology, notably drawing on discourses in crime and harm to study actions of the powerful and the ways in which water is politicised for power and profit (Brisman et al. 2018; McClanahan 2014; McClanahan et al. 2015). This paper also undertakes a documentary analysis of official sentencing transcripts, media coverage, the South Australian Royal Commission into the Murray–Darling Basin, and post-commission reports and inquiries to examine the issue of water theft in the Murray–Darling Basin. Why some forms of water theft are considered criminal yet others not is a major concern, as is critical analysis of state-corporate collusion in perpetrating unjust, inequitable and unsustainable uses of fresh water. These matters are not inconsequential.

For example, the Australian Federal Government recently announced an unprecedented amount—almost AUD\$2 billion—in funding, relief and aid for drought-stricken areas and industries across a nation experiencing its worst water crisis in 800 years (Department of the Prime Minister and Cabinet 2018; Freund et al. 2018). Amid a water emergency widely regarded as part of human-induced climate change, it is reported that the theft of water is also playing an increasingly significant role in undermining and compromising Australia's freshwater security (Australian Institute of Criminology 2017; King et al. 2018). Fresh water—a necessity for human and non-human existence and the lifeblood of Australian industries—is a precious natural resource currently imperilled with unprecedented challenges for Australian governments (Australian Industry Standards 2018; Poljak 2018; Roberts et al. 2006). The security, sustainability and equitable access to fresh water are issues of Australian national concern and imperative

to all levels of government. As mentioned, these issues are significant for many countries around the world and are likely to worsen over time due to global warming (Brisman et al. 2018; Njeru 2012; White 2018a). The most affected areas of water shortage in Australia have been across New South Wales (NSW) and South Australia—notably regions that host the flows of the Murray–Darling Basin. This unique 3,375 km expanse of fresh water has been the subject of significant controversy during the last few years, with issues of water theft and corruption catapulted into national headlines (Puddy and Campbell 2018; Slezak and Davies 2018). In July 2017, an ABC *Four Corners* (2017) investigation revealed a series of improper conducts pertaining to the Murray–Darling Basin. Specifically, it was alleged that:

- substantial amounts of water were being diverted (stolen) for use by large agriculture companies upstream
- there was meter and pump tampering as well as failure to keep diaries and logs
- the top regulator, Gavin Hanlon, had offered to help lobbyists campaign against the Murray–Darling Basin Plan (MDBP) (by sending de-identified government documents to industry people)
- the Strategic Investigations Unit was disbanded at precisely the time when it was asking for more resources to address significant problems.

The broadcast led to no less than eight official inquiries into these issues, involving federal and state agencies, anti-corruption and water management groups through to the NSW Ombudsman (Craik 2018; Murray–Darling Basin Authority [MDBA] 2017b; Neales 2017). The subsequent and pending prosecutions of irrigators in the Murray–Darling Basin have exposed fractures in riparian politics, policies and regulation. Such events have called into question the effectiveness of the existing regulatory apparatus, with Basin states threatening to withdraw from the Murray–Darling Basin Agreement¹ (Davies 2018). Moreover, the Federal Government has called for a national inquiry into state responsibility and the effective utility of existing legal regulatory mechanisms. Yet, for all its importance to personal, social and economic health and wellbeing, there has been very little criminological interest in water crime issues (Bricknell 2010; Brisman et al. 2018; Johnson et al. 2015; White 1998, 2003). Especially in light of key environmental drivers—such as land use, climate change and infrastructure—there is an urgent need to consider the nature, dynamics and effects of water theft in Australia and within broader international contexts. This article addresses this gap in the criminological literature. It explores the official documents of government inquiries and cases of those convicted in Australia, and provides a green criminological analysis relevant to future policy, practice and prevention.

