

# Restrictions on the use of force at sea: An environmental protection perspective

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## Abstract

*The restrictions on the use of force at sea exist in different branches of international law: the law of the sea and environmental law, mainly applicable during peacetime, and international humanitarian law (IHL), as the law applicable in times of armed conflict. Different rules from these areas must be compared and analyzed to determine the common principles applicable to restricting the use of force at sea for the purposes of environmental protection. Taking into account the particular problems of protecting the marine environment in the context of the use of force, the law of the sea and international environmental law should be applied to restrict means and methods of using force at sea during armed conflict. The detailed concepts and approaches in the law of the sea and environmental law may complement IHL, and the precautionary principle of international environmental law should be triggered to address the lacunae in IHL protecting the marine environmental during armed conflict.*

**Keywords:** use of force at sea, environmental protection, restrictions, IHL, UNCLOS.



The use of force at sea has existed extensively in both wartime and peacetime. It has not only caused human casualties and property damage, but has also had an impact on the environment. The use of force at sea involves three elements: the use of force as such, the sea, and impacts on the environment. It is therefore regulated by three areas of law: international humanitarian law (IHL), the international law of the sea, and international environmental law. However, each of these areas of law has its own distinct requirements and restrictions regarding the environmental impacts of the use of force at sea, which are not necessarily consistent with each other and have left some gaps to be filled for a better protection of the environment in the context of the use of force at sea.

The contexts of State use of force at sea include armed conflict at sea and maritime law enforcement. Each has different legal bases. This article begins with an analysis of the impacts of the use of force at sea on the environment and goes on to clarify the legal norms, standards, approaches and mechanisms relevant to these impacts, before analyzing the requirements and restrictions imposed by different areas of international law. The article then highlights the legal frameworks on the use of force at sea, concluding that they do not include sufficient protection of the environment. Few provisions in IHL, international environmental law or the law of the sea explicitly address environmental protection during use of force at sea, and these bodies of law remain somewhat imperfect for dealing with marine environment protection. Moreover, laws applicable during war and peace are not mutually exclusive, and their intersection brings both opportunities and complexities. Consequently, a combination of precautions taken by all bodies of law is necessary but insufficient – the rules still need to be improved and clarified.

There remain three key gaps. First, a number of discrepancies exist in the legal frameworks applicable to the use of force at sea. IHL alone cannot offer enough protections for the marine environment during the use of force at sea, and whether and to what extent international environmental law and the law of the sea continue to apply and provide protection during armed conflict is a matter of debate. Second, there are some principles common to IHL, the law of the sea and international environmental law that may be invoked to address issues of marine environment protection in the context of the use of force; however, these may have somewhat different meanings in each area of law. It is therefore crucial to interpret relevant principles. Third, the question of which means and methods of using force at sea should be explicitly prohibited or restricted by international law still needs to be clarified. In the last part of this article, for each of the gaps in law discussed, the article clarifies the applicability of the United Nations Convention on the Law of the Sea (UNCLOS)<sup>1</sup> and international environment treaties on the protection of the marine environment in wartime, and presents the interpretation of the precautionary principle from international environmental law that should act as a restriction on means and methods when force is used at sea.

1 United Nations Convention on the Law of the Sea (UNCLOS), 1833 UNTS 3, 10 December 1982 (entered into force 16 November 1994).

## Impacts of the use of force at sea on the environment

The use of force at sea in both wartime and peacetime may damage or otherwise affect the marine environment. The environment may be understood and defined in various ways. Broadly construed, the environment writ large may be defined as “all natural features that make up the world’s ecosystem”.<sup>2</sup> Similarly, the marine environment is comprehensive; the International Seabed Authority defines the marine environment as including

the physical, chemical, geological and biological components, conditions and factors which interact and determine the productivity, state, condition and quality of the marine ecosystem, the waters of the seas and oceans and the airspace above those waters, as well as the seabed and ocean floor and subsoil thereof.<sup>3</sup>

This definition demonstrates that the maritime environment is comprehensive and encompasses everything in the ocean space, including both physical and chemical components, non-living and living resources, marine ecosystems and ecological complexes, including diverse marine life. Such a broad definition reflects a growing belief of the international community that environmental protections should be extended to various situations involving armed conflict.<sup>4</sup>

The damage to the marine environment resulting from the use of force at sea is not always collateral, for the marine environment itself may become the target or victim of the use of force. In so-called “environmental warfare”,<sup>5</sup> the marine environment may be changed in order to cause environmental catastrophes as a means of compromising the enemy. In the context of maritime law enforcement, when the target of the use of force is an oil tanker, liquefied natural gas carrier or chemical cargo ship, and the force is used inappropriately, the risks to the environment are no less severe than in the context of armed conflicts at sea.

The impacts on or damage to the marine environment caused by the use of force may be understood in three ways. First, the use of force may affect the intrinsic and instrumental values of the marine environment.<sup>6</sup> Intrinsic value “is usually

2 John Alan Cohan, “Modes of Warfare and Evolving Standards of Environmental Protection under the International Law of War”, *Florida Journal of International Law*, Vol. 15, No. 4, 2003, p. 485.

3 Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, ISBA/6/A/18, 13 July 2000 (amended 22 July 2013), Regulation 1.3(c).

4 Generally accepted international rules and standards cannot be equated with customary international law. For a discussion on the identification of which provisions concerning marine pollution in UNCLOS reflect customary international law, see Joseph Ashley Roach, “Today’s Customary International Law of the Sea”, *Ocean Development & International Law*, Vol. 45, No. 3, 2014, pp. 250–251; Walter G. Sharp, “The Effective Deterrence of Environmental Damage during Armed Conflict: A Case Analysis of the Persian Gulf War”, *Military Law Review*, Vol. 137, No. 1, 1992, p. 32.

5 For further discussion on the international law of active and passive environmental warfare, see Eric Talbot Jensen, “The International Law of Environmental Warfare: Active and Passive Damage during Armed Conflict”, *Vanderbilt Journal of Transnational Law*, Vol. 38, No. 1, 2005.

6 Some scholars believe that focusing only on instrumental or intrinsic values may fail to resonate with views on personal and collective well-being with regard to nature and the environment. Relational values pertain to all manner of relationships between people and nature. See Kai M. A. Chan *et al.*, “Why Protect Nature?”

attributed to ‘natural’ components of the environment and not to, say, better sewerage systems or more beautiful lampposts”.<sup>7</sup> The intrinsic value of the environment is recognized in international instruments such as the Convention on Biological Diversity, which states that the contracting parties are “[c]onscious of the intrinsic value of biological diversity”.<sup>8</sup> The mere existence of the marine environment is valuable in itself, beyond any possible value generated by the interests of humankind. The impacts of the use of force at sea on the intrinsic value of the marine environment mainly consist of damaging consequences to that environment, such as water pollution and the reduction or extinction of marine life.<sup>9</sup> The instrumental value of the marine environment is viewed from a human-centric perspective and thus refers to the usefulness of the marine environment to humankind. With such instrumental value, the marine environment may provide humankind with resources or become the object of scientific research. There are two ways by which the use of force at sea may affect the instrumental values of the environment. One way is to damage the living and non-living resources that are crucial to human survival, or to reduce their economic value. The other is to pollute the environment so that the population living nearby may breathe in toxic substances, be exposed to radioactive substances or suffer from a polluted food chain, for example.

Second, the use of force at sea has both immediate and long-term impacts on the environment. The damage caused by the use of force at sea will not only harm the current generation, but will also cause endless troubles for future generations. Separate from the damage to the environment caused by the use of force on land, it is more difficult to drag or clean weapons or ships containing toxic or hazardous materials once they have sunk to the depths of the sea. In this respect, the consequences of the two World Wars remain alarming. For example, it has been estimated that from 1939 to 1945, over 9,000 military, auxiliary and merchant marine vessels were sunk, and the hazards related to these shipwrecks include oil spills, chemical releases, unexploded ordnance and coral-reef degradation, altering the feeding grounds of marine life.<sup>10</sup> After the Second World War, ships have tended to become bigger and more diverse, resulting in increasing number of tankers, gas carriers and chemical cargo ships with heavy loads. Though there have been no cases of massive pollution caused

Rethinking Values and the Environment”, *Proceedings of the National Academy of Sciences of the United States of America*, Vol. 113, No. 6, 2016, p. 1462.

- 7 Wilfred Beckerman and Joanna Pasek, *Justice, Posterity and the Environment*, Oxford University Press, Oxford, 2001, p. 128.
- 8 Convention on Biological Diversity, 1760 UNTS 79, 6 June 1992 (entered into force 29 December 1993), Preamble.
- 9 On valuing biodiversity, some scholars agree that monetary value can serve as a useful link between environmental problems and political decision-making processes, although the future challenge is to identify common ground for comparing monetary and intrinsic values. See Mirka Laurila-Pant *et al.*, “How to Value Biodiversity in Environmental Management?”, *Ecological Indicators*, Vol. 55, 2015, pp. 6–7.
- 10 See Umesh Chandra Jha, *Armed Conflict and Environmental Damage*, Vij Books India Pvt Ltd., New Delhi, 2014, pp. 41–42.

by the use of force in maritime law enforcement actions, such a possibility cannot be precluded.

