

Eco-crimes and Ecocide at Sea: Toward a new blue criminology

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Abstract

This essay adopts an interdisciplinary approach to consider the meaning of ‘eco-crime’ in the aquatic environment and draws on marine science, the study of criminal law and environmental law, and the criminology of environmental harms. It reviews examples of actions and behaviours of concern, such as offences committed by transnational organised crime and the legal and illegal over-exploitation of marine resources, and it discusses responses related to protection, prosecution and punishment, including proposals for an internationally accepted and enforced law of ecocide. One key element of the policy and practice of ending ecocide is the call to prioritise the adoption of technologies that are benign and renewable. Our essay concludes with a description of the ‘Almadraba’ method of fishing to illustrate that there are ways in which the principles of sustainability and restoration can be applied in an ethical and just way in the context of modern fisheries.

Keywords

Almadraba; blue criminology; ecocide; green criminology; illegal, unreported and unregulated fishing (IUU); transnational organised crime

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1 **1. Introduction**

2 The challenges associated with what we can call ‘eco-crimes’ are growing. ‘Humanity’s
3 self-ordained mandate to subdue and dominate nature’, as Bearzi (2020) puts it, has affected
4 the planet so much that it is, arguably, entering a new geological epoch—the Anthropocene
5 (Brisman & South 2018). These actions and effects occur across a wide variety of locations
6 and the resulting impacts may materialise far from their source, in terrestrial, atmospheric or
7 aquatic ecosystems (Zalasiewicz et al. 2019). Referring to the vital role that recognition of the
8 Anthropocene will play in the context of international law, Vidas (2015: 2) remarks that it ‘will
9 bring a fundamental shift ... in which the challenges are increasingly recognized as the
10 consequences of natural, not only political, change’. This factor may exacerbate already
11 ‘existing tensions in the regulation of inter-state relations under international law’, and
12 present serious challenges to fledgling international environmental criminal law. Despite the
13 well-documented state of the planet—the degradation of land, destruction of forests,
14 pollution of air, and endangerment of the seas and aquatic life—political and popular opinion
15 and action have, for various reasons, not addressed the challenges with the urgency they
16 deserve (South 2016; see also Klein 2019).

17 In this essay, we consider the case of the world’s seas, often overlooked in comparison
18 to the attention paid to air quality or loss of forests due to wildfires and agricultural clearance
19 (see Sheppard 2019). Jouffray and colleagues (2020: 46) refer to the increasing human
20 pressures now being placed on the worlds’ oceans as ‘the blue acceleration’, noting that while
21 human claims to marine ‘resources’, such as for food and materials, are not new, ‘the extent,
22 intensity, and diversity of today’s aspirations are unprecedented’. Crimes and harms affecting
23 the marine environment might, we suggest, be considered as part of a new ‘blue criminology’
24 which embraces, for example, the concept of transnational organised crime at sea which can

1 be found in operation in differing ways across the world's maritime regions (see generally
2 Paulson 2018). Bueger and Edmunds (2020) identify three focal categories of relevance here:
3 crimes against mobility (modern piracy, cybercrime), criminal flows or transit crime
4 (smuggling, human trafficking), and environmental crimes (e.g., fishing, waste dumping at
5 sea, unregulated activities). To consider all these together suggests the need for international
6 criminal law that is holistic and that can provide the basis for a comprehensive response.

7 Today, the social and natural sciences need to be more sophisticated, without being
8 more compartmentalized: in other words, they need to be intellectually receptive and
9 sympathetic to each other in order to synthesize useful knowledge regarding environmental
10 threats (see Bearzi 2020). Adopting an interdisciplinary approach to findings from marine
11 science opens a window of opportunity for the study of criminal law, and for a criminology
12 concerned with environmental harms to consider the meaning of 'blue crime' and possible
13 interventions (Bueger & Edmunds 2020). Both the criminology of the environment—referred
14 to as 'green criminology' (Brisman & South 2019b, 2020)—and environmental criminal law
15 (Boyle 2012, García Ruiz 2017, Sands et al. 2018, Junker 2019)—have played increasingly
16 important and thought-provoking roles in their disciplines. A 'green' perspective in
17 criminology has extended the field and dissemination of its arguments to different audiences
18 far from the limitations of orthodox criminology (South 1998, see also Lynch et al. 2017), while
19 environmental law has often sought to push international and national law in new directions
20 and to make connections with rights discourses, victim's movements and environmental
21 campaigns.

22 Green criminological studies are focused on not only acts and omissions defined as
23 'crimes' under the law, but also legally perpetrated harm (South 2014). As such, green
24 criminologists have a spectrum of activities and consequences to explore (for an overview of

