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**Critical Literature Review  
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***Review of the 1991 Madrid Protocol***

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**Abstract:**

In an environment as fragile and influential as Antarctica, protection and preservation guidelines form an important part of human interaction and governance. As the Antarctic Treaty system developed over the 20<sup>th</sup> Century, environmental issues moved to the forefront of the international discussion. Signed in 1991 and ratified in 1998, the Protocol on Environmental Protection to the Antarctic Treaty was viewed as a ground-breaking legal document, with the capability of enhancing the protection of the Antarctic environment through a comprehensive ecosystem approach. Today, the Protocol is met with significant criticism around issues of implementation, human impacts, and its ability to meet new and distinct environmental challenges. In this review, the successes and failures of the Madrid Protocol will be examined, with the literature showing widespread discontent with the Protocol's environmental capabilities. These perspectives reflect an increasing urgency around the need for changes to be made to the Treaty system, in order to maintain the Antarctic environment for future scientific research, tourism, and other human related activities.

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## **Introduction**

The Protocol on Environmental Protection to the Antarctic Treaty forms a key part of the Antarctic Treaty System (ATS), as it outlines a desire for comprehensive protection of the Antarctic environment as well as its dependant and associated ecosystems. Signed in 1991 and ratified in 1998, the Madrid Protocol is widely considered a “significant turning point in Antarctic conservation, notably because of its prohibition on mineral resource activities” (Antarctic Southern Ocean Coalition, 2011, 3). The Protocol is generally regarded as a success not only in terms of environmental protection, but also in the development of international law and peaceful political interaction. While “Antarctica represents a unique model for development and implementation of international environmental law” (Rothwell, 2000, 592), the then-named ‘world park regime’ has come under considerable criticism in recent years, due to the Protocol’s perceived limitations when attempting comprehensive environmental protection for Antarctica (Rothwell, 1990). This review will look to analyse the Protocol’s successes and limitations in more depth, and critically assess how contemporary factors like human impacts, the changing climate, and international politics challenge the values and management of the Protocol and its main articles.

Reviewing the literature dedicated to the Madrid Protocol enables wider assessments to be made around the Antarctic Treaty System, the historic backdrop of the Protocol, and the interactions of states within the analytical framework of Antarctica. The Protocol’s legitimacy is inherently linked to its ability to realise solutions put forward from within the ATS and consultative parties (Vicuna, 1996). As a piece of international legislation that came into force with such promise, the Madrid Protocol promised to be a significant blueprint for preserving the Antarctic region, but is now regarded as a reactive and limited environmental document (Vicuna, 1996). Growing public perception around environmental protection played a significant part in demanding more comprehensive international legislation to do so, motivating the ATS to depart from the heavily stringent CRAMRA (which allowed mining) – to the Protocol, a document arguably less enforceable, but that wholly prohibited mineral resource extraction (Blay, 1992). When “both marine and terrestrial ecosystems are vulnerable to, and slow to recover from disturbance, environmental rules need to ensure that the unspoiled environment and fragile ecosystem of the land, inland waters and ice-covered areas are maintained and that the ecological relationships and high productivity of the Southern Ocean not be undermined” (Benninghoff & Bonner, 1985, 21).

## **Successes of the Protocol**

Much of the positivity around the Madrid Protocol centres on the idea that the creation of the Protocol itself is a testament to the international goodwill towards cooperatively managing Antarctica and its natural environment and resources. Moreover, it is considered a milestone

in the international management of Antarctica and more generally for international environmental law (Rothwell, 2000). The Antarctic Southern Ocean Coalition (ASOC) recognises a number of the Protocol's strengths, highlighting the high standards of implementation by certain parties and the successful establishment of a Committee for Environmental Protection (CEP). The operation of the CEP involves regular meetings mandated by Article 11, and has been tasked with providing advice for the management of protected areas, with a particular focus on more contemporary challenges and needs. Consequently, the CEP is seen as a workhorse for promoting higher environmental standards. The Protocol also pushed for higher standards of transparency and communication, with Article 17 of the Protocol demanding parties to report annually and give feedback on treaty implementation and standards. As a result, there has been an ever increasing amount of reporting and improved communication between treaty parties (ASOC, 2011).

The Madrid Protocol has also been commended for establishing more stringent rules through the departure of voluntarism and decentralisation towards the 'common commitment' of treaty parties, resulting in much more rigorous environmental principles than had been seen in prior agreements (Elliot, 1994). While an environmental focus had been developing since the signing of the 1959 Treaty, the Protocol's promotion of transparency through entry permits, management plans of research and bases, and wider ranging environmental principles reinforced an 'ecosystem approach'. Elliot (1994) contends that for the first time there existed a standard agreement which impacted on a vast range of Antarctic activities, considered a new and novel approach for both international law and environmental protection at the time. While the establishment of the CEP in providing advice to the parties on the implementation of the Protocol (including the operation of the annexes) was environmentally positive, crucially, it was already causing tension between treaty parties at the time of Rothwell's (2000) article.