Water Theft: A Green Criminological Analysis

Green criminology refers to criminological research and scholarship comprised of distinct theoretical approaches that collectively deal with environmental, social and animal rights issues (Hall 2015; Lynch et al. 2017; Nurse 2016; Rodriguez Goyes et al. 2017; South and Brisman 2013; White and Heckenberg 2014). The approach deals with several interrelated areas, all of which have relevance to the study of water theft (White 2020). This covers:

- the nature and dynamics of environmental crimes and harms, which may incorporate wider definitions of crime than that provided in strictly legal definitions (e.g., what activities affect the quality and quantity of fresh water, and why and how does this happen?)
- environmental laws, including enforcement, prosecution and sentencing practices (e.g., what laws exist in regard to water and how are these implemented in criminal justice processes and sanctioning outcomes?)
- environmental regulation, concerning systems of administrative, civil and criminal law that are designed to manage, protect and preserve specified environments and species, and to manage the negative consequences of particular industrial processes (e.g., who is responsible for protecting

resources such as fresh water and what powers and resources do they have to ensure its preservation and equitable use?)

- eco-justice, or the valuing of and respect for humans, ecosystems, non-human animals and plants (e.g., in what ways are humans and non-human environmental entities [such as animals, plants, ecosystems and rivers] affected by activities that disrupt water flow and influence water quality?)

The application of a green criminological perspective to policy, practice and crime prevention as these pertain to water theft involves distinct conceptual applications. We briefly outline some of these below.

Focus on Harm

A fundamental premise of green criminology is that environmental crime needs to be defined and studied in relation to harm, and not solely on the basis of legal definitions. Thus, it does not just refer to *legal* definitions of 'crime' but includes 'social harm' definitions (in part because the lawmakers, influenced by or part of powerful groups such as nation-states and corporations, pass laws that favour themselves even where harm is an outcome). This distinction is important (initially) since the 'taking of water from the river' is generally not in itself criminalised or a crime in its own right. Rather, the status of this activity is defined by whether it is subject to legal restrictions or licensing provisions. This means that it is not 'theft' unless it has been expressly prohibited and/or involves breach of licence conditions. However, green criminologists may question the extent to which a licence allows so much water to be taken that it constitutes an environmental harm. That is, the use of *ecological criteria* instead of official government metrics (involving stipulated maxima for water use) may give rise to different answers to the question, 'is this harmful?' Moreover, Indigenous connections with land and water generally do not reference relevant natural resource issues in terms of 'ownership', therefore, rendering legal constructions of 'theft' as intrinsically problematic. Rather, the emphasis is on stewardship, duty of care and ecological sustainability (as opposed to sustainable development). Harm must be redressed, and reparation is essential.

Focus on Eco-justice

Ecocentrism refers to valuing nature for its own sake. This eco-philosophical orientation requires that all social practices incorporate ecological sensitivities and heightened awareness of the intrinsic value of flora, fauna, ecosystems and non-living entities such as rivers and mountains (White 2018b). An eco-justice framework is comprised of three key elements: *environmental justice* deals with humans, *ecological justice* deals with specific environments, and *species justice* deals with non-human animals and plants (White 2013). From a green criminology perspective, analysis and interpretation of water theft requires concerted efforts to research the effects of water-taking on both humans and non-human environmental entities such as rivers and landscapes, trees, plants and fish, as well as other species. Information and data pertaining to these questions are vital in exposing the nature of environmental harm and the consequences of such harm for different types of victims.

Focus on Power and Interests

Concepts such as state-corporate crime and ecocide alert us to the specific power and social interests that underpin the use and abuse of natural resources, as well as the damage being done to the planet due to 'business-as-usual' approaches to the environment–economy nexus (Higgins et al. 2013; Michalowski and Kramer 2007). For example, many activities and events threaten the quality and quantity of fresh water, and these have major negative social and environmental consequences. A crucial problem is the conceptualisation and management of drinking water primarily or solely as an economic resource. Often, freshwater resources are commodified through a global market for bottled water, tenured under individual legal ownership and delivered to consumers through private corporate networks and corrupt states at a profit (Barlow and Clarke 2017; Brisman et al. 2018; Johnson et al. 2015). The global bottled water market was estimated to be worth more than USD\$250 billion in 2018 (Business Research Company 2018). This means that water is essentially seen as a commodity and, as such, a source of profit rather than as a basic requirement of human life (and other species and ecosystems). A profit-based system also