1 causes, responses, prevention and meaning of eco-crime or environmental crime and harm
2 and their eco-philosophical alignments, see Brisman & South 2019b, 2020). The range of
3 manifestations of eco-crimes/harms at sea could embrace, among other examples: illegal
4 shipping and marine piracy, both of which involve blatant disregard for national, regional and
5 international environmental law (e.g., Collins 2015, Bueger & Edmunds 2020); illegal fishing,
6 which competes with traditional fisheries, destroys sea-bottom ecosystems, and aggravates
7 tensions over vessel licensing (Belhabib & Le Billon 2020: 1); massive extraction of mineral
8 and metal resources from seawater, involving companies engaging in fracking offshore and
9 dumping toxic chemicals into the ocean (Jouffray et al. 2020); depletion of mangrove
10 ecosystems and salt marshes, which are increasingly threatened by direct and indirect human
11 activities, or by the effects of climate change (WWF 2020, see also Cohen 2018, Lavaniegos
12 2018, Pierre-Louis and Popovich 2019, Smale et al. 2019); discharges of waste in ocean waters
13 (Greife and Stretesky 2013, see also Taylor 2019); the impact of light pollution (artificial light)
14 on marine fish and zooplankton in an increasingly warmer Arctic (Berg et al. 2020, Gibbens
15 2020); and ‘ghost fishing’ caused by abandonment or dumping of fishing gear in the oceans
16 (Brown & Macfayden 2007, Leschin-Hoar 2016).

17 The response of criminal law and legislation is far from homogeneous at the
18 international level and policy is often centred more on human environmental actions and
19 impacts than on advancing ‘rights’ of oceans, seas or aquatic life (see Brisman 2014a). In other
20 words, diverse impacts are met with disparate responses.

21 The discussion here is wide-ranging but focused on the waters of the oceans and seas
22 and their adjacent zones. (For a review of challenges relating to fresh water sources and
23 systems, see Brisman et al. 2018.) The aim is to provide the basis for facilitating the design
24 and adoption of appropriate, new or improved, regulations, norms and behaviours to protect

1 ecosystems, human and non-human animals (Brisman 2014b), as well as the biosphere *per se*
2 (Brisman & South 2019b). There is an urgency about doing this. Politics can be populist and
3 poorly informed, and law-making can be slow and conservative; both can be ‘opportunistic
4 [...] and short-sighted’ (Díez-Ripollés 2019: 52)⁴. The environmental problems of today require
5 acknowledgement of the benefits of traditional forms of engagement with the environment
6 that have valued stewardship, as well as recognition of the long-term consequences of poor-
7 decision making.

8 In the sections that follow, we review examples of the kind of actions and behaviours
9 that are of concern to green criminology and environmental law, such as organised crime
10 offences and the legal and illegal over-exploitation of marine resources. We then turn to the
11 matter of responses and issues related to protection, prosecution and punishment. One of
12 the most powerful propositions that has been made in relation to these responses is that
13 there should be an internationally accepted and enforced law of ecocide and this is outlined
14 next. Calling for the end of ecocide is for the benefit of the planet, its ecosystems and all those
15 beings that depend on them, and it is timely given threats like climate change, pollution and
16 the pressures on the land and the sea as sources of food production. One key element of the
17 policy and practice of ending ecocide is the call to prioritise the adoption of technologies that
18 are benign and renewable on a global basis (Higgins et al. 2013: 263). We therefore conclude
19 our essay with a description of the ‘Almadraba’ method of fishing to illustrate that there are
20 ways in which the principles of sustainability, restoration and control over the depletion of
21 certain species, can be applied in the context of modern fisheries.

⁴ We omit an examination here of the effects of civil or administrative sanctions because these are limited geographically, with varying macro-level impacts. Our approach would, therefore, view the concept of ‘ecocide’ (discussed further below) as one to be applied to the sea/ocean *globally* and would also consider international criminal law as a primary method of prevention (without denying the value of dialogue with other branches of law). For a related discussion on international criminal law, prevention and wildlife crime, see Nurse (2015).

1 **2. Eco-organised crime at sea**

2 ‘Eco-crime’ is a term that can be applied to the activities of various organised groups
3 operating at multiple environmental sites (Walters 2014, see also Collins 2015, Fajardo 2015,
4 Sergi & South 2016, Gore et al. 2019). Some of the most damaging eco-crime categories
5 involve a *transnational* dimension—such as working across borders or in international waters
6 to dispose of toxic waste, discharge oil and garbage from ships illegally, or engage in illegal
7 fishing outside of regulatory controls designed to protect at-risk species (Bondaroff et al.
8 2015, Haenlein 2017, Bueger & Edmunds 2020). According to Belhabib and Le Billon (2020:
9 1), ‘[t]he criminal dimensions of illegal fishing include both fisheries related crimes such as
10 enforcement evasion, misreporting, document forging, money laundering, labor abuses, and
11 tax evasion [...] but also crimes associated with the fisheries sector, including piracy (Denton
12 & Harris 2019) and various types of trafficking’ (UNODC 2011; Vrancken et al. 2019). An
13 additional complication here is that criminal agents are often working with, or taking
14 advantage of, institutional bodies and practices engaged in *legal* activities in the market
15 (Ruggiero & South 2010, Ruggiero 2013, White 2017).