Third, the impacts on the environment caused by the use of force at sea are both regional and transboundary. Those impacts will increase with the evolution of new means and methods of warfare. The physical nature and ecosystems of the sea are different from the land – the sea is characterized by fluidity – and habitats in the sea and on land differ dramatically in species composition and diversity.<sup>11</sup> The impacts of the use of force at sea are more complicated than those on land. On the one hand, the marine environment is an integrated system, the inherent fluidity of which entails that the damage to a certain marine area is very likely to affect other areas. With the combined effects of tides, ocean currents, winds, weather and other factors, the impacts of the use of force on the marine environment are inevitably diffuse, and the scope and extent are largely uncontrollable. On the other hand, targets of the use of force at sea are primarily ships and offshore platforms. When force is used against oil tankers, offshore oil platforms or chemical cargo ships, the possible spill and leakage of oil and chemicals may become major threats to the marine environment. For example, during the “Tanker War” that took place during the Iran–Iraq War of the 1980s, no fewer than 447 oil tankers were attacked in the Persian Gulf, and in 1984 alone, more than 2 million tonnes of oil spilled into the Gulf,<sup>12</sup> resulting in severe oil pollution and damage to marine ecosystems, coral reefs and sea grass beds.<sup>13</sup> In the *Oil Platforms* case, marine pollution caused by the United States’ actions led Iran to request reparation for the costs of mounting environmental rescue operations.<sup>14</sup>

## When is force used by States at sea?

The nature of the use of force at sea – armed conflict or law enforcement – is determined by the background, basis and forms of the use of force,<sup>15</sup> rather than by the identity of the actors and their competence under domestic law. The users of force at sea consist of States, organized armed groups and private entities, mainly private military and security companies (PMSCs), pirates, smugglers and other criminals. Naval battles between States and organized armed groups are quite rare; for example, the Liberation Tigers of Tamil Eelam is probably the only

11 Richard K. Grosberg, Geerat J. Vermeij and Peter C. Wainwright, “Biodiversity in Water and on Land”, *Current Biology*, Vol. 22, No. 21, 2012, p. R900.

12 See Philippe Antoine, “International Humanitarian Law and the Protection of the Environment in Time of Armed Conflict”, *International Review of the Red Cross*, Vol. 32, No. 291, 1992, p. 530; Hassan Partow, “Environmental Impact of Wars and Conflicts”, in Mostafa K. Tolba and Najib W. Saab (eds), *Arab Environment: Future Challenges*, Arab Forum for Environment and Development, Beirut, 2008, p. 164.

13 See Nada Al-Duaij, *Environmental Law of Armed Conflict*, Transnational Publishers, New York, 2003, p. 39.

14 See International Court of Justice (ICJ), *Oil Platforms Case (Iran v. United States of America)*, Memorial submitted by Iran, *ICJ Reports* 1993, p. 127.

15 See Permanent Court of Arbitration (PCA), *Maritime Boundary Delimitation Case (Guyana v. Suriname)*, Award, *PCA Reports* 2007, paras 442–443.

non-State armed group ever to have its own navy during a non-international armed conflict.<sup>16</sup> The targets of the PMSCs' use of force are mainly pirates and/or armed robbers at sea. In terms of the scale of force used and the types of arms used, and in view of maritime security practice, the use of force by PMSCs and criminal gangs can hardly affect the maritime environment. From the environmental perspective, it is the use of force by States that has the greatest impact and therefore merits the most attention.

## Armed conflict

Armed conflict at sea is just one of the contexts in which force is used at sea. IHL distinguishes between international and non-international armed conflicts.<sup>17</sup> However, in contrast to the fact that in the modern era, especially after the Second World War, most armed conflicts on land have been of non-international nature, most well-known armed conflicts at sea have been conflicts between States, such as the war over the Falkland Islands/Malvinas between the United Kingdom and Argentina in 1982, the military and paramilitary activities of the United States in and against Nicaragua in 1984, the skirmish in the South China Sea between China and Vietnam in 1988, and the naval battles near Yeonpyeong Island between South Korea and North Korea in 1999 and 2002. Sometimes, armed conflicts may spread from the land to the sea, as happened during the "Tanker War" in the Persian Gulf. There have been very few, if any, armed conflicts between State and non-State actors or between non-State actors at sea.<sup>18</sup>

The threat or use of force between States is prohibited by Article 2(4) of the United Nations (UN) Charter.<sup>19</sup> Nevertheless, force has frequently been used in various contexts, including at sea, and some forms of the use of force may be recognized as legitimate and even necessary under international law, depending on the nature of the use of force. In the contemporary international legal order, States may legitimately use force with the authorization of the UN Security Council or as a means of self-defence as permitted under Article 51 of the UN Charter, or even arguably under the "Uniting for Peace" resolutions of the UN General Assembly.<sup>20</sup> However, there have been very few cases in which force was used at sea within the framework of the UN's actions.<sup>21</sup> By contrast, it has been

16 See Donald A. Donahue *et al.*, "The All Needs Approach to Emergency Response", *Homeland Security Affairs Journal*, Vol. 8, 2012, p. 2.

17 See International Committee of the Red Cross (ICRC), "How Is the Term 'Armed Conflict' Defined in International Humanitarian Law?", March 2008, available at: [www.icrc.org/eng/assets/files/other/opinion-paper-armed-conflict.pdf](http://www.icrc.org/eng/assets/files/other/opinion-paper-armed-conflict.pdf) (all internet references were accessed in August 2017).

18 See Report of the Special Rapporteur on the protection of the environment in relation to armed conflicts, UN Doc. A/CN.4/70, 3 June 2016, para. 15.

19 Charter of the United Nations, 1 UNTS XVI, 26 June 1945 (entered into force 24 October 1945), Art. 2(4).

20 See Anthony Clark Arend and Robert J. Beck, *International Law and the Use of Force: Beyond the U.N. Charter Paradigm*, Routledge, London and New York, 2013, pp. 59–60, 72–78.

21 A very rare example in this respect is that the United Kingdom blockaded the Port of Beira of Mozambique, pursuant to Resolution 221 of the UN Security Council, as the port was used to transport oil to support the Smith regime in Rhodesia (now Zimbabwe). Two Greek ships, *Joanna V* and *Manuela*, were visited and examined when they sought to break the blockade, and a French

rather common for States to use force at sea as a means of self-defence, at least so claimed, against armed attacks on their territory, ships or aircraft. For example, the United Kingdom resorted to the right of self-defence as the justification for its military actions during the armed conflicts over the Falkland Islands/Malvinas.<sup>22</sup>

## Law enforcement operations

Maritime law enforcement is another major factor in the discussion on the use of force at sea. Maritime law enforcement may be defined as the actions taken by qualified domestic law enforcement agencies under relevant domestic laws in order to maintain or restore public security and order at sea.<sup>23</sup> Force has been frequently used in such actions, and they have therefore become the main context in which force is used at sea. The enforcement of domestic laws is not permissible in all maritime zones and cannot justify the legitimacy of all actions at sea. The sovereignty of a coastal State extends to its territorial sea in accordance with UNCLOS,<sup>24</sup> while it may only exercise the control necessary to deal with specific issues in the contiguous zone, exclusive economic zone and high seas.<sup>25</sup> The Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation, as amended by its Protocol of 2005, explicitly recognizes that a State's maritime law enforcement officials are entitled to use force under certain circumstances,<sup>26</sup> subject to the conditions that the persons concerned have unlawfully and intentionally committed an offence within the meaning of the said Convention.<sup>27</sup> Furthermore, under Article 301 of UNCLOS, on the peaceful uses of the seas, it is only required that:

In exercising their rights and performing their duties under this Convention, States Parties shall refrain from any threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with the principles of international law embodied in the Charter of the United Nations.<sup>28</sup>

That is to say, the threat or use of force in compliance with the principles of international law embodied in the UN Charter is also not prohibited by

tanker, *Artois*, was shot on the bow for violating the prohibition against importing oil. See UNSC Res. 221, 9 April 1966. Also see Adam Roberts and Dominik Zaum, "UN Security Council-Authorised Military Operations, 1950–2007", *The Adelphi Papers*, Vol. 47, No. 395, 2007, p. 81.

22 See John Sankey, "Decolonisation: Cooperation and Confrontation at the United Nations", in Erik Jensen and Thomas Fisher (eds), *The United Kingdom — The United Nations*, Macmillan, London, 1990, p. 114; A. Roberts and D. Zaum, above note 21, pp. 79–84.

23 See Patricia Jimenez Kwast, "Maritime Law Enforcement and the Use of Force: Reflections on the Categorisation of Forcible Action at Sea in the Light of the Guyana/Suriname Award", *Journal of Conflict Security Law*, Vol. 13, No. 1, 2008, p. 54.

24 UNCLOS, Art. 2.

25 UNCLOS, Arts 33, 56, 94, 99, 105 ff.

26 Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation, 1678 UNTS 221, 10 March 1988 (entered into force 1 March 1992); Protocol of 2005 to the Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation, IMO Doc. LEG/CONF.15/21, 14 October 2005 (entered into force 28 July 2010), Art. 8bis, para. 9.

27 *Ibid.*, Art. 3bis.

28 UNCLOS, Art. 301.

UNCLOS. It was also accepted by the Arbitral Tribunal in the *Maritime Boundary Delimitation* case that in international law, force may be used in law enforcement activities provided that such force is unavoidable, reasonable and necessary.<sup>29</sup> However, since the use of force is permitted only when it is unavoidable, reasonable and necessary, it is an exceptional means of maritime law enforcement rather than a regular means in general practice.