carries with it certain tendencies associated with profit maximisation. When water production, consumption and distribution is 'for profit', then it is the company bottom line that counts most and not the water itself or the interests of those who produce and consume it (White 1998). Therefore, neoliberal discourses and market models that assert the privatisation of water for commercial property are important contexts for understanding the exploitation of water, the violation of human rights, human dislocation and conflict, and ecological demise (Brisman et al. 2020; Eman et al. 2020).

Focus on Social Action

Crimes against the environment affect the living and the non-living, and, ultimately, we are destroying and degrading that which makes life possible and life worth living. Much green criminological attention is directed at how, where and why natural resources are used and the effect this has on the wider environment. For example, in the context of rapid climate change, freshwater resources stand out as one of the vital pinch points arising from global warming. These resources are under threat worldwide due to shrinking glaciers and polar ice sheets, extended periods of drought, human diversion and pollution of waterways, flooding, saltwater contamination due to sea level rise, and expanding consumer (residential and commercial) demands. The environment and its resources are what sustain humanity. We have a moral obligation to the planet and all that resides on it. Water, especially, is essential to life: it is our duty to protect and preserve places, to prevent and repair harm, and to address issues of social and ecological justice.

Water Theft: A Not-so-new Phenomenon

Internationally, water theft has been recognised as a global issue relevant to human security and environmental crime (see INTERPOL 2020; United Nations Environment Programme and INTERPOL 2016). While some criminologists refer to water crime as a contemporary crisis embedded in the politics of privatisation, poverty and climate change, it is important to note the historical contexts, laws and regulations involving the theft of water (Brisman et al. 2018). Indeed, water theft is not only an issue of contemporary global concern, but also an ancient one that dates back thousands of years to antiquity, and is closely linked to the creation of irrigation and water management practices (see Baird and Walters 2020).

Some of the first laws pertaining to water theft originate in Ancient Mesopotamia, where the Code of Hammurabi (1790 BC) once restricted the theft of a water wheel—a water management technology used to increase the flow of water through irrigation canals (Gleick and Heberger 2012; Hatami and Gleick 1994). Similarly, the Hittite Laws (1650–1500 BC) indicate that if water were stealthily taken or diverted from an irrigation ditch, the perpetrator must pay compensation (Kornfeld 2009; Melchert 1979; Ohlig et al. 2002). The *Lex Rivalicia* (116 BC) and *Lex Quinctia de aqueductibus* (8 BC) were some of the more significant provisions of Roman water law to acknowledge water theft more directly, thus, suggesting it was a critical issue (Bannon 2017; Caponera and Nanni 1992).

Greek philosopher Plato (cited in Schofield 2016: 316) discussed water theft around 400–380 BC in his manuscripts *The Laws*, in which Book 8, Section 845d states (Cohen 1983):

water above all else in a garden is nourishing; but it is easy to spoil. For while soil and sun and wind, which jointly with water nourish growing plants, are not easy to spoil by means of sorcery or diverting or theft, all these things may happen to water; hence it requires the assistance of law.

Plato recognised the vitality of water and depicted it as a crucial element for the functioning of a democratic society. Yet, water can be easily exploited by means of theft, for example, and can harm the establishment of a democracy by limiting water accessibility for those who depend on it—thus, requiring the assistance of law (Baird and Walters 2020; Schofield 2016).