16 The commission of serious offences at sea occurs, in part, because they can be highly
17 lucrative—as profitable as illegal drug trafficking or smuggling. For example, as a study
18 conducted by the United Nations Office on Drugs and Crime (UNODC) (2011: 127) concluded,
19 ‘marine living resources have become a high profit, low risk target for criminals [...] Typically,
20 marine living resource crimes are offences against marine living resource management and
21 conservation regulations. A number of States regard marine living resource crimes as the
22 predicate offences of up- and downstream crimes such as money laundering, corruption,
23 handling of stolen goods and tax- and customs fraud’. In addition, such crimes are often hard
24 to detect and, when offenders are apprehended and prosecuted, sanctions are lower than for

1 some less serious crimes. Generally, then, the majority of such criminal actions go
2 unpunished; when punishment is imposed, the focus is often on determining financial liability
3 and imposing pecuniary fines rather than on sentencing individuals to a prison term, which
4 could possibly play a more dissuasive and preventive role for states and large corporations.
5 Detection is not impossible of course and, notably, a recent global law enforcement operation
6 involving environmental, maritime and border agencies, as well as national police, customs,
7 and port authorities across sixty-one countries, did identify thousands of illicit activities,
8 including severe marine pollution and serious cases of contamination worldwide (Europol
9 2019b, Interpol 2019)⁵. We discuss issues of protection, prosecution and punishment further
10 below.

11

12 **3. Crimes and harms of overexploitation of marine resources**

13 The Common Fisheries Policy is the statement of European Union (EU) rules designed
14 to combat illegal, unreported and unregulated fishing (IUU), to manage European fishing
15 fleets, and to conserve fish stocks (the most recent update took effect on 1 January 2014).
16 IUU fishing practices generate enormous profits every year worldwide. Indeed, they generate
17 massive flows of ‘dirty money’, which remains outside financial and tax control. Therefore,
18 such activities represent a pattern of activity closer to the profile of an ‘organised criminal
19 industry’ (UNODC 2011, 2017), further increasing the threat of extinction to species, with the
20 largely irreversible and harmful ecological consequences extinction entails (Dayton et al.
21 1995; see also Brisman & South 2019a, Kolbert 2019). Moreover, older and more polluting

⁵ As one example of an illegal market based on smuggling, the fishing season in 2018-19 was particularly profitable for the business of smuggling glass eels: European law enforcement was able to seize 5,789 eels with a market value of €2000 per kilo. According to Europol, criminal organisations may have made more than €6 million a year from this illegal transnational operation.

1 vessels employed by some IUU fishers have a greater impact on the environment than other
2 vessels (Bondaroff et al. 2015: 17).

3 Pauly and Zeller (2016) have analysed data to produce estimates regarding global
4 marine fisheries catches. Using a decade-long, multinational ‘catch reconstruction’
5 methodology, covering the Exclusive Economic Zones (EEZ) of the world’s maritime countries
6 from 1950 to 2010, and accounting for all fisheries, they point out an urgent need for
7 improved monitoring of *all* fisheries, including often neglected small-scale fisheries, and
8 illegal and other problematic fisheries, as well as discarded bycatch. The authors reach their
9 ‘urgent’ conclusion because, based on the reconstructed data, overall, catches are 53% higher
10 than the data reported by the Food and Agriculture Organization (FAO) on behalf of its
11 member countries (Pauly & Zeller 2016: 3; see also the Ecopath modelling approach and
12 software <http://sirs.agrocampus-ouest.fr/EcoBase/> and FishBase, the online encyclopedia of
13 fishes www.fishbase.org complemented recently by SeaLifeBase www.sealifebase.org). The
14 argument is that monitoring can have an effect. After the International Commission for the
15 Conservation of Atlantic Tunas (ICCAT)—an inter-governmental fishery organization
16 responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and its
17 adjacent seas (<https://www.iccat.int/en/>)—launched requirements for statistical
18 documentation schemes, the amount of unreported tuna catch decreased significantly in the
19 Central Atlantic. The decline of illegal fishing in the Western Indian Ocean also reflects the
20 gradual increase in control over time by coastal states (Agnew et al. 2009: 3). This partial
21 international control is not sufficient, however, to deal with ‘the context of burgeoning
22 demand for food and particularly protein’, which will continue to place enormous pressure
23 on fish stocks over the next 50 years (Agnew et al. 2009: 5, see also Costello et al. 2020). As
24 just one indicator, the demand for tuna and tuna-like species seems to be currently at an all-

1 time high (Greenberg 2010, Coulter et al. 2020). In addition, a serious threat to various
2 endangered small cetaceans comes from small-scale fisheries responding to growing demand
3 for domestic consumption rather than for export. The rise in fishing activity, then, creates
4 further dangers as discard of tackle and fishing nets can lead to entangling larger species, such
5 as sperm whales, which has occurred in the Mediterranean Sea (Brown & Macfayden 2007,
6 Leschin-Hoar 2016, Staff 2020). Brownell and colleagues have suggested that the definitive
7 long-term solution to this is the use of 'efficient, inexpensive, alternative fishing gear that can
8 replace gillnets without jeopardizing the livelihoods of fishermen' (2019: 293). We return to
9 the possibilities of long-term benefits offered by small-scale fishing later.