## Applicable legal frameworks

States have obligations to protect and preserve the marine environment, and this has been recognized by both treaty law<sup>30</sup> and customary international law.<sup>31</sup> Since the adoption of the Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration) in 1972,<sup>32</sup> the relationship between the use of force and the protection of the environment has been expanded, with IHL, international environmental law and the law of sea interactively improving the legal framework for the use of force at sea in relation to environmental issues. However, given the fact that treaty law in this respect is far from satisfactory, such legally non-binding “soft law” instruments as the *San Remo Manual on International Law Applicable to Armed Conflicts at Sea* (San Remo Manual),<sup>33</sup> the *Guidelines for Military Manuals and Instructions on the Protection of the Environment in Times of Armed Conflict* (Guidelines for Military Manuals),<sup>34</sup> and international judicial and arbitration decisions regarding the environmental restrictions on the use of force should also be taken into account. These instruments have declared and clarified the extent of permissible use of force at sea, as reflected in existing or emerging principles and rules; provided important legal grounds against which the compatibility of such use of force with the requirements are to be evaluated; and evidenced existing or emerging customary law.

### International humanitarian law (*jus in bello*)

IHL has included rules applicable to naval warfare almost since its beginning in the mid-nineteenth century. Since the Paris Declaration Respecting Maritime Law was

29 PCA, *Maritime Boundary Delimitation*, above note 15, para. 446.

30 See, e.g., UNCLOS, Art. 192.

31 See David Freestone, “The Conservation of Marine Ecosystems Under International Law”, in Michael Bowman and Catherine Redgwell (eds), *International Law and the Conservation of Biological Diversity*, Kluwer Law International, London, 1996, pp. 91–92; Alan Boyle, “Further Development of the 1982 Law of the Sea Convention: Mechanisms for Change”, *International and Comparative Law Quarterly*, Vol. 54, No. 4, 2005; Nilufer Oral, *Regional Co-operation and Protection of the Marine Environment Under International Law: The Black Sea*, Martinus Nijhoff, Leiden and Boston, MA, 2013, pp. 136–137.

32 Declaration of the United Nations Conference on the Human Environment, A/CONF.48/14/Rev1, 16 June 1972.

33 See San Remo International Institute of Humanitarian Law, “The San Remo Manual on International Law Applicable to Armed Conflicts at Sea”, *International Review of the Red Cross*, No. 816, 1995, pp. 583–637.

34 *Guidelines for Military Manuals and Instructions on the Protection of the Environment in Times of Armed Conflict*, UN Doc. A/49/323 and UNGA Res. 49/50, 9 December 1994 (Guidelines for Military Manuals).



proclaimed in 1856,<sup>35</sup> the international community has adopted a number of conventions on naval warfare. However, almost no environmental restrictions on the use of force at sea may be found in those conventions. While gradually some international humanitarian conventions and regulations came to prohibit the use of poison or poisonous arms during armed conflicts,<sup>36</sup> which has an impact on the environment, the focus was not on protecting the environment. In both treaties and customary international law, the connection between the use of force and environmental protection started to gain traction in the 1970s. In treaty law, it began with the Convention on the Prohibition of Military or any Hostile Use of Environmental Modification Techniques (ENMOD Convention),<sup>37</sup> adopted in 1976, and Additional Protocol I to the Geneva Conventions (AP I), adopted in 1977,<sup>38</sup> followed by other conventions also restricting means and methods of combat from an environmental perspective.<sup>39</sup> In customary international law, it is noted that certain environmental components have been indirectly protected against the use of methods and means of warfare since at least the 1970s,<sup>40</sup> and arguably such “soft law” instruments as the San Remo Manual and the Guidelines for Military Manuals<sup>41</sup> have reflected and compiled such developments.

On the basis of IHL today, the restrictions on the use of force at sea during armed conflict designed to protect the environment may be categorized as follows. First, the marine environment is by nature a civilian object, and may not become the objective of an attack.<sup>42</sup> IHL distinguishes between military and civilian objectives. Participants in armed conflicts can only attack combatants or military objectives, while civilians and civilian objects should not be the targets of attack. Article 52 (1) of AP I establishes that “[c]ivilian objects shall not be the object of attack or of reprisals”. While Article 52(2) does not define the concept of “civilian object”

35 Paris Declaration Respecting Maritime Law, British State Papers 1856, Vol. 61 (entered into force 16 April 1856), pp. 155–158.

36 For example, Hague Convention (II) with respect to the Laws and Customs of War on Land (Hague Convention II), and its Annex, Regulations concerning the Laws and Customs of War on Land, 29 July 1899, Art. 23(1), available at: <https://ihl-databases.icrc.org/ihl/INTRO/195?OpenDocument>; Hague Convention (IV) respecting the Laws and Customs of War on Land, and its Annex, Regulations concerning the Laws and Customs of War on Land, 18 October 1907, Art. 23(a); Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, 17 June 1925.

37 Convention on the Prohibition of Military or any Hostile Use of Environmental Modification Techniques (ENMOD Convention), 1108 UNTS 151, 10 December 1976 (entered into force 5 October 1978).

38 Protocol Additional (I) to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts, 8 June 1977 (entered into force 7 December 1978) (AP I), Art. 35(3).

39 For example, Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, 1974 UNTS 45, 13 January 1993 (entered into force 29 April 1997) (Chemical Weapons Convention), Arts 4(10), 5(11).

40 See Alan Vaughn Lowe, “Commentary on the 1972 Bacteriological Convention”, in Natalino Ronzitti (ed.), *The Law of Naval Warfare: A Collection of Agreements and Documents with Commentaries*, Martinus Nijhoff, Dordrecht, Boston, MA, and London, 1999, p. 647; Karen Hulme, *War Torn Environment: Interpreting the Legal Threshold*, Martinus Nijhoff, Leiden and Boston, MA, 2004, p. 10.

41 Guidelines for Military Manuals, above note 34.

42 See AP I, Art. 8(2)(b)(iv); K. Hulme, above note 40, p. 300; Mara Tignino, “Water, International Peace, and Security”, *International Review of the Red Cross*, Vol. 92, No. 879, 2010, p. 661.

*per se*, it narrowly defines military objectives as objects which by their nature, location, purpose or use make an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage. By the method of exclusion, any objects that are not military objectives are civilian objects. Elements of the marine environment are mostly civilian objects,<sup>43</sup> and therefore should not be subject to attack, and the restrictions in Articles 35(3) and 55(1) of AP I – general provisions governing hostilities apply to the protection of the marine environment – shall apply,<sup>44</sup> unless the object in question has become a legitimate military objective in one way or another.<sup>45</sup> Typical military objectives at sea are enemy combatants; infrastructures, buildings and military positions, and the materials and armaments kept therein; and means of military transportation and communication. If any civilian objects are used for military purposes, such as when anti-aircraft weapons are deployed on an offshore platform, they may be regarded as military objectives and thus subject to armed attack. What is more, once military objectives are located or navigating in a marine area, the area may contribute effectively to military action and its neutralization may offer a definite military advantage. Thus, it becomes a military objective.<sup>46</sup>

Second, there are general limitations on the permissible means and methods of warfare at sea. In both international and non-international armed conflicts, any use of force at sea will inevitably affect the marine environment to some extent. It should be noted that the ENMOD Convention and AP I only prohibit environmental damage occurring in international armed conflicts, No environmental damage provision was included in Additional Protocol II to the Geneva Conventions,<sup>47</sup> which regulates non-international armed conflict.<sup>48</sup>

43 See Michael Bothe, Carl Bruch, Jordan Diamond and David Jensen, “International Law Protecting the Environment during Armed Conflict: Gaps and Opportunities”, *International Review of the Red Cross*, Vol. 92, No. 879, 2010, p. 576.

44 Articles 35(3) and 55(1) of AP I prohibit not all conditions, but those conditions attached to “long-term, widespread and severe” damage to the environment. See AP I, Arts 35(3), 55(1).

45 Besides the condition of military objectives, in the view of the committee established to review the North Atlantic Treaty Organization (NATO) military operations in the Federal Republic of Yugoslavia in 1999, Articles 35(3) and 55 of AP I only cover very significant damage. The adjectives “widespread, long-term, and severe” used in AP I are joined by the word “and”, meaning that this is a triple, cumulative standard. See *Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign against the Federal Republic of Yugoslavia*, June 2000, para. 15, available at: [www.icty.org/x/file/About/OTP/otp\\_report\\_nato\\_bombing\\_en.pdf](http://www.icty.org/x/file/About/OTP/otp_report_nato_bombing_en.pdf). Meanwhile, there is a critical appraisal of the above assessment which holds that the Committee’s report shows a poor grasp of legal concepts, and deviates from well-established case law of the International Criminal Tribunal for the former Yugoslavia. See Paolo Benvenuti, “The ICTY Prosecutor and the Review of the NATO Bombing Campaign against the Federal Republic of Yugoslavia”, *European Journal of International Law*, Vol. 12, No. 3, 2001, pp. 509–511.

46 M. Bothe *et al.*, above note 43, p. 576.

47 Protocol Additional (II) to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts, 1125 UNTS 609, 8 June 1977 (entered into force 7 December 1978).