## **Criticisms of the Protocol**

### **Keeping up with Developing Challenges**

Central concerns for efficacy of the Protocol have been based around its ability to remain a current piece of environmental legislation amongst rapidly growing environmental pressures. These are arguably not being addressed strategically within the protocol nor by individual nations. The current challenge for the Protocol and the ATS as a whole is how to respond effectively, without allowing territory and resource interests to be the prevailing focus (ASOC, 2011). This sentiment is echoed by a study completed by Hughes *et al.* (2013) that examined the success of Antarctic protected areas and the associated risks in the 21<sup>st</sup> century.

While policy makers may be recognising that the ATS is under considerable environmental pressure, their failure to respond to these challenges in a timely fashion could be having significant negative consequences (Chown *et al.*, 2012). Advancing marine ecosystem

protection is a major governance challenge, and increasing human activity in the region means the risks of human impacts continue to escalate, calling for dynamic planning and implementation, a sentiment echoed by Orheim *et al.* (2009); “the pace of change in Antarctica is beginning to demand a more responsive and proactive system of management” (220). Further, while “the most potential for effective action lies within the Antarctic Treaty itself” (Chown *et al.*, 2012, 159), managing activities and research that push the boundaries of exploitation is a challenge international Antarctic agreements must address. Unfortunately, the reality that their current capabilities to deal with these challenges may be outpaced is becoming more evident.

A significant issue directly related to the Protocol is that the implementation of environmental standards and guidelines vary significantly between stations and national programs. A 2011 report written by ASOC contends that stations in more populated areas of Antarctica (like the Antarctic Peninsula and Ross Dependency) have been subject to more rigorous inspection than those in comparatively remote areas, further impacting the inconsistency of implementation of protocol standards. The limitations of the Protocol are further exposed by observations that in some cases, even after standardised inspection and the exposure of poor environmental practice, (e.g. fuel storage and handling, waste management, and management of former sites) little change is made over as much as 10 year periods (ASOC, 2011). The Protocol essentially relies on the political will of the treaty parties for implementation of its environmental protection principles, and these examples of negligence clearly demonstrate a disregard of certain provisions of the Protocol by National Antarctic Programs (NAP). This demonstrates that the enforcement constraints of the Protocol have allowed for ranging standards of environmental practice from the parties involved (Elliot, 1994).

### **Ambiguity of Key Terms**

The ambiguity of a number of key terms within the Protocol inevitably allows for a range of interpretations by the Treaty parties. In core provisions of the Protocol, Rothwell argues that several terms of the Treaty were deliberately left vague, thus allowing them to be the subject to interpretation by the Treaty parties (2000). This is further exacerbated by a number of technical caveats in the Protocol’s provisions that are regularly exploited by Treaty parties (Rothwell, 2000; French, 1999). Rothwell highlights a number of provisions and annexes whereby significant environmental damage continues to be caused due to the flexibility of the interpretation and implementation of NAPs. Rothwell also notes how Environmental Impact Assessments (EIA) classify all human activities on the basis of impact, but EIAs are deliberately ambiguous in several areas, leaving the possibility of interpretation open once again (Vicuna, 1996). Despite reasserting the conservation of flora and fauna in annex two of the Protocol, Rothwell cites a number of cases where environmental protection has been ignored in the face of the national interests of states. For example, the Protocol’s waste disposal and management practices apply to all human activities in the Antarctic, but the use of the term ‘maximum extent practicable’ allows for a vast range of implementation (Vicuna, 1996).

ASOC's (2011) chief criticism around implementation is how the Protocol relies on the individual and collective efforts of the parties for enforcement, which has already shown to be a particularly fragile basis with which to implement such a comprehensive advisory scheme. While this approach reflects the salient qualities that characterise international law – universally acknowledged as a system that relies on the good-will basis of the parties involved to implement particular goals or strategies – the chronic inconsistency of implementation of the Protocol, and the widening gap between those operating properly and those not, continues to undermine the overall goals of the Protocol and the wider treaty system (ASOC, 2011). Further, the systematic failure to protect the Southern Giant Petrel (as a result of poor handling by SCAR) and the limited commitment of active parties in protecting Antarctica's dependant and associated ecosystems reflects growing concern about the Protocol's effectiveness, and reinforces the idea that the Protocol has not been able to meet the expectations created when it was negotiated (Vicuna, 1996).