10

11 **4. Lack of uniformity of protection, prosecution and punishment regarding eco-crimes at** 12 **sea**

13 Protected areas in marine and coastal areas might be described as any one of the
14 following: *marine conservation area, marine management area, marine monument, marine*
15 *park, marine reserve, marine refugia, marine sanctuary, or marine wilderness area*. These
16 terms may carry different implications or expectations regarding protections in place and
17 often the activities that are permitted and exempt from protective restrictions will be
18 dissimilar and depend on the country administering such zones (Dudley et al. 2008, 2013: 55-
19 59, Laffoley et al. 2019). Possibly the most common nomenclature internationally is 'Marine
20 Protected Area' (MPA). Over 70% of the surface of the Earth is ocean, comprised of highly
21 diverse ecosystems, and providing a wide range of marine ecosystem services that support
22 human society, health and the economy, but only 7.91% of this is designated as MPAs and
23 fewer than 10% of such areas achieve their management goals and objectives (UNEP-WCMC
24 & IUCN 2020). Maximising the size of the ocean areas covered by MPA status is one of the

1 most pressing issues regarding the prevention of overexploitation of species (Sosa-Nunez
2 2018: 4, see also Cohen 2018, Rodríguez-Rodríguez 2019: 480). As Bearzi (2020) reminds us,
3 however, human impact may *increase* within MPAs if management permits certain actions to
4 continue (such as overfishing or high-intensity noise from oil and gas exploration). Moreover,
5 MPAs cannot fully prevent other important pressures damaging to marine life, such as water
6 pollution. In other cases, such as over-exploitation, as Belhabib and Le Billon (2020:2) argue,
7 '[a]uthorities should not simply respond to illegal fishing through fishery management, but
8 address its many transnational criminal dimensions'. Correspondingly, Jouffray and
9 colleagues (2020: 48) observe that the 'once-popular view that the ocean—unlike the
10 continents—was simply too big to be affected by human actions has been replaced by the
11 reality of the Anthropocene Ocean (Levin & Poe 2017), in which the ocean is neither "too big
12 to fail nor too big to fix, it is too big to ignore" (Lubchenco & Gaines 2019)', and today,
13 'addressing the diversity of claims, their impacts, and their interactions, will require effective
14 governance'.

15 Such governance would ideally reflect the global 'common interest' (Hardin 1968, see
16 also Brisman 2003) but, at present, the 'sharing' that is implied in the idea of 'the commons'
17 has been undermined and lost support. Indeed, although the oceans are global, in law they
18 are divided into areas, either subject to national jurisdiction—national waters—or areas
19 beyond national jurisdiction (ABNJ)—international waters—an arrangement which means
20 national jurisdictional bodies are generally (and formally) incapable of prosecuting and
21 judging most transnational criminal activities happening at sea. Such limited jurisdictions also
22 signify that each coastal state holds certain exclusive rights over their own EEZ and the
23 continental shelf, which extends for up to 200 nautical miles out from the coastal baseline
24 (Schiffman 2018). The outer limits of any EEZ should mark the start of international waters,

1 where any state has the right to freedom of navigation, freedom of fishing, and freedom to
2 pursue scientific marine research (Orbach 2003). In recent years, however, a phenomenon
3 that Jouffray and colleagues (2020: 46) refer to as ‘seabed grabbing’ has seen an increasing
4 number of states lay claims to extended continental shelf territories with degrees of overlap
5 (see, e.g., Chivers 2007, Parfitt 2007, Reuters 2007). This, they argue, is ‘not only transforming
6 the geopolitical landscape’—or seascape—but ‘also substantially shrinking the area
7 designated as the common heritage of humankind’ (Jouffray et al. 2020: 46).

8 Despite efforts to create or consolidate a single body of laws aimed at safeguarding
9 the oceans, the current picture of international law of the sea presents a tapestry of national
10 and international rules, customs, treaties, and agreements. These complement the important
11 United Nations Convention on the Law of the Sea (UNCLOS), adopted in 1982—the so-called
12 ‘Constitution for the Seas’—that continues to be the primary international treaty (see
13 Brisman 2011, Schiffman 2018)⁶. The formalization of UNCLOS was a watershed moment in
14 ending centuries of legal freedom to navigate the ocean (the concept of *mare liberum*) and
15 moving towards its territorialization (as epitomized by the concept of *mare clausum*) (Russ &
16 Zeller 2003).

⁶ The foremost international and European legislation on the issue—among other bilateral agreements and regional initiatives—are (in chronological order) as follows: International Convention for the Regulation of Whaling 1946; International Convention for the Prevention of Pollution of the Sea by Oil 1954; International Convention on Civil Liability for Oil Pollution Damage 1969; Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972; Protocol to the International Convention on Civil Liability for Oil Pollution Damage 1976; International Convention for the Prevention of Pollution from Ships 1976, as modified by the Protocol of 1978 (MARPOL); International Convention for the Safety of Life at Sea 1974 (SOLAS); International Convention on Oil Pollution Preparedness, Response and Cooperation 1990 (OPRC); International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances (HNS) by Sea 1996; International Convention on the Control of Harmful Anti-fouling Systems on Ships 2001; Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean 2000; Environmental Liability Directive 2004/35/EC; Marine Strategy Framework Directive 2008/56/EC; Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora; Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the Conservation of Wild Birds. For an overview of some of these instruments, see Schiffman (2018:66-73).

1 UNCLOS has not resolved all questions of oceanic ownership, however. At present, for
2 example, relevant procedural and substantive issues are the subject of energetic discussions
3 in relation to the rights of certain nations to articulate claims on the wealth of mineral
4 resources from the Arctic. This has become a case that some parties have wished to press
5 with increasing urgency as the Arctic sea ice retracts, making access to the natural resources
6 of the region more accessible than ever before (Brisman 2013, Sun & Beckman, 2018, Berg et
7 al. 2020, Gibbens 2020).