48 Julian Wyatt, “Law-Making at the Intersection of International Environmental, Humanitarian and Criminal Law: The Issue of Damage to the Environment in International Armed Conflict”, *International Review of the Red Cross*, Vol. 92, No. 879, 2010, p. 612.

Article 1 of the ENMOD Convention prohibits “military or any other hostile use of environmental modification techniques having widespread, longlasting or severe effects as the means of destruction, damage or injury to any other State Party”. It appears from the text that what is prohibited is merely the intentional use of environmental modification techniques as means or methods of warfare for the purpose of destruction, damage or injury. By contrast, AP I, adopted shortly after the ENMOD Convention, prohibits not only methods or means of warfare which are intended to cause widespread, long-term and severe damage to the natural environment, but also those which “may be expected”<sup>49</sup> to have such effects.<sup>50</sup> There are, then, two significant expansions of scope of prohibition in AP I in comparison to the ENMOD Convention. One is that *any* method or means of warfare, not just environmental modification techniques, is prohibited as long as it may cause damage to the natural environment.<sup>51</sup> The other is that even if the damage to the environment is not intended, such methods and means of warfare are nevertheless prohibited as long as they “may be expected” to have such effects.<sup>52</sup> The second point reflects the principle of precautions in attack,<sup>53</sup> which is referred to by the International Committee of the Red Cross in its report submitted to the UN General Assembly in 1993 on the protection of the environment in times of armed conflict as

an emerging, but generally recognized principle of international law [whose object it is] to anticipate and prevent damage to the environment and to ensure that, where there are threats of serious or irreversible damage, lack of scientific certainty shall not be used as a reason to postpone any measures to prevent such damage.<sup>54</sup>

This assertion has not been contested by any States.<sup>55</sup> Reprisals are allowed under IHL, subject to a wide range of limitations, but attacks against the natural

49 AP I, Arts 35(3) and 55(1).

50 One line of thought focused on the obligation of “care” in Article 55(1) of AP I holds that the real gem hidden among those provisions is not the prohibition of means and methods causing widespread, long-term and severe damage in Article 35(3), but the obligation on States Parties to take care to protect the environment against such harm. See Karen Hulme, “Taking Care to Protect the Environment against Damage: A Meaningless Obligation?”, *International Review of the Red Cross*, Vol. 92, No. 879, 2010, pp. 675–676.

51 ICRC, “Additional Protocol I of 1997: Ban on the Use of Methods and Means of Warfare that Damage the Environment”, 31 January 2003, available at: [www.icrc.org/en/document/1976-convention-prohibition-military-or-any-hostile-use-environmental-modification](http://www.icrc.org/en/document/1976-convention-prohibition-military-or-any-hostile-use-environmental-modification); also in Reference Materials to Accompany IUCN Statement on Armed Conflict and the Environment, UN Doc. A/CONF.151/26, Vol. 1, 12 August 1992.

52 See AP I, Art. 55(1).

53 “With respect to attacks, the following precautions shall be taken: those who plan or decide upon an attack shall: take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimizing, incidental loss of civilian life, injury to civilians and damage to civilian objects.” See AP I, Art. 57(2)(a)(ii).

54 *Protection of the Environment in Time of Armed Conflict*, report submitted by the ICRC to the 48th Session of the UN General Assembly, 1993, available at: [www.icrc.org/eng/resources/documents/report/5deesv.htm](http://www.icrc.org/eng/resources/documents/report/5deesv.htm).

55 Jean-Marie Henckaerts and Louise Doswald-Beck (eds), *Customary International Humanitarian Law*, Vol. 1: *Rules*, Cambridge University Press, Cambridge, 2005, p. 150.

environment by way of reprisals are prohibited by Article 55(2) of AP I. The restrictive conditions of “widespread, long-term and severe damage”<sup>56</sup> to the natural environment reflect the principle of proportionality to a certain extent, since damage of such nature cannot be regarded as a proportionate consequence of any method or means of warfare. In accordance with Article 8(2)(b)(iv) of the Rome Statute of the International Criminal Court,<sup>57</sup> if an attack is launched in the knowledge that it will cause “widespread, long-term and severe damage” to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated, such an attack would constitute a war crime.<sup>58</sup>

Third, there are general limitations on the weapons that can permissibly be used at sea. Weapons that are excessively injurious or have indiscriminate effects have long been prohibited by IHL, all the way back to Article 23(e) of Hague Convention (II) with Respect to the Laws and Customs of War on Land (Hague Convention II) in 1899,<sup>59</sup> which prohibits any arms, projectiles, or material of a nature to cause “superfluous injury”. However, for a long time this prohibition mainly applied to weapons having such effects on human bodies. One linkage with the protection of environment was made in the 1980 Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects (CCW),<sup>60</sup> which incorporated Article 35(3) of AP I in its Preamble. Most weapons which are used in land war are also used at sea. The provisions above can only be seen as general limitations which are applicable at sea. While none of the Protocols to the CCW explicitly mentions the limitations on weapons with respect to environmental protection, especially not in the naval context, it is arguable that due to the inclusion of Article 35(3) of AP I in the Preamble, if the weapons prohibited by the CCW’s Protocols cause damage to the natural environment, and the damage and its consequences may be deemed to be excessively injurious or to have indiscriminate effects on human bodies, the provisions of the CCW may apply. Similar logic can be applied to biological weapons and chemical weapons, the development, production, stockpiling (and use, in case of chemical weapons) of which are prohibited by the 1972 Convention on the Prohibition of Biological Weapons<sup>61</sup> and the 1993 Convention Prohibiting Chemical Weapons respectively.<sup>62</sup>

56 Cf. Article 1(1) of the ENMOD Convention, which only prohibits the use of environmental modification techniques having “widespread, longlasting or severe effects”.

57 Rome Statute of the International Criminal Court, UN Doc. A/CONF.183/9, 17 July 1998 (entered into force 1 July 2002), Art. 8(2)(b)(iv).

58 *Ibid.*

59 See Hague Convention II, Art. 23(e).

60 Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects (and Protocols) (as amended on 21 December 2001), 1342 UNTS 137, 10 October 1980 (entered into force 2 December 1983).

61 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, 1015 UNTS 163, 10 April 1972 (entered into force 26 March 1975), Arts 1(1) and (2).

62 Chemical Weapons Convention, Arts 1 and 9(3).

Fourth, there is a need to protect the marine environment of neutral States. There are no specific IHL treaties or provisions to protect the marine environment of States that have not engaged in hostilities (neutral States). However, Article 1 of the 1907 Convention concerning the Rights and Duties of Neutral Powers in Naval War required the belligerents to respect the sovereign rights of neutral Powers, which implies that the rights of neutral States in relation to the marine environment should also be respected by belligerents.<sup>63</sup> The traditional law of neutrality has lost much of its formal importance due to the prohibition of the resort to war in modern international law. However, the relevant principle has arguably become a customary rule of international law, as noted by the International Court of Justice (ICJ) in the *Corfu Channel* case, citing “every State’s obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States”.<sup>64</sup> As discussed earlier, fluidity is inherent in the marine environment as an integrated system. Thus, even if the hostilities take place within the waters under the jurisdiction of the belligerents or on the high seas, damage to the environment may spread to the waters under the jurisdiction of a third State. In such a case, the belligerents would be responsible for the environmental damage to the third-party State.

## The law of the sea

UNCLOS is the most comprehensive treaty governing legal matters relating to the sea. With respect to the use of force at sea and its implications for the environment, although Articles 19(2)(a), 39(1)(b) and 301 of UNCLOS stipulate that States Parties shall refrain from any threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with the principles of international law embodied in the UN Charter, Article 111 of UNCLOS implicitly permits States to use force during hot pursuit – a special form of law enforcement – but equally does not address its environmental implications. However, the protection and preservation of the marine environment played a central role in UNCLOS,<sup>65</sup> as evidenced by the fact that a whole part of the Convention, Part XII, was dedicated to the “protection and preservation of the marine environment”. No such terms as “threat or use of force” or “law enforcement” appear in Part XII of UNCLOS, but since all States Parties have a general obligation to protect and preserve the marine environment under Article 192 of UNCLOS, it is evident that they must comply with all relevant requirements under Part XII when they use force at sea, whether as part

63 Hague Convention (XIII) concerning the Rights and Duties of Neutral Powers in Naval War, USTS 545, 18 October 1907 (entered into force 26 January 1910).

64 ICJ, *Corfu Channel Case (United Kingdom of Great Britain and Northern Ireland v. Albania)*, Judgment (Merit), ICJ Reports 1949, p. 22.

65 Veronica Frank, *The European Community and Marine Environmental Protection in the International Law of the Sea: Implementing Global Obligations at the Regional Level*, Martinus Nijhoff, Leiden and Boston, MA, 2007, p. 12.

of naval warfare or as a means of law enforcement. A few provisions have particular significance in this respect.

First, while all States have a negative obligation not to pollute the environment under international law, States party to UNCLOS clearly also undertake positive obligations in relation to the protection of the marine environment. All States Parties are under a general obligation to protect and preserve the marine environment under Article 192. The verbs “protect” and “preserve” clearly indicate that States Parties should take positive measures to ensure that the marine environment is protected and preserved against any possible actions that may pollute it.<sup>66</sup> This general positive obligation is reinforced by the requirements under Article 194(1) that States Parties “shall take, individually or jointly as appropriate, all measures consistent with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source”. These positive obligations, together with the requirement that “the measures taken pursuant to this Part shall deal with *all sources of pollution* of the marine environment” (emphasis added) under Article 194(3), entail that when a State uses force at sea, which may well be a source of pollution, it has a clear obligation to take all necessary measures before, during and after the use of force, to prevent, reduce and control any possible pollution of the marine environment that might be a consequence of the use of force.