### **Tension between Diverging Interests and Antarctica**

That the implementation of the Protocol is largely left to domestic action inevitably causes a range of issues and limitations to Antarctic environmental protection (Vicuna, 1996). In assessing the relationship between sustainable development and environmental protection, French (1999) observes that "Antarctica is a particularly sensitive environment, and one that is important to the biosphere, sustainable development requires that activities there are subject to more stringent conditions and greater levels of environmental protection" (306). Due to this, he asserts that the Protocol attempts to take a philosophical approach to environmental protection in Antarctica (through the conservation of local ecosystems), but the Protocol's efficacy on the ground largely depends on the commitment of the treaty parties to achieve the goals set down originally (Elliot, 1994; French, 1999).

Traditional arguments on the tension between national sovereignty and international environmental regimes argue that states cannot fully commit to global regime principles whilst also maintaining sovereignty norms (Elliot, 1994; Vidas, 2000). Elliot (1994) goes further, claiming that "voluntarism and decentralisation have proved inadequate in managing transboundary or global environmental insecurities" (248). In this way, environmental protection agreements (like the Protocol) are inherently compromised by several, often diverging, national interests. ASOC's (2011) report cites the conflict that occurred during the building of a new Russian station (Larsemann Hills), which was also a proposed ASMA zone, as evidence that national interests tend to prevail over environmental protection, notwithstanding international spaces such as Antarctica.

Even in the absence of overt demonstrations of political relations, Vidas (2000) maintains that the unresolved claims regarding sovereignty and jurisdiction over Antarctica remain omnipresent in the actions of the parties and their inconsistency of implementation of protocol

recommendations and measures. Further, laboured decision making through consensus, due to the divergence of varying national interests, has not helped the Protocol's response to rapidly changing environmental demands. As a consequence, changes have been slow and reactive rather than precautionary (Elliot, 1994). Vidas further contends that if no one has ownership then no one has responsibility to police the protocol and the environment, and thus the ATS struggles to foster genuine and accountable environmental protection at the cost of the treaty parties themselves (2000). These observations highlight the difficulty of creating genuine and accountable environmental protection in a political landscape where sovereignty norms prevail, and "raise the question of whether voluntary restraint and compliance can ever be effective in achieving environmental protection" (Elliot, 1994, 265).

### **Human impacts**

Robust challenges remain regarding the rapidly changing Antarctic climate, with both tourism and national programs significantly contributing to these impacts (Orheim *et al.*, 2009). This perspective reinforces much of the literature in observing that human activity in Antarctica typically takes two forms – scientific activities of NAPs and fee-paying recreation (i.e. tourism)(Shaw *et al.*, 2014). In regards to Antarctic tourism, Hughes *et al.* (2013) reiterate that the regulation of tourism activity has proved a difficult issue. Generally, problems derive from confusion over jurisdiction of 'unofficial' persons, due to tourists not being part of any national programs and therefore national designations. Interestingly, "by 1989, North American operators of ship tours had devised their own environmental guidelines, tired of waiting for the consultative parties to provide more effective guidance on their own" (Elliot, 1994, 257), reflecting further frustration for the speed with which the ATS has historically progressed. Here, multiple criticisms of the Protocol find common ground in the glacial progress of politically minded state interaction; as "the consensus decision making rule which applies to matters of substance, including conservation measures, is politically important, but flawed in terms of ensuring that good environmental rules will be adopted" (259).

Rothwell's (2000) chief criticism of the Protocol is centred on the inadequacy of its provisions in protecting the Antarctic environment against a number of factors, one of them being the tourist industry. Others reinforce that the absence of rules around tourism in the Protocol remains a weakness and is resulting in steady increases in tourism numbers to the Antarctic region (Elliot, 1994; Frenot *et al.*, 2005). A range of observations around Antarctic tourism assert that numbers are mainly concentrated around the Antarctic peninsula due to easy accessibility from South America, trends show popularity moving towards smaller rather than larger tours (offering increased landings and accessibility to different areas), and the range of tourist activities is expanding (e.g. extended walks, kayaking trips)(Frenot *et al.*, 2005). However, sites of high popularity have been known to change over time, presenting further complications to treaty parties and organisations attempting to contain human impacts in Antarctica.

Debate around impacts caused by research is much more contentious (Elliot, 1994). National programs present a distinct range of threats to the Antarctic environment, with far fewer people involved in scientific research than tourism but more wide-ranging contact with the land and sea, oftentimes conducting research for long periods. Hughes *et al.* (2013) characterise the situation as, “Antarctica hosts over 100 research facilities, c. 4000 national operator staff and up to 33,000 tourist landings each year with some areas, particularly within the northern Antarctic Peninsula and Ross Sea Region, experiencing high levels of concentrated long-term activity” (121). Further, regularly impacted areas (by both research and tourism) coincide with those with the highest terrestrial biodiversity, with their levels of resilience largely unclear (Hughes *et al.*, 2013; Frenot *et al.*, 2005). What is certain, however, is that the current ATS and environmental Protocol is not coping with the current risks and challenges associated with wide ranging contaminants threatening the Antarctic ecosystem, and that a range of further mitigation measures need to be considered very soon (Frenot *et al.*, 2005; Hughes *et al.*, 2013).