8 In this regard, compliance with the International Code for Ships Operating in Polar
9 Waters (Polar Code) of the International Maritime Organisation (IMO), which entered into
10 force in 2017, is mandatory under both the International Convention for the Safety of Life at
11 Sea (SOLAS) and the International Convention for the Prevention of Pollution from Ships
12 (MARPOL). The Polar Code covers the full range of construction, design, equipment,
13 operation, search and rescue, and training, as well as environmental protection matters,
14 relevant to ships operating in the waters surrounding the two poles. The question, however,
15 is whether the Polar Code provides the basis for sufficient protection and effective regulation
16 to minimize the likely pollution from increased shipping in this striking marine environment
17 and manage potential threats, such as heavy grade oil use and disposal, ballast water
18 discharge, and anti-fouling requirements (Nengye 2016).

19 The aim of protecting oceans and seas and promoting the sustainable use of marine
20 resources has been developed mainly through the ‘Regional Seas Programme’ of the United
21 Nations Environment Programme (UNEP)—the leading global environmental authority. UNEP
22 also created the Global Programme of Action for the Protection of the Marine Environment
23 from Land-based Activities. Together, Regional Seas Conventions and Action Plans represent
24 the world’s only legal framework for protecting the oceans and seas at the regional level.

1 These global intergovernmental mechanisms address directly the nexus between terrestrial,
2 freshwater, coastal and marine ecosystems. In addition, in 2016, the European Commission
3 and the EU's High Representative set out a joint agenda for the future, proposing fifty actions
4 for safe, secure, clean and sustainably managed oceans in Europe and around the world (see
5 'International ocean governance: an agenda for the future of our oceans in the context of the
6 2030 SDGs' and the Joint Report to the European Parliament and the Council 'Improving
7 International Ocean Governance—Two years of progress' {SWD (2019) 104 final}, Brussels,
8 15.3.2019). As Brownell and colleagues (2019: 293) observe, 'institutions with the
9 responsibility, legal authority, expertise, and resources to pursue conservation as a top
10 priority' can help to meet these goals, 'particularly if local communities are involved in a
11 manner that rewards and reinforces their commitment', although the legal framework to
12 accomplish this often awaits further reforms coupled with the enactment of technically
13 suitable environmental laws (see for example, the report on adaptation of EU Directive
14 2008/99/EC on the protection of the environment through criminal law into the Portuguese-
15 Spanish criminal arena: Fuentes Osorio et al. 2020).

16 Forthcoming responses to address global blue governance still seem to be weak and
17 underdeveloped, although in 2019, the UN did present proposals for the 2020 United Nations
18 Conference to Support the Implementation of Sustainable Development Goal 14: Conserve
19 and sustainably use the oceans, seas and marine resources for sustainable development.
20 Naturally, due to the Covid-19 pandemic, this planned conference has been postponed *sine*
21 *die* (GA decision 74/548)⁷.

⁷ A/RES/73/292. Resolution adopted by the General Assembly on 9 May 2019. UN Ocean Conference: 'Save our Ocean, Protect our Future'. Lisbon, Portugal 2020: <https://www.un.org/en/conferences/ocean2020>

1 International criminal law oriented to the safeguarding of the seas and oceans must
2 acknowledge each state's sovereignty, i.e., each nation's environmental criminal law rules,
3 but national case law and campaigns can also help to influence and shape international law.
4 National and international law are mutually influential, for example within the context of
5 European criminal law.

6 Some of the most important developments in marine pollution legislation have been
7 triggered by large-scale maritime catastrophes, such as the cases of the 'Erika' (Giovannini et
8 al. 2013) or the 'Prestige' (Frank 2005, Penela-Arenaz et al. 2009, García Ruiz 2014). The
9 Mattese tanker 'Erika', sank off the coast of Brittany (France) in 1999, eventually broke in two
10 parts carrying about 30, 000 tonnes of heavy fuel oil and as a result, 14,000 tonnes of oil were
11 spilled. The pollution stretched along more than 100 miles of the Atlantic coastline. A Panama
12 branch of the French company, 'Total International Ltd.', owned the cargo and the final
13 judgement, which was far from exemplary but could not be appealed, ruled that the company
14 was guilty only of negligence (Giovannini et al. 2013: 29).

15 In 2002, the catastrophic oil-spill caused by the break up and sinking of a different
16 ship, the 'Prestige', that was in poor structural condition, caused the Galician coastline (Spain)
17 to suffer an ecological and economic tragedy of unprecedented proportions. The subsequent
18 investigations highlighted the difficulties involved in determining who might be held
19 responsible for the oil spill because the Prestige was officially registered in the Bahamas. Both
20 the Spanish oil company Repsol—since 1997—and the British company BP (formerly British
21 Petroleum)—since 2000—had previously rejected use of the ship for several reasons: its age,
22 problem with its documentation, and absence of a CAP (Condition Assessment Program)
23 (García Ruiz 2014). Despite these and many other repeated experiences, such as the recent
24 oil spill in the Indian Ocean near Mauritius from the Japanese vessel MV Wakashio (Bueger

1 2020), the global legal system continues to tolerate ‘an organized irresponsibility model which
2 benefits major polluters’ (Baucells & Petit 2013: 5).