Moreover, the first water commissioner of Ancient Rome, Sextus Julius Frontinus, observed a number of obscure tappings on the Roman public aqueducts in 97 AD. Groups known as the 'water-men' would illegally install hidden pipes on the public aqueducts to divert fresh water for personal uses and profit (Frontinus and Herschel 1913; Mays 2010). This would continue throughout the Middle Ages whereby, for example, private dwellings in outer London would extract most of the clean fresh water to avoid using polluted water from the River Thames (Foord 2011; Keene 2001; Rudden 1985; Water History 2004). One of the only examples of water theft in Ancient Egypt found in the literature dates back to 332 AD, when a farmer called Sakaon noticed his upstream neighbours illegally diverting and stealing water in Egypt's Faiyum Oasis (Haug 2012; Price 1995). The literature also highlights that baptismal fonts had to be secured under lock and key during the Middle Ages by many religious bodies, as holy water was perceived as a desirable commodity to steal for witchery and black magic (Baird and Walters 2020; Bond and Eden 1908; Oestigaard 2013; Thomas 2008).

Therefore, it is noted that crimes such as water theft are not a new phenomenon, and neither are regulations in place to prevent it. Throughout the ages, the importance and value of fresh water has been heightened in times of drought, as witnessed by an increasing number of laws and regulatory regimes to avoid exploitation and prevent theft.

In Australia, current climatic conditions, combined with a history of overuse and variable source replenishment, has brought unauthorised extraction and use of water to the national forefront. Water theft covers not only taking from natural water courses, but also the stealing of harnessed or piped water. These take in offences of actual theft, the breach of extraction conditions, construction of works to illegally take water, tampering with meters to relay false readings, and contravening declared water restrictions. As Bricknell (2010) points out, knowledge of incidents of water theft comes from three forms of monitoring activity. The first focuses on *compliance auditing* of water licences, involving site visits and inspection of works and equipment, as well as review of metering and water usage records. Compliance auditing is supplemented by *surveillance*, comprising (depending on jurisdiction) aerial, ground and river surveys, combined with aerial photography and the use of satellite images. Surveillance is used to detect unauthorised works, irregular flows and other signs of illegal water diversion. Reports of *alleged breaches* from the public, local councils or state utilities and other government departments represent the third method, whereby regulators are alerted to possible water theft (Bricknell 2010).

An Australian study by Barclay and Bartel (2015) on the perspectives of farmers provides insight into how fresh water is being stolen through diversion, despoiling and depletion, the drivers or incentives for water theft, issues of noncompliance, and how water theft results in availability and access injustices. They observed that:

water theft ... includes the pumping, impoundment or diversion of water from irrigation channels, river systems, dams or ground water bores without a licence or in contravention of licence conditions that cause changes to flows and reduce water access to neighbouring farms, livestock and riparian zone management.

Drought has created incentives for water theft particularly with water restrictions and scarce water resources. (NSW Department of Industries [DPI] 2014, cited in Barclay and Bartel 2015: 190)

Thus, a vital context for understanding the mechanics and motivations for water theft is the environmental and social climate within which it occurs.

Australia's Water Insecurity and the Alarm Bells of Theft

In July 2017, *Four Corners* documented a variety of improper conducts and matters of noncompliance with NSW water laws and regulations pertaining to the Murray–Darling Basin; this brought to the forefront the issue of water theft at a national scale. The program, titled ‘Pumped’, specifically alleged that certain irrigators had pumped fresh water during unauthorised periods or in large quantities in excess of their licence, and that freshwater resources bought with taxpayer funds for environmental purposes were being illegally diverted for private purposes. In addition, both meter tampering and failure to record daily volumes of pumped water were common, waterworks (e.g., dams and irrigation canals) were constructed on Crown land without approval, and confidential information was shared among irrigators and senior water management officials (Four Corners 2017; Matthews 2017; NSW Ombudsman 2017). It has been largely suggested that the rise of alleged water theft in NSW was the result of weak compliance and enforcement activities and standards, as well as maladministration of laws and regulations (Matthews 2017; NSW Ombudsman 2017; Walker 2019; White 2019). Following the publicity surrounding water theft and the controversy detailed in *Pumped*, the National Resource Access Regulator (NRAR 2020) has responded to over 150 received complaints and cases of alleged water theft.