Second, while the above-mentioned provisions impose obligations on States with respect to the marine environment in a general sense, Article 194(2) specifically requires States not to harm the marine environment of other countries by ensuring that activities under their jurisdiction or control do not pollute the marine environment of other countries, and pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights. Moreover, when a State exercises its right of hot pursuit under Article 111, the pursuit may continue in the exclusive economic zone or contiguous zone of another State, which means the State exercising the hot pursuit may use force within such zones. With the restrictions set forth by Article 194(2), the State exercising the hot pursuit needs to ensure that its possible use of force does not impair the environment of the coastal State, regardless of its right to hot pursuit in the zones under the jurisdiction of that State.

Third, unreasonable risk should be avoided during the use of force at sea. Article 225 of UNCLOS imposes a specific obligation of conduct on States, namely that when they exercise their powers of enforcement against foreign vessels, they “shall not ... expose the marine environment to an unreasonable risk”. This requirement appears to have two implications with respect to the use of force at sea. On the one hand, States are not prevented from exposing the marine environment to a reasonable amount of risk when they use force against foreign

66 See Jon M. Van Dyke and Sherry P. Broder, “International Agreements and Customary International Principles Providing Guidance for National and Regional Ocean Policies”, in Biliana Cicin-Sain, David L. Vander Zwaag and Miriam C. Balgos (eds), *Routledge Handbook of National and Regional Ocean Policies*, Routledge, London and New York, 2015, p. 49.

vessels in law enforcement. There is a certain degree of tolerance with respect to the environmental consequences of using force in law enforcement, which has to be measured by the proportionality between the necessity of using of force and the result of the damage. On the other hand, the requirement has a particular significance for the protection of the environment of the high seas. States may use force against foreign vessels on the high seas, while the principle of “no harm to foreign environment” would not apply to protect the marine environment of the high seas and international seabed areas that are not under the jurisdiction of any State. In this regard, Article 225 may serve to protect the high seas from unreasonable risk when the use of force is involved.

UNCLOS does not directly regulate naval warfare as such, and does not connect the conduct of hostilities at sea with environmental issues, which are limited by Articles 88 and 236 of UNCLOS. Article 88 regulates the reservation of the high seas for peaceful purposes – without a comprehensive definition of “peaceful purposes” – and Article 236 suggest that warships, naval auxiliaries and other vessels or aircraft owned or operated by a State and used, for the time being, only on government non-commercial service, enjoy sovereign immunity and hence are not in the same position as merchant ships.<sup>67</sup> It suggests that environmental protection provisions may not apply during times of armed conflict. Indeed, Article 301 indicates that military activities consistent with the principles of international law embodied in the UN Charter, especially Articles 2 (4) and 51, are not prohibited.<sup>68</sup> Article 236 exempts warships, but as the Preamble implies that application was only contemplated during peacetime, such exemption may not entirely prevent UNCLOS from applying during armed conflict. As one observer has noted, there may be vessels involved in hostilities that do not fall within the exemption, and pollution may originate from sources other than vessels, such as an oil platform or a shore-based facility.<sup>69</sup>

## International environmental law

International environmental law is a rather new branch of international law; the UN’s Stockholm Conference on the Human Environment in 1972 is widely regarded as the moment of “birth” of modern international environmental law.<sup>70</sup> Given this status, this newly emerged body of law mainly consists of various

67 See UNCLOS, Art. 236.

68 *Study on the Naval Arms Race: Report of the Secretary General*, UN Doc. A/40/535, 17 September 1985, para. 188, pp. 54–55.

69 See United Nations Environment Programme (UNEP), *Protecting the Environment during Armed Conflict: An Inventory and Analysis of International Law*, UNEP and Earthprint, Nairobi, 2009, p. 36; Michael N. Schmitt, “Green War: An Assessment of the Environmental Law of International Armed Conflict”, *Yale Journal of International Law*, Vol. 22, No. 1, 1997, p. 48.

70 Jutta Brunnée, “The Stockholm Declaration and the Structure and Processes of International Environmental Law”, in Aldo E. Chircop, Ted L. McDorman and Susan J. Rolston (eds), *The Future of Ocean Regime Building: Essays in Tribute to Douglas M. Johnston*, Kluwer Law International, London, 2008, p. 41; Philippe Sands, Jacqueline Peel and Ruth MacKenzie, *Principles of International Environmental Law*, Cambridge University Press, Cambridge, 2012, p. 888.

declarations and treaties. It has been estimated that there are hundreds or even thousands of environmental treaties worldwide.<sup>71</sup> Due to the huge number of treaties, it would not be possible to analyze them one by one. Taking into account the fact that most environmental treaties mainly offer a series of principles, norms, objectives and coordinating mechanisms; that some of them have provisions similar to Article 236 of UNCLOS, which states that vessels or aircrafts owned or operated by a State are immune to the provisions regarding the protection and preservation of the marine environment;<sup>72</sup> and that these treaties do not directly regulate the use of force at sea, only some fundamental principles of international environmental law that are widely accepted and frequently endorsed by State practice might be applicable to restrict the use of force at sea, and to fill the gaps in international law for the protection of the marine environment that have not already been covered by treaty or custom.<sup>73</sup>

The first of these fundamental principles is the precautionary principle, similar to the IHL principle of precautions in attack, which has already been mentioned above. The precautionary principle in international environmental law was first introduced at the regional level to the regional discussion of marine environmental issues by the First Ministerial Conference on the Protection of the North Sea in 1984.<sup>74</sup> It was then introduced at the international level by Principle 15 of the Rio Declaration on Environment and Development (Rio Declaration) in 1992.<sup>75</sup> Since then, this principle has received widespread support from the international community<sup>76</sup> and has been adopted by many international environmental treaties, either invoked in the preamble,<sup>77</sup> listed as a guiding principle,<sup>78</sup> or provided in the operative parts as a basis for domestic

- 71 See Philippe Roch and Franz Xaver Perrez, "International Environmental Governance: The Strive Towards a Comprehensive, Coherent, Effective and Efficient International Environmental Regime", *Colorado Journal of International Environmental Law and Policy*, Vol. 16, No. 1, 2005, pp. 5–6, claiming that "the number of environmental treaties worldwide has grown to over 500"; and Ronald B. Mitchell, "International Environmental Agreements: A Survey of Their Features, Formation, and Effects", *Annual Review of Environment and Resources*, Vol. 28, 2003, pp. 429–430, which surveyed over 700 multilateral agreements and more than 1,000 bilateral treaties, conventions, protocols and amendments designed to protect the environment.
- 72 See, e.g., International Convention for the Prevention of Pollution from Ships, as modified by the Protocol of 1978 relating thereto, 1340 UNTS 61, 2 November 1973 (entered into force 12 October 1983), Art. 3(3).
- 73 Svitlana Kravchenko, Tareq M. R. Chowdhury and Jahid Hossain Bhuiyan, "Principles of International Environmental Law", in Shawkat Alam *et al.* (eds), *Routledge Handbook of International Environmental Law*, Routledge, London and New York, 2012, p. 43.
- 74 See Patricia W. Birnie and Alan E. Boyle, *International Law and the Environment*, Oxford University Press, Oxford, 2002, p. 116; Simon Marr, *The Precautionary Principle in the Law of the Sea: Modern Decision Making in International Law*, Martinus Nijhoff, The Hague, London and New York, 2003, pp. 89–93.
- 75 Rio Declaration on Environment and Development, A/CONF. 151/26, 14 June 1992 (Rio Declaration).
- 76 P. Sands, J. Peel and R. MacKenzie, above note 70, p. 221.
- 77 See, e.g., the Preamble to the Convention for the Protection of the Marine Environment of the North-East Atlantic, 2354 UNTS 67, 22 September 1992 (entered into force 25 March 1998) (OSPAR Convention); and the Preamble to the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, 2226 UNTS 208, 29 January 2000 (entered into force 11 September 2003).
- 78 See, e.g., Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1673 UNTS 57, 22 March 1989 (entered into force 5 May 1992), Art. 4(2)(a); Convention for the Protection of the Marine Environment of the North-East Atlantic, Art. 2(2)(a); UN Framework



policy-making and legislation.<sup>79</sup> The precautionary principle under environmental law still lacks a consistent definition, but the most widely known definition can be ascribed to Principle 15 of the Rio Declaration.<sup>80</sup> It states that:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall be not used as a reason for postponing cost-effective measures to prevent environmental degradation.<sup>81</sup>

It appears that the precautionary principle may have satisfied the necessary elements to become a rule of customary international law,<sup>82</sup> requiring that decision-makers ought, at the very least, to make themselves aware of the potential effects of what they are sanctioning, in order to be able to determine what level of environmental change or risk of change is “necessary”.<sup>83</sup>

The second principle is the principle of “no harm to foreign environment”, which has already been mentioned above in the context of the law of the sea. In the *Trail Smelter* case in 1941, it was noted that “no state has the right to use or permit the use of its territory in such a manner as to cause injury ... in or to the territory of another”.<sup>84</sup> Later, in 1972, the Stockholm Declaration affirmed in its Principle 21 that “States have ... the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction”.<sup>85</sup> Moreover, “no harm to foreign environment” has been accepted as a fundamental principle by many international environmental conventions, such as the Convention on Biological Diversity, the Convention on the Prevention of the Marine Pollution by Dumping Wastes, the Convention for the Protection of the Ozone Layer, the United Nations Framework Convention on Climate Change and the Stockholm Convention on Persistent Organic Pollutants.<sup>86</sup> In Principle 2 of the Rio

Convention on Climate Change, 1771 UNTS 107, 9 May 1992 (entered into force 21 March 1994), Art. 3 (3).