3 As Bennet and colleagues (2019: 991) note, ‘Policy frameworks and environmental
4 assessment processes to adequately understand and manage the environmental risks of
5 maritime development are nascent or often do not yet exist’. We attempt to illustrate aspects
6 of this dynamic and some possible responses in the next section.

7

8 **5. Ecocide at sea**

9 In general, ‘ecocide’ is described as ‘the extensive damage to, destruction of or loss of
10 ecosystem(s) of a given territory, whether by human agency or by other causes to such an
11 extent that peaceful enjoyment by the inhabitants—human and non-human—of that
12 territory has been severely diminished’ (Higgins 2015: 63). For Higgins, because ‘territory’
13 represents an ‘open’ concept, maritime extensions should also be included. Of course,
14 ‘ecocide’ is not yet recognized internationally as a ‘crime’, and the International Criminal
15 Court (ICC) remains the single competent judicial authority to prosecute individuals for
16 international crimes of genocide, crimes against humanity, crimes of aggression, and war
17 crimes, as set out by the Rome Statute (RS), in force from 1 July 2002 (for an overview and
18 explanation why the initiative to include ‘ecocide’ in the Rome Statute failed, see Gauger et
19 al. 2012, Higgins et al. 2013, Higgins 2015, García Ruiz 2018). Although ecocide has not yet
20 been incorporated into international law, it has been defined by several authors, such as Berat
21 (1993), Falk (1973) and Gray (1996), who had formulated conceptual descriptions preceding
22 Higgins' definition (García Ruiz 2018: 6). The amendment of the Rome Statute presented by
23 Higgins to the United Nations Law Commission in 2010 was aimed at pushing for the
24 enactment of an ‘Ecocide Act’ within the jurisdiction of the ICC. To date, however, this

1 proposal for an international law designating ecocide as a *crime* represents only a proposal
2 *de lege ferenda*—with a view to future law (García Ruiz 2018). Examining international
3 criminal law is not a facile exercise as the legal and technical elaborations involved are
4 intricate even within the general frame in which such law is routinely practiced (in terms of
5 crimes against humankind). It is also a complex field because it is relatively young (developing
6 from the second half of the twentieth century onwards), growing, and still being tested. It is,
7 therefore, understandable that the even younger field of international environmental
8 criminal law is still in its early days of ‘struggling for breath’.

9 Let us apply the idea of ecocide in the context of marine environments to two cases.
10 First, a recurrent catastrophe destroying Europe’s largest salt water lagoon is occurring on
11 the coast of Mar Menor (Spain) with thousands of fish and crustaceans washed up dead on
12 beaches in the region due to lack of oxygen, unsustainable urban developments, farming and
13 pollution. This phenomenon has been observed for at least 20 years, although it attracted
14 public attention and scrutiny as a signal of collapse only recently as a result of a disaster taking
15 place in the area in October 2019, known as DANA or a ‘cold front’—an event caused by
16 meteorological processes associated with the stratosphere-troposphere exchange which
17 trigger torrential rains and floods. This is not to attribute responsibility to nature, for, at most,
18 nature is also a victim of what is occurring. The causes seem to lie with the effects of intensive
19 and persistent processes of urbanisation, as well as soil fertilisation being carried out in the
20 region.

21 For a second case, let us consider the first-ever scientific report on the impact of
22 climate and environmental change in the Mediterranean basin—relying on previous research
23 carried out since 2015 by a group of over 80 scientists under German geographer Wolfgang
24 Cramer’s guidance (see Cramer et al. 2018)—which has found that ‘the region faces unequal

1 distribution of resources, social instability, conflict and migration’ (MedECC 2019:5). The
2 Balearic Islands, the northwest Ionian, the Aegean and Levantine Seas, have been identified
3 as the regions where fisheries and aquaculture are currently impacted most by destructive
4 practices, such as overfishing and coastal development (MedECC 2019: 8), and are also
5 experiencing a significant increase in sea surface temperature. Those causing and those
6 affected by these manifestations of ecocide at sea regularly become mired in debates about
7 what causes and consequences should be attributed to nature and what to other, artificial
8 sources.

9 Would these cases amount to illustrations of ‘ecocide’? Undoubtedly, they meet the
10 requirements of the definition offered by Higgins. That said, we are witnessing some
11 concerted efforts to treat our oceans as something other than (boundless) resources to be
12 pillaged in pursuit of perpetual growth and material wealth—and to reject the misguided
13 belief that we, as humans, have a right to dominion and sovereignty over the seas. We
14 conclude our essay with an example of ways in which the principles of sustainability,
15 restoration and environmental justice can be applied in the context of modern fisheries.