There are some indications as to who might be stealing water in the Murray–Darling Basin. For example, many local perceptions are geared towards multimillion-dollar irrigators and farmers of agricultural products such as cotton, some of whom appear to take water without a licence or in contravention of licence conditions (Davies 2019; Four Corners 2017; NSW Ombudsman 2017; Walker 2019; *WaterNSW v Barlow* [2019] NSWLEC 30; *WaterNSW v Harris (No 3)* [2020] NSWLEC 18).

There are also prospects of extensive institutionalised theft that extends into the legal realm of Basin water management (i.e., evidence of direct and/or moral corruption). The state has permitted foreign investors to buy and extract large volumes of fresh water from the Murray–Darling and has handed out millions of dollars in taxpayer funds to big irrigators (Farrell and McDonald 2020; Rubinsztein-Dunlop et al. 2019). The state has prioritised freshwater resources over greater and more dire local and ecological considerations for profit and foreign investments. This form of institutionalised theft from Australian rivers harms the fragile state of the Murray–Darling Basin and clearly demonstrates there are offenders of water theft that exist on either side of the legal–illegal divide.

There has also been significant controversy surrounding the issue of floodplain harvesting, which recent events show may constitute another form of water theft. It is alleged that large volumes of water are being harvested and extracted from floodplain habitats freely and without a licence by upstream irrigators in the northern catchments of the Murray–Darling Basin. When the rains come and waters are replenished, floodplain harvesting upriver reduces inland flows for downstream communities and riparian environments. The NSW Government has been criticised for allowing upstream flows and floods being diverted to large commercial irrigators, and for knowing that this unregulated activity has been occurring for a long period of time (Brewster 2020; Dooley 2020; Druce and Foley 2018).

The reasons or causal factors behind water theft are varied. One potential motive includes the common belief that cotton is a water-intensive or ‘thirsty crop’ that requires substantial volumes of water to grow (Walker 2019). Other drivers may include drought, climate variability, increasing water prices, insufficient water allocations, personal desire to farm, the advantages of ongoing availability and accessibility of fresh water upstream, and that fresh water is a valuable and profitable commodity to be sold, especially during times when fresh water is scarce (Barlow and Clarke 2017; Douglas et al. 2016; Four Corners 2017; Holley et al. 2020; Walker 2019). For some, the taking of water is not perceived as a crime, especially if it is for survival purposes, and is, thus, more akin to a rural folk crime than a serious offence (White 2019).

Yet, the unlawful and unregulated taking of water has multiple negative effects. Water theft reduces inland water flows in downstream catchments of the Basin and imposes detrimental implications for downstream

communities, smaller irrigators, wildlife and surrounding ecosystems that rely on fresh water to survive and perform daily tasks to make a living (Barclay and Bartel 2015; Four Corners 2017; NSW Ombudsman 2017; Walker 2019). Thousands of fish have died within stagnant pools as a result of a lack of flowing water along the Darling River, inadequate water management in the North, and harmful algal conditions (Vertessey et al. 2019).

The rise of alleged water theft in NSW has also been construed as the result of weak compliance and enforcement activities and standards, and the maladministration of laws and regulations (Matthews 2017; NSW Ombudsman 2017; Walker 2019). While *Pumped* highlighted water theft and placed it at the national forefront, government inquiries and investigations reveal that this has been a historical and longstanding issue. For example, the NSW Department of Industries managed the majority of compliance and enforcement activities throughout the last decade. It established the Strategic Investigations Unit in 2012 to handle high-risk contraventions of water laws and regulations, which saw the number of enforceable undertakings increase from 400 in 2012 to above 800 in 2016 (NSW Ombudsman 2017).

