Soundings

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Current and Future Legal Implications Regarding the Use of Military Drones Across Maritime Boundaries

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Executive Summary

As a wealthy island state, Australia has a vital interest in good order at sea. While the Law of the Sea traditionally facilitates this order, the advent of the drone appears to unsettle this characterisation. International law's silence on the classification of drones and their use across military boundaries, particularly in hot pursuit, threatens to challenge the way states operate in the seas. Without law reform, navies around the world will continue to operate with hesitancy and/or incur unnecessary risks in deploying drones.

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Introduction

As humans have progressed from their Neolithic roots, societies have developed laws and legal systems which seek to establish common rules with the aim of promoting efficiency and mutually beneficial conduct. The Law of the Sea[1] is no different, with states and supranational institutions like the UN 'working to ensure the peaceful, cooperative, legally defined uses of the seas and oceans for the individual and common benefit of humankind'.[2] International law, especially the Law of the Sea 'is used to help regulate how the sea is sustainably used by each State, either as an economic resource, a unique environment, or as a means of transportation'.[3] In this regard, navies around the world play an important role in enforcing their own domestic law and international law where applicable. Therefore, international law should function to best facilitate good order at sea for all states and also give navies certainty when lawfully maintaining good at order at sea.

Australia's coastline extends approximately 34,000 kilometres[4] and the '[Australian Defence Force] ADF's maritime area of operations covers approximately 10 per cent of the surface of the world',[5] meaning that Australia has an enormous responsibility to prevent illegal conduct within its maritime zones. However, in the past two decades, the drone has emerged, providing navies like the Royal Australian Navy (RAN) with significant new tools and capabilities to prevent illegal conduct within their maritime zones. The RAN's 2010 *Australian Maritime Doctrine* (AMD) stated that 'UAVs [Unmanned Aerial Vehicles], some of which can be deployed from ships, show great promise for a wide range of uses, as do unmanned underwater vehicles'.[6] While recognising the usefulness of drones in military operations, the ADF has also flagged the possible legal issues related to their use. In 2021, Air Vice-Marshal Cath Roberts said:

Artificial intelligence and human-machine teaming will play a pivotal role for air and space power into the future . . . We need to ensure that ethical and legal issues are resolved at the same pace that the technology is developed.[7]

Military drones raise significant legal issues in relation to their potential use across maritime boundaries. As the proliferation of drone technology increases, the feasibility of the use of drones across maritime boundaries will also increase. This paper will begin by explaining good order at sea. The recent proliferation of drone technology will then be analysed in the context of the feasibility of its use across maritime boundaries, particularly in preventing Illegal, Unreported and Unregulated (IUU) fishing. Thirdly, drones and the maritime zones will be defined with innocent passage outlined, and definitional issues and legal issues related to their use across maritime boundaries will be investigated. Finally, the paper will conclude with proposed law reform.

Figure 1: The span of maritime tasks.

Section 1:

Good Order at Sea

The Law of the Sea is 'concerned with public order at sea'.[8] The term 'good order at sea'[9] refers to the need for states to ensure safety and security of shipping and the safe and secure pursuance of shipping, maritime resources and other maritime interests 'in an ecologically sustainable and peaceful manner in accordance with international law'.[10] As outlined in the 2010 AMD, 'Good order at sea is of paramount importance to Australia' with Australia relying 'upon international law and diplomacy to resolve any differences that may occur among Nation States'. [11]

Maritime forces are useful in a wide spectrum of applications, from 'peaceful human activity through to the highest levels of conflict'.[12] In a doctrinal sense, Australia places heavy emphasis on maintaining

good order at sea. Such maintenance concerns the constabulary function of the RAN (see Figure 1).[13] Tasks inside this function don't strictly involve the use of force and can include resource protection to prevent IUU fishing. It is in this regard that this paper will later argue that the use of drones across maritime boundaries is most feasible, given that the legal issue of hot pursuit involves action against foreign ships undertaking conduct illegal under international or domestic law. The Australian Fisheries Management Authority states that IUU fishing 'is an enduring threat to the sustainability and economic viability of fisheries nationally, regionally and globally'.[14] It is clear that IUU fishing is a threat to good order at sea.[15] A commonly cited example is IUU fishing by China's People's Armed Forces Maritime Militia in the contested South China Sea as degrading good order at sea.[16] However, at the same time, 'the unclear legal position of drones in the Law of the Sea'[17] and 'their potential for deployment'[18] can be seen to threaten good order at sea.