16

17 **6. Turning the tide toward sustainability: The ‘Almadraba’ fishing method**

18 It can be suggestive to compare traditional fishing systems with modern industrial techniques
19 that result in overfishing of critically endangered species, such as the Atlantic bluefin tuna
20 (see generally Kolbert 2019). Historically, bluefin tuna, caught by the method of creating a
21 labyrinth of nets (called the ‘Almadraba’) that the tuna swim through, has been a sustainable
22 method of fishing without contributing to the decline of the species and has ancient roots
23 dating back to the Phoenician-Punic-Roman period (Florido del Corral 2018). Today, harmful
24 fishing practices (such as encircling the tuna with nets) and the global expansion of the tuna

1 fishing industry, have contributed to overexploitation of tuna, endangering their survival
2 (García Vargas & Florido del Corral 2010, Di Natale 2012, Brownell et al. 2019, Coulter et al.
3 2020). Traditional fishing systems have been slowly disregarded (Coulter et al. 2020) perhaps
4 because, as the EU acknowledged (Directorate-General for Internal Policies 2015), the
5 method of ‘Almadraba’ harvesting is more labour-intensive than any other fishing method.
6 Tuna caught by this method is increasingly appreciated by the market, although at present, it
7 is practiced only in Italy, Morocco, Portugal and Spain.

8 On account of the peculiar transit connection between Atlantic bluefin tuna and the
9 Mediterranean Sea, the broadest sense of the word ‘Almadraba’ or ‘Madrague’ in French,
10 once widely translated as ‘tuna fishing’, remains solidly related to the place where the trapped
11 tunas struggle to escape from traps (Corriente 2008: 138). Despite its Arabic sound— derived
12 from Hispanic-Arabic (Drae)—the etymological origin remains controversial (see Soto Melgar
13 2014: 282). For instance, Italian terminology linked to this artisanal fishing technique includes
14 the descriptive expressions ‘Mattanza’ or ‘Tonnara’ (see Maggio 2000)—or ‘camera della
15 muerte’—that embodies the space in the net where the tuna is caught (Pitcher 2001: 603,
16 Emery 2010: 1). Regrettably, use of the traditional tuna trap barely survives in contemporary
17 fishing: only a few of these *tonnare* are seasonally active in insular zones in places such as
18 Sardinia and Sicily (Addis et al. 2016: 138) or in other, historically influential, zones in the
19 Mediterranean belonging to Libya or Tunisia (Addis et al. 2012, Emery 2010).

20 Significant Spanish tuna traps are installed in the Straits of Gibraltar at Barbate, Conil,
21 la Janda, Tarifa and Zahara de los Atunes, along with traps set in the Moroccan waters, but
22 increasingly, the numbers in Morocco are few and fluctuating (Abid et al. 2012). This
23 geographically restricted and shrinking space is the location of ‘one of the most emblematic
24 sites of the ABFT [Atlantic bluefin tuna] life cycle’ (Cort & Abaunza 2019:37) because they are

1 obliged to pass through it on their routes to the Mediterranean spawning grounds. The ritual
2 of the 'Almadraba' occurs twice a year. First, it is practiced with inward-bound traps 'when
3 the fish swim close to the Andalusian coast in the Straits of Gibraltar during their genetic
4 migration from the Atlantic to their breeding grounds in the Mediterranean Sea's warmer
5 waters' (Florido del Corral 2018:30). This is called the *Almadraba de derecho*. Second, it is
6 performed with outward-bound traps 'on the return journey [...] as the tuna again pass
7 through the Straits in search of the food on which they gorge in the Atlantic' (Florido del Corral
8 2018: 30), known as *Almadraba de revés*. At present, the technique that prevails over others
9 in the Spanish case is known as 'Almadraba de buche' (buche type). This takes place in coastal
10 waters fewer than 30 meters deep, where the shoals of bluefin tuna first enter the maze of
11 static nets (fixed to the seabed), then move ahead through the chambers until the crucial
12 moment in which they are eventually trapped inside and 'the fishermen decide to lift the
13 'copo' (terminal section) of the final chamber—into which the fish, in today's practice, are
14 forced by boats as well as frogmen—to the surface' (García Vargas & Florido del Corral 2010:
15 207, Florido del Corral 2018).

16 In Portugal, fishing for bluefin tuna does not use any other method except employing
17 almadraba traps, mainly in the Algarve region, although tradition is also being changed by the
18 expansion of fishing activity to other species and by the growth of tourism (for an overview
19 see EU report 'The future of the Almadraba Sector' 2015, Lino et al. 2018).

20 The continuing use of this ancient method means a network of tuna traps is
21 maintained and hundreds of both direct and indirect employment positions are sustained.
22 Other kinds of tuna traps (called 'almadrabeta', 'moruna' or 'tonnarella') are also found along
23 the Mediterranean for catching smaller species of tuna like 'the bullet tuna (*Auxis rochei*) or
24 the skipjack Tuna (*Katsuwonus pelamis*)' (The future of the Almadraba Sector—Traditional

1 Tuna Fishing Methods in the EU 2015: 16), as well as sand smelt (*Atherina boyeri*), squid
2 (*Teuthida*) or greater amberjack (*Seriola dumerili*).

3 The value of this approach as a sustainable method is why it is of interest here and this
4 could be tested in the area of La Azohía (Cartagena), for instance, by examining the
5 performance of the isolated Almadraba fishing fleet located in the South of Spain that has
6 been regularly employed between February and July since 1946. Recently, this community
7 has developed communications management strategies using social network websites such
8 as Instagram (https://www.instagram.com/almadraba_la_azohia/?hl=es) and Twitter
9 (<https://twitter.com/AAzohia>) to catch the attention and connect with the increasing
10 international interest in Atlantic bluefin tuna.