### **Impacts on ASPAs and ASMAs**

The creation of the Protocol brought forward the system of ASMAs and ASPAs to simplify and assist in the planning and management of protected areas, but this method of protection under the Protocol is perceived as ‘apparent’ and not ‘real’, as areas reflect management *intent* and not management *outcome*. This results in the Protocol outwardly projecting the image that Antarctica is well protected when this is not the case (Shaw *et al.*, 2014; Hughes *et al.*, 2013). This failure of protection is largely due to specially protected sites being situated closer to human activity than would be expected; “while there is a widespread general perception that Antarctica is well conserved, in practice conservation of terrestrial biodiversity from a continent-wide perspective is poorly served by the protected-area system” (Shaw *et al.*, 2014, 3). Evidence also shows that several ASPAs were still experiencing significant levels of traffic to undertake scientific research, overlooking the fact that this may not be in the best interests of the area designated for protection. In this way, the ASPA/ASMA system supports the assessment that Antarctic conservation lags behind environmental and conservation initiatives developed in other parts of the world, where just one set of political objectives/interests must be accommodated. Recommendations are less linear than criticisms in the literature, with some asserting that improvements could be achieved by a network specifically designed to conserve the biodiversity of Antarctica as a whole area with ongoing management efforts (Shaw *et al.*, 2014), whereas others perceive that progress through traditional channels needs to increase dramatically to begin to act proactively about the impact being made on Antarctica by human activity (Hughes *et al.*, 2013; Tin *et al.*, 2008).

## Summary and Conclusions

Despite robust criticism of the Protocol, many scholars still view it as a critical environmental protection document (ASOC, 2011; Vicuna, 1996; Rothwell, 2000), just one that perhaps falls shorter than its original and proclaimed values, and certainly one constrained by a theme of consensus based decision making, that has inadvertently generated mass compromise (Elliot, 1994). In many respects, the Protocol has made significant steps towards environmental protection, but unfortunately the region is experiencing growing environmental pressures that are not being addressed effectively or efficiently (ASOC, 2011). Nevertheless, the Protocol could still be considered an impressive document in international terms (Rothwell, 2000), which, “if compared to an ideal model, [the current system of environmental protection’s] defects may stand out; but if the Antarctic protection system is compared to a model based on what is feasible and realistic, it will be clear that its contribution has been significant” (Vicuna, 1996, 270).

The lack of recent literature making comprehensive assessments of the protocol as the keystone documents for environmental protection in Antarctica arguably reflects the idea that challenges in the scientific, political and legal community are salient and constantly evolving (Hughes *et al.*, 2013). In this way, the host of journal articles and books produced throughout the 1990s reflected a period whereby the academic community genuinely believed that the Protocol could (and would) cater to the range of environmental pressure facing Antarctica at that time. Today, studies are focusing on specific aspects of Antarctic activity (e.g. human impacts, sea ice melt, and temperature changes), perhaps reflecting a broadening and multiplying of challenges facing the Antarctic continent.

The literature also contains infrequent recommendations in regard to improvements to the Protocol or ATS in general. Shah *et al.* (2012) argue that environmental principles must be enacted at the regional and national level of states in order to create meaningful Antarctic legislature, because climate change impacts vary from one local ecosystem to another, and therefore a global legal response can only do so much acting alone. Further, Chown *et al.* (2012) also recommend greater engagement with other international environmental policy instruments and organisations, ideally creating a more robust and accountable system for states and regions to operate within. The need for more effective response alongside a greater commitment to international management from the entire ATS is without question, however, how that will be done remains unclear (ASOC, 2011).

As demonstrated in this review, the Madrid Protocol has no shortage of critics. Despite this, and perhaps because of it “there should be little doubt that the Antarctic is an extremely important place, not only in political, geographical and environmental terms, but also in the wider consciousness of the international community” (French, 1999, 292), and work must continue to be done to properly manage, protect and preserve it. In spite of the developing

perspectives on the Protocol – from its initial and enthusiastic supporters to its modern-day critics – there is a consensus that it remains a central document in governing the Antarctic and its environmental regimes. This review has explored several broad themes of success and failure on the part of the Protocol, and looked towards what could and might be done to mitigate them in the future. Now that the document’s shortcomings and limitations have been well and truly explored, attention must turn to how they can be amended, and further, how best to remain proactive and prepared for governing a rapidly changing Antarctic environment.

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