However, in its investigations, the NSW Ombudsman (2017) found that compliance and enforcement standards dating between 2007 and 2017 were incredibly weak: there were inadequate departmental responses to complaints of illegal waterworks, and systematic negative directives from senior officials limited the capacity of departmental staff to respond to complaints of alleged water theft. This was largely attributable to issues associated with staff training and organisational culture, lacking legal support, the transfer of compliance and enforcement powers and responsibilities between departments, and insufficient departmental resources. Resources were only allocated to high-profile cases of noncompliance, and medium and low-profile cases were sidelined (NSW Ombudsman 2017; Walker 2019).

The Ken Matthews (2017) investigation, in response to *Pumped*, also noted that the overall standard for compliance and enforcement was poor; metering, monitoring and measuring standards for water extractions did not meet expectations; cases of alleged noncompliance remained unattended or unresolved for long periods of time; and there was minimal transparency over NSW regulatory procedures of the Basin (Walker 2019). In addition, a review of the MDBA (2017b) highlighted inadequate responses to allegations of serious breaches of the MDBP and significant variations between the Basin states regarding their delivery of compliance and enforcement, level of resourcing, transparency, and clarity of their policy frameworks. An important observation from the review was that the use of meters in South Australia was 96% compared to between 25% and 51% in NSW, which was hardly surprising given that water theft allegedly occurred primarily in the latter Basin state (Walker 2019).

However, there are also issues outside departmental capacity that may undermine compliance and enforcement activities. Given the vast landscape of the Basin, remote destinations of some irrigation sites and lack of departmental resources, the perceived likelihood of detection of water theft by authorities is low. This only increases the difficulty of ensuring that irrigators are consistently complying with water laws and regulations (Greiner et al. 2016). In addition, although most irrigators and communities along the Basin are highly compliant with and respectful and understandable of the water laws and regulations, Greiner et al. (2016) point out that if an irrigator were caught illegally extracting water by another, a witness would be unlikely to report them to the relevant authorities (Matthews 2017; Walker 2019). Basically, a sense of community and belonging among local irrigators may cloud the issues of illegal water extractions and impede an authority's capacity to respond effectively.

The MDBA and recent South Australian Royal Commission into the Murray–Darling Basin have made numerous recommendations in efforts to respond to and prevent water theft, amend the poor state of compliance and enforcement, and conserve freshwater resources. These include significant improvements to metering standards, pumping technologies and reporting capabilities in relation to acts of noncompliance; greater transparency and accountability over regulatory procedures; and the

consolidation and strengthening of governance frameworks to address the political inconsistencies over water management between the Basin states (Matthews 2017; MDBA 2017b, 2018; Walker 2019). Such scrutiny also highlights the need for satellite coverage and aerial surveillance to monitor the hydrometric network to detect any sudden changes within the flows of environmental water, which may be a result of water theft (MDBA 2017b; Walker 2019). For example, the Australian Geoscience Data Cube is a Landsat satellite imagery pilot project that was tested to discern if it could support the MBDA water management policies and decisions. This has already proven effective for locating and timing water extractions, water storages and irrigation activities along the Barwon–Darling (MDBA 2017a). Finally, as mentioned earlier, the failures of the MDBP itself have led the Australian Federal Minister for Water Resources to appoint an Inspector-General of the Murray–Darling Basin or a water theft sheriff. The appointee was former Australian Federal Police Commissioner Mick Keelty, whose role includes conducting reviews of the Northern and Southern Basin to address issues like water theft (Clark 2019).