DRONE PROLIFERATION AND FEASIBILITY

The projection of military drones across maritime boundaries is becoming increasingly feasible. Similar to how new technologies in warfare posed new challenges to international law in the 20th century, the advent and proliferation of drone technology is currently posing challenges to international law in the 21st century. Since the September 11 attacks, drone technology has proliferated, with their American deployment in Iraq and Afghanistan revealing their usefulness in military operations, particularly in surveillance, reconnaissance and ground attack applications.[19] In 2020, the global military drone market had an estimated worth of US$10.68 billion and is predicted to grow to US$26.12 billion by 2028. This growth is predicted to accelerate once COVID-19 related delays and inhibited demand abate.[20] Crucially, this proliferation has not occurred exclusively within the US military. By late 2019, 95 countries possessed military drone technology.[21] Throughout this era of drone proliferation, the ADF has made clear the role drones will play in the future of warfare. The 2010 AMD stated that 'UAVs, some of which can be deployed from ships, show great promise for a wide range of uses, as do unmanned underwater vehicles'.[22] The ADF operates a wide range of drones and is procuring

Figure 2: MQ-4C Triton Unmanned Aircraft System.

systems like the MQ-4C Triton (see Figure 2).[23] The ADF will be getting seven Tritons and will operate as 'high altitude long endurance (HALE) aircraft that will be used for maritime patrol and other surveillance roles'.[24] Notwithstanding the enhanced capabilities of drones that the ADF recognises especially with their active procurement, Australia's military leaders also recognise their more subtle de-escalatory value. In a 2021 Defence Science and Technology Group report from a workshop on the ethics of Artificial Intelligence for Defence, stakeholders reported:

> shooting down an unmanned drone has reduced ethical risk, given no harm or loss of life for human operators, providing a new calculus of actions in the achievement of military objectives. The shooting down of a drone may still provoke an escalation in a retaliatory use of force, but to a lesser extent than the shooting down of a crewed aircraft.[25]

Recognising drones' advantages, the ADF and other militaries are investing considerable resources into this technology. Consequently, we are seeing a commensurate increase in the number of unmanned systems deployed and an enhancement of unmanned military capabilities. New systems like the MQ-4C Triton will have a significant maritime intelligence, surveillance and reconnaissance role, replacing conventional manned systems like the AP-3C Orion.[26] In a commercial promotional video, manufacturer Northrop Grumman claims the Triton will perform critical tasks including 'border and infrastructure security . . . illegal fishing detection' and will 'help secure vital ocean resources and territorial integrity'.[27] Therefore, given the MQ-4C Triton's stated use and capabilities, it is entirely feasible that unmanned systems like it will cross maritime boundaries in realising the RAN's constabulary functions such as in preventing IUU. As the proliferation of drone technology increases, so will the feasibility of their use across maritime boundaries. This enhanced feasibility renders the legal issues that I will later explore, all the more feasible and consequential.

DEFINITIONS AND DEFINITIONAL ISSUES

While the title of this paper uses the term 'drone', this is a ubiquitous albeit non-technical term referring to a remote-controlled or autonomous vehicle. The term is useful in that anecdotally its meaning is widely understood with discussion of concepts pertaining to their use made easier as a result. Within the ADF, this term is idiomatic.[28] However, in the naval context, the 'drone' can be more precisely redefined into Maritime Autonomous Vehicle (MAV). MAVs have been defined as '. . . vehicles that operate on,

below or above the ocean's surface and have varying degrees of human control, albeit not on the vehicle itself'.[29] This will be the guiding definition of this paper with the term drone only functioning as an idiomatic placeholder term for MAV.

This paper will seek to split the MAV concept into the following three subsets, which are not authoritative but rather operative for later discussion. While these definitions are taken from different sources, they have been identified with the intention of overcoming any possible definitional problems that may otherwise cloud discussion of the important issues.