79 See Timothy O’Riordan and James Cameron, *Interpreting the Precautionary Principle*, Routledge, London and New York, 2013, pp. 255–256; Jacqueline Peel, *The Precautionary Principle in Practice: Environmental Decision-Making and Scientific Uncertainty*, Federation Press, New South Wales, 2005, pp. 31–32.

80 Agne Sirinskiene, “The Status of Precautionary Principle: Moving towards a Rule of Customary Law”, *Jurisprudence*, Vol. 4, No. 118, 2009, p. 351.

81 See Rio Declaration, Principle 15.

82 There have been some controversies amongst scholars in relation to the legal status of the precautionary principle in international law. See, e.g., A. Sirinskiene, above note 80, pp. 351–352.

83 Owen McIntyre and Thomas Mosedale, “The Precautionary Principle as a Norm of Customary International Law”, *Journal of Environmental Law*, Vol. 9, No. 2, 1997, p. 241. Also see Arie Trouwborst, “Prevention, Precaution, Logic and Law: The Relationship between the Precautionary Principle and the Preventative Principle in International Law and Associated Questions”, *Erasmus Law Review*, Vol. 2, No. 2, 2009, p. 123.

84 Report of International Arbitral Awards, *Trail Smelter Case (United States v. Canada)*, UN, *International Law Report*, Vol. 3, 1941, p. 1965.

85 UNGA Res. 3281 (XXIX), 12 December 1974.

86 Convention on Biological Diversity, Art. 3; Convention on the Prevention of Marine Pollution by Dumping Wastes and other Matter, 26 UNTS 2403, 29 December 1972 (entered into force 30 August 1975), Preamble; Convention for the Protection of the Ozone Layer, 1513 UNTS 323, 22 March 1985

Declaration, this principle was not only restated but also specifically connected to armed conflict: “States shall therefore respect international law providing protection for the environment in times of armed conflict and cooperate in its further development, as necessary.”

The third principle is the principle of prohibiting damage to the environment by using force in a particular area, the Antarctic. There are no treaties that explicitly state this, but relevant provisions of several treaties regarding the Antarctic combined definitely have this effect. The Antarctic Treaty of 1959 requires that “Antarctica shall be used for peaceful purposes only”, and that “any military measures, with the exception of use of military assets for scientific research or any other peaceful purpose, are prohibited”.<sup>87</sup> Therefore, any use of force for non-peaceful purposes is prohibited, regardless of its environmental consequences. This restriction may not apply to the use of force as a means of law enforcement. However, even if States may use force in law enforcement actions in the Antarctic area, they are not allowed to discharge oil, oily mixture, noxious liquid substances or any other harmful substance into the sea,<sup>88</sup> in the area south of 60° South latitude.<sup>89</sup>

## Comparing the legal frameworks

IHL, the law of the sea and international environmental law each have rules to restrict the use of force at sea, but the underlying rationale of each is different. However, the lack of clarity surrounding legal norms and obligations regarding environmental restrictions on the use of force at sea raises the question of marine environmental protection under IHL, the law of the sea and international environmental law, each of which is relevant for environmental protection during the use of force at sea but has significant gaps and deficiencies.

## Compatibility and incompatibility

IHL, the law of the sea and international environmental law all establish some environmental restrictions on the use of force at sea. In terms of applicability to the marine environment, IHL regulates the conduct of belligerents and protects the marine environment in times of armed conflict; the law of the sea and international environmental law mainly protect the marine environment in the process of law enforcement during peacetime. Compared with the laws applicable during peacetime, IHL traditionally is a body of law that is exclusively applicable

(entered into force 22 September 1988), Preamble; UN Framework Convention on Climate Change, Preamble; Stockholm Convention on Persistent Organic Pollutants, 2256 UNTS 119, 22 May 2001 (entered into force 17 May 2004), Preamble.

87 Antarctic Treaty, 402 UNTS 71, 1 December 1959 (entered into force 23 June 1961), Art. 1.

88 Annex IV to the Protocol on Environmental Protection to the Antarctic Treaty, 30 ILM 1455, 4 October 1991 (entered into force 14 January 1998), Arts 3(1) and 4.

89 See Antarctic Treaty, Art. 6(1).

during armed conflicts and ceases to apply during peacetime.<sup>90</sup> Although contemporary perspectives increasingly bridge IHL and other bodies of law, applying peacetime international law during armed conflict to varying degrees, the question of their relationship (*lex specialis*) also has to be answered where they apply concurrently,<sup>91</sup> and the extent to which the law of the sea and international environmental law offer protection during armed conflict at sea is not entirely clear.

There are certain discrepancies or even incompatibilities between IHL, on the one hand, and the law of the sea and international environmental law, on the other, with respect to their restrictions on the use of force that affects the marine environment. The problem is, however, that in most IHL treaties, even such basic concepts as “pollution of the marine environment”, as defined by Article 1(4) of UNCLOS, do not exist, and therefore IHL as a body of law lacks adequate rules to restrict pollution of the marine environment. The customary international law so far developed in this regard has only set forth some general principles, without imposing explicit environmental standards on the use of force at sea. Another way to identify the relevant rules is through the case law of international judicial bodies, but there have been no typical cases submitted to any international mechanism of settlement in which the effect on the marine environment of the use of force, either during armed conflict or as a means of law enforcement, was specifically addressed. Therefore, except for some general principles of environmental protection, the question of which specific rules should apply to and determine the limits of the use of force affecting the marine environment has not yet been clarified. After all, it is clear that IHL, the law of the sea and international environmental law should be combined to address the issues of restricting use of force at sea for the purpose of protecting the marine environment; none of them would be sufficient to deal with such issues by itself.

### The applicability of the law of the sea and international environmental law during armed conflict

Since the 1990s, there has been a noticeable shift in the historic belief that laws applicable during war and peace are mutually exclusive. Contemporary perspectives increasingly bridge the two bodies of law, applying peacetime international law during armed conflict to varying degrees.<sup>92</sup> As noted above, neither the ENMOD Convention or AP I proved particularly effective in preventing subsequent wartime environmental damage,<sup>93</sup> while the rules relevant to environmental protection contained in the law of the sea and international environmental law do not specifically and adequately address the problems occurring in the context of armed conflict. However, the applicability of the law

90 See Adam Roberts, “Transformative Military Occupation: Applying the Laws of War and Human Rights”, *American Journal of International Law*, Vol. 100, No. 3, 2006, p. 589.

91 M. Bothe *et al.*, above note 43, p. 580.

92 *Ibid.*

93 J. Wyatt, above note 48, p. 612.

of the sea and international environmental law may build upon the existing rules in order to achieve the maximum legal protection possible for the maritime environment in the context of armed conflict.

Whether or not the law of the sea and international environmental law may be applicable to armed conflicts can be understood from the viability of relevant rules and the contextual approach. Viewed via the viability of rules, international humanitarian rules co-exist with rules of the law of the sea and international environmental law.<sup>94</sup> The law of the sea and international environmental law do not cease to function because of the existence of armed conflict; as indicated in the Guidelines for Military Manuals, it is a general principle of international law that “[i]nternational environmental agreements and relevant rules of customary law may continue to be applicable in times of armed conflict to the extent that they are not inconsistent with the applicable law of armed conflict”.<sup>95</sup> Viewed from the contextual approach, if the rules of the law of the sea or international environmental law are to be applied in times of armed conflict, three conditions must be met: the use of force at sea has affected or impaired the environment; the application is within the scope and terms of the relevant rules, and not incompatible with the rules of IHL as the *lex specialis*; and the rules are contained in such special conventions and agreements as referred to in Article 237 of UNCLOS. While according to Article 237(1) of UNCLOS, the provisions of its Part XXII are without prejudice to the specific obligations assumed by States under special conventions and agreements concluded previously which relate to the protection and preservation of the marine environment and to agreements which may be concluded in furtherance of the principles set forth in UNCLOS, Article 237(2) requires that the specific obligations assumed by States under special conventions, with respect to the protection and preservation of the marine environment, should be carried out in a manner consistent with the principles and objectives of UNCLOS. That is to say, the environmental obligations to be complied with in times of use of force at sea have two dimensions: one is the identification of obligations, requiring that the obligations derived from the law of the sea and international environmental law are compatible with each other; and the other is the implementation of obligations, requiring that the methods of implementing international environmental law are compatible with the general principles and objectives of UNCLOS. In fact, the general principles and objectives of UNCLOS are not only the bottom lines for international environmental law to deal with the protection of the marine environment, but also the minimum requirements for restricting the use of force at sea.