Another problem has been the low number of prosecutions for acts of noncompliance in NSW. Between 2010 and 2016, only 12 prosecutions were recorded within NSW and of the 820 enforcement activities undertaken between 2014 to 2015—which was the greatest recorded within these six years—the number of prosecutions fell below 1%. No prosecutions were recorded in 2017 (MDBA 2018; NSW Ombudsman 2017). By contrast, consider the number of jurisdictions involved in managing the Murray–Darling Basin: this stretches across South Australia, Victoria, NSW, Queensland, the Australian Capital Territory (ACT) and the Federal Government. Enforcement activity varies greatly depending on jurisdiction. For example, in 2016–17:

NSW issued 44 warning letters and notices, Queensland 14, South Australia 355, Victoria 562, and the ACT 1. For advisory letters, the numbers were 122 in NSW, Queensland issued 12, Victoria 412, South Australia 9,765 (the latter number is high because it includes pre-emptive letters associated with introducing self-reading of meters), with no advisory letters issued in the ACT. ... Across all Basin states, the end result of compliance activity is a very small number of prosecutions. In 2016–17 there were no prosecutions in NSW and Queensland, and six in the other states. (MDBA 2017b: 13)

At the state level, there is considerable variation in compliance and enforcement systems, compliance resourcing and transparency, as well as the availability and use of administrative, civil and criminal penalties and sanctions (MDBA 2017b). In NSW, the organisational and departmental issues within the water management sector, as described above, increased the difficulty for staff to respond with prosecutorial decisions to complaints of alleged water theft within statute limitations and strict time frames. As such, this led to a large number of prosecution cases being forfeited in the last decade (MDBA 2018; NSW Ombudsman 2017).

However, in response to water theft following the *Four Corners* review, Anthony Barlow of the cotton farm ‘Burren Downs’ (the irrigation site about which the allegations of water theft were raised in *Pumped*) was convicted and fined close to AUD\$200,000 for illegally pumping water during an embargo and for having metering equipment that was not operational (*WaterNSW v Barlow [2019] NSWLEC 30*; Walker 2019). An irrigator was also charged for illegally pumping water during low flows along the Barwon–Darling River, but these charges have now been dropped, as the NSW Land and Environment Court found that prosecutors failed to establish the elements of the offence (Davies 2019, 2020; *WaterNSW v Harris (No 3) [2020] NSWLEC 18*). In addition, the NRAR was created, replacing the split functions of the NSW Department of Industries and WaterNSW. The NRAR (2020) has already responded to and overseen multiple complaints of acts of noncompliance in NSW, including six prosecutions and a large number of other compliance and enforcement activities (Walker 2019).

It is still more generally recommended that prosecution guidelines and penalty regimes need to be improved not just within NSW, but across all Basin states, to respond to contraventions of water laws and

regulations (such as water theft) on a more uniform and harmonised level (MDBA 2018; Walker 2019). However, Greiner et al. (2016) point out that marginally increasing the severity of a penalty is unlikely to deter water theft, as the monetary benefits of stealing water—whether it is to sell water or finalise crop development for financial gain—may outweigh the penalty, or the penalty may only constitute a small financial proportion of the overall financial prospects. Much also depends on the resources and expertise of the agencies and courts assigned to deal with allegations and prosecutions of water theft.

A Criminological Research Agenda

These analytical focuses provide essential conceptual starting points for further investigation of crimes such as water theft. For example, research in this area could incorporate efforts to provide a comprehensive geographical and contextual profile of water thefts in Australia. This charts the motivations of offenders and the contexts that permit or enable misconduct; catalogues the socio-economic costs associated with water theft in Australia, including harms to humans, non-humans and ecosystems; critically examines, compares and contrasts existing national, state and territory policies for ensuring water security, regulation and compliance; and proposes models for future compliance, mitigation and crime prevention. The use of green criminology discourses permits the concept of ‘crime’ to be examined in its broadest sense to include harmful acts not necessarily prohibited or regulated by government legislation at the present time.