MAV subsets	
Unmanned Aircraft (UA)	'A powered, aerial vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, can fly autonomously or be piloted remotely, can be expendable or recoverable, and can carry a lethal or non-lethal payload. Ballistic or semi-ballistic vehicles, cruise missiles, and artillery projectiles are not considered unmanned aerial vehicles.'[30]
Unmanned Surface Vehicle (USV)	'an unmanned vessel that travels on the surface of the water, such as a remote controlled ship.'[31]
Unmanned Underwater Vessel (UUV)	'an unmanned vehicle that operates under the water such as a submarine or underwater research vessel.'[32]

Drone definitions and classifications are integral to the legal issues surrounding their use. During the research for this paper, an important distinction was noted between the drone system and the drone itself. For example, the term Unmanned Aircraft System (UAS) refers to an Unmanned Aircraft (UA) in conjunction with the supporting infrastructure such as 'communications/data links, maintenance, launch and recovery systems'.[33] This can be distinguished from the UA alone. The distinction between drone and drone system is important as it may assist in informing whether a drone is operating as a standalone

independent craft or as an organic component of a mother ship; the distinction is pertinent to questions of constructive presence.

The determination of what may or may not be a UA, USV or UUV may be determined by various metrics including but not limited to dimension, displacement, weight, range, capability, use and any other relevant or applicable metrics. Currently, such determinations are unsettled, with jurisdictions and other authorities having differing interpretations of what type of craft may actually constitute a drone. Determinations impinge the legal issues related to the potential use of drones across maritime boundaries as codified in the United Nations Convention on the Law of the Sea (UNCLOS). Drone determinations could render the craft in an instance to be MAV, military aircraft, warship or craft entirely out of scope. This aspect will be discussed later.

THE MARITIME ZONES AND INNOCENT PASSAGE OF DRONES

Incursion can be defined as 'a hostile entrance into or invasion of a place or territory, especially one of sudden character'.[34] Because foreign incursion into maritime zones strikes at the heart of state sovereignty, it is important to outline the basics of the Law of the Sea and why it matters. 'The concept of national sovereignty is, of course, the cornerstone of international law',[35] with states existing as co-equal sovereigns, each having final authority over their respective territories.[36] At the most fundamental level, international law protects state sovereignty with the Montevideo Convention,[37] which codified 'requirements for statehood in customary international law'.[38] Furthermore, state sovereignty is expressly protected by the UN Charter, which states, 'All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state'.[39] Most critically, state sovereignty extends into the seas, with Article 2(1) of the UNCLOS stating that 'The sovereignty of a coastal State extends, beyond its land territory and internal waters and, in the case of an archipelagic State, its archipelagic waters, to an adjacent belt of sea, described as the territorial sea'[40] and Article 2(2) stating that 'This sovereignty extends to the air space over the territorial sea as well as to its bed and subsoil'.[41] With this in mind, it's clear that foreign maritime incursions when not coming under an exception in accordance with international law – such as innocent passage – fundamentally challenge state sovereignty.

Before investigating what incursions may look like generally, it is essential to outline the maritime zones and the restrictions they may impose on vessels and craft within them. See Figure 3 for a visual representation.[42] In their EEZ, coastal states have the sovereign rights for 'exploring and exploiting, conserving and managing'[43] living resources such as fish.

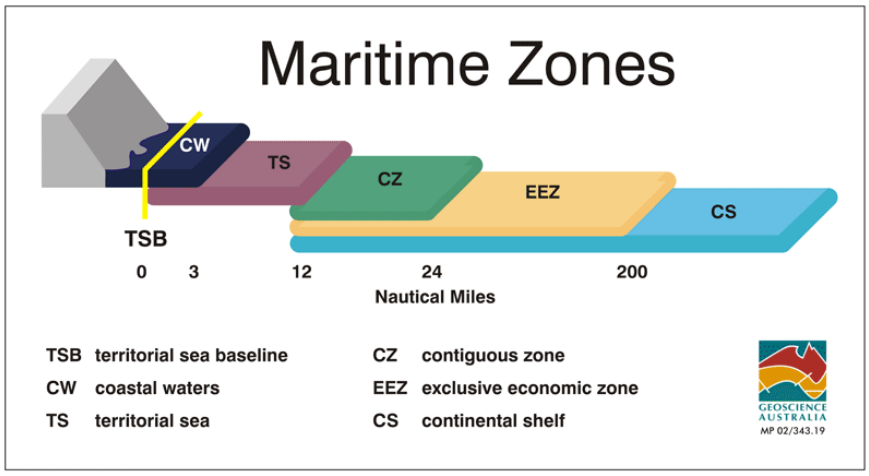

Figure 3: Maritime zone definitions.