11
12 Fig.1 *Lifting of the trap (the 'leva') at the Almadraba in La Azohía (Spain)*
13 *Source: Photograph by Mercedes García*
14

15 In terms of economics, hundreds of families depend on the Almadraba, an important
16 source of employment in the fishery sphere and the 'subsidiary' industries of salting and
17 canning (García Vargas & Florido del Corral 2010, The future of the Almadraba Sector—

1 Traditional Tuna Fishing Methods in the EU 2015). In terms of the environment, this method
2 of fishing offers several advantages.

3 First, it is a seasonal system based on the migration of the shoals of bluefin tuna both
4 in late spring across the Strait of Gibraltar to reach warmer waters and to mislead their natural
5 predators—killer whales—and in the late summer (trophic migration) on their return. They
6 search for proper 'hatching areas (gametic migration) where they can find nutrients for their
7 offspring and where the temperature and salinity of the water favours the development of
8 young fish' (García Vargas & Florido del Corral 2010: 206). In this light, it has already been
9 pointed out that tuna traps modify neither the habitual tuna migration routes, nor their life
10 cycle, growth, or reproduction, nor do they cause any harmful effects on the seabed or the
11 pelagic ecosystem (The future of the Almadraba Sector—Traditional Tuna Fishing Methods
12 in the EU 2015: 55)⁸.

13 Second, the method is founded upon passive selective fishing methods: there is no use
14 of methods to drive, lure or attract the tuna but only use of 'passive gear' which may be
15 anchored to the seabed. Regardless of how this method is operated, it is far less destructive
16 than bottom trawling bycatch methods.

17 Third, the number of catches is controlled. The maritime authorities can manage the
18 catch operation because this arrangement of nets is usually close to land. Moreover, a legal
19 framework and a ban on additional fishing are set every year in order to protect stocks against
20 depletion and to administer the system of authorisation regarding positioning and setting up

⁸ In terms of biology, studies note that migrations get longer as the size of tuna increases and 'In order to spawn the tunas emigrate in great shoals (Arena 1979) that choose ...' (Cort & Abaunza 2019: 8) areas of ecological and environmental abundance. Marine health and sustainability in these areas, and the status of the Mediterranean bluefin tuna population, need monitoring and it has been noted that the traps do serve as a form of basic scientific observatory (Cort & Abaunza 2019: 66). To collect more detailed and comparative data will require investment in additional systems, given that the closure of the Tunisian and Libyan traps in recent years means the loss of these sources of observation (Addis et al. 2012: 140).

1 of nets in ways that allocate and guarantee historical entitlements. Equally important is the
2 supervision of the quota and their minimum size, aiming to allow the tuna to reach sexual
3 maturity and to reproduce harmoniously⁹.

4 Fourth, use of tuna traps has never led to the collapse of stocks and or exerted any
5 influence on the local hydrological dynamics. From 1998 to 2008, however, both ‘capitalist
6 fishing operations, as much as the high level of underreporting, misreporting, un-reporting
7 catch, caused a catastrophic situation’ (Longo & Clark 2012, The future of the Almadraba
8 Sector—Traditional Tuna Fishing Methods in the EU 2015: 50).

9 This is an example of an approach to living with the sea and benefiting from fishing
10 that combines the importance of cultural heritage with the modern concept of sustainability.

11

12 **7. Conclusion**

13 As Cohen and colleagues (2019: 5) observe, ‘[t]o date oceans and coasts have not been
14 well accounted for in the calculation or conceptualization of planetary boundaries’ and in
15 devising policies for the future—whether regarding food or extraction—these must be
16 sustainable and ‘navigate the space between the environmental ceiling or “planetary
17 boundaries” [...] and a “social foundation”’. The complexity of these ecosystems must be
18 understood and emphasized and orthodox international criminal law must do more to
19 recognize and respond to the implications of the growing ‘burden on ocean ecosystems’
20 (Blasiak 2020) and the dangers of entering an era of unsustainability. Adoption of a law of
21 ecocide, as well as related forms of inclusive governance that involve those whose livelihoods

⁹ As Minder (2015) points out, however, ‘the almadraba fishermen say their method has been unfairly punished for the past fishing excesses of others, not least because in their method, only adult tuna—weighing on average around 440 pounds each—are trapped and lifted in their large mesh nets’.

1 depend on the sea and the land (see Leschin-Hoar 2016), could build on evidence that it is
2 possible to ‘successfully manage the tensions between national and regional economic
3 growth, local livelihood resilience, and food and nutritional security for those most in need
4 (Jentoft & Chuenpagdee, 2015)’ (Cohen et al. 2019: 6). Cultural and socioeconomic strata are
5 essential in the way of living ascribed to the Almadraba. The ‘Almadraba’ symbolises the
6 ability of maritime societies to turn a natural phenomenon—recurring migrations of tunas
7 and their approach to the coasts under certain environmental circumstances—into a
8 sociocultural construction that celebrates and embraces sustainability (Florido del Corral
9 2005: 2); this example of one of the first industrial activities in history (Di Natale 2018: 2944)
10 deserves more consideration and adoption. This is an ethical approach, realistic but
11 principled. It is realistic in acknowledging the pressures exerted by calls for economic growth
12 and by globalised demand and supply, but ethical in prioritising the need to remember to
13 defend access, locality and equity.
14

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