Further research is also required on specific topics that pend analysis, and could include intended use of water (e.g., human consumption, industrial, agricultural), legal basis of the offence (e.g., civil, administrative, criminal), crime classification (e.g., offences directly against water quality, water quantity, public safety and state security), legal status of the perpetrator(s) (e.g., individual, company, organised crime group), motive for the crime (e.g., need, economics, ideology), modus operandi (i.e., methods and means of crime), and consequences of the crime (e.g., harm to water, natural environmental, animals, humans, infrastructures and public economy). In conjunction with developing a working typology of water theft, this kind of intervention would also require a network analysis that maps the Australian landscape in regard to the key players and regulatory frameworks pertaining to water theft, identifying the network of actors having an interest in water-related issues at the federal, state and local levels. The focus would be on examination of relevant legislation (e.g., water management, water services and water markets), official stakeholders (governments at all levels, water companies and water users), policy and regulations (e.g., national water frameworks), and identification of relevant science and technology experts (e.g., those with water expertise such as hydrologists). This would need to be accompanied by consideration of the availability of data management systems pertaining to enforcement and compliance, the prosecution of water theft, and the quality and quantity of water supply.

Finally, a major concern is with problem identification and potential crime prevention strategies. Accordingly, research would need to be undertaken with water managers (private and government), water enforcement officers (e.g., environmental protection agencies, police and regulators), judicial officers with environmental remits (e.g., judges of the NSW Land and Environment Court), non-government agencies (e.g., Environmental Defenders Offices), local councils (e.g., environment officers), representatives from federal and state departments of environment (or equivalent), scientists (e.g., hydrologists and climate scientists), and disaster relief (e.g., police and emergency services). Of fundamental importance is the inclusion of communities in any intervention strategy, such as farmers, fishers, Indigenous people, environmentalists, residents and citizen scientists. Intervention should take the form of social action research insofar as its orientation is towards the development of strategies that deal with water thefts in the here and now; it should also cover a host of over-the-horizon probabilities and possibilities related in large measure to the effects of global warming.

Conclusion

In light of the Earth's dwindling freshwater supply, water theft will remain both a reoccurring and an intensifying global problem. While governments around the world continue to recognise the theft of water as an important issue, it is vital that criminologists have a say in how specific sectoral interests then frame these matters, in turn. These are not simply 'technical' violations of law, for example, relating to licensing issues. Likewise, the problem is not solely one of poor or even corrupt regulatory systems. Political economy and regulatory theory provide insight into each of these areas, but these do not tell the whole story.

In our view, there are complex issues here that require further conceptual unpacking and citizen-level engagement and intervention. For example, there are issues pertaining to locality and rural culture, multiple uses and users of water; variations in level and types of victimisation (including non-human environmental entities); the implications of climate change for drought; acknowledgement of Indigenous rights and knowledge; and tensions between ecological concern and economic survival. We have not even mentioned developments in Earth jurisprudence, such as the granting of rights to non-human environmental entities like rivers and the resultant implications for how we view water theft. The Te Awa Tupua in New Zealand is one such example of a river that is legally recognised as its own independent being with the same rights and liberties as a human (Blankestijn and Martin 2018; White 2018b).

For green criminology in particular, the challenge is to not simply expose the harms arising from and the social interests that contribute to the problem of water theft. It is to also think carefully about the varied ecological and social justice issues involved, and to map crime prevention strategies that will resonate with and engage diverse stakeholders so that they are an active part of the solution. To do this demands sustained analysis of communities and environments. It also requires promulgation of ecocentrism—the valuing of nature for its own sake—as an ethical and ecological necessity, as we navigate the troubled waters that lie ahead. The current situation in Australia demands nothing less, and therein lies its global significance.

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¹ The Murray–Darling Basin Plan serves as the official water management framework of the Murray–Darling Basin and requires all Basin states and federal actors to comply with and uphold the water laws, regulations and obligations pertaining to the *Water Act 2007*. This was the largest environmental restoration project in Australian history, costing AUD\$13 billion in taxpayer funds, and was designed to improve the ecological health of the Murray–Darling Basin, while continuing to support and promote farming and other agricultural industries (Four Corners 2017; Leblanc et al. 2012; Murray–Darling Basin Authority 2020; Walker 2019; Wheeler et al. 2014).

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