It is arguable that the antithesis of incursion is innocent passage, given that it involves the lawful and non-hostile entrance into a place or territory. The right of innocent passage is outlined in Section 3 of UNCLOS and allows ships to enter a state's territorial sea[44] as long as the passage is 'continuous and expeditious'[45] and 'not prejudicial to the peace, good order or security of the coastal State'.[46] While 'Submarines and other underwater vehicles are required to navigate on the surface and to show their flag'[47] when exercising innocent passage, aerial vehicles are entirely forbidden.[48] Article 19(2) exhaustively outlines the activities 'prejudicial to the peace, good order or security of the coastal State'[49] (see Appendix A), while capturing a very broad range of activities, notably including 'any fishing activities'[50] as well as the 'launching, landing or taking on board of any military device'[51] or 'any other activity not having a direct bearing on passage'.[52] In regard to the applicability of innocent passage to drones, US Coast Guard judge advocate Captain Andrew Norris has argued that non-vessel objects or devices cannot exercise innocent passage, with the exception of UUVs. In doing so, Norris cites Article 20's language of 'other underwater vehicles'[53] but concedes this exception is 'at best a tenuous argument'[54] given innocent passage in UNCLOS has a contextual focus on 'ships'.[55] However, Showalter and Manley argue that 'most [drone] operations would be considered prejudicial'[56] given that drone capabilities are usually inherently prejudicial. However, regardless if a UUV or USV may exercise innocent passage generally, 'pursuing a vessel through, or taking direct enforcement action, in the territorial sea'[57] as part of hot pursuit[58] would not be permitted as innocent passage.

It is unclear whether foreign military craft or military activities are permitted in EEZs, with UNCLOS vague on the issue. Article 58 permits freedom of 'navigation and overflight'[59] but that states will have 'due regard to the rights and duties of the coastal states'.[60] This language has caused some states to have different interpretations as to what is permissible. For example, the China asserts that it has the right to restrict foreign military activity and surveillance within its EEZ.[61] This was most infamously seen during the 2001 EP-3 crisis,[62] and the 2009 USNS *Impeccable* Incident.[63] It is important to note that this restrictive interpretation may directly conflict with the right of hot pursuit[64] given that, Article 111(3)[65] states that pursuit only terminates when the ship enters the territorial sea and not the EEZ or even the contiguous zone of the third state. Therefore, it remains uncertain to whether the use of military drones across the EEZ is permitted by international law.

LEGAL ISSUES

No authoritative determination exists of how international law defines UA, USV and UUV. While UNCLOS is silent in defining military aircraft, the Convention on International Civil Aviation simply deems it as 'state aircraft'.[66] Reuland has argued that the definition is 'self-evident'[67] and can be analogised from the definition of warship in UNCLOS[68] (discussed in the next paragraph). While not an authoritative source of international law, the *San Remo Manual on International Law Applicable to Armed Conflicts at Sea* defines military aircraft as 'an aircraft operated by commissioned units of the armed forces of a State having the military marks of that State, commanded by a member of the armed forces and manned by a crew subject to regular armed forces discipline'.[69] The later *Manual on International Law Applicable to Air and Missile Warfare* (MILAMW) modifies the final manned element to also include 'controlled' and 'preprogramed'.[70] It has been argued that the MILAMW definition of military aircraft reflects customary international law.[71] In regard to UA, there is uncertainty as to whether nano or micro UA 'would be defined as a "military aircraft" given their small size, limited range, speed'.[72] RAN reservist Lieutenant Scott Maloney has suggested that they 'may be more properly categorised as an organic component of a larger platform'[73] – namely, a mother ship. In doing so, Maloney cites the MILAMW in that only larger UAs could carry visible state markings and that a determination would 'be a question of fact and degree depending on the circumstances of each individual case'.[74] In this regard, military UAs large enough for this determination could qualify as military aircraft. More significant uncertainty exists to whether USVs or UUVs can be classified as warships given the express definition of 'warship' in UNCLOS as 'bearing the external marks distinguishing such ships of

its nationality . . . manned by a crew which is under regular armed forces discipline'.[75] Analogising and applying Maloney's argument on distinguishing UAs as military aircraft,[76] USVs and UUVs of requisite size having distinguishable external marks could also qualify as warships. However, when reading Article 29 literally, the inherent unmanned character of USVs or UUVs would seem to refuse them warship classification regardless of size. Prominent commentator Professor Rob McLaughlin has argued that USVs and UUVs are more likely to be warships when their operation is less autonomous and under more remote human control.[77] Furthermore, UUVs and USVs can be readily classified as systems of a ship rather than independent warships, when launched off a mother ship, especially when engaged as a 'sensor system'[78] at the behest of the mother ship. Ultimately, the current legal regime of classifying drones as warships, military aircraft or other craft is unauthoritative, contradictory and relies on a range of vague contextual factors. This lack of uncertainty ultimately renders drone usage in hot pursuit legally problematic.