The definitions of some concepts in IHL depend on the law of the sea and international environmental law. Under Article 35(3) of AP I, the employment of methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment is

94 See Report of the Special Rapporteur on the Protection of the Environment in Relation to Armed Conflicts, A/CN.4/674, 30 May 2014, paras 5–6.

95 Guidelines for Military Manuals, above note 34, Rule 4.

prohibited under IHL. However, the term “damage” is not defined in the Protocol itself, and thus the law of the sea and international environmental law may play an informing role. The applicability of concepts and of rules should be consistent with each other. Whether the concepts in UNCLOS and international environmental treaties can be used to clarify some concepts in IHL depends on the applicability of the rules under UNCLOS and international environmental treaties to armed conflict. If such rules are inapplicable during armed conflict, the concepts contained therein cannot be used to clarify the concepts in IHL either, unless they reflect or have become part of customary international law. Even if the law of the sea may not become *lex specialis* in times of armed conflict, given the fact that such treaties as UNCLOS have been universally recognized by States, those concepts may well be used as evidence of customary rules and may be applicable in determining the damage to the marine environment in times of armed conflict. The concept of “pollution of the marine environment” – the main manifestation of damage – defined in Article 1(4) of UNCLOS, and the concepts of biological diversity,<sup>96</sup> substances other than oil<sup>97</sup> and wrecks,<sup>98</sup> may contribute to identifying damage to the marine environment in the context of IHL.

### Common but different principles

There are some fundamental principles that may be invoked to address the issues of protecting the marine environment in the context of use of force, including the principles of necessity, precaution and proportionality, which are common to IHL, the law of the sea and international environmental law. The basic rationale is that the principles of necessity, precaution and proportionality, as legal principles, can be found in IHL and other bodies of law, and that when treaty provisions and any recognized customary international law fail to offer necessary rules to prevent environmental damage caused by the use of force at sea, these principles can play a role “in giving a legal system coherence in terms of a set of norms that express fundamental or at least important values of the system [that are overriding], so that they tend to be regarded as supplying self-sufficient justification of decisions”.<sup>99</sup> Meanwhile, controversies are still fierce in relation to the legal status of these principles and whether they should be treated as general or customary principles of international law.<sup>100</sup> The modalities for the exercise of

96 See Convention on Biological Diversity, Art. 2(1).

97 See Protocol relating to Intervention on the High Seas in Cases of Pollution by Substances other than Oil, 1313 UNTS 4, 2 November 1973 (entered into force 30 March 1983), Art. 1(2).

98 See International Convention on the Removal of Wrecks, 46 ILM 694, 23 May 2007 (entered into force 14 April 2015), Art. 1(4).

99 See Neil MacCormick, *Legal Reasoning and Legal Theory*, Clarendon Press, Gloucestershire, 1978, p. 180; cited in Eloise Scotford, *Environmental Principles and the Evolution of Environmental Law*, Hart Publishing, Oxford and Portland, OR, 2007, p. 44 (emphasis added).

100 See A. Sirinskiene, above note 80, pp. 351–352; Erik V. Koppe, “The Principle of Ambiguity and the Prohibition against Excessive Collateral Damage to the Environment during Armed Conflict”, *Nordic Journal of International Law*, Vol. 82, No. 1, 2013, p. 63; Michael A. Newton and Larry May, *Proportionality in International Law*, Oxford University Press, Oxford, 2014, pp. 33 ff.

these principles differ from one legal area to another. However, small differences between different legal bodies do not prevent the application of common principles, if it achieves the same result, albeit by different means, in different legal areas.

### *Necessity*

The term “necessity” has diverse connotations under different bodies of law governing the use of force at sea. Necessity is closely related to the legality of the use of force at sea, but even the lawful use of force may still affect or impair the marine environment. Under IHL, necessity of the use of force means only that amount of force is justified which is necessary to achieve a legitimate military purpose.<sup>101</sup> In the *Nuclear Weapons* Advisory Opinion of 1996, the ICJ stated that “important environmental factors ... are *properly* to be taken into account in the context of the implementation of the principles and rules of the law applicable in armed conflict”.<sup>102</sup> Therefore, the marine environment may become a legitimate target of the use of force only if it is necessary to achieve a legitimate military purpose.

While the impacts of an attack on the environment should be properly taken into account in evaluating the legality of an attack in armed conflict, the principle of necessity itself is not able to offer clear guidelines for limiting the use of force for the purpose of environmental protection. Similarly, in the context of using force in law enforcement, the principle of necessity only relates to the question of whether such use of force is necessary for the purpose of law enforcement, and thus in no way justifies direct attack on the marine environment.

Since the possible negative impacts of law enforcement actions on the marine environment would usually be caused by improper or excessive use of force, they have to be measured and addressed by other principles than the principle of necessity.<sup>103</sup>

### *Proportionality*

The principle of proportionality applies in the circumstances in which the use of force on a legitimate object may also result in collateral environmental damage. It is very important in terms of use of force, for it serves to reduce the damage caused whenever force is used in the context of either armed conflict or law enforcement operations.

101 Cordula Droegge and Marie-Louise Tougas, “The Protection of the Natural Environment in Armed Conflict: Existing Rules and Need for Further Legal Protection”, in Rosemary Rayfuse (ed.), *War and the Environment: New Approaches to Protecting the Environment in Relation to Armed Conflict*, Martinus Nijhoff, Leiden and Boston, MA, 2014, p.94.

102 ICJ, *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinions, *ICJ Reports 1996*, para. 33.

103 Central to the international law of law enforcement are the general principles of necessity and proportionality. When it is necessary to use force, the force actually used must be no more than the minimum necessary in the circumstances. See Stuart Casey-Maslen and Sean Connolly, *Police Use of Force under International Law*, Cambridge University Press, Cambridge and New York, 2017, p. 354.

Proportionality comes into play when the principle of necessity has been met, but when acting in accordance with the principle of necessity, it may render necessary force unlawful.<sup>104</sup> The key concept with respect to the principle of proportionality is “threshold”. In IHL, if the expected environmental damage caused by the use of force is deemed excessive in relation to the intended military purpose, the threshold is crossed and the attack is prohibited.<sup>105</sup> In the law of the sea, the threshold is expressed as not exposing the marine environment to an unreasonable risk when States exercise their powers of enforcement against foreign vessels.<sup>106</sup> Therefore, the environmental damage caused by the use of force in the context of both armed conflict and law enforcement is tolerated only when the damage does not exceed the extent required by the purpose pursued. However, the use of proportionality cannot justify “widespread, long-term and severe damage to the environment”, which is forbidden in all cases. The principle of proportionality only applies below such a threshold.<sup>107</sup> Despite the inclusion of such expressions as “unavoidable, reasonable”<sup>108</sup> and “minimum use of force”<sup>109</sup> to restrict the methods or intensity of the force used, there are no specific and explicit rules or assessment in either conventional or customary law to determine if a certain damage is above or below the threshold.

Besides, it is not clear if the threshold is the same with respect to armed conflict and law enforcement. Assessment factors of the threshold which should be taken into account in armed conflict include the location of the civilian population and of civilian objects, the terrain, the kind of weapons to be used, weather conditions, and the specific nature of the military objectives.<sup>110</sup> In maritime law enforcement, the location of the objective (whether the vessel is located in protected marine areas, or fish breeding areas), the kind of weapons to be used, the sea condition, the specific nature of the sea area (enclosed or semi-enclosed sea<sup>111</sup> etc.) and the type of cargo on board (oil, hazardous chemicals, radioactive substances etc.) should be considered. If the use of force against a vessel is excessive during law enforcement, the stability of the vessel will be

104 Stuart Casey-Maslen, *Use of Force in Law Enforcement and the Right to Life: The Role of the Human Rights Council*, Academy In-Brief No. 6, ICRC, Geneva, 2016, p. 9.

105 See Silja Vöneky, “Environment Protection in Armed Conflict”, in Frauke Lachenmann and Rüdiger Wolfrum (eds), *The Law of Armed Conflict and the Use of Force: The Max Planck Encyclopedia of Public International Law*, Oxford University Press, Oxford, 2016, p. 380; Carson Thomas, “Advancing the Legal Protection of the Environment in Relation to Armed Conflict: Protocol I’s Threshold of Impermissible Environmental Damage and Alternatives”, in Rosemary Rayfuse (ed.), *War and the Environment: New Approaches to Protecting the Environment in Relation to Armed Conflict*, Martinus Nijhoff, Leiden and Boston, MA, 2014, p. 110.

106 See UNCLOS, Art. 225.

107 P. Benvenuti, above note 45, p. 510.

108 PCA, *Maritime Boundary Delimitation*, above note 15, para. 518.

109 ICJ, *Fisheries Jurisdiction (Spain v. Canada)*, Judgment, *ICJ Reports* 1998, para. 84.

110 See ICRC, *Exploring Humanitarian Law IHL Guide: A Legal Manual for EHL Teachers*, 5 June 2009, available at: [www.icrc.org/en/publication/0960-exploring-humanitarian-law-ehl-guide-legal-manual-ehl-teachers](http://www.icrc.org/en/publication/0960-exploring-humanitarian-law-ehl-guide-legal-manual-ehl-teachers).