Under the law of hot pursuit, coastal states may pursue a foreign ship outside their EEZ if they have 'good reason to believe' that the foreign ship violated relevant law when within the continental shelf or closer and the pursuit is uninterrupted.[79] Pursuit is only exercised 'by warships or military aircraft, or other ships or aircraft clearly marked and identifiable as being on government service and authorized to that effect'[80] and only commences 'after a visual or auditory signal to stop has been given at a distance which enables it to be seen or heard'.[81] If the pursued ship enters its own state or a third state's territorial waters, then hot pursuit ceases.[82] The case of *M/V Saiga (No 2)*[83] outlined that the 'procedural requirements are cumulative'[84] in order to satisfy legal hot pursuit. Assuming that drones do indeed qualify as craft eligible to conduct hot pursuit under Article 111(5),[85] their use in hot pursuit poses various incidental issues.

Debate exists as to whether drones can validly give a signal to stop. Norris asserts that drones 'could easily initiate pursuit by giving a universally-recognized signal to stop'[86] and that there are no other technical obstacles for compliance.[87] Modern drones are technologically advanced, equipped with vast sensor arrays, encouraging their use from afar. Because the MQ-4C Triton possesses all-weather, high-altitude, over-the-horizon capabilities, it's rendered feasible that suspect vessels could be detected before reaching auditory or visual signal range. Traditionally, radio has been excluded as a signal to stop,[88] seemingly to ensure that the 'warship and the suspect vessel are in close quarters'.[89] However, in the

case of *M/V Saiga (No 2),* the tribunal expressed sympathy with the view that a radio message could constitute an auditory message.[90] Tasikas argues that it is not sufficiently clear whether radio contact qualifies as an auditory signal.[91] However in the *Arctic Sunrise*[92] arbitration, it was established 'that the requirement of a signal to stop must be interpreted in light of present technological capabilities'.[93] Because of the heritage of hot pursuit and the lack of an authoritative determination, it is not certain if radio signals would always qualify as an auditory signal. Given the inherent capabilities of drones, this uncertainty will continue to pose a practical obstacle to the drone in lawfully initiating hot pursuit.

Constructive presence refers to the situation in which a coastal state exercises extended jurisdiction over a foreign mother ship acting in concert with other vessels that are violating relevant law. Such situations are common in IUU fishing scenarios.[94] This idea is applicable to the right of hot pursuit, as a mother ship can be pursued for the violations of its teamed craft within the relevant maritime zone.[95] Importantly, Article 111(4) is uniquely wide by including 'other craft',[96] therefore potentially capturing non-ship drones. However, one issue that arises is legal uncertainty to what constitutes 'team work' or 'mother ship'.[97] In this context, Professor Natalie Klein appears to suggest that an inverse scenario of a foreign ship launching drones could be a mother ship[98] for the purposes of Article 111(4). This argument is supported more so when drones are operating less autonomously and more at the mother ship's behest.

POTENTIAL LAW REFORM

In reflecting on the issues identified so far, there is a clear need for international law reform to clarify the ambiguities and reduce potential risk. From there, the maintenance of good order at sea may be promoted, with the RAN able to undertake its constabulary functions with greater certainty and capability in regard to its use of drones across maritime boundaries. At the UN, there has been moderate activity in clarifying legal issues related to military drones. In 2017, the UN Institute for Disarmament Research released a report canvassing some of the previously mentioned legal issues related to drones. In acknowledging the challenge, the report made clear that 'legal accountability requires a sufficiently shared understanding of common norms, and thus a clear standard of judgement, and it further requires appropriate institutional structures to maintain oversight'.[99] Furthermore, 'existing legal norms are being put under pressure' with the drones' capabilities leading to 'legal situations not previously envisaged on . . . State sovereignty'.[100] The report called for states to propose international law reform while also endorsing the non-authoritative *San Remo Manual* and MILAMW as potential frameworks for change.

The report concluded by warning that a lack of reform will erode international law and 'have deleterious consequences for all'.[101]

The Law of the Sea was not created with drones in mind.[102] At a minimum, the incorporation of *San Remo* and MILAMW into a new treaty or existing treaties like UNCLOS would assist in clarifying uncertainty about the classification of drones, especially in codifying alleged customary international law around the definition of military aircraft. Such reform would allow for greater certainty over the use of UA in hot pursuit permitted by international law. Furthermore, such reform could also serve to crystallise customary international law by providing *Opinio Juris* in regard to warships being able to be 'controlled' and/or 'preprogramed'[103] in conjunction with being manned. Ideally, however, the words 'controlled, manned or preprogramed' would be inserted into the UNCLOS definition of warships[104] to authoritatively include USVs and UUVs in the regime. Another potential reform item is authoritative qualification of 'visual or auditory signal'[105] to include radio or another communication wavelengths. Radio communication has improved in reliability since the signing of UNCLOS in 1982 to the extent that it is ubiquitous among sailors, who have now forgotten flag and light signals.[106] Permitting hot pursuit initiation via radio signal will maximise the usefulness of drones in hot pursuit scenarios and therefore maximise good order at sea in preventing IUU fishing.

Seemingly, the stakes for clarifying the classification of drones and their use in hot pursuit are high, given the financial, reputational and escalatory risks involved with their deployment across maritime zones. For example, following the USNS *Bowditch* incident, China justified its seizure of the US Navy UUV because it was 'unidentifiable',[107] provoking a serious diplomatic incident. In regard to hot pursuit, coastal states improperly exercising their right to hot pursuit may be financially or reputationally liable given Article 111(8) allows for compensation 'for any loss or damage'[108] caused. In pushing for limited international law reform, states like Australia could confidently deploy drones in ensuring good order at sea. Law reform would bring certainty to the classification of drones and their use in hot pursuit to prevent IUU fishing.

Conclusion

As the proliferation of drone technology accelerates, so will the feasibility of drone use by all navies. Drones like the MQ-4C Triton are intended to ensure good order at sea by preventing IUU fishing.

However, international law's silence on the classification and use of drones across maritime boundaries in hot pursuit means that, without reform, increasing the use of drones will significantly disrupt the maintenance of good order at sea. Failing to rectify these issues via limited law reform may expose states deploying drones to vulnerabilities, and may encourage maritime drone operations to occupy the grey zone of military activities, ultimately undermining existing international law and good order at sea as a consequence.

Appendix A

Activities considered to be prejudicial to the peace, good order or security of the coastal state if engaged by a foreign ship in the territorial sea as listed in Article 19 (2) of the UNCLOS.

'2. Passage of a foreign ship shall be considered to be prejudicial to the peace, good order or security of the coastal State if in the territorial sea it engages in any of the following activities:

(a) any threat or use of force against the sovereignty, territorial integrity or political independence of the coastal State, or in any other manner in violation of the principles of international law embodied in the Charter of the United Nations;

(b) any exercise or practice with weapons of any kind;

(c) any act aimed at collecting information to the prejudice of the defence or security of the coastal State;

(d) any act of propaganda aimed at affecting the defence or security of the coastal State;

(e) the launching, landing or taking on board of any aircraft;

(f) the launching, landing or taking on board of any military device;

(g) the loading or unloading of any commodity, currency or person contrary to the customs, fiscal, immigration or sanitary laws and regulations of the coastal State;

(h) any act of wilful and serious pollution contrary to this Convention;

(i) any fishing activities;

(j) the carrying out of research or survey activities;

(k) any act aimed at interfering with any systems of communication or any other facilities or installations of the coastal State;

(l) any other activity not having a direct bearing on passage'[109]

ENDNOTES

[1] United Nations Convention on the Law of the Sea, opened for signature 10 December 1982, 1833 UNTS 397 (entered into force 16 November 1994) ('UNCLOS').

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[43] UNCLOS art 56(1)(a).

[44] UNCLOS art 17.

[45] UNCLOS art 18(2).

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[47] UNCLOS art 20.

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[49] UNCLOS art 19(2).

[50] UNCLOS art 19(2)(i).

[51] UNCLOS art 19(f).

[52] UNCLOS art 19(l).

[53] Norris, Captain A, *Legal Issues Relating to Unmanned Maritime Systems*, p. 34.

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