111 “Enclosed or semi-enclosed sea” means a gulf, basin or sea surrounded by two or more States and connected to another sea or the ocean by a narrow outlet or consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal States. See UNCLOS, Art. 122.

seriously affected, and this could lead to oil or hazardous chemicals being spilled. When the foreseeable maritime environmental damages are out of proportion with the expected advantage, the use of force is above the threshold. It can also be said that the principle of proportionality may be used to evaluate the effect of the use of force afterwards. But given the different physical nature of the marine environment from the environment on land, this kind of *ex post facto* application would not be sufficient to protect the marine environment.

### *Precaution*

The principle of precaution is pertinent to the regulation of the use of force at sea when there is no sufficient scientific evidence regarding the environmental consequences. The principle of precaution has different roles in IHL, the law of the sea and international environmental law. In IHL, this principle focuses on avoiding harm to civilian lives and related civilian objects, but does not treat the protection of the environment as a priority concern above other considerations. Article 57(2)(a)(ii) of AP I limits the choice of means and methods of attack in order to avoid and minimize incidental loss of civilian life, injury to civilians and damage to civilian objects. In the other two bodies of law, this principle has mainly been used to address such issues as the preservation of marine biological resources and prevention of pollution from toxic and chemical substances. For example, Principle 15 of the Rio Declaration aims to protect the environment itself, and emphasizes that a lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation when threats of serious or irreversible damage exist. In this regard, the environment itself is the direct object of the principle, while the benefit of humankind, such as health, is treated as an indirect beneficiary.

## **Conclusion: The way forward**

### Applying the precautionary principle

The marine ecosystem is a self-contained and self-balanced system that is highly vulnerable to external interferences. It will take a long process for the system to recover from any major pollution, including that caused by the use of force at sea. The damage caused by pollution is difficult to eliminate and sometimes irreversible. With respect to some pollution caused by the use of force at sea – for example, when nuclear-powered ships or ships carrying nuclear weapons are sunk – the possible damage to the marine environment is highly unpredictable but potentially catastrophic. As Christof Heyns wrote in 2014:

Once a situation arises where the use of force is considered, it is often too late to rescue the situation. Instead ... all possible measures should be taken “upstream” to avoid situations where the decision on whether to pull the



trigger arises, or to ensure that all the possible steps have been taken to ensure that if that happens, the damage is contained as much as is possible.<sup>112</sup>

Therefore, given the irreversibility and unpredictability of pollution of the marine environment, the interpretation of the precautionary principle in international environmental law requires that States must, prior to any use of force, conduct environmental impact assessments with respect to such factors as the weapons to be used and the means and methods of warfare to be employed, including the chemical components and scope of effect of the weapons, and the management of the dangerous wastes to be discharged before, during and after the use of force. For example, the issue of using force against ships exists in law enforcement as well as in times of armed conflict, and in this respect, special attention must be given to nuclear-powered ships. Nowadays, not only are many military ships (such as submarines and aircraft carriers) nuclear-powered, but also the number of nuclear-powered civilian ships and platforms is increasing. In future armed conflicts at sea, the use of force against nuclear-powered military ships seems quite probable. It is also possible that nuclear-powered civilian ships and platforms may become the object of the use of force either in law enforcement actions or in times of armed conflict. Once such ships or platforms are attacked and the radioactive substance leaks or sinks, the surrounding area may be immensely polluted and the marine food chain may be severely affected. There are no specific rules regarding nuclear-powered military ships as objects in IHL. Similarly, there are no specific rules regarding nuclear-powered civilian ships and platforms as objects of law enforcement actions in the law of the sea or international environmental law. A set of precautionary rules in this respect will have to be designed in the future development of laws regarding the use of force at sea.

On the other hand, controversies on legal status notwithstanding, it is better to regard the principle of precaution with a functional recognition at the level of State practice. This means that the precautionary principle may provide qualified considerations and discourse frameworks for a State's policy or decisions governing the use of force at sea for the purpose of environmental protection, and may even have the effect of providing guidance and evaluation between States' negotiations and consultations. The need to use force at sea may also be obviated, or at least minimized, by military operations other than war such as arms control. Failure to adopt less harmful measures may lead to a violation of the principle of precaution.

## Restrictions on means of using force

Due to military needs and technological innovations, military weapons are evolving all the time and their impact on the environment is not always predictable. In this

112 Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions, Christof Heyns, A/HRC/26/36, 1 April 2014, para. 63, p. 11.

respect, the Martens Clause<sup>113</sup> – in sum, anything not explicitly prohibited by IHL is not automatically permissible – may play a crucial role. The Martens Clause has been treated as customary international law applicable during armed conflict, and was reaffirmed in slightly different wording by numerous treaties and conventions during the twentieth century, including the 1949 Geneva Conventions and their Additional Protocols of 1977.<sup>114</sup> While many scholars make restrictive interpretations of its scope,<sup>115</sup> even the most restrictive suggests that, even in cases outside the ambit of the Hague Conventions governing international armed conflict, civilian objects continue to be afforded a basic level of protection by the Martens Clause.<sup>116</sup> That is to say, if any new weapons are to be used in armed conflict at sea, regardless of whether there are corresponding legal rules to prohibit or restrict such weapons, they still need to comply with the Martens Clause and the environmental obligations contained in other customary rules of international law.

Regarding weapons used in law enforcement, it is suggested that the use of toxic chemicals as weapons for law enforcement should be limited to riot control agents,<sup>117</sup> and the use of firearms and ammunition that cause unwarranted injury or present an unwarranted risk is prohibited.<sup>118</sup> Even though these requirements mainly concern the effects of weapons on human bodies, the underlying notions may also apply to the environmental effects of weapons: those weapons that may affect or impair the environment, including the marine environment, should not be used in law enforcement, and at the same time, necessary measures must be taken in law enforcement actions to prevent or reduce damage to environment.

## Restrictions on methods of using force

International legal rules regarding methods of using force at sea must be updated. With respect to the use of force at sea in times of armed conflict, methods of naval warfare have evolved to an unprecedentedly complicated level, and this has posed new challenges to international law. The ENMOD Convention, the only special treaty to prohibit changes in the environment for military or any other

113 “Until a more complete code of the laws of war is issued, the High Contracting Parties think it right to declare that in cases not included in the Regulations adopted by them, populations and belligerents remain under the protection and empire of the principles of international law, as they result from the usages established between civilized nations, from the laws of humanity and the requirements of the public conscience.” See Hague Convention II, Preamble.

114 Vladimir V. Pustogarov, “The Martens Clause in International Law”, *Journal of the History of International Law*, Vol. 1, No. 2, 1999, pp. 126–129; Marco Sassòli, Antoine A. Bouvier and Anne Quintin, *How Does Law Protect in War?*, 3rd ed., Vol. 1, ICRC, Geneva, 2011, pp. 10–11.

115 The restrictive interpretations on the Martens Clause, see Ian Henderson, *The Contemporary Law of Targeting*, Martinus Nijhoff, Leiden and Boston, MA, 2009, pp. 29–30.

116 See Zeray Yihdego, “Darfur and Humanitarian Law: The Protection of Civilians and Civilian Objects”, *Journal of Conflict & Security Law*, Vol. 14, No. 1, 2009, p. 41; Michael Salter, “Reinterpreting Competing Interpretations of the Scope and Potential of the Martens Clause”, *Journal of Conflict & Security Law*, Vol. 17, No. 3, 2012, p. 405.

117 ICRC, “Toxic Chemicals as Weapons for Law Enforcement”, 6 February 2013, available at: [www.icrc.org/eng/resources/documents/interview/2013/02-06-toxic-chemical-weapons-law.htm](http://www.icrc.org/eng/resources/documents/interview/2013/02-06-toxic-chemical-weapons-law.htm).

118 Basic Principles on the Use of Force and Firearms by Law Enforcement Officials, Art. 11(3).

hostile purposes, was adopted more than forty years ago and may not be able to adequately address such challenges. While the existing principles and rules from various areas of international law should be combined to deal with those challenges, it is also necessary to envisage a new, specifically designed convention to protect the environment, including the marine environment, from damage caused by the use of force.

With respect to the use of force in law enforcement, it has already been mentioned that States are required to take necessary measures to prevent, reduce and control pollution of the marine environment from any source. The phrase “any source” suggests that this provision covers all sources of pollution of the marine environment in a comprehensive way, including pollution resulting from the use of force in legal enforcement, regardless of the weapons used, the object or any parts of it attacked, or the degree of attack. However, it should be noted that under this clause, pollution should only be prevented, reduced and controlled, rather than being absolutely prohibited, which implies that some minor consequences for the marine environment are to be tolerated.<sup>119</sup>

To sum up, IHL, the law of the sea and international environmental law need to complement each other in order to better protect the marine environment. Given the sheer number of international treaties in related areas, it would be impossible to evaluate each one’s applicability to the use of force at sea. Although it is not entirely clear to what extent the law of the sea and international environmental law offer protection for the marine environment, it is important to consider their potential application during armed conflict, and this application should not go beyond the scope and terms of the relevant rules or be contrary to the special rules of IHL. The restrictions on means and methods of force used can be seen as precautionary approaches that are aimed at avoiding or minimizing damage to the marine environment. The precautionary principle and the Martens Clause should be interpreted and enhanced in order to promote the formation of an international legal regime aimed at better protecting the marine environment in the context of the use of force at sea.

119 See P. W. Birnie and A. E. Boyle, above note 74, p. 181; Robin Rolf Churchill, Alan Vaughan Lowe, *The Law of the Sea*, Manchester University Press, Manchester, 1999, p